OBIHAI
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Obihai Technology, Inc.

OBi Device Administration Guide

Models:

OBi1 Series – OBi100, OBi110

OBi2 Series – OBi200, OBi202

OBi3 Series – OBi300, OBi302

Version 01092013 – September 2013

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Introduction

Audience

Cloud Service Providers and Managed Service VARs

Note to End Users

End users are highly encouraged to use the OBiTALK web portal to configure and manage their OBi devices. The reason for this is two-fold. One, the major benefits afforded by the OBi devices are available to be turned on, set-up and modified from within the portal. What's more is the application of the functional configuration is controlled by device configuration files tightly integrated with the settings configured by the OBiTALK portal and cloud-based applications managed by Obihai which make possible the device's "plug-n-play" operation.

Where to Go for Help

Obihai has a number of options available to customers who are seeking help regarding their Obihai products.

Obihai Web Site:

1. Obihai Support Web Site: http://www.obihai.com/support.html
   On this web site visitors will find links to the OBiTALK forum, Documents and Downloads, Tools Tips and Tricks as well as an FAQ / Knowledge Base.
2. Enter a Support Request at: http://www.obihai.com/supportTicketForm.php
3. Go to the OBiTALK forum at: www.obitalk.com/forum
4. E-mail the Obihai Support Team at: support@obihai.com

Notational Conventions

An OBi device configuration parameter and value is represented in the style listed below:

Group Name:: ParameterName = *Parameter Value*

`Group Name` is the heading of the parameter group on the left side panel of the device configuration web page and may contain spaces. When a group heading has more than one level, each level is separated with a -, such as

Services Providers - ITSP Profile A – SIP::

`ParameterName` is the name of the parameter as shown on the web page and MUST NOT CONTAIN ANY SPACES. *`Parameter Value`* is the literal value to assign to the named parameter and may contain spaces. **`Group Name`** or its top level headings may be omitted when the context is clear. Examples:

SP1 Service:: AuthUserName = *4082224312*

ITSP Profile A - SIP:: ProxyServer = *sip.myserviceprovider.com*

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The OBi110 LINE Port and OBiLINE USB to FXO Adapter

A built-in LINE port is available only on the OBi110 model. For OBi models that have a USB Port, an OBiLINE USB to FXO adapter accessory may be attached to provide an additional LINE port. As such, references in this document that describe configuration or behavior of the LINE port or "Li" interface apply to the OBi110 or devices with an OBiLINE USB to FXO adapter attached.

OBiLINE USB to FXO Adapter

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Introduction to OBi Devices

Built with a high-performance system-on-a-chip platform to ensure high quality voice conversations, OBi devices are dedicated systems targeted at applications for voice over IP services. OBi devices have high availability and reliability because they are always-on to make or receive calls. With an OBi device, a computer is not required and a computer does not need to be on to talk to people. To get started, all you need is a phone, power and a connection to the Internet.

OBi Devices:

Model	VoIP Account Support (SIP or Google Voice)	OBiTALK Support	Phone Port(s)	Line Port	Ethernet Port(s)	USB Port
OBi100	Yes – 2 Accounts	Yes	1	0	1	0
OBi110	Yes – 2 Accounts	Yes	1	1	1	0
OBi200	Yes – 4 Accounts	Yes	1	0*	1	1
OBi202	Yes – 4 Accounts (SIP only)	Yes	2	0*	2	1
OBi300	Yes – 4 Accounts	Yes	1	0*	1	1
OBi302	Yes – 4 Accounts (SIP only)	Yes	2	0*	2	1

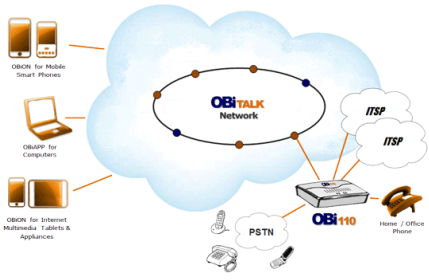
* You may connect an *OBiLINE* USB to FXO adapter to the USB Port of the OBi device to provide an extra Line port. In that case, many of the Line Port related features and configuration parameters described in this guide will be applicable on that device.

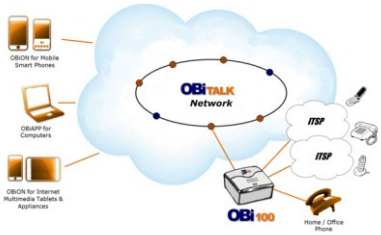
OBi Devices Are Complemented by Other OBi Products & Services

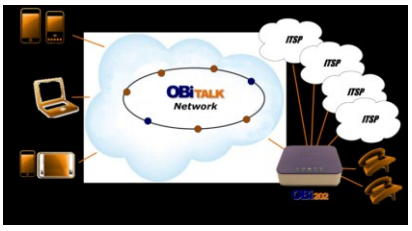
OBiTALK: A customer portal for device management allowing members to add people and associated OBi endpoints to "circles of trust" such that additional functionality can be shared amongst authorized users. The OBiTALK portal is also where members can download the OBiAPP and OBiON applications for PCs and the iPhone, iPad, iPod touch & Android devices, respectively.

OBiON for iPhone, iPad, iPod touch & Android Devices: An application for iPhone, iPad, iPod touch and Android devices which makes possible placing and receiving calls to/from other OBi endpoints.

OBiAPP for PC: An application for a PC that facilitates placing and receiving calls to/from other OBi endpoints.







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Key Features of the OBi Voice Service Bridge / Telephone Adapter:

- Google Voice Support for Up to Four (4) Google Accounts – 2 on the OBi1 Series, 4 on the OBi2 Series
  - Google Voice Support Not Available on the OBi3 Series
- SIP Service Provider Support for Up to Four (4) SIP Accounts – 2 on the OBi1 Series, 4 on the OBi2 and OBi3 Series
- Any Available Service Can be Accessed from Each Phone Port Independently
- Aggregation and Bridging of SIP and/or Google Voice, OBiTALK & Land Line (POTS) Services**
- Automatic Attendant for Simplified Call Routing (AA)
- Call Back Service – Automatic Call Back to Connect User to the AA to Make a New Call or Ring the Attached Phone

** Land line available on OBi110 or with OBiLINE accessory (OBiLINE works with OBi2 and OBi3 Series devices only.).

OBiTALK Web Portal Integration

- Configuration and Management of OBi Endpoints
- Download OBi Client Applications for PCs, Mobile Phones & Internet Devices
- Creating & Joining Circles of Trust So You Can Share Your OBi
- Setting Up Your OBi Endpoint Speed Dial Directory

Configurable to Work with Any SIP Compliant Internet Telephone Service or Google Voice Communications Service
Configurable to Work with Most Loop Start Analog Telephone Lines
Analog Phone & Telephone Line Impedance Agnostic

Robust Telephony Features:

- Message Waiting Indication - Visual and Tone Based
- Speed Dialing of 99 OBi Endpoints or Numbers
- Three Way Conference Calling with Local Mixing
- Hook Flash Event Signaling
- Caller ID – Name & Number
- Call Waiting
- Call Forward - Unconditional
- Call Forward on Busy
- Call Forward on No Answer
- Call Transfer
- Anonymous Call
- Block Anonymous Call
- Do Not Disturb
- Call Return
- Repeat Dialing

Powerful Call Routing & Voice Service Features:

- SIP Support for Voice and Fax Over IP from Internet Telephony Service Providers
- OBiTALK Managed VoIP Network for OBi Endpoint Devices & Applications
- High Quality Voice Encoding Using G.711, G.726, G.729 and iLBC (OBi200/OBi202/OBi300/OBi302 only) Algorithms
- Recursive Digit Maps & Associated Call Routing (Outbound, Inbound)

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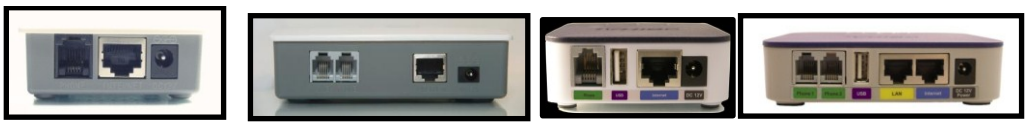
Physical Interfaces of the OBi Device

Overview of the OBi Device Physical Interfaces

Top Views of the OBi100, OBi110, OBi200/300 and OBi202/OBi302
LED Order (Left to Right): Power Status – Internet Port Activity – LAN Port Activity (OBi202) – PHONE Status – LINE Status (OBi110)



Rear Views of the OBi100, OBi110, OBi200/300 and OBi202/OBi302
Port Order (L-to-R): LINE Port (OBi110) – PHONE Port(s) – LAN Port (OBi202/OBi302) – Internet Port – 12v DC Power Jack

OBi Device Feature Comparison

Model	FXS RJ11	FXO RJ11	USB 2.0	WiFi b/g/n	USB-FXO	Blue-tooth	WAN Eth	LAN Eth	SIP/GV	OBi P2P
OBi100	1	-	-	-	-	-	1	-	2 / 2	1
OBi110	1	1	-	-	-	-	1	-	2 / 2	1
OBi200	1	-	1	√	-	√ 2	1	1	4 / 4	1
OBi202	2	-	1	√	√	√ 2	1	1	4 / 4	1
OBi300	1	-	1	√	√	√ 2	1	1	4 / -	1
OBi302	2	-	1	√	√	√ 2	1	1	4 / -	1

- Up to 2 OBiBT devices may be used (USB hub required).

- FXO connectivity may be added to OBi2 and OBi3 Series devices with the OBiLINE USB to FXO adapter.

Connecting Power to the OBi Device

Connect the supplied 12-volt power adapter to the OBi device and the wall outlet or working power strip. Only use the power adapter supplied with the original packaging to power the OBi device. Use of any power adaptor other than what was provided with the OBi will void the warranty and may cause the unit to not function at all or cause undesired operation.

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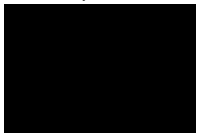
LED Description and LED Behaviour

There are four (4) LED lights on the top of the OBi. They are used to provide the user with a visual indication of the working order and general status of key functional aspects of the OBi device. Under normal operating conditions the LEDs should show green (solid or blinking) signals.

Here below, are specific details/explanation of the OBi LED description and behaviour.

LED Icon	Light Behavior	What It Means
	Off	The OBi is not receiving power.
	Solid Green	The OBi is operational.
	Flashing Green	The OBi is looking for a DHCP IP address.
	Flashing Orange	The OBi is upgrading. DO NOT remove power!
	Solid Red	The OBi is non-operational.
LED Icon	**Light Behavior**	**What It Means**
	Flashing Green (Intermittent)	Light flashes when there is data activity on the OBi Internet Ethernet port.
	Flashing Green (Intermittent)	Light flashes when there is data activity on the OBi LAN Ethernet port. (OBi202 Only)
LED Icon	**Light Behavior**	**What It Means**
OBi100 & OBi110: OBi202 & OBi302: OBi200/OBi300: 	Off	The port is not enabled. Otherwise: - If the Primary Line is the PSTN LINE, indicates OBiTALK service is not available. - If Primary Line is SP1/SP2/OBiTALK, indicates the corresponding primary service is not available (but the secondary services may still be available).
	Solid Green	The phone is ready to be used: - If the Primary Line is the PSTN LINE, indicates OBiTALK service is available. - If the Primary Line is SP1/SP2/OBiTALK, indicates the corresponding primary service is available.
	Flashing Green	The phone is in use.
	Fast Flashing Green	The phone is ringing.

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	Programmable using the phone port's MWILedTimer parameter Available on Obi2 Series and Obi3 Series Only	New voicemail available (MWI)
LED Icon	**Light Behavior**	**What It Means**
OBi110 Only	Off	The port in not enabled.
	Solid Green	The line is ready to be used.
	Flashing green	The line is in use.
	Fast Flashing Green	The line is ringing.

LED Pattern When Hardware Reset Button Is Pressed for Ten (10) Seconds:
Power LED blinks green slowly for 5 seconds and fast for 4 seconds preceding unit reboot.

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Internet Connection Set-Up and Configuration

Connect one end of an Ethernet cable to the OBi INTERNET port and the other end of the Ethernet cable to an Ethernet port on your Internet router or Ethernet switch. By default the OBi will request an IP, DNS and Internet (WAN) Gateway IP addressing via DHCP.

PHONE Port Set-Up and Configuration

A phone has a very basic UI (User Interface) for I/O (Input / Output) of signalling or control messages.

The OBi PHONE port supports input signalling and control messages comprised of: On Hook, Off Hook, Hook Flash, DTMF tones.

The OBi PHONE port supports output signalling and control messages comprised of: Caller ID/CWCID, MWI, DTMF/Tone, Ring, Pol-Rev, CPC, Power Denial.

The OBi PHONE port has a Maximum Sessions capacity of two (2). This is not configurable.

The OBi PHONE port will reply BUSY to a new incoming call when:

- The PHONE port already has 2 calls in session.
- The PHONE port is ringing the phone.
- The phone is in a dialing or fast busy "Invalid" state.
- The OBi is already in a FAX call.

The OBi PHONE port supports Call Waiting when a 2nd call is an inbound call:

- A Hook-Flash (or depressing the Flash button) invokes switching between two (2) calls.
- When the OBi PHONE port goes On-Hook this will end current call and invoke a ring for the holding call.

The OBi PHONE port supports 3-way Calling when the second call is an outbound call.

On the first Hook-Flash during an active call the OBi can make a second outbound call.

On the second Hook-Flash, the first call and the second outbound call are placed in a conference.

To remove the second conferenced party, invoke a third Hook-Flash.

When the OBi goes On-Hook during a 3-way Call, this will become a transfer when 2nd (outbound) call is ringing or connected. If the 2nd (outbound) call does not succeed, e.g. no answer or busy, then the OBi PHONE port can go to an On Hook state and will ring as the holding call is still on the line, or simply Hook-Flash to resume the first call.

The OBi PHONE port can select from the following services to which it can complete a call: SP1 Service (SP1), SP2 Service (SP2), SP3 Service (SP3), SP4 Service (SP4), OBiBlueTooth 1 Service (BT1), OBiBlueTooth 2 Service (BT2), OBiTALK Service (PP1), and PSTN Line (LI1).

PHONE PORT:: DigitMap

PHONE PORT:: OutboundCallRoutes

PHONE PORT:: CallReturnDigitMaps

Using the OBi as a Paging System

You may connect the OBi PHONE port to an external PA system via an RJ11-to-Line-Out connector (available at many popular electronics shops), and enable the PHONE port option UseForPagingOnly. In this configuration, the phone port is expected to be "off-hook" all the time. The OBi will automatically answer incoming calls. It will not accept call-waiting.

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When the phone port goes from on-hook to off-hook, in case the user needs to dial * * * to invoke the IVR, the OBi will play a dial tone for 5 seconds. After 5 seconds the OBi will turn silent and be ready to accept an incoming call to page.

Primary Line

By default, devices which come with an analog (PSTN) line port will use this as the Primary Line for outbound calls made from the PHONE port and via the OBi Auto Attendant. This means that when you dial a new number using the AA, you do not need to first dial a service route access code. You can select the Primary Line for the PHONE port and for the AA, respectively, using the parameters **`PHONE Port::`**`PrimaryLine` and **`Auto Attendant::`**`PrimaryLine`.

Depending on the device model, you may add up to two (2) or four (4) SP VoIP services to the OBi, and attach a PSTN line to the LINE Port as an additional voice service. The VoIP services can be SIP-based services or the Google Voice service (SIP only on OBi302 and OBi300). In addition, all device models come with the free OBiTALK (peer-to-peer) service. In this document we sometimes refer to any one of these voice services as a *trunk*. A trunk group (TG) is a (comma-separated) ordered list of trunks. If a TG is selected for making an outbound call, the OBi will pick the first available member in that trunk group for the call. Up to four (4) TGs can be defined in an OBi (see the section *Trunk Groups* for detail).

You can make one of the available trunks or TG1 as the Primary Line for outbound calls. The Primary Line for the PHONE port(s) and the Auto Attendant is configured via the OBi device management web page described herein or the OBiTALK Device Configuration VoIP Service Provider set-up screen also gives the user the option to select a trunk or TG1 as the Primary Line. The list below summarizes the choices available for selection as the primary line:

- SP1 Service
- SP2 Service
- SP3 Service
- SP4 Service
- OBiTALK Service
- PSTN Line[1]
- OBiBlueTooth[1]
- OBiBlueTooth 2[1]
- Trunk Group 1
- Trunk Group 2[1]

When you want to make a call via a service that is not the Primary Line, you will need to dial that service's access code before the destination number.

The default service route access codes are defined as:

- ** 1 : SIP Service Provider 1 or Google Voice Service 1 (SP1)
- ** 2 : SIP Service Provider 2 or Google Voice Service 2 (SP2)
- ** 3 : SIP Service Provider 3 or Google Voice Service 3 (SP3)
- ** 4 : SIP Service Provider 4 or Google Voice Service 4 (SP4)
- ** 8 : PSTN Line Port Service (LI) on OBi110[1]
- **70: PSTN Line Port Service (LI) on OBi200/OBi202/OBi300/OBi302[1] Requires OBiLINE Accessory
- **8 or **81: OBiBlueTooth 1 Service (BT1)[1]
- **82: OBiBlueTooth 2 Service (BT2)[1]

[1] A dedicated LINE Port is available only on the OBi110 or devices with an attached OBiLINE USB to FXO adapter accessory. OBiBlueTooth is available only on devices with an attached OBiBT USB adapter accessory. OBiBlueTooth 2 is available only on devices with two OBiBT USB dongles attached. Trunk Group 2 is not available as a choice of primary line on OBi100/OBi110.

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- ** 9 : OBiTALK Network (PP)

Service route access codes for calling from the PHONE port can be customized if necessary by modifying **PHONE Port::**DigitMap and **PHONE Port::**OutboundCallRoute. Service route access codes for calling via the Auto Attendant can be customized if necessary by modifying **Auto Attendant::**DigitMap and **Auto Attendant::**OutboundCallRoute.

Note: Occurrences of (Mpli) and pli are substituted internally with the corresponding abbreviated trunk name of the selected primary line.

LINE Port Set-Up and Configuration

Like a PHONE port, a LINE port has a basic UI (User Interface) for I/O (Input / Output) of signalling or control messages:

The OBi LINE port supports the following inputs: DTMF, Polarity, CPC, Caller ID, Ring, Tone

The OBi LINE port supports the following outputs: DTMF/Tone, On Hook, Off Hook, Hook Flash*

The OBi LINE port will assume a call is Connected on the following conditions:

End of dialing for outbound calls

Off-hook for inbound calls

The OBi LINE port will assume a call is Disconnected on the following conditions:

Power Down, CPC, Long Silence, or Disconnect Tone

Note: The OBi LINE port and system logic will not attempt to invoke or interpret PSTN supplementary services. This is directly between the user and the Phone Company.

- To signal hook-flash to the PSTN Line during a call from the phone attached to the PHONE port, **Phone PORT::**HookFlashHandling must be set to *Send Flash Hook to PSTN*

Features Available on the OBi2 Series and OBi3 Series Models

Sharing Files on an External USB Storage Device

The OBi2 Series models have a USB port that can be attached to an external USB storage device, such as a USB flash drive or USB hard disk drive. The device's native web server includes functionality for browsing the contents on the attached USB device and sharing them selectively with other parties.

There are three levels of access to an attached USB storage device, *admin*, *user*, and *anonymous*. Admin and user level access are protected by a User ID and Password. The admin will have full access while a user level access can be restricted. Anonymous access is limited to read-only without being prompted by the OBi device to enter a User ID or Password. To have admin level access, one must login with the User ID "admin" and provide the corresponding password. To login as a user, one must login with a valid User ID and provide the corresponding password. Up to 10 User IDs can be specified in the OBi device's configuration for user level access, and each User ID can be enabled individually and assigned a different set of restrictions with the following attributes:

- Home Directory: This specifies where in the device directory tree the user nay start browsing.
- File Filter: This specifies which file types the user can see and manipulate. File filters are limited to filename suffixes such as *.jpg; *.mp3
- Write Enable: This specifies whether the user can upload, delete, copy, cut and paste files or create new directories on the USB device. Note: By default, read/file-download access is granted to all users.

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Use the following URLs on a web browser to launch the OBi File Explorer:

- For anonymous level access: http://<OBi-IP-Address>/obi_share/anonymous
- For admin or user level access: http://<OBi-IP-Address>/obi_share

The File Explore can be launched from either the WAN or LAN side of the OBi. The WAN side access can be disabled in the configuration.

IP Routing and LAN Switching Features (OBi202 and OBi302 Only)

OBi202 and OBi302 have two Ethernet ports labelled as the Internet port and the LAN port. The OBi works as a router by default. All the native voice services and features use the WAN port only when the OBi202/OBi302 is in router mode. The OBi can also be set to work as a 3-port switch (a.k.a. Bridge mode), by changing its OperationMode parameter from Router to Bridge. Note: One of the switch ports is for OBi202/OBi302 internal use only.

IP Routing Features

In router mode we refer to the network connected to the OBi Internet Port as the WAN side of the OBi202/OBi302, and the network connected to the OBi LAN Port the LAN side of the OBi. The WAN side may be connected to another Ethernet switch or directly to an access device such as a cable or DSL modem for Internet access. The OBi202/OBi302 routes traffic between the LAN side and the WAN side, thus allowing the devices (such as PCs) attached to the LAN side to share Internet access. The OBi202/OBi302 supports subnet masks as big as 255.255.255.0 to accommodate up to 253 IP addresses on its LAN side subnet.

In addition to being a NAT (Network Address Translation) router, the OBi202/OBi302 includes a DHCP server, a DNS forwarder and a basic firewall. It supports port forwarding, DMZ, QoS, and VLAN (802.1q). The maximum routing throughput between the WAN and the LAN side is approximately 30 Mbps. This speed can be achieved when there are no active calls in the system. Otherwise the throughput will be limited to a slower speed to accommodate the load for voice processing. Note that if the WAN side is connected to an Internet access device directly, then the throughout could be further limited by the speed of the Internet uplink and downlink.

The OBi202/OBi302 will acquire its WAN side IP address using one of the following methods: Static Address Assignment, DHCP, or PPPoE. By default, the OBi202/OBi302 acquires its WAN side IP address using DHCP. Also by default, the OBi202/OBi302's own DHCP server is enabled to support LAN side clients, e.g. PCs. The default LAN side IP address of the router is 192.168.10.1.

Incoming packets receiving from the WAN side are forwarded by the router according to the following flow:

- If firewall is enabled, discard the packet if it is rejected by any one of the active firewall components
- If the sending host address matches a valid entry in an internal host binding table, queue the packet for local processing. This binding table is updated by the router with an internal algorithm.
- If the sending host address matches a valid entry in an internal NAT binding table, forward the packet to the corresponding LAN IP address. The NAT binding table is updated by the router with an internal algorithm.
- If the receiving port and protocol matches a reserved pair to support an internal process (e.g. TCP Port 80 for the OBi202 web server process), queue the packet for local processing.
- If the receiving port and protocol matches a port forwarding rule, forward the packet to the LAN IP address according to that rule.
- If a DMZ host is configured, forward the packet to that LAN IP address.
- Queue the packet for internal processing.

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DHCP Server

By default, the built-in DHCP server is enabled on the OBi202/OBi302. It assigns IP address, network mask, DNS server and default gateway address to the DHCP clients on the LAN side. The default gateway and DNS server have the same IP address as the LAN side IP address of the router. In the DHCP server configuration, you may select the range of client IP addresses to give out the Lease Time and the Local Domain Name. Furthermore, by using the DHCP reservation feature, you may reserve specific IP addresses for some devices with specific MAC addresses. With this, those devices can always be assigned the same IP addresses reserved for them each time they make a request to the DHCP server. See the LAN Settings and DHCP Reservation sections for more details.

Firewall

The firewall protects local processes and LAN side clients against certain basic threats from the WAN side (or the Internet), such as port scanning and a DOS (Denial of Service) attack. The firewall settings also allow you to selectively turn on or off the following related features:

- NATRedirection – Supports NAT Redirection (a.k.a NAT Loopback or Hairpin) if enabled (default is disabled).
- DRDOSAttackProtection – Protects against DOS attack if enabled (default is disabled).
- VPNPassThrough – Blocks all VPN traffic if disabled (default is enabled).

The settings of these features will take effect only if firewall is enabled. Otherwise, they will take on their respective default values (that is, no NATRedirection or DRDOSAttackProtection and VPNPasssThrough is allowed).

Port Forwarding

Up to 20 port forwarding rules may be defined on the OBi. For each rule a range of ports and a designated receiving LAN IP address must be specified such that incoming traffic arriving at any of those ports on the WAN side are forwarded to the same port at the designated IP address on the LAN side. You may also specify for each rule if it should only apply to packets transported over UDP, TCP or both.

DMZ

The DMZ host in the router is the default LAN client address to which a packet received from the WAN side is forwarded when the router fails to find a matching LAN IP address or matching local process to forward the packet to. Note if firewall is enabled, that the packet is still subject to firewall inspection before forwarding to the DMZ host.

QoS

QoS (Quality of Service) refers to the prioritization of network traffic based on the type of traffic. For example, time critical traffic such as VoIP may be allocated the highest priority so they can have a better chance of on time delivery to the destination. On the OBi202, QoS policy applies to upstream traffic (LAN-to-WAN) only. Downstream QoS is entirely up to the ISP / upstream routers and switches. The upstream traffic is prioritized according to its type of service as indicated by the DiffServ/TOS bits in the IP header of each packet. In the QoS settings, you may map the 64 possible types of service to one of the three priority classes: High, Medium and Low. You may also specify the guaranteed minimum upstream bandwidth for each priority class. LAN side clients indicate the desired priority class of their outbound packets to the router by marking the DiffServ/TOS bits of their packets accordingly. See the QoS Settings section for more details.

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In addition to the three priority classes, a fourth priority class known as the **Restricted** class is available. The Restricted class has the highest priority among the four classes. The guaranteed bandwidth for the Restricted class is allocated separately with its own parameter in the configuration.

Note that the total guaranteed bandwidth allocated to all the four priority classes is equal to the total available uplink bandwidth, which must be specified correctly in the UpStreamBandwidth parameter in the QoS settings for QoS to work properly.

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VLAN Support in Router Mode

In router mode, the OBi202/OBi302 can support VLAN (802.1Q) on the WAN side. When VLAN is enabled, incoming packets from the WAN side not belonging to the same VLAN are dropped, while all outgoing packets to the WAN side are tagged with the configured VLAN ID. The VLAN support is transparent to the devices on LAN side. The router removes the VLAN tag when forwarding packets to the LAN side.

LAN Switching Features

Instead of acting as a router, the OBi202/OBi302 can be set to work as a 3-port switch. One of the ports is internal and is used by the OBi202/OBi302 CPU only, while the two external ports (labelled as Internet and LAN) can be connected to other devices. This mode of operation is known as the bridge mode. In this mode, all the router features, such DHCP server, firewall and port forwarding, will not take effect. The QoS policy in this case is hardwired such that the native voice and related traffic will always have highest priority (this behavior is not configurable). Furthermore, accessing the OBi device management web pages from either of the two external ports is always allowed.

VLAN Support in Bridge Mode

When VLAN is enabled, packets sent to the OBi not belonging to the same VLAN are dropped, while packets sent by the OBi are tagged with the configured VLAN ID. The packets switched directly between the external ports, on the other hand, are not modified by the OBi.

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End User Features Available on the OBi

OBiTALK Web Portal:

The OBiTALK Web Portal allows you to manage your OBi endpoints and their relation to other endpoints in your Circle of Trust. OBiTALK is a web portal and OBi configuration utility which helps OBi users configure devices for optimum savings and access applications which make using OBi with even more convenience.

OBi Circles of Trust

The OBiTALK Web Portal is also where you can set-up Circles of Trust. The Circles of Trust provide a means to team-up with other people with OBi devices and endpoints so that everyone's calls can be made as inexpensively as possible.

OBiON iPhone & iPod Touch + Android Smart Phone Apps

After setting up an account and logging in to the OBiTALK portal, users may download applications for their iPhone and Android smart phones.

OBiAPP for PC Soft Phone App

After setting up an account and logging in to the OBiTALK portal, users may download applications for their iPhone and Android smart phones.

OBi Works with Your Existing Services

If you do not want to configure a new service in order to make free calls using your Internet connection you can simply plug in your existing analog line from your telco phone service or connect the line coming from an VoIP service (from an ATA or cable EMTA) to the OBi. Connect your telephone to the OBi's phone port and you are ready to call other users' endpoints on the OBiTALK network.

Bridge Your Services for Optimum Savings & Convenience

With the OBi device, you can bridge multiple services to route calls in the most efficient cost-effective way. You can connect your telco phone service to the OBi at your house and use your PC or Apple iPhone, iPod touch or Android Smart phone to bridge a call from the OBiTALK network to the phone landline or Internet phone service connected to the OBi device at home.

Call Forwarding

Call Forwarding allows you to send incoming calls to another number of your choosing. Calls can be forwarded to a number reachable from the landline service, VoIP service or OBiTALK network. The following types of call forwarding are possible with the OBi:

Call Forward ALL: When you use Call Forward ALL, all calls are immediately forwarded to the number you indicate when you turn on the feature. To enable Call Forward ALL, from a phone attached to the OBi, dial *72. You will be prompted to enter the number to which the calls will be forwarded. Dial the number plus the # key and a confirmation tone will be heard. To disable Call Forward ALL, dial *73. A confirmation tone will be heard.

Call Forward on Busy: When you use Call Forward on Busy, all calls are forwarded to the number you indicate only when you are already engaged in a call with your phone attached to the OBi. To enable Call Forward on Busy, from a phone attached to the OBi, dial *60. You will be prompted to enter the number to which the calls will be forwarded. Dial the number plus the # key and a confirmation tone will be heard. To disable Call Forward on Busy, dial *61. A confirmation tone will be heard

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Call forward on No Answer: When you use Call Forward on No Answer, all calls are forwarded to the number you indicate only when you do not answer the call with your phone attached to the OBi. To enable Call Forward on No Answer, from a phone attached to the OBi, dial *62. You will be prompted to enter the number to which the calls will be forwarded. Dial the number plus the # key and a confirmation tone will be heard. To disable Call Forward on No Answer, dial *63. A confirmation tone will be heard.

Caller ID – Name & Number

Caller ID allows you to see the number and (if available) the name of the person calling you. You can use this information to decide whether or not to answer the call. You must have a phone (or device) that supports caller ID to use this feature.

Call Waiting

Call waiting lets you take a second call that comes in when you are already on the phone with another party and not have to disconnect to take the new call. When you are on the line with the first party, you will hear a tone signalling you there is a second call coming in. To answer this call, press the "flash" button on your phone or depress and release the switch hook on the telephone. The first party will be placed on hold and you will be connected to the second party until you press the "flash" button or depress and release the switch hook again.

Since Call Waiting can interfere with fax calls already in progress, it is advised that you configure your fax machine to dial the Cancel Call Waiting code before it dials the destination fax machine.

3-Way Calling

3-Way Calling allows you to talk to two parties at the same time with everyone on a telephone at a different location. To use 3-Way Calling, when you are in a call with another party and want to add a second to the conversation, press the "flash" button or depress and release the switch hook on your phone. You will be presented with a second dial tone and the first party will be placed on hold. Dial the second party. When they answer, you will be able to inform them that you intend to connect them with the first party (now on hold) and have a conference. At this point press the "flash" button or depress and release the switch hook on your phone. This will connect the first party, the second party and yourself. You can all continue to talk together.

Call Transfer (Attended)

You can transfer a call to a third party using the attended transfer capabilities of the OBi. To use Attended Call Transfer, while in a call with the party who will be transferred, press the "flash" button or depress and release the switch hook on your phone. You will be presented with a second dial tone. The party who will be transferred will be placed on hold. Dial the transfer target. When the transfer target answers, you will be able to inform them that you intend to connect them with the party on hold. At this point press the "flash" button or depress and release the switch hook on your phone. This will connect the party to be transferred, the transfer target and yourself. You can continue to talk together, as this is now a 3-way call, or you can hang up the phone and the other two parties will remain connected.

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Nordic Style Feature Invocation

In the above description of call waiting, 3-way calling, and call transfer operations, the way the features are invoked is referred to as N. America style. In Nordic regions (such as Sweden, Norway), the same features are invoked by hook flashing followed by a digit 0, 1, 2, 3, or 4 to more precisely control which operations to apply to the calls. For these regions, the phones may also be equipped with an R button for hook flashing. The commands issued to the OBi are referred to as R0, R1, R2, R3, R4, and R5. Here is a summary of the operations:

Commands	Operations	Scenarios
R0	Reject the 2nd incoming call	1st call connected, 2nd call ringing
R1	End the 1st call. Resume or answer the 2nd call	1st call connected, 2nd call on hold or ringing
R2	Hold 1st call. Resume or answer the 2nd call (swap calls)	1st call connected, 2nd call on hold or ringing
R3	Keep the 1st call. Resume or answer the 2nd call (conference)	1st call connected, 2nd call on hold or ringing
R4	Transfer 2nd call peer to the 1st call peer	1st call connected, 2nd call on hold or connected

To select the Nordic style of feature invocation, set the parameter PHONE Port::CallCommandSignalMethod to “Nordic Regions (R1, R2, …)”. The default is: N. America.

Caller ID Block (Anonymous Calling)

Caller ID Block allows you to mask your name and number information from appearing on the phone you are calling. To use Caller ID Block for one call only, dial *67 and then the destination number. To use Caller ID Block on a persistent basis, dial *81 from the handset attached to the OBi. All calls will use the Caller ID Block feature until you cancel the Caller ID Block. To cancel Caller ID Block, dial *82 from the handset attached to the OBi.

Note: This service feature requires ITSP support. While most ITSP services support this service feature, at present, Caller ID Blocking is NOT available with Google Voice service.

Automatic Call Back (Call Return)

Automatic Call Back, also called Call Return can be used to call back the last caller who called you without actually dialing their number. To use Automatic Call Back, from the phone attached to the OBi, dial *69. The OBi will then attempt to use the previous callers Caller ID information to make the call.

Repeat Dialing

Repeat Dialing is useful when you call a number that is busy and you want to keep trying so that your call gets through when the far end is available. Repeat dialing will continue to try the last number until the OBi device can complete the call or Repeat dialing is cancelled. To enable repeat dialing, from the phone attached to the OBi, dial *05 and hang up. To cancel repeat dialing, from the phone attached to the OBi, dial *06.

Anonymous Call Block

Anonymous Call Block allows you to block calls from incoming callers when there is no identifying caller ID name or number. Incoming calls will be presented with a busy signal. To use Anonymous Call Block, from the phone attached to the OBi, dial *77. To cancel Anonymous Call Block, from the phone attached to the OBi, dial *87.

Do Not Disturb

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Do Not Disturb (DND) allows you to set the phone to immediately forward calls made to your OBi to the number set-up as your voicemail number / account. If no voicemail account is set-up, the OBi will return a busy signal to the caller until you turn off DND. To turn on DND, from a phone attached to the OBi, dial *78. To turn off DND, from a phone attached to your OBi, dial *79.

Message Waiting Indication – Visual and Tone Based

Message Waiting Indication allows you to be notified when there is a new voice message for you. The OBi supports both Visual and Tone based Message Waiting Indication. With Tone-based Message Waiting Indication, you will know there is a message for you when you hear a "stutter" dial tone right when you first pick up the phone to make a call. Typically, this stutter tone will be removed once you listen to your message(s). Visual-based Message Waiting Indication will turn on a light or screen icon on your phone (or phone base station) when there is a message waiting for you. Typically, this light or icon will go dark when you have listened to your new message(s).

Speed Dialing of 99 OBi Endpoints or Numbers

The OBi device supports Speed Dialing of 99 numbers. These numbers can be associated with phones reachable via an Internet or landline service or the OBiTALK network. Be careful with the Speed Dial Set-Up as this will conflict with the Speed Dials set-up on the OBiTALK portal. The Speed Dials that are set-up on the OBiTALK portal will always overwrite anything set-up via the phone connected to the OBi.

PHONE 1/2 Collaborative Features (OBi202 and OBi302 Only)

While PHONE 1 and PHONE 2 can function independently of each other, the OBi202 and OBi302 also offer some collaborative features to let the two phone ports work together as a mini phone system.

With the factory default digit map and call routing rules, you can dial a single "#" (pound/hash) digit to call from one phone port to ring the other phone port. Depending on the current state of the called phone, one of the following can happen:

1. If the called phone is idle (on-hook), it will ring normally with a special Caller-ID that indicates the call is from the other PHONE Port.
2. If the called phone is already on a call, the calling phone will barge in to join the call.
3. If the called phone is on-hook with a call on-hold, the calling phone will pick up and resume that call.
4. If the called phone is ringing, the calling phone will pick up and aswer that call.
5. For all other scenarios, the calling phone will hear busy tone.

Note that you can prevent the calling phone port from doing 2, 3 and 4, as they can be disabled by setting the parameter EnablePhonePortBargeIn to false for that port. In that case, 2 will become normal call-waiting on the called phone, but the calling phone will hear busy tone for 3 and 4.

You can also transfer an external call from PHONE 1 to PHONE 2 the usual way: while connected on an external all, hook flash and dial # to ring the other phone, then hang up to transfer when the caller phone rings or answers.

For incoming calls on any trunk (SP1-4 or OBiTALK Service), one can set up the corresponding inbound call route to ring just PHONE 1 or PHONE 2 or both. The default inbound call routes are setup to ring both phone ports.

For outgoing calls, each phone port has its own digit map and outbound call route configuration, which means that you have the full flexibility in allocating trunks for making calls from each port independently. Each port may also have a different primary line assigned; the default however is to set the prmary line to SP1 for both phone ports.

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Star Code Features

The OBi device supports service features via the handset connected to the PHONE port. The following Star Codes can be used to access the indicated features. OBi Star Code Enabled Features Apply to All Voice Services.

*03, Request peer device to loopback media in the next outbound call

*04, Request peer device to loopback RTP packets in the next outbound call

*05, Tell device to periodically redial the last called number until the called party rings or answers

*06, Cancel the last repeat dial request

*07 Redial

*69 Call Return

*81 Block Caller ID (Persistent Mode)

*82 Unblock Caller ID (Persistent Mode)

*67 Block Caller ID (One Time)

*68 Unblock Caller ID (One Time)

*72 Call Forward All (Enter Number + #)

*73 Disable Call Forward All

*60 Call Forward on Busy (Enter Number + #)

*61 Disable Call Forward in Busy

*62 Call Forward on No Answer (Enter Number + #)

*63 Disable Call Forward No Answer

*77 Block Anonymous Calls

*87 Unblock Anonymous Calls

*56 Enable Call Waiting

*57 Disable Call Waiting

*78 Do Not Disturb – Turn On

*79 Do Not Disturb – Disable

*66 Repeat Dial

*86 Disable Repeat Dial

*74 Speed Dial Set-Up (Enter SD No. [1-99] then Tel No. + #) ∞

*75 Speed Dial Read-Back (Enter SD No.)

*76, Clear a Speed Dial

*96, Barge In

*98, Blind Transfer

*4711, Use G711 Only on the next outbound call

*4729, Use G729 Only on the next outbound call

28, Make OBiBT Bluetooth Adapter discoverable for the next 120s (OBI202 only) and set it as OBiBlueTooth 1

29, Make OBiBT Bluetooth Adapter discoverable for the next 120s (OBI202 only) and set it as OBiBlueTooth 2

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∞ Note: Be careful with the Speed Dial Set-Up as this will conflict with the Speed Dials set-up on the OBiTALK portal. The Speed Dials that are set-up on the OBiTALK portal will always overwrite anything set-up via the phone connected to the OBi.

* Note: You must attach one and only one OBiBT dongle to the unit when using this star code; otherwise the operation will fail.

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Call Forward Numbers

There is one set of Call Forward Settings per voice service on the OBi, such that the settings apply to incoming calls on that service only. However calls may be forwarded to numbers on the same service or on another service. Therefore each call forward number stored in the OBi configuration MUST include call routing information to let the device know which voice service should be used to forward the call to. The general format of a call forward number is:

TK(number)

Note: *TK* is the abbreviated name of a voice service.

Valid values of *TK* are SP1 for the SP1 Voice Service (with ITSP A or B), SP2 for the SP2 Voice Service (with ITSP A or B), LI1 for the PSTN service (on the LINE Port), or PP1 for the OBiTALK Service.

The *number* to forward to must be in the final form that is acceptable by the service provider. OBi will not apply any Digit Map or Call Routing Rules on it.

Examples: SP1(14089991234), PP1(ob200333456)

You may also set the call forward number to a phone port (ph, ph1 or ph2) or the AA (aa)

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Configuration and Management Interfaces of the OBi Device

Telephone-IVR-Based Local Configuration

The OBi utilizes an interactive voice response (IVR) system for both its configuration and day-to-day function. The IVR is, in essence and automated attendant the OBi user will access to either invoke a verbal response from the OBi to provide information to the user (such as IP address) or instruct the OBi to act on the routing / placement of a call to a particular interface. More information about the Auto Attendant IVR for OBi call processing will be provided later in the document.

There are two IVR menus.

1. Auto Attendant IVR 1: Referred to as "aa" (or aa1) for call processing commands.
2. Auto Attendant IVR 2: Referred to as "aa2" for local configuration.

If settings require reboot, it will be done automatically when quitting the IVR.

IVR (AA2) invoked by *** as default.

Tip: By pressing the appropriate button sequence on the telephone key pad, you can barge into the next menu of the IVR or invoke a command without first waiting for the previous announcement to end.

Main Menu configuration options are accessed by pressing *** * *** from a phone attached to the PHONE port of the OBi, followed by a single digit of the option number as listed below:

Selection	Announcement	What Can You Do?
1	Basic Network Status Your IP address and DHCP status will be read back to you.	Press 0 to repeat the information.
2	Advanced Network Status Your primary & back-up DNS server, primary & back-up NTP server will be read back to you.	Press 0 to repeat the information.
3	DHCP Current Value Your current value will be read back to you and you will be given the option to change the value	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information.
4	IP Address Current Value Your current value will be read back to you and you will be given the option to change the value. If you elect to enter a new value (static IP address) DHCP will be disabled.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information.
5	Password Current Value Your current IVR password value will be read back to you and you will be given the option to change the value.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information.

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6	Please Wait (while OBi is checking for software update)… This is followed by either: - Software Update Available. Press 1 to update software, OR - Software Update Not Available	If an update is available, press 1 to proceed with the update. The software update process will start as soon as you hang up the phone. Warning: Once the software upgrade process starts, the device's power LED will blink rapidly. Please make sure the power and network cable stay connected to the unit until the process is complete.
8	Restore Factory Default	Press 1 to confirm device restore to factory default settings. Press # to return to device configuration menu. Press # # to exit IVR.
9	Reboot OBi Device	Press 1 to confirm device reboot. Press # to return to device configuration menu. Press # # or hang up to exit IVR.
0	Additional Options Access other configuration options of the OBi device.	Enter option followed by the # key.

Note for OBi202 and OBi302: Options 1 – 4 apply to the WAN (Ethernet) interface only. These options will appy to OBiWiFi instead if the WAN (Ethernet) interface is not connected and the OBiWiFi Wireless Adapter is connected to a Wi-Fi access point. To access similar options that apply specifically to OBiWiFi, we recommend use of options 41 – 44 instead to avoid ambiguity.

System Level Configuration Options

Additional Configuration Options Available with the OBi IVR after Pressing *** * * 0**:

Selection (Always Press "#" After Entering Selection)	**Announcement**	**What Can You Do?**
1	Firmware Version The current value of the firmware version will be read back.	Press 0 to repeat the information. Press # to enter another configuration selection.
2	IVR Password	Press 1 to enter a new value.

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	The current value of the IVR password will be read back.	Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
3	Debug Level The current value of the debug level will be read back.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
4	Syslog Server IP Address The current IP address of the syslog server will be read back.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
5	Syslog Server Port The current value of the syslog server port will be read back.	Press 1 to enter a new value. Press 2 to set the default value of 514. Press 0 to repeat the information. Press # to enter another configuration selection.
81[3]	Factory Reset just the Voice configuration parameters. Leave the Router configuration parameters unchanged	Press 1 to confirm. Press # to enter another configuration selection
82[3]	Factory Reset just the Router configuration parameters. Leave the Voice configuration parameters unchanged	Press 1 to confirm. Press # to enter another configuration selection

Network Related Configuration Options

Additional Configuration Options Available with the OBi IVR after Pressing *** * * 0**:

Selection (Always Press "#" After Entering Selection)	**Announcement**	**What Can You Do?**
20	DHCP Configuration The current value of the DHCP configuration will be read back.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information.

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		Press # to enter another configuration selection.
21	IP Address The current value of the IP address will be read back.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
22	Default Gateway The current value of the default internet gateway will be read back.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
23	Subnet Mask The current value of the subnet mask will be read back.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
24	DNS Server (Primary) The current value of the primary DNS server will be read back.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
26	NTP Server (Primary) The current value of the primary NTP server will be read back.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.

Router Related Configuration Options (OBi202 and OBi302 Only)

Additional Configuration Options Available with the OBi IVR after Pressing *** * * 0**:

Selection Note: Always Press "#" After Entering Selection	**Announcement**	**What Can You Do?**
30	Enable Web Management Access from WAN port The current value will be read back.	Press 1 to enter a new value. Press 2 to set the default value.

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	(Effective in Router mode only) 0: Disable Access from WAN 1: Enable Access from WAN	Press 0 to repeat the information. Press # to enter another configuration selection.
31	Choose Router or Bridge Mode The current value will be read back. 0: Router 1: Bridge	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
32	Enable DHCP Server on LAN side in router mode The current value will be read back. 0: Disable DHCP Server 1: Enable DHCP Server	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
33	Enable Firewall in router mode The current value will be read back. 0: Disable Firewall 1: Enable Firewall	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
38	Enable QoS feature in router mode The current value will be read back. 0: Disable QoS 1: Enable QoS	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.

OBiWiFi Network Related Configuration Options (OBi2 Series and OBi3 Series Only)

Additional Configuration Options Available with the OBi IVR after pressing *** * * 0**:

Selection Note: Always Press "#" After Entering Selection	**Announcement**	**What Can You Do?**
40	DHCP Configuration The current value of the DHCP configuration will be read back.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.

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41	IP Address The current value of the IP address will be read back.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
42	Default Gateway The current value of the default internet gateway will be read back.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
43	Subnet Mask The current value of the subnet mask will be read back.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
44	DNS Server (Primary) The current value of the primary DNS server will be read back.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
46	NTP Server (Secondary) The current value of the Secondary NTP server will be read back.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.

SIP Service Provider Configuration Options

Additional Configuration Options Available with the OBi IVR after Pressing *** * * 0** for SIP Service Provider One (SP1):

Selection (Always Press "#" After Entering Selection)	**Announcement**	**What Can You Do?**
100	Enable Service Provider One (SP1) The current value will be read back.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information.

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		Press # to enter another configuration selection.
101	Registration State of SP1 The current value will be read back.	Press 0 to repeat the information. Press # to enter another configuration selection.
102	SP1 User ID The current value will be read back.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
167	SP1 Block Caller ID Enable	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
168	SP1 Block Anonymous Call Enable	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
172	SP1 Call Forward ALL – Enable / Disable	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
173	SP1 Call Forward ALL Number	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
174	SP1 Call Forward on Busy – Enable / Disable	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.

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175	SP1 Call Forward on Busy Number	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
176	SP1 Call Forward on No Answer – Enable / Disable	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
177	SP1 Call Forward on No Answer Number	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.

Additional Configuration Options Available with the OBi IVR after Pressing *** * * 0** for SIP Service Provider Two (SP2):

Selection (Always Press "#" After Entering Selection)	**Announcement**	**What Can You Do?**
200	Enable Service Provider One (SP2) The current value will be read back.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
201	Registration State of SP2 The current value will be read back.	Press 0 to repeat the information. Press # to enter another configuration selection.
202	SP2 User ID The current value will be read back.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
267	SP2 Block Caller ID Enable	Press 1 to enter a new value.

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		Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
268	SP2 Block Anonymous Call Enable	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
272	SP2 Call Forward ALL – Enable / Disable	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
273	SP2 Call Forward ALL Number	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
274	SP2 Call Forward on Busy – Enable / Disable	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
275	SP2 Call Forward on Busy Number	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
276	SP2 Call Forward on No Answer – Enable / Disable	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
277	SP2 Call Forward on No Answer	Press 1 to enter a new value.

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	Number	Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.

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OBiTALK Configuration Options

Additional Configuration Options Available with the OBi IVR after Pressing *** * * 0**:

Selection (Always Press "#" After Entering Selection)	**Announcement**	**What Can You Do?**
900	Enable OBiTALK Service The current value will be read back.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
901	Registration State of OBiTALK The current value will be read back.	Press 0 to repeat the information. Press # to enter another configuration selection.
967	OBiTALK Block Caller ID Enable	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
968	OBiTALK Block Anonymous Call Enable	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
972	OBiTALK Call Forward ALL – Enable / Disable	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
973	OBiTALK Call Forward ALL Number	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
974	OBiTALK Call Forward on Busy – Enable / Disable	Press 1 to enter a new value. Press 2 to set the default value.

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		Press 0 to repeat the information. Press # to enter another configuration selection.
975	OBiTALK Call Forward on Busy Number	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
976	OBiTALK Call Forward on No Answer – Enable / Disable	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
977	OBiTALK Call Forward on No Answer Number	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.

Auto Attendant Configuration Options

Additional Configuration Options Available with the OBi IVR after Pressing *** * * 0**:

Selection (Always Press "#" After Entering Selection)	**Announcement**	**What Can You Do?**
80	Enable / Disable Auto Attendant.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.

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LINE (FXO) Port Configuration Options[1]

Additional Configuration Options Available with the OBi IVR after Pressing *** * * 0**:

Selection (Always Press "#" After Entering Selection)	**Announcement**	**What Can You Do?**
90	Enable / Disable FXO LINE Port The current value will be read back.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.
91	FXO State The current value of the state will be read back.	Press 0 to repeat the information. Press # to enter another configuration selection.
92	Ring Thru Delay The current value will be read back.	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection.

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Customized AA Prompt Recording Options

Additional Configuration Options Available with the OBi IVR after Pressing *** * * 0**:

Selection (Always Press "#" After Entering Selection)	**Announcement**	**What Can You Do?**
1001	Option 1001 current value is: (the recorded prompt)	Press 1 to enter a new value. Press 2 to set the default value. Press 0 to repeat the information. Press # to enter another configuration selection. Note: After pressing 1 to record a new prompt, the OBi says "Enter value followed by the # key)\". At that point, you can press any digit (0-9) to start recording, and then press # to end recording. Tips: Leave about 1s of gap at the end of recording to avoid unintended truncation by the OBi. After a new prompt is recorded, Obi immediately plays back the recorded audio, and then presents the following options: Press 1 to save (save the recorded prompt permanently in long term memory) Press 2 to re-enter (the last recorded prompt is discarded) Press 3 to review Press # to cancel (the last recorded prompt is discarded)
Similarly for Options 1002 - 1010		

With these options you can record up to 10 prompts which can be arranged in any combinations and used as customized AA prompts. Each prompt recording is limited to 60s, where the prompt duration is rounded to the nearest number of seconds. A total of 122s is available to store all the recordings. The device will reboot automatically when you hang-up if any of the prompts have been modified and saved. Furthermore you can enter a text description for each recorded prompt as a reminder of the contents of the prompt (under the Voice Services - Auto Attendant configuration page).

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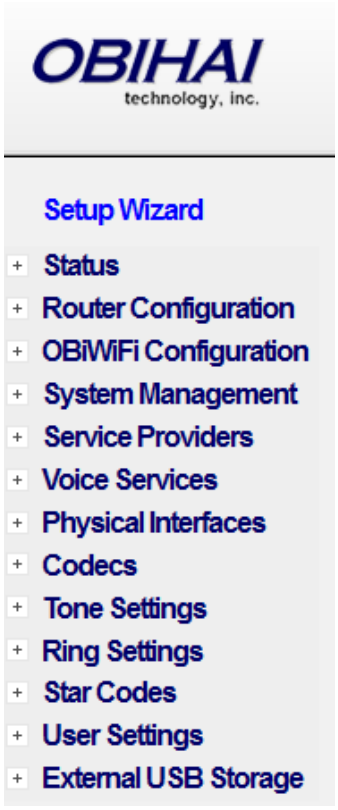
Web Server-Based Local Configuration



The OBi device has an integrated device management web server which can be accessed from a PC or similar device using a browser. Although all popular browsers are tested for compatibility with the OBi device management web server, there may be inconsistencies which arise from time to time. Please contact support@obihai.com if you have any questions about the OBi device management web server and how it appears in your browser window.

Access the OBi Device Management Web Page:

1. From a phone attached to the OBi, dial *** * *** to access the OBi Config Attendant.
2. Choose "**1**" to hear the IP Address of the OBi read back to you. Write this down.
3. Enter the OBi IP Address in a local PC web browser address field:
4. When prompted, enter "admin" for user name and "admin" for password.

When you access the OBi device management web page, you will be prompted for a user name and password. There are two levels of access to the OBi web page – User Level and Admin Level. The default "user name / password" for User Level access is "user / user". The default "user name / password" for Admin Level access is "admin / admin". The Admin and/or User passwords may have been changed using the OBi device web page, provisioning by a service provider or via the OBiTALK web portal (Admin only). Please be sure you have access to the correct Admin or User password before you attempt to log on to the OBi Device Management Web Page.

The OBi device management web page is organized into sections to allow for a manageable and compartmentalized approach to configuring the many hundreds of parameters available on the OBi device. Use the expandable / collapsible menu tree on the left side of the page to easily navigate the various configuration parameter sections of the OBi device.

IMPORTANT: Every configuration page must be submitted individually after changes made on the page. Otherwise those changes will be discarded once you navigate to another page. Most changes will require a reboot of the unit (by clicking the reboot button for instance) to take effect. However, you may reboot the unit just once after you have made and submitted all the necessary changes on all the pages.

When the device is operating in router mode (OBi202/OBi302 only), the built-in web server may be accessed from the LAN side or the WAN side. While access from the LAN side is always allowed, for security reasons, the access from the WAN side may be disabled by configuration. In fact, the WAN side access to the web server is disabled by default. You can enable this option on the device web page (from the LAN side), or by using the device configuration IVR (* * * 0 option 30) from an attached telephone.

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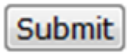
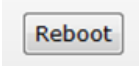
Web Page Conventions and Icons & Buttons:

Icon / Button	Description	Remark
	This icon indicates that there is more information available which might describe the workings, limits or thresholds for the parameter to which it is adjacent. You can mouse over this icon to reveal this information.	
	When a modification has been made to a parameter on a page, the Submit button MUST be clicked before proceeding to another page.	
	If you make changes to a parameter on a page and you do not want to keep them for submission, click the "Clear Changes" button to revert back to the parameter setting present before the most recent change was entered.	
	Click the "Use Defaults Only" button if you want to revert all parameters on a given page to their Default settings. If you want to revert just one or two parameters on a page to default settings you should use the Default check box found on the right side of the parameter. See next Item.	You will be prompted to confirm that you want all the parameters on the page to revert back to system default settings.
	When you wish to modify a parameter away from its default setting, you should un-check the 'Default' box. This will open the parameter field for access and modification. If there is a non-default setting in a parameter field and you want to revert that parameter back to its default setting, check the "Default" box and the default setting will appear.	Default value of a parameter may be changed with a firmware upgrade. Leaving a parameter at default setting allows the device to use proper default value with the firmware currently installed in the device
	This icon indicates that the configuration currently programmed on the OBi device is "set" and "running". No reboot is necessary if you have submitted configuration modifications.	This icon does not indicate the currently running configuration is working properly.
	After Submitting changes to a web page on the OBi, the "Reboot Required" icon may appear. In order for the modifications to run, you will need to reboot the OBi.	You can continue to make modifications to OBi parameters – on separate pages if necessary – before you reboot and "set" the modifications in the running system.
	The "Reboot" button is used when the "Reboot Required" icon appears indicating the OBi device requires a reboot to invoke one or more parameter modifications.	When performing a System Configuration Reset, the Reboot button does not need to be pressed. The OBi will reboot automatically when the "Reset" button is selected.

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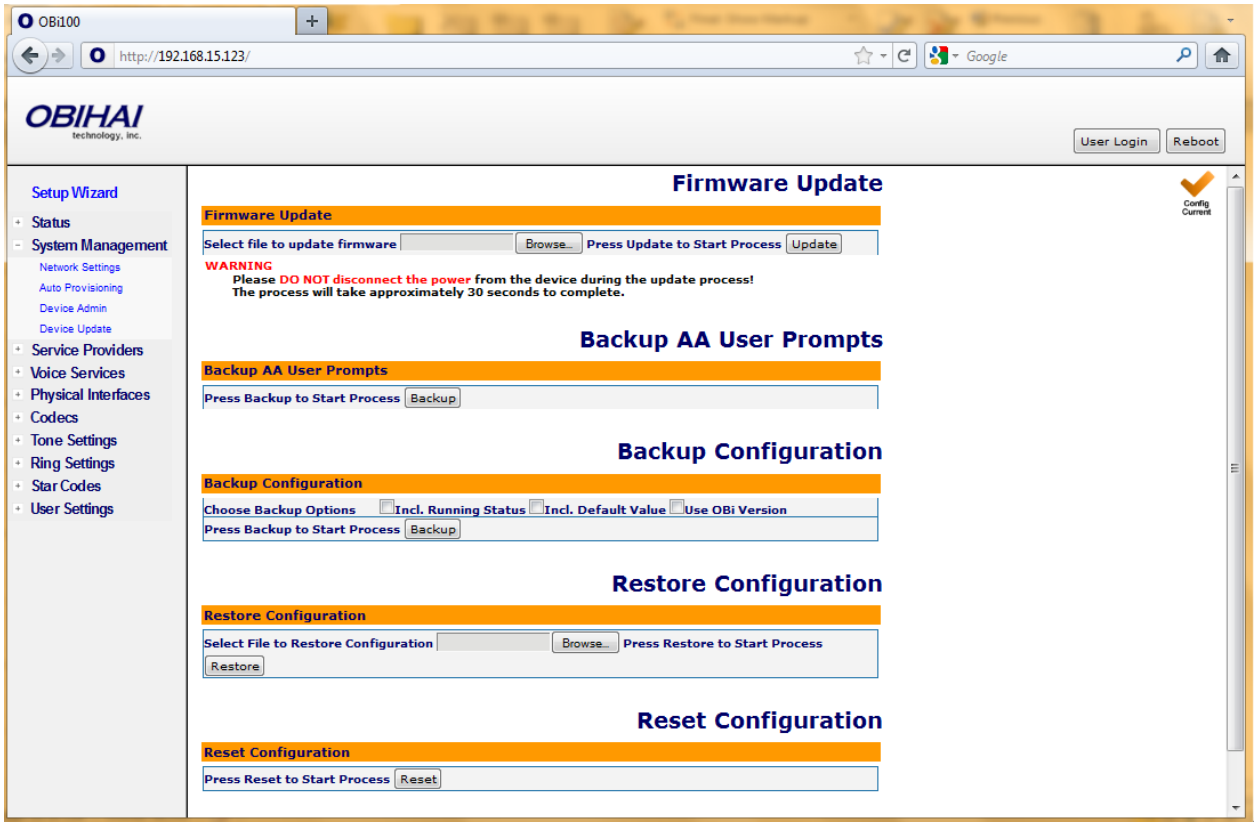
Firmware: Local OBi Device Update and Management



Updating Firmware:

You may upgrade the firmware for your OBi device from the device configuration web page. The firmware file with which you want to upgrade the device must be stored locally on a computer from which you can access with a web browser.

Follow these steps to upgrade:

Step 1: Select the, "System Management – Device Update" menu on the side panel of the web page.

Step 2: Specify the path of the firmware file by clicking the, "Select file to upgrade firmware" box or pressing the, "Browse" button in the Firmware Update section of the page. This will present a file browser window where you can navigate to and select the firmware file.

Step 3: Upon selection of the firmware file, press the "Update" button to start the upgrade process.

The entire process will take about 30 seconds to complete. Note that you MUST NOT disconnect the power from the device during this procedure. If the new firmware is upgraded successfully, the OBi device will reboot automatically to start running the new firmware. Otherwise the page will show an error message explaining why upgrade has failed.

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Possible Error Messages on Firmware Update Failure:

Error Message	Description	Suggested Solution
Firmware Package Checksum Error	A corrupted Firmware package file has been used for the update.	Check the file and / or re-download the firmware package and try again.
System Is Busy	The OBi device is busy because one of the phone services is in an active call or device provisioning is in progress.	Try to update again later
Firmware Is Not Modified	The OBi device is already running the same firmware as the one selected for update.	No need to upgrade.

Customized AA Prompts Backup & Restore:

Up to 10 individual prompts may be recorded through the device IVR interface (see ***Telephone-IVR-Based Local Configuration*** section). These prompts may be backed up into a single file from the web browser. The default name of the file is "backupaa.dat". The backup file also includes the anotations entered for each recorded prompt.

To restore an AA prompt file onto an OBi, do it exactly like a firmware upgrade via the web browser but provide the device with the prompt file instead of a firmware file. The OBi can detect from the file header that you are trying to upload a prompt file and process the file accordingly. *Warning: All the existing prompts in the device will be removed first when applying the backup file; this process cannot be undone*.

Configuration Backup & Restore:

The current configuration of the OBi device can be backed up and stored as a file in XML format at a user specified location. The default name of the file is "backup*xxxxxxxxxxxx*.xml", where the *xxxxxxxxxxxx*x represents the MAC address of unit.

When backing up a device's configuration, you may select the following three options before selection of the "Backup".

Option	Description	Default Setting
Incl. Running Status	If checked, the value of all status parameters will be included in backup file. Otherwise, status parameters are excluded from the backup	No
Incl. Default Value	If checked, the default value of parameters will be included in the backup file. Otherwise, default values are excluded from the backup	No
Use OBi Version	If not checked, the backup file uses XML tags that are compliant with TR-104 standard. Otherwise, the backup file will be stored in an OBi proprietary format where the XML tags are not compliant with TR-104; but the file size will be smaller and the file will be more readable	No

When the file browser window pops up for, you can change the filename and choose the location to save the backup file. Note that different web browser might handle this differently. If the operation is blocked due to the security setting of the web browser, you should change the security setting temporarily to allow this operation to complete.

When restoring the configuration to a previous backup copy, you will need to specify the backup file you want to restore to by selecting the "Browse" button in the Restore Configuration section of the web page. Then, select the "Restore" button to start the process. The OBi device will automatically reboot, after the restoration is complete.

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IMPORTANT Note: All passwords and PINs are excluded from the backup file. Hence they will not be available to restore. Call history is excluded from the backup, but can be saved as an XML formatted file separately from the Call History web page.

Reset Configuration to Factory Default

The OBi device may be reset to factory default condition. Call history and various statistical information will be removed at the same time. Resetting the device configuration should be used with **extreme caution** as the operation cannot be undone. To do this you press the "Reset" button in the Reset Configuration section. A confirmation window will pop up. The OBi device then proceeds to reset the configuration once you confirm that this is indeed what you want to do. The OBi device will reboot automatically when factory reset is completed.

For the OBi202, there are three factory reset options: reset just the voice settings, reset just the router settings, and reset all settings. There is a different IVR option for invoking each factory reset option. By default, the hardware reset button located via an opening on the underside of the OBi202 will reset all settings. Via software configuration, it can be configured to reset just the voice or just the router settings.

Zero-Touch, Massive Scale Remote Provisioning:

OBi ZT or Zero Touch provisioning is a system level approach to deploying and maintaining thousands or millions of OBi devices with high security and control at the device level down to the individual parameter provisioned on each device. Please contact sales@obihai.com for information regarding the capability, process and practice of using OBi ZT Provisioning.

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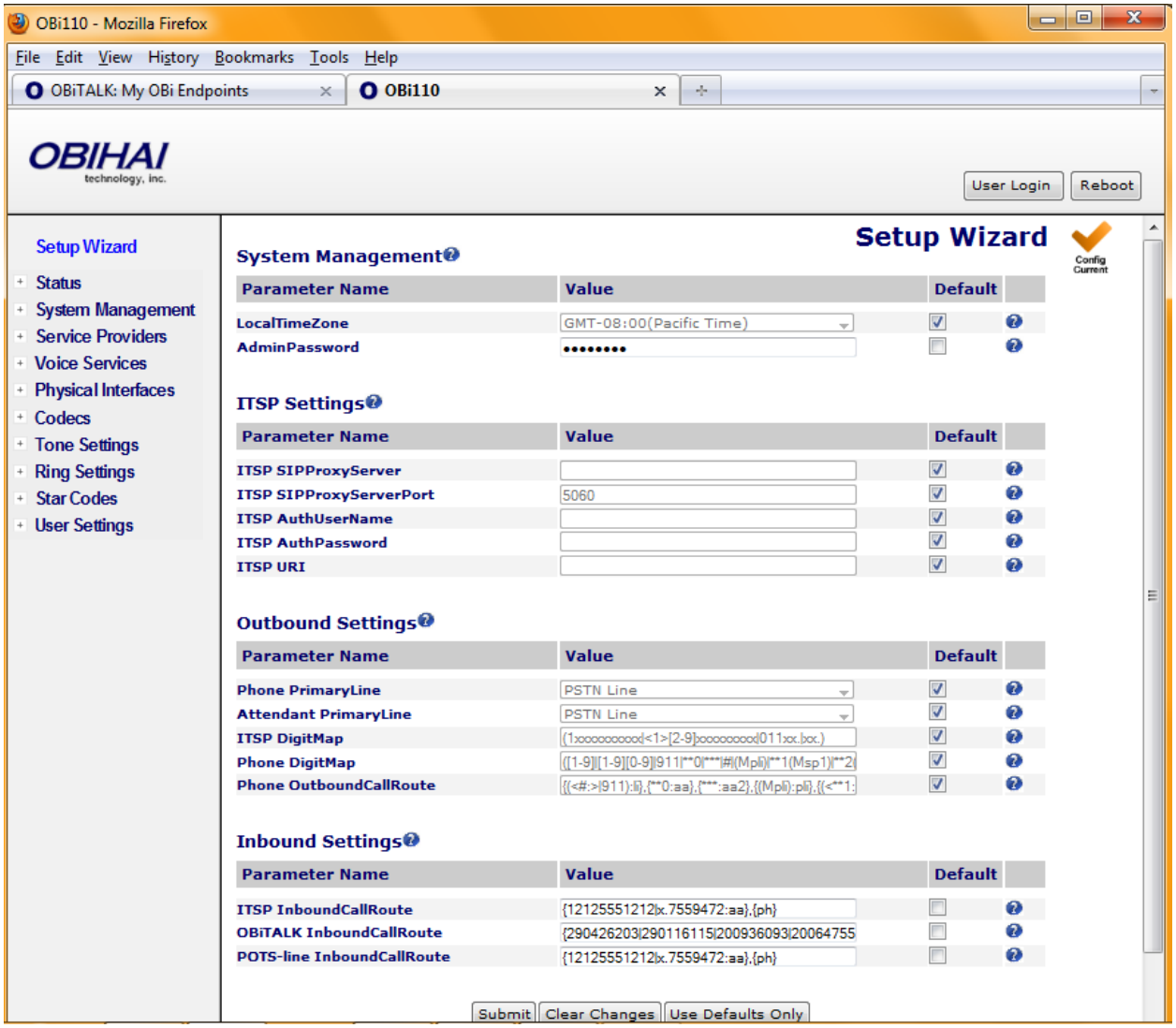
ITSP Quick Start Setup Wizard (OBi100 and OBi110)

The Setup Wizard page displays a collection of commonly used parameters in a condensed format. Each parameter listed here corresponds to a parameter inside one of the parameter groups. The Setup Wizard page may use more user friendly (but similar) parameters name for the actual parameters they mirror. In other words, if the mirrored parameters are changed from the web page or remote provisioning, the corresponding parameters on the Setup Wizard page will show the same values.

The illustration below depicts the OBi device web page Setup Wizard.



ITSP Quick Start Setup Parameter Guide (OBi100 and OBi110):

Parameter	Description	Default Setting
System Management		
Local Time Zone	Local time zone. Mirrors System Management – NetworkSettings:: LocalTimeZone	GMT-08:00 (Pacific Time)
Admin Password	Administrator Password, case sensitive.	admin

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	Mirrors System Management – Device Admin:: AdminPassword	
ITSP Settings		
ITSP SIPProxyServer	Host name or IP address of the SIP proxy server. Mirrors Service Providers – ITSP Profile A – **SIP::**ProxyServer	
ITSP SIPProxyServerPort	Destination port to connect to the SIP server. Mirrors Service Providers – ITSP Profile A – **SIP::**ProxyServerPort	5060
ITSP AuthUserName	Username used by the device to authenticate to a SIP UAS (User Agent Server) when an outbound SJP Request is challenged with a 401 or 407 response. Mirrors Voice Services – SP1 Service::AuthUserName	
ITSP AuthPassword	Password by the device to authenticate to a SIP UAS (User Agent Server) when an outbound SJP Request is challenged with a 401 or 407 response. Mirrors Voice Services – SP1 Service::AuthPassword	
ITSP URI	If a value is specified for this parameter, it affects the way the device forms its AOR (Address of Record) or Public Address when sending outbound SIP Requests (such as REGISTER and INVITE); otherwise device forms its AOR in the normal way. See description of **`Voice Services – SP1 Service::`**`URI` for details on how to use this parameter. Mirrors Voice Services – SP1 Service::URI	
Outbound Settings		
Phone PrimaryLine	Indicate which service is the primary line when dialing out. Mirrors PHONE Port::PrimaryLine	PSTN Line
Attendant PrimaryLine	Indicate which service is the primary line when dialing out via the AA. Mirrors Auto Attendant::PrimaryLine	PSTN Line
ITSP DigitMap	Digit map controlling the transmission of dialed digit information. Mirrors Service Providers – ITSP Profile A – General::DigitMap	(1xxxxxxxxxx|<1>[2-9]xxxxxxxxx |011xx.|xx.)

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Phone DigitMap	Digit map to limit dialable numbers on this port. Mirrors PHONE Port::DigitMap	For OBi100: ([1-9]x?*(Mpli)|[1-9]|[1-9][0-9]|911|**0|***|#| **1(Msp1)|**2(Msp2)|**9(Mpp)|(Mpli)) For OBi110: ([1-9]x?*(Mpli)|[1-9]|[1-9][0-9]|911|**0|***|#| **1(Msp1)|**2(Msp2)|**8(Mli)|**9(Mpp)|(Mpli))
Phone OutboundCallRoute	Routing rule for outbound calls made from this port. Mirrors PHONE Port:: OutboundCallRoute	For OBi100: {([1-9]x?*(Mpli)):pp}, {**0:aa},{***:aa2}, {(<**1:>(Msp1)):sp1},{(<**2:>(Msp2)):sp2}, {(<**9:>(Mpp)):pp},{(Mpli):pli} For OBi110: {([1-9]x?*(Mpli)):pp},{(<#:>|911):li}, {**0:aa},{***:aa2}, {(<**1:>(Msp1)):sp1},{(<**2:>(Msp2)):sp2}, {(<**8:>(Mli)):li},{(<**9:>(Mpp)):pp},{(Mpli):pli}
Inbound Settings		
ITSP InboundCallRoute	Routing rule for inbound calls on this trunk. Mirrors Voice Services – **SP1 Service::**X_InboundCallRoute	ph
OBiTALK InboundCallRoute	Routing rule for inbound calls on this trunk. Mirrors OBiTALK Service::InboundCallRoute	ph
POTS-line InboundCallRoute	Routing rule for inbound calls on this trunk. Mirrors **LINE Port::**InboundCallRoute	ph

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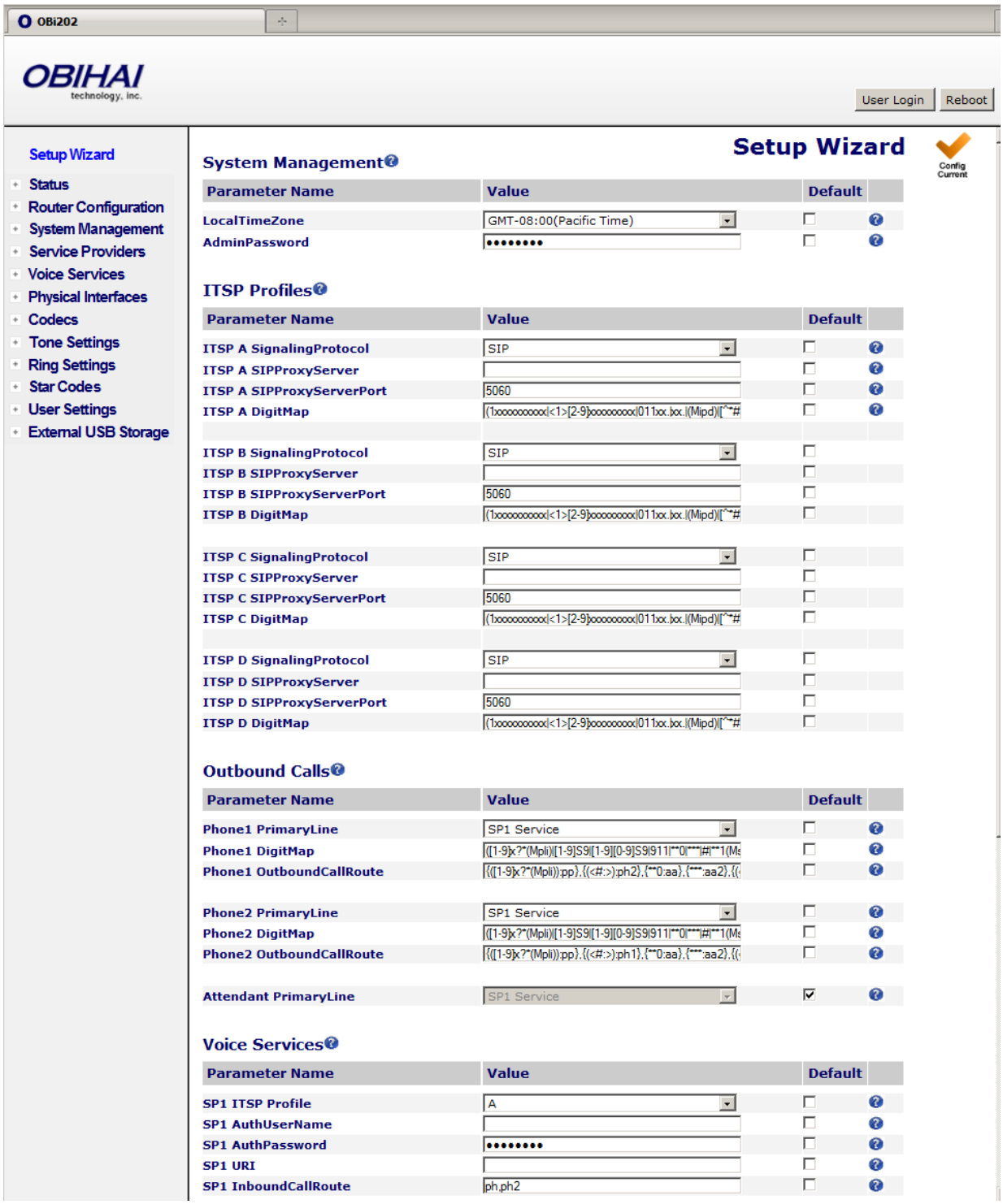
ITSP Quick Start Setup Wizard (OBi202, OBi302)

The Setup Wizard page for OBi202 and OBi302 is very similar to that of the OBi1xx, with a few additions to cover the additional ISTP profiles and SP services. The illustration below depicts the OBi202 device web page Setup Wizard.



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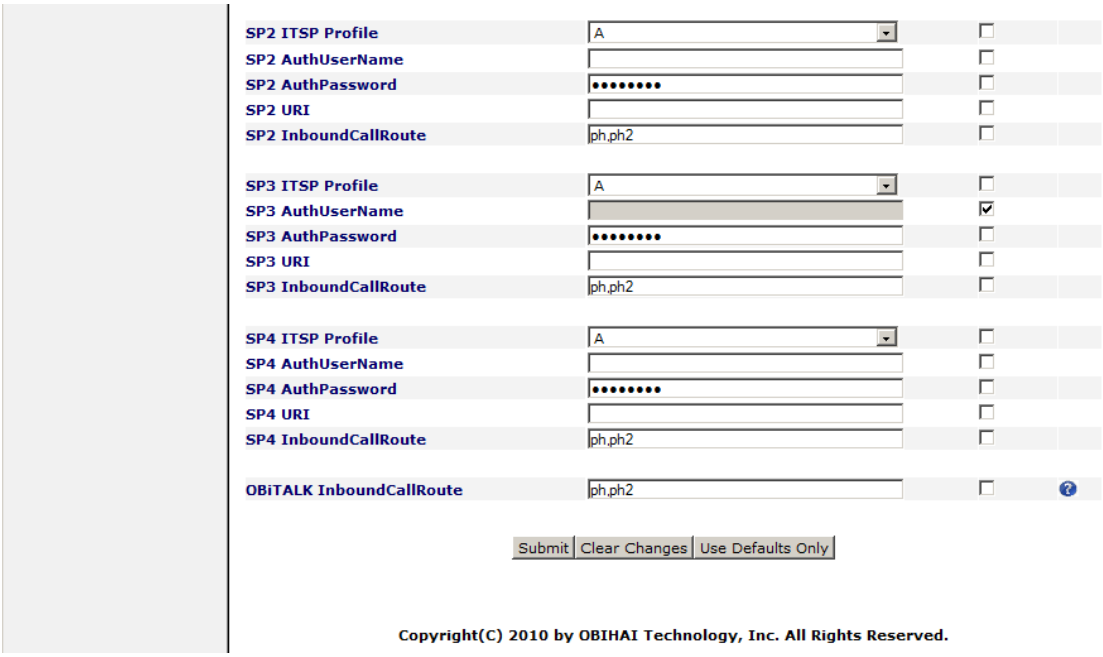

ITSP Quick Start Setup Parameter Guide (OBi202) :

Parameter	Description	Default Setting
System Management		
Local Time Zone	Local time zone. Mirrors System Management – NetworkSettings:: LocalTimeZone	GMT-08:00 (Pacific Time)
Admin Password	Administrator Password, case sensitive. Mirrors System Management – Device Admin:: AdminPassword	admin
ITSP Profiles (*X* = A, B, C, or D)		
ITSP *X* SignalingProtocol	Choose either SIP or Google Voice Mirrors Service Providers – ITSP Profile *X* – General**::**SignalingProtocol Note: The Google Voice option is not available on OBi302.	SIP
ITSP *X* SIPProxyServer	Host name or IP address of the SIP proxy server. Mirrors Service Providers – ITSP Profile *X* – SIP::ProxyServer	
ITSP *X* SIPProxyServerPort	Destination port to connect to the SIP server. Mirrors Service Providers – ITSP Profile *X* –	5060

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	SIP::ProxyServerPort	
ITSP *X* DigitMap	Digit map controlling the transmission of dialed digit information. Mirrors Service Providers – ITSP Profile *X* – General::DigitMap	(1xxxxxxxxxx|<1>[2-9]xxxxxxxxx |011xx.|xx.)
Outbound Settings (N = 1 or 2)		
Phone *N* PrimaryLine	Indicate which service is the primary line when dialing out. Mirrors PHONE Port *N*::PrimaryLine	SP1 Service
Phone *N* DigitMap	Digit map to limit dialable numbers on this port. Mirrors PHONE Port *N*::DigitMap	([1-9]x?*(Mpli)|[1-9]|[1-9][0-9]|911|**0|***|#|##|**1(Msp1) |**2(Msp2)|**3(Msp3) |**4(Msp4)|**9(Mpp)|(Mpli))
Phone 1 OutboundCallRoute	Routing rule for outbound calls made from this port. Mirrors PHONE Port 1:: OutboundCallRoute	{([1-9]x?*(Mpli)):pp},{(<#:>):ph2},{(<##:>):li},{(<**70:>(Mli)):li},{(<**82:>(Mbt2)):bt2},{(<**81:>(Mbt)):bt},{(<**8:>(Mbt)):bt},{**0:aa},{***:aa2},{(<**1:>(Msp1)):sp1},{(<**2:>(Msp2)):sp2},{(<**3:>(Msp3)):sp3},{(<**4:>(Msp4)):sp4},{(<**9:>(Mpp)):pp},{(Mpli):pli}
Phone 2 OutboundCallRoute	Routing rule for outbound calls made from this port. Mirrors PHONE Port 2:: OutboundCallRoute	{([1-9]x?*(Mpli)):pp},{(<#:>):ph},{(<##:>):li},{(<**70:>(Mli)):li},{(<**82:>(Mbt2)):bt2},{(<**81:>(Mbt)):bt},{(<**8:>(Mbt)):bt},{**0:aa},{***:aa2},{(<**1:>(Msp1)):sp1},{(<**2:>(Msp2)):sp2},{(<**3:>(Msp3)):sp3},{(<**4:>(Msp4)):sp4},{(<**9:>(Mpp)):pp},{(Mpli):pli}
Attendant PrimaryLine	Indicate which service is the primary line when dialing out via the AA. Mirrors Auto Attendant::PrimaryLine	SP1 Service
Voice Services (*n* = 1, 2, 3, or 4)		
SP*n* ITSP Profile		
SP*n* AuthUserName	Username used by the device to authenticate to a SIP UAS (User Agent Server) when an outbound SJP Request is challenged with a 401 or 407 response. Mirrors Voice Services – SP*n* Service::AuthUserName	
SP*n* AuthPassword	Password by the device to authenticate to a SIP UAS (User Agent Server) when an outbound SJP Request is challenged with a 401 or 407 response. Mirrors Voice Services – SP*n* Service::AuthPassword	
SP*n* URI	If a value is specified for this parameter, it affects the way the device forms its AOR (Address of Record) or Public Address when sending outbound SIP Requests (such as REGISTER and INVITE); otherwise device forms its AOR in the normal way. See	

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	description of Voice Services – SP*n* Service::URI for details on how to use this parameter. Mirrors Voice Services – SP*n* Service::URI	
SP*n* InboundCallRoute	Routing rule for inbound calls on this trunk. Mirrors Voice Services – SP*n* Service::X_InboundCallRoute	ph,ph2
OBiTALK InboundCallRoute	Routing rule for inbound calls on this trunk. Mirrors OBiTALK Service::InboundCallRoute	ph,ph2

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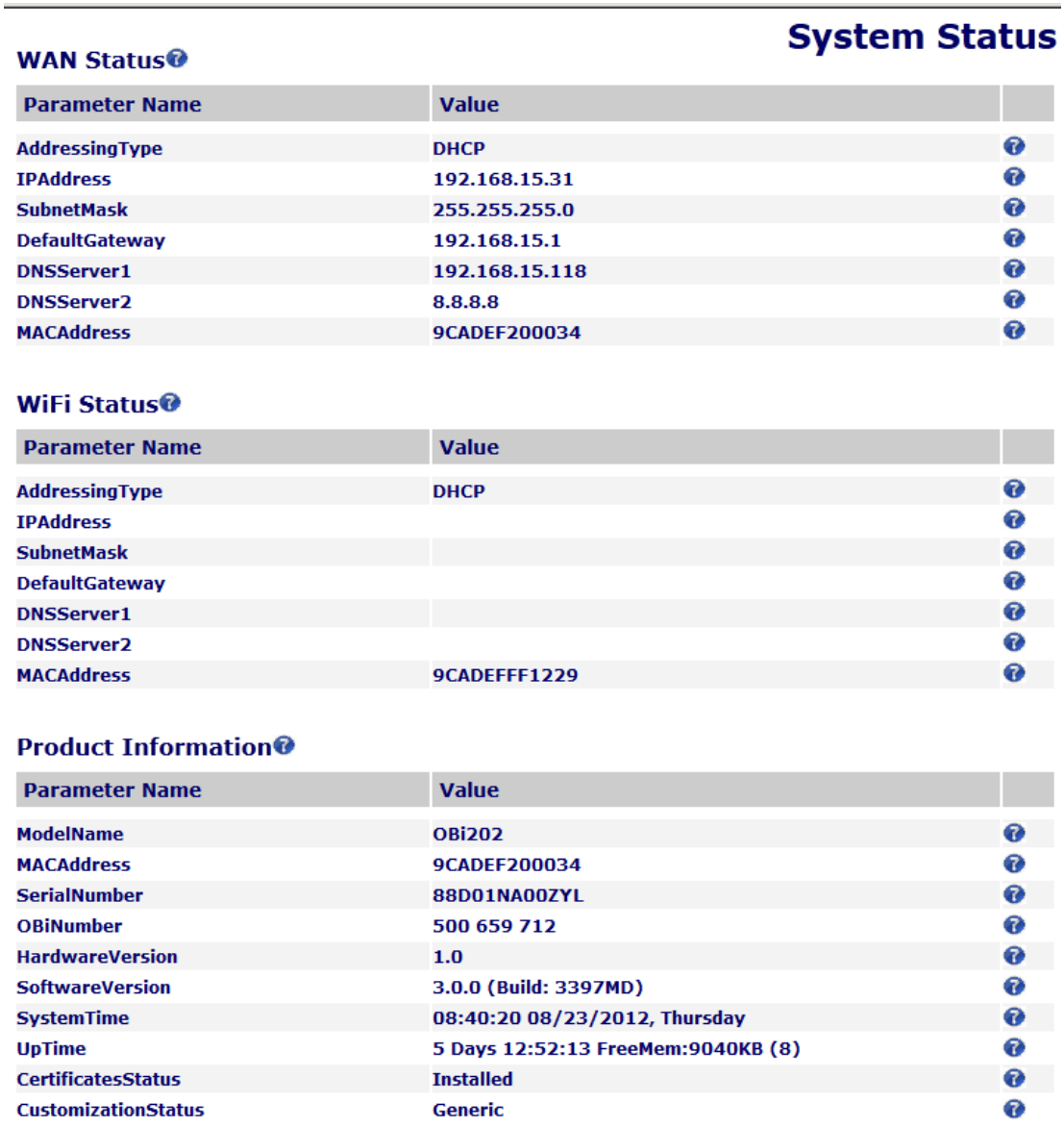
Status Pages

System Status

The following series of illustrations are taken from screen shots of the System Status page of an OBi202. The System Status page is divided into several sections: WAN Status, WiFi Status, Product Information, OBiBlueTooth Service Status, SP1 – SP4 Service Status, OBiTALK Service Status, and OBiPLUS Service Status.



System Status

WAN Status

Parameter Name	Value
AddressingType	DHCP
IPAddress	192.168.15.31
SubnetMask	255.255.255.0
DefaultGateway	192.168.15.1
DNSServer1	192.168.15.118
DNSServer2	8.8.8.8
MACAddress	9CADEF200034

WiFi Status

Parameter Name	Value
AddressingType	DHCP
IPAddress	
SubnetMask	
DefaultGateway	
DNSServer1	
DNSServer2	
MACAddress	9CADEFFF1229

Product Information

Parameter Name	Value
ModelName	OBi202
MACAddress	9CADEF200034
SerialNumber	88D01NA00ZYL
OBiNumber	500 659 712
HardwareVersion	1.0
SoftwareVersion	3.0.0 (Build: 3397MD)
SystemTime	08:40:20 08/23/2012, Thursday
UpTime	5 Days 12:52:13 FreeMem:9040KB (8)
CertificatesStatus	Installed
CustomizationStatus	Generic

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OBiBT Dongle 1 Status

Parameter Name	Value
Status	Disconnected
Discoverable	Not Discoverable
CallState	0 Active Calls
BindingService	Unassigned

OBiBT Dongle 2 Status

Parameter Name	Value
Status	No Dongle
Discoverable	
CallState	
BindingService	

SP1 Service Status

Parameter Name	Value
Status	Connected
PrimaryProxyServer	
SecondaryProxyServer	
CallState	0 Active Calls

SP2 Service Status

Parameter Name	Value
Status	Connected
PrimaryProxyServer	
SecondaryProxyServer	
CallState	0 Active Calls

SP3 Service Status

Parameter Name	Value
Status	Service Not Configured
PrimaryProxyServer	
SecondaryProxyServer	
CallState	0 Active Calls

SP4 Service Status

Parameter Name	Value
Status	Service Not Configured
PrimaryProxyServer	
SecondaryProxyServer	
CallState	0 Active Calls

OBiTALK Service Status

Parameter Name	Value
Status	Normal (User Mode);ex-addr=99.53.83.157:11492
CallState	0 Active Calls

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OBiPLUS Service Status

Parameter Name	Value	
LicenseState	Premium Active	

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WAN Status

The status of the WAN (Ethernet) interface: includes such information as the assigned IP address, default gateway and subnet mask.

WiFi Status

This status is only available on the OBi202 and OBi302. This shows the status of OBiWiFi and includes such information as the assigned IP address, default gateway and subnet mask.

Product Information

This status shows some basic product information, as well as the system up-time with the last reboot reason code in parenthesis. The reboot reason codes are defined below.

Reboot Reason Codes

0: Reboot on Power Cycle
1: Operating System Reboot
2: Reboot after Firmware Update via provisioning or phone (***6)
3: Reboot after New Profile Invoked
4: Reboot after Parameter Value Change or Firmware has changed and invoked via device web page
5: Reboot after Factory Reset using the OBi device hardware pin
6: New Profile Invoked AND Profile URL Changed
7: Reboot from SIP Notify (Reserved)
8: Reboot from Telephone Port (IVR)
9: Reboot from Webpage - No change in parameter value(s) or firmware
10: Reboot During OBiTALK Signup
11: Reboot During OBiTALK Signup
12: Reboot after DHCP server offers IP, GW-IP and/or Netmask different from what the OBi device is currently using
13: Reboot on Data Networking Link Re-establishment
18: Reboot on WAN IP address change (OBi202/OBi302 only)
19: Reboot on LAN IP address change (OBi202/OBi302only)

OBiBT Bluetooth USB Adapter 1/2 Status

This status is available on OBi202 and OBi302 only. It shows the status regarding the OBiBT USB adapter attached to the unit and the corresponding OBiBlueTooth Services. The following status values are available:

- State – It can be one of the following values:
  - No Dongle: No authentic OBiBT dongle detected
  - Connecting <device-name>: Connecting to the named device
  - Disconnected: Not connected with any paired device
  - No Device To Connect: No device paired
  - Service Down: Connected to a mobile phone which does not have an active service (e.g., no SIM card or no signal)
  - Service Disabled: OBiBlueTooth service has been disabled in the OBi configuration
  - Connected to <device-name>: Connected to the named device; OBiBlueTooth service is available only in this state
- Discoverable – It either shows “Not Discoverable” or the number of seconds for which OBiBT will remain discoverable
- CallState – It can be one of the following values:
  - Incoming Call: BT detected an incoming call, but ringing has not started yet
  - Ring <Caller-ID>: Mobile phone is ringing. <Caller-ID> is the caller’s number
  - Outgoing Call: Mobile phone is making a call that is not answered yet

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- Voice Disconnected: Mobile phone is in a connected call, but the audio stays in the phone instead of going to OBiBT
- 0 Active Calls
- 1 Active Call: Mobile phone is in a connected call, with audio going to OBiBT

- BindingService – The external paired device currently connected with the OBiBT

SP*n* Service Status (n = 1, 2, 3, 4)

Note that SP3 and SP4 Service Status are available on the OBi2 Series and OBi3 Series models only. The SP*n* service status values indicate the current state of the service with regard to its configuration (or not) and if configured its registration status. If there are problems with the registration or authentication of the OBi with a prescribed service, the SIP 4xx error message will be displayed here. This is very useful information for troubleshooting issues with SIP-based services.

OBiTALK Service Status

The status of the OBiTALK Service includes the following values:

- Status – Possible values are:
  - Normal (User Mode): The service is functioning normally
  - Backing Off: The service is currently down; the device is taking a short pause before retrying connection
- CallState – Possible values are:
  - *N* Active Calls (where N = 0, 1, .., up to the maximum number of calls allowed in the configuration

OBiPLUS Service Status

OBiPLUS is a small business collaboration system. It is an optional service that requires a separate subscription. You may subscribe to this service on OBiTALK.com. The administration of this service is described separately in the OBiPLUS Administration Guide.

The status is available on the OBi202 and OBi302 only. The following status values are available:

- LicenseState – The state regarding the OBiPLUS Subscription. Possible values are:
  - Service not subscribed
  - Premium Active: Premium level subscription is currently active
  - Basic Active: Basic level subscription is currently active
  - License Expired: Service is not available because your last subscription has expired.

LAN Status (OBi202/OBi302 only)

The LAN Status page shows the devices currently on the LAN. There are two sections:

- Attached Devices: All the devices that the router has discovered on the LAN side; each entry has a MAC address and an IP address
- DHCP Clients: All the DHCP clients that have an active lease with the DHCP server; each entry has a Client Name, a MAC address, an IP address, and the lease expiration time (in seconds)

Below is a screen shot of a typical LAN Status page. This page is available when the OBi202/OBi302 is working in router mode.

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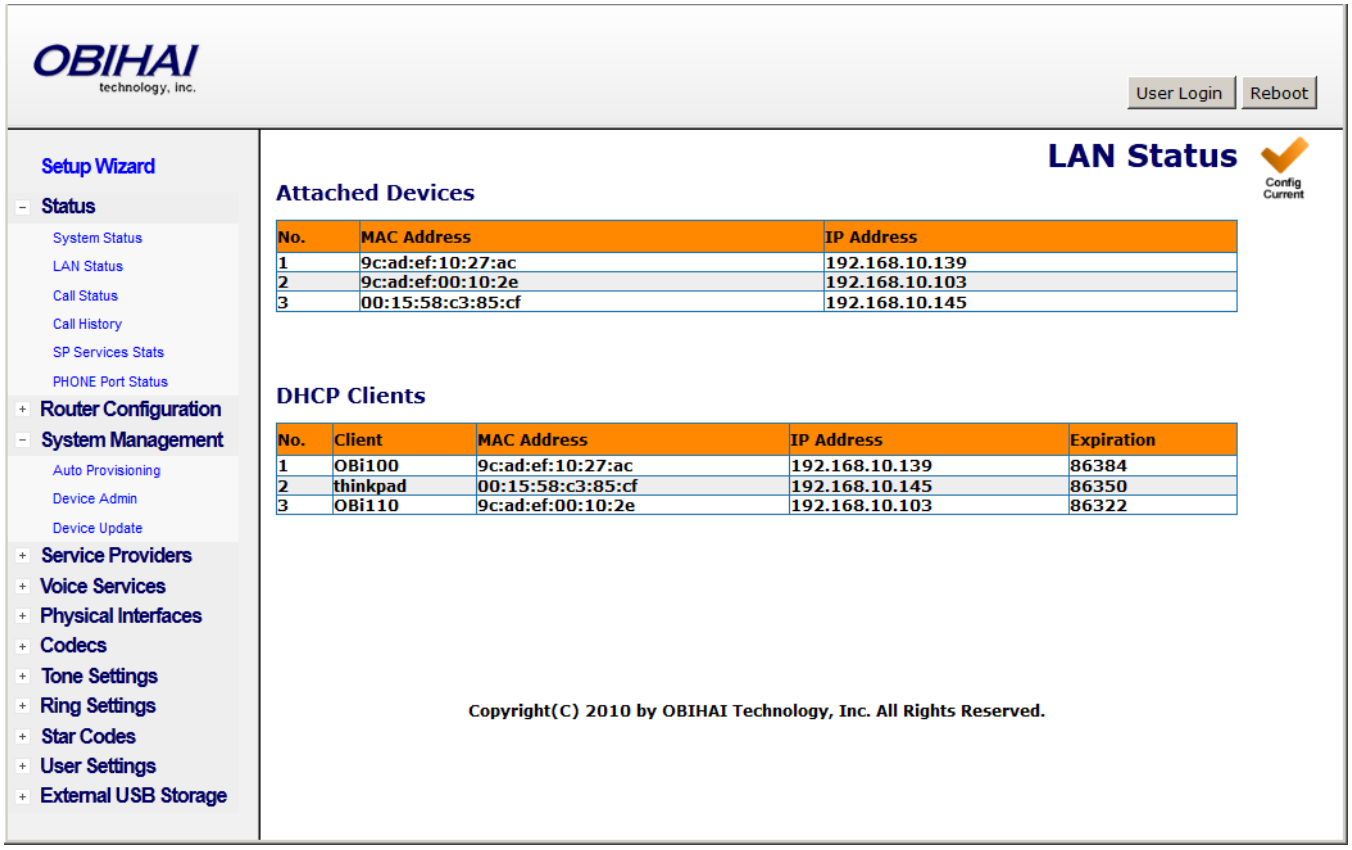
OBIHAI
technology, inc.
User Login
Reboot
Setup Wizard
Status
System Status
LAN Status
Call Status
Call History
SP Services Stats
PHONE Port Status
Router Configuration
System Management
Auto Provisioning
Device Admin
Device Update
Service Providers
Voice Services
Physical Interfaces
Codecs
Tone Settings
Ring Settings
Star Codes
User Settings
External USB Storage
LAN Status
Config Current
Attached Devices
No. MAC Address IP Address
1 9c:ad:ef:10:27:ac 192.168.10.139
2 9c:ad:ef:00:10:2e 192.168.10.103
3 00:15:58:c3:85:cf 192.168.10.145
DHCP Clients
No. Client MAC Address IP Address Expiration
1 OBi100 9c:ad:ef:10:27:ac 192.168.10.139 86384
2 thinkpad 00:15:58:c3:85:cf 192.168.10.145 86350
3 OBi110 9c:ad:ef:00:10:2e 192.168.10.103 86322
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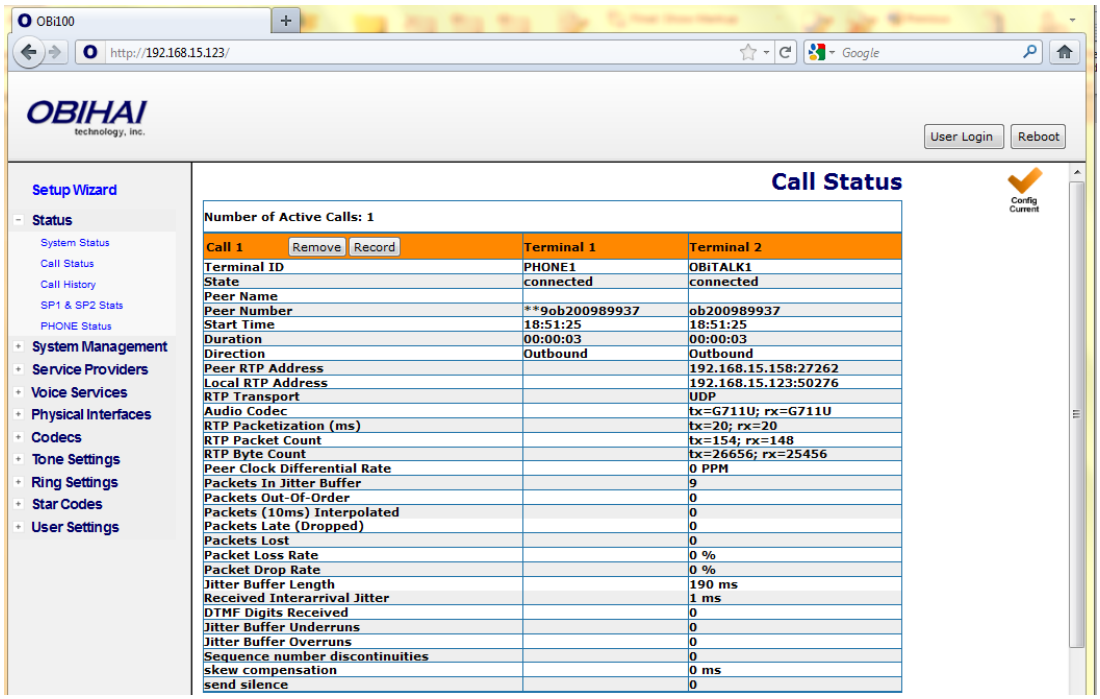
Call Status

The Call Status page shows a number of running call statistics and state parameters for each active call currently in progress. A sample call status page is shown below.



For each entry on the call status page, the following buttons may be available:

- **Remove**: This button is available for all calls. Pressing this button will end that call.
- **Record**: This button is available for calls involving the Phone port only. Pressing this button allows you to record the current conversation in an audio (.au) file

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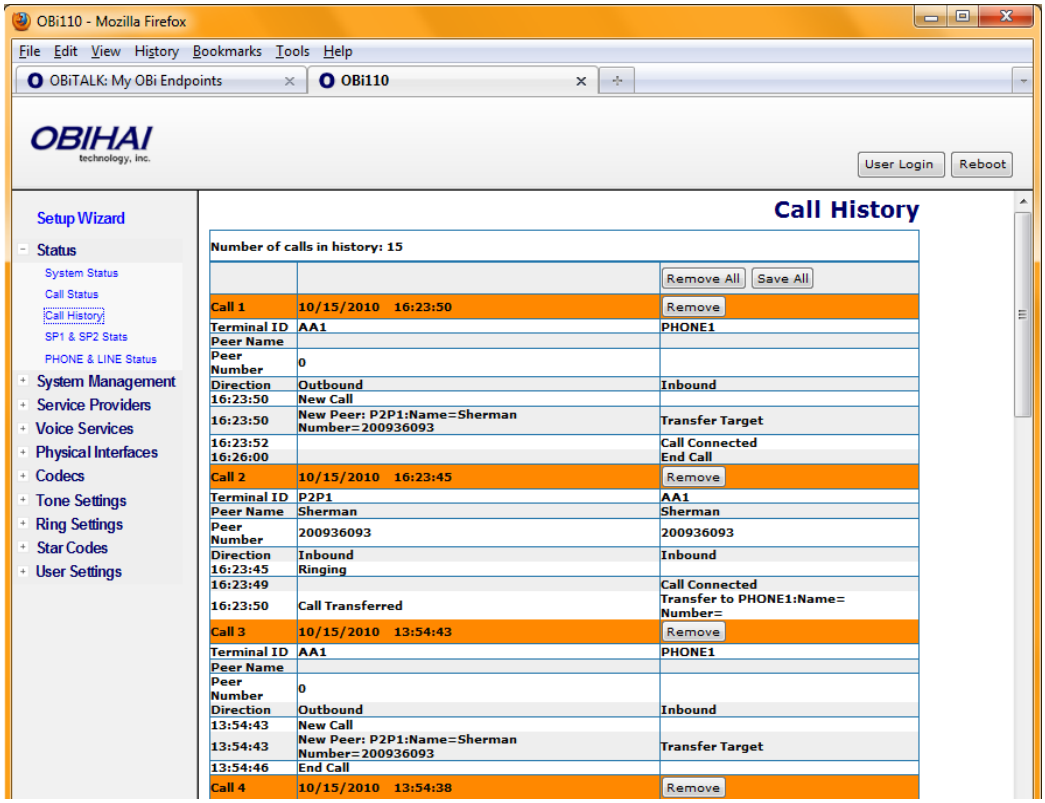
Call History

The OBi Call History page shows the last 400 calls made with the OBi (200 calls only on the OBi100/OBi110). Detailed call information is available, including what terminals were involved, the name (if available) of the Peer endpoints making the call and the direction / path the call took.

The Call History page also captures what time various events took place.

The Call History can be saved at any time by clicking on the “Save All” button. The Call History can be saved as an XML formatted file called “callhistory.xml”.



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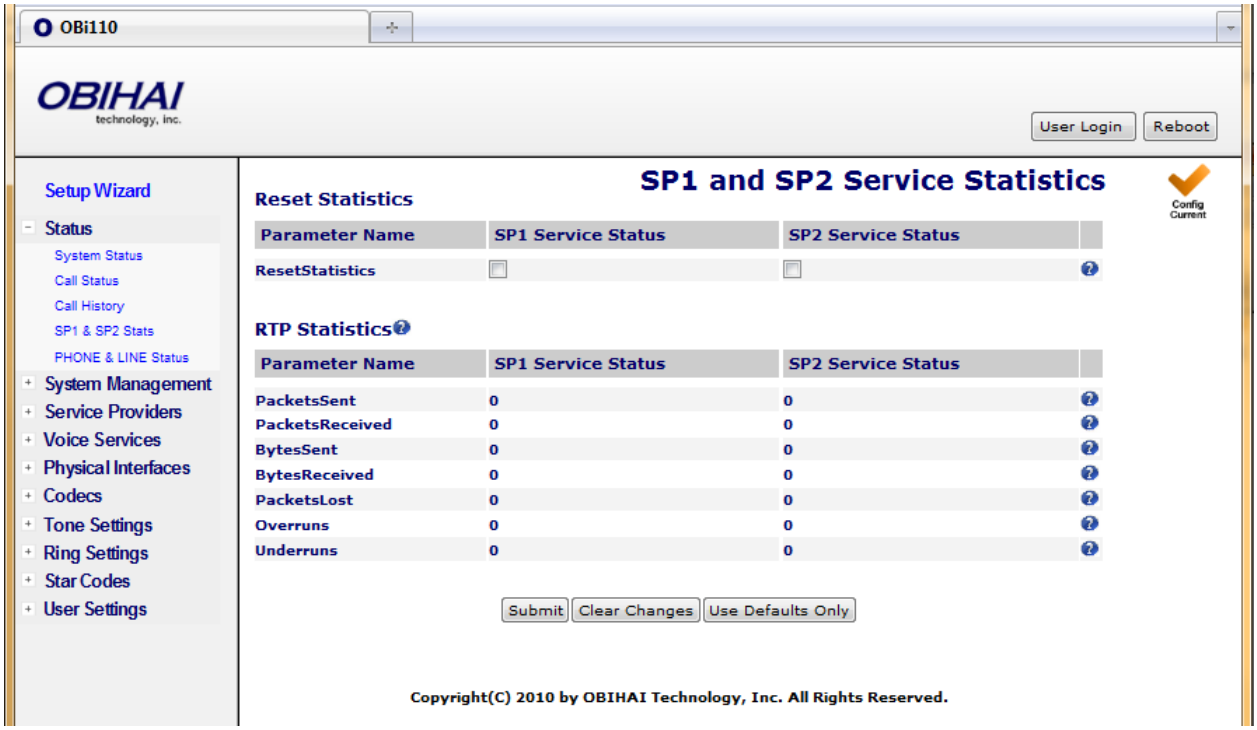
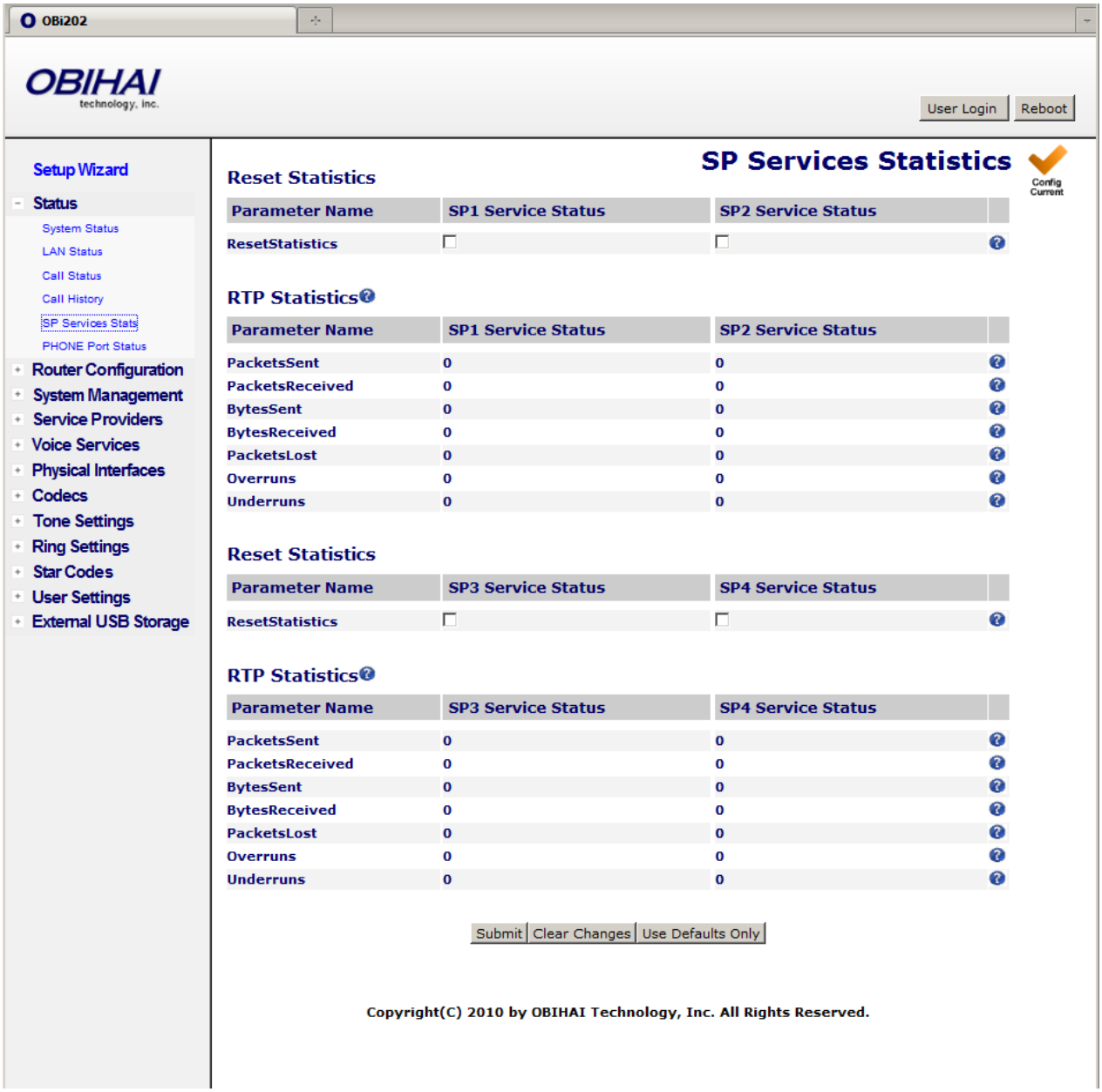
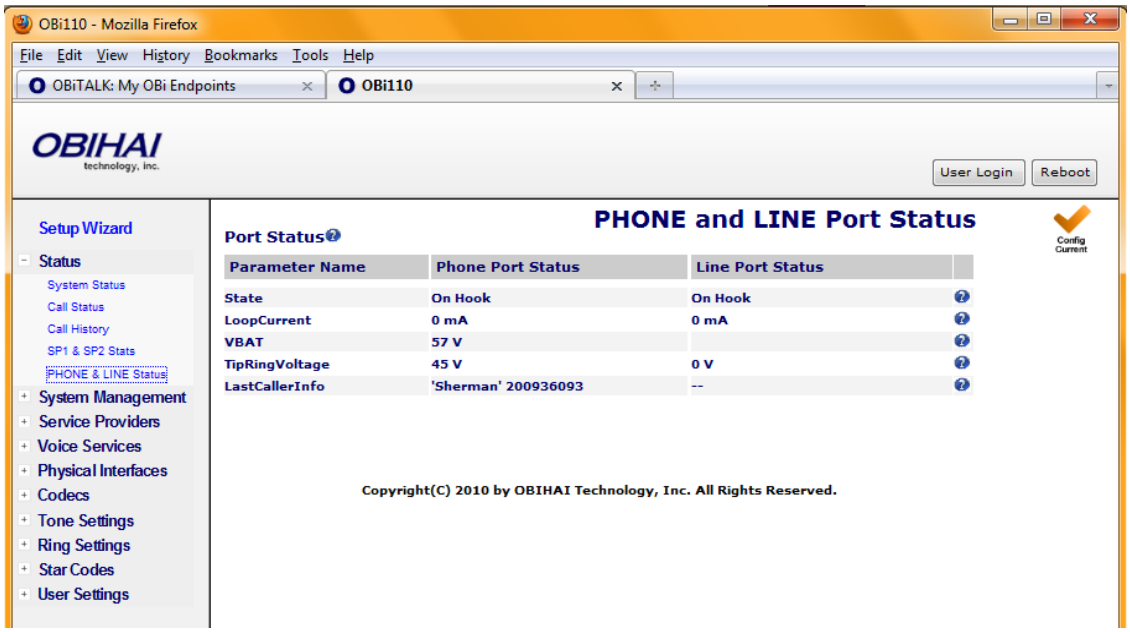
Services, Phone & Line Status

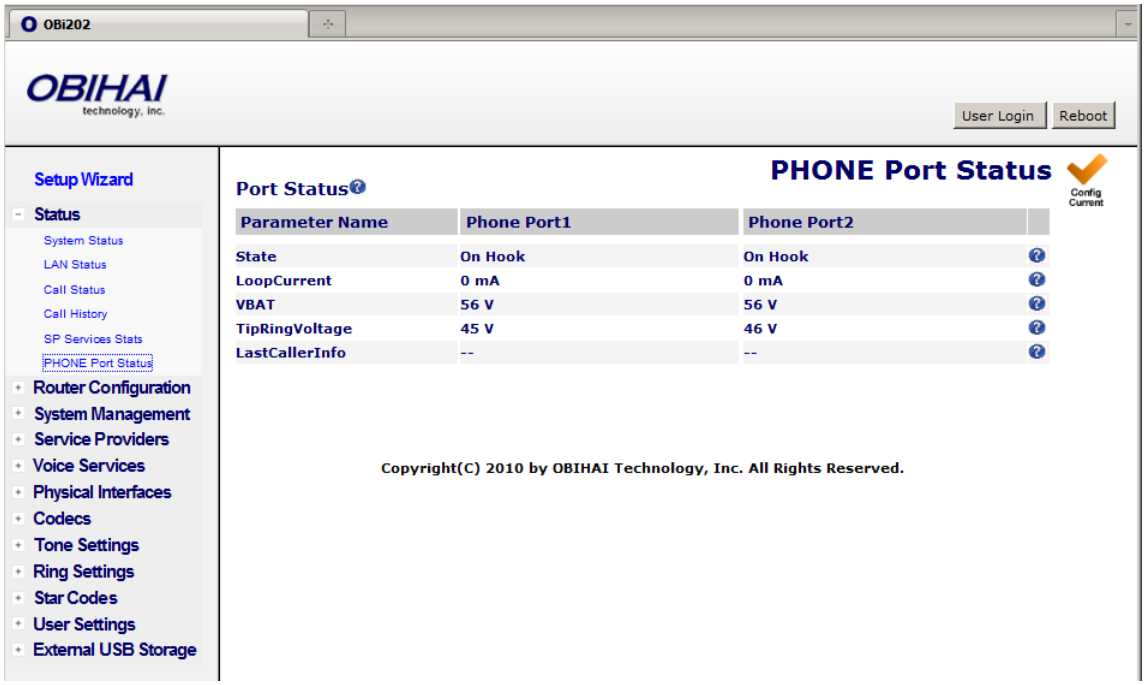
Statistics relevant to SP*n* can be found on the SP*n* Stats page (where *n* = 1, 2, 3, 4).





Parameter	Description	Default Setting
Reset Statistics		
ResetStatistics	Resets the statistics for this voice service	NA
RTP Statistics		
PacketsSent	Total RTP packets sent on this line	NA
PacketsReceived	Total RTP packets received on this line	NA
BytesSent	RTP payload bytes sent for this line	NA
BytesReceived	RTP payload bytes received for this line	NA
PacketsLost	Number of RTP packets lost on this line	NA
Overruns	Number of times receive jitter buffer overrun on this line	NA
Underruns	Number of times receive jitter buffer underrun on this line	NA



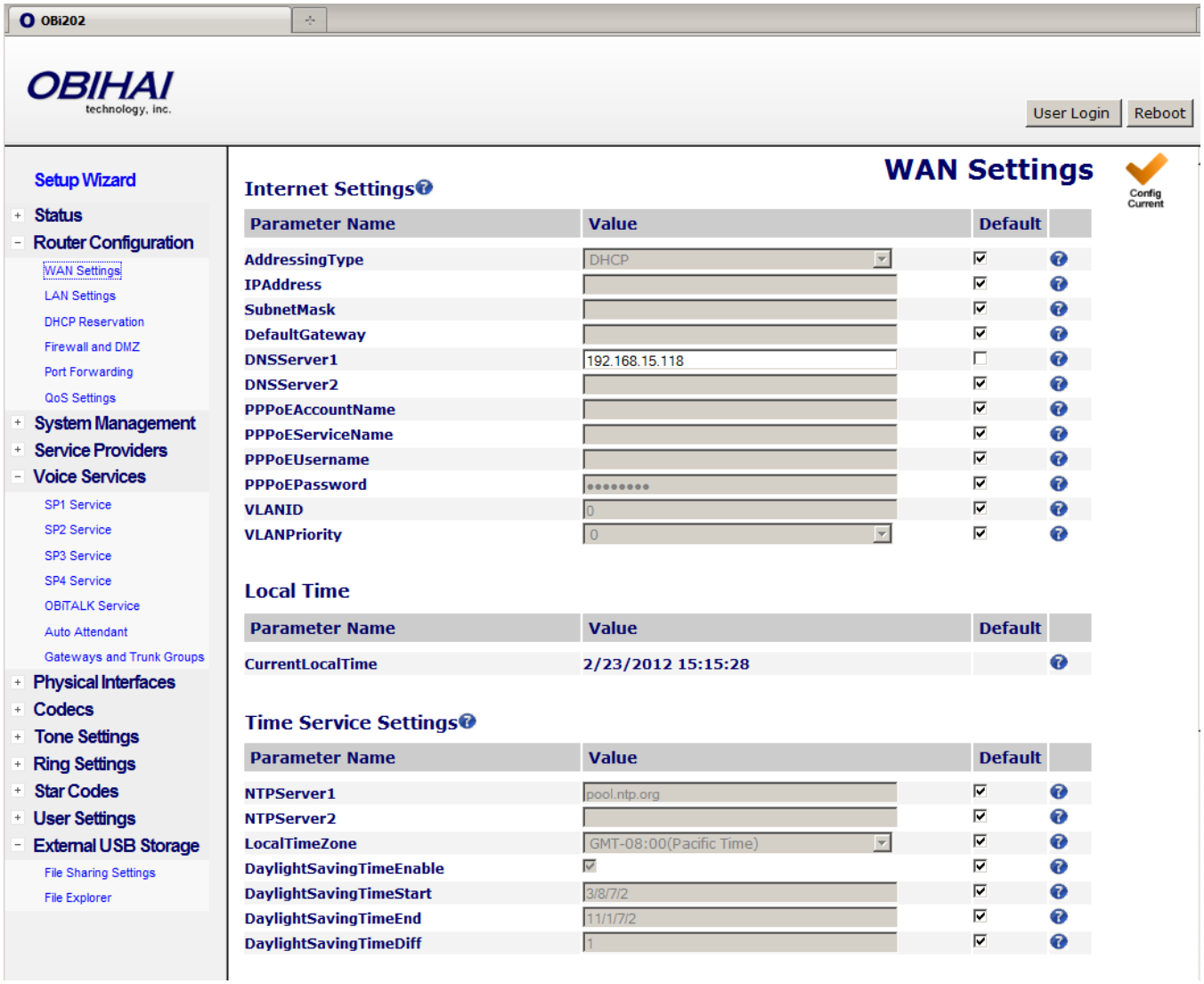


Parameter	Description	Default Setting
Port Status		
State	Port status, such as on-hook, off-hook, ringing	NA
LoopCurrent	Loop current in mA	NA
VBAT	PHONE port battery voltage in volts. Not applicable for LINE port	NA
TipRingVoltage	Sensed differential Tip/Ring voltage in volts	NA
LastCallerInfo	Caller ID of previous call	NA

Router Configuration (OBi202, OBi302 Only)

WAN Settings

Below is a screen shot of the WAN Settings device web page.



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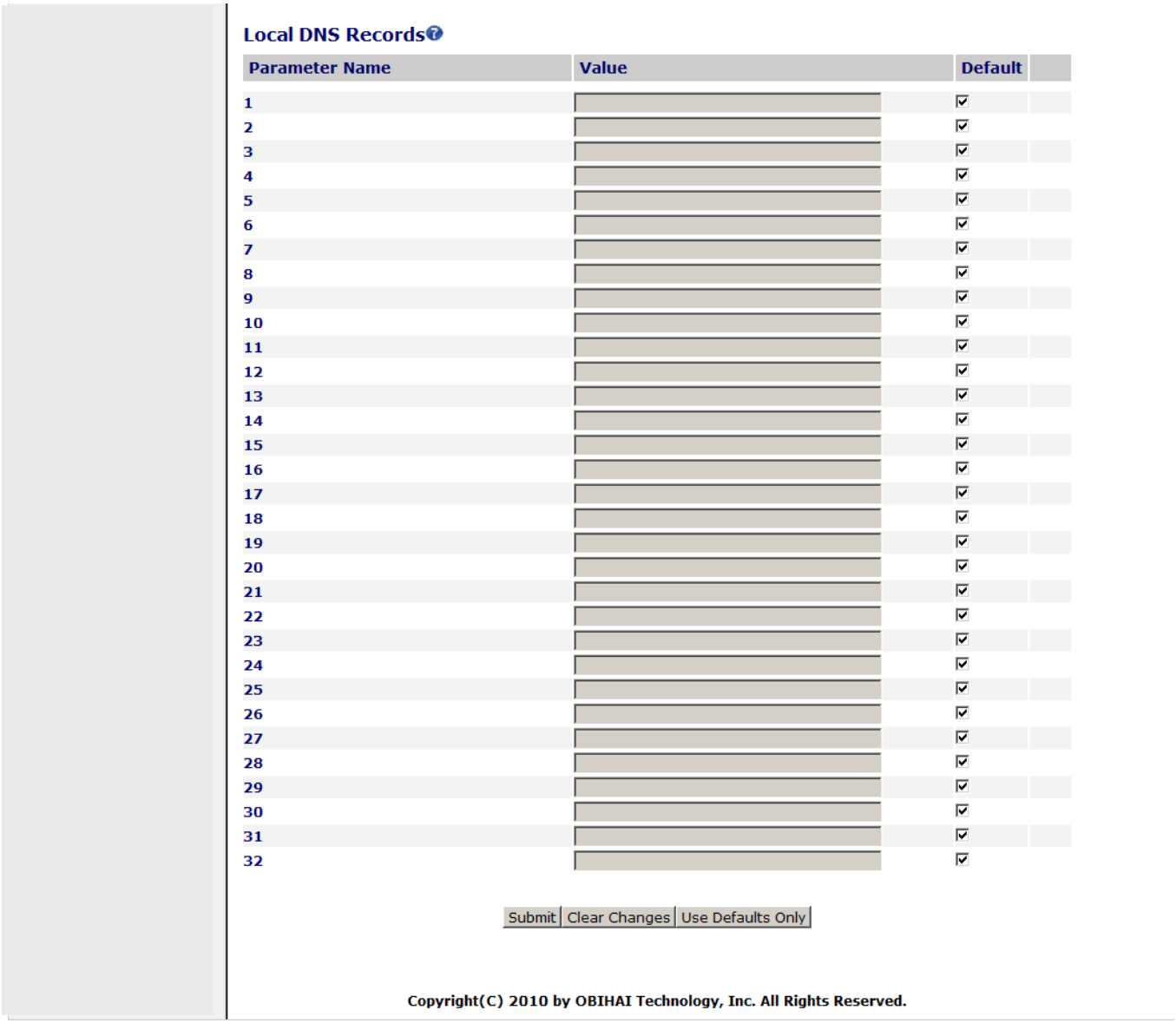

WAN Settings Parameter Guide:

Parameter	Description	Default Setting
Internet Settings		
AddressingType	The method used for assigning IP address, subnet mask, default gateway, etc., to the device. Available choices are: DHCP: IP address, default gateway, etc. are assigned by DHCP Server Static: IP address, default gateway, etc. are taken from the manually configured values PPPoE: IP address default gateway, etc. are acquired by PPPoE Protocol (OBi202, OBi302 only)	DHCP
IPAddress	The IP address to assign to the device when AddressingType is set to Static	
SubnetMask	The subnet mask to use when AddressingType is set to Static	

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DefaultGateway	The default gateway IP address to assign to the device when AddressingType is set to Static	
DNSServer1	IP address of the first DNS server to use, in addition to the ones obtained from the DHCP server when DHCP is also enabled. If AddressingType is set to Static, the device only uses DNSServer1 and DNSServer2 for DNS lookup. It will try up to 5 DNS servers when attempting to resolve a domain name. DNSServer1 and DNSServer2 will be tried first, whichever is specified, and then the ones obtained from the DHCP Server if available	
DNSServer2	IP address of the second DNS server to use, in addition to the ones obtained from the DHCP server when DHCP is also enabled. If AddressingType is set to Static, the device only uses DNSServer1 and DNSServer2 for DNS lookup. It will try up to 5 DNS servers when attempting to resolve a domain name. DNSServer1 and DNSServer2 will be tried first, whichever is specified, and then the ones obtained from the DHCP Server if available	
PPPoEACName	PPPoE access concentrator name. Enter if it is required	
PPPoEServiceName	PPPoE service name. Enter if it is required	
PPPoEUsername	PPPoE account username provided by your ISP	
PPPoEPassword	PPPoE account password	
VLANID	Valid range is 0 – 4094 (4095 is reserved). 0 means VLAN is disabled and egress packets are not tagged by the device. This setting applies to all packets sent by the device	0
VLANPriority	Valid choices are 0 – 7. This setting applies to all packets sent by the device.	0
Local Time		
CurrentLocalTime	Current local date and time of the device (read only)	
Time Service Settings		
NTPServer1	Hostname or IP address of the first NTP server	pool.ntp.org
NTPServer2	Hostname or IP address of the second NTP server	
LocalTimeZone	Local time zone. Available choices are: - GMT-12:00(Int'l Dateline West) - GMT-11:00(Samoa) - GMT-10:00(Hawaii) - GMT-09:00(Alaska) - GMT-08:00(Pacific Time) - GMT-07:00(Mountain Time) - GMT-06:00(Central Time) - GMT-05:00(Eastern Time) - GMT-04:00(Atlantic Time) - GMT-03:30(Newfoundland) - GMT-03:00(Buenos Aires,Greenland) - GMT-02:00(Mid-Atlantic) - GMT-01:00 - GMT+00:00(London,Lisbon) - GMT+01:00(Rome,Paris,Madrid) - GMT+02:00(Athens,Cairo) - GMT+03:00(Moscow,Baghdad) - GMT+04:00(Abu Dhabi) - GMT+04:30(Kabul) - GMT+05:00(Islamabad,Karachi) - GMT+05:30(New Delhi) - GMT+05:45(Kathmandu) - GMT+06:00	GMT-08:00

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	- GMT+07:00(Bangkok,Jakarta) - GMT+08:00(Beijing,HK,Singapore) - GMT+09:00(Tokyo,Seoul) - GMT+10:00(Sydney,Guam) - GMT+11:00(Solomon Is.) - GMT+12:00(Fiji,Auckland)	
DaylightSavingTimeEnable	Enable daylight saving time on the unit	Yes
DaylightSavingTimeStart	Daylight Saving Time Start Date. Format: month/day/weekday/hh:mm::ss, where month=1-12, day=±(1-31), weekday=0,1-7 (0=special, 1=Monday, 7=Sunday), hh=0-23,mm=0-59,ss=0-59. If weekday=0, daylight saving starts on the given month/day; otherwise it starts on the weekday on or after the given month/day if day > 0, or on the weekday on or before the last-day-of-given-month+day+1 (note that day = -1 equivalent to last day of the month). :ss may be omitted if the value is 0; :mm:ss may be omitted if mm and ss are both 0.	3/8/7/2
DaylightSavingTimeEnd	Daylight Saving Time End Date. Same format as Start Date	11/1/7/2
DaylightSavingTimeDiff	Amount of time to add to current time during Daylight Saving Time. Format: [-]hh:mm:ss. :ss may be omitted if it is 0; :mm:ss may be omitted if both are 0.	1

DNS Control		
DNSQueryOrder	When more than one DNS servers are available, the unit will attempt to resolve a domain name by querying each server sequentially until a successful result is received. The parameter controls the order in querying the servers. Available choices are: - DNS Server1, DNS Server2, DHCP Offered DNS Servers - DHCP Offered DNS Servers, DNS Server1, DNS Server2	DNS Server1, DNS Server2, DHCP Offered DNS Servers
DNSQueryDelay	When more than one DNS servers are available, the unit will attempt to resolve a domain name by querying each server sequentially until a successful result is received. This parameter controls the number of seconds between successive DNS query made by the unit for a given domain name. Choices are 0 – 5 (s)	2
Local DNS Records		
N where *N* = 1 – 32	One of 32 Local DNS Records (numbered 1 – 32). Each record is a mini script of the following format: *Name=A,A,A,...* **OR** *Name=R,R,R,...* where *Name* represents the domain name to be resolved locally, and has the format *prefix+domain* (such as `machine.sip+obihai.com`). Everything after '+' is considered as the *domain* to be appended to the *host* field in each *R* on the right hand side. '+' is optional; if missing the full domain must be used in every *R*. *A* represents an A record which is just an ip address, such as 192.168.12.17. *R* represents an SRV record and has the format: {*host*:*port*,*pri*,*wt*} where - *host* is a hostname with or without domain part (such as xyz, xyz.abc.com.). A dot (.) at the end of *host* indicates it is a complete hostname that does not require the domain to be appended. - *port* is a port number (such as 5060) - *pri* is the priority. Valid value is 0(highest) – 65535(lowest) - *wt* is the weight. Valid value is 0(lowest) – 65535(highest)	

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	wt is optional; 1 is the default if not specified. *pri* is optional only if *wt* is not specified; 1 is the default if not specified. *port* is optional; the default to use will be based on the protocol (5060 for SIP, 80 for HTTP, etc.) . The enclosing curly braces { } are also optional if there is only one *R*; or if there is no comma used inside the *R*. Examples: _sip._udp+obihai.com=abc,xyz,pqr:5080,{mmm,2},{super.abc.com.} abc.obihai.com=192.168.15.118,192.168.15.108 Note: If the A record of a given hostname cannot be found in any of the Local DNS Records, the device will attempt to resolve it using external DNS queries. Any change applied to local DNS Record needs reboot in order to take effect.	

LAN Settings

Below is a screen shot of the LAN Settings device web page.

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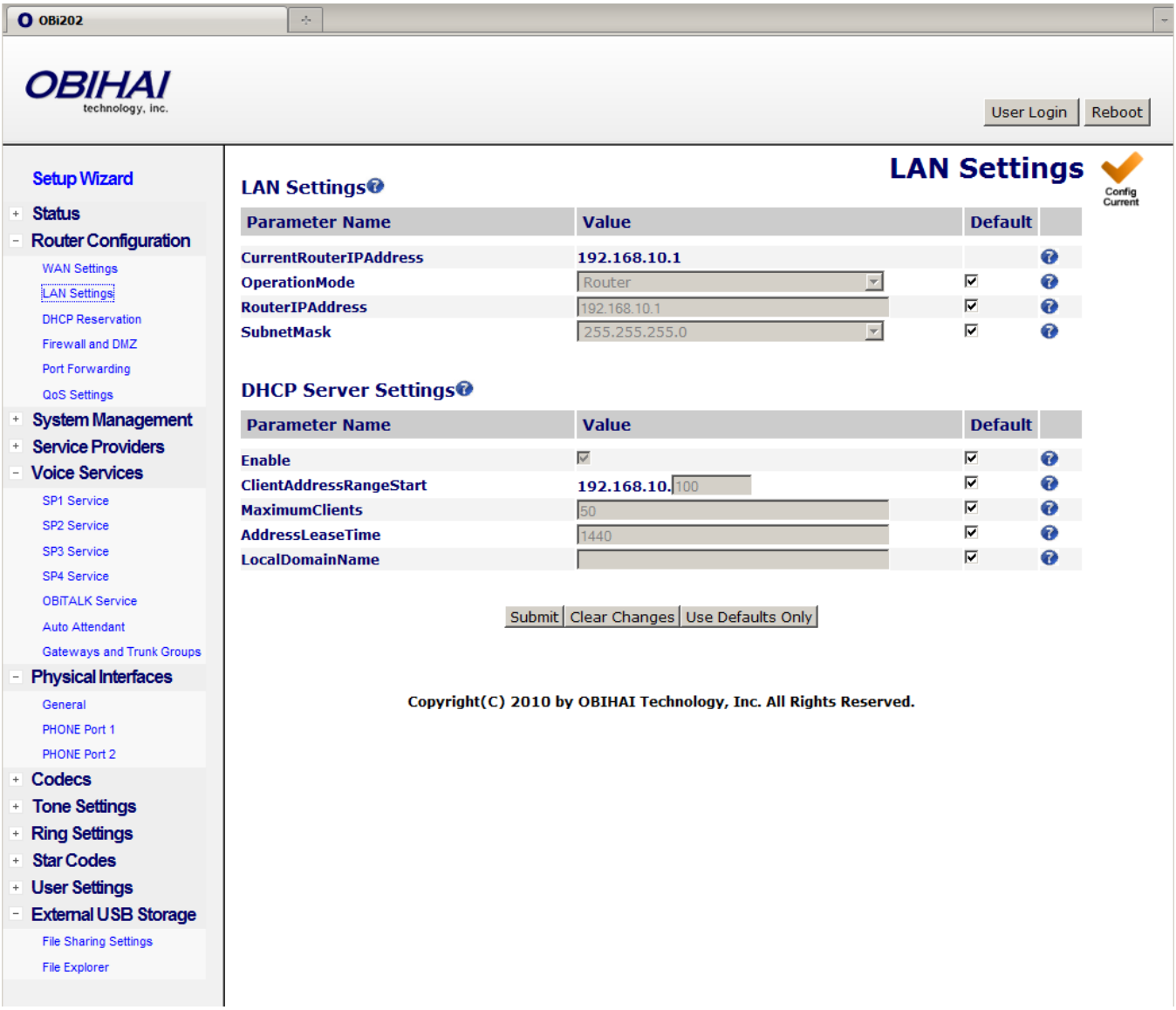

LAN Settings Parameter Guide:

Parameter	Description	Default Setting
LAN Settings		
CurrentRouterIPAddress	The current IP address of the router on the LAN side (read only). It is blank if OBi is operating in bridge mode.	
OperationMode	The Networking Operation Mode for the device. It can be one of the following	Router

<table>
<tr><td></td><td>values:
Router
Bridge</td><td></td></tr>
<tr><td>RouterIPAddress</td><td>The LAN side IP address to be used by the router. If it conflicts with the WAN side IP address, the OBi will automatically pick a different LAN side IP address to resolve the conflict.</td><td>192.168.10.1</td></tr>
<tr><td>SubnetMask</td><td>The LAN side Subnet Mask to be used by the router. It can be one of the following values:
255.255.255.0
255.255.255.128
255.255.255.192
255.255.255.224
255.255.255.240
255.255.255.248</td><td>255.255.255.0</td></tr>
<tr><td colspan="3">DHCP Server Settings</td></tr>
<tr><td>Enable</td><td>Enable the DHCP Server on the LAN side</td><td>Yes</td></tr>
<tr><td>ClientAddressRangeStart</td><td>The value of this parameter together with the values of CurrentRouterIPAddress and SubnetMask determine the starting IP address to assign to DHCP clients. The value of this parameter is the starting value of the lower bits of the 32-bit starting IP address not masked by the SubnetMask, and it MUST fit within the unmasked range of the SubnetMask. Here are some examples:
<table>
<tr><th>SubnetMask</th><th>CurrentRouter IPAddress</th><th>ClientAddress RangeStart</th><th>First Client IP Address</th></tr>
<tr><td>255.255.255.0</td><td>192.168.10.1</td><td>100</td><td>192.168.10.100</td></tr>
<tr><td>255.255.255.0</td><td>192.168.2.1</td><td>50</td><td>192.168.2.50</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table></td><td>100</td></tr>
<tr><td>MaximumClients</td><td>The size of the IP address range from which to pick addresses to assign to DHCP clients that are not in the DHCP reservation list. If the range extends to addresses outside of the SubnetMask, a red exclamation mark (!) will be shown next to the value on the OBi device web page.</td><td>50</td></tr>
<tr><td>AddressLeaseTime</td><td>IP address lease time in minutes</td><td>1440</td></tr>
<tr><td>LocalDomainName</td><td>Local Domain Name for the LAN</td><td></td></tr>
</table>

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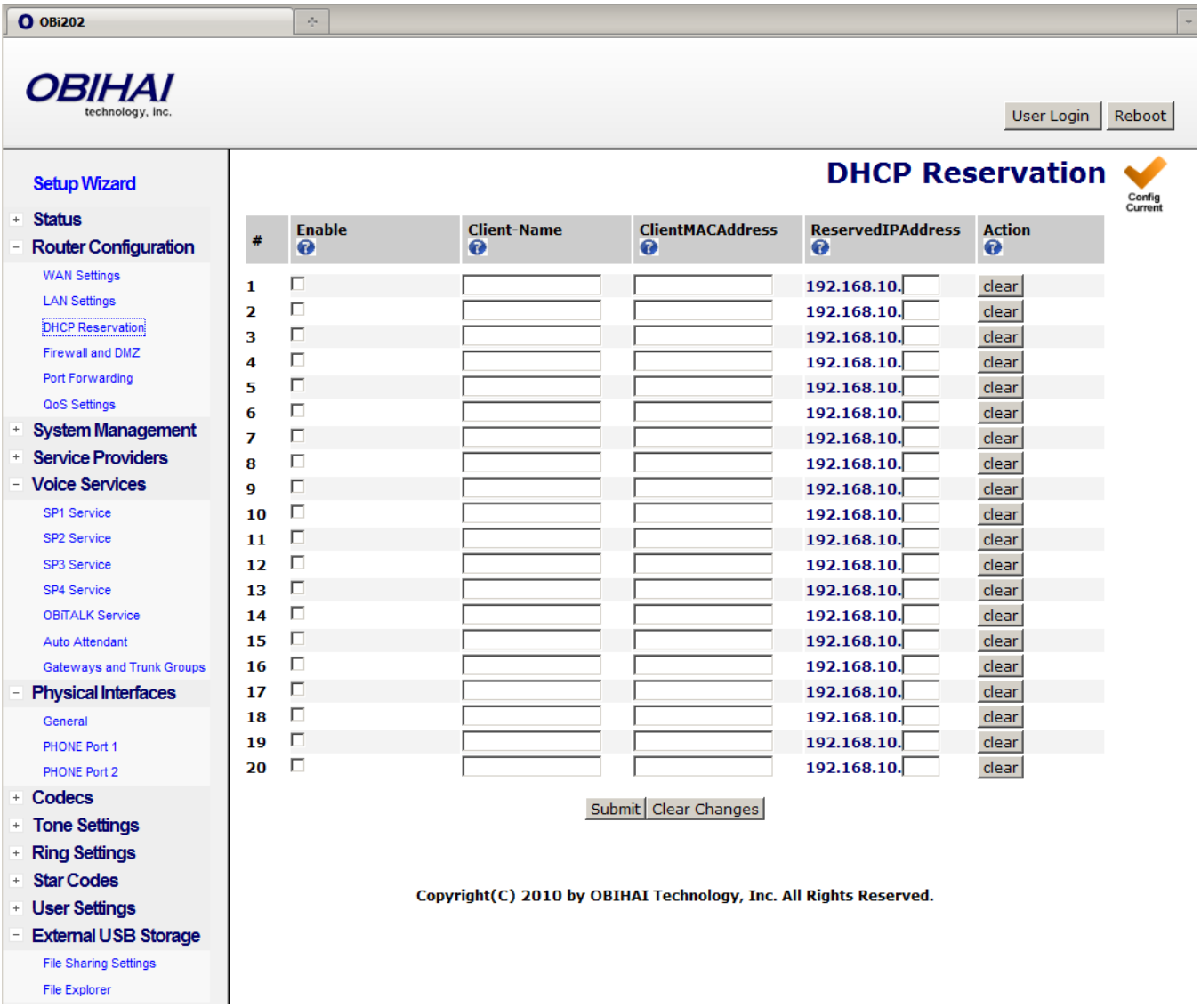
DHCP Reservation

You can reserve up to 20 specific IP addresses for the DHCP server to give out to DHCP clients with specific MAC addresses. Below is a screen shot of the DHCP Reservation web page.



DHCP Reservation Parameter Guide:

Parameter	Description	Default Setting
(Reservation) 1 – 20		
Enable	Enable this reservation	No
ClientName	An optional name for easy identification of the client	
ClientMACAddress	Client MAC address in the format "xx:xx:xx:xx:xx:xx" (where each x is a hex digit that can be in the upper or lower case)	
ReservedIPAddress	The IP address to reserve for this client	

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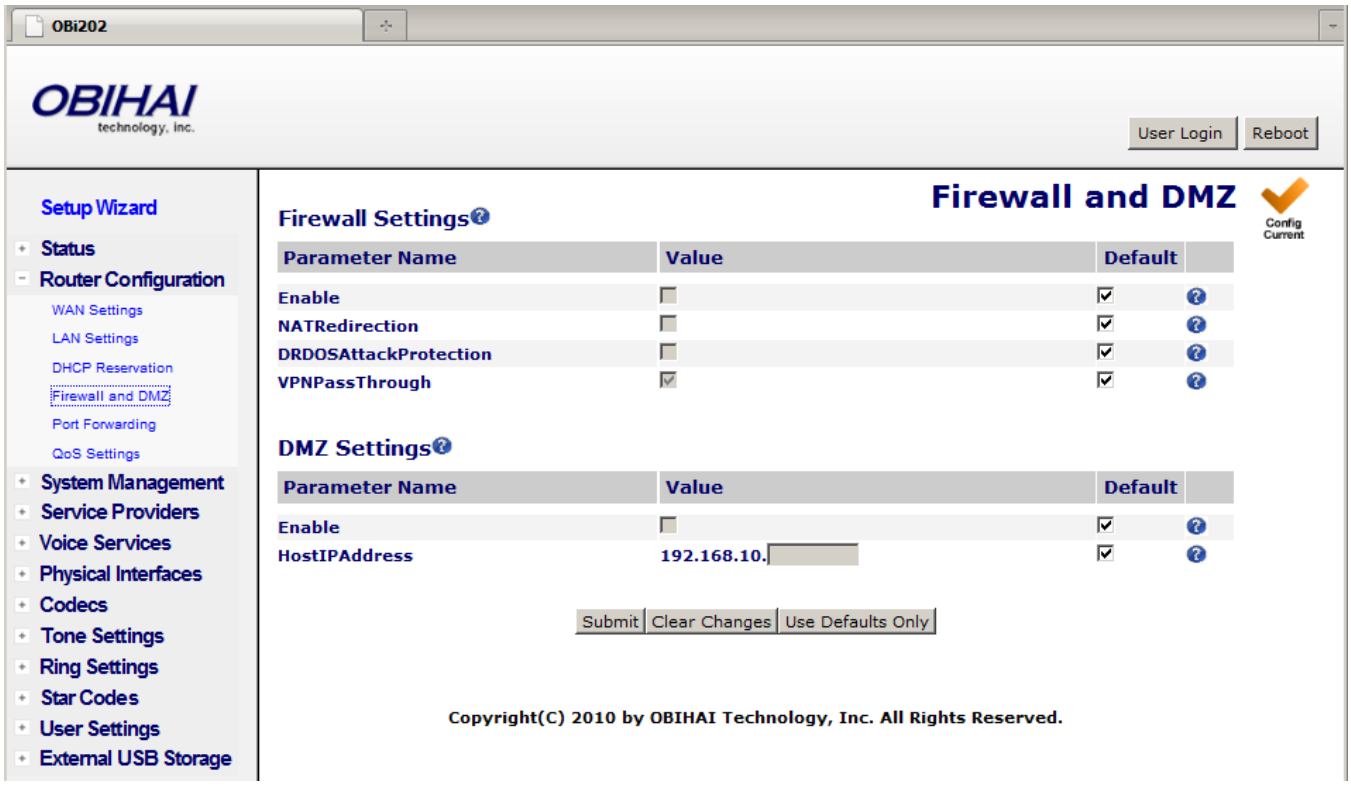
Firewall and DMZ

Firewall and DMZ apply only when the OBi is set to work in the router mode. The firewall filters incoming packets from the WAN side only. It provides protection against some threats from the WAN side. There is a global firewall enable option which, when disabled, disables all the firewall components. In addition, the three firewall related features, NATRedirection, DRDOSAttackProtection, and VPNPassThrough, will take effect only If firewall is enabled. Below is a screen shot of the Firewall and DMZ device web page.



Firewall and DMZ Parameter Guide:

Parameter	Description	Default Setting
Firewall Settings		
Enable	Enable the firewall	No
NATRedirection	Support NATRedirection (a.k.a. NAT Loopback or Hairpin). This setting takes effect only if firewall is enabled; otherwise this feature is *disabled*	No
DRDOSAttackProtection	Enable the protection against Distributed Reflection Denial of Service. This setting takes effect only if firewall is enabled; otherwise this feature is *disabled*	No
VPNPassThrough	Allow VPN (L2TP, PPTP and IPSEC) traffic to pass through if enabled; otherwise all VPN traffic are blocked. This setting takes effect only if firewall is enabled; otherwise this feature is *enabled*	Yes
DMZ Settings		
Enable	Enable DMZ Service	No
HostIPAddress	The IP address of the DMZ server	

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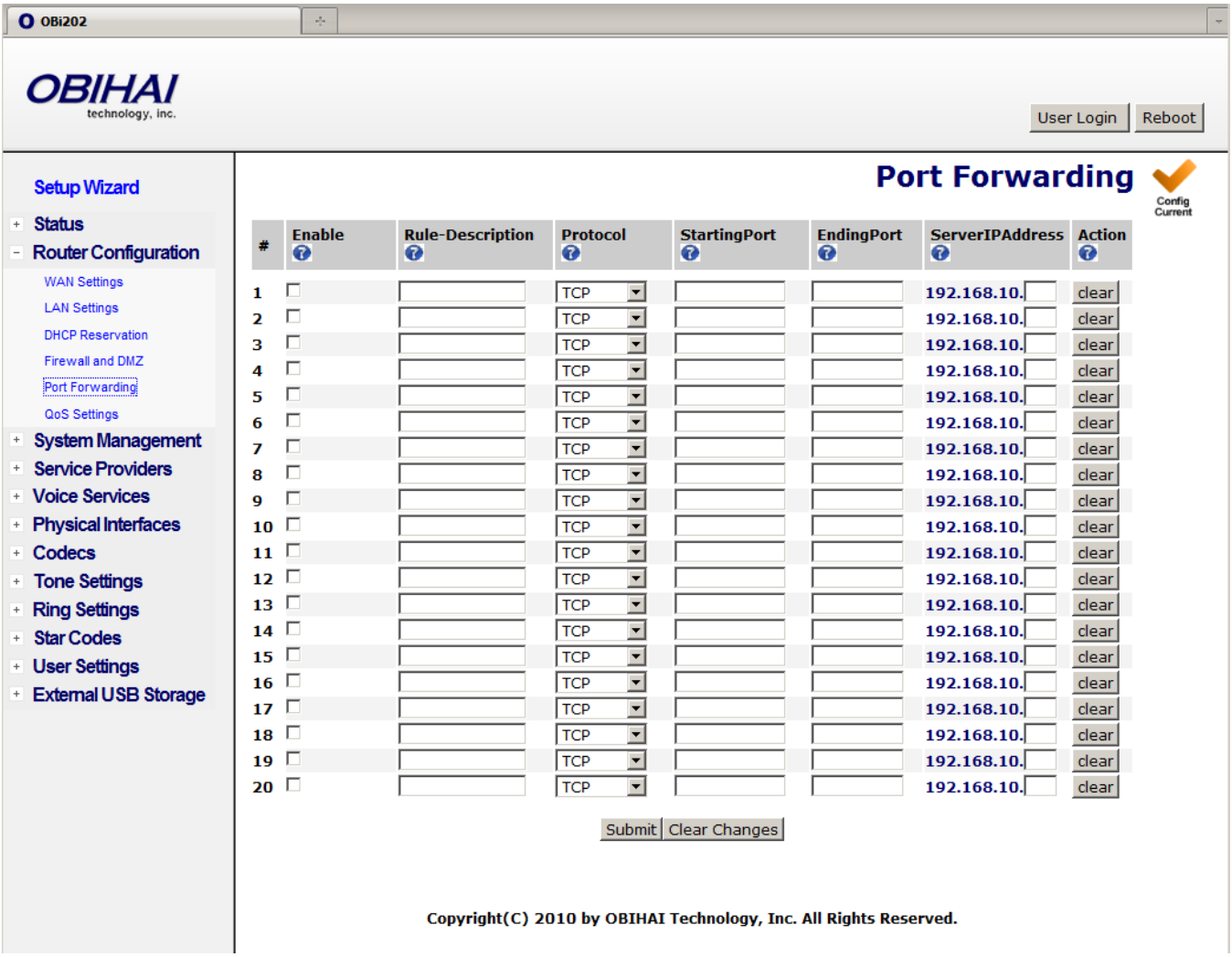
Port Forwarding

A port forwarding rule is useful for supporting a server application on a LAN client, such as FTP Server or HTTP Server. On the OBi 202 you can define up to 20 port forwarding rules. Below is a screen shot of the Port Forwarding web page.



Port Forwarding Parameter Guide:

Parameter	Description	Default Setting
Enable	Enable this port forwarding rule	No
RuleDescription	The description of this rule	
Protocol	The transport protocol for the specified port range in this rule. It can take one of the following values: TCP – TCP only UDP – UDP only Both – TCP and UDP	TCP
StartingPort	Starting port number of the forwarded port range	
EndingPort	Ending port number of the forwarded port range. If it is the same as StartingPort, only the one port equal to the StartingPort will be forwarded	

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ServerIPAddress	The LAN side IP address to forward the packet to when it is received at a port on the WAN side within the port range in this rule with matching transport protocol	

QoS Settings

QoS only applies to upstream traffic to the WAN side. The QoS settings described here takes effect in router mode only. It is based on Traffic Control(TC) and Hierarchy Token Bucket (HTB). Refer to the HTB home pages for details on TC and HTB (http://luxik.cdi.cz/~devik/qos/htb/).

Four priority classes of upstream traffic are defined in the OBi QoS policy: The Restricted class has the highest priority, followed by the High, the Medium, and the Low classes. To fully utilize the upstream bandwidth, it is important to have a relatively accurate upstream bandwidth estimation configured in the UpStreamBandwidth parameter; this tells the OBi the total upstream bandwidth to allocate to the four priority classes.

The guaranteed uplink bandwidth for Restricted class traffic is configured in the RestrictedBandwidth parameter. The rest of the upstream bandwidth (the UpStreamBandWidth less the RestrictedBandwidth) is divided among the High, Medium,and Low classes proportionally according to the assigned weighting factor for each class in the configuration. Let W_{high}, W_{medium}, and W_{low} be the respective weight assigned to the High, Low, and Medium classes, the corresponding guaranteed uplink bandwidth for each class is calculated using the following formulae:

BW_{high} = (UpstreamBandwidth – RestrictedBandwidth) * W_{high} / (W_{high} + W_{medium} + W_{low}) (Kbps)

BW_{medium} = (UpstreamBandwidth – RestrictedBandwidth) * W_{medium} / (W_{high} + W_{medium} + W_{low}) (Kbps)

BW_{low} = (UpstreamBandwidth – RestrictedBandwidth) * W_{low} / (W_{high} + W_{medium} + W_{low}) (Kbps)

The native voice related traffic is always classified as Restricted. Other network packets are classified based on the Differentiated Service Code Point (DSCP) in their IP headers. The 64 possible DSCP codes (0 – 63) can be mapped into one of the four priority classes using the configurable DSCP to Priority Class Mapping table.

Below is a screen shot of the QoS Settings web page.

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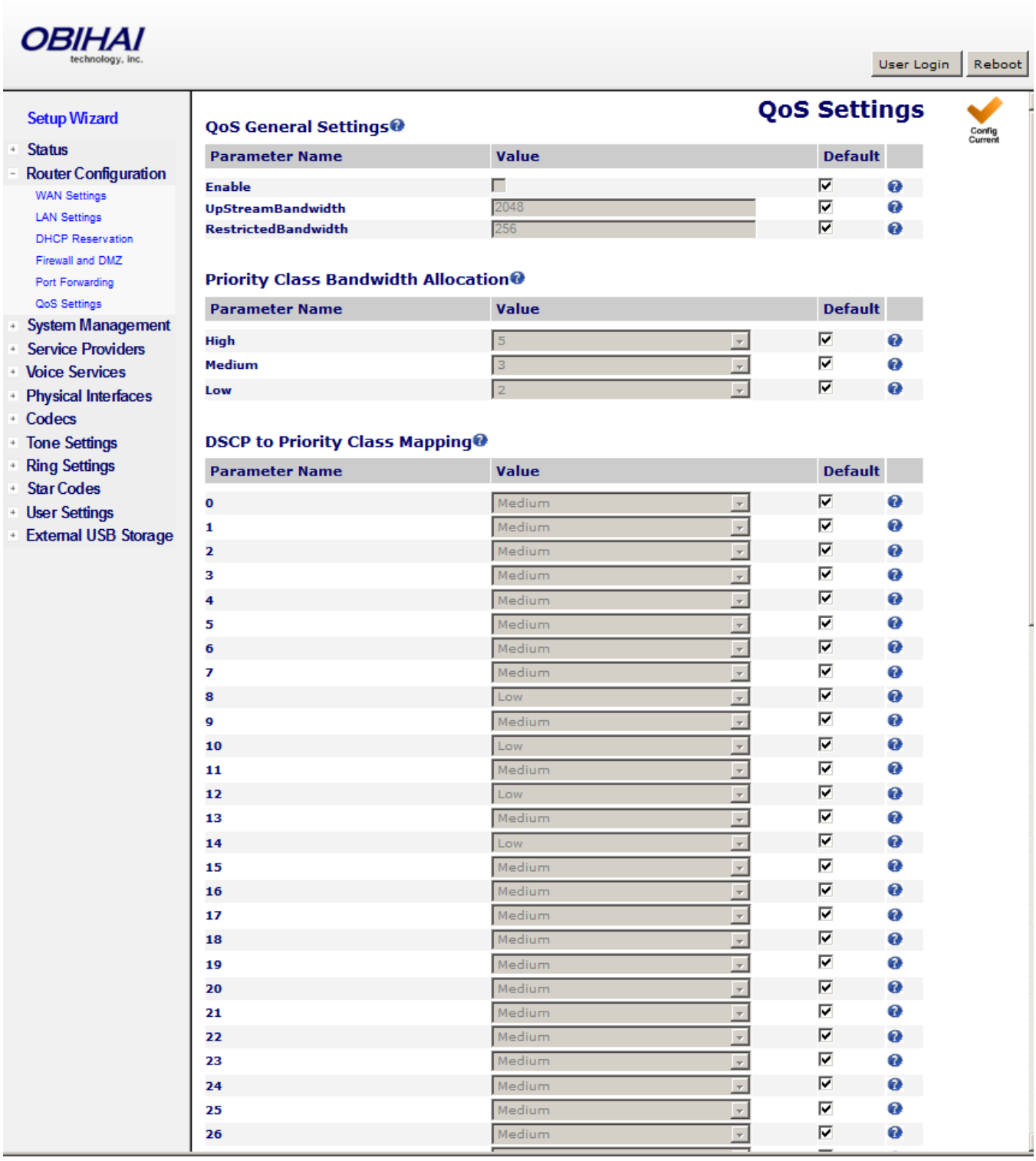

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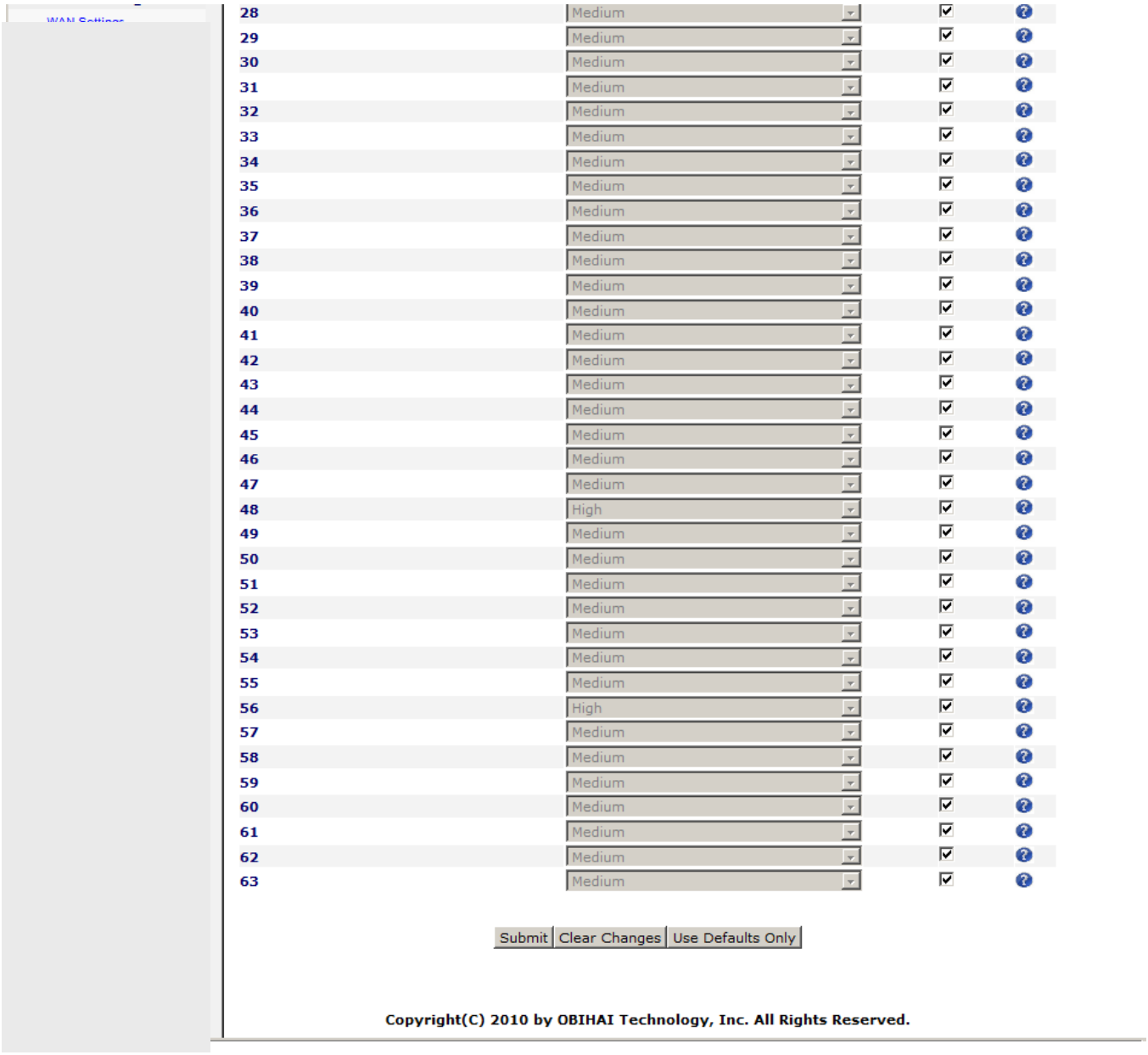

QoS Parameter Guide:

Parameter	Description	Default Setting
QoS General Setting		
Enable	Enable QoS Service (take effect in router mode only)	No
UpStreamBandwidth	The total upstream bandwidth in Kbps	2048
RestrictedBandwidth	The guaranteed bandwidth for Restricted class traffic in Kbps	512
Priority Class Bandwidth Allocation		
High	The guaranteed uplink bandwidth allocation weight for High Priority class traffic. It must be a value between 1 and 10	5
Medium	The guaranteed uplink bandwidth allocation weight for Medium Priority class traffic. It must be a value between 1 and 10	3

Low	The guaranteed uplink bandwidth allocation weight for Low Priority class traffic. It must be a value between 1 and 10	2
DSCP to Priority Class Mapping		
N (*N* = 0 – 63)	The priority class to be assigned to the packet which has the DSCP code equal to *N* in the IP header. The choices are: Restricted High Medium Low Note: Restricted class has the highest priority	For *N* = 8, 10, 12, or 14, the default is Low. For *N* = 48 or 56, the default is High. For all other DSCP codes, the default is Medium

OBiWiFi Wireless USB Adapter

Note: OBiWiFi is available on the OBi2 Series and OBi3 Series models only.

OBiWiFi supports the 8021.11 b/g/n wireless standards so that an OBiWiFi Wireless Adapter may be used with the USB 2.0 port of the OBi2 Series and OBi3 Series devices. From an IP routing point of view, OBiWiFi is an additional WAN interface. If both WAN interfaces are connected (Ethernet port and OBiWiFi), the traffic destined to the WAN side will route through the Ethernet interface only, unless a) the WAN (Ethernet) interface and OBiWiFi are on different subnet and b) the destination address is on the same subnet as OBiWiFi.

If the OBi is set to function as a LAN switch rather than a router, OBiWiFi is disabled internally.

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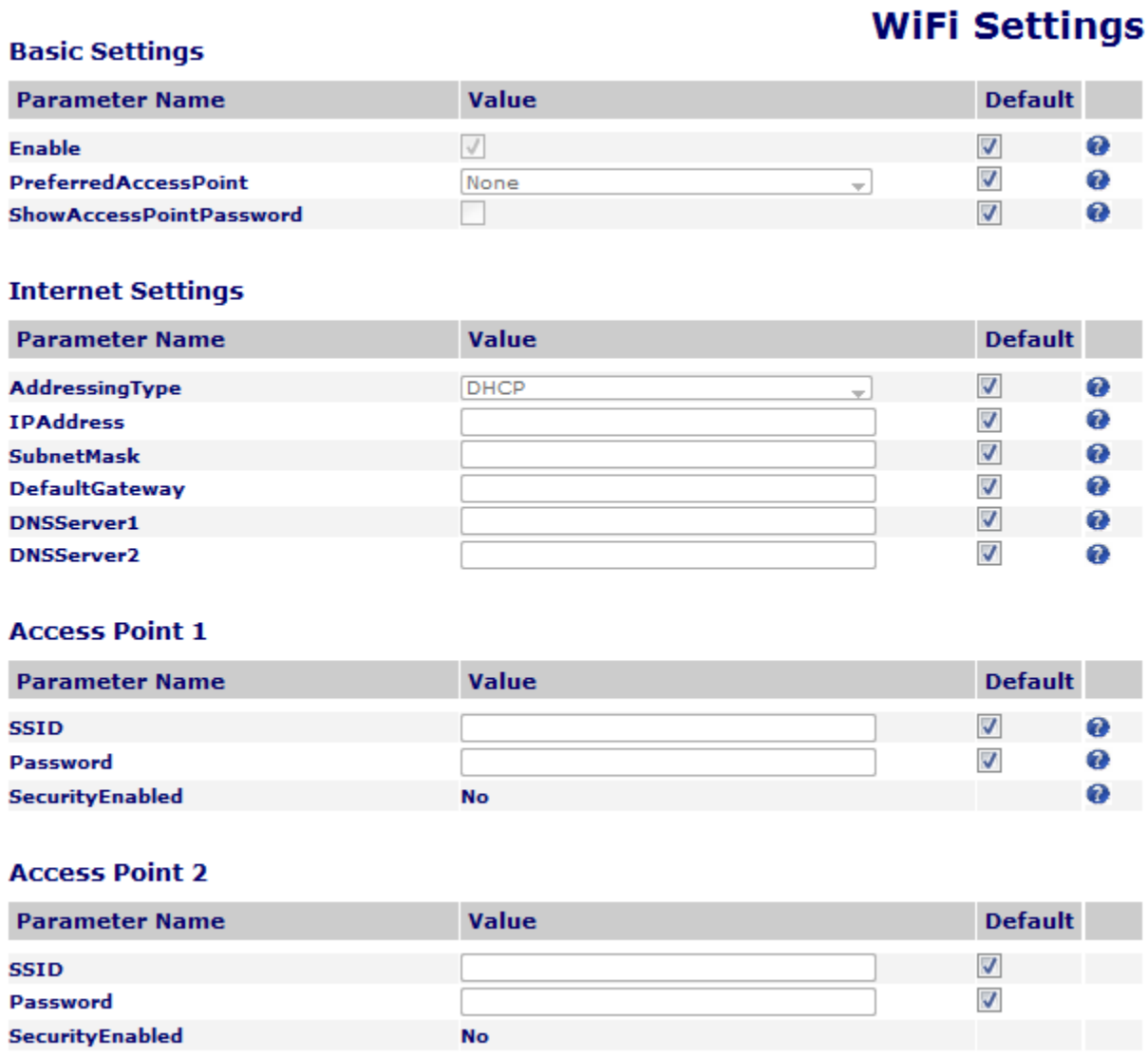
WiFi Settings

A screenshot of the WiFi Settings device page is shown below.



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WiFi Settings Parameter Guide:

Parameter	Description	Default Setting
Basic Settings		
Enable	Enable OBiWiFi feature. You must have an OBiWiFi dongle attached to the OBi to use the feature	Yes
PreferredAccessPoint	Indicate which access point to use when more than one remembered AP are in range. Select from the list: None, Access Point 1, Access Point 2, …, Access Point 20. This value is automatically populated with the last AP that OBi user chose to connect explicitly from the device web page	None
ShowAccessPointPassword	Check this box and press submit to show all the AP passwords in (unmasked) plain text (no reboot required). The passwords will be masked again following a reboot of the device	No
Internet Settings		
AddressingType	The method to assign an IP address to this interface. Choose between DHCP or Static	DHCP
IPAddress	The IP address to use if AddressingType = Static	
SubnetMask	The subnet mask to use if AddressingType = Static	
DefaultGateway	The default gateway to use if AddressType = Static	
DNSServer1	An additional DNS Server to use in addition to the ones received from DHCP	
DNSServer2	An additional DNS Server to use in addition to the ones received from DHCP	
Access Point *N* (*N*=1,2,…,20)		
SSID	SSID of the access point	
Password	Password or pass-phrase based on the authentication method used by the AP. For WPA, the pass-phrase should be no more than 64 characters. For WEP, the password should be in one of the four formats: 10 HEX digits, 26 HEX digits, 5 ASCII characters, or 13 ASCII characters. The HEX digits can be upper or lower case	
SecurityEnabled	This is a read only parameter. It indicates if the AP has security enabled or not	

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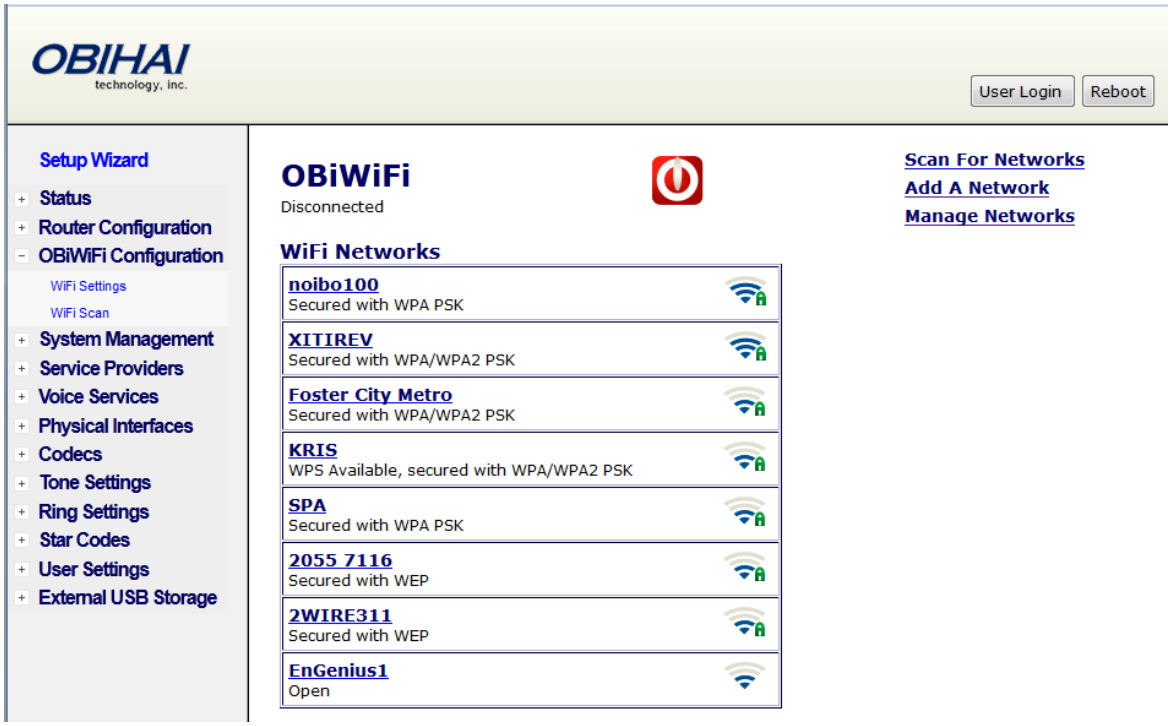
WiFi Scan

The WiFi Scan device page offers a familiar user interface to let you scan for access points in the neighborhood. A screenshot of this page is shown below. You can click on the page one of the available AP to connect to. If the AP requires authentication but the OBi does not have any valid credential, a page will be returned to prompt you to enter a password or pass-phrase and press "Connect" to continue.

If your AP does not show up as a listed device on this page, e.g. perhaps its SSID is not broadcast, you may enter its SSID and security credentials manually by clicking the "Add a Network" link. The "Manage Networks" link takes you back to the WiFi Settings device page, whereas the "Scan For Networks" link reloads this page in order to rescan for the access points in the neighbourhood.



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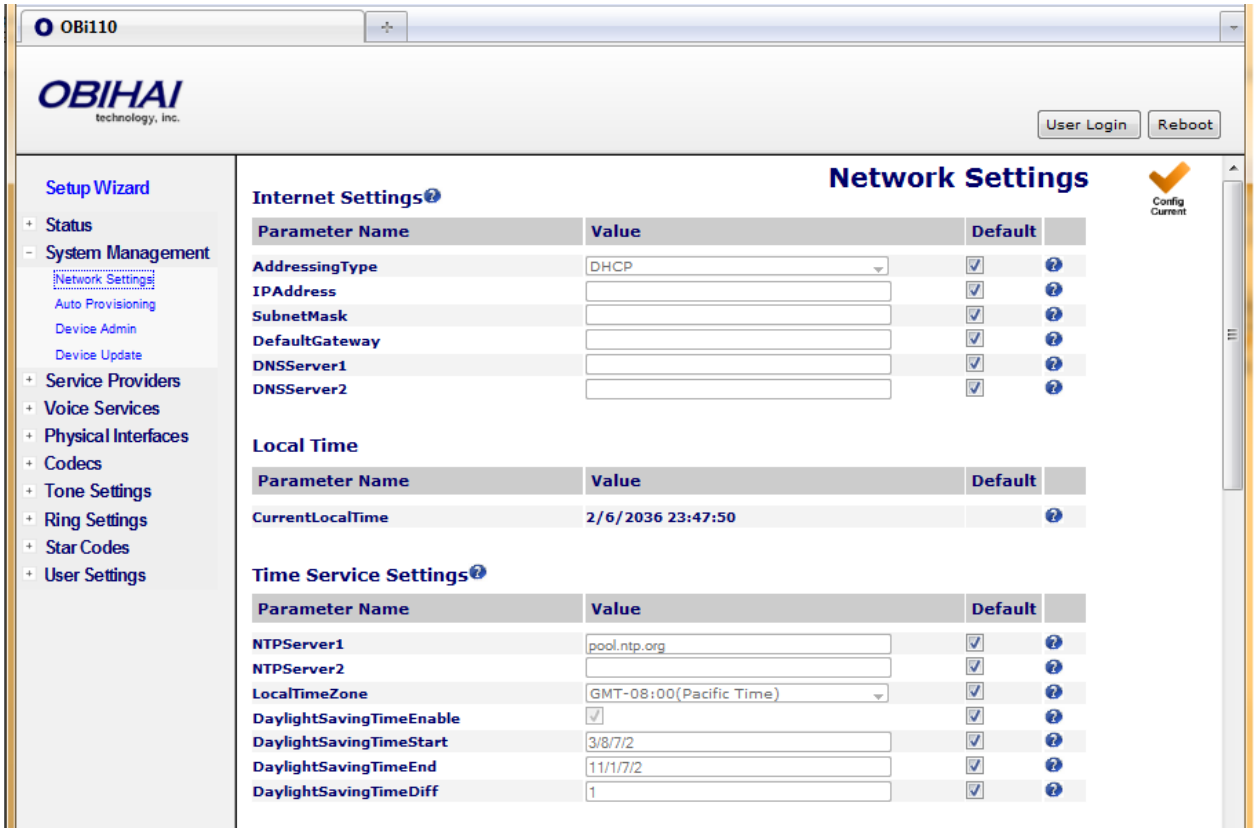
System Management Features of the OBi Device

Network Settings

This section applies to OBi100/OBi110 only. For OBi2 Series and OBi3 Series models, please refer to the section WAN Settings.



Network Settings Parameter Guide:

Parameter	Description	Default Setting
Internet Settings		
AddressingType	The method used for assigning IP address, subnet mask, default gateway, etc., to the device. Available choices are: DHCP: IP address, default gateway, etc. are assigned by DHCP Server. these these Static: IP address, default gateway, etc. are taken from the manually configured values.	DHCP
IPAddress	The IP address to assign to the device when AddressingType is set to Static.	
SubnetMask	The subnet mask to use when AddressingType is set to Static.	
DefaultGateway	The default gateway IP address to assign to the device when AddressingType is set to Static.	
DNSServer1	IP address of the first DNS server to use, in addition to the ones obtained from the DHCP server when DHCP is also enabled. If AddressingType is set to Static, the device only uses DNSServer1 and DNSServer2 for DNS lookup. It will try up to 5 DNS servers when attempting to resolve a domain name. DNSServer1 and	

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	DNSServer2 will be tried first, whichever is specified, and then the ones obtained from the DHCP Server if available.	
DNSServer2	IP address of the second DNS server to use, in addition to the ones obtained from the DHCP server when DHCP is also enabled. If AddressingType is set to Static, the device only uses DNSServer1 and DNSServer2 for DNS lookup. It will try up to 5 DNS servers when attempting to resolve a domain name. DNSServer1 and DNSServer2 will be tried first, whichever is specified, and then the ones obtained from the DHCP Server if available.	
VLANID	Valid range is 0 – 4094 (4095 is reserved). 0 means VLAN is disabled and egress packets are not tagged by the divice. This setting applies to all packets sent by the device.	0
VLANPriority	Valid choices are 0 – 7. This setting applies to all packets sent by the device.	0
Local Time		
CurrentLocalTime	Current local date and time of the device	
Time Service Settings		
NTPServer1	Hostname or IP address of the first NTP server	pool.ntp.org
NTPServer2	Hostname or IP address of the second NTP server	
LocalTimeZone	Local time zone. Available choices are: - GMT-12:00(Int'l Dateline West) - GMT-11:00(Samoa) - GMT-10:00(Hawaii) - GMT-09:00(Alaska) - GMT-08:00(Pacific Time) - GMT-07:00(Mountain Time) - GMT-06:00(Central Time) - GMT-05:00(Eastern Time) - GMT-04:00(Atlantic Time) - GMT-03:30(Newfoundland) - GMT-03:00(Buenos Aires,Greenland) - GMT-02:00(Mid-Atlantic) - GMT-01:00 - GMT+00:00(London,Lisbon) - GMT+01:00(Rome,Paris,Madrid) - GMT+02:00(Athens,Cairo) - GMT+03:00(Moscow,Baghdad) - GMT+04:00(Abu Dhabi) - GMT+04:30(Kabul) - GMT+05:00(Islamabad,Karachi) - GMT+05:30(New Delhi) - GMT+05:45(Kathmandu) - GMT+06:00 - GMT+07:00(Bangkok,Jakarta) - GMT+08:00(Beijing,HK,Singapore) - GMT+09:00(Tokyo,Seoul) - GMT+10:00(Sydney,Guam) - GMT+11:00(Solomon Is.) - GMT+12:00(Fiji,Auckland)	GMT-08:00
DaylightSavingTimeEnable	Enable daylight saving time on the unit	Yes
DaylightSavingTimeStart	Daylight Saving Time Start Date. Format: month/day/weekday/hh:mm::ss,	3/8/7/2

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	where month=1-12, day=±(1-31), weekday=0,1-7 (0=special, 1=Monday, 7=Sunday), hh=0-23,mm=0-59,ss=0-59. If weekday=0, daylight saving starts on the given month/day; otherwise it starts on the weekday on or after the given month/day if day > 0, or on the weekday on or before the last-day-of-given-month+day+1 (note that day = -1 equivalent to last day of the month). :ss may be omitted if the value is 0; :mm:ss may be omitted if mm and ss are both 0.	
DaylightSavingTimeEnd	Daylight Saving Time End Date. Same format as Start Date	11/1/7/2
DaylightSavingTimeDiff	Amount of time to add to current time during Daylight Saving Time. Format: [-]hh:mm:ss. :ss may be omitted if it is 0; :mm:ss may be omitted if both are 0.	1
DNS Control		
DNSQueryOrder	When more than one DNS servers are available, the unit will attempt to resolve a domain name by querying each server sequentially until a successful result is received. The parameter controls the order in querying the servers. Available choices are: - DNS Server1, DNS Server2, DHCP Offered DNS Servers DHCP Offered DNS Servers, DNS Server1, DNS Server2	DNS Server1, DNS Server2, DHCP Offered DNS Servers
DNSQueryDelay	When more than one DNS servers are available, the unit will attempt to resolve a domain name by querying each server sequentially until a successful result is received. This parameter controls the number of seconds between successive DNS query made by the unit for a given domain name. Choices are 0 – 5 (s)	2
Local DNS Records		
N where *N* = 1 – 32	One of 32 Local DNS Records (numbered 1 – 32). Each record is a mini script of the following format: *Name*=*A*,*A*,*A*,... **OR** *Name*=*R*,*R*,*R*,... where *Name* represents the domain name to be resolved locally, and has the format *prefix*+*domain* (such as `machine.sip+obihai.com`). Everything after '+' is considered as the *domain* to be appended to the *host* field in each *R* on the right hand side. '+' is optional; if missing the full domain must be used in every *R*. *A* represents an A record which is just an ip address, such as 192.168.12.17. *R* represents an SRV record and has the format: {*host*:*port*,*pri*,*wt*} where - *host* is a hostname with or without domain part (such as xyz, xyz.abc.com.). A dot (.) at the end of *host* indicates it is a complete hostname that does not require the domain to be appended. - *port* is a port number (such as 5060) - *pri* is the priority. Valid value is 0(highest) – 65535(lowest) - *wt* is the weight. Valid value is 0(lowest) – 65535(highest) *wt* is optional; 1 is the default if not specified. *pri* is optional only if *wt* is not specified; 1 is the default if not specified. *port* is optional; the default to use will be based on the protocol (5060 for SIP, 80 for HTTP, etc.) . The enclosing curly braces { } are also optional if there is only one *R*; or if there is no comma used inside the *R*. Examples: _sip._udp+obihai.com=abc,xyz,pqr:5080,{mmm,2},{super.abc.com.}	

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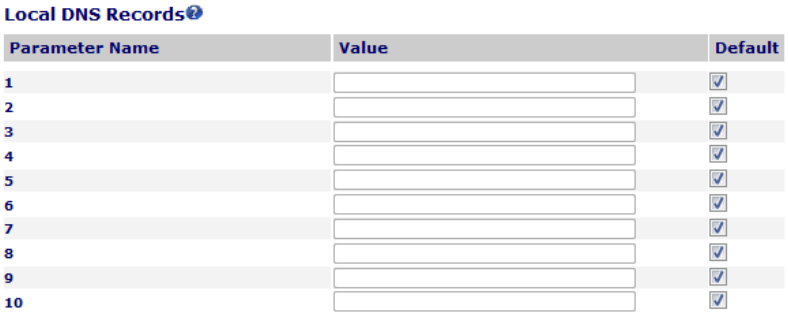
	abc.obihai.com=192.168.15.118,192.168.15.108 Note: If the A record of a given hostname cannot be found in any of the Local DNS Records, the device will attempt to resolve it using external DNS queries. Any change applied to local DNS Record needs reboot in order to take effect.	



32 Local DNS Records (numbered 1 – 10 pictured here)

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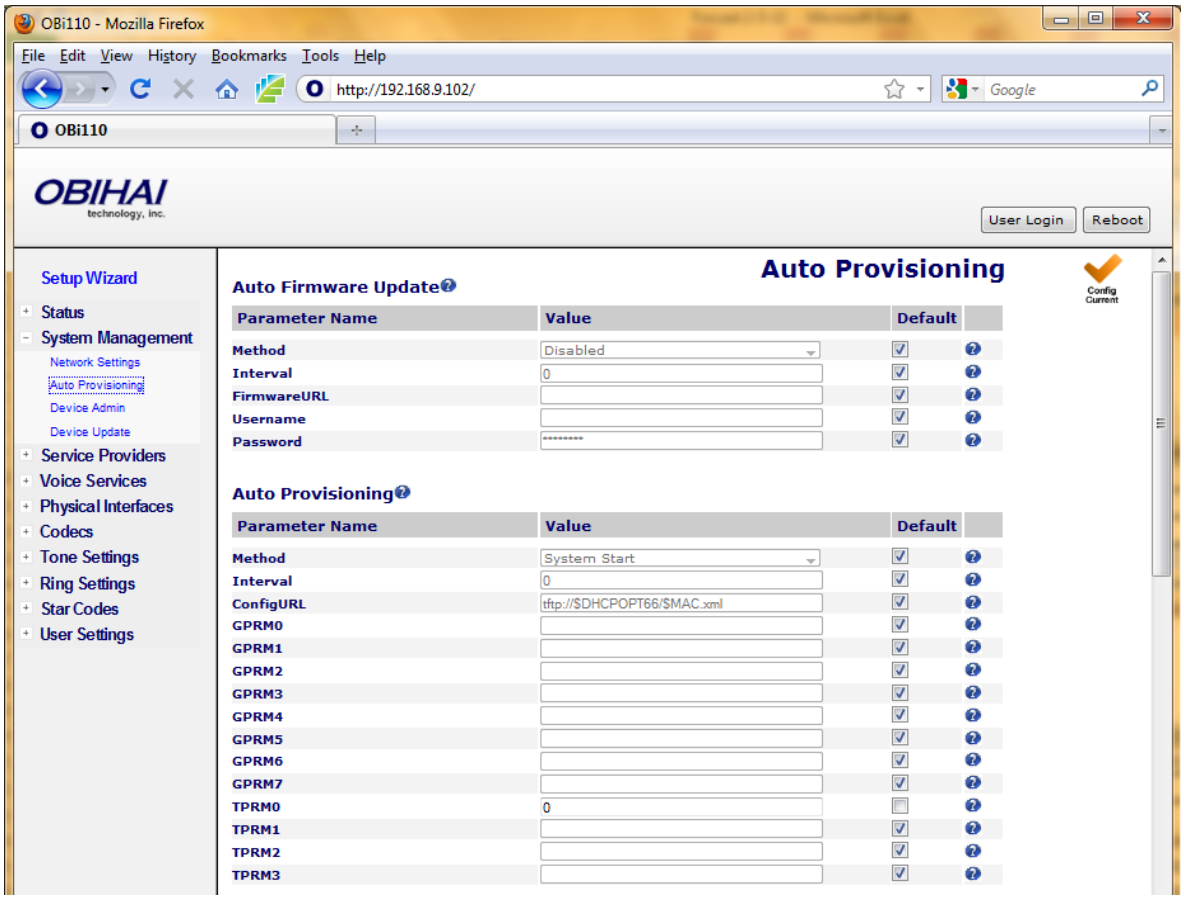
Automatic Firmware Update & Provisioning



Auto Provisioning Parameter Guide:

Parameter	Description	Default Setting
Auto Firmware Update		
Method	Current operational method of auto firmware updating. Available choices are: - Disabled = Do not check for f/w upgrade from FirmwareURL - System Start = Check for f/w upgrade from FirmwareURL just once on system start - Periodically = Check for f/w upgrade from FirmwareURL on system start, and then periodically at the interval specified in the Interval paramter Note: First f/w upgrade check on system start will be performed after a random delay of 0-30s	Disabled

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Interval	When Method is set to Periodically, this is the number of seconds between each checking of f/w upgrade check from FirmwareURL. If value is 0, device checks once only on system start (i.e., equivalent to setting Method to System Start)	0
FirmwareURL	URL of firmware package. URL must include scheme. Supported schemes are http:// and tftp://	
DnsLookupType	Control what type of DNS record to lookup. Available choices are: - A Record Only - SRV Record Only - - Try Both Note: Option not available on OBi100/OBi110	A Record Only
DnsSrvPrefix	Control whether to add a standard prefix to the domain name when looking up a SRV Record. For HTTP and HTTPS, the prefix to add is "_http._tcp.". For TFTP, the prefix to add is "_tfto._udp." Available choices are: - No Prefix - With Prefix - Try Both Note: Option not available on OBi100/OBi110	No Prefix
Username	Username for authentication, if needed, if scheme is http://	
Password	Password for authentication, if needed, if scheme is http://	
ITSP Provisioning		
Method	Current operational method of Provisioning. Available choices are: - Disabled = Do not download from ConfigURL - System Start = Download from ConfigURL just once on system start - Periodically = Download from ConfigURL on system start, and then periodically at the interval specified in the Interval paramter Note: First download on system start will be performed after a random delay of 30 – 90s. If there is a firmware update scheduled at the beginning. Or a random delay of 10- 70s..	System Start

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Interval	When Method is set to Periodically, this is the number of seconds between download from ConfigURL. If value is 0, device downloads once only on system start (i.e., equivalent to setting Method to System Start)	0
ConfigURL	URL of config file	tftp://$DHCPOPT66/$MAC.xml
DnsLookupType	Control what type of DNS record to lookup. Available choices are: - A Record Only - SRV Record Only - - Try Both Note: Option not available on OBi100/OBi110	A Record Only
DnsSrvPrefix	Control whether to add a standard prefix to the domain name when looking up a SRV Record. For HTTP and HTTPS, the prefix to add is "_http._tcp.". For TFTP, the prefix to add is "_tfto._udp." Available choices are: - No Prefix - With Prefix - Try Both Note: Option not available on OBi100/OBi110	No Prefix
GPRM0 to GPRM7	Non-volatile generic parameters which can be referenced in other parameters, such as ConfigURL	
TPRM0 to TPRM3	Temporary variables used in scripts for ConfigURL. Please refer to device provisioning guide for examples on how to these variables.	

OBiTALK Provisioning		
Method	Current operational method of Provisioning. Available choices are: - Disabled = Do not download from ConfigURL - System Start = Download from ConfigURL just once on system start - Periodically = Download from ConfigURL on system start, and then periodically at the interval specified in the Interval paramter Note: First download on system start will be performed after a random delay of 30 – 90s. If there is a firmware update	System Start

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	scheduled at the beginning. Or a random delay of 10- 70s..	
Interval	When Method is set to Periodically, this is the number of seconds between download from ConfigURL. If value is 0, device downloads once only on system start (i.e., equivalent to setting Method to System Start)	0
ConfigURL	URL of config file	tftp://$DHCPOPT66/$MAC.xml
DnsLookupType	Control what type of DNS record to lookup. Available choices are: - A Record Only - SRV Record Only - - Try Both Note: Option not available on OBi100/OBi110	A Record Only
DnsSrvPrefix	Control whether to add a standard prefix to the domain name when looking up a SRV Record. For HTTP and HTTPS, the prefix to add is "_http._tcp.". For TFTP, the prefix to add is "_tfto._udp." Available choices are: - No Prefix - With Prefix - Try Both Note: Option not available on OBi100/OBi110	No Prefix
GPRM0 to GPRM7	Non-volatile generic parameters which can be referenced in other parameters, such as ConfigURL	
TPRM0 to TPRM3	Temporary variables used in scripts for ConfigURL. Please refer to device provisioning guide for examples on how to these variables.	
User Defined Macro 0–3 ($UDM0 – $UDM3)		
Value	The value can be any plain text or a valid canonical parameter name preceded by a $ sign. For example: `$X_DeviceManagement.WebServer.Port` Note: Here you MUST NOT enclose the parameter name following the $ sign with braces or parentheses.	
ExpandIn	This is a comma separated list of canonical parameter names, where the macro expansion can be used. Up to 3 parameter names may be specified. Specify ANY to allow the macro to expand in any parameter. Example:	

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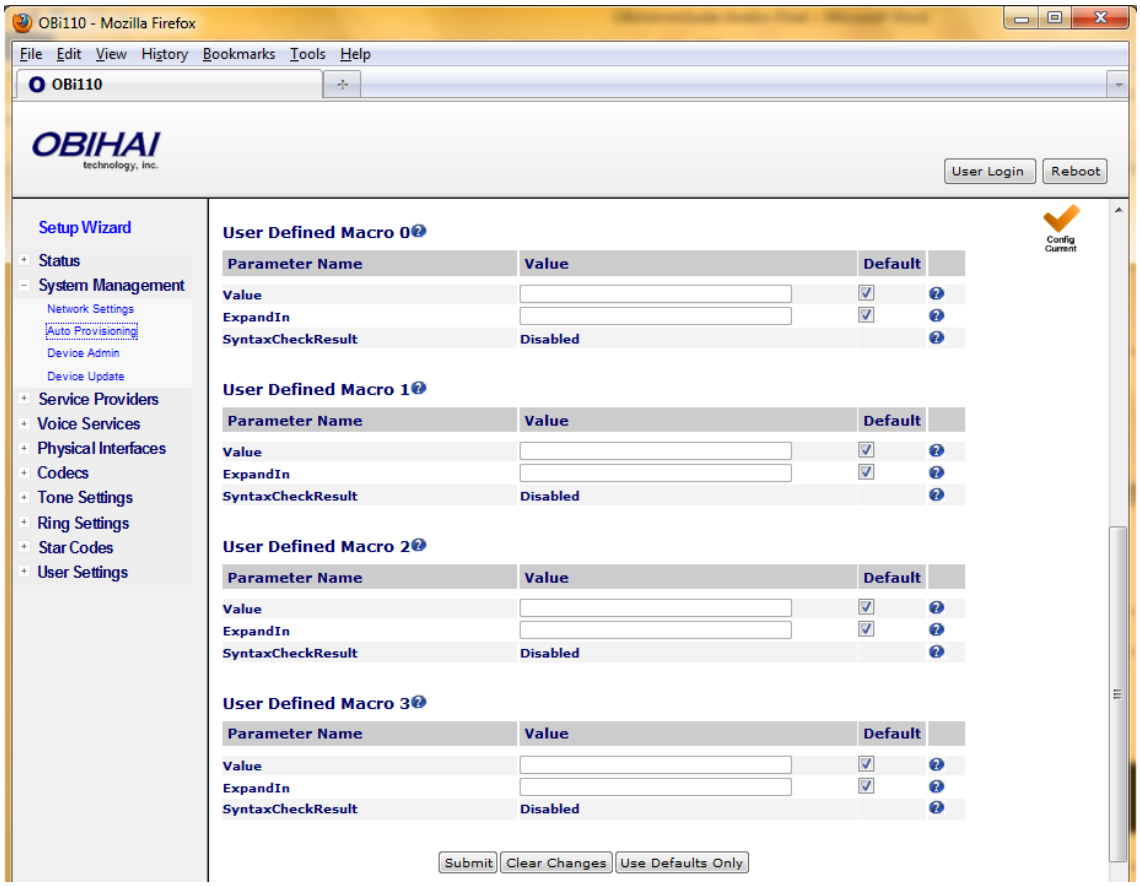
	X_DeviceManagement.HTTPClient.UserAgent Note: There is no $ sign in front of the parameter name. The macro cannot be used in any parameter value if this value is set to blank (the default)	
SyntaxCheckResult	This is read only status value regarding the syntax of the UDM. “Pass” means that this UDM is valid. Otherwise, it shows the syntax error detected by the device either in the Value or ExpandIn parameters of the UDM.	



$MACRO Expansion Supported by the OBi Device

Macro Name	*Description*	*Where It Can Be Used*
MAC	Device MAC address, such as 9CADEF000000	ANY
MACC	Device MAC address with colon, such as 9C:AD:EF:00:00:00	ANY
mac	Device MAC address lower case, with colon, such as 9c:ad:ef:00:00:00	ANY

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FWV	Firmware version, such as 1.0.3.1626	ANY
HWV	Hardware version, such as 2.8	ANY
IPA	Device current IP Address, such as 192.168.15.100	ANY
DM	Device Model Name, such as OBi110	ANY
DMN	Device Model Number, such as 110	ANY
OBN	Device OBi Number, such as 200123456	ANY
DSN	Device S/N, such as 88B01NA00000	ANY
GPRM*n* *n*=0–7	Value Auto Provisioning::GPRM*n*	Auto Provisioning::ConfigURL, Auto Firmware Update::FirmwareURL
TPRM*n* *n*=0-3	Value Auto Provisioning::TPRM*n*	Auto Provisioning::ConfigURL, Auto Firmware Update::FirmwareURL
UDM*n*, *n*=0-3	Value of User Define Macro *n*::Value	The value of User Define Macro *n*::ExpandIn

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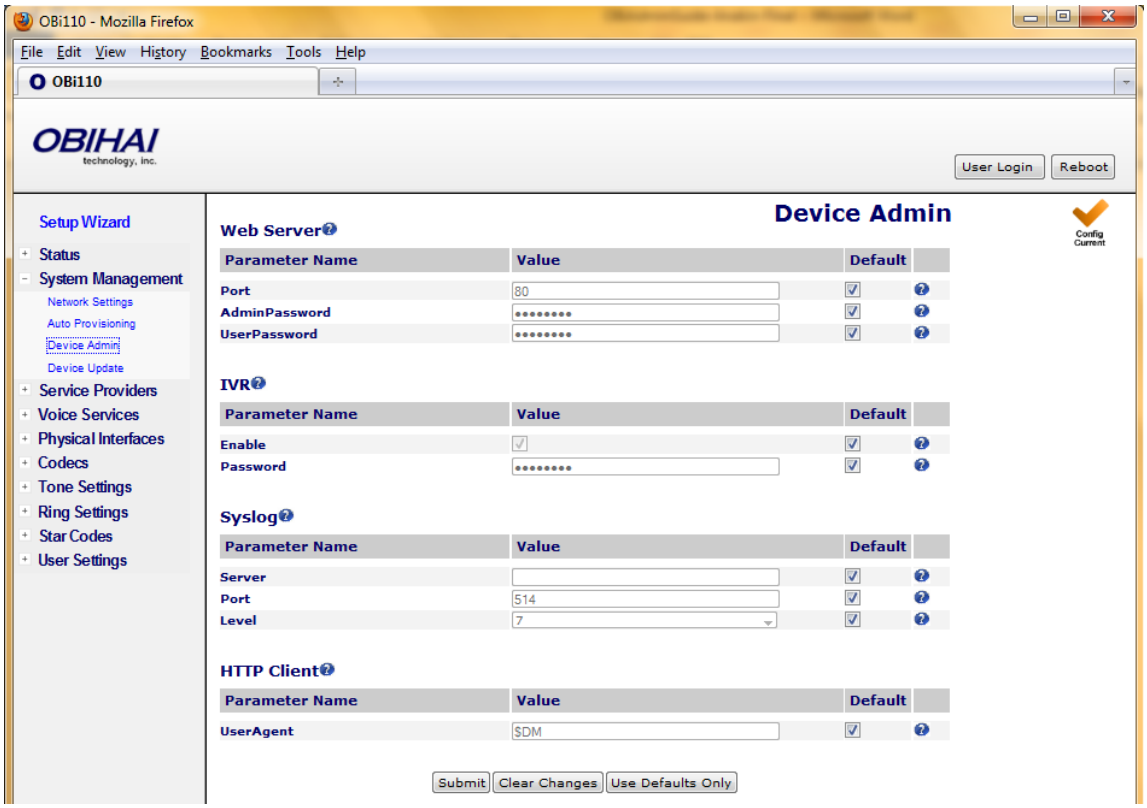
Device Administration



Device Administration Parameter Guide:

Parameter	Description	Default Setting
Web Server		
Port	Web Server Port Number	80
AdminPassword	Administrator Password, case sensitive	admin
UserPassword	User Password, case sensitive	user
AccessFromWAN	Allow access the OBi device management web pages from the WAN side Note: Option available on OBi202/OBi302 only	No
IVR		
Enable	Enable IVR for local configuration	Yes
Password	IVR access password (must be all digits)	
Syslog		
Server	IP address of the Syslog Server where the device sends syslog debug messages to. If the value is blank, syslog is disabled	
Port	Syslog Server Port Number	514
Level	Syslog Message Level	7
TAG	A string of text no longer than 32 characters to prepend every syslog message sent out by this unit. Note: Option not available on OBi100/OBi110	

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HTTP Client		
UserAgent	Value of the User-Agent header in all HTTP Requests which are used in firmware upgrade and auto provisioning.	$DM
TimeOut	A time limit specified in number of seconds such that any file download (firmware or configuration file) by the device via HTTP must be completed within this limit or the device will abort and conclude that the operation has failed for the reason of “taking too long to complete”	600

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Device Update

See the section entitled, "Firmware: OBi Device Update and Management" for details on device firmware updates.

SIP Service Provider Features of the OBi Device

The following section describes the SIP Service Provider features of the OBi device. Up to four SIP accounts (two only on OBi1 Series – OBi100 and OBi110), or SIP Trunks, can be configured on the OBi. For the purposed of this document and elsewhere on OBi device web page, documentation and the OBiTALK portal, the term ITSP is used to describe the logical entity providing the SIP Trunk service to the OBi. ITSP stands for Internet Telephony Service Provider. Please note that when the OBi is used in conjunction with an IP PBX, the IP PBX would take the place of the ITSP if it is the entity providing the SIP Trunk account credential and connectivity to the OBi.

Each ITSP configuration is grouped together as an ITSP Profile. We refer to them as ITSP Profile A, B, C[2], and D[2] respectively.. The SP service account specifics on the other hand are grouped under the heading SP*n* Service, where *n* = 1, 2, 3 or 4. An ITSP Profile includes such parameters as `ProxyServer`, `OutboundProxy`, and `DigitMap`, but does not include account specific parameters. A SP Service includes account specific parameters such as `AuthUserName` (usually the phone number of the account), `AuthPassword`, `CallerIDName`, and `X_ServProfile` (which ITSP Profile to assume). If both SP Service use the same ITSP, then only one ITSP Profile needs to be configured with both SP Services referred to the same profile.

From the OBi device point of view, the SP*n* Service using ITSP Profile *X* is enabled with the following minimal settings:

ITSP Porfile *X* – SIP::ProxyServer = *Not Blank*

SP*n* Service::Enabled = Yes

SP*n* Service::AuthUsername = *Not Blank*

where *X* = A or B, *n* = 1, 2, 3, or 4. Otherwise the service is considered disabled.

[2] ITSP Profile C and D are not available on OBi100/OBi110

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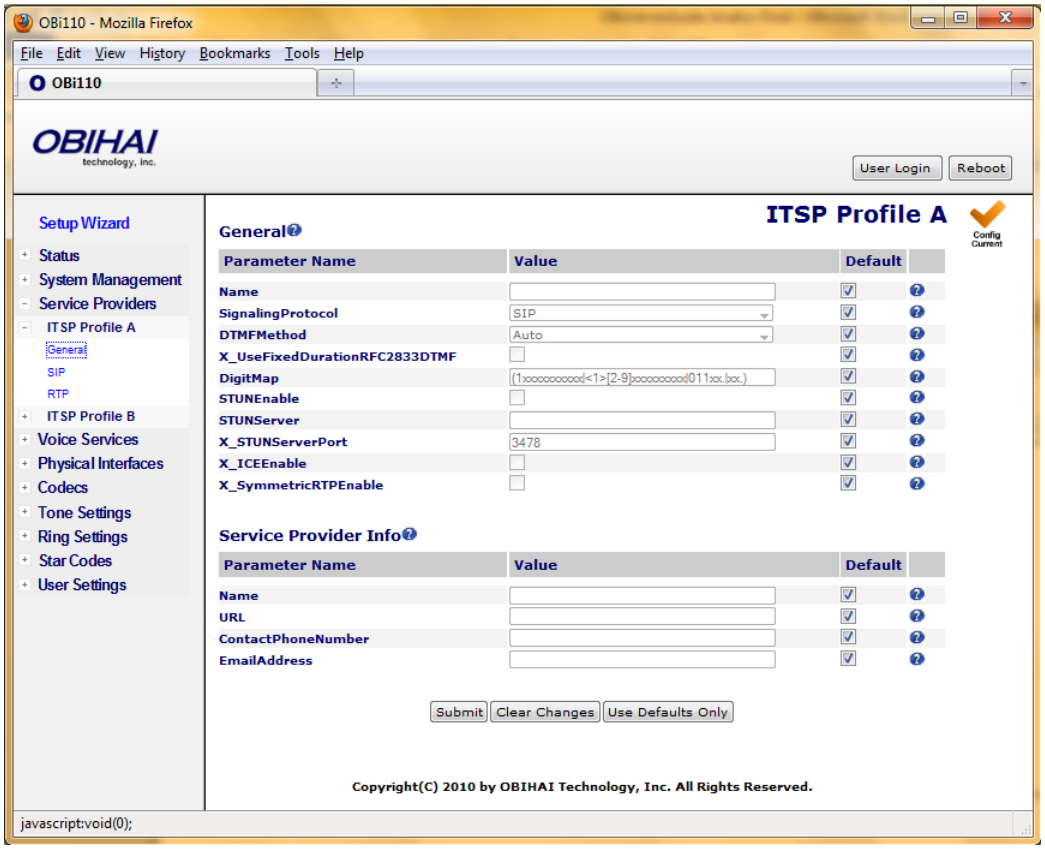

SIP Registration

Device can be setup to periodically register with a SIP Proxy Server or SIP Registration Server. SIP Proxy Server and SIP Registration Server can be different, although they are usually the same in practice. SIP Proxy Server is a required parameter that must be configured on the OBi device. The Registration Server is optional and assumed to be the same as the SIP Proxy Server if it is not configured on the device.

The main purpose of registration is to create and maintain a dynamic binding of the SIP account to the device's local contact address. Service provider can also rely on this periodic message to infer if the device is online and functional. Each OBi device takes only one local IP address that is either statically assigned in the device's configuration, or dynamically obtained from a local DHCP server. The SP*n* service for *n* = 1, 2, 3, and 4, on the other hand each uses a different local contact port for sending and receiving SIP messages (default is 5060, 5061, 5062, and 5063 respectively).

Note that dynamic address binding through periodic registration is not strictly necessary if the local IP address of the device does not change; the device's contact address may be statically configured on the Registration Server.

SIP Outbound Proxy Server

An outbound proxy server can be configured on the device such that all outbound requests are sent via the outbound proxy server instead of directly to the SIP Proxy Server or Registration Server.

DNS Lookup of SIP Servers

When sending out SIP requests to the server, the device looks up the IP address of the server using standard DNS query if the server is specified as a domain name instead of an IP address. If Outbound Proxy Server is configured, it is used instead

of the SIP Proxy Server or SIP Registration Server. The resolution of the server domain name into IP address is performed in the following manner:

- Try looking up the name as DNS A Record. If not found.
- Try looking up the name as DNS SRV Record. If not found.
- Try looking up the name as DNS SRV Record with "_sip._udp. " prepended to the hostname. If not found, fail the request.

If the result from the DNS query is a SRV record, the server port is taken from that record also (the server port value configured on the device is ignored). Otherwise, the server port is taken from the configured value or use 5060 if none specified.

NAT Traversal Considerations

If the device sits behind a NAT (typically the case), it can discover the mapped external address corresponding to its local SIP contact address as seen by the server in one of the following ways:

- From the "received=" and "rport=" parameters of the VIA header of the REGISTER response sent by the server; these two parameters tells the device its mapped IP address and port number respectively. This method is used if periodic registration is enabled on the device
- From the response to a STUN binding request the device sent to a STUN server. This method is used by enabling X_KeepAliveEnable and setting the X_KeepAliveMsgType parameter to "stun". In that case, the STUN server is taken from the X_KeepAliveServer parameter, if it is specified. Otherwise, the keep-alive messages are sent to the same server where a REGISTER request would be sent to. The latter is the most effective way of using STUN to discover the mapped external contact address

The device always uses the mapped external contact address in all outbound SIP requests instead of its local contact address if one is discovered by either method discovered above.

SIP Proxy Server Redundancy and Dual REGISTRATION

Server Redundancy specifically refers to the OBi device's capability to a) look for a working server to REGISTER with from among a list of candidates, and b) switch to another server once the server that it currently registers with becomes unresponsive. In other words, DEVICE REGISTRATION MUST BE ENABLED in order to use the server redundancy feature. Other SIP requests, such as INVITE or SUBSCRIBE, are sent to the same server that the device currently registers with.

If Outbound Proxy Server is provided, server redundancy is applied to the Outbound Proxy Server instead of the REGISTRATION server. Server redundancy behavior is enabled by enabling the parameter ITSP Profile X – SIP::X_ProxyServerRedundancy (which is disabled by default).

Another requirement for using the server redundancy feature is that the underlying server must be configured in the device as a domain name instead of an IP address. This allows the OBi to collect a list of candidate servers based on DNS query. The domain name may be looked up as DNS A record or DNS SRV record. For A records, all the IP addresses returned by the DNS server are considered to have the same priority. For SRV records, the hosts returned by the DNS server can be each assigned a different priority.

After a list of candidate servers are obtained, the OBi device will first look for a working server according to the stated priority. A *working server* means one that the device can successfully registers with. This is known as the *Primary Server*. Subsequently, the device maintains registration with the primary server the usual way. However, if no working server is found after traversing the entire list, device takes a short break and repeats the search in the same order.

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While maintaining registration with the Primary Server, the OBi will continually attempt to fallback to one of the candidate servers that has higher priority than the primary server, if any. The list of candidate servers that the device is trying to fallback on is known as the *primary fallback list*, which may be empty.

In addition, an OBi device can be configured to maintain a secondary registration with a server that has lower or equal priority than the primary server. Secondary registration can be enabled by setting the parameter X_SecondaryRegistration to YES. If X_ProxyServerRedundancy is NO, however, X_SecondaryRegistration does not take any effect. If this feature is enabled, as soon as a primary server is found, the OBi will search for a working secondary server in the same manner from the list of candidate servers that are of lower or equal priority than the primary server. Simarly, once a secondary server is found, the OBi forms a *secondary fallback list* to continually attempt to fallback on if the list is not empty.

The interval for checking the primary fallback list and the secondary fallback list are configured in the parameter X_CheckPrimaryFallbackInterval and X_CheckSecondaryFallbackInterval respectively. These parameters are specified in seconds and the default value is 60 for both.

Notes:

- Secondary server exists implies primary server exists.
- If the secondary server exists, it immediately becomes the primary server when the current primary server is fails; device then starts searching for a new secondary server if the candidate set is not empty.
- The candidate list may change (lengthened, shortened, priority changed, etc.) on every DNS renewal (based on the entry's TTL). Device will rearrange the primary and secondary servers and fallback lists accordingly, whichever applicable.

If the server redundancy feature is disabled, the device resolves only one IP address from the server's domain name, and will not attempt to try other IP addresses if the server is not responding.

SIP Privacy

The OBi device observes inbound caller privacy and decodes caller's name and number from SIP INVITE requests by checking the FROM, P-Asserted-Identity (PAID for short), and Remote-Party-ID (RPID for short) message headers. All these headers may carry caller's name and number information.

If PAID is present, device takes the name and number from it. Otherwise, it takes name and number from RPID if it is present, or from the FROM header otherwise. RPID, if present, will include privacy setting desired by the caller. This privacy may indicate one of the following options:

- *off* = no privacy requested; the OBi will show name and number.
- *full* = full privacy requested; the OBi will hide both name and number.
- *name* = name privacy requested; the OBi will show the number but hide the name.
- *uri* = uri privacy requested; the OBi will show the name but hide the number.

Regardless, if PAID exists or not, the device always takes the privacy setting from the RPID if it is present in the INVITE request. Note that if the resulting caller name is "Anonymous" (case- insensitive), device treats it as if the caller is requesting full privacy.

For outbound calls, caller's preferred privacy setting can be stated by the device in a RPID header of the outbound INVITE request. To enable this behavior, the parameter ITSP Profile *X* – SIP::X_InsertRemotePartyID must be set to YES or TRUE, which is the default value of this parameter. OBi only supports two outbound caller privacy setting: privacy=off or privacy=full. The RPID header generated by the device carries the same name and number as the FROM header. If outbound caller-ID is blocked, the device sets privacy=full in RPID, and also sets the display name in the FROM and RPID headers to "Anonymous" for backward compatibility. The device will not insert PAID in outbound INVITE requests.

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STUN and ICE

The OBi supports standard STUN based on RFC3489 and RFC5389 for passing inbound RTP packets to the device sitting behind NAT's. The parameters that control STUN feature can be found under the section ITSP Profile X – General::

- STUNEnable – To Enable this feature (default is NO or FALSE).
- STUNServer – The IP address or domain name of the external STUN server to use. STUN feature will be disabled if this value is blank, which is the default.
- X_STUNServerPort – The STUN Server's listening UDP port. Default value 3478 (standard STUN port).

It should be noted that the STUN feature used in this context is only for RTP packets, not SIP signaling packets (which typically does not require STUN). The device to send out a STUN binding request right before making or answering a call on SP1/2. If the request is successful, the device decodes the mapped exteranal address and port from the binding response and use them in the m= and c= lines of its SDP offer or answer sent to the peer device. If the request fails, such as STUN server not found or not responding, the call will go on without using external address in the SDP.

Standard RTP requires the use of even number port in the m= line. If the external port is not a even number, device changes the local RTP port and redo STUN, and will continue to do this up to 4 times or until an even external port number is found. If the 4th trial still results in an odd external port number, the call will go on without using external address in the SDP.

OBi supports standard ICE based on RFC5245. ICE is done on a per call basis for automatically discovering which peer address is the best route for sending RTP packets. To enable ICE on the device, set the parameter: ITSP Profile X – General::X_ICEEnable to YES (or TRUE). The default, however, is NO (or FALSE).

Note that ICE would be more effective if STUN is also enabled. However STUN not a requirement for using ICE on the device. If STUN is enabled and an external RTP address different from its local address is discovered, OBi offers two ICE candidates in its SDP:

- The local (host) address (highest priority)
- The external (srflx or server reflexive) address

Otherwise only the local host candidate is shown in the device's SDP. Note that the device uses the srflx address in the m= and c= lines of the SDP if STUN is enabled and successful.

If ICE is enabled and peer's SDP has more than one candidate, device sends STUN requests to each peer candidate from its local RTP port. As soon as it receives a response from the highest priority candidate, device concludes ICE and uses this candidate to communicate with the peer subsequently. Otherwise, the OBi allows up to 5s to wait for the response from all the candidates, and selects the highest priority one that has a response. Once ICE is completed successfully, the device will further apply symmetric RTP concept to determine the peer's RTP address (i.e., send to the address where peer's RTP packets are coming from).

ITSP Driven Distinctive Ringing

OBi device offers 10 ring and 10 call-waiting tone patterns in each ring profile. These patterns are numbered from 1 to 10. Each pattern also comes with a configurable name. A different default ring may be assigned to each trunk on the device.

An ITSP can tell OBi device which ring to use by name for a call routed to SP1/SP2 by inserting an Alert-Info header in the SIP INVITE sent to the device. The Alert-Info must include a URI. For example:

Alert-Info: http://www.xyz.com/some-folder/bellcore-dr4

When the device receives this, it will look for a ring tone name or call-waiting tone name in the ring profile that matches the Alert-Info URI. Ring tone names are compared case- insensitively. If a match is found, device plays the corresponding ring or call-waiting tone. Otherwise, device plays the default ring.

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RTP Statistics – the X-RTP-Stat Header

When ending an established call, OBi device can include a summary of the RTP statistics collected during the call in the SIP BYE request or the 200 response to the SIP BYE request sent by the peer device. The summary is carried in an X-RTP-Stat header in the form of a comma separated list of fields. The reported fields are:

PS=[Number of Packets Sent]
PR=[Number of Packets Received]
OS=[Number of bytes sent]
OR=[Number of bytes received]
PL=[Number of packets lost]
JI=[Jitter in milliseconds]
LA=[Decode latency or jitter buffer size in milliseconds]
DU=[Call duration in seconds]
EN=[Last Encoder Used]
DE=[Last Decoder Used]

For example:

X-RTP-Stat:PS=1234,OS=34560,PR=1236,OR=24720,JI=1,DU=1230,PL=0,EN=G711U, DE=G711U

To enable the X-RTP-Stat feature, the parameter ITSP Profile X – SIP::X_InsertRTPStats must be set to YES (or TRUE).

Media Loopback Service

The OBi supports the media loopback draft as described in *draft-mmusic-media-loopback-13.txt*. The following media loopback features are supported by the OBi device:

- Loopback modes: loopback-source and loopback-mirror
- Loopback types: rtp-media-loopback and rtp-packet-loopback
- Loopback packet formats:: encaprtp, loopbkprimer

When acts as a loopback mirror, OBi device always sends primer packets so that incoming packets can get through NAT/Firewall. The media loopback feature is controlled by the following parameters (under PHONE Port – Calling Features section):

- AcceptMediaLoopback – Enable device to accept incoming call that requests media loopback. Default is YES.
- MediaLoopbackAnswerDelay – The delay in millis before the OBi answers a media loopback call. Default is 0.
- MediaLoopbackMaxDuration – The maximum duration to allow for an incoming media loopback call. Default is 0, which means the duration is unlimited.

Note that the device will reject incoming media loopback call if:

- PHONE port is off hook.
- PHONE port is ringing.
- PHONE port is onhook with a call on hold.

Device will terminate an inbound media loopback call already in progress when:

- PHONE port is off-hook.
- PHONE port is ringing.

To make an outgoing loopback call, user can dial one of the following star codes before dialing the target number:

- *03 – Make a Media Loopback Call.
- *04 – Make a RTP Packet Loopback Call.

Note that outbound Media Loopback Call is not subjected to call duration limit; it will last until the user hangs up or until the called device ends the call.

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ITSP Profile A & B (General & SP Info Settings) Parameter Guide:

Parameter	Description	Default Setting
General ITSP Settings		
Name	Human-readable string to identify the profile instance. Maximum Length = 127 characters	
SignalingProtocol	Choose among the following list of signalling protocols for this ITSP: - SIP - Google Voice Note that Google Voice option is not available on the OBi302	SIP
DTMFMethod	Method to pass DTMF digits to peer device. Available choices are: Inband - DTMF tone are sent as inband audio signal RFC2833 - DTMF tone events are relayed per RFC2833 SIPInfo - DTMF tones are relayed with SIP INFO request Auto - Method to use based on call setup negotiation (either Inband or RFC2833 may be negotiated)	Auto
X_UseFixedDurationRFC2833DTMF	When relaying DTMF digit events on this trunk using RFC2833, the RFC2833 RTP packets normally will keep streaming for as long as the digit is pressed. With this option set to TRUE, the device sends only one RTP digit event packet with a fixed duration of 150 ms regardless how long the digit has been pressed	FALSE
DigitMap	A Digit map to restrict the numbers that be dialed or called with this service. See *OBi Call Routing and Digit Map Section* for a description of digit map syntaxes. Maximum Length = 511 characters	(1xxxxxxxxxx|<1>[2-9]xxxxxxxxx|011xx.|xx.)
STUNEnable	Enable device to send a STUN binding request for its RTP port prior to every call	No
STUNServer	IP address of domain name of the STUN Server to use	
X_STUNServerPort	UDP listen port of the STUN Server.	3478
X_ICEEnable	Enable device to use ICE algorithm to find the best peer RTP address to forward RTP traffic for every call	No
X_SymmetricRTPEnable	Enable device to apply symmetric RTP behavior on every call: That is, send RTP to peer at the address where incoming RTP packets are received from	No
Service Provider Info		
Name	Human-readable string identifying this service provider. Maximum Length = 127 characters	
URL	Website of this service provider. Maximum Length = 127 characters	
ContactPhoneNumber	Phone number to contact this service provider. Maximum Length = 31 characters	
EmailAddress	Email address to contact this service provider. Maximum Length = 127 characters.	

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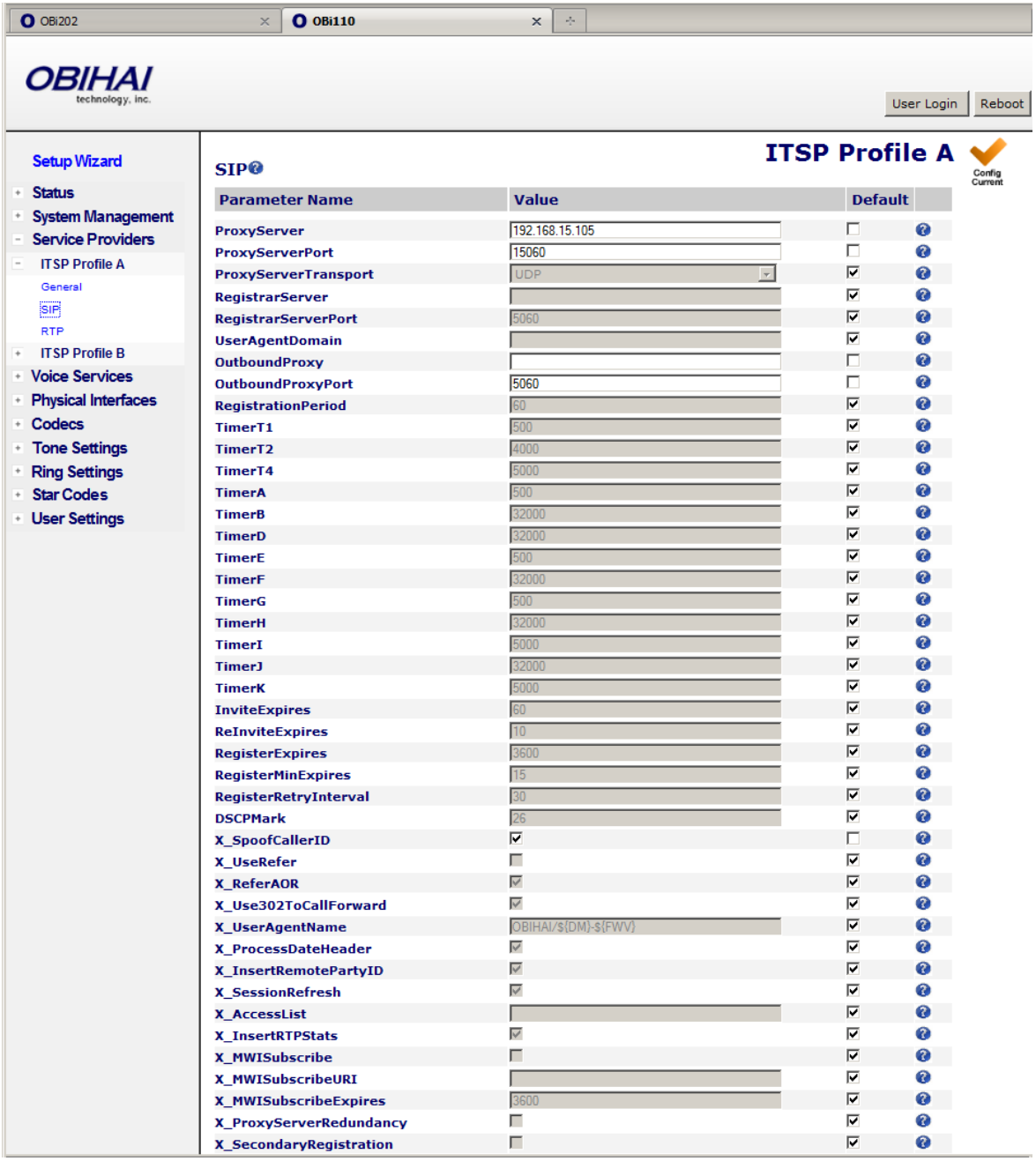
OBi202
OBi110
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User Login
Reboot
Setup Wizard
Status
System Management
Service Providers
ITSP Profile A
General
SIP
RTP
ITSP Profile B
Voice Services
Physical Interfaces
Codecs
Tone Settings
Ring Settings
Star Codes
User Settings
SIP
ITSP Profile A
Config Current
Parameter Name
Value
Default
ProxyServer 192.168.15.105
ProxyServerPort 15060
ProxyServerTransport UDP
RegistrarServer
RegistrarServerPort 5060
UserAgentDomain
OutboundProxy
OutboundProxyPort 5060
RegistrationPeriod 60
TimerT1 500
TimerT2 4000
TimerT4 5000
TimerA 500
TimerB 32000
TimerD 32000
TimerE 500
TimerF 32000
TimerG 500
TimerH 32000
TimerI 5000
TimerJ 32000
TimerK 5000
InviteExpires 60
ReInviteExpires 10
RegisterExpires 3600
RegisterMinExpires 15
RegisterRetryInterval 30
DSCPMark 26
X_SpoofCallerID
X_UseRefer
X_ReferAOR
X_Use302ToCallForward
X_UserAgentName OBIHAI/${DM}-${FWV}
X_ProcessDateHeader
X_InsertRemotePartyID
X_SessionRefresh
X_AccessList
X_InsertRTPStats
X_MWISubscribe
X_MWISubscribeURI
X_MWISubscribeExpires 3600
X_ProxyServerRedundancy
X_SecondaryRegistration
X_CheckPrimaryFallbackInterval 60
X_CheckSecondaryFallbackInterval 60
X_ProxyRequire
X_MaxForward 70
X_AcceptLanguage
X_DnsSrvAutoPrefix
X_DiscoverPublicAddress
X_PublicIPAddress
X_UseRport
Submit
Clear Changes
Use Defaults Only
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ITSP SIP Settings Parameter Guide:

Parameter	Description	Default Setting
ProxyServer	Host name or IP address of the SIP proxy server	
ProxyServerPort	Destination port to connect to the SIP server	5060
ProxyServerTransport	Transport protocol to connect to SIP server. The three choices are UDP, TCP, or TLS	UDP
RegistrarServer	Hostname or IP address of the SIP registrar. If a value is specified, device sends REGISTER to the given server; otherwise REGISTER is sent to *ProxyServer*	
RegistrarServerPort	Destination port to connect to SIP registrar	5060
RegistrarServerTransport	Transport protocol to connect to registrar. This parameter is reserved for future. The only choice is *UDP*	UDP
UserAgentDomain	CPE domain string. If empty, device uses ProxyServer as its own domain to form its AOR (Address Of Record) or Public Address when constructing SIP messages (for example, in the FROM header of outbound SIP Requests). Note: If **`SPx Service::`**`URI` is specified, additional rules applied in forming the AOR. See description of `URI` parameter for more details and examples	
UserAgentTransport	Transport protocol for incoming call control signalling. This parameter is reserved for future. The only choice is *UDP*	UDP
OutboundProxy	Host name or IP address of the outbound proxy. Outbound proxying is disabled if this parameter is blank.	
OutboundProxyPort	Destination port to be used in connecting to the outbound proxy	5060
X_OutboundProxyTransport	Control the SIP transport for the outbound proxy server which may be different from that of the proxy server. Available choices are: - UDP - TCP - TLS - Follow ProxyServerTransport Note: Option not available on OBi100/OBi110	Follow ProxyServerTransport
X_BypassOutboundProxyInCall	Enable this option to bypass the OutboundProxy inside a SIP dialog. Note: Option not available on OBi100/OBi110	No
RegistrationPeriod	Nominal interval between device register in seconds	60
X_RegistrationMargin	Number of seconds before current registration expires that the OBi should re-Register (e.g. 5s). If value is less than one, it is	

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	interpreted as a fraction of the current expires value (e.g 0.1 of 60s is 6s). If value is 0 or blank, OBi will determine a proper margin on its own. Note: Option not available on OBi100/OBi110	
TimerT1	Value of SIP timer T1 in ms	500
TimerT2	Value of SIP timer T2 in ms	4000
TimerT4	Value of SIP timer T4 in ms	5000
TimerA	Value of SIP timer A in ms	500
TimerB	Value of SIP timer B in ms	32000
TimerD	Value of SIP timer D in ms	32000
TimerE	Value of SIP timer E in ms	500
TimerF	Value of SIP timer F in ms	32000
TimerG	Value of SIP timer G in ms	500
TimerH	Value of SIP timer H in ms	32000
TimerI	Value of SIP timer I in ms	5000
TimerJ	Value of SIP timer J in ms	32000
TimerK	Value of SIP timer K in ms	5000
InviteExpires	Invite request Expires header value in seconds	60
ReInviteExpires	Re-invite Expires header value in seconds	10
RegisterExpires	Register Expires header value in seconds (not used at the moment)	3600
RegistersMinExpires	Register Min-Expires header value in seconds (not used at the moment)	15
RegisterRetryInterval	Register retry interval in seconds	30
X_RegisterRetryResponseCode	A set of SIP register error response codes and the corresponding retry delay (in seconds) specified in a digit map format. See the default value on the right as an example, where the value to the left of the colon of each rule represents a set of 3-digit response codes and the value to the right of the colon is the waiting time in seconds. If the waiting time is given as a range (with a '-'), a randomized waiting time within the specified range will be used. Note: Option not available on OBi100/OBi110	(<40[17]:w120>|<40[34]:w120>|<99[01]:w120-200>|[4-9]xx)
DSCPMark	Diffserv code outgoing SIP packets	0
VLANIDMark	VLAN ID for outgoing SIP signalling packets	0
EthernetPriorityMark	Ethernet priority code for outgoing SIP signalling packets	3
X_SpoofCallerID	Allow outbound Caller ID spoofing. If set to Yes, device will attempt to set the caller-id name and userid field in the FROM header to that of a remote caller in the case of a bridged call (from another trunk, such as PSTN Line or another SP Service). Otherwise, device always its own account information to form the FROM header. Note that most service provider will not allow	No

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	originating a call if the FROM header field does not match the account credentials. Enable this option only if you are sure that the service provider allows it, e.g. an IP PBX may allow it.	
X_UseRefer	Enable the use of SIP REFER for call transfer. If disabled, device will bridge the call instead when performing a call transfer (which consume some resources on the device)	No
X_ReferAOR	Enable the use the target's AOR (Address of Record or public address) in Refer-To header of SIP REFER. If disabled, the target's Contact will be used instead	Yes
X_Use302ToCallForward	Enable the use of 302 response to INVITE for call forward. If disabled, device will bridge the call legs instead when forwarding a call (and will consume some resources on the device)	Yes
X_UserAgentName	If a value is specified, device includes a User-Agent header in all SIP Requests, or a Server header in all SIP responses, that contains exactly the given value	OBIHAI/${DM}-${FWV}
X_ProcessDateHeader	Enable the device to decode the DATE header sent by the ITSP in a 200 response to its REGISTER. The DATE header specifies the current GMT time and the device can use to adjust its local time and date without relying on NTP	Yes
X_InsertRemotePartyID	Enable the device to include a Remote-Party-ID header in its outbound SIP INVITE to indicate to the ITSP the caller's preferred privacy setting (either full or none)	Yes
X_SessionRefresh	Enable session refresh signalling (with SIP Re-INVITE) during a connected call. This allows the OBi to detect if the connection with the peer is broken abnormally so it can release the call. Disable this option if the ITSP does not support Re-INVITE sent from the client device.	Yes
X_AccessList	A comma separated list of IP addresses such that the device only accepts SIP requests coming from one of the given addresses. If the list is empty, the device accepts SIP requests from any IP address	
X_InsertRTPStats	Enable the device to include a X-RTP-Stat header in a BYE request or 200 response to BYE request at the end of an established call. This header contains a summary of RTP statistics collected during the call.	Yes
X_MWISubscribe	Enable this option to have the device SUBSCRIBE to the message-summary event package to support MWI and VMWI service. Note that device handles NOTIFY of this event package regardless MWISubscribe is	No

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	enabled or not	
X_MWISubscribeURI	Blank implies to use the same URL as REGISTER for the TO and FROM header as well as the Request-URI Otherwise, if the URI does not contain '@', it is user as the userid field in TO/FROM header as well as the Request-URI, which are otherwise same as REGISTER If the URI contains '@', it is used in the TO and FROM header as well as the Request-URI as is Note that OBi device forms the Request-URI of SUBSCRIBE the same way as the TO header, with an additional port number	
X_MWISubscribeExpires	X_MWISubscribeExpires: periodic interval to renew SUBSCRIBE (default 3600s)	3600
X_RegSubscribe	Enable subscription to the "reg" event package	No
X_RegSubscribeExpires	Expires value for subscription to the "reg" event package	3761
X_ProxyServerRedundancy	Enable proxy redundancy feature on the device. To use this feature, device registration must be enabled and the SIP Registration Server or Outbound Proxy Server must be configured as a domain name	No
X_SecondaryRegistration	Enable device to register with a secondary server in addition to the primary server. X_ProxyServerRedundancy must be enabled for this parameter to take effect	No
X_CheckPrimaryFallbackInterval	Interval in seconds at which the device should check the primary fallback list of candidate servers	60
X_CheckSecondaryFallbackInterval	Interval in seconds at which the device should check the secondary fallback list of candidate servers	60
X_ProxyRequire	If this parameter is not blank, OBi will include a Proxy-Require header stating the value of this parameter in all SIP requests sent to the ITSP	
X_MaxForward	Value for the Max-Forward header in all SIP requests sent by the OBi	70
X_AcceptLanguage	If this parameter is not blank, OBi will include an Accept-Language header stating the value of this parameter in all SIP requests sent to the ITSP.	
X_DnsSrvAutoPrefix	Enable this option to let OBi automatically prepend a standard prefix to the domain name when querying DNS Server to resolve the ProxyServer or OutboundProxy name as a SRV record. The standard prefix is _sip._udp. for SIP over UDP, _sip._tcp. For SIP over TCP,	No

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	and _sip._tls. for SIP over TLS.	
X_UserEqPhone	Include the parameter 'user=phone' in Request-URI and To-URI of outbound INVITE. Note: Option available on OBi100/110 only	No
X_CallWaitingIndication	Enable inclusion of an indication in a 18x response to the calling peer if this is a call-waiting situation. Note: Option available on OBi100/110 only	No
X_Support100rel[3]	Enable this option to turn on the support for RFC3262 (reliable provisional SIP responses). If enabled, OBi will announce this support in a SIP Supported header, and will require a caller to use this option if the caller also supports this feature.	No
X_DiscoverPublicAddress	Enable this option to let the OBi use the public IP address and port it has discovered as its SIP Contact address	Yes
X_UsePublicAddressInVia	Enable the use of the discovered external IP address (instead of the unit's assigned local IP address) in outbound Via header Note: Option not available on OBi100/110	No
X_PublicIPAddress	A static public IPv4 address, if specified, will be used by the OBi to form its SIP Contact address	
X_UseRport	Enable this option to let the OBi insert a blank rport parameter in the VIA header our outbound SIP messages. This option should be turned off if you are using port forwarding on the external router to route inbound SIP messages to the OBi	Yes
X_UseCompactHeader	Enable the use of compact form SIP message header names. Note: Option not available on OBi100/110	No
X_FaxPassThroughSignal	Select the signaling method to indicate to the peer to switch to FAX passthrough. Available choices are: - ReINVITE - RFC2833 - Auto - None	ReINVITE
X_IncludeMessageHash	Enable the inclusion of a X-MD5-Hash header in outbound SIP messages and x-md5-hash attribute in outbound SDP. The header contains the MD5 hash of all the other SIP message headers; the attribute contains the MD5 hash of all theo ther SDP attributes. These data can be used by the recipient to	No

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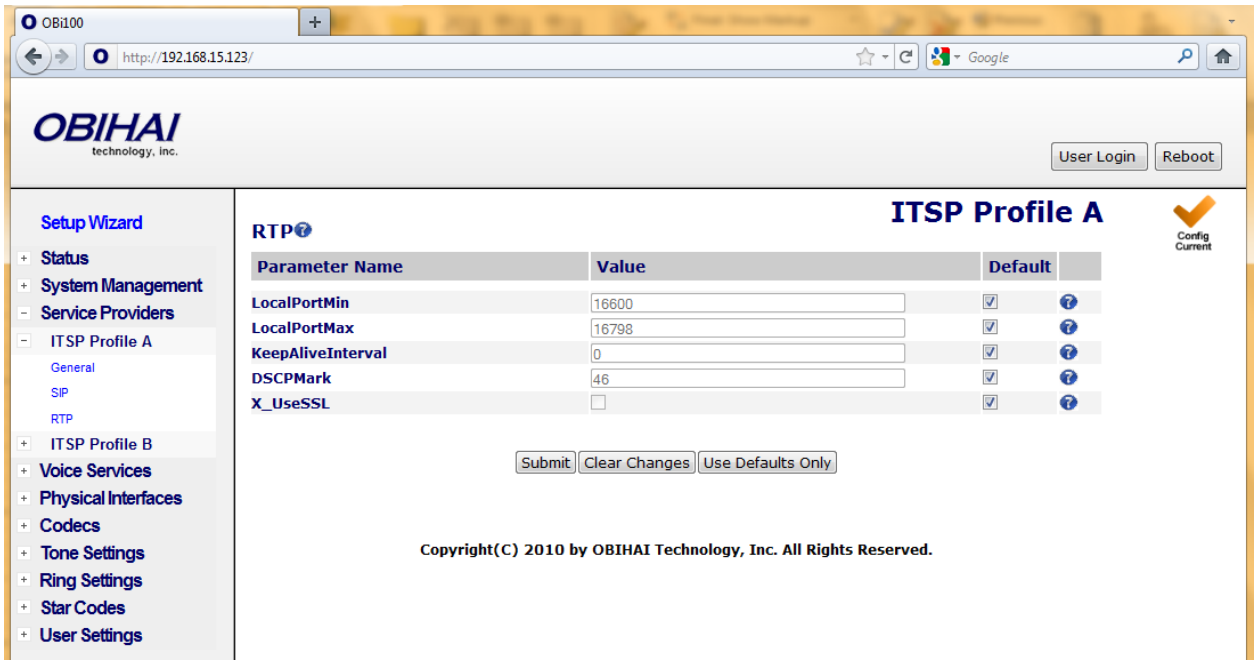
	determine if the message has been modified by an intermediary (such as a SIP ALG) Note: Option available on OBi100/110 only	
X_EchoServer	Name or IP address of an echo server for SIP ALG detection	
X_EchoServerPort	Listening of the echo server for SIP ALG detectiion	
X_EnableRFC2543CallHold	Enable interpretation of call hold indication per RFC2543 Note: Option not available on OBi100/110	



ITSP RTP Settings Parameter Guide:

Parameter	Description	Default Setting
RTP		
LocalPortMin	Base of port range for tx/rx RTP with this SP	16600
LocalPortMax	Top of port range for tx/rx RTP with this SP	16798
KeepAliveInterval	Interval in seconds between sending keep alive packet on an RTP channel that is currently in idle (due to call hold for instance). RTP keepalive is disabled if the value of this parameter is set to 0.	0
DSCPMark ∞	Diffserv code for outgoing RTP packets with this SP	0
X_UseSSL	Enable this option to force OBi to send RTP over a SSL channel when the ITSP is Google Voice	No
RTCP		
Enable	Enable RTCP	No
TxRepeatInterval	RTCP packet transmission interval in milliseconds	10000
LocalCName	The canonical name to use in RTCP messages. If blank, the device will use	

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	<userid>@<local_IP_address> as its canonical name	
X_RTCPMux	Enable the use a rtcp-mux attribute in SDP (i.e., send and receive RTCP on the same port as RTP).	No

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Google Voice™ Service

OBi device includes a native implementation of the Google Talk™ (XMPP) protocol that allows the user to use the Google Voice™ communications service as the SP1 or SP2 service (not available on OBi302). To enable Google Voice as the SP1 or SP2 service, set the underlying ITSP Profile's General::Protocol parameter to "Google Voice" (the default value of this parameter is "SIP"). Both SP1 and SP2 can be enabled for Google Voice, with a different account on each service.

Google Voice offers a call screening feature such that you must press digit 1 before answering an incoming GV call. OBi device can be setup to automatically do that for you when you pick up the phone. To enable this feature on the device, set the X_SkipCallScreening parameter to YES (default is NO) (on the device web page, under the SP1/SP2 Service – CallingFeatures section).

Please note that the codec is limited to G711u only for all calls.

When Google Voice is selected as the protocol, all the other ITSP Profile parameters are ignored except the DigitMap parameter. The following SP1/SP2 Service parameters are also ignored:

- X_Codec_Profile, X_RegisterEnable, X_UserAgentPort, X_SipDebugOption
- X_KeepAliveEnable, X_KeepAliveExpires, X_KeepAliveServer, X_KeepAliveServerPort, X_KeepAliveMsgType
- URI, MaxSessions, X_AcceptDialogSubscription, X_AcceptLinePortStatusSubscription

Starting with firwmare release 1.2, the following features are supported:

- MWI (Message Waiting Indication) and VMWI (Visual Message Waiting Indication) for Google Voicemail.
- Non-Gmail domain in account name for Google Voice Communications Service.
- Accept DTMF input from a Google Talk client entered by the user as text messages (only 0 – 9, *, and # will be recognized by the device).
- Accept the setting of the parameter ITSP Profile A/B – General::DTMFMethod. The value can be either InBand or RFC2833. Other values will be reverted to RFC2933. Default is RFC2833.
- Voice Service Features of the OBi Device.

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SP1, SP2, SP3, and SP4 Services

Parameter Name	Value	Default	
Enable	☑	☐	?
X_ServProvProfile	A	☐	?
X_RingProfile	A	☐	?
X_CodecProfile	A	☐	?
X_InboundCallRoute	{>snos108:an(0)},{108>:sp1},{>108:sp1(108@local_c	☐	?
X_RegisterEnable	☑	☐	?
X_KeepAliveEnable	☐	☑	?
X_KeepAliveExpires	15	☑	?
X_KeepAliveServer		☑	?
X_KeepAliveServerPort	5060	☑	?
X_KeepAliveMsgType	keep-alive	☑	?
X_UserAgentPort	5060	☑	?
DirectoryNumber		☑	?
X_DefaultRing	1	☑	?
X_CallOnHoldRing	8	☑	?
X_RepeatDialRing	5	☑	?
X_BargeInRing	4	☑	?
X_CallParkedRing	10	☑	?
X_SipDebugOption	Disable	☑	?
X_SipDebugExclusion		☑	?
X_SatelliteMode	☐	☑	?
X_Proxy	☑	☐	?
X_ProxyClientConfig	mac="cce1485a52a2" model="Cisco/SPA303" dm="([	☐	?

SIP Credentials

Parameter Name	Value	Default	
AuthUserName	108	☐	?
AuthPassword		☐	?
URI		☑	?

Calling Features

Parameter Name	Value	Default	
CallerIDName	Sherman	☐	?
MaxSessions	4	☐	?
CallForwardUnconditionalEnable	☐	☑	?
CallForwardUnconditionalNumber		☑	?
CallForwardOnBusyEnable	☐	☑	?
CallForwardOnBusyNumber		☑	?
CallForwardOnNoAnswerEnable	☐	☑	?
CallForwardOnNoAnswerNumber		☑	?
CallForwardOnNoAnswerRingCount	2	☑	?
MWIEnable	☐	☐	?
MWIEnable2	☐	☐	?
X_VMWIEnable	☐	☐	?
X_VMWIEnable2	☐	☐	?
MessageWaiting	☐	☐	?
AnonymousCallBlockEnable	☐	☑	?
AnonymousCallEnable	☐	☑	?
DoNotDisturbEnable	☐	☑	?
X_BridgedOutboundCallMaxDuration		☑	?
X_AcceptDialogSubscription	☐	☑	?
X_SkipCallScreening	☑	☑	?
X_SRTP	Disable SRTP	☑	?

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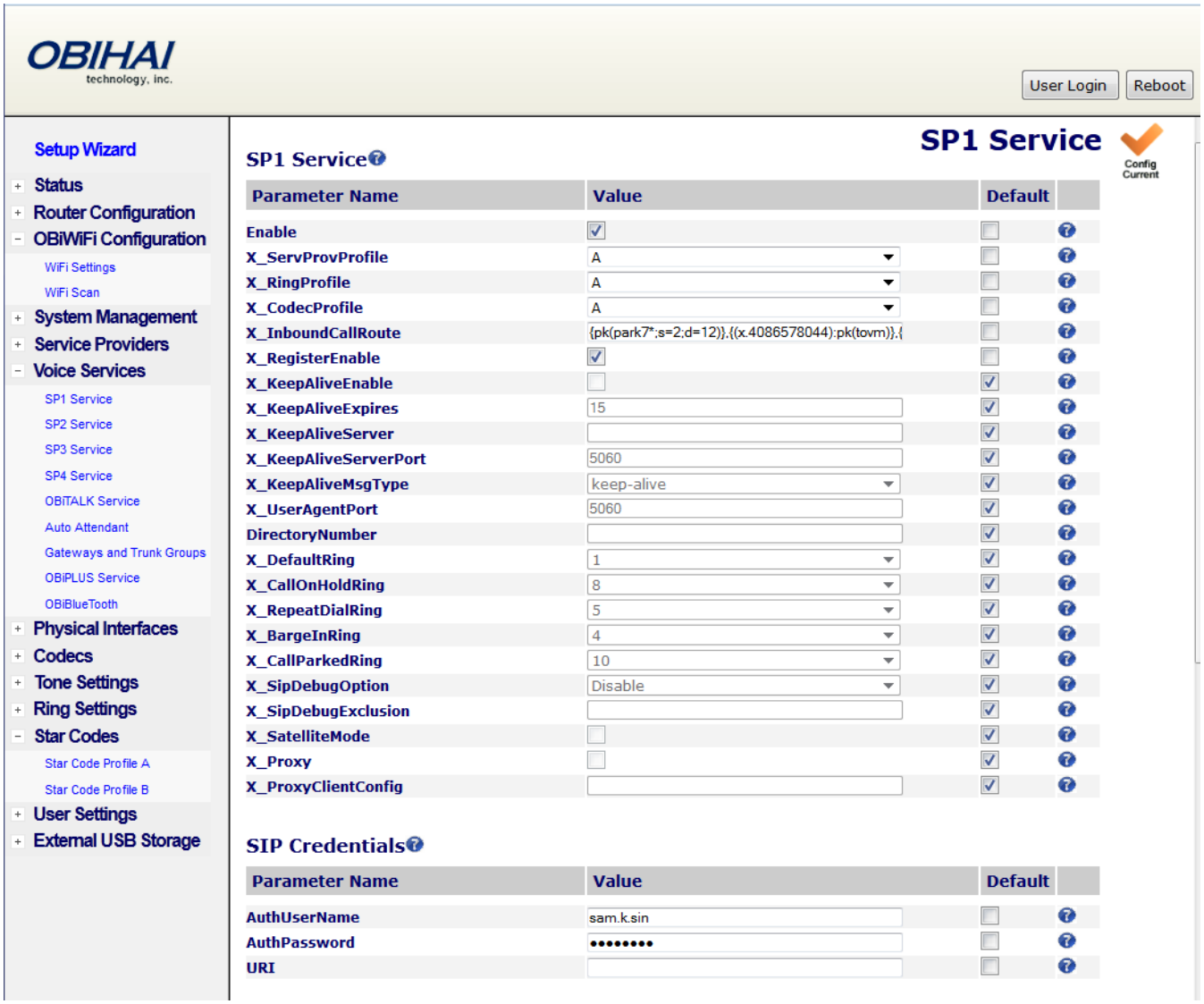

Parameter Guide:

Parameter	Description	Default Setting
SP"x" Service		
Enable	Enable this line	Yes
X_ServProvProfile	Select a Service Provider Profile for this service. Choices are A, or B	A
X_RingProfile	Select a Ring Profile to ring the PHONE port with for incoming calls on this service that are routed to the PHONE port. The ringing pattern will be taken from the given profile. Choices are A, or B	A
X_CodecProfile	Select a Codec Profile for all calls on this service. Choices are A, or B	A

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X_InboundCallRoute	Routing rule for directing incoming calls on this service. The default rule is to send all incoming calls to the PHONE port (ph). See *OBi Call Routing and Digit Map Section* for a description of the syntaxes for specifying this parameter	ph
X_RegisterEnable	Enable registration for this line. If set to YES, device sends periodic SIP REGISTER to the service provider according to the settings in the ITSP Profile. Otherwise, device does not send any SIP REGISTER for the service	Yes
X_NoRegNoCall	Enable this option to disallow making or receiving calls on this service unless registeration with the SIP server is successful.	No
X_KeepAliveEnable	Enable sending keep alive message. If set to YES, device sends periodic keep-alive messages to the destination specified in X_KeepAliveServer and X_KeepAliveServerPort, at the interval specified in X_KeepAliveExpires. The content of this message is the ASCII string "keep-alive\r\n"	No
X_KeepAliveExpires	Keep alive period in seconds	15
X_KeepAliveServer	Hostname or IP address of keep alive server	
X_KeepAliveServerPort	UDP port of the keep alive server	5060
X_KeepAliveMsgType	The type of keep alive messages to send out periodically if keep-alive is enabled. It can be one of the following choices: - keep-alive: The string "keep-alive" - empty: A blank line - stun: A standard STUN binding request; device will use the binding response to form its contact address for REGISTRATION - custom: use the value of X_CustomeKeepAliveMsg (note: option not available on OBi100/OBi110)	keep-alive
X_CustomKeepAliveMsg	Defines the custom message to be used when X_KeepAliveMsgType is "custom". The value should have the following format: `mtd=NOTIFY;event=`*<whatever>*`;user=`*<anyone>* Where - NOTIFY may be replaced by any other SIP method, such as PING, - event parameter is optional and is only applicable if method is NOTIFY. If event is not specified, the 'keep-alive' event will be used with NOTIFY - user parameter is optional; if not specieifed, the request-uri will not have a userid, and the TO header field will use the same userid as the FROM header (which is the local account userid). If user is specified, it will be used as the userid in the Request-URI and TO header.	

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	SIP messages for keep-alive are sent only once without retransmission; response to the SIP messages are ignored by the OBi. Note: Option not available on OBi100 and OBi110	
X_UserAgentPort	UDP port where the device sends and listens for SIP messages	5060
DirectoryNumber	Directory number associated with this service	
X_DefaultRing	Default ring pattern number to ring the PHONE port for incoming calls on this trunk that are routed to the PHONE port according to the InboundCallRoute of this service. The ring pattern is taken from the selected Ring Profile. Valid choices are 1-10	1
X_CallOnHoldRing	Pattern to ring PHONE port when holding a call on this trunk that has been connected to the PHONE port. Typically this is a very short distinctive ring pattern that serves as a reminder to the user that a call is being on hold. The ring pattern is taken from the selected Ring Profile. Valid choices are: NO Ring, or 1-10	8
X_RepeatDialRing	The ring pattern number to use to ring the PHONE port when a repeat dial operation on this trunk is successful as the called party is either ringing or answered	5
X_BargeInRing	Call Waiting Ring pattern to ring the PHONE port when the incoming call is requesting to barge-in. This is applicable in a call-waiting scenario on the PHONE port	4
X_CallParkedRing	Ring pattern to ring the PHONE port only as a reminder that there are some calls parked in the parking lot. This feature is applicable only in an OBiPLUS solution.	10
X_SIPDebugOption	Enable sending of SIP signaling debug information to the syslog server (if one is configured on the device). Available choices are: Disable (do not send SIP signaling debug information) Log All Messages Log All Except REGISTER Messages	Disable
X_SipDebugExclusion	A list of SIP methods to exclude from the syslog for this SP service. For example: notify, subscribe	
X_SatelliteMode	Enable satellite mode on this trunk. In this mode, the user must explicitly sign on (using * code) to receive phone calls on this trunk. The SIP REGISTER sent by the OBi to the ITSP on this trunk will indicate if the user wants to sign on (and therefore takes over the incoming calls for this account). This feature is only applicable if the service is provided by an OBiPLUS system Note: Option not available on OBi100/OBi110	No
X_Proxy	Enable proxy mode operation on this SP service. If enabled, the SP will accept SIP Registration from one client device from the LAN side, which must be using the same user-id and password as this SP's AuthUserName and AuthPassword parameters, for authentication. The client device, known as the *local_client*, may send SIP INVITE to the OBi at this SP to make calls; this SP's InboundCallRoute must be set up with the proper routing rule to handle calls from the local_client. The SIP Proxy Server parameter on the local_client should be set to: <obi-number>.pnn.obihai.com:<sp-user-agent-port>	No

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	where <obi-number> is the 9-digit OBi number of this device, <sp-user-agent-port> this SP's X_UserAgentPort parameter. For example, SP1 has a local_client with the userid 4086578118 and the client wants to make and receive calls using SP3 which is set up for Google Voice. The SP1 InboundCallRoute shall include the following rule: {4086578118>:sp3} The SP3 InboundCallRoute shall be: {sp1(408657118@local_client)} Note: Option not available on OBi100/OBi110.	
X_ProxyClientConfig	A list of IP phone attributes separated by a space or newline character for provisioning an IP Phone with the given MAC address and model number. Each attribute has the syntax <attribute-name>=”<attribute-value>” with no white space before and after the '=' sign. Every character within the pair of double quotes is taken as the attribute's value. The following attributes are supported: - mac: Required. The MAC address of the IP Phone in 12-hex-digit format, such as “008e3c123456” - model: Required. The make/model of the phone, such as "Cisco/SPA504G" - ext: Required. The extension number assigned to the phone, such as "104". The account will be installed on Ext 1 of the phone - dm: Optional. The dial plan on Ext 1 of the phone, such as"([1-5]xx|[67][0-9*][0-9*]|9,1 xxx xxx xxxx|9,011 xx.|8,<:1408>[2-9]xxxxxx|8,1 xxx xxx xxxx|8,011 xx.)" - mohs: Optional. The extension number of the MOH Server, such as "69*" - bn: Optional. A function button to be configured with the attributes that follow. Valid values are “1”, “2”, … up to the maximum number of programmable function buttons on that phone model. Sidecar buttons are numbered the same way with 100 added to the button number, such as “101”, ‘102”, …, “132 (there are 32 buttons per sidecar). A *bn* attribute is followed by one or more of the *fn*, *va*, and *la* attributes. The end of a *bn* section is marked by another *bn* attribute. You must insert a *bn*=”0” attribute after the last button - fn: Required. A code that represents the function served by the current button. This attribute must be located somewhere between two *bn* attributes. The following codes are defined: o “Ext 1”: A line key for calls on phone's Ext 1 account o “Speed Dial”: A speed dial. Requires a *va* attribute with the target number as the value o “BLF”: Classic BLF. Requires a *va* attribute with the extension number to monitor as the value o “Send To Leave VM”: Blind transfer the current	

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	active call to leave voicemail. Requires a *va* attribute with the target mailbox ID, such as “00”, “01”, …, as the value o “Send To Park”: Blind transfer the current call to a parking lot partition. Requires a *va* attribute with the parking lot partition mask, such as “0*”, “1*”, “**”, … as the value o “Monitor VM”: Monitor if new voicemail available in a mailbox. Requires a *va* attribute with the target mailbox ID, such as “00”, “01”, … as the value o “Monitor Park”: Monitor a parking lot partition. Requires a *va* attribute with the target parking lot partition mask, such as “0*”, “1*”, “**”, … as the value o “Monitor Night Mode”: Monitor the system’s day/night mode status. No *va* attribute required. o “Auto Night Mode”: Monitor if the system’s auto day/night mode switching feature is active. No *va* attribute required o “Sign On/Off”: Let user sign on/off an extension. Requires a *va* attribute with the extension number to sign on/off as the value, such as “101” - va: Required if the function code requires it. This attribute must be located somewhere between two *bn* attributes - la: Optional. If present, it must be somewhere between two bn attributes. A string label to display on the phone screen next to the current function key. For example “$USER”, “Park”, “Night”. It should be no longer than 7 characters due to space limitation. This attribute does not apply for a sidecar button Note: Other than “Ext 1” and the generic “Speed Dial” function, all the other button functions are only applicable if the service installed on this SP is from an OBiPLUS system. This parameter is useful only if the *X_Proxy* parameter is enabled. In that case, the OBi will provide a configuration file based on the attributes given in this parameter, upon request from an IP phone with the matching MAC address. The IP phone must be installed on the LAN side of the OBi and must be one of the following make/model: - Cisco/SPA303 - Cisco/SPA504G - Cisco/SPA508G - Cisco/SPA509G - Cisco/SPA525G Note: Option not available on OBi100/OBi110	
X_AcceptResync	Control whether to accept a SIP NOTIFY request with event=resync to trigger a reboot of the device (so it can download new f/w or configuration upon boot up). Available choices are: - no (do not accept resync trigger) - yes with authentication (accept after challenging the sender) - yes without authentication (accept w/o challenging the sender)	yes without authentication

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	Note: Option not available on OBi100/OBi110	

SP"x" SIP Credentials		
AuthUserName	The User ID to authenticate to a SIP UAS (User Agent Server) when an outbound SIP request sent by the device is challenged by the UAS with a 401 or 407 Response	
AuthPassword	The Password (corresponding to AuthUserName) to authenticate to a SIP UAS (User Agent Server) when an outbound SIP request sent by the device is challenged by the UAS with a 401 or 407 Response	
URI	This parameter affects the way the AOR is formed by the device in outbound SIP Requests. The AOR has the format: user@domain. If the value of URI is empty, device gets the user portion of its AOR from the AuthUserName, and the domain portion the value of ITSP Profile's UserAgentDomain if it is not empty, or that of the ProxyServer otherwise. If the value URI is not empty and does not contain "@", it is used as the user portion of the AOR while the domain portion is formed the usual way. If the value of URI contains "@', it is interpreted as a full AOR and device takes it as the AOR as is. Some Examples: 1) Let ProxyServer = *sip.myitsp.com*, AuthUserName = *4089991123*, URI=[empty], UserAgentDomain=[empty], then AOR = *4089991123@sip.myitsp.com* 2) Change UserAgentDomain to *users.myitsp.com*, then AOR = *4089991123@users.myitsp.com* 3) Change URI to bobdylan, then AOR = *bobdylan@users.myitsp.com* 4) Change URI to *bobdylan@superusers.myitsp.com*, then AOR = *bobdylan@superusers.myitsp.com* Note: In all cases, device uses AuthUserName and AuthUserPassword to compute authorization if challenged by a 401 or 407 response.	

SP"x" Calling Features		
CallerIDName	Display name to identify the subscriber. The display name field is usually inserted in a FROM header in outbound SIP requests (such as INVITE) for the purpose of displaying a Caller ID Name on the recipient's device.	
MaxSessions	The maximum number of simultaneous calls that may be established on this service	2
CallForwardUnconditionalEnable	Enable call forwarding of all calls unconditionally by the device. If CallForwardUnconditionalNumber is blank, this parameter is treated as if it has been set to *No*. Note: It is possible for a user to set this parameter from the	No

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	phone using a Star Code	
CallForwardUnconditionalNumber	Directory number to forward all incoming calls on this service unconditionally. Maximum Length is 127 characters. Note: It is possible for a user to set this parameter from the phone using a Star Code	
CallForwardOnBusyEnable	Enable call forwarding of all incoming calls when the device is busy. If CallForwardOnBusyNumber is blank, this parameter is treated as if it has been set to *No*. Device is considered busy if one of the following conditions holds: This service already reaches the limit of simultaneous calls as specified in MaxSessions DND (Do Not Disturb) Service is enabled on this service If the call is routed to the PHONE port where the phone is in a busy state (such as ringing, dialing, playing reorder, or already having 2 calls in progress) Note: It is possible for a user to set this parameter from the phone using a Star Code	No
CallForwardOnBusyNumber	Directory number to forward all incoming calls on this service when the device is busy. Maximum Length is 127 characters. Note: It is possible for a user to set this parameter from the phone using a Star Code	
CallForwardOnNoAnswerEnable	Enable call forwarding of all incoming calls when the call is not answered after a period as specified in CallForwardOnNoAnswerRingCount. If CallForwardOnNoAnswerNumber is blank, this paramete is treated as if it has been set to No. Note: It is possible for a user to set this parameter from the phone using a Star Code	No
CallForwardOnNoAnswerNumber	Directory number to forward all incoming calls when the call is not answered after a period specified in CallForwardNoAnswerRingCount Note: It is possible for a user to set this parameter from the phone using a Star Code	
CallForwardOnNoAnswerRingCount	Number of rings to be considered by the device as no answer to an incoming call. Note: 1 ring is approximately 6s	2
X_BlockedCallers	A comma separated list of up to 10 caller numbers to block from calling this service. Note: Option not available on OBi100 and 110	
MWIEnable	Enable Message Waiting Indication Service for this service. If enabled, device plays stutter dial tone on the PHONE port (or PHONE1 port) when there are new messages for the subscriber. It will also turn on VMWI signal on the PHONE port (or PHONE1 ort) if X_VMWIEnable is set to Yes	No
MWIEnable2	Enable Message Waiting Indication Service for this service. If enabled, device plays stutter dial tone on the PHONE2 port when there are new messages for the subscriber. It will also turn on	No

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	VMWI signal on the PHONE2 port if X_VMWIEnable is set to Yes Note: Option available on OBi202/OBi302 only	
X_VMWIEnable	Enable Visual Message Waiting Indication for this service for the PHONE port (or PHONE1 port)	No
X_VMWIEnable2	Enable Visual Message Waiting Indication for this service for the PHONE2 port Note: Option available on OBi202/OBi302 only	No
MessageWaiting	This is a state rather than a configuration parameter, that indicates if there are any new messages for this subscriber on the service provider's voicemail system	No
AnonymousCallBlockEnable	Enable blocking of Anonymous Calls on this service. Anonymous calls are rejected with a SIP 486 (Busy) response and Call Forward On Busy service is not applied. Note: It is possible for a user to set this parameter from the phone using a Star Code	No
AnonymousCallEnable	Enable masking of Caller-ID information for all outgoing calls. If enabled, the called party should perceive the call as coming from an anonymous caller. Note: It is possible for a user to set this parameter from the phone using a Star Code	No
DoNotDisturbEnable	Enable Do Not Disturb Service. If enabled, all incoming calls on this service are treated as if the device is busy. Note: It is possible for a user to set this parameter from the phone using a Star Code	No
X_BridgedOutboundCallMaxDuration	Limit on the call duration in seconds for all outbound calls that are bridged from the same or another trunk. A blank or 0 value implies the call duration is not limited.	
X_AcceptDialogSubscription	Enable the device to accept SUBSCRIBE to this trunk's dialog event package	No
X_AcceptLinePortStatusSubscription	Enable the device to accept SUBSCRIBE to the LINE port status Note: Option available only on OBi110 and devices with an attached OBiLINE USB adapter.	No
X_SkipCallScreening	Enable the device to automatically skip call screening when the underlying ITSP is Google Voice	Yes
X_SMSNotify	Ring the phone on SMS reception from Google Voice and display the first few characters of the message as Caller-ID Note: Option available on OBi200/OBi202 only	No
X_XMPPPriority	XMPP Priority to assume by this client for Google Voice when there are multiple clients using the same account. Valid values are 0 (highest) or 32-127 Note: Option available on OBi200/OBi202 only	0
X_GTalkSimultaneousRing	Ring all other clients using the same Google Voice account at present. Note: Option available on OBi200/OBi202 only	Yes
X_SRTP	This is a drop down list with 3 choices:	Disable SRTP

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	- Disable SRTP = Do not use SRTP for all calls; the call will fail if the peer insists on using SRTP only - Use SRTP Only = Require all calls to use SRTP; the call will fail if the peer does not support SRTP - Use SRTP When Possible = Use SRTP for a call if the peer supports SRTP; otherwise fallback to use regular unencrypted SRTP	

Using SP*n* as a Proxy for a SIP IP Phone

(Available on OBi202/OBi302 only)

An SP service may be set up as a proxy for a legacy IP phone, to let the phone access OBiTALK, OBiBlueTooth, OBiPLUS (on SP*n*), or Google Voice service (on SP*n*) installed on the OBi. This proxy mode of operation must be explicitly enabled in the SP 's configuration on the OBi; it is disabled by default. The IP phone using this proxy service is known as the *local_client* of the SP service. It must be installed on the LAN side of the OBi device.

In this mode, SP*n* will accept SIP Registration from the client device from the LAN side, which must be using the same user-id and password as this SP*n*'s AuthUserName and AuthPassword parameters, for authentication. This client device may also send SIP INVITE to the OBi at this SP to make calls; this SP's InboundCallRoute must be setup with the proper routing rule to handle calls from the local_client.

The SIP Proxy Server parameter on the client device must be sent to:

<obi-number>.pnn.obihai.com:<spn-user-agent-port>

where <obi-number> is the 9-digit OBi number of this device, and <spn-user-agent-port> SP*n*'s X_UserAgentPort parameter.

For example, SP1 has a local_client with the user-id 4086578118. The client wishes to make and receive calls on SP3 which has been set up with Google Voice. The SP1 InboundCallRoute shall include the following rule:

{4086578118>:sp3}

The SP3 InboundCallRoute shall be: {sp1(**408657118@local_client**)}

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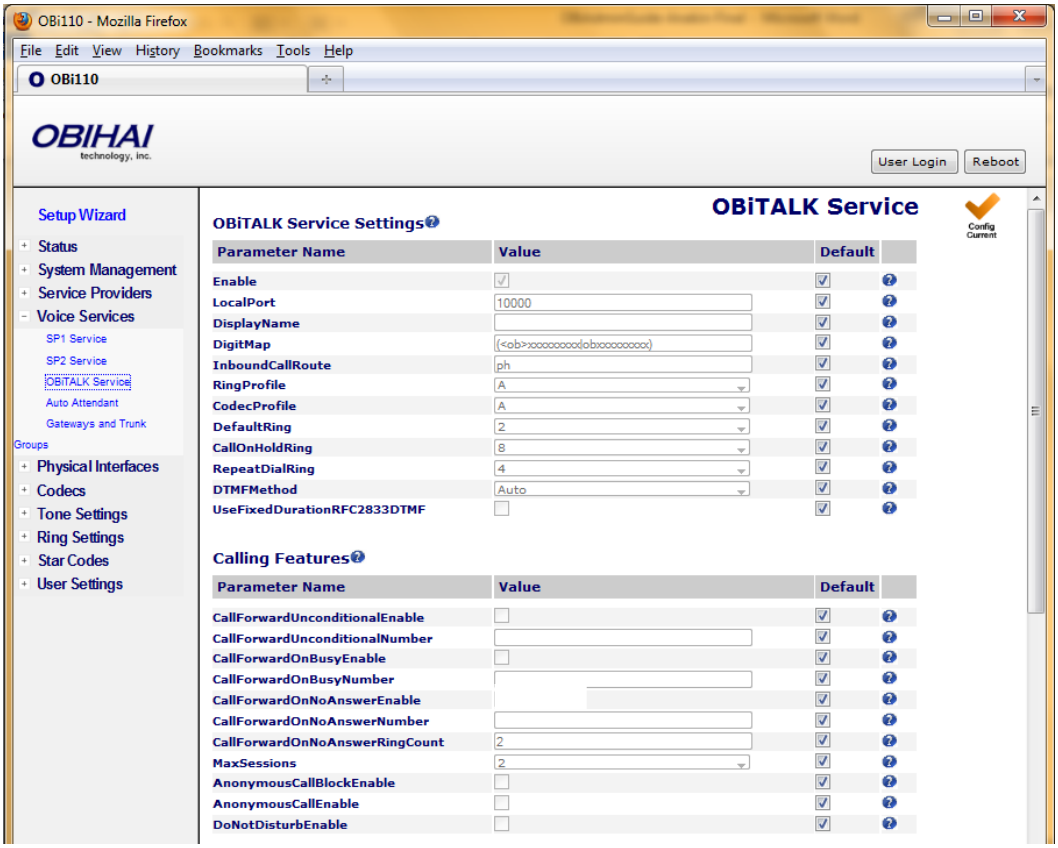
OBiTALK Service Settings



OBiTALK Service Settings Parameter Guide:

Parameter	Description	Default Setting
Enable	Enable the OBiTALK Service (the built-in free voice service that comes with every OBi Device)	Yes
LocalPort	The UDP or TCP port used by device to send and listens for OBiTALK messages	10000
TryMultiplePorts	Enable the unit to try a few random UDP ports until it can successfully join the OBiTALK network	No
DisplayName	Display name to identify the subscriber, for the purpose of displaying a Caller ID Name on the recipient's device	
DigitMap	Digit map to restrict numbers that can be dialed or called with this service. See *OBi Call Routing and Digit Map Section* for a description of the syntaxes for specifying a Digit Map.	(<ob>xxxxxxxxx|obxxxxxxxxx)
InboundCallRoute	Routing rule for directing incoming calls on this service. The default rule is to send all incoming calls to the PHONE port (ph). See *OBi Call Routing and Digit Map Section* for a description of the syntaxes for specifying this parameter	Ph
RingProfile	Select a Ring Profile to ring the PHONE port with when an incoming call is routed to the PHONE port. Choices are A, or B	A
CodecProfile	Select a Codec Profile to be used for all calls on this service. Choices are A, or B.	A

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DefaultRing	Default ring pattern number to ring the PHONE port for incoming calls on this trunk that are routed to the PHONE port according to the InboundCallRoute of this service. The ring pattern is taken from the selected Ring Profile. Valid choices are 1-10	2
CallOnHoldRing	Pattern to ring PHONE port when holding a call on this trunk that has been connected to the PHONE port. Typically this is a very short distinctive ring pattern that serves as a reminder to the user that a call is being on hold. The ring pattern is taken from the selected Ring Profile. Valid choices are: NO Ring, or 1-10	8
RepeatDialRing	The ring pattern number to use to ring the PHONE port when a repeat dial operation on this trunk is successful as the called party is either ringing or answered	4
DTMFMethod	Method to pass DTMF digits to peer device. Available choices are: Inband - DTMF tone are sent as inband audio signal RFC2833 - DTMF tone events are relayed per RFC2833 SIPInfo - DTMF tones are relayed with SIP INFO request Auto - Method to use based on call setup negotiation (either Inband or RFC2833 may be negotiated)	AUTO
UseFixedDurationRFC2833DTMF	When relaying DTMF digit events on this trunk using RFC2833, the RFC2833 RTP packets normally will keep streaming for as long as the digit is pressed. With this option set to TRUE, the device sends only one RTP digit event packet with a fixed duration of 150 ms regardless how long the digit has been pressed	FALSE

OBiTALK Calling Features Parameter Guide:

Parameter	Description	Default Setting
CallForwardUnconditionalEnable	Enable call forwarding of all calls unconditionally by the device. If CallForwardUnconditionalNumber is blank, this parameter is treated as if it has been set to *No*. Note: It is possible for a user to set this parameter from the phone using a Star Code	No
CallForwardUnconditionalNumber	Directory number to forward all incoming calls on this service unconditionally. Maximum Length is 127 characters. Note: It is possible for a user to set this parameter from the phone using a Star Code	
CallForwardOnBusyEnable	Enable call forwarding of all incoming calls when the device is busy. If CallForwardOnBusyNumber is blank, this parameter is treated as if it has been set to *No*. Device is considered busy if one of the following conditions holds: This service already reaches the limit of simultaneous calls as specified in MaxSessions DND (Do Not Disturb) Service is enabled on this service If the call is routed to the PHONE port where the phone is in a busy state (such as ringing, dialing, playing reorder, or already having 2 calls in progress)	No

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	Note: It is possible for a user to set this parameter from the phone using a Star Code	
CallForwardOnBusyNumber	Directory number to forward all incoming calls on this service when the device is busy. Maximum Length is 127 characters. Note: It is possible for a user to set this parameter from the phone using a Star Code	
CallForwardOnNoAnswerEnable	Enable call forwarding of all incoming calls when the call is not answered after a period as specified in CallForwardOnNoAnswerRingCount. If CallForwardOnNoAnswerNumber is blank, this parameter is treated as if it has been set to No. Note: It is possible for a user to set this parameter from the phone using a Star Code	No
CallForwardOnNoAnswerNumber	Directory number to forward all incoming calls when the call is not answered after a period specified in CallForwardNoAnswerRingCount Note: It is possible for a user to set this parameter from the phone using a Star Code	
CallForwardOnNoAnswerRingCount	Number of rings to be considered by the device as no answer to an incoming call. Note: 1 ring is approximately 6s	2
BlockedCallers	A comma separated list of up to 10 caller numbers to block from calling this service Note: Option not available on OBi100/OBi110	
MaxSessions	The maximum number of simultaneous calls that may be established on this service	2
AnonymousCallBlockEnable	Enable blocking of Anonymous Calls on this service. Anonymous calls are rejected with a SIP 486 (Busy) response and Call Forward On Busy service is not applied. Note: It is possible for a user to set this parameter from the phone using a Star Code	No
AnonymousCallEnable	Enable masking of Caller-ID information for all outgoing calls. If enabled, the called party should perceive the call as coming from an anonymous caller. Note: It is possible for a user to set this parameter from the phone using a Star Code	No
DoNotDisturbEnable	Enable Do Not Disturb Service. If enabled, all incoming calls on this service are treated as if the device is busy. Note: It is possible for a user to set this parameter from the phone using a Star Code	No

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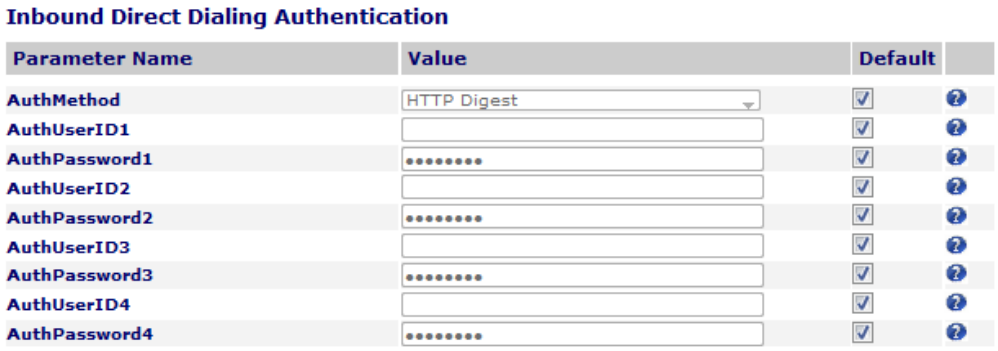

OBiTALK Inbound Direct Dialing Authentication Parameter Guide:

Parameter	Description	Default Setting
AuthMethod	The OBiTALK protocol allows incoming calls to indicate a target number that is different from this device's OBi number. The device in that case will attempt to establish and bridge the call to the target number according to the rules configured in the trunk's InboundCallRoute parameter. Hence this device acts as a gateway and the method is referred to direct dialing or 1-stage dialing (versus 2-stage dialing via the Auto-Attendant). Since the caller is not able to enter a PIN in such cases, an automated method based on signalling protocol must be used to authenticate the caller if authentication is required. OBi device offers the following choices for this purpose: - None = Disable authentication - HTTP Digest = Use HTTP Digest with User-ID and Password pairs. Note that at least one of AuthPassword*x* (*x*=1,2,3,4) must be specified, otherwise authentication is disabled.	HTTP Digest
AuthUserID1	One of 4 user IDs for authenticating direct dialing callers	
AuthPassword1	One of 4 passwords for authenticating direct dialing callers	
AuthUserID2	One of 4 user IDs for authenticating direct dialing callers	
AuthPassword2	One of 4 passwords for authenticating direct dialing callers	
AuthUserID3	One of 4 user IDs for authenticating direct dialing callers	
AuthPassword3	One of 4 passwords for authenticating direct dialing callers	
AuthUserID4	One of 4 user IDs for authenticating direct dialing callers	
AuthPassword4	One of 4 passwords for authenticating direct dialing callers	

Note: If AuthPassword is specified, AuthUserID may be set to blank to let the device use the default value which is a special hash of the AuthPassword. This is only applicable if the external gateway is also an OBi device that understands how to generate the default AuthUserID using the same hash function.

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Auto Attendant Service

Automated Attendant

The OBi call processing Auto Attendant (AA) invoked by including “aa” in the inbound call routing rule associated the interface on the OBi processing an incoming call. When connecting to the AA in this manner, there are two options at present.

Note: At present an OBi device supports only 1 session of AA at a time. Additional calls routed to the AA while a session is in progress will be rejected by the AA as busy.

AA Callback Service

The OBi offers two methods for the AA to call you back at a number that you picked (or designated by the admin of the OBi device).

The first method is by statically configuring a trunk’s InboundCallRoute. A rule can be added to the InboundCallRoute parameter to have the AA call back the caller’s or any other number, if the caller hangs up before the AA answers. The rule should indicate that “aa(*callback-number*)” is the target destination of the call, where *callback-number* is the number that the AA should call back if the caller hangs up before the AA answers the call. For example, the following rule

{(<**1>(14089913313|12121559801)):aa($1)}

says that: if 14089913313 or 12121559801 calls, the call is routed to AA. If caller hangs up before the AA answers, AA calls the number represented by $1. Recall that $1 is expanded into the caller number after processing by the digit map on the left side of the colon. In this case it is the caller’s number prepended by **1. The **1 is required for outbound call routing when AA calls back; here it indicates SP1 is to be used for calling back (assuming default value of the AA OutboundCallRoute parameter)

The parameter AA Service::CallbackAnswerDelay controls the number of milliseconds before AA answers when a callback number is specified as shown in the example. The default value is 10000 ms (10 seconds). Without the (*callback-number*) argument, the AA behaves the normal way and the answer delay is governed by the parameter AA Service::AnswerDelay.

The second method is by selecting AA option 3 to “Enter a callback number” after the AA answers the call. The caller can explicitly enter the number to be called back by the AA. If a valid number is entered, AA says “Thank You” and “Goodbye”, and then will start calling back 2 seconds after the current call has ended. If number entered is invalid, AA plays SIT tone followed by an error message. Note that the variable $1 (representing the caller’s number) is carried over to the subsequent AA callback call. The AA DigitMap can include $1 to be used in a callback context. For example, the following rule in the AA DigitMap

(<00:**1$1>|…)

says that if the AA dials 00, the device will transforms it into the caller’s number prepended by **1. In other words, if the caller wants the AA to callback the current number (typically the case), he can simple enter 00# after selecting option 3 on the AA menu. Note that $1 can only be used as part of a substitution element in the digit map; it must not be used for matching elements since its value is unknown.

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Automated Attendant:

IVR Announcement Number	Attendant Announcement	What Happens Next:
1	Press 1 to continue this call.	When accessed from the OBiTalk,
2	Press 2 to make a new call.	If "UsePIN" authentication is enabled and the user enters a matching PIN, the OBi Attendant will immediately prompt the user to enter number followed by the pound (#) key. If the entered PIN is not a match, the Attendant will give the user two additional attempts to enter the PIN. If the third attempt does not match, the Attendant will announce a thank you message and disconnect the call.
3	Press 3 to enter a callback number.	If a valid number is entered, AA says "Thank you" and "Goodbye", hangs up, and then callback the number in 2s. It the given number is invalid, AA plays SIT tone followed by an error message. Tips: Caller can simply dial 00# to have the AA call back his current number.

User Recorded Prompts

The OBi supports 10 user recordable prompts which are referred to as the *User1* to *User10* prompt, respectively. See the section ***Telephone-IVR-Based Local Configuration*** on how they can be recorded, or the section ***Customized AA Prompts Backup & Restore*** on how they can be duplicated from one device onto another device.

Customizing AA Prompt Lists

AA does not play individual user prompts directly. Instead it plays a comma separated list of prompt elements, known as a *Prompt List*. A prompt element can be a user prompt with optional parameters, or a control element. A user prompt is referred as %User<N>% where <N> = 1 – 10. In a prompt list this may be followed by a *;r=<start>-<end>* parameter that specifies the range to play for that prompt, where

<start> = starting time mark in milliseconds; 0 is the default if omitted

<end> = ending time mark in milliseconds; the end of the prompt is the default if omitted

If the r= parameter is omitted, the full range of the prompt is played.

Examples:

%User1%;r=1000	= play User1 prompt starting at 1000ms mark to the end
%User2%	= play the entire User2 prompt from start to finish
%User3%;r=1300-3720	= play User3 prompt starting from 1300ms mark to the 3720ms mark
%User4%;r=3200-1200	= does not play anything since <end> is less than <start>

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Each prompt list control elements starts with a '&' in a prompt list. The following control elements are supported:

&pause(<duration>) = pause playing for a number of seconds as given by the <duration> parameter

An example of prompt list:

%User1%;r=105,&pause(3),%User5%,%User9%;r=0-1350,&pause(15)

You can replace any of the following AA prompt lists with your own specified prompt lists:

AA Prompt List	System Default	Prompt Be Played
Welcome	Welcome to OBi Attendant	Once, at the beginning when the AA starts
InvalidPin	Invalid PIN	After user enters an invalid PIN
EnterPin	Enter PIN	Prompts user to enter a valid PIN
MenuTitle	Main Menu	Once, after Welcome and before announcing the menu options
Menu	Press 1 to continue this call. Press 2 to make a new all. Press 3 to enter a callback number.	A couple of times after MenuTitle
PleaseWait	Please wait while your call is being connected.	Once, after user enters a phone number to call
EnterNumber	Enter number followed by the # key.	Prompts user to enter a valid number after option 2 or option 3 is selected by the user
Bye	Thank you for choosing Obihai Technology. Goodbye.	When user presses * or # key to leave the AA

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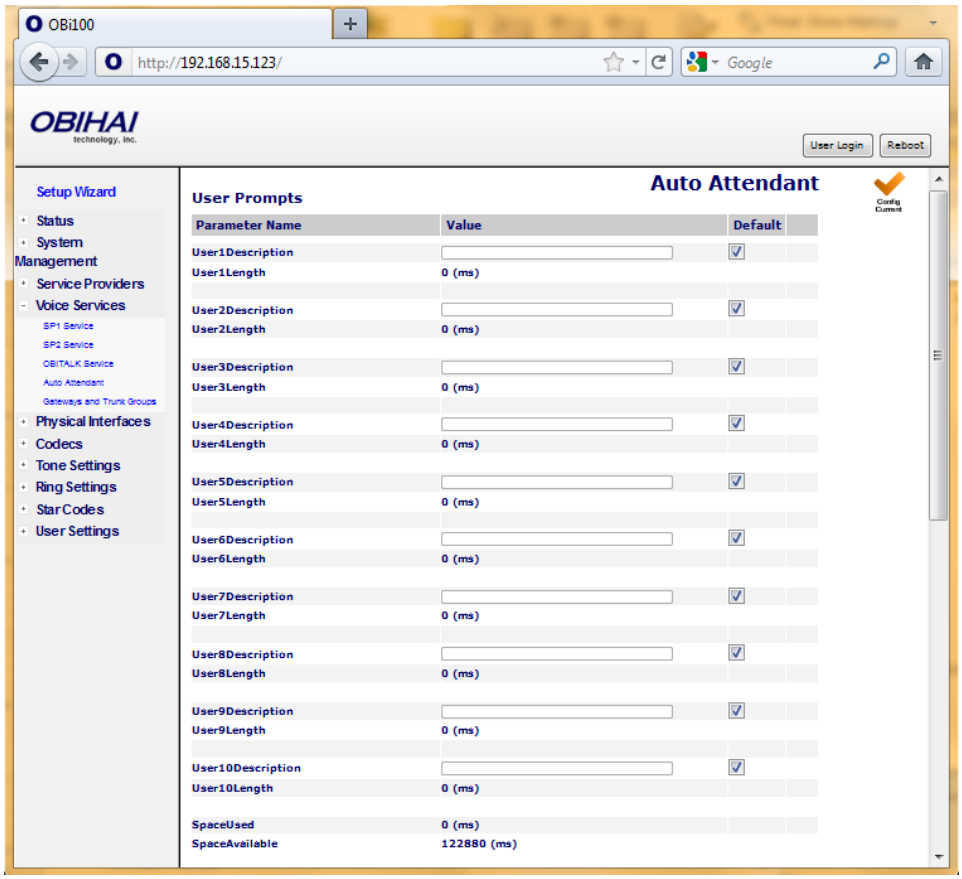
OBi100
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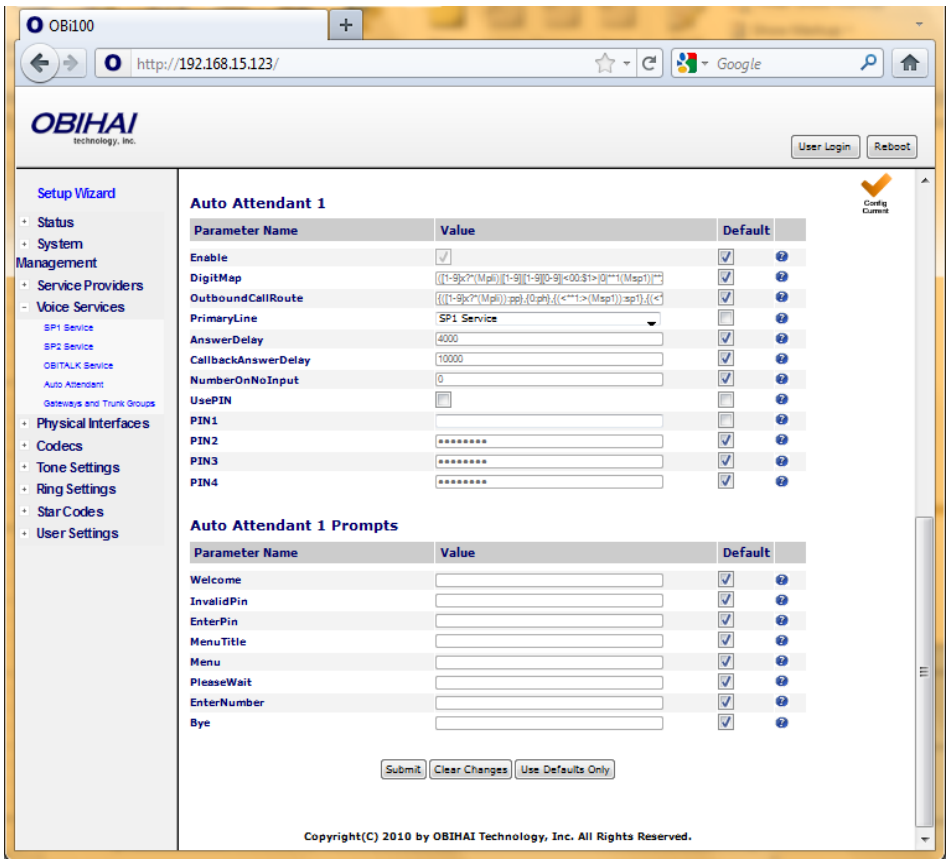
technology, inc.
User Login
Reboot
Setup Wizard
Status
System Management
Service Providers
Voice Services
SP1 Service
SP2 Service
OBITALK Service
Auto Attendant
Gateways and Trunk Groups
Physical Interfaces
Codecs
Tone Settings
Ring Settings
Star Codes
User Settings
Auto Attendant
User Prompts
Parameter Name
Value
Default
User1Description
User1Length 0 (ms)
User2Description
User2Length 0 (ms)
User3Description
User3Length 0 (ms)
User4Description
User4Length 0 (ms)
User5Description
User5Length 0 (ms)
User6Description
User6Length 0 (ms)
User7Description
User7Length 0 (ms)
User8Description
User8Length 0 (ms)
User9Description
User9Length 0 (ms)
User10Description
User10Length 0 (ms)
SpaceUsed 0 (ms)
SpaceAvailable 122880 (ms)


OBi100
http://192.168.15.123/
Google
OBIHAI
technology, inc.
User Login
Reboot
Setup Wizard
Status
System Management
Service Providers
Voice Services
SP1 Service
SP2 Service
OBITALK Service
Auto Attendant
Gateways and Trunk Groups
Physical Interfaces
Codecs
Tone Settings
Ring Settings
Star Codes
User Settings
Auto Attendant 1
Parameter Name
Value
Default
Enable
DigitMap
OutboundCallRoute
PrimaryLine
SP1 Service
AnswerDelay
4000
CallbackAnswerDelay
10000
NumberOnNoInput
0
UsePIN
PIN1
PIN2
PIN3
PIN4
Auto Attendant 1 Prompts
Parameter Name
Value
Default
Welcome
InvalidPin
EnterPin
MenuTitle
Menu
PleaseWait
EnterNumber
Bye
Submit
Clear Changes
Use Defaults Only
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User Prompts Parameter Guide:

Parameter	Description	Default Setting
User<N>Description <N> = 1-10	A text string that describes the contents of this user prompt	
User<N>Length <N> = 1-10	This is a read-only status parameter. It shows the space occupied by this prompt in number of milliseconds	
SpacedUsed	This is a read-only status parameter. It shows the amount of recording space used in number of milliseconds	
SpaceAvailable	This is a read-only status parameter. It shows the amount of recording space remaining in number of milliseconds	

Auto Attendant Parameter Guide:

Parameter	Description	Default Setting
Enable	Enable AA. If enabled, the AA will answer an incoming call that has been routed to it after a period as specified in AnswerDelay. If disabled, the AA will not attempt to answer any incoming call.	Yes
DigitMap	Once the AA answers an incoming call, it presents the caller with an option to make a further call using one of the available voice services on the device. This Digit map serves to restrict the numbers that can be dialed or called via this AA option. See *OBi Call Routing and Digit Map Section* for a description of the syntaxes to specify a digit map.	For OBi100: ([1-9]x?*(Mpli)|[1-9]|[1-9][0-9]| <00:$1>|0|**1(Msp1)| **2(Msp2)|**9(Mpp)|(Mpli)) For OBi110: ([1-9]x?*(Mpli)|[1-9]|[1-9][0-9]| <00:$1>|0|**1(Msp1)| **2(Msp2)|**8(Mli)|**9(Mpp)| (Mpli)) For OBi200/202/300/302: ([1-9]x?*(Mpli)|[1-9]|[1-9][0-9]| <00:$1>|0|**1(Msp1)| **2(Msp2)|**3(Msp3)| **4(Msp4)|**70(Mli)|**8(Mbt)|* *81(Mbt)|**82(Mbt2)| **9(Mpp)|(Mpli))
OutboundCallRoute	After the caller dials a number that is acceptable by the AA (according to its DigitMap) to make a further call, the device uses this outbound call routing rule to determine which service to make this call with. See *OBi Call Routing and Digit Map Section* for a description of the syntaxes to specify this parameter Note that while forking to multiple numbers in an AA outbound call routing rule is not supported on OBi100 and OBi110, it is supported on the OBi202. For example, on the OBi202 you may have a rule	For OBi100: {([1-9]x?*(Mpli)):pp}, {0:ph}, {(<**1:>(Msp1)):sp1}, {(<**2:>(Msp2)):sp2}, {(<**9:>(Mpp)):pp}, {(Mpli):pli} For OBi110: {([1-9]x?*(Mpli)):pp}, {0:ph}, {(<**1:>(Msp1)):sp1}, {(<**2:>(Msp2)):sp2}, {(<**8:>(Mli)):li}, {(<**9:>(Mpp)):pp}, {(Mpli):pli} For OBi:202/OBi302:

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	like this: {0:ph,ph2} which forks to ring both PHONE1 and PHONE2. In general you can have up to 4 destinations is a forking rule. On the other hand, you must not specify more than one destination number on the OBi100 and OBi110.	{([1-9]x?*(Mpli)):pp}, {0:ph.ph2}, {(<**1:>(Msp1)):sp1}, {(<**2:>(Msp2)):sp2}, {(<**3:>(Msp3)):sp3}, {(<**4:>(Msp4)):sp4}, {(<**70:>(Mli)):li}, {(<**82:>(Mbt2)):bt2}, {(<**81:>(Mbt)):bt}, {(<**8:>(Mbt)):bt}, {(<**9:>(Mpp)):pp}, {(Mpli):pli} For OBi:200/OBi300: {([1-9]x?*(Mpli)):pp}, {0:ph}, {(<**1:>(Msp1)):sp1}, {(<**2:>(Msp2)):sp2}, {(<**3:>(Msp3)):sp3}, {(<**4:>(Msp4)):sp4}, {(<**70:>(Mli)):li}, {(<**82:>(Mbt2)):bt2}, {(<**81:>(Mbt)):bt}, {(<**8:>(Mbt)):bt}, {(<**9:>(Mpp)):pp}, {(Mpli):pli}
PrimaryLine	By primary line we mean the service that does not require any access code prefix (such as **1 or **9) when dialing; it is the default service to be used for making the call when no explicit access code prefix is entered. This parameter indicates to the device which voice service is considered as the primary line when dialing out via the Auto Attendant. Available choices are: SP1 Service (*code = sp1*) SP2 Service (*code = sp2*) SP3 Service (code = sp3) SP4 Service (code = sp4) OBiTALK Service (*code = pp1*) PSTN Line (*code=li1*)[1] Trunk Group 1 (code=*tg1*) The OBi device process the parameter by substituting of the occurrences of *pli* and *(Mpli)* in DigitMap and OutboundCallRoute with the corresponding *code* and *(Mcode)*. For example, if PrimaryLine = PSTN Line, then all occurrences of *pli* and *(Mpli)* will be substituted internally with *li1* and *(Mli1)* respectively	PSTN Line
AnswerDelay	Period of time in milliseconds that the AA will wait before answering an incoming call that has been routed to it	4000
NumberOnNoInput	In the case that the caller does not enter any option from the top level menu after the menu has been announced for 3 times, the AA directs the caller to the number specified in this parameter. If this number is not specified, the AA simply terminates the current call.	0 Note: According to the default DigitMap and OutboundCallRoute, calling 0 means calling the PHONE port
UsePIN	Enable the use of PIN to authenticate callers when	No

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	they select the option to make a further call. If PIN1, PIN2, PIN3, and PIN4 are all empty, device treats it as if UsePIN is set to No. Otherwise, the caller must enter one of the non-empty PIN in order to proceed,	
PIN1	PIN code to make a call (must be all digits). Maximum Length = 15	
PIN2	PIN code to make a call (must be all digits). Maximum Length = 15	
PIN3	PIN code to make a call (must be all digits). Maximum Length = 15	
PIN4	PIN code to make a call (must be all digits). Maximum Length = 15	

Auto Attendant Prompt Parameter Guide:

Parameter	Description	Default Setting
Welcome	Prompt List to replace the system's Welcome message	
InvalidPin	Prompt List to replace the system's InvalidPin message	
EnterPin	Prompt List to replace the system's EnterPin message	
MenuTitle	Prompt List to replace the system's MenuTitle message	
Menu	Prompt List to replace the system's Menu message	
PleaseWait	Prompt List to replace the system's PleaseWait message	
EnterNumber	Prompt List to replace the system's EnterNumber message	
Bye	Prompt List to replace the system's Bye message	

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Voice Gateways

A gateway in this context is another OBi device which lets incoming OBiTALK callers to call further on one or more of its trunks (such as SP1, SP2, or LI). The caller can call the gateway first with a normal OBiTALK call, get the AA, and then dial the target number. For authentication the AA may ask the user to enter a PIN before establishing the second call. This way of dialing is known as 2-stage dialing.

On the other hand, a gateway can be configured on the originating OBi device such that the caller can dial the target number directly without going through the AA. We refer to this method of dialing as direct dialing or 1-stage dialing. Since it is not possible to enter a PIN in the case of direct dialing, a userid/password pair can be configured for the gateway also so that the device can authenticate with the gateway automatically using HTTP digest method. HTTP digest authentication is optional. You do not need to provide user/password if the gateway does not require authentication for direct dialing.

OBi allows the user to specify up to 8 gateways. Each gateway is addressed using its factory-assigned OBi Number. A gateway is conceptually a trunk with its own DigitMap. You can refer to a gateway and its associated DigitMap with the short trunk name VG*n* and (Mvg*n*) respectively, for *n* = 1, 2, 3, …, 8. VG*n* and (Mvg*n*) can be used in call routing rules and digit maps just like other real trunks.

As an example, you can add the rule {(1xxx xxx xxxx):vg2} in PHONE port's OutboundCallRoute to let the device dials out using VGs when caller dials any 11-digit number starting with 1. On the gateway side, you can add the corresponding rule {>(1 xxx xxx xxxx):sp1} in the OBiTALK Service::InboundCallRoute to make the call on its SP1 trunk. You can change the last rule to {(290 333 100|200 444 101)>(1 xxx xxx xxxx):sp1} if you want to limit the gateway to allow just the two stated caller numbers to make such calls.

Starting with firmware release 1.2, a gateway may also be configured with a SIP URL as the access number to be accessed by the device over one of the SP trunks. For example, one can set the gateway access number as SP1(some-sip-server.mydomain.com), or SP2(192.168.15.111:5062), etc. Note that when using a SP trunk to access a (SIP) gateway, the device will:

- Not use the outbound proxy, ICE, or STUN regardless the settings on the SP trunk.
- Use only the device's local address as the SIP Contact, and ignore any NATed address discovered by the device.
- Use the gateway's SIP URL to form the FROM header of the outbound INVITE.
- Use the gateway's AuthUserID and AuthPassword for authentication.
- Apply the symmetric RTP concept.

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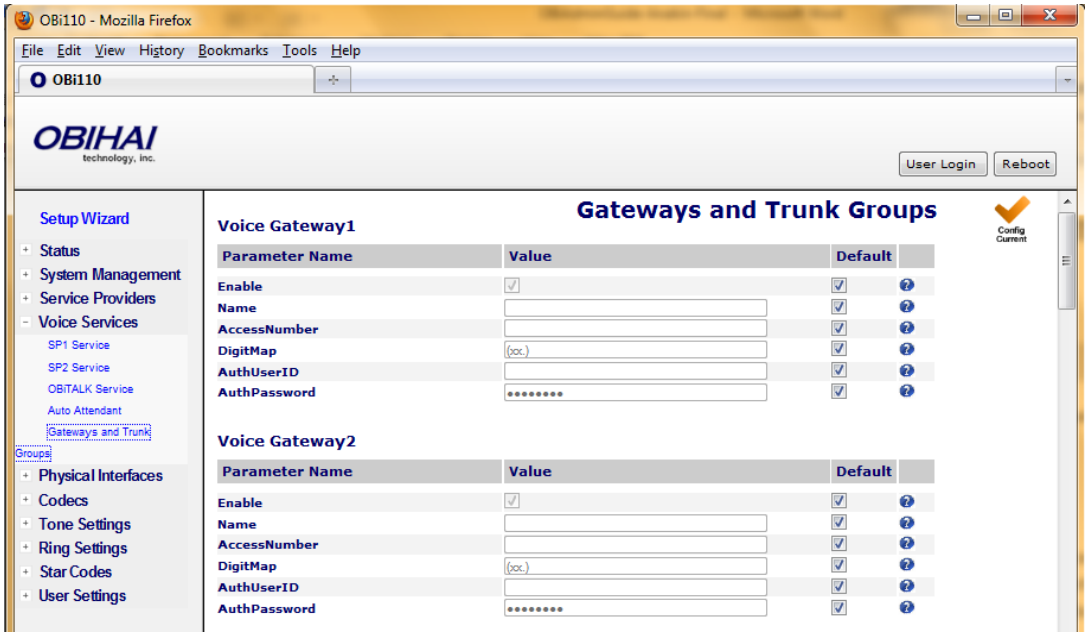

Voice Gateway Parameter Guide:

Parameter	Description	Default Setting
Trunk Group *n* (*n*=1–8)		
Enable	Enable this voice gateway	Yes
Name	An arbitrary user-friendly name to identify this gateway (optional)	
AccessNumber	The gateway's OBiTALK number, including trunk information, such as: PP(ob200112334) or PP(ob300331456) If the value is blank, device treats this VG as disabled. Starting with release 1.2, this can also be set to a SIP URL, such as: SP1(sip.mycompany.com:5060), or SP2(192.168.15.113)	
DigitMap	DigitMap for this VG. It can be referenced as (Mvg*n*)	(xx.)
AuthUserID	A User-ID to authenticate with the gateway	
AuthPassword	A Password to authenticate with the gateway	

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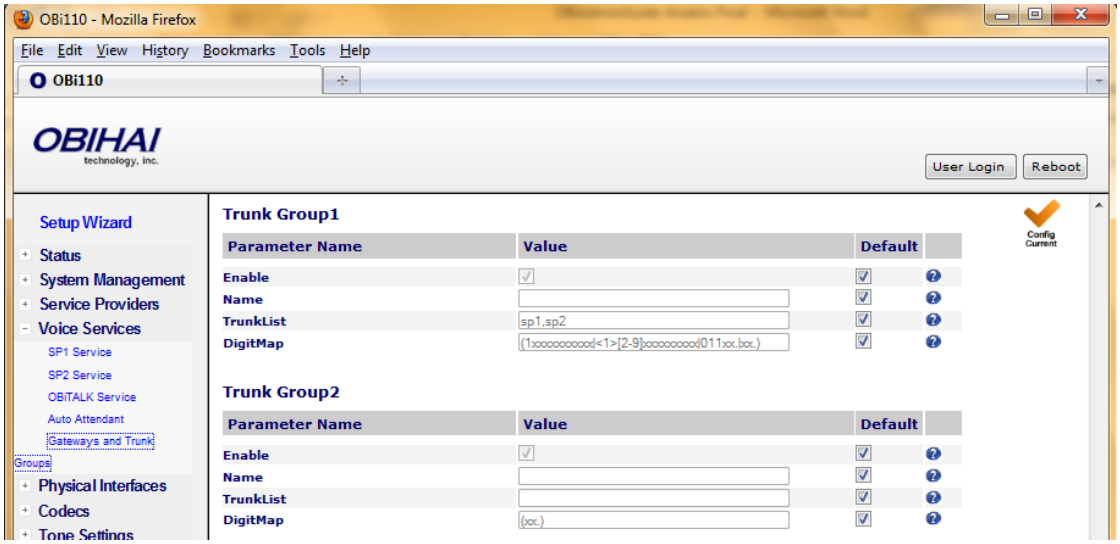
Trunk Groups

As the name implies, a trunk group is a group of trunks. If a call is routed to a trunk group, OBi picks one of the available trunks from the group to make the call. Availability of trunk is based on:

- Whether the trunk's digit map allows the number to call, AND
- Whether the trunk has capacity to make one more call

Up to 4 trunk groups can be configured on an OBi device. Each trunk group is conceptually another trunk with its own DigitMap. A trunk group and its associated DigitMap are referenced using the short name TG*n* and (Mtg*n*) respectively, where *n* = 1, 2, 3, 4. They can be referenced in other digit maps and call routing rules so that calls may be routed to a particular trunk group.

Only trunks can be added to a trunk group. These include: PP1, SP1, SP2, SP3, SP4, LI1[1], VG1, VG2, …, VG8, TG1, TG2, … TG4. Note that a TG may include another TG (that is, TG can be recursive). However, you must make sure this does not result in infinite recursion.



Trunk Group Parameter Guide:

Parameter	Description	Default Setting
Trunk Group *n* (*n*=1–4)		
Enable	Enable this trunk group	Yes
Name	An arbitrary user friendly name to identify this trunk group (optional)	
TrunkList	A comma separated list of names of trunks to include in this trunk group.	For TG1, the default for OBi100 and OBi110 is: sp1,sp2 and for OBi202 is: sp1,sp2,sp3,sp4 For other TG, the default is (blank)
DigitMap	Digit map associated with this trunk group. It can be referenced as (Mtg*n*)	For TG1, the default is (1xxxxxxxxx|<1>[2-9]xxxxxxxx|011xx.|xx.)

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		For other TG, the default is (xx.)

OBiBlueTooth

This feature is available only on models with a USB port i.e. OBi2 Series and OBi3 Series devices.).

The OBiBlueTooth feature requires an OBiBT Bluetooth Adapter USB dongle (sold separately) connected to the USB port of the OBi device. OBiBT is compatible with Bluetooth 1.1 to 4.0 and supports the HFP (handsfree) profile. When paired with a mobile phone, OBiBT plays a role similar to a Bluetooth headset from the perspective of the mobile phone.

Up to two OBiBT dongles can be attached to the OBi (requires an external USB hub if more than one). Each dongle must be set up to associate with either OBiBlueTooth 1 (BT1) Service or ObiBlueTooth 2 (BT2) Service.

Pairing OBiBT with Mobile Phone

To use OBiBlueTooth with a mobile phone, you must first pair it with the phone. You can initiate the pairing operation from the mobile phone's Bluetooth setup screen. A typical mobile phone has a "Scan for devices" option under its Buetooth setting. Activating that option shows a list of Bluetooth devices in the neighbourhood. For your OBiBT to show up in this list, you must make sure it is set to "discoverable".

There are two ways to make OBiBT discoverable (BT1 or BT2, but not both at the same time):

1. Connect a phone to any one of the OBi phone ports, pick up the phone and dial ***28**. If you have an authentic OBiBT dongle attached to the OBi, you will hear a beep-beep confirmation tone, and the OBiBT will be discoverable for the next 120 seconds. If you do not have an OBiBT dongle attached to the OBi, you will hear a fast busy tone instead
2. Open the device web page and click on **OBiBlueTooth** 1 under **Voice Services** on the left side panel of the page. Check the option *Discoverable* under **Device Settings** on the OBiBlueTooth page and press the submit button at the bottom of the page. This makes your OBiBT discoverable for the next 120 seconds if you have an authentic dongle attached to the device

Notes:

- Dialing *28 while having a single OBiBT dongle attached to the unit also associates the dongle with BT1 Service, as well as making BT1 dongle discoverable for 120 seconds.
- Similarly to the above, dialing ***29** while having a single OBiBT dongle attached to the unit associates the dongle with BT2 Service, as well as making BT2 dongle discoverable for 120 seconds
- You must attach one and only one OBiBT dongle to the unit when dialing *28 or *29. Failure to do so will result in operation failure as indicated by a fast-busy tone.
- If you plan to use both BT1 and BT2 services, you must first associate each dongle to a BT service by attaching one dongle to the unit at a time and dial *28 or *29. When you are done with both BT service association and pairing each dongle with external device, attach both OBiBT dongles to make both BT services available on the OBi.

Note that you do not want the OBiBT to remain discoverable indefinitely to avoid unauthorized pairing.

If your OBiBT is discoverable, it should show up in your mobile phone's scanned device list, with the name "OBi". Then you can select that device for pairing. That would be it for most modern mobile phones. For some older phone models, however, it may further prompt you to enter a 4-digit PIN code in order to complete pairing with the OBiBT. You may enter 0 0 0 0 if you are prompted to do so.

Once paired, the mobile phone and the OBi will remember the pairing so that you do not need to perform this operation again in the future, until the pairing is explicitly removed. In fact, the OBi will remember the last 10 paired devices. The name "OBi" should be shown in the list of paired devices on your mobile phone. The mobile phone should then allow you to select "OBi" from the list to establish a connection. If the operation is successful, it should say connected. With that, you are ready to make and receive mobile calls on the OBi via your mobile handset.

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After an initial pairing and connection with the mobile phone, OBiBT will automatically request connection with the same phone next time it comes in range. If it still remembers the pairing information with OBiBT, your mobile phone would also quietly accept the connection request.

You can find the device pairing information for the last 10 paired devices on the OBiBlueTooth device web page under the Device Settings section. A screenshot of this page is shown below. There are two parameters for each paired device *X*, where *X* = 1, 2, …, 10:

- PairedDevice*X* – The name of the paired device.
- RemovePairedDevice*X* – Check this box and press the submit button to remove this device from the paired device list.

Some exceptions:

- If the pairing information is removed from the mobile phone after initial pairing and connection with OBiBT, the next time it comes in range with OBiBT, the phone may pop up a message to let you know that the device "OBi" is requesting connection. You may then manually accept the connection.
- If the pairing information is removed from the OBi after initial pairing and connection with a mobile phone, it will not automatically connect with the phone next time it comes in range. You must then go to your mobile phones's Bluetooth setup screen and explicitly select the paired device "OBi" to re-establish connection
- OBi remembers the paired devices based on particular OBiBT dongle that is used during pairing. Each OBiBT dongle has a different hardware ID. If you replace the dongle with a different one, the existing device pairing information will not be valid and OBi will not be able to recognize the previously paired devices when they are in range

OBiBlueTooth Call Features

OBiBlueTooth is the voice service that is made possible with an attached OBiBT dongle that is connected with a (in-service) mobile device. This service allows you to make or receive mobile calls using a conventional phone attached to the OBi phone port, or by bridging in a VoIP call over a SP service or OBiTALK service. OBiBlueTooth only allows one incoming or outgoing call on OBiBT at a time. In other words, there is no 3-way call or call-waiting support on OBiBlueTooth. The supported call features are similar to the equivalent ones supported under SP or OBiTALK service.

The screenshot below shows the Calling Feature parameters on the OBiBluebooth device web page, which should be self-explanatory.

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OBiBlueTooth

Parameter Name	Value	Default
Enable	☑	☑
DigitMap	(xxxxxxxS4|1xxxxxxxxxx0x.)	☑
InboundCallRoute	ph,ph2	☑
RingProfile	A	☑
DefaultRing	1	☑
CallOnHoldRing	8	☑
DirectoryNumber		☑

Calling Features

Parameter Name	Value	Default
CallForwardUnconditionalEnable	☐	☑
CallForwardUnconditionalNumber		☑
CallForwardOnBusyEnable	☐	☑
CallForwardOnBusyNumber		☑
CallForwardOnNoAnswerEnable	☐	☑
CallForwardOnNoAnswerNumber		☑
CallForwardOnNoAnswerRingCount	2	☑
AnonymousCallBlockEnable	☐	☑
DoNotDisturbEnable	☐	☑
BridgedOutboundCallMaxDuration		☑

Device Settings

Parameter Name	Value	Default
Discoverable	☐	☐
PreferredPairedDevice	Device 2	☐
PairedDevice1	Sherman Scholten's iPhone	
RemovePairedDevice1	☐	☑

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OBiBlueTooth Parameter Guide:

Parameter	Description	Default Setting
Enable	Enable the OBiTALK Service (the built-in free voice service that comes with every OBi Device)	Yes
DigitMap	Digit map to restrict numbers that can be dialed or called with this service. See *OBi Call Routing and Digit Map Section* for a description of the syntaxes for specifying a Digit Map.	(<ob>xxxxxxxxx|obxxxxxxxxx)
InboundCallRoute	Routing rule for directing incoming calls on this service. The default rule is to send all incoming calls to the PHONE port (ph). See *OBi Call Routing and Digit Map Section* for a description of the syntaxes for specifying this parameter	ph
RingProfile	Select a Ring Profile to ring the PHONE port with when an incoming call is routed to the PHONE port. Choices are A, or B	A
DefaultRing	Default ring pattern number to ring the PHONE port for incoming calls on this trunk that are routed to the PHONE port according to the InboundCallRoute of this service. The ring pattern is taken from the selected Ring Profile. Valid choices are 1-10	2
CallOnHoldRing	Pattern to ring PHONE port when holding a call on this trunk that has been connected to the PHONE port. Typically this is a very short distinctive ring pattern that serves as a reminder to the user that a call is being on hold. The ring pattern is taken from the selected Ring Profile. Valid choices are: NO Ring, or 1-10	8
DirectoryNumber	The phone number of the connected mobile phone service. This is just informational with no significance	

OBiBLueTooth Calling Features Parameter Guide:

Parameter	Description	Default Setting
CallForwardUnconditionalEnable	Enable call forwarding of all calls unconditionally by the device. If CallForwardUnconditionalNumber is blank, this parameter is treated as if it has been set to *No*. Note: It is possible for a user to set this parameter from the phone using a Star Code	No
CallForwardUnconditionalNumber	Directory number to forward all incoming calls on this service unconditionally. Maximum Length is 127 characters. Note: It is possible for a user to set this parameter from the phone using a Star Code	
CallForwardOnBusyEnable	Enable call forwarding of all incoming calls when the device is busy. If CallForwardOnBusyNumber is blank, this parameter is treated as if it has been set to *No*. Device is considered busy if one of the following conditions holds: This service already reaches the limit of simultaneous calls as specified in MaxSessions DND (Do Not Disturb) Service is enabled on this service If the call is routed to the PHONE port where the phone	No

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	is in a busy state (such as ringing, dialing, playing reorder, or already having 2 calls in progress) Note: It is possible for a user to set this parameter from the phone using a Star Code	
CallForwardOnBusyNumber	Directory number to forward all incoming calls on this service when the device is busy. Maximum Length is 127 characters. Note: It is possible for a user to set this parameter from the phone using a Star Code	
CallForwardOnNoAnswerEnable	Enable call forwarding of all incoming calls when the call is not answered after a period as specified in CallForwardOnNoAnswerRingCount. If CallForwardOnNoAnswerNumber is blank, this parameter is treated as if it has been set to No. Note: It is possible for a user to set this parameter from the phone using a Star Code	No
CallForwardOnNoAnswerNumber	Directory number to forward all incoming calls when the call is not answered after a period specified in CallForwardNoAnswerRingCount Note: It is possible for a user to set this parameter from the phone using a Star Code	
CallForwardOnNoAnswerRingCount	Number of rings to be considered by the device as no answer to an incoming call. Note: 1 ring is approximately 6s	2
BlockedCallers	A comma separated list of up to 10 caller numbers to block from calling this service	
AnonymousCallBlockEnable	Enable blocking of Anonymous Calls on this service. Anonymous calls are rejected with a SIP 486 (Busy) response and Call Forward On Busy service is not applied. Note: It is possible for a user to set this parameter from the phone using a Star Code	No
AnonymousCallEnable	Enable masking of Caller-ID information for all outgoing calls. If enabled, the called party should perceive the call as coming from an anonymous caller. Note: It is possible for a user to set this parameter from the phone using a Star Code	No
DoNotDisturbEnable	Enable Do Not Disturb Service. If enabled, all incoming calls on this service are treated as if the device is busy. Note: It is possible for a user to set this parameter from the phone using a Star Code	No
BridgedOutboundCallMaxDuration	Limit on the call duration in seconds for all outbound calls that are bridged from another trunk. A blank or 0 value implies the call duration is not limited.	
AAAskForConfirm	When an incoming call on this service is answered by the AA, enabling this option lets the AA ask for confirmation	Yes

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	from the caller before making a second call to brige with the original call. This option is useful since inband DTMF detection on a BT channel is NOT very reliable.	

OBiBlueTooth Device Settings Parameter Guide:

Parameter	Description	Default Setting
Discoverable	Check this box and click the submit button to make the OBiBT device discoverable for the next 120 seconds	No
PreferredPairedDevice	Select which paired device is preferred, in the event that more than one paired device are in range. The value is automatically set to the device that explicitly requested connection with OBiBT	None
PairedDevice*N*, *N* = 1, 2, …, 10	The name of the device that has successfully paired with OBiBT	
RemovePairedDevice*N*, *N* = 1, 2, …, 10	Check this box and click the submit button to remove this paired device	No

Phone Interface Features of the OBi Device

Repeat Dialing Service

Repeat dialing service is when a user dials *05 to tell the device to redial the last called number repeatedly while the phone is on-hook, until the called party rings or answers. When that happens, device rings the PHONE port and the user can pick it up to talk to the called party. Typically the last called number was busy when the user invokes this feature, but the device allows this feature for all cases.

This feature can be controlled with the following two parameters (under the PHONE Port – Calling Feature section):

- RepeatDialInterval = the minimum number of seconds between each redial. Default is 30s.
- RepeatDialExpires = the maximum duration in seconds when the repeat dialing remains active. Default is 1800s.

User dials *06 to cancel Repeat Dialing. Only one repeat dial request is supported. Dialing *05 while a repeat dial is in progress will be rejected with a fast busy tone. If *05 is accepted, the device plays normal dial tone.

Notes:

- The first redial happens 5s after the phone is on-hook following *05.
- When phone is off-hook or rings for an incoming call, device pauses redial and cancels the call if it's already dialed but the peer device is not ringing yet.
- As soon as phone goes on hook or ringing stops without any calls on hold, repeat dialing resumes in 5s.
- If called party answers before the local caller, device sends normal ringback tone over RTP to the called party.
- The ring for alerting local user when the called party rings or answers is taken from outgoing trunk's RepeatDialRing parameter.
- Repeat Dial service cannot be used on the LINE port. If the last call was made over the LINE port, dialing *05 will result in fast busy.

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- Repeat Dial calls are not logged to call history, except the last and successful one when the called party rings or answers.

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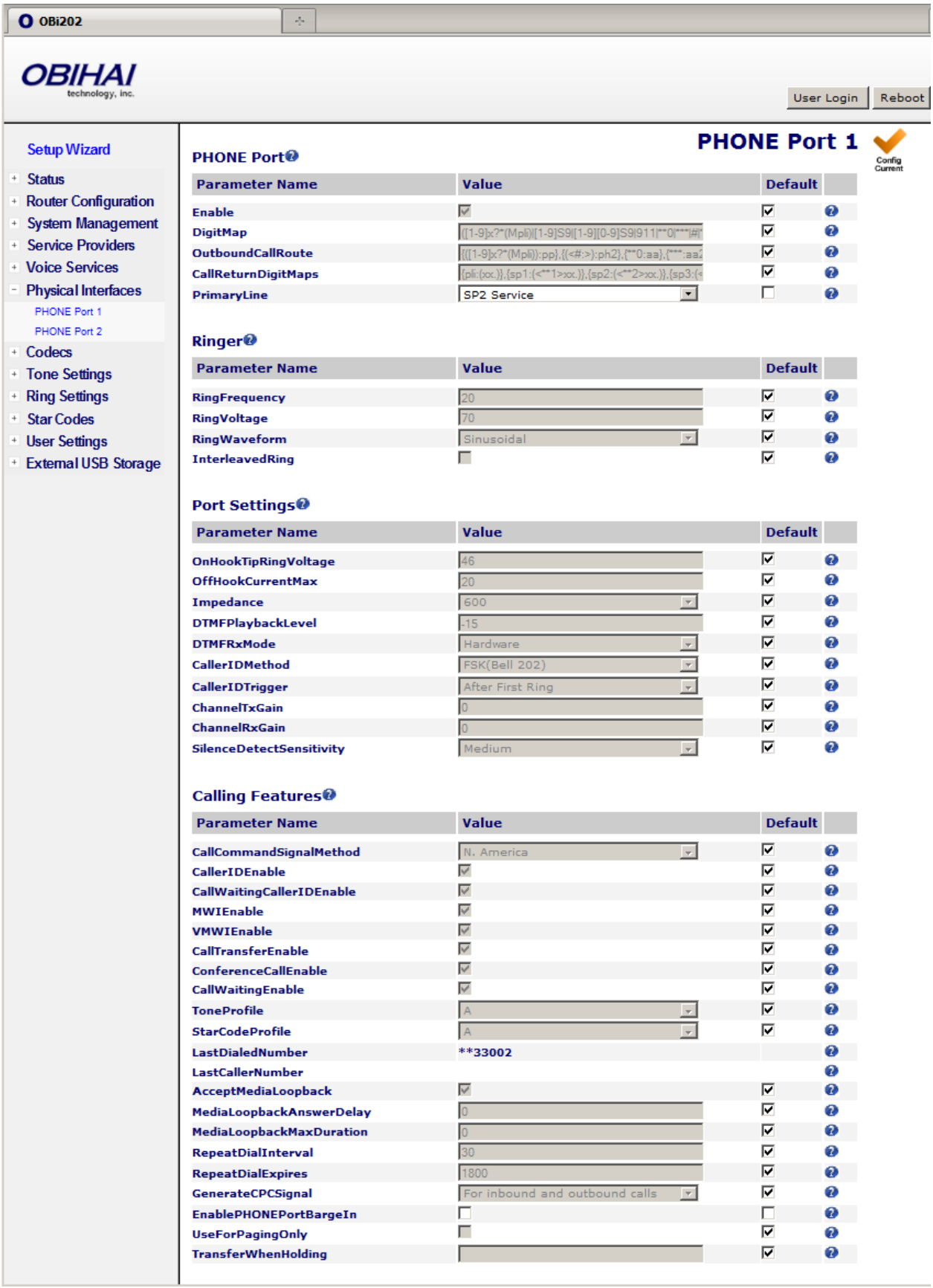

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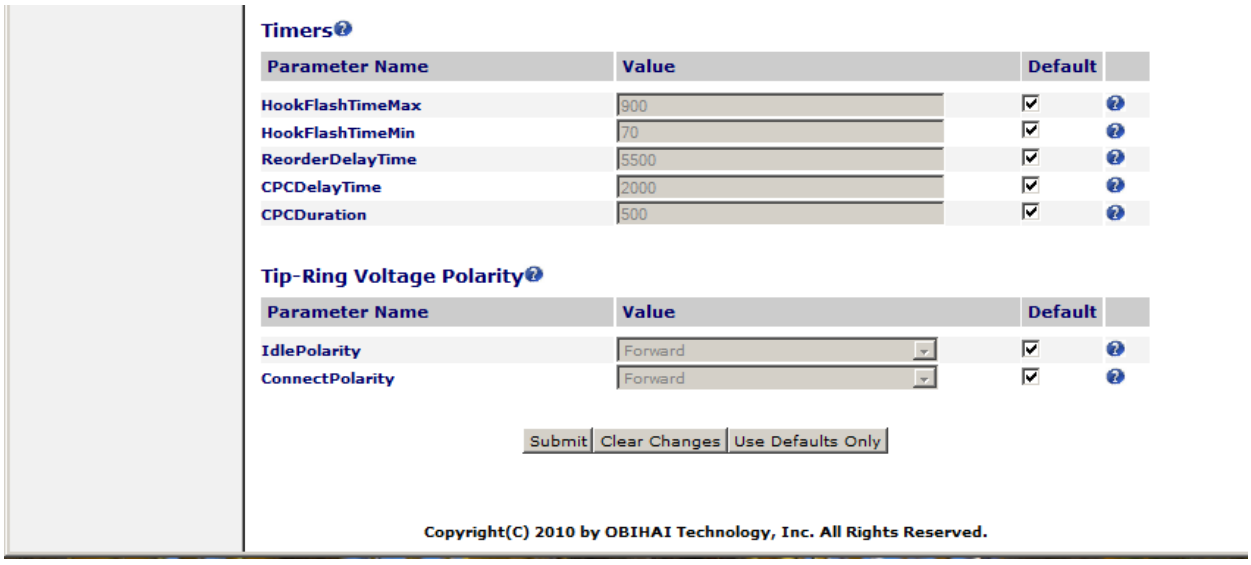

PHONE Port Parameter Guide:

Parameter	Description	Default Setting
PHONE Port		
Enable	Enable the PHONE port	Yes
DigitMap	This Digit map serves to restrict the numbers that can be dialed or called from the PHONE port. If the caller dials a number that is not allowed by the digit map, OBi plays SIT tone followed by a short error message to let the caller know that the dialed number is invalid. See *OBi Call Routing and Digit Map Section* for a description of the syntaxes to specify a digit map.	For OBi100: ([1-9]x?*(Mpli)|[1-9]| [1-9][0-9]|911|**0|***| **1(Msp1)|**2(Msp2)| **9(Mpp)|(Mpli)) For OBi110: ([1-9]x?*(Mpli)|[1-9]| [1-9][0-9]|911|**0|***|#| **1(Msp1)|**2(Msp2)| **8(Mli)|**9(Mpp)|(Mpli)) For OBi200/202/300/302: ([1-9]x?*(Mpli)|[1-9]S9| [1-9][0-9]S9|911|**0|***|#|##| **70(Mli)|**8(Mbt)|**81(Mbt)| **82(Mbt2)| **1(Msp1)|**2(Msp2)| **3(Msp3)|**4(Msp4)| **9(Mpp)|(Mpli))
OutboundCallRoute	After the caller dials a number that is acceptable according to the DigitMap, OBi device uses this outbound call routing rule to determine which service to make this call with. If no appropriate call route found, OBi plays SIT tone followed by a short error message to let the caller know that there is no call route to place the call. See *OBi Call Routing and Digit Map Section* for a description of the syntaxes to specify this parameter	For OBi100: {([1-9]x?*(Mpli)):pp}, {**0:aa},{***:aa2}, {(<**1:>(Msp1)):sp1}, {(<**2:>(Msp2)):sp2}, {(<**9:>(Mpp)):pp}, {(Mpli):pli} For OBi110: {([1-9]x?*(Mpli)):pp}, {(<#:>|911):li}, {**0:aa},{***:aa2}, {(<**1:>(Msp1)):sp1}, {(<**2:>(Msp2)):sp2}, {(<**8:>(Mli)):li}, {(<**9:>(Mpp)):pp}, {(Mpli):pli}

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		For OBi202/OBi302 PHONE1: {([1-9]x?*(Mpli)):pp}, {(<##:>):li}, {(<#:>):ph2}, {(<**70:>(Mli)):li}, {(<**82:>(Mbt2)):bt2}, {(<**81:>(Mbt)):bt}, {(<**8:>(Mbt)):bt}, {**0:aa},{***:aa2}, {(<**1:>(Msp1)):sp1}, {(<**2:>(Msp2)):sp2}, {(<**3:>(Msp3)):sp3}, {(<**4:>(Msp4)):sp4}, {(<**9:>(Mpp)):pp}, {(Mpli):pli} For OBi202/OBi302 PHONE2: {([1-9]x?*(Mpli)):pp}, {(<##:>):li}, {(<#:>):ph}, {(<**70:>(Mli)):li}, {(<**82:>(Mbt2)):bt2}, {(<**81:>(Mbt)):bt}, {(<**8:>(Mbt)):bt}, {**0:aa},{***:aa2}, {(<**1:>(Msp1)):sp1}, {(<**2:>(Msp2)):sp2}, {(<**3:>(Msp3)):sp3}, {(<**4:>(Msp4)):sp4}, {(<**9:>(Mpp)):pp}, {(Mpli):pli} For OBi200/OBi300: {([1-9]x?*(Mpli)):pp}, {(<##:>):li}, {(<**70:>(Mli)):li}, {(<**82:>(Mbt2)):bt2}, {(<**81:>(Mbt)):bt}, {(<**8:>(Mbt)):bt}, {**0:aa},{***:aa2}, {(<**1:>(Msp1)):sp1}, {(<**2:>(Msp2)):sp2}, {(<**3:>(Msp3)):sp3}, {(<**4:>(Msp4)):sp4}, {(<**9:>(Mpp)):pp}, {(Mpli):pli}
CallReturnDigitMaps	Call Return is the service where the user can call the last caller by dialing a star code (*69 by default). OBi device implements this service by remembering the number of the last caller in memory. However the stored information does not include any dialing prefix to tell the device which voice service to use to call back the last caller. This list of digit maps serve the purpose of mapping a caller's number to one that includes the desired dialing prefix used exclusively for call return service.	For OBi100: {pli:(xx.)}, {sp1:(<**1>xx.)}, {sp2:(<**2>xx.)}, {pp:(<**9>xx.)} For OBi110: {pli:(xx.)}, {sp1:(<**1>xx.)}, {sp2:(<**2>xx.)}, {li:(<**8>xx.)}, {pp:(<**9>xx.)} For OBi202: {pli:(xx.)}, {sp1:(<**1>xx.)},

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		{sp2:(<**2>xx.)}, {sp3:(<**3>xx.)}, {sp4:(<**4>xx.)}, {pp:(<**9>xx.)}
PrimaryLine	By primary line we mean the service that does not require any access code prefix (such as **1 or **9) when dialing; it is the default service to be used for making the call when no explicit access code prefix is entered. This parameter indicates to the device which voice service is considered as the primary line when dialing out from the PHONE port. Available choices are: SP1 Service (*code = sp or sp1*) SP2 Service (*code = sp2*) SP3 Service (*code = sp3*) SP4 Service (*code = sp4*) OBiTALK Service (*code = pp or pp1*) PSTN Line (*code=li1*) OBiBlueTooth (*code = bt or bt1*) OBiBlueTooth 2 (*code = bt2*) Trunk Group 1 (*code = tg1*) Trunk Group 2 (*code = tg2*) The OBi device process the parameter by substituting of the occurrences of *pli* and *(Mpli)* in DigitMap, OutboundCallRoute, and CallReturnDigitMaps with the corresponding *code* and *(Mcode)*. For example, if PrimaryLine = *PSTN Line*, then all occurrences of *pli* and *(Mpli)* will be substituted internally with *li1* and *(Mli1)* respectively Notes: - SP3, SP4, BT1, and BT2 not available on OBi100/OBi110 - PSTN Line not available on OBi100 - TG2 not selectable as Primary Line on OBi100/OBi110	For OBi110: PSTN Line For all other models: SP1 Service
ToneOnPrimaryServiceDown (OBi202 and OBi302 only)	Select the tone to play in place dial tone when the service corresponding to the Primary Line is out-of-service. Choose from: - No Tone - Normal Dial Tone - SIT Tone 1 - SIT Tone 2 - SIT Tone 3 - SIT Tone 4 Note: Option not available on the OBi100/OBi110	Normal Dial Tone
Ringer		
RingFrequency	Ringer frequency in Hz (14 - 68) to apply to the PHONE port when ringing	20
RingVoltage	Peak ringer voltage in volts (55 - 82) to apply to the PHONE port when ringing	70
RingWaveform	Ringer waveform to apply to the PHONE port when ringing. Choices are Sinusoidal or Trapezoidal	Sinusoidal
InterleavedRing	When both phone ports are ringing, enabling this option	No

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	will cause the OBi to interleave the ring signal applied to each port to reduce the chance of overloading the power supply. Note: Option available only on OBi202/OBi302	
Port Settings		
OnHookTipRingVoltage	Tip/Ring Voltage when the attached phone is on hook (30 v to 52 v)	46
OffHookCurrentMax	Maximum supported current (15 mA to 45 mA) when the attached phone is off-hook	20
Impedance	PHONE port impedance setting. Available choices are (units in ohm if not specified): - 600 - 900 - 270+(750||150 nF) - 220+(820||120 nF) - 370+(620||310 nF) - 320+(1050||230 nF) - 350+(1000||210 nF) - 200+(680||100 nF) - 600+2.16 uF - 900+2.16 uF - 600+1 uF - 220+(820||115 nF)	600
DTMFPlaybackLevel	Out of band DTMF tone playback level in dBm (-90 to 3)	-15
CallerIDMethod	Caller ID delivery standard. Choices are: FSK(Bell202) FSK(V.23) DTMF(Finland,Sweden) DTMF(Denmark)	FSK(Bell202)
CallerIDTrigger	Triggering event for on-hook Caller ID signal generation. Choices are: After First Ring After Polarity Reversal Before First Ring	After First Ring
ChannelTxGain	Transmit gain in dB (-12 to 12) to apply to signal sent from OBi to the attached phone(s)	0
ChannelRxGain	Receive gain in dB (-12 to 12) to apply to signal received by OBi from the attached phone(s)	0
SilenceDetectSensitivity	PHONE port silence detection servers the purpose of driving silence suppression in RTP transmission when the phone Call terminates on SP1/2 or OBiTALK Service and silence suppression is enabled. This parameter is used to set a sensitivity level for OBi silence detection algorithm. Available choices are: Low (harder to detect silence) Medium (suggested) High (easier to detect silence)	Medium
Calling Features		

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CallCommandSignalMethod	Select the method to signal a command to the OBi when the phone is off-hook with an active call in connected state, while there is a second call on hold or ringing. The two choices are: - N. America (uses hook switch events only) - Nordic Regions (R1, R2, …), where R = hook flash or the 'R' button, R0 = Reject the 2nd incoming call (applicable only if the 2nd call is ringing), R1 = End current call, resume/answer the 2nd call R2 = Hold current call, resume/answer the 2nd call R3 = Conference the two calls R4 = Transfer 2nd call peer to the 1st (not applicable if 2nd call is ringing)	N. America
HookFlashHandling	Indicate the Method to Handle Hook Flash. Choices are Handle Hook Flash Locally This is the normal setting, where the device intercepts all the hook flash events detected on the PHONE port, and acts on them accordingly, such as: - Hold current call and start second dial tone for 3-way calls - Start a 3-way conference - End call with 2nd conferencee in a 3-way conference - Swap between two calls in a call-waiting situation Send Hook Flash Signal to PSTN Device does not act on hook flash events detected on the PHONE port. It either ignores hook flash events OR regenerates similar hook flash events on the PSTN line if the phone user is currently in a call using the PSTN line service when the hook flash event happens. This option may be useful in cases where the user has traditional call-waiting or 3-way calling services on his PSTN line service; hence he can control those PSTN supplementary services using hook flash signals. However, the OBi in this case would automatically disables its own call-waiting function on the PHONE port, and the user would have no means to tell OBi to make 3-way calls. Note that an alternative way to let OBi generate a hook flash signal to the PSTN line is to use a double hook flash event by hook flashing twice within 700 ms. See the description of the parameter EnableDoubleHookFlash in this table. With this enabled, you can still let the device handle normal hook flash event locally and preserve the call-waiting and 3-way calling functionalities. This option is only available in OBi110 and units with an OBiLINE USB to FXO adapter accessory attached	Handle Hook Flash Locally
CallerIDEnable	Enable Caller ID Signal generation. This option can be set to Yes even if the attached phone is not capable of displaying Caller ID. There is no harm in sending Caller ID signal while the phone is in the on hook state.	Yes

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CallWaitingCallerIDEnable	Enable Call Waiting Caller ID (CWCID) Signal generation. CWCID signal is sent to the phone when it is in the off hook state. It starts with a handshake between the OBi device and the attached phone, by exchanging audible short tones. OBi will proceed with the transmission of the remaining Caller ID signal only if the handshake succeeds (with a phone is capable of displaying CWCID). In that case the phone mutes the handset earpiece until the CWCID signal is complete. Some users however may still find the audible handshake tones objectionable, especially if their phones do not support CWCID. We recommend to those users to set this option to No, if they do not want CWCID feature, or do not have phones that are capable of displaying CWCID.	Yes
MWIEnable	Enable MWI Signal (stutter dial tone) generation. If enabled, any SP voice service enabled on the device that has MWI Service enabled will trigger the generation of stutter dial tone if there are new voicemails for the subscriber on the service provider's voicemail system.	Yes
VMWIEnable	Enable VMWI Signal generation. If enabled, any SP voice service enabled on the device that has VMWI Service enabled will trigger the generation of VMWI signal if there are new voicemails for the subscriber on the service provider's voicemail system.	Yes
CallTransferEnable	Enable Call Transfer. Call Transfer, if enabled, is initiated by the user by hanging up the phone in one of the following scenarios: - One call on hold while a 2nd outgoing call ringing - One call on hold while a 2nd outgoing call connected - One call connected while a 2nd outgoing call ringing - 3-way conference with both calls connected If Call Transfer is disabled, hanging up the phone in the above scenarios simply ends all the calls, except for the one that is holding, which will remain on hold (cases 1 and 2).	Yes
ConferenceCallEnable	Enable 3-way Conference Call w/ local audio mixing. Conference Call, if enabled, is initiated by the user by hook flashing the phone in one of the following scenarios: - One call on hold while a 2nd outgoing call ringing - One call on hold while a 2nd outgoing call connected We refer to case (1) as an early conference, where the second conferencee is still ringing; the other 2 parties may converse while hearing ringback tone in the background until the 3 party answers. In either case, the user can end the call with the second conferencee by hook flashing another time and the call reverts to a 2-way call. If Conference Call service is disabled, then hook flashing the phone resumes the holding call but ends the second outgoing call in scenario (1), and swaps between the two calls in scenario (2) (as in a call waiting situation)	Yes
UseExternalConferenceBridge	Enable the use of an external conference bridge for	No

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	conference calls (SIP only). In addition, the following rule {cbridge:SP*x*(*bridge-userid*)} must also added to the phone port's OutboundCallRoute parameter, where *x*=1,2,3,4, and *bridge-userid* the userid of the conference bridge SUA. Note that the keyword **cbridge** is hard-coded and must not be changed. Note: Option not available on OBi100/110	
CallWaitingEnable	Enable call waiting service. Call Waiting is the situation where a new incoming call is routed to the PHONE port when there is already another call connected. If this service is enabled, OBi plays call-waiting tone to alert the user, as well as generates CWCID signal if CWCID is enabled. The user may then swap between the two calls by hook flashing. If the service is disabled, OBi rejects the incoming call as busy. Note: It is possible for the user to set this parameter from the phone using a Star Code	Yes
ToneProfile	Select a Tone Profile for call progress tone generation. Choices are A, or B	A
StarCodeProfile	Select a Star Code Profile for interpreting Star Codes entered by the user. Choices are None, A, or B. If value is set to None, no star code will be recognized by OBi device.	A
LastDialedNumber	Last number dialed out on the PHONE port	
LastCallerNumber	Last caller's number that rings the PHONE port	
AcceptMediaLoopback	Enable the device to accept incoming media loopback calls	Yes
MediaLoopbackAnswerDelay	Delay in milliseconds before the device answers an incoming media loopback call	0
MediaLoopbackMaxDuration	Maximum duration in seconds to allow for an inbound media loopback call. Set the value to blank or 0 to make it unlimited	0
RepeatDialInterval	Interval in seconds between retry in a repeat dial operation.	30
RepeatDialExpires	Duration of time in seconds when a repeat dial operation remains active.	1800
GenerateCPCSignal	Controls when the device should generate a CPC signal when the remote party hangs up on an established call. The choices are: - Never - For Inbound Calls Only - For Outbound Calls Only - For Inbound and Outbound Calls	For Inbound and Outbound Calls
EnableLINEPortBargeIn	This option is useful only when a PSTN line is connected to the OBi110. By default a user can pick up the phone and dial # to connect to the LINE port. If no one else using the PSTN line at that time, the user will hear dial tone from the phone company. On the other hand, if the line is already in use, the user will hear fast busy tone if this option is disabled, or join the current call in progress	No

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	otherwise. This option is only available on the OBi110 and devices with an attached OBiLINE USB to FXO adapter accessory.	
EnablePHONEPortBargeIn	Enable the caller to barge in when he calls the other phone port from this phone port while the other phone port has an active call in progress, on-hold, or ringing. This option is only available on the OBi202/OBi302	Yes
EnableDoubleHookFlash	A double hook flash event is two successive hook flash events that are less than 700ms apart (by default). If this event is enabled, the device will generate a hook flash signal on the PSTN line if the phone is currently on a call on the line. This option is useful only if HookFlashHandling is set to “Handle Hook Flash Locally”. This option is only available on the OBi110 and devices with an attached OBiLINE USB to FXO adapter.	Yes
UseForPagingOnly	Enables the OBi to be used for paging only when the PHONE port is connected to an external PA system (via a RJ11 to line out connector, available from many electronics shops). In such configuration the PHONE port is expected to be “off-hook” all the time; the OBi will automatically answer an incoming call and will not accept call-waiting.	No
TransferWhenHolding	This option provides a short cut to transfer a call to a fixed pre-configured number without dialing it. If a valid number is specified for this parameter, the OBi will transfer the call to the given number when the phone hook flashes and then on-hook (which would normally leave the call holding if this parameter is not specified). The valid number should be a complete number with trunk information, such as SP1(14083334567).	
EndHoldingCallWhenHangUp	If this option is enabled, when a user hangs up while a call is still on hold, the OBi will end that call instead of alerting the same to the user (with a short ring).	No
MOHServiceNumber	The number to call to get music streamed to the remote party when the remote party is placed on hold. Note: Option not available on the OBi100 and OBi110	
PlaySITOnCallFailureCodes	A list of (3-digit) error response codes on outbound calls to trigger SIT w/ optional announcement of the error. OBi plays fast busy tone w/o any announcement for all other call failure codes. The codes must be specified collectively as a digit map. Note: Option not available on OBi100 and OBi110	([4-9]xx)
PlaySITWithAnnoucement	Enable this option to include announcement of the error when an outbound call has failed Note: Option not available on OBi100 and OBi110	Yes
Timers		
HookFlashTimeMax	Hook Flash is a quick transition of the phone’s hook	900

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	switch from Off-Hook state to On-Hook state, and back to Off-Hook state. This parameter specifies the upper time limit in milliseconds such that if the hook switch stays at the intermediate On-Hook state for longer than this time limit, the OBi device will not recognize the state transition as a HOOK FLASH event, but instead as an ON HOOK event followed by an OFF HOOK event	
HookFlashTimeMin	Hook Flash is a quick transition of the phone's hook switch from Off-Hook state to On-Hook state, and back to Off-Hook state. This parameter specifies the lower time limit in milliseconds such that if the hook switch stays at the intermediate On-Hook state for less than this time limit, the OBi device will not recognize the state transition as a HOOK FLASH event, but consider the hook switch remains at Off-Hook state throughout the transition (in other words, the transition is discarded as a glitch if it happens too quickly)	100
DoubleHookFlashTimeMin	Minimum time apart between two successive hook flash events to be recognizable by the device as a double hook flash event. The unit is in milliseconds. This option is only available in OBi110 and devices with an attached OBiLINE USB to FXO adapter.	100
DoubleHookFlashTimeMax	Maximum time apart between two successive hook flash events to be recognizable by the device as a double hook flash event. The unit is in milliseconds. This option is only available in OBi110 and devices with an attached OBiLINE USB to FXO adapter.	700
CPCDelayTime	A short delay in milliseconds before OBi generates a CPC signal to the PHONE port after the far end has hung up during a call	2000
CPCDuration	OBi device generates CPC (Calling Party Control) Signal by removing power from the PHONE port for a short period. This parameter specifies the length of this period in milliseconds. CPC signal tells the attached phone equipment that the far end has ended the call	500
DigitMapLongTimer	Value of the long inter-digit timer (in seconds) when collecting dialed digits according to the DigitMap on this phone port. This timer governs the timeout when one or more patterns are partially matched or a variable length pattern (that can accommodate one or more optional digits) is matched. Note: Option not available on OBi100/OBi110 (where the long inter-digit timer is always 10s)	10
DigitMapShortTimer	Value of the short inter-digit timer (in seconds) when collecting dialed digits according to the DigitMap on this phone port. This timer governs the timeout when a fixed length pattern has been matched while one or more other patterns can be potentially matched with more input digits.	2

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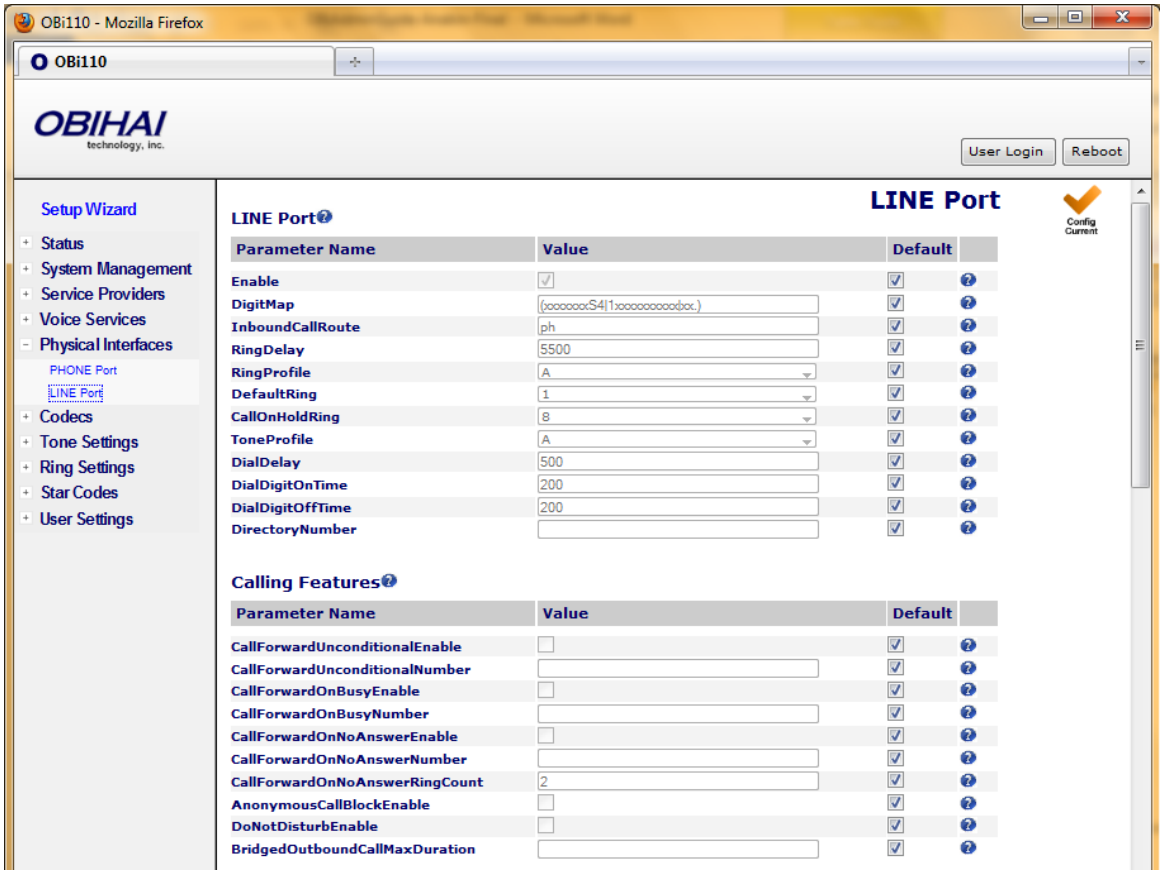
	Note: Option not available on OBi100 and OBi110 (where the short inter-digit timer is always 2s)	
Tip Ring Voltage Polarity		
IdlePolarity	Tip/Ring voltage polarity the line is idle, before a call is connected, or after one side hangs up. Choices are: Forward, or Reverse	Forward
ConnectPolarity	Tip/Ring voltage polarity when the line is connected on a call. Note: By using a different polarity for an Idle and a Connected line, OBi effectively generates a polarity reversal signal to the PHONE port, which can be used to signal the attached phone equipment that the call is either connected or ended.	Forward

Telephone Line Interface Features of the OBi Device



Line Port Status Event Package

OBi device accepts subscription to the proprietary x-line-port-status event package for notification of status change on its LINE port. The SIP SUBSCRIBE may be directed to SP interfaces. The SIP NOTIFY sent by OBi device to the subscribers of this event package includes an XML document in the message body with the proprietary Content-Type: application/x-line-port-status+xml. The XML document has the following format:

```
<?xml version="1.0"?>
```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```
<x-line-port-status version="ver" state="full-or-partial">
  <line id="1" state="line-port-state"/>"
</x-line-port-status>
```

Where …

- *ver* is a monotonically increasing integer on each NOTIFY, starting with 0
- *full-or-partial* is either
  - full (for the immediate NOTIFY triggered by a SUBSCRIBE), or
  - partial (for the NOTIFY triggered by a status change on the LINE port)
- *line-port-state* can be one the following values:
  - onhook = LINE port is on hook
  - line in use = The PSTN line is being used by an external handset parallel to the LINE port
  - ringing = The line is ringing
  - offhook = The LINE port is currently off hook
  - pwr down = The PSTN line is disconnected from the LINE port

LINE Port Parameter Guide:

Parameter	Description	Default Setting
LINE Port		
Enable	Enable the LINE port	Yes
DigitMap	Digit map to restrict numbers that can be dialed or called on the PSTN line. See *OBi Call Routing and Digit Map Section* for a description of the syntaxes for specifying a Digit Map.	(xxxxxxxS4|1xxxxxxxxxx|xx.)
InboundCallRoute	Routing rule for directing incoming calls on PSTN line. The default rule is to send all incoming calls to the PHONE port (ph). See *OBi Call Routing and Digit Map Section* for a description of the syntaxes for specifying this parameter	ph
RingDelay	Delay in milliseconds after initial ring detected on the LINE port before the device acts on the call (to route it according to InboundCallRoute). This value could be 0 so that the call is handled immediately. However, you should consider setting it to a large enough value to allow OBi to completely decode the PSTN Caller-ID signal if the service is available on the PSTN line. This is required if the InboundCallRoute relies on Caller-ID information to route the incoming call.	5500
RingProfile	Select a Ring Profile to ring the PHONE port with when an incoming call is routed to the PHONE port. Choices are A, or B	A
DefaultRing	Default ring pattern number to ring the PHONE port for incoming calls on this trunk that are routed to the PHONE port according to the InboundCallRoute of this service. The ring pattern is taken from the selected Ring Profile. Valid choices are 1-10	1
CallOnHoldRing	Pattern to ring PHONE port when holding a call on this trunk that has been connected to the PHONE	8

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	port. Typically this is a very short distinctive ring pattern that serves as a reminder to the user that a call is being on hold. The ring pattern is taken from the selected Ring Profile. Valid choices are: NO Ring, or 1-10	
Tone Profile	Select a tone profile for tone detection to support the detection of outbound call connected state	A
DetectOutboundConnectMethod	Select a method to detect if an outbound call on the PSTN line has been answered. It can be one of the following values: - None: Do not detect call connected state. Device will simply assume the call is connected once it finishes dialing - Detect speech: Device will detect speech signal on the line as a positive indication of call connected state. - Detect polarity reversal: Device will detect a polarity reversal signal on the line as a positive indication of call connected state. - Assume connected after a short delay Note that polarity reversal signal is not always generated by the phone company when a call is answered. However, if available, polarity reversal is the most robust signal for detection of call connected state. If the method is not “None”, the device will also indicate peer ringing state when it detects ring back signal on the line prior to call connected state.	None
DialDelay	Delay in milliseconds before dialing out the first digit to the PSTN line after the OBi takes the LINE port hardware to the Off-Hook state. This is a simple way to allow the PSTN company time to get ready to receive DTMF signals from the OBi without having the OBi monitor dial tone from the PSTN company	500
DialDigitOnTime	Duration in milliseconds of each digit to dial out on the PSTN line	200
DialDigitOffTime	Interdigit time in milliseconds when dialing a number on the PSTN line	200
OutboundCallConfirmTone	Enable this to play a short beep prior to making an outbound call on this port, as a reminder to the user that the call is being placed on a PSTN line.	No
DirectoryNumber	Phone number of the attached PSTN line. Informational only; not used by OBi device	
Calling Features		
CallForwardUnconditionalEnable	Enable call forwarding of all calls unconditionally by the device. If CallForwardUnconditionalNumber is blank, this parameter is treated as if it has been set to *No*. Note: It is possible for a user to set this parameter	No

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	from the phone using a Star Code	
CallForwardUnconditionalNumber	Directory number to forward all incoming calls on this service unconditionally. Maximum Length is 127 characters. Note: It is possible for a user to set this parameter from the phone using a Star Code	
CallForwardOnBusyEnable	Enable call forwarding of all incoming calls when the device is busy. If CallForwardOnBusyNumber is blank, this parameter is treated as if it has been set to *No*. Device is considered busy if one of the following conditions holds: DND (Do Not Disturb) Service is enabled on this service If the call is routed to the PHONE port when the it is in a busy state (such as ringing, dialing, playing reorder tone, or already having 2 calls in progress) Note: It is possible for a user to set this parameter from the phone using a Star Code	No
CallForwardOnBusyNumber	Directory number to forward all incoming calls on this service when the device is busy. Maximum Length is 127 characters. Note: It is possible for a user to set this parameter from the phone using a Star Code	
CallForwardOnNoAnswerEnable	Enable call forwarding of all incoming calls when the call is not answered after a period as specified in CallForwardOnNoAnswerRingCount. If CallForwardOnNoAnswerNumber is blank, this parameter is treated as if it has been set to No. Note: It is possible for a user to set this parameter from the phone using a Star Code	No
CallForwardOnNoAnswerNumber	Directory number to forward all incoming calls when the call is not answered after a period specified in CallForwardNoAnswerRingCount Note: It is possible for a user to set this parameter from the phone using a Star Code	
CallForwardOnNoAnswerRingCount	Number of rings to be considered by the device as no answer to an incoming call. Note: 1 ring is approximately 6s	2
AnonymousCallBlockEnable	Enable blocking of Anonymous Calls on this service. If enabled, anonymous incoming calls will be ignored by the OBi device. Note: It is possible for a user to set this parameter from the phone using a Star Code	
DoNotDisturbEnable	Enable Do Not Disturb Service. If enabled, all incoming calls on the PSTN line will be treated with busy handling by OBi device.	

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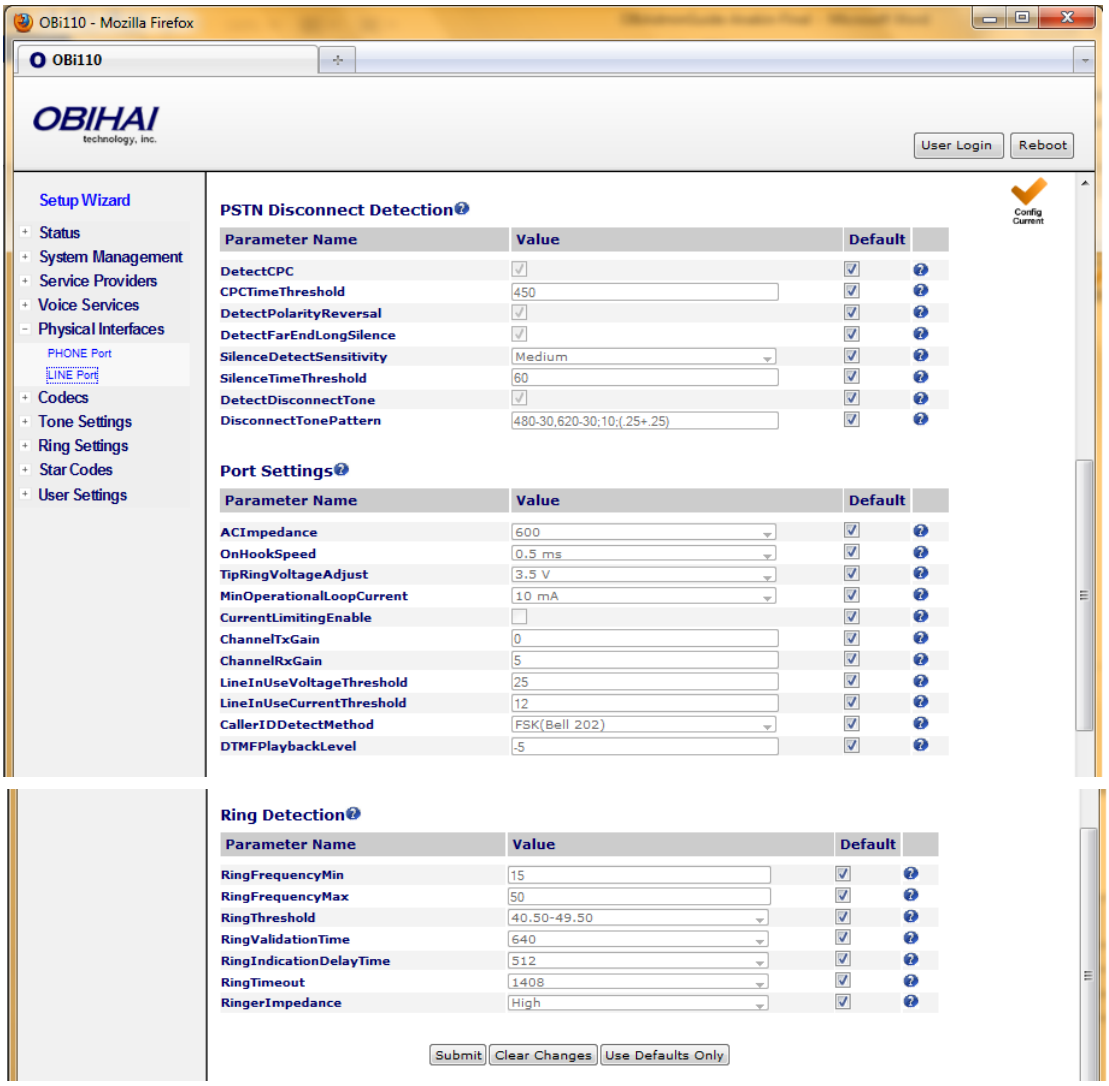
	Note: It is possible for a user to set this parameter from the phone using a Star Code	
BridgedOutboundCallMaxDuration	Limit on the call duration in seconds for all outbound calls that are bridged from another trunk. A blank or 0 value implies the call duration is not limited.	



Line Port Parameter Guide: Continued . . .

Parameter	Description	Default Setting
PSTN Disconnect Detection		
DetectCPC	Enable CPC signal detection. If enabled, OBi will consider the PSTN call ended once it detects a CPC signal during a connected call on the PSTN line. It then proceeds to tear down the call and takes the LINE port hardware to the On-Hook state	Yes
CPCTimeThreshold	Minimum duration in milliseconds to declare CPC signal	450

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DetectPolarityReversal	Enable polarity reversal detection	Yes
DetectFarEndLongSilence	Eanble the detection of long period of voice inactivity as a trigger to end the current call	Yes
SilenceDetectSensitivity	PSTN line silence detection servers the purpose of determining if the PSTN peer has ended the call when silence is detected for a prolonged period (while CPC, Disconnect Tone, and Polarity Reversal signals are not available). This parameter is used to select a sensitivity level for OBi silence detection. Available choices are: Low (harder to detect silence) Medium (suggested) High (easier to detect silence)	Yes
SilenceTimeThreshold	For OBi to declare that the PSTN line has gone silent, the energy level of the signal received from the far end has to fall below the threshold selected in SilenceSignalThreshold for at least a certain continuous period of time. This parameter specifies the minimum duration of this silent period in seconds.	60
DetectDisconnectTone	Enable the detection of disconnect tone (as specified in DisconnectTonePattern parameter) as a trigger to end the current call	Yes
DisconnectTonePattern	A tone pattern that describes the tone from the phone company when the call is terminated by the peer or by the phone company herself. For example, a fast busy tone or busy tone can be used as the disconnect tone.	480-30,620-30;10;(.25+.25)
Port Settings		
ACImpedance	Off-hook AC termination	600
OnHookSpeed	Time for line-side device to go on-hook	0.5 ms
TipRingVoltageAdjust	Voltage on DCT pin of line-side device, which affects TIP/RING voltage on the line. Low-voltage countries should use lower TIP/RING voltage	3.5 V
MinOperationalLoopCurrent	Minimum loop current the LINE port hardware can operate at	10 mA
CurrentLimitingEnable	Limit loop current to 60 mA per the TBR21 standard	No
ChannelTxGain	Gain in dB (-15 to 15) to apply to the signal transmit from the OBi to the PSTN company	0
ChannelRxGain	Gain in dB (-15 to 15) to apply to the signal received by the OBi from the PSTN company	5
LineInUseVoltageThreshold	Voltage below which to detect a parallel device off-hook when LINE port hardware is in the On-Hook state	25
LineInUseCurrentThreshold	Current (mA) above which to detect a parallel device off-hook when LINE port hardware is in the Off-Hook state	12
CallerIDDetectMethod	The Caller ID delivery standard for which the OBi device should assume when decoding Caller ID signal received from the PSTN company. Available choices are: FSK(Bell202) FSK(V.23) DTMF(Finland, Sweden) DTMF(Denmark)	FSK(Bell 202)
DTMFPlaybackLevel	The energy level of DTMF signal transmitted on PSTN line port in dBm (-90 to 3)	-5
Ring Detection		
RingFrequencyMin	Minimum ring frequency to detect	15
RingFrequencyMax	Maximum ring frequency to detect	50
RingThreshold	Voltages (Vrms) below the lower limit will not trigger ring detection; voltages above the upper limit will	40.50-49.50
RingValidationTime	Time in ms to validate the ring signal	640

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RingIndicationDelayTime	Time in ms between ring signal validated and valid ring signal indicated	512
RingTimeout	Time (ms) elapsed since last ring threshold crossing to declare ring is over	1408
RingerImpedance	Synthesized ringer impedance to meet specification in countries, such as Poland, South Africa, and Slovenia	High

Codec Profile Features of the OBi Device

There are two Codec Profiles available on OBi devices. They are selectable Per Trunk (SP1/SP2/SP3/SP4/OBiTALK). To select a codec as the preferred codec in this profile, set the priority of that codec to be highest among all the enabled codecs in this profile. Each of the SP1, SP2, SP3, SP4, and OBiTALK services can be assigned a codec profile in its corresponding configuration. The codec list to use when setting up a call on the underlying service is formed from the list of enabled codecs in the chosen profile and ordered according to the assigned priorities in the profile.

The codecs available on the OBi100/OBi110 and on the OBi200/OBi202/OBi300/OBi302 are slightly different. Below screen shots show the Codec Profile web page for each device model.

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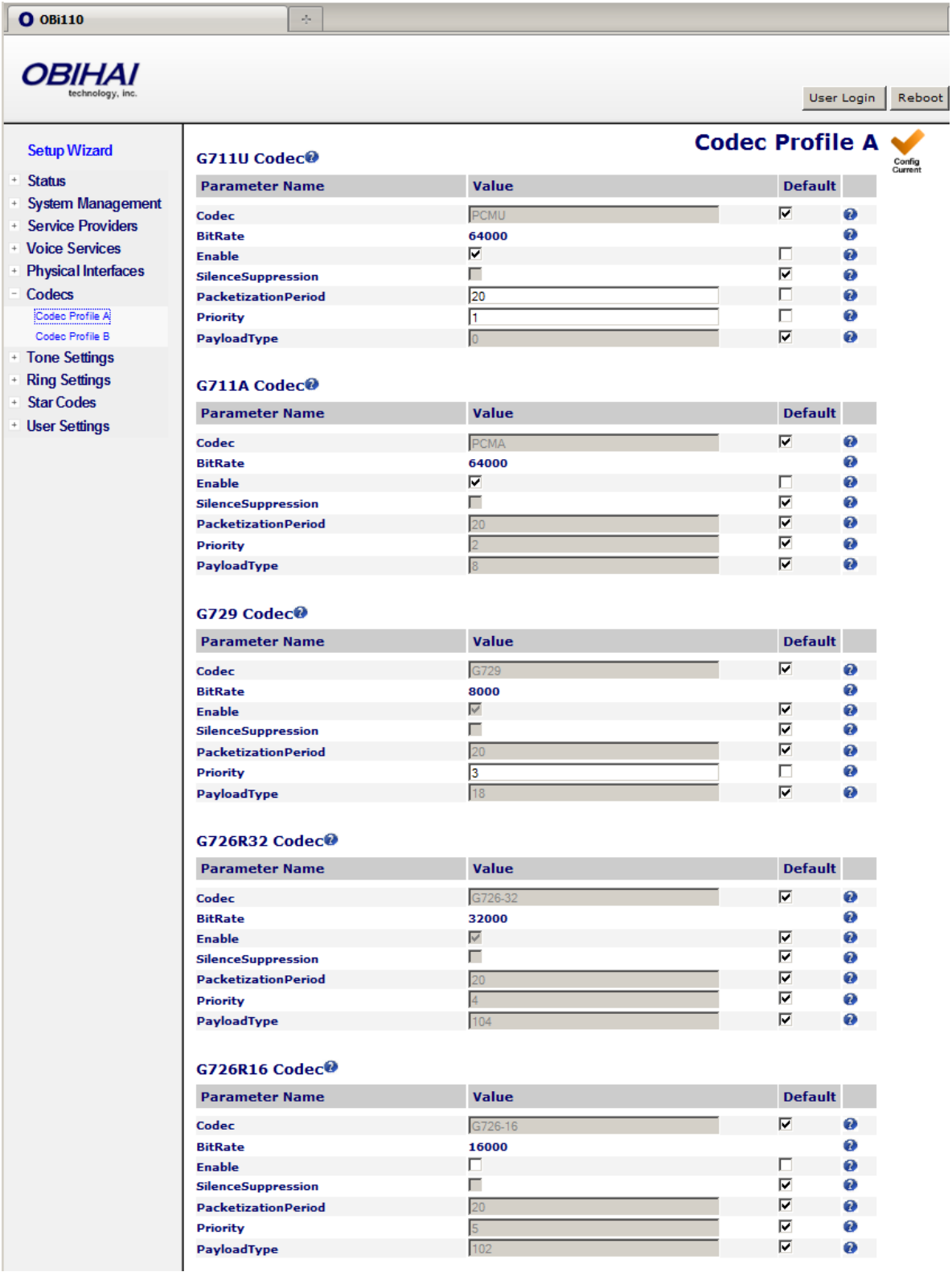

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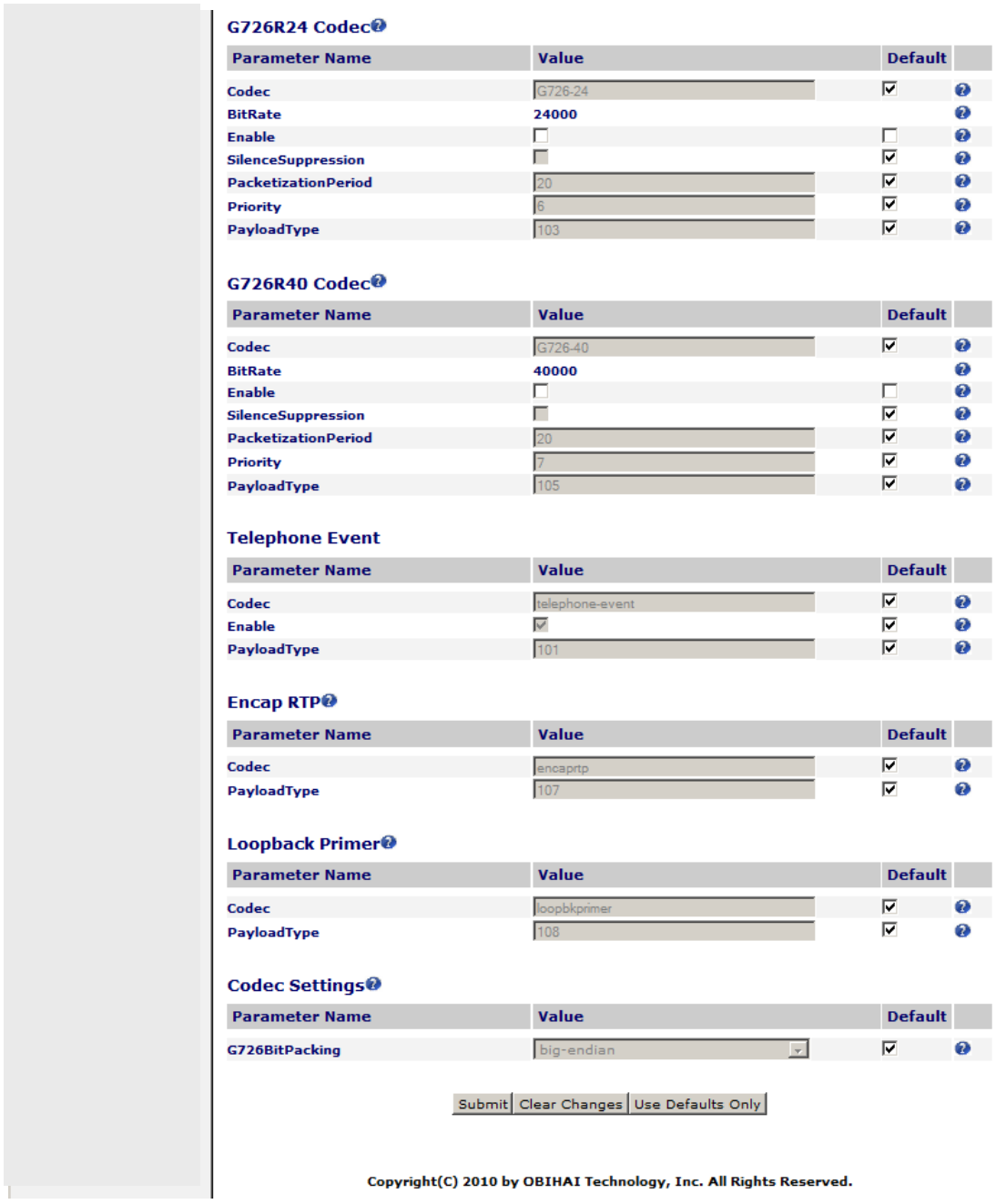

G726R24 Codec

Parameter Name	Value	Default
Codec	G726-24	☑
BitRate	24000	
Enable	☐	☐
SilenceSuppression	☐	☑
PacketizationPeriod	20	☑
Priority	6	☑
PayloadType	103	☑

G726R40 Codec

Parameter Name	Value	Default
Codec	G726-40	☑
BitRate	40000	
Enable	☐	☐
SilenceSuppression	☐	☑
PacketizationPeriod	20	☑
Priority	7	☑
PayloadType	105	☑

Telephone Event

Parameter Name	Value	Default
Codec	telephone-event	☑
Enable	☑	☑
PayloadType	101	☑

Encap RTP

Parameter Name	Value	Default
Codec	encaprtp	☑
PayloadType	107	☑

Loopback Primer

Parameter Name	Value	Default
Codec	loopbkprimer	☑
PayloadType	108	☑

Codec Settings

Parameter Name	Value	Default
G726BitPacking	big-endian	☑

Submit | Clear Changes | Use Defaults Only

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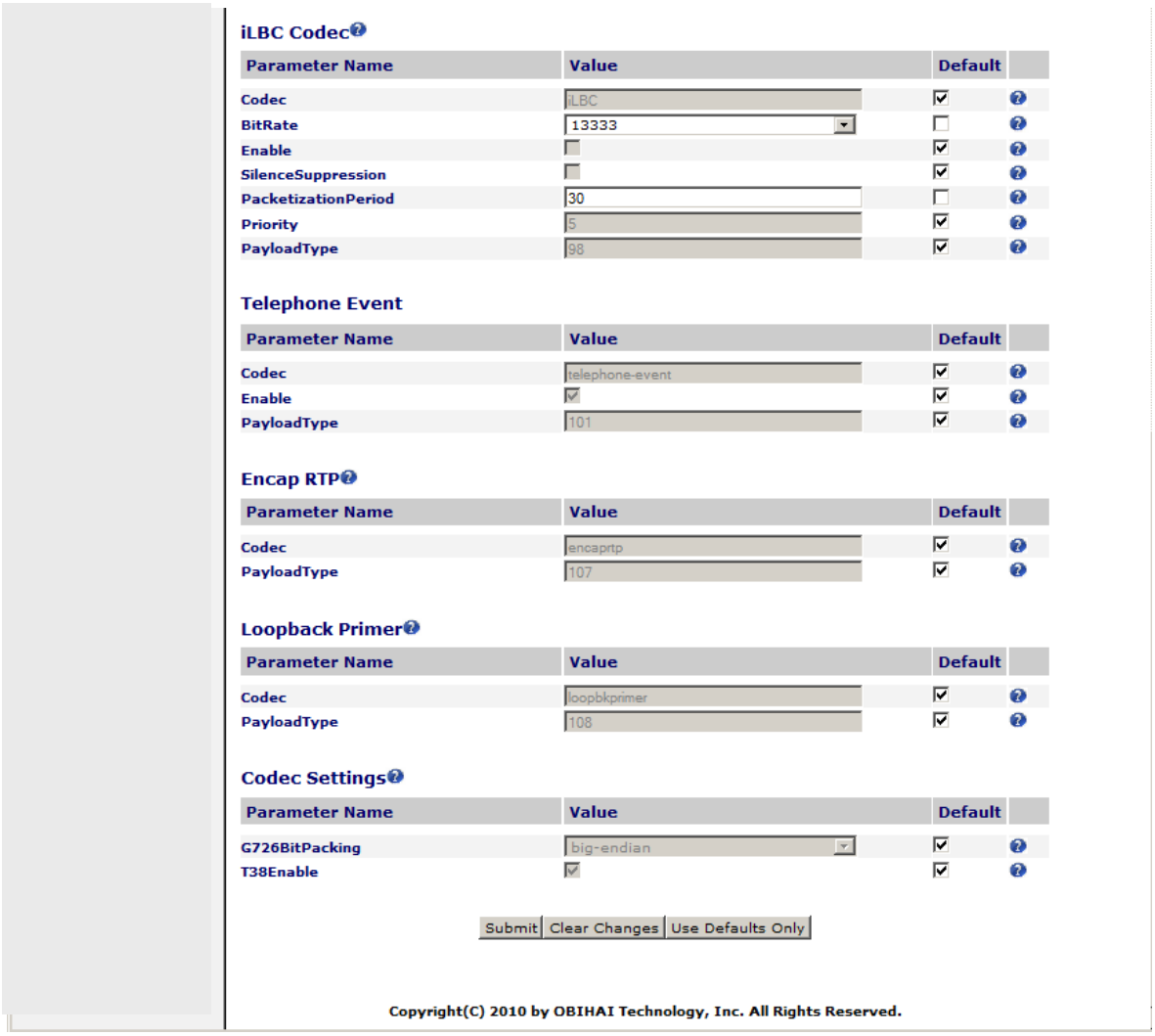

Codec Profile Parameter Guide:

Parameter	Description	Default Setting
G711U Codec		
Codec	Codec Name	G711U
BitRate	Bit rate in bits/sec. Note: Informational only; not configurable	64000
Enable	Enable this codec	Yes
SilenceSuppression	Enable silence suppression for this codec	No
PacketizationPeriod	Packet size in ms	20
Priority	Priority assigned to this codec (1 is the highest)	1
PayloadType	Standard payload type for this codec Note: Informational only; not configurable	0
G711A Codec		
Codec	Codec Name	G711A
BitRate	Bit rate in bits/sec Note: Informational only; not configurable	64000
Enable	Enable this codec	Yes
SilenceSuppression	Enable silence suppression for this codec	No
PacketizationPeriod	Packet size in ms	20

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Priority	Priority assigned to this codec (1 is the highest)	2
PayloadType	Standard payload type for G711-alaw Note: Informational only; not configurable	8
G729 Codec		
Codec	Codec Name	G729
BitRate	Bit rate in bits/sec Note: Informational only; not configurable	8000
Enable	Enable this codec	Yes
SilenceSuppression	Enable silence suppression for this codec	No
PacketizationPeriod	Packet size in ms	20
Priority	Priority assigned to this codec (1 is the highest)	3
PayloadType	Standard payload type for G.729 Note: Informational only; not configurable	18
G726R32 Codec		
Codec	Codec Name	G726-32
BitRate	Bit rate in bits/sec Note: Informational only; not configurable	32000
Enable	Enable this codec	Yes
SilenceSuppression	Enable silence suppression for this codec	No
PacketizationPeriod	Packet size in ms	20
Priority	Priority assigned to this codec (1 is the highest)	4
PayloadType	Dynamic Payload type for this codec. Valid range is 96-127	104
G726R16 Codec[4]		
Codec	Codec Name	G726-16
BitRate	Bit rate in bits/sec Note: Informational only; not configurable	16000
Enable	Enable this codec	Yes
SilenceSuppression	Enable silence suppression for this codec	No
PacketizationPeriod	Packet size in ms	20
Priority	Priority assigned to this codec (1 is the highest)	5
PayloadType	Dynamic Payload type for this codec. Valid range is 96-127	102
G726R24 Codec[4]		
Codec	Codec Name	G726-24
BitRate	Bit rate in bits/sec Note: Informational only; not configurable	24000
Enable	Enable this codec	Yes
SilenceSuppression	Enable silence suppression for this codec	No
PacketizationPeriod	Packet size in ms	20
Priority	Priority assigned to this codec (1 is the highest)	6
PayloadType	Dynamic Payload type for this codec. Valid range is 96-127	103
G726R40 Codec[4]		
Codec	Codec Name	G726-40
BitRate	Bit rate in bits/sec Note: Informational only; not configurable	40000
Enable	Enable this codec	Yes
SilenceSuppression	Enable silence suppression for this codec	No
PacketizationPeriod	Packet size in ms	20
Priority	Priority assigned to this codec (1 is the highest)	7

[4] G726R16, G726R24, and G726R40 codecs are only available only on the OBi100/110; iLBC codec is only available on the OBi200/OBi202/OBi300/OBi302

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PayloadType	Dynamic Payload type for this codec. Valid range is 96-127	105
iLBC Codec[4]		
Codec	Codec Name	iLBC
BitRate	Bit rate in bits/sec Two values to choose from: 13333 bps or 15200 bps	13333
Enable	Enable this codec	No
SilenceSuppression	Enable silence suppression for this codec	No
PacketizationPeriod	Packet size in ms. Must be multiples of 30 for 13333 bps or multiples of 20 for 15200 bps	30
Priority	Priority assigned to this codec (1 is the highest)	5
PayloadType	Dynamic Payload type for this codec. Valid range is 96-127	98
FAX Event		
Codec	Codec Name. This codec can be used for relaying FAX tone event using RTP	fax-event
Enable	Enable this codec	No
PayloadType	Dynamic Payload type to be used to indicate this event	100
FaxEvents	Comma separated list of event IDs to indicate (such as CED, CNG)	32
Telephone Event		
Codec	Codec Name. This codec is for relaying DTMF events using RTP	telephone-event
Enable	Enable this codec	Yes
PayloadType	Dynamic Payload type to be used for RFC2833 telephone (DTMF) events. Valid range is 96-127	101
Encap RTP		
Codec	Codec Name. This codec is used to encapsulate RTP packets during a packet loopback call	encaprtp
PayloadType	Dynamic Payload type for this codec. Valid range is 96-127	107
Loopback Primer		
Codec	Codec Name. The codec is used by the OBi when acts as a media loopback mirror and before receiving any packets from the loopback source during a media loopback call	loopbkprimer
PayloadType	Dynamic Payload type for this codec. Valid range is 96-127	108
Codec Settings		
G726BitPacking	Two values to choose from: big-endian or little-endian	big-endian
T38Enable	Enable the use of T38 (FAX Relay). Note: Option not available on the OBi100 and OBi110	Yes
T38Redundancy	The packet redundancy factor to use when operating T38 relay. Available choices are: - 0 (no redundancy) - 1 - 2 (higher redundancy; consumes more network bandwidth) Note: Option not available on OBi100 and OBi110	
FaxPassThroughCodec	The codec to use when operating in the FAX pass-through mode. Available choices are: - G711U - G711A	G711U

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Tone & Ring Patterns

Note: Tone and Ring Profile A default settings are set for USA telephone standards. Tone and Ring Profile B default settings are set for Australia telephone standards.

Tone Profile Features of the OBi Device

The general format for tone profiles follows the following format: [field-1];[field-2];[field-3];...;[field - 6]

Use ";" to separate the configuration fields.

Note that no spaces are allowed to be used in a tone profile pattern.

Field–1 Composition:

This field describes frequency components used for tone synthesis and it supports up to three different frequencies.

The frequency expression is a string of numeric values with the notation '+' or '-'.

The numeric values are the frequency's decimal values in Hz and amplitude in dBm (Maximum 3 dBm).

Different frequencies are separated by ',' .

Example: 350-18,440-18,550+2

The above example illustrates the 1st frequency at 350 Hz with strength at -18 dBm, the 2nd frequency: 440 Hz with strength at -18 dBm and the 3rd frequency: 550 Hz with strength at +2 dBm.

Field–2 Composition:

This field describes the overall tone playback duration in seconds.

The expression is a numeric value, and supports up to 3 decimated digits.

The numeric value can negative, zero, positive, or skipped:

- Negative value: tone plays indefinitely
- Zero value: tone playback is skipped
- Positive value: Normal playback duration
- No value: tone plays indefinitely

Example: 30.234

Meaning: tone playback terminates after 30.234 seconds

Field–3 to Field–6 Composition:

Field - 3/4/5/6 share the same definition, and each field describes one single cadence segment. Together 4 fields form a macro-segment, which will be repeated until tone playback expires.

The expression is a string of numeric values with the special notation '/', '(', ')' and ','.

It has a complete format as below:

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t(f_0/on_0+off_0,f_1/on_1+off_1,f_2/on_2+off_2,f_3/on_3+off_3)

t: the cadence segment duration in seconds

- Negative value: tone plays indefinitely
- No value: tone plays indefinitely
- Zero value: the duration of this particular segment is zero
- Positive value: Normal playback duration

f_0/1/2/3: a numerical describe which frequency component(s) are used for the synthesis, and it can be one of following 8 options (0 ~ 7)

- 0: No frequency specified, i.e., silent tone
- 1: The 1st frequency
- 2: The 2nd frequency
- 3: The 1st and 2nd frequencies
- 4: The 3rd frequency
- 5: The 1st and 3rd frequencies
- 6: The 2nd and 3rd frequencies
- 7: The 1st and 2nd frequencies if two or more than two frequency components, or the 1st frequency if only one frequency component is available.

If no value is provided for f_0/1/2/3, it will automatically use the combination of the first one or two available frequency components.

on_0/1/2/3: the tone active time in seconds

- Negative value: Not allowed
- No value: infinite tone active time
- Others: normal tone active time (up to 3 decimated digits)

off_0/1/2/3: the tone inactive time in seconds

- Negative value: Not allowed
- No value: infinite tone inactive time
- Others: normal tone inactive time (up to 3 decimated digits)

Example: 4(1/.3+2.34,3/2+1.5)

The above example illustrates using the first frequency to generate tone for 0.3 seconds, followed by 2.34 seconds of silence, then use a combination of the first and second frequencies to generate tone for 2 seconds, then followed by 1.5 seconds silence. The cadence operates repeatedly for 4 seconds.

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Tone Examples:

With these examples, we will show the interpretation of a few common tone patterns:

Dial Tone:

DIAL, "350-18,440-18"

Dial tone is generated as a mixture of two frequency components:

350 Hz at -18 dBm and 440 Hz at -18 dBm

The expiration time is infinite, and tone active time is infinite.

Busy Tone:

BUSY, "480-18,620-18;10;(.5+.5)"

Busy tone is generated as a mixture of two frequency components:

480 Hz at -18 dBm and 620 Hz at -18 dBm

The expiration time is exactly 10 seconds. It has only one cadence segment, which has tone active 0.5 second and tone inactive 0.5 second.

Prompt Tone:

PROMPT, "480-16;10"

Prompt tone is generated from a single frequency component:

480 Hz at -16 dBm. The expiration time is exactly 10 seconds. It has only one cadence segment, which has tone infinite active time.

SIT Tone:

SIT_1, "985-16,1428-16,1777-16;20;(1/.380+0,2/.380+0,4/.380+0,0/0+4)"

Special information tone (SIT) is generated from a set of frequency components:

- 1st frequency: 985 Hz at -16 dBm
- 2nd frequency: 1428 Hz at -16 dBm
- 3rd frequency: 1777 Hz at -16 dBm

The expiration time is exactly 20 seconds. It has only one cadence segment, which includes 4 on-off sections. The segment has infinite repeating time:

- The 1st on-off section: generated by the 1st frequency component, and it has 0.38 tone second active time and 0 inactive time.
- The 2nd on-off section: generated by the 2nd frequency component, and it has 0.38 tone second active time and 0 inactive time.
- The 3rd on-off section: generated by the 3rd frequency component, and it has 0.38 tone second active time and 0 inactive time.

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- The 4th on-off section: only generate silence since no frequency component is specified. It has tone 0 second active time and 4 seconds inactive time.

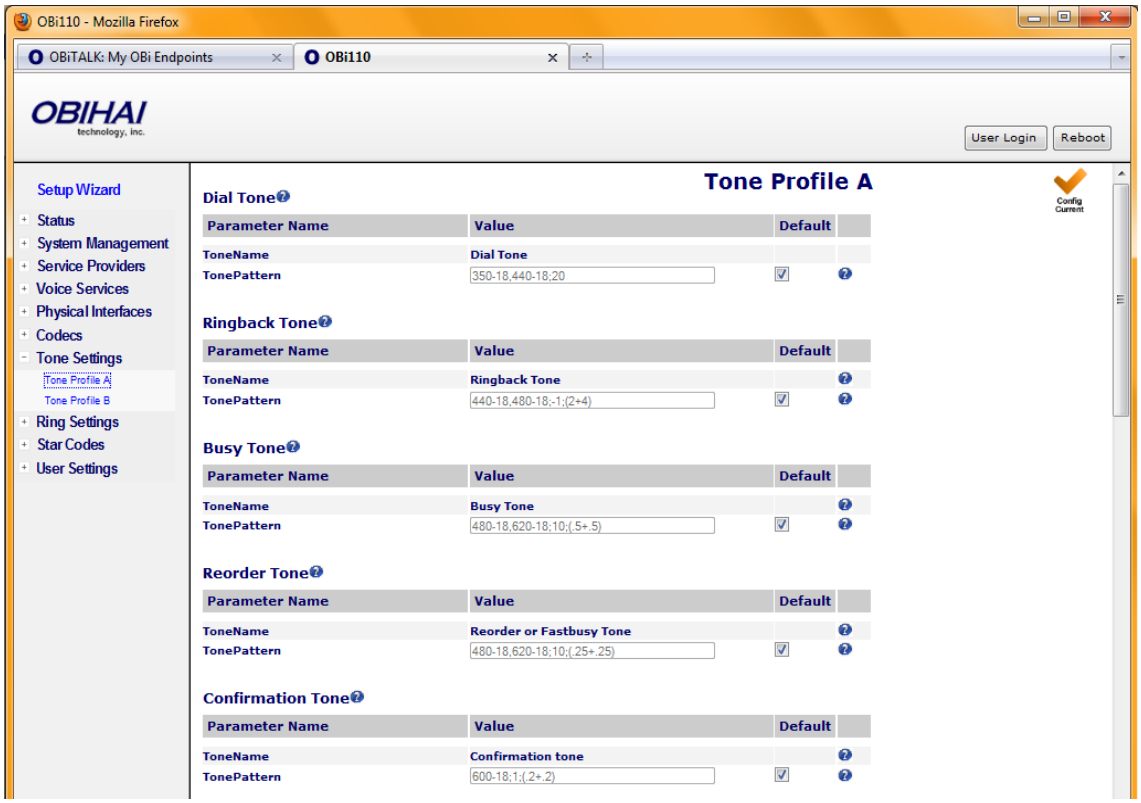
Stutter Tone:

STUTTER, "350-18,440-18;20;.2(.1+.1);()"

Stutter dial tone is generated from a mixture of two frequency components:

350 Hz at -18 dBm and 440 Hz at -18 dBm. The expiration time for the entire tone is exactly 20 seconds. It has two cadence segments.

- The first segment: includes only one on-off sections, on 0.1 second and off 0.1 second, and on-off repeats for 2s second.
- The second segment: include one on-off section, and has infinite repeating time and infinite tone active time, and will play until the entire tone duration has elapsed



Tone Profile A & B Parameter Guide:

Parameter	Description	Default Setting
Dial Tone		
ToneName	Dial Tone	
TonePattern	Obihai Tone Pattern Script	350-18,440-18;20
Ringback Tone		
ToneName	Ringback Tone	
TonePattern	Obihai Tone Pattern Script	440-18,480-18;-1;(2+4)
Busy Tone		

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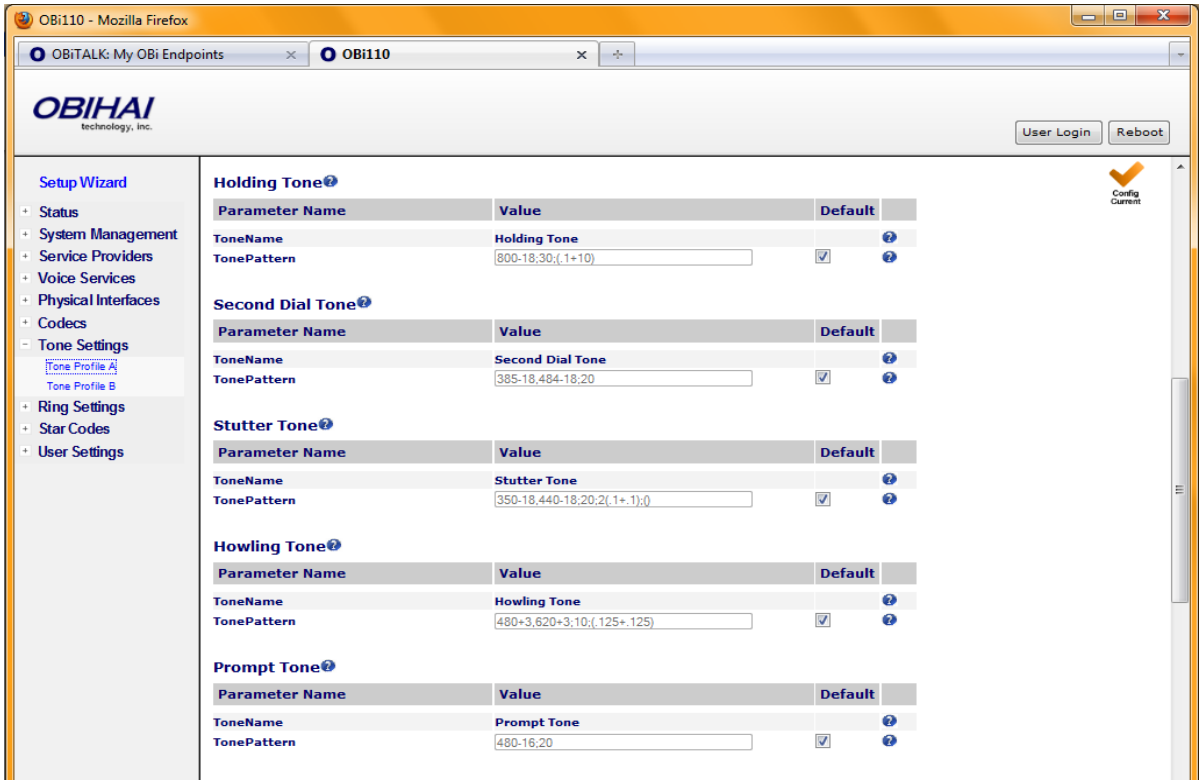
ToneName	Busy Tone	
TonePattern	Obihai Tone Pattern Script	480-18,620-18;10;(.5+.5)
Reorder Tone		
ToneName	Reorder tone or Fastbusy	
TonePattern	Obihai Tone Pattern Script	480-18,620-18;10;(.25+.25)
Confirmation Tone		
ToneName	Confirmation Tone	
TonePattern	Obihai Tone Pattern Script	600-18;1;(.2+.2)



Tone Profile Parameter Guide: Continued . . .

Parameter	Description	Default Setting
Holding Tone		
ToneName	Holding Tone played when peer holding the call	
TonePattern	Obihai Tone Pattern Script	800-18;30;(.1+10)
Second Dial Tone		
ToneName	Second Dial Tone played when dialing second call in a 3-way call	
TonePattern	Obihai Tone Pattern Script	385-18,484-18;20
Stutter Dial Tone		
ToneName	Stutter Dial Tone	
TonePattern	Obihai Tone Pattern Script	350-18,440-18;20;2(.1+.1);()
Howling Tone		
ToneName	Howling Tone for off-hook warning	
TonePattern	Obihai Tone Pattern Script	480+3,620+3;10;(.125+.125)
Prompt Tone		
ToneName	Prompt Tone to prompt user to enter a number for configuration, such as speed dial	
TonePattern	Obihai Tone Pattern Script	480-16;20

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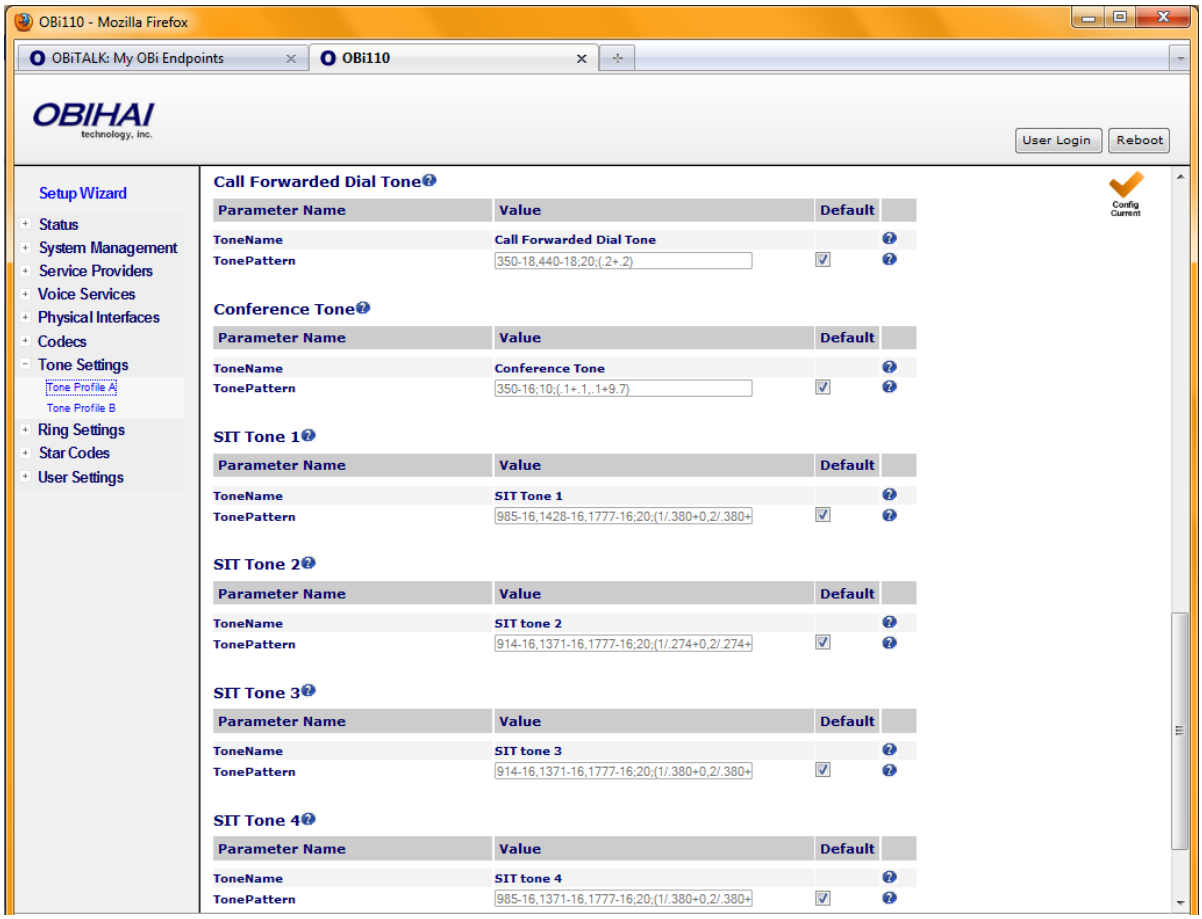

Tone Profile Parameter Guide: Continued . . .

Parameter	Description	Default Setting
Call Forwarded Dial Tone		
ToneName	Call Forwarded Dial Tone: A special dial tone to indicate call-forward-all is active	(Not configurable)
TonePattern	Obihai Tone Pattern Script	350-18,440-18;20;(.2+.2)
DND Dial Tone		
ToneName	DND Dial Tone: A special dial tone to indicate DND is active	(Not configurable)
TonePattern	Obihai Tone Pattern Script	350-18,440-18;20;(.2+.2)
Conference Tone		
ToneName	Conference Tone (Indicates a 3-way conference call has started)	(Not configurable)
TonePattern	Obihai Tone Pattern Script	350-16;10;(.1+.1,.1+9.7)
SIT Tone 1		
ToneName	Special Information Tone - 1	(Not configurable)
TonePattern	Obihai Tone Pattern Script	985-16,1428-16,1777-16;20;(1/.380+0,2/.380+0,4/.380+0,0/0+4)
SIT Tone 2		
ToneName	Special Information Tone - 2	(Not configurable)

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TonePattern	Obihai Tone Pattern Script	914-16,1371-16,1777-16;20;(1/.274+0,2/.274+0,4/.380+0,0/0+4)
SIT Tone 3		
ToneName	Special Information Tone - 3	(Not configurable)
TonePattern	Obihai Tone Pattern Script	914-16,1371-16,1777-16;20;(1/.380+0,2/.380+0,4/.380+0,0/0+4)
SIT Tone 4		
ToneName	Special Information Tone - 4	(Not configurable)
TonePattern	Obihai Tone Pattern Script	985-16,1371-16,1777-16;20;(1/.380+0,2/.380+0,4/.380+0,0/0+4)
Outside Dial Tone		
ToneName	Outside Dial Tone	(Not configurable)
TonePattern	Obihai Tone Pattern Script	385-16;10
R-Command Tone		
ToneName	R-Command Tone	(Not configurable)
TonePattern	Obihai Tone Pattern Script	400-16;5
Paging Tone		
ToneName	Paging Tone	(Not configurable)
TonePattern	Obihai Tone Pattern Script	480-16;1;(.2+.2)

Ring Profile A & B Features of the OBi Device

The general format of an OBi Ring Profile is as follows: [field-1];[field-2];...;[field - 5]

Use the ";" to separate up to five (5) configuration fields.

Please note that no spaces are allowed to be used in a tone profile pattern.

Field–1 Composition:

Field-1 describes the overall ringing duration in seconds.

The expression is a numeric value, and supports up to 3 decimated digits.

The numeric value can negative, zero, and positive:

- Negative value: Ringing lasts indefinitely
- No value: Ringing lasts infinitely
- Zero value: Ringing is skipped
- Positive value: Normal ringing duration

Example: 30.5

The above example illustrates a ringing tone that terminates after 30.5 seconds.

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Field –2 to Field –5 Composition:

Field - 2/3/4/5 share the same definition, and each field describes one single cadence segment. Together, the four (4) fields form a macro-segment, which will be repeated until ringing expires.

The expression is a string of numeric values with the special notation '**(**' , '**)**' and '**,**'

It has the format as per the following construct: t(on_0+off_0,on_1+off_1,on_2+off_2,on_3+off_3)

t: The cadence segment duration in seconds.

- Negative value: Ringing indefinitely
- No value: Ringing indefinitely
- Zero value: Ringing is skipped
- Positive value: Normal ringing duration

on_0/1/2/3: The ring active time in seconds.

- Negative value: Not allowed
- No value: Infinite ring active time
- Others: Normal ring active time (up to 3 decimated digits)

off_0/1/2/3: The ring inactive time in seconds

- Negative value: Not allowed
- No value: Infinite ring inactive time
- Others: Normal ring inactive time (up to 3 decimated digits)

Example: 4(.3+2.34,2+1.5)

The above example illustrates a ringing tone comprised of two segments. Ringing is active for 0.3 seconds, followed by 2.34 seconds of silence, then ringing for 2 seconds, and followed by 1.5 seconds of silence.

The above cadence operates repeatedly for 4 seconds.

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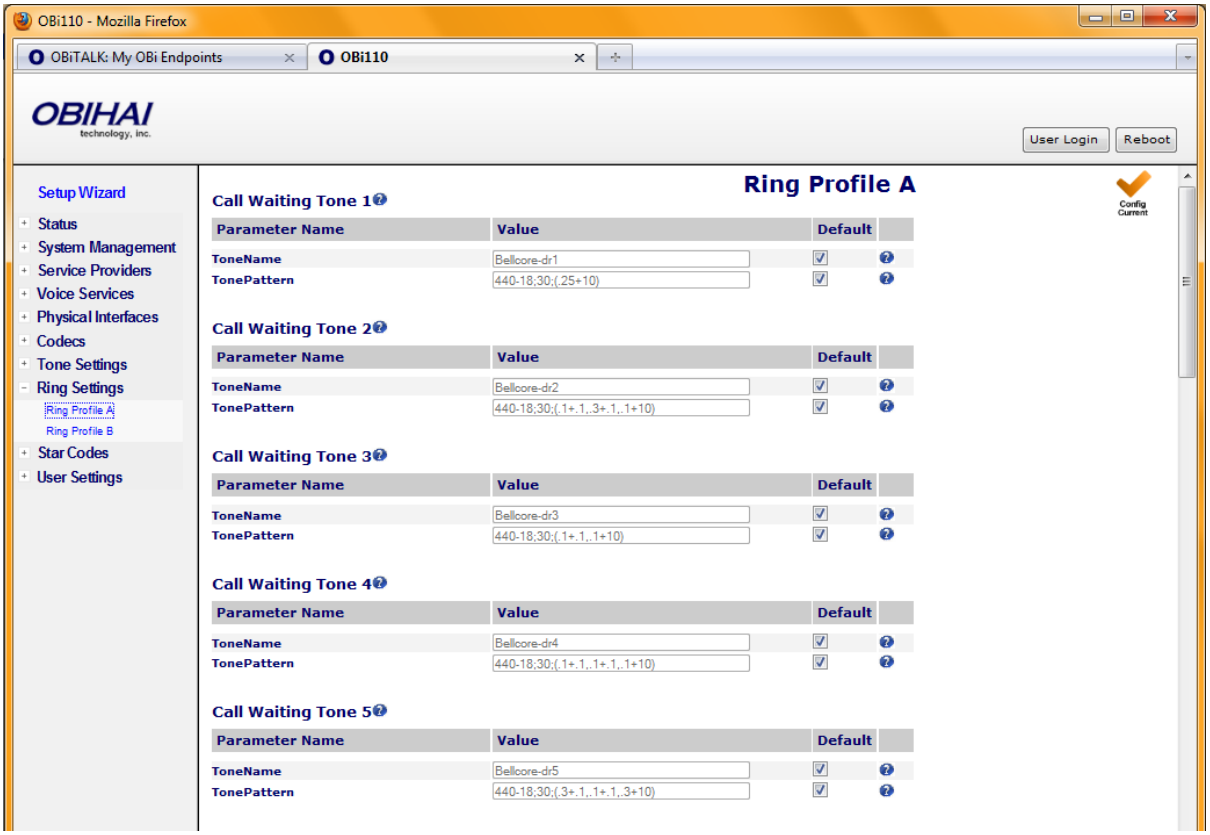

Parameter	Description	Default Setting
Call Waiting Tone 1		
ToneName	Distinctive Call Waiting Tone 1. An incoming SIP INVITE may include the same name in an Alert-Info header to choose this ring	Bellcore-dr1
TonePattern	Obihai Tone Pattern Script	440-18;30;(.25+10)
Call Waiting Tone 2		
ToneName	Distinctive Call Waiting Tone 2. An incoming SIP INVITE may include the same name in an Alert-Info header to choose this ring	Bellcore-dr2
TonePattern	Obihai Tone Pattern Script	440-18;30;(.1+.1,.3+.1,.1+10)
Call Waiting Tone 3	Obihai Tone Pattern Script	
ToneName	Distinctive Call Waiting Tone 3. An incoming SIP INVITE may include the same name in an Alert-Info header to choose this ring	Bellcore-dr3
TonePattern	Obihai Tone Pattern Script	440-18;30;(.1+.1,.1+10)
Call Waiting Tone 4		
ToneName	Distinctive Call Waiting Tone 4. An incoming SIP INVITE may include the same name in an Alert-Info header to choose this ring	Bellcore-dr4
TonePattern	Obihai Tone Pattern Script	440-18;30;(.1+.1,.1+.1,.1+10)
Call Waiting Tone 5		
ToneName	Distinctive Call Waiting Tone 5. An incoming SIP INVITE may include the same name in an Alert-Info header to choose this ring	Bellcore-dr5
TonePattern	Obihai Tone Pattern Script	440-18;30;(.3+.1,.1+.1,.3+10)

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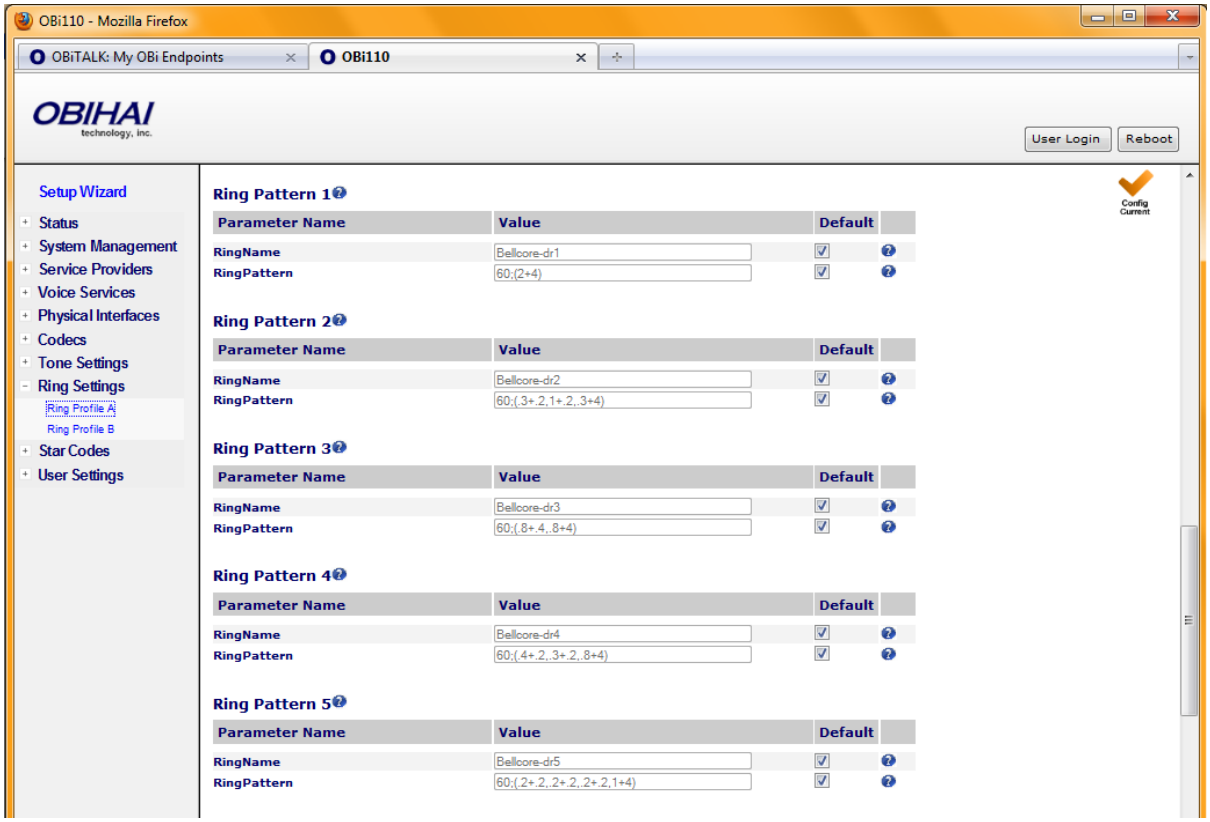
Call Waiting Tone 6		
ToneName	Distinctive Call Waiting Tone 6. An incoming SIP INVITE may include the same name in an Alert-Info header to choose this ring	User-dr1
TonePattern	Obihai Tone Pattern Script	440-18;30;(.1+.1,.3+.2,.3+10)
Call Waiting Tone 7		
ToneName	Distinctive Call Waiting Tone 7. An incoming SIP INVITE may include the same name in an Alert-Info header to choose this ring	User-dr2
TonePattern	Obihai Tone Pattern Script	440-18;30;(.3+.1,.3+.1,.1+10)
Call Waiting Tone 8		
ToneName	Distinctive Call Waiting Tone 8. An incoming SIP INVITE may include the same name in an Alert-Info header to choose this ring	User-dr3
TonePattern	Obihai Tone Pattern Script	440-18;30;(.3+2)
Call Waiting Tone 9		
ToneName	Distinctive Call Waiting Tone9. An incoming SIP INVITE may include the same name in an Alert-Info header to choose this ring	User-dr4
TonePattern	Obihai Tone Pattern Script	440-18;30;(.3+2)
Call Waiting Tone 10		
ToneName	Distinctive Call Waiting Tone 10. An incoming SIP INVITE may include the same name in an Alert-Info header to choose this ring	User-dr5
TonePattern	Obihai Tone Pattern Script	440-18;30;(.3+2)



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Ring Profile Parameter Guide:

Parameter	Description	Default Setting
Ring Pattern 1		
RingName	Name of the ring. An incoming SIP INVITE may include the same name in an Alert-Info header to choose this ring	Bellcore-dr1
RingPattern	Obihai tone cadence script	60;(2+4)
Ring Pattern 2		
RingName	Name of the ring. An incoming SIP INVITE may include the same name in an Alert-Info header to choose this ring	Bellcore-dr2
RingPattern	Obihai tone cadence script	60;(.3+.2,1+.2,.3+4)
Ring Pattern 3		
RingName	Name of the ring. An incoming SIP INVITE may include the same name in an Alert-Info header to choose this ring	Bellcore-dr3
RingPattern	Obihai tone cadence script	60;(.8+.4,.8+4)
Ring Pattern 4		
RingName	Name of the ring. An incoming SIP INVITE may include the same name in an Alert-Info header to choose this ring	Bellcore-dr4
RingPattern	Obihai tone cadence script	60;(.4+.2,.3+.2,.8+4)
Ring Pattern 5		
RingName	Name of the ring. An incoming SIP INVITE may include the same name in an Alert-Info header to choose this ring	Bellcore-dr5
RingPattern	Obihai tone cadence script	60;(.2+.2,.2+.2,.2+.2,1+4)
Ring Pattern 6		
RingName	Name of the ring. An incoming SIP INVITE may include the same name in an Alert-Info header to choose this ring	User-dr1
RingPattern	Obihai tone cadence script	60;(.2+.4,.2+.4,.2+4)
Ring Pattern 7		
RingName	Name of the ring. An incoming SIP INVITE may include the same name in an Alert-Info header to choose this ring	User-dr2
RingPattern	Obihai tone cadence script	60;(.4+.2,.4+.2,.4+4)
Ring Pattern 8		
RingName	Name of the ring. An incoming SIP INVITE may include the same name in an Alert-Info header to choose this ring	User-dr3
RingPattern	Obihai tone cadence script	60;(.25+9.75)
Ring Pattern 9		
RingName	Name of the ring. An incoming SIP INVITE may include the same name in an Alert-Info header to choose this ring	User-dr4
RingPattern	Obihai tone cadence script	60;(.25+9.75)
Ring Pattern 10		
RingName	Name of the ring. An incoming SIP INVITE may include the same name in an Alert-Info header to choose this ring	User-dr5
RingPattern	Obihai tone cadence script	60;(.25+9.75)

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Star Code Profile Features of the OBi Device

Star codes are short sequences of digits where each sequence serves as a command to the OBi Device to perform certain operation. Each sequence usually starts with the * key followed by a 2-digit code (such as *69), hence the term star code. A typical operation to carry out is to set the value of one or more configuration parameters. At present the OBi device allows user to issue star code from the PHONE port only; user issues a star code the same way he dials a number to make a call. In OBi every star code and its operation are defined with a short *Star Code Script* parameter. The set of star codes that can be dialed from the PHONE port is collectively referred to as a Star Code Profile.

OBi has two star code profiles available in its configuration, known as Start Code Profile A and B respectively. Each profile has 30 star code script parameters, known as Code1 to Code30. You can select which star code profile to use by setting **`PHONE Port::`**`StarCodeProfile` to *A* or *B*, or *None* if star code is not to be used.

A star code script is defined with the help of a number of predefined variables and actions. Each variable represents one or one group of configuration parameters. An action can be checking or setting the value of a variable, collecting a phone number from the user, or calling a certain number.

Star Code Script Variables (*VAR*)

A star code script variable or *VAR* can be trunk specific or phone-port specific. The general format of a phone-port specific variable is $var and it applies to the current phone port where the star code is entered. The general format of a trunk specific variable is *TK*($var) , where *TK* is the abbreviated name of a trunk (SP1, SP2, LI1, or PP1). If *TK* is not specified for a trunk-specific variable, it implies all the applicable trunks in the system.

Note that: SP1 is the SP1 Service, SP2 the SP2 Service, LI1 the LINE port and PP1 the OBiTALK Service. Each service is also referred to as a “trunk” in this document.

Here is a list of the supported $var variables:

$CFA = call forward unconditional enable (trunk specific; admissible value: 0 for disable, 1 for enable)

$CFB = call forward busy enable (trunk specific; admissible value: 0 for disable, 1 for enable)

$CFN = call forward no-answer enable (trunk specific; admissible value: 0 for disable, 1 for enable)

$CFAN = call forward unconditional number (trunk specific; admissible value: a token representing a call forward number)

$CFBN = call forward busy number (trunk specific; admissible value: a token representing a call forward number)

$CFNN = call forward no-answer number (trunk specific; admissible value: a token representing a call forward number)

$MWS = message waiting state (trunk specific; admissible value: 0 for no new messages, 1 for one or more new messages)

$DND = do-not-disturb enable (trunk specific; admissible value: 0 for disable, 1 for enable)

$BAC = block-anonymous caller enable (trunk specific; admissible value: 0 for disable, 1 for enable)

$BCI = block outbound caller-ID enable (trunk specific; admissible value: 0 for disable, 1 for enable)

$CWA = call-waiting enable on this phone port (phone-port specific; admissible value: 0 for disable, 1 for enable)

$BCI1 = block caller-ID once in the next call on this phone port (phone-port specific; admissible value: 1 for enable)

$UBCI1 = unblock caller-ID once in the next call on this phone port (phone-port specific; admissible value: 1 for enable)

$LBM1 = Loopback media (audio samples) once in the next call on this phone port (phone-port specific; admissible value: 1)

$LBP1 = Loopback RTP packets once in the next call on this phone port (phone-port specific; admissible value: 1)

$BAR1 = Barge-In once in the next call on this phone port (phone-port specific; admissible value: 1)

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$NOEC1 = Disable echo canceller once in the next call on this phone port (phone-port specific; admissible value: 1) (Not available on OBi100/OBi110)

$NOJI1 = Disable jitter buffer adjustment once in the next call on this phone port (phone-port specific; admissible value: 1) (Not available on OBi100/OBi110)

$IBDT = Enable in-band DTMF transmission once in the next call on this phone port (phone-port specific; admissible value: 1) (Not available on OBi100/OBi110)

$BCLR = Clear all blocked callers (trunk specific; admissible value: 1)

$CIDG = Enable Generate Caller ID Generation on this phone port (phone-port specific; admissible value: 1 for enable, 0 for disable)

$CWCIDG = Enable CWCID Generation on this phone port (phone-port specific; admissible value: 1 for enable, 0 for disable)

$MWIG = Enable MWI (Stutter Tone) Generation on this phone port (phone-port specific; admissible value: 1 for enable, 0 for disable)

$VMWIG = Enable VMWI Generation on this phone port (phone-port specific; admissible value: 1 for enable, 0 for disable)

$BXRN = Blind transfer number for the current call on this phone port (phone-port specific; admissible value: a number representing the blind transfer target). As soon as a complete blind transfer target number is collected, the OBi will (blind) transfer the current call peer to the target number.

$CDM1 = Codecs to enable in the next call on this phone port (temporarily overriding any codec preferences in device configuration) (phone-port specific; admissible value: An 8-bit unsigned number where each bit of its value represents one audio codec:

- Bit0 (LSB) = G711u
- Bit1 = G711a
- Bit2 = G726r16
- Bit3 = G726r24
- Bit4 = G726r32
- Bit5 = G726r40
- Bit6 = G729

)

$LDN = last dialed number on this phone port (for redial) (phone-port specific; read only)

$LCR = last caller's number on this phone port (for call return) (phone-port specific; read only)

$SPD[*n*] = number for the speed dial *n* (*n* = 1 – 99) (global; admissible value: literal or token representing a phone number)

$CODE = the digit(s) representing the variable part of a star code (see examples below; read only)

Variable names are CASE INSENSITIVE.

Star Code Script Actions (*ACT*)

The general format of an action: *ACT*(*par*, *par*, ….)

The following actions are supported:

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- set(*VAR*,*token*) = Set the given *VAR* to the value represented by *token*.
- call(*token*) = Call the number represented by *token.*
    - **PHONE Port::**`OutboundCallRoute` will be applied when making the call (but not the `DigitMap`)
- rpdi(*token*) = repeat dial the number represented by *token*
- coll(*VAR*) = collect a number from the user and store it as the value of the parameter(s) represented by *VAR*.
    - The number is collected with **PHONE Port::**`DigitMap` applied
- say(*token*) = announce the value represented by *token*
    - Values are announced as a list of alphabets or numbers

  where token can be a literal (such as 1234) or another variable (such as $CFAN or SP1($CFBN))
- btdscvr(*n*) = make the OBiBT dongle discoverable for the next 120s; *n* = 0 for BT1, or 1 for BT2
- wifiap() = make the OBi acts like a WiFi Access Point when an ObiWiFi USB Dongle is attached
- You can set multiple variables with multiple set() action with a single star code
- **Action** names are CASE INSENSITIVE.

Star Code Script Format

General Format: code, name, action1, action2, action3, …

- code = the star code, such as *72. It may contain a variable part enclosed in parenthesis, such as *74(x|xx)
    - The variable part as entered by the user are stored in the variable $CODE
- name = a descriptive name of the function of this star code, such as *Call Forward Unconditional*
- action1, action2, … = a valid action with parameters

Actions are carried out one-by-one in the order as specified in the script.

Restrictions:

- At most 1 *coll* action per code.
- Either 1 *say* or 1 *call* action at most per code, and it must be the last action in the script.

Star Code Script Examples

The following examples are taken from some of the default star code scripts in the OBi device.

*69, Call Return, call($LCR)

Calls the number of the caller who rings the PHONE port last time

*07, Redial, call($Ldn)

- Redials the last dialed number

*72, Call Forward Unconditional, coll($cfan),set($cfa,1)

- Collects a number from the user according to the DigitMap. Then set the CallForwardUnconditionalNumber on all trunks to the collected value, and set the CallForwardUnconditionalEnable on all trunks to Yes
- To modify the script to enable CallForwardUnconditional on SP1 only, change it to

*72, Call Forward Unconditional SP1, coll(SP1($cfan)),set(SP1($cfa),1)

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- Same as kat except applies the result on SP1 Service only

*67, Block Caller ID Once, set($BCI1,1)

- Enable masking of caller ID information once for the next call on any trunk

*99, Disable Echo Canceller For One Call, set($Noec1,1)

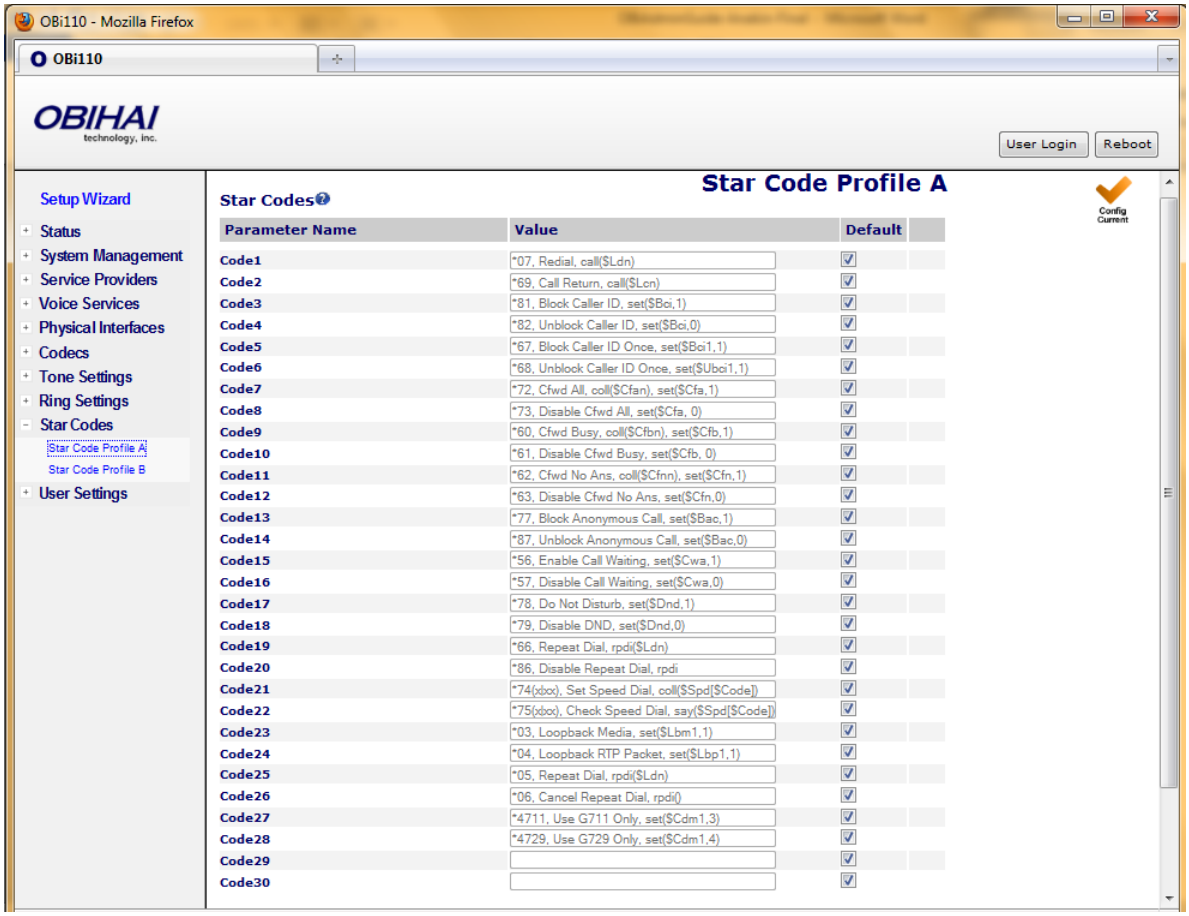
- Disable the Echo Canceller for one call on the current phone port

*74(x|xx), Set Speed Dial, coll($Spd[$code])

- After user dials *74, OBi expects one or two more digits from the user which represent a speed dial slot index (1 to 99). The 1 or 2-digit variable part is stored in the variable $code.
- OBi device then plays a prompt tone and proceeds to collect a number from the user according to the DigitMap. Finally OBi stores the collected number in the given speed dial slot. If the slot already has a number specified, it will be overwritten quietly with the new value.

*75(x|xx), Check Speed Dial, say($Spd[$code])

- After user dials *75, OBi expects one or two more digits from the user which represent a speed dial slot index (1 to 99). The 1 or 2-digit variable part is stored in the variable $code.
- OBi device then announces the number stores in the speed dial slot, or says “not available” if the slot is empty.



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Star Code Profile Parameter Guide:

Parameter	Description	Default Setting
Code1	Default = Redial Star Code	*07, Redial, call($Ldn)
Code2	Default = Call Return Star Code	*69, Call Return, call($Lcn)
Code3	Default = Block Caller ID (Persistent) Star Code	*81, Block Caller ID, set($Bci,1)
Code4	Default = Unblock Caller ID (Persistent) Star Code	*82, Unblock Caller ID, set($Bci,0)
Code5	Default = Block Caller ID Once Star Code	*67, Block Caller ID Once, set($Bci1,1)
Code6	Default = Unblock Caller ID Once Star Code	*68, Unblock Caller ID Once, set($Ubci1,1)
Code7	Default = Call Forward Unconditional Star Code	*72, Cfwd All, coll($Cfan), set($Cfa,1)
Code8	Default = Disable Call Forward Unconditional Star Code	*73, Disable Cfwd All, set($Cfa, 0)
Code9	Default = Call Forward on Busy Star Code	*60, Cfwd Busy, coll($Cfbn), set($Cfb,1)
Code10	Default = Disable Call Forward on Busy Star Code	*61, Disable Cfwd Busy, set($Cfb, 0)
Code11	Default = Call Forward on No Answer Star Code	*62, Cfwd No Ans, coll($Cfnn), set($Cfn,1)
Code12	Default = Disable Call Forward on No Answer Star Code	*63, Disable Cfwd No Ans, set($Cfn,0)
Code13	Default = Block Anonymous Calls Star Code	*77, Block Anonymous Call, set($Bac,1)
Code14	Default = Unblock Anonymous Calls Star Code	*87, Unblock Anonymous Call, set($Bac,0)
Code15	Default = Enable Call Waiting Star Code	*56, Enable Call Waiting, set($Cwa,1)
Code16	Default = Disable Call Waiting Star Code	*57, Disable Call Waiting, set($Cwa,0)
Code17	Default = Do Not Disturb Star Code	*78, Do Not Disturb, set($Dnd,1)
Code18	Default = Disable Do Not Disturb Star Code	*79, Disable DND, set($Dnd,0)
Code19	Default = Repeat Dial Star Code	*66, Repeat Dial, rpdi($Ldn)
Code20	Default = Disable Repeat Dial Star Code	*86, Cancel Repeat Dial, rpdi()
Code21	Default = Set Speed Dial Star Code	*74([1-9]|[1-9]x), Set Speed Dial, coll($Spd[$Code])
Code22	Default = Check Speed Dial Star Code	*75([1-9]|[1-9]x), Check Speed Dial, say($Spd[$Code])
Code23	Default = Loopback Media Star Code	*03, Loopback Media, set($Lbm1,1)
Code24	Default = Loopback RTP Star Code	*04, Loopback RTP Packet, set($Lbp1,1)
Code25	Default = Force G711u Codec Star Code	*4711, Use G711 Only, set($Cdm1,3)
Code26	Default = Force G729 Codec Star Code	*4729, Use G729 Only, set($Cdm1,4)
Code27	Default = Clear Speed Dial Star Code	*76([1-9]|[1-9]x), Clear Speed Dial, set($Spd[$Code],)
Code28	Default = Blind Transfer Star Code	*98, Blind Transfer, coll($Bxrn)
Code29	Default = Barge In Star Code	*96, Barge In, set($Bar1,1)
Code30	Default = OBiBT 1 Discoverable Star Code (Not available on OBi100 and OBi110)	*28, OBiBT Discoverable, btdscvr(0)
Code 31	Default = Enable ObiWiFi as Access Point (Not available on OBi100 and OBi110)	*27, run OBiWiFi as Access Point, wifiap()
Code32	Default = Set OBiPLUS to Day Mode Star Code (Requires OBiPLUS Subscription)	*10, Day Mode, set($Opm,0)
Code33	Default = Set OBiPLUS to Night Mode Star Code (Requires OBiPLUS Subscription)	*11, Night Mode, set($Opm,1)
Code34	Default = Set OBiPLUS to Auto Night Mode Star Code	*12, Auto Night Mode, set($Opm,2)

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	(Requires OBiPLUS Subscription)	
Code35		*28, OBiBT Discoverable, btdscvr(1)
Code36		
Code37		
Code38		
Code39		
Code40		

Note: Code31 – Code40 are not available on OBi100 and OBi110

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User Settings Features of the OBi Device

Speed Dial Numbers

Each OBi device supports 99 speed dial numbers. The 99 speed dial slots are numbered from 1 to 99 and are invoked by dialing a 1 or 2-digit number corresponding to the slot number. Speed dials may be dialed from the PHONE port or via the Auto Attendant. Note that the 2-digit numbers “01”, “02”, …, “09” are not admissible; you must dial the 1-digit number “1”, “2”, …, “9” for slot number 1-9.

Speed dial value can be set using the configuration web page, remote provisioning, or star code (see the *Star Code Section* in this document for more details). The value may be a number just like the one you normally dial, with or without any service access code prefix, such as: **9200112233, **214089991123, 4280913, etc. It may also include explicit trunk information with the general format TK(number), where TK= SP1, SP2, LI, or PP. For example, PP(ob200112233), SP2(14089991123), LI(4280913), etc.

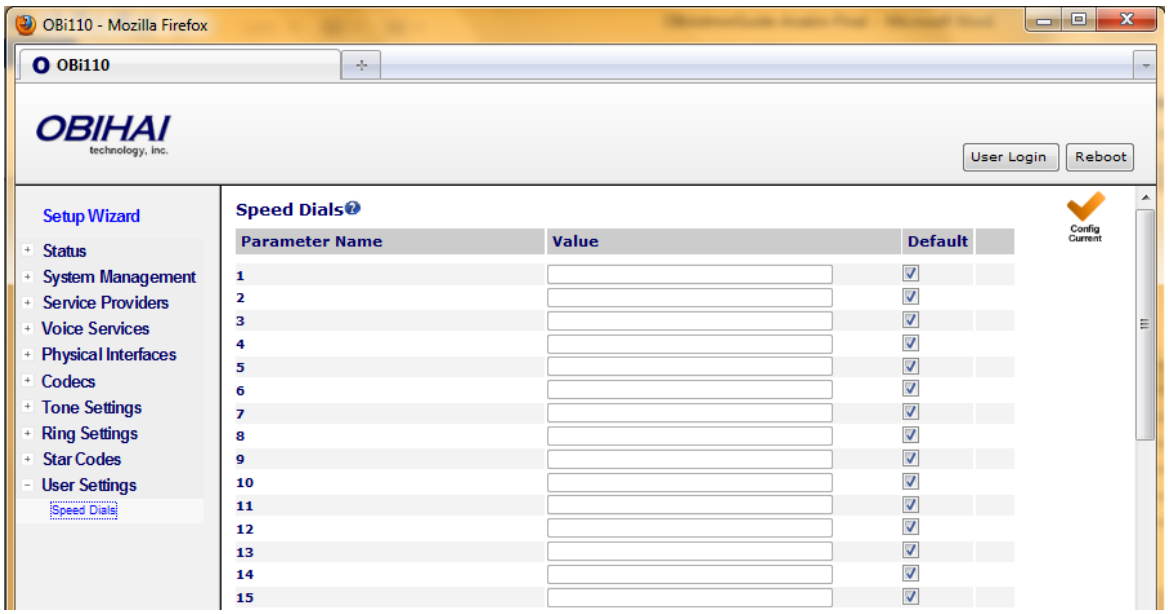
If trunk information is *not* specified in the speed dial entry, OBi device applies DigitMap and OutboundCallRoute when making the call. Otherwise neither DigitMap nor OutboundCallRoute is applied.

Using Speed Dial Number as Ad Hoc Gateway

If an external gateway does not require authentication, its access number can be stored in one of the 99 speed dial slots to allow ad hoc direct dialled gateway calls. To do this, the user dials the gateway’s speed dial, followed by a *, followed by the target number. That is <gateway-speeddial> * <target-number>. For example, the gateway access number pp(ob200333456) is stored at speed dial 8, and the user can dial 8*14085551234 to call 14085551234 using the given gateway.

Note: At the present time, only gateways that are accessed with an OBi number can be used this way.

Speed Dial Settings



Speed Dials Parameter Guide:

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Parameter	Description	Default Setting
1	Speed Dial 1	
2	Speed Dial 2	
3	Speed Dial 3	
To	to	
99	Speed Dial 99	

User Defined Digit Maps

For an explanation of this feature, please refer to the section User Defined Digit Maps under Digit Map Configuration.

User Defined Digit Maps Parameter Guide:

Parameter	Description	Default Setting
User Defined Digit Map 1		
Label	A 2-16 characters long label to reference this digit map in other digit maps and call routing rules. It must be alphanumeric, not containing any spaces, and different from other user-defined or built-in digit map labels	ipd
DigitMap	A valid digit map	(xx.<*:@>xx?x?<*:.>xx?x?<*:.>xx?x?<*:.>xx?x?|xx.<*:@>xx?x?<*:.>xx?x?<*:.>xx?x?<*:.>xx?x?<*::>xx?x?x?x?) Note: this default value supports IPv4 dialing
User Defined Digit Map *N* (*N* = 2 – 10)		
Label	A 2-16 characters long label to reference this digit map in other digit maps and call routing rules. It must be alphanumeric, not containing any spaces, and different from other user-defined or built-in digit map labels	
DigitMap	A valid digit map	

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Sharing Files on an Attached External USB Storage Device (OBi202 Only)

File Sharing Settings

There are three levels of access to the files stored on a USB storage device attached to the OBi202:

- Admin: Always enabled and requires login as the admin. Admin level has full access to all the files.
- User: The admin can define and enable up to 10 users (User1 – User10) in the OBi device configuration with individual UserID and Password. User must login with the corresponding UserID and Password before he can access the files. Each user level access can be further limited by three configurable attributes: HomeDirectory, FileFilter, and WriteEnable. These attributes are explained in the parameter table below.
- Anonymous: The admin can enable anonymous access where the user does not need to login. However the access is limited to read-only for anonymous users.

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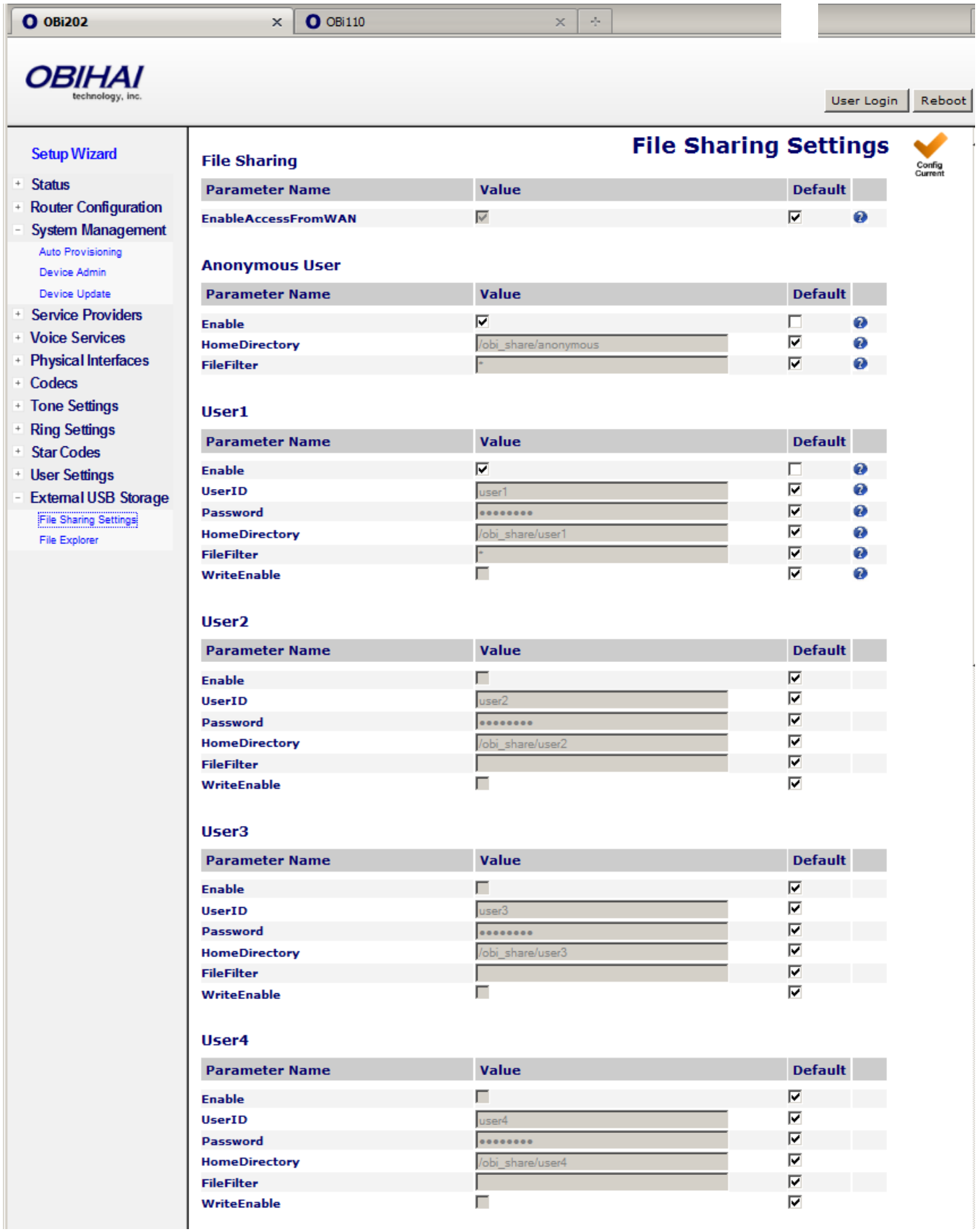
Here is a screen short of the File Sharing Settings device web page.



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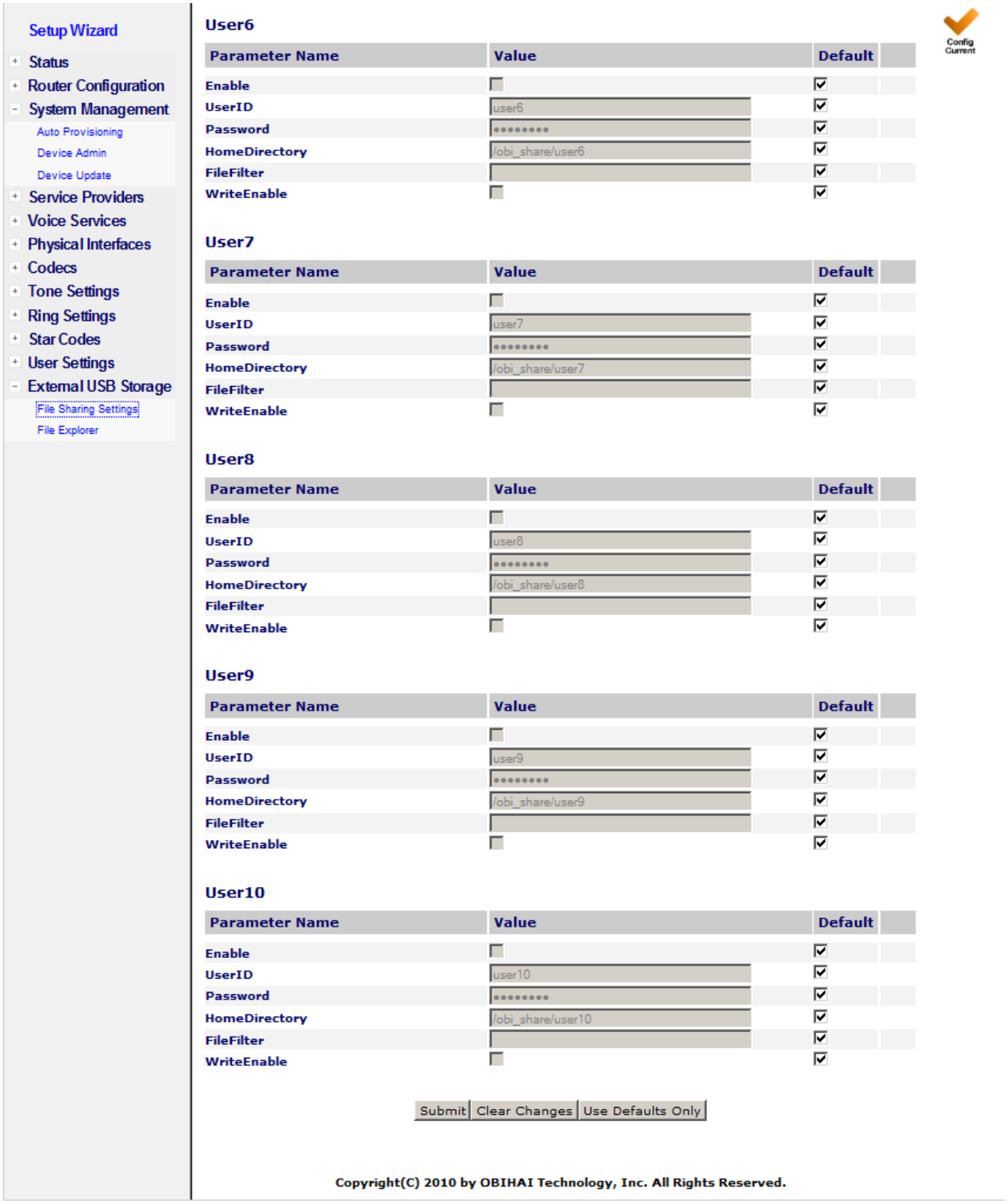
Setup Wizard
Status
Router Configuration
System Management
Auto Provisioning
Device Admin
Device Update
Service Providers
Voice Services
Physical Interfaces
Codecs
Tone Settings
Ring Settings
Star Codes
User Settings
External USB Storage
File Sharing Settings
File Explorer
Config Current
User6
Parameter Name
Value
Default
Enable
UserID
user6
Password
HomeDirectory
/obi_share/user6
FileFilter
WriteEnable
User7
Parameter Name
Value
Default
Enable
UserID
user7
Password
HomeDirectory
/obi_share/user7
FileFilter
WriteEnable
User8
Parameter Name
Value
Default
Enable
UserID
user8
Password
HomeDirectory
/obi_share/user8
FileFilter
WriteEnable
User9
Parameter Name
Value
Default
Enable
UserID
user9
Password
HomeDirectory
/obi_share/user9
FileFilter
WriteEnable
User10
Parameter Name
Value
Default
Enable
UserID
user10
Password
HomeDirectory
/obi_share/user10
FileFilter
WriteEnable
Submit
Clear Changes
Use Defaults Only
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File Sharing Parameter Guide:

Parameter	Description	Default Setting
File Sharing		
EnableAccessFromWAN	While accessing files on the attached USB storage device from the LAN side of the OBi is always enabled, accessing the files from the WAN side may be disabled. By enabling this option you allow access to the files from the WAN side. This option applies to all levels of access (admin, user, and anonymous). Note: If this option is disabled, you will be denied from accessing the files from the WAN when you click on the File Explorer link on the device web page even if you have logged in as the admin. Note: This option needs a reboot for this change to take effect	Yes
Anonymous User		
Enable	By enabling this option, you allow anonymous (read-only) access to the files on the USB storage device., using this link: http://<obi-address>/obi_share/anonymous The user will be challenged to enter any UserID or Password in this case.	No
HomeDirectory	The Home Directory for anonymous level access, such that user cannot navigate the file system above this directory. Maximum length of this field is 256 characters. Note: A blank value is same as slash (/) which allows navigation all the way to the root of the file system	/obi_share/anonymous
FileFilter	A list of semicolon (;) separated filename filters to limit the type of filtes this user can see. Each filter MUST be of the format: *.<file-type> Where <file-type> is a literal string (no wildcards or space), such as jpg, pdf, mp3, etc., and * is a wildcard that matches any valid filename string. For example: *.jpg; *.pdf; *.mp3; *.mov Maximum length of this field is 256 characters.	*
User *N* (*N* = 1 – 10)		
Enable	Allow users to login for file sharing with the UserID and Password for User *N*	No
UserID	UserID is case sensitive. It must be an alphanumeric string, must not start with a number, and must not contain any space. Maximum length is 64 characters.	user*N*

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Password	Password is case-sensitive. It must be an alphanumeric string and must not contain any space. Maximum Password length is 64 characters.	
HomeDirectory	The Home Directory for anonymous level access, such that user cannot navigate the file system above this directory. Maximum length of this field is 256 characters. Note: A blank value is same as slash (/) which allows navigation all the way to the root of the file system	/obi_share/user*N*
FileFilter	A list of semicolon (;) separated filename filters to limit the type of filtes this user can see. Each filter MUST be of the format: *.<file-type> Where <file-type> is a literal string (no wildcards or space), such as jpg, pdf, mp3, etc., and * is a wildcard that matches any valid filename string. For example: *.jpg; *.pdf; *.mp3; *.mov Maximum length of this field is 256 characters.	*
WriteEnable	By enabling write access to the file system, you allow the user to upload, copy, remove, rename, cut and paste files, or create, remove, and rename directories on the USB storage device.	No

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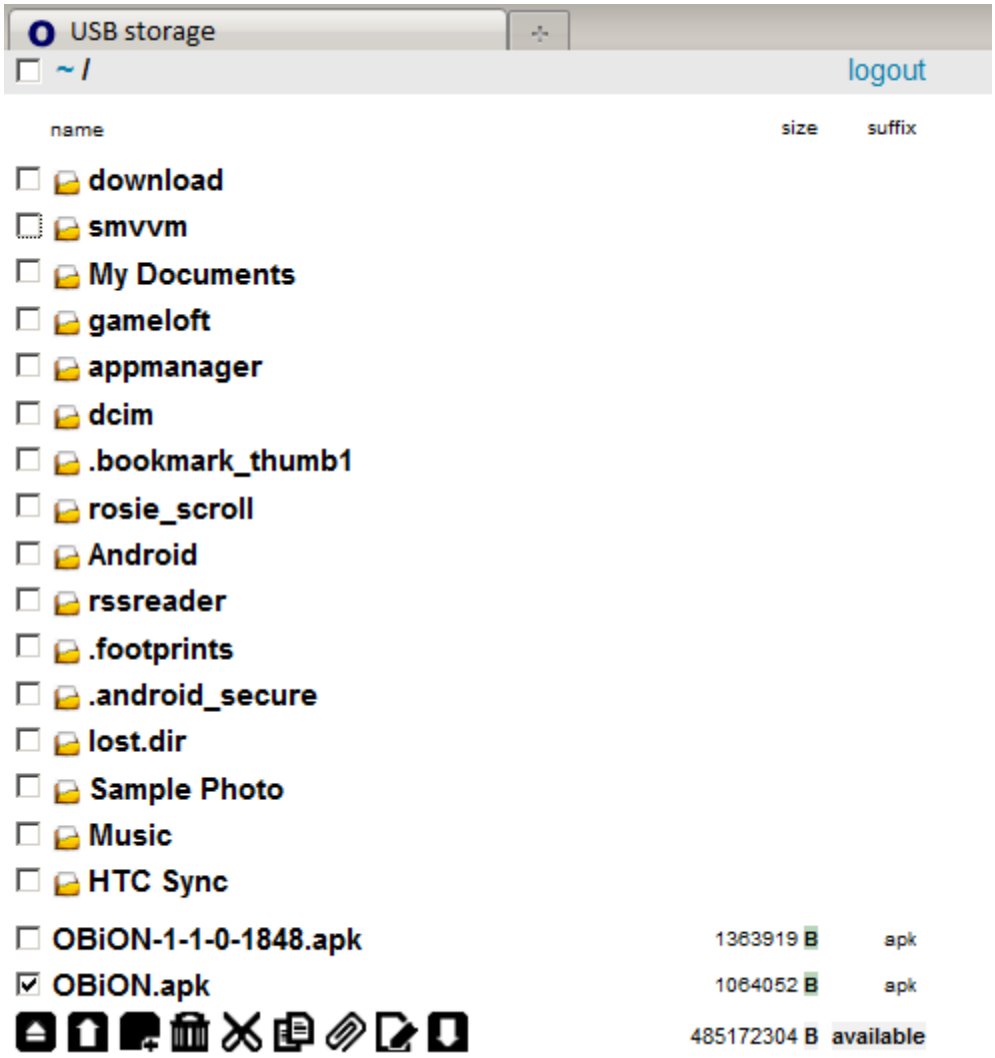
File Explorer

The File Explorer web page can be launched by clicking the File Explorer link on the OBi device webpage or visit the link: http://<obi-address>/obi_share. You may be requested to login with a valid UserID and Password. To use the File Explorer as an anonymous user, visit the link: http://<obi-address>/obi_share/anonymous.

Below is a screen shot of a typical File Explorer web page.



File Explorer Web Page Layout

At the top of the page is a status bar that looks like this:

On the left corner of the status bar is a “select all” checkbox for selecting all the items on the current page. To the right of the checkbox is the current directory path. On the far right of the status bar is the User ID of the current login user and the logout button, which are not shown for anonymous level login.

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The current directory path information is with respect to the home directory of the login user. The symbol ~ represents the home directory which is always at the root of the path. Each level in the directory path is separated from the previous level with a slash (/). User can click any directory name in the path shown on the status bar to jump to a different level in the directory. Click the "logout" button to logout or login as a different user.

The contents of current directory are listed below the status bar, with all the sub-directories, if any, followed by all the files in this directory. For example:

As shown above, each sub-directory or file is shown as a selectable item per row, with a "selected for operation" checkbox on the left. A sub-directory item has a directory icon ( ) and a directory name. A file item has a filename, the file size in bytes and the file type. In the current design, the file type is simply the filename suffix, or a pair of "<>" is shown if the filename does not have a suffix. You can select one or more items for applying an operation by clicking the corresponding checkboxes. The available operations that can be applied are shown on the bottom of the page and may depend on the kind of items or the number of items selected. In the following example, each operation is represented by a special icon on the bottom line:

Also shown on the far right of the bottom line is the currently available space in bytes on the attached USB storage device, if the option WriteEnable is true for login user.

The name of each sub-directory item is a link to navigate into that sub-directory. Clicking the link of a file item on the other hand may show the contents of the file or download the file based on the file type and web browser functionality.

The table below listed the available file sharing operations:

Icon	Operation	Remarks
	Eject USB - Safely detach the USB storage device from the OBi.	This operation is available to the admin only. Any un-pasted Cut or Copy operation will be forgotten by the OBi upon this operation. We highly recommend the admin to always perform this operation before detaching the USB device or rebooting the OBi. If the file system on the USB storage device is HPS Plus or HFP+, the admin MUST perform this operation before detaching the USB device. Failure to do so may cause the USB device to become read only and may require reformatting of the USB device
	Upload File - Upload a single file from the local host to the USB storage device.	You should check that the size of the file to be uploaded can fit in the available space on the USB device. If there is already a file with the same name in the same location, the OBi will pop up a prompt window to ask for confirmation before overwriting the existing file.
	Create Folder - Create a new folder with the given path name if it does not exist already; an input box will pop up	Any intermediate directory in the given path name will be created automatically if it does not exist

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	for entering the path name when you click this icon	
	Delete - Remove the selected files and sub-directories permanently from the USB storage device. This operation cannot be undone.	Available only when one or more files or sub-directories are selected. The OBi will pop up a prompt window to ask for confirmation before proceeding.
	Cut - Cut the selected files and sub-directories to be pasted elsewhere on the USB storage device with a subsequent Paste operation (in the same session).	Available only when one or more files or sub-directories are selected.
	Copy - Copy the selected files or sub-directories to be pasted in a different directory on the USB storage device with a subsequent Paste operation (in the same session).	Available only when one or more files or sub-directories are selected.
	Paste - Paste the selected files or sub-directories that are either cut with a previous Cut operation or copied with a previous Copy operation	Available only if there is a previous “Cut” or “Copy” operation (in the same session) that has not been pasted yet.
	Rename - Rename the selected file or directory to the given name; an input box will pop up for entering the new name when you click this icon	Available when one and only one file or sub-directory item is selected.
	Save Link As… - Download the selected file to store a copy on the local host	Available when one and only one file item is selected.
	Copy Link Location - Copy the links (URLs) of the selected items to the clipboard of the local host	Available only when one or more files or sub-directories are selected. On some web browsers a prompt window will pop up to ask for confirmation before proceeding; the user may need to press Control+C for example before the Link Locations (URLs) are copied into clipboard of the local host.

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OBi Call Routing and Digit Map

Trunks, Endpoints, and Terminals

An OBi device is a Voice Service Bridge (VSB) that supports multiple voice services. It can bridge calls across any of the supported services. By a call bridge we refer to a voice connection connecting two calls on the same or different voice services. An OBi allows 4 concurrent independent call bridges. The following matrix shows the possible call bridge connections on an OBi.

Supported 2-way Call Bridges on the OBi Device

	SP1 Service	SP2 Service	SP3 Service	SP4 Service	OBiTALK Service	LINE Port (PSTN)	BT1 Service (via OBiBT)	BT2 Service (via OBiBT)
SP1 Service	yes	yes	yes	yes	yes	yes	yes	yes
SP2 Service	yes	yes	yes	yes	yes	yes	yes	yes
SP3 Service	yes	yes	yes	yes	yes	yes	yes	yes
SP4 Service	yes	yes	yes	yes	yes	yes	yes	yes
OBiTALK Service	yes	yes	yes	yes	yes	yes	yes	yes
LINE Port (PSTN)	yes	yes	yes	yes	yes	no	yes	yes
BT1 Service	yes	yes	yes	yes	yes	yes	no	yes
BT2 Service	yes	yes	yes	yes	yes	yes	yes	no

Note: Highlighted services may not be available on some models and/or require additional accessories.

Each supported service is also referred to as a *trunk* (a traditional telco term for a physical wire or wires that deliver phone services to homes or businesses). Each trunk is represented with 2-letter abbreviation and a 1-based instance identifier:

- SP1 = the SP1 Voice Service (with ITSP A, B, C, or D)
- SP2 = the SP2 Voice Service (with ITSP A, B, C, or D)
- SP3 = the SP3 Voice Service (with ITSP A, B, C, or D)
- SP4 = the SP4 Voice Service (with ITSP A, B, C, or D)
- PP1 = the OBiTALK Service
- LI1 = the PSTN Line Service on the LINE port
- BT1 = OBiBlueTooth 1 Service
- BT2 = OBiBlueTooth 2 Service

The instance identifier may be omitted if it is equal to 1; hence LI is equivalent LI1, PP is equivalent to PP1, etc. These short-hand notations are used heavily in configuring the OBi device, as found in call routes, call forward numbers, and speed dials parameters. Unless stated otherwise, the abbreviated trunk names are case insensitive.

In addition to all the call bridging functionalities, each OBi has one or two built-in physical PHONE ports for hooking up analog telephones or FAX machines. The OBi includes a set of features to support its PHONE ports to make it work also as a full-featured ATA device. Users can place and receive calls on the PHONE ports over any of the trunks.

The OBi also comes with an Auto Attendant for helping callers to direct their calls landed on the device. When an inbound call is received on the device, it may be routed to the AA which then offers a menu of options to the caller to direct it further. It could be directed to ring any one or all of the available PHONE ports, or bridged with another call on a trunk (which the AA "dials" or sets up on behalf of the caller).

The PHONE ports and the AA are the two entities in the OBi device that calls can terminate (i.e., starts or ends there), as opposed to the trunks, which rely on the corresponding service providers to terminate the call. In this document we refer to the PHONE ports and the AA as *endpoints*. Like the trunks, each endpoint is represented by a 2-letter abbreviation and a 1-based instance identifier:

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- PH1 = the PHONE Port (same as PHONE1 port)
- PH2 = the PHONE2 Port[5]
- AA1 = the Auto Attendant

Unless stated otherwise, abbreviated endpoint names are case insensitive. A trunk or an endpoint is also referred to as a *Terminal* in this document.

The following matrix shows the possible call connections between the endpoints and the trunks:

Supported endpoint calls on the OBi

	Any Trunk	**PHONE Port (PHONE1 Port)**	**PHONE2 Port[5]**	**AA**
Any Trunk	n/a	yes	yes	Yes
PHONE Port (PHONE1 Port)	yes	no	yes	Yes
PHONE2 Port	yes	yes	no	Yes
AA	yes	yes	yes	No

Call Routing – The OBi Way

Call Routing is the process by which the OBi Device sets up a call bridge or a (endpoint) call based on such information as: the trunk on which the call originates, the caller's number, the called number, etc. Call Routing Rules are parameters used to instruct the OBI device how to route calls. A call may transform into a call bridge or an endpoint call after being routed by the OBi according to the given routing rules.

Every call has to be originated from somewhere. From the device's perspective, calls originated from the trunk side are considered Inbound Calls, while calls originated from an endpoint Outbound Calls. The call routing rule syntaxes for inbound calls and outbound calls are slightly different and we shall explain them separately below. Call Routing Rule configuration relies heaving on digit maps. If you are not familiar with how digit map works yet, please read the *Digit Map Configuration Section* in this document first.

[5] PHONE2 or PH2 Port is available on the OBi202/OBi302 only

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Inbound Call Route Configuration

Every trunk has a corresponding InboundCallRoute in the OBi device configuration. It is a comma separated list of rules where each rule is also surrounded by a pair of curly braces { }. No extra white spaces are allowed. These rules tell the OBi how to handle an inbound call, such as sending it to the PHONE port (and ringing the attached phone(s)), sending it to the Auto Attendant for further routing (interactively with the caller), or making another call on a specific trunk to bridge with this call.

The general format is:

InboundCallRoute := *rule* **OR** {*rule*},{*rule*},….

Note that the curly braces may be omitted if there is only one rule in the route. The **OR** operator is NOT part of the parameter syntax; it is used here to separate alternative values only.

A rule has the following format:

rule := peering-list : terminal-list

where

peering-list := *peering*,*peering*,… (comma separated list of 0 or more *peering* object)

terminal-list := *terminal*,*terminal*,…. (comma separated list of 0 or more *terminal* object)

peering := caller-list > callee-list

caller-list := *caller*|*caller*|*caller*|… (vertical bar separated list of 0 or more *caller* object)

callee-list := *callee*|*callee*|*callee*| … (vertical bar separated list of 0 or more callee object)

caller := *number* **OR** *embedded-digit-map* **OR** ? **OR** @ (?=anonymous, @=any number but anonymous)

callee := number **OR** embedded-digit-map **OR** @

terminal := PH*x* **OR** AA*x* **OR** LI*x*(*arg*) **OR** SP*x*(*arg*) **OR** PP*x*(*arg*) (*arg* object is optional)

arg := cid > target

x := 1 OR 2 OR 3… (where applicable; can be omitted if it is equal to 1)

cid := spoofed-caller-number **OR** $1

target := number-to-call **OR** $2

embedded-digit-map := (Mlabel) **OR** digit-map

Notes:

- *Terminal-list* can be empty, which means to block this call. The preceding ':' cannot be omitted. Up to 4 *terminals* may be specified in the list. The listed *terminals* will be called/rung by OBi simultaneously; we refer to this operation as *forking* the call. A terminal may be a trunk or an endpoint.
- Abbreviated terminal names are case-insensitive
- *number and number-to-call* are literal strings, such as 14089991234
- *digit-map* is just any proper digit map, such as (1xxx|xx.); make sure to include the enclosing parentheses

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- *spoofed-caller-number* is a literal string, such as 14081112233, to be used as the caller number for making a new call on the specified trunk
- (M*label*) is a named digit map, where *label* is the abbreviated name of any terminal that has a digit map defined: SP1, SP2, SP3, SP4, LI[1], PP, PH, PH2, or AA
- $1 is an internal variable containing the value of the caller number of this inbound call, after any digit map transformation in the matched *caller* object of the matched *peering* object in the *peering-list*.
- $2 is an internal variable containing the called number of this inbound call, after any digit map transformation in the matched *callee* object of the matched *peering* object in the *peering-list*.

More notes on *peering-list* and *peering* objects:

- *Peering-list* is optional in InboundCallRoute. If *peering-list* is empty, the succeeding ':' can be omitted also. An empty *peering-list* implies a single *peering* object whose *caller* object list matches any caller number. That is, the InboundCallRoutes listed below are all equivalent
    - ph
    - {ph}
    - {:ph}
    - {?|@>@:ph}
- *Callee-list* in a *peering* object can be empty. It implies the *callee* object @, meaning any called number. The preceding '>' can be omitted if callee-list is empty.
- *Caller-list* in a *peering* object can be empty. It implies the *caller-list* @|?, meaning any caller number including anonymous. The succeeding '>' cannot be omitted if caller-list is empty but not the callee-list

More notes on the *arg*, *cid*, and *target* objects:

- The *cid* object inside an *arg* object is optional. If omitted, it implies no caller-ID spoofing when making the call on the specified trunk. The succeeding '>' can be omitted is *cid* is omitted
- The *target* object inside an *arg* object is optional. If omitted, it implies the *target* $2, which means to call the original called number after applying any necessary digit map transformation implied by the rule. The preceding '>' cannot be omitted if *target* is omitted but cid is not
- *arg* object is optional. If omitted, it implies the *arg* with the *target* $2 and no *cid*. If *arg* is omitted, the succeeding parentheses ( ) can be omitted also.

An inbound call matches a rule if its caller-number/callee-number matches one of the *peering* objects of the rule. *Peering* objects are tested in the order left and right, and the first matched *peering* object will win. Rules are also checked in the order left to right, and the first matched rule will win. Therefore it is important that you place the more specific rules first in the InboundCallRoute if multiple rules can potentially match the same inbound call.

InboundCallRoute Examples:

1) ph **OR** {ph} **OR** {:ph} **OR** {@|?>@:ph} (all equivalent)

It says: Ring the PHONE port for all incoming calls. This is the default InboundCallRoute for all trunks.

2) {(14081223330|15103313456):aa},{(1800xx.|1888xx.):},{ph}

It says: Ring both PHONE port and AA for calls coming from 1 408 122 3330 or 1 510 331 3456, block all 800, 888, and anonymous calls, and ring the PHONE port for all other calls

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3) {(x.4081113333|x.4152224444):aa},{ph}

It says: Ring the AA for calls coming from any number that ends with 408 111 3333 or 415 222 4444, and ring the PHONE port for all other calls. Be sure to include the enclosing parentheses in this example since "x." is a digit map specific syntax.

4) {200123456:aa},{sp1(14083335678)}

It says: Ring the AA for calls coming from 200123456. For all any other call, bridge it by calling 1 408 333 5678 using SP1 Service

Outbound Call Route Configuration

Every endpoint has an OutboundCallRoute parameter in the OBi device configuration. It tells the device where to send the call when the endpoint attempts to make a call. Endpoints may call each other or an outside number using one of the trunks. The OutboundCallRoute syntaxes are almost identical to those of the InboundCallRoute; the differences are mainly in the implied value when an optional field is omitted, no *caller* objects and one and only one terminal object per terminal-list in an OutboundCallRoute. Forking is not supported when routing outbound calls.

The general format is:

OutboundCallRoute := *rule* **OR** {*rule*},{*rule*},….

Note that the curly braces may be omitted if there is only one rule in the route. The **OR** operator is NOT part of the parameter syntax; it is used here to separate alternative values only.

A rule has the following format:

rule := callee-list : terminal

where

callee-list := *callee*|*callee*|*callee*| … (vertical bar separated list of 0 or more callee object)

callee := *number* **OR** *embedded-digit-map* **OR** @ (@ = any number)

terminal := PH*x* **OR** AA*x* **OR** LI*x*(*arg*) **OR** SP*x*(*arg*) **OR** PP*x*(*arg*) (*arg* object is optional)

arg := cid > target

x := 1 OR 2 OR 3… (where applicable; can be omitted if it is equal to 1)

cid = spoofed-caller-number

target = number-to-call **OR** $2

embedded-digit-map = (Mlabel) **OR** digit-map

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Notes:

- A terminal may be a trunk or another endpoint.
- Abbreviated terminal names are case-insensitive
- *number and number-to-call* are literal strings, such as 14089991234
- *digit-map* is just any proper digit map, such as (1xxx|xx.); make sure to include the enclosing parentheses
- *spoofed-caller-number* is a literal string, such as 14081112233, to be used as the caller number for making a new call on the specified trunk
- (M*label*) is a named digit map where *label* is the abbreviated name of any terminal that has a digit map defined: SP1, SP2, LI, PP, PH, or AA
- $2 is an internal variable containing the called number of this outbound call, after any digit map transformation in the matched *callee* object
- *Callee-list* can be empty, which implies the single *callee* object @, which means any called number. The succeeding ':' can be omitted also when *callee-list* is empty

More notes on the *arg*, *cid*, and *target* objects:

- The *cid* object inside an *arg* object is optional. If omitted, it implies no caller-ID spoofing when making the call on the specified trunk. The succeeding '>' can be omitted if *cid* is omitted.
- The *target* object inside an *arg* object is optional. If omitted, it implies the *target* $2, which means to call the original called number after applying any necessary digit map transformation implied by the rule. The preceding '>' cannot be omitted if *target* is omitted but not the cid.
- *arg* object is optional. If omitted, it implies the *arg* with the *target* $2 and no *cid*

An outbound call matches a rule if its called number matches one of the *callee* objects of the rule. *Callee* objects are tested in the order left and right, and the first matched *callee* will win. Rules are also checked in the order left to right, and the first matched rule will win. Therefore it is important that you place the more specific rules first in the OutboundCallRoute if multiple rules can potentially match the same outbound call.

Note that every endpoint also has a digit map defined. The user dialed number is completely processed with the endpoint's digit map first before it is passed to the OutboundCallRoute for routing decision. Therefore the number used for matching call routing rules has already incurred the transformations, if any, implied by the digit map. Remember this fact when crafting your own OutboundCallRoute.

OutboundCallRoute Examples:

1) sp1 **OR** {SP1} **OR** {:SP1} **OR** {@:Sp1} (all equivalent)
This rule says: Make all calls using SP1 Service, without any caller-id spoofing or digit transformation

2)
{(<#:>|911):li},{**0:aa},{***:aa2},{(Mpli):pli},{(<**1:>(Msp1)):sp1},{(<**2:>(Msp2)):sp2},{(<**8:>(Mli)):li},{(<**9:>(Mpp)):pp}
This is the default OutboundCallRoute for the PHONE port. It says:

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- Dial # key to connect to the LINE port; OBi will take the LINE port hardware to off-hook but will not dial out any digit. The net result is that the user will hear dial tone generated by the PSTN company if a working line is connected to the LINE port. The user may then continue to dial the PSTN number directly to the phone company. Note that from the OBi's point of view, the PSTN call is connected the moment it takes the LINE port to the off-hook state!
- Use the PSTN Line to call 911
- Dial **0 to invoke AA1 or AA
- Dial *** to invoke the local device configuration IVR (a.k.a AA2)
- (Mpli) and pli will be substituted with the PrimaryLine's abbreviated name
- Use SP1 Service to call all numbers that start with **1 and subsequent digits matching SP1 Service's DigitMap. Remove the **1 prefix from the resulting number before making the call
- Use SP2 Service to call all numbers that start with **2 and subsequent digits matching SP2 Service's DigitMap. Remove the **2 prefix from the resulting number before making the call
- Use the LINE port to call all numbers that start with **8 and subsequent digits matching LINE port's DigitMap. Remove the **8 prefix from the resulting number before making the call
- Use the OBiTALK Service to call all numbers that start with **9 and subsequent digits matching OBiTALK Service's DigitMap. Remove the **9 prefix from the resulting number before making the call

Digit Map Configuration

Digit Map Rules and Elements

A digit map serves to transform and restrict the number that may be dialed or called, and determine if sufficient digits have been dialed by the user to form a complete number. Each map is composed of one more rules surrounded by parentheses (which MUST NOT be omitted). Here is the general format of a digit map:

(rule|rule|….|rule)

A digit map *rule* is a rule for matching a given sequence of digits. It may contain extra white spaces for readability; all spaces are removed by the OBi device during parsing. A rule may contain one or more of the following *elements*:

- literals - Any combination of 0-9,*,#,+,-,A-Z,a-z, except m, M, s, S, x, X which have special meaning in the digit map syntax. It matches digit sequences with exactly the same literals
- 'literals' - Everything inside a pair of single quotes is treated as a literal except for the single quote (') character.
- x - a wild card digit that matches any digit from 0-9. x is CASE SENSITIVE
- x. - matches 0 or more x
- [123-7] or [135] - A set of 1 or more digits surrounded by pair of [ ]. It matches any digit in the set. The – syntax represents an inclusive digit range, such as 0–9, 3–7. So [123–7] is equivalent to [1–7] or [1234567]
- S, S0, S1, S2, …S9 - Digit timer of 0, 1, 2, …,9 seconds respectively; S is equivalent to S1; S0 is the same as "blank". You can concatenate multiple S elements together if you need more than 9s timeout, such as S9S5 for a 14s timeout. S is CASE SENSITIVE. It should only be used either as the first element of a rule for hot/warm line implementation, or as the last element of a rule as a means of overriding the default interdigit timer
- <elements:literals> - Substitute the digit sequence matching *elements* with the given *literals*. Single quote syntax is NOT needed or allowed for the *literals* in this context; special characters may be used here as they do not apply in this context either. Elements can be empty, in which case the ':' may be omitted. This case is useful for inserting

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some extra digits in certain part of the dialed digits. The literals part can be empty also but the ':' MUST NOT be omitted. This case is useful for removing part of dialed digits. *Elements* and *literals* MUST NOT be both empty.

- (*map*) – An embedded digit map for matching subsequent digits.
- (M*label*) – A named embedded digit map for matching subsequent digits, where *label* is one of abbreviated terminal names. Possible choices are:
    - (Msp1) for **SP1 Service::**DigitMap
    - (Msp2) for **SP2 Service::**DigitMap
    - (Msp3) for **SP3 Service::**DigitMap
    - (Msp4) for **SP4 Service::**DigitMap
    - (Mpp) for **OBiTALK Service::**DigitMap
    - (Mli) for **LINE Port**[1]**::**DigitMap
    - (Mph) for **PHONE Port::**DigitMap
    - (Mph2) for **PHONE2 Port::**DigitMap
    - (Maa) for **Auto Attendant::**DigitMap
    - (Mtg*N*) for TrunkGroup*N*::DigitMap, *N*=1,2,3,4
    - (Mvg*N*) for VoiceGateway*N*::DigitMap, *N*=1,2,3,4,5,6,7,8

Starting with release 1.2, the following elements are added:

- X – A wildcard digit that matches 0–9 or *. This is equivalent to [x*] or [0-9*x]
- @ – A wildcard character that matches any alphanumeric character except #
- x? – matches 0 or 1 x
- @? – matches 0 or 1 @
- [^…] – matches any single alphanumeric character that is not in the set
- Allow alphanumeric and wildcard inside a set [ ], such as [x], [X#], [@#], [a-zA-Zx]

The last two elements imply that the OBi digit maps are *recursive*. Recursive digit maps allow digit maps to be re-used and make their specification more compact and readable. It is important that you do not specify digit maps that lead to infinite recursion. For example, ***a digit map must not include a named embedded digit map that references itself***.

To bar users from calling numbers that match a rule, add a '!' in front of that rule in the digit map. The rule is then referred to as a *barring rule*.

Let's look at some examples.

1408xxxxxxx – Matches any 11-digit number that starts with 1408

011xx. – Matches any number that starts with 011 followed by one or more digits

<1408>xxxxxxx – Matches any 7-digit number. OBi pre-pends 1408 to the number when making the call

<:1408>xxxxxxx – Equivalent to the last example

<+>1xxxxxxxxxx – Pre-pends '+' to any 11-digit number that starts with 1

<**1:>1408xxxxxxx – Matches any number that starts with **11408 followed by 7 digits. OBi removes the **1 prefix when making the call

*74(x|xx) – Matches any number that starts with *74, followed by 1 or 2 digits

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**1(Msp1) – Matches any number that starts with **1 and with the rest of digits matching the `DigitMap` in the SP1 Service

<:1234> – Matches an empty phone number and replaces with 1234. This is the syntax for a hotline to 1234

<S0:1234> – Equivalent to the last example

<:#> – Hotline to the number #

<S0:#> – Equivalent to the last example

<S4:1234> – Call 1234 if no digits entered for 4s. This is the syntax of a warm line.

xx.853 7683 – Matches any number with at least 8 digits and ends with 8537683, such as 15108537683, 98537683

(x.408 223 1122) – Matches any number with at least 10 digits and ends with 408 223 1122, such as 4082231122, 1408 223 1122

xx.<#> – Adds a # to the end of any number with 1 or more digits

!1900xxx xxxx – Barring all 11-digit numbers that start with 1900

[^*]@@. – Arbitrarily long alphanumeric sequence (except #) that does not start with *

xx? – one or two-digit number

(1xxxxxxxxxS0|xx.) – Arbitrarily long digit sequence not starting with 1; otherwise it is limited to 11 digits

Matching Against Multiple Rules in Digit Map

One important function of a digit map is to determine if sufficient digits have been entered by the user during dialing. A digit map normally contains more than one rules. The Digit Map Processor (DMP) must return the best matched rule at some point, or declare the input digit sequence is invalid. The DMP keeps refining its decision as each digit is entered until it reaches a *final decision*, or will be forced to make a *timely decision* when the interdigit timer expires.

The DMP restarts the interdigit timer on every newly entered digit. The duration of this timer can be either *long* or *short*. The long and the short timer values are set to 10s and 2s respectively by default and are configurable per phone port via the DigitMapLongTimer and DigitMapShortTimer parameters respectively (execpet on OBi100/OBi110 where the two timer values are not configurable). Whether to use the long or short interdigit timer depends on the current rule matching states. The DMP maintains a matching state for each rule in the digit map as it processes each input digit. The following states are defined:

- Partially Matched (PM) – The rule partially matches the accumulated input sequence. Initially all rules are in this state before any digit is entered. Rules in this state have the potential of becoming EM or IM as more digits are entered. Example: 1234 partially matches the rules xxxxxxx, 1xxxx, 1234567, <123:>xxxx.
- Exactly Matched (EM) – The rule exactly matches the accumulated input sequence. However, any further input digit will turn this rule into the MM state. Example: 1234 exactly matches the rules xxxx, 1234, 1xxx, <123:5678>x

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- Indefinitely Matched (IM) – The rule matches the accumulated input sequence indefinitely, with a variable length such that the rule can potentially stay as IM as more matching digits are entered. Example: 011853 indefinitely matches the rules xx., 011xx., <011:>xx.
- Mismatch (MM) – The rule does not match the accumulated input sequence. This state will not change as more digits are entered. Example: 1234 mismatches the rules 123, 1xx, 12345

Rules in the EM or IM state are candidates to be selected by the DMP. After processing a new digit, the DMP returns a final decision if any of the following conditions holds:

1. All rules are the MM state. DMP returns an error
2. One or more rules are in the EM state with no rules in the IM state. DMP returns the best matched EM rule. If the best matched rule is a barring rule, DMP returns an error instead

Otherwise, DMP starts the short interdigit timer if there is at least one rule in the EM state, or else the long one. When the interdigit timer expires, DMP makes a timely decision by returning the best matched rule at that moment if one is found, or else a timeout error. Again if the best matched rule in this case is a barring rule, DMP returns an error instead. Note that the timer to wait for the first input digit is NOT governed by the interdigit timer, but the duration of dial tone being played and could be a lot lengthier than the long interdigit timer.

The best matched rule is the one that has the most specific literals matching the input digit sequence. For example, the input sequence 1234 matches the rule 123x better than 1xxx. On the other hand, an EM rule is always selected over an IM rule.

Finally, the default interdigit timer can be overridden by appending the S*n* element at the end of the rule (*n* = 0–9).

Let's look at some examples. Consider this simple digit map:

(<1408>xxx xxxx)

As soon as 7 digit have been entered, the DMP returns a complete number by pre-pending the accumulated digits with 1408.

Consider another simple map:

(xx.)

After user dials one or more digits, the DMP returns the accumulated digits as a complete number when the long interdigit timer expires.

Let's combine the last two maps:

(xx. | <1408>xxx xxxx)

After user dials 1 or more digits but less than 7 digits, the DMP would return the accumulated digits as a complete number when the (long) interdigit timer expires. As soon as 7 digits are entered, the DMP would return 1408 followed by the accumulated 7-digit when the (short) interdigit expires. On the 8th digit and beyond, however, the DMP will consider the first rule only and return the accumulated digits as is when the (long) interdigit timer expires.

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Now add a S4 timer to the 2nd rule:

(xx. | <1408>xxx xxxxS4)

In this case the DMP behaves exactly the same as the last, except that the short interdigit timer the DMP uses upon receiving the 7th digit is overridden by a 4s timer; hence the user will have up to 4s instead of 2 to dial the 8th digit.

Forcing Interdigit Timeout With A Pound(#) Key

When dialing, user may force an interdigit timeout with a # key instead of waiting for the DMP to timeout its own long or short timer. This is allowed as long as the # key does not match the current element of any PM rules. Otherwise the # key will be "swallowed" by the DMP instead of triggering a timeout.

Consider the digit map (33xx.)

If the user enters 333#, the DMP will return immediately with the number 333.

Now consider the digit map (33xx.|333#1234x.)

If the user enters 333#, the DMP will not return but continue to wait for further input or its interdigit timer to expire. Note that the first rule "33xx." is now in the MM state since the digit # does not match "x". The user may continue to enter 1234#, or 1234 and wait for a long interdigit timeout for the DMP to successfully return 333#1234.

Invoke Second Dial Tone in Digit Map

You can tell OBi to start a tone after a certain pattern of digits have been dialed by specifying the element {t=<tone>} within a digit map, where <tone> is a 1 to 3-letter name of the tone to play. The tone will stop when the next digit is entered. For example:

(**1{t=di2}(Msp)|**8{t=od}(Mli))

which tells the device to play Second Dial Tone when **1 is dialed, or play Outside Dial Tone when **8 is dialed. Here is a full list of acceptable (case insensitive) values of <tone>:

bu = Busy Tone

cf = Call Forwarded Dial Tone

cm = Confirmation Tone

co = Conference Tone

cw1 – cw10 = Call Waiting Tone 1-10, respectively

di = Dial Tone

di2 = Second Dial Tone

fb = Fast Busy Tone

ho = Holding Tone

od = Outside Dial Tone

pr = Prompt Tone

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rb = Ringback Tone

ro = Reorder Tone (same as fast busy)

si1 – si4 = SIT TONE 1 – 4, respectively

st = Stutter Tone

0 – 9, *, #, a – d = DTMF 0 – 9, *, #, A – D respectively

Change Inter-digit Long Timer Dynamically After Partial Match

The OBi starts off with the inter-digit long timer set to the configured DigitMapLongTimer value when processing a new digit sequence by a digit map. You may change the long timer as some patterns are partially matched by embedding the syntax {L=<time>} within a rule in the digit map, where <time> is the desired number of seconds for the long timer. For example:

(011 853 xxxx xxxx{L=5}x. |xx.)

Here the long timer is shortened to 5s after the user has entered 011 853 + 8 digits. Hence the OBi will declare that a complete number is collected in 5s when no more digits are received. Without the {L=5} syntax the user will have to wait for 10s (by default) for the same to happen.

Note: This feature is not available on the OBi100/OBi110.

User Defined Digit Maps

Starting from release 1.2, there are 10 user definable digit maps available under the User Settings – User Defined Digit Maps section of the device configuration web page. These digit maps are referred to as User Defined Digit Map 1 to 10. Each user defined digit map is specified with 2 parameters:

- Label: An arbitrary string for referencing this digit map in other digit map specification. The value should be 2-16 characters long. For example, “friends”. In this case, (Mfriends) can be referenced in other digit maps, such as PHONE Port::DigitMap
- DigitMap

By default both parameters are empty, except for User Defined Digit Map 1 (see the section below).

A User Defined Digit Map For IPv4 Dialing

The default values of the parameters for User Defined Digit Map 1 are set the following values to support IPv4 Dialing:

- Label: ipd
- Digit Map: (xx.<*:@>xx?x?<*:.>xx?x?<*:.>xx?x?<*:.>xx?x?|

xx.<*:@>xx?x?<*:.>xx?x?<*:.>xx?x?<*:.>xx?x?<*::>xx?x?x?x?)

The map (Mipd) is referenced in the default setting of the DigitMap in ITSP Profile A and B. It supports the following two forms of IPv4 dialing:

a) <user-id>*<a>*<b>*<c>*<d>

b) <user-id>*<a>*<b>*<c>*<d>*<port>

where <user-id> is an arbitrary length numeric user-id, such as 100345, <port> is a port number in the range 0–65535, and each of <a>,<b>,<c>,<d> is a 1-3 digit pattern in the range 1–255 that identifies one byte of an IP address. The dialed

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number will be translated into <user-id>@<a>.<b>.<c>.<d> and <user-id>@<a>.<b>.<c>.<d>:<port> respectively. Here are some examples:

1234*192*168*15*113	maps to 1234@192.168.15.113
123456*192*168*15*180*5061	maps to 123456@192.168.15.180:5061

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Specifications & Environmental Characteristics of the OBi Device

OBi100

General

Brand	Obihai Browse Obihai Devices
Manufacturer	Obihai
Hardware Designer	Obihai Technology, Inc.
Model Name	OBi100
Release Date	March 2011

Microprocessor

Chip Vendor	Obihai SoC
Width of Machine Word	32 bit
Instruction Set	MIPS

FXS SLIC (Subscriber Line Integrated Circuit)

Ringer Specifications	Ring Frequency: 14Hz – 68Hz Ring Waveform: Trapezoidal, Sinusoidal Ring Voltage: 55v – 85v
Maximum Ring Load	5 REN (Ringer Equivalence Number)
FXS (PHONE Port) Configuration Settings	Recursive Digit Map & Associated Outbound Call Routing On-Hook Tip Ring Voltage: 30v – 52v Off-Hook Current Max: 15mA – 45mA Impedance: 12 Independent Settings DTMF Playback Level: -90 dBm – 3dBm Caller ID Method (FSK Bell202, FSK V.23, DTMF FI/SE/DK) Caller ID Trigger (Before / After First Ring, Polarity Reversal) Channel Tx Gain: -12dB – 12dB Channel Rx Gain: -12dB – 12dB Silence Detect Sensitivity Hook--Flash Time Max HookFlash Time Min CPC Delay Time CPC Duration Idle Polarity Connect Polarity

Management – Configuration

Local Access Interface	IVR, Web Page – Password Protected (Admin & User Level Log-in)
Remote Access Interface	Syslog (Multi-Level Granularity), Invokable via SIP Notify, Web, Provisioning
Device Web Page Standard	HTTP v1.1, XML v1.0
Remote Provisioning	XML via TFTP or HTTP, TR069 / TR104
Secure Remote Provisioning	SSL via HTTPS , Encrypted XML via HTTP or TFTP – Dedicated User Name & Password
Secure Remote Firmware Update	Encrypted Binary File via TFTP or HTTP + Dedicated User Name & Password
Customization	OBi-ZT: Obihai Zero-Touch Automatic Customization & Configuration **
Call History (CDRs)	Call Detail Records on OBi Web Page, Export to XML
LED Indications	Power, Device Status, Upgrade Progress Status, Ethernet Actvty, PHONE Status
RTP Statistics	RTP Transport Type Audio Codec Type (Tx/Rx) RTP Packetization - ms (Tx/Rx)

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RTP Statistics Cont…	RTP Packet Count (Tx/Rx) RTP Byte Count (Tx/Rx) Peer Clock Differential Rate - PPM Packets In Jitter Buffer Packets Out-Of-Order Packets Interpolated Packets Late (Dropped) Packets Lost Packet Loss Rate % Packet Drop Rate % Jitter Buffer Length - ms Received Interarrival Jitter - ms DTMF Digits Received Jitter Buffer Underruns Jitter Buffer Overruns Sequence Number Discontinuities Skew Compensation - ms
Session Information	SIP Session Status OBiTALK Status Phone Port Status
Primary SIP Service Set-Up Wizard	Dedicated Device Web Page for Quick ITSP Account Set-Up
System Settings Back-Up / Restore	Save & Restore Configuration via XML file to / from a Local Folder

Security

Local Access Interface	IVR Password
Remote Access Interface	User Name & Password Access via HTTP, TFTP – HTTPS
Device Web Page Standard	HTTP v1.1, XMLv1.0
Secure Remote Provisioning	TFTP, HTTP, HTTPS

Network – Application Details

Data Networking	MAC Address (IEEE 802.3) UDP (RFC 768) TCP (RFC 793) IP version 4 (RFC 791) – Static IP and DHCP Support ICMP (RFC 792) ARP - Address Resolution Protocol RTP (RFC 1889, 1890) RTCP (RFC 1889) DHCP Client (RFC 2131) DiffServ (RFC 2475) – Independently Configured: Service, SIP & Media ToS (RFC 791, 1349) – Independently Configured: Service, SIP & Media VLAN Tagging (802.1p) – Independently Configured: Service, SIP & Media SNTP (RFC 2030) – Primary & Secondary NTP Servers
VoIP	SIPv2 (RFC 3261, 3262, 3263, 3264) SIP over UDP SIP over TCP SIP over TCP with TLS 2 SIP Service Provider Service Sessions – Concurrent Operation 2 XMPP (Google Voice) Sessions 1 OBiTALK Service Session SIP Proxy Redundancy – Local or DNS Based SVR, Primary & Secondary Fallback List Restrict Source IP Address Maximum Number of Sessions – Independent per Service Trunk Groups (4) Voice Gateway – Direct Dialing (8) G.711 A-Law G.711 μ-Law

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VoIP Cont…	G.726 (40/32/24/16) G.729a Codec Pre-selection Code Voice Processing per SIP Service – TX/RX Audio Gain, Echo Cancellation Adjustable Audio Frames per Packet Codec Name Assignment Codec Profile per SIP SP (2) & OBiTALK Service Dynamic Audio Payload Packet Loss Concealment Jitter Buffer (Adaptive) STUN ICE SUBSCRIBE / NOTIFY Framework (RFC 3265) NOTIFY Dialog, Line Status SUBSCRIBE Message Summary VoIP NAT Interworking DATE Header Support ALERT-INFO Header Support Remote-Party-ID (RPID) P-Asserted-Identity (PAID) RTP Statistics in BYE Message Media Loopback Support
Telephony	Configurable Contact List (Inbound Call Routing) Automatic Attendant (English) with Configurable Answer Delay PIN Access Control to AA (Up to 4 PINs) Recursive Digit Map for Call Routing (AA, Phone, Voice Gateways, Trunk Groups) AA Configurable Outbound Call Routing Rule SIP Service Configurable Inbound Call Routing Rule (2) Direct / Single-Stage Dialing (Route to Voice Gateway) Fax Pass Through (G.711) Modem Pass Through (G.711) In-Band DTMF (G.711) Out of Voice Band DTMF (RFC 2833) Out of Voice Band DTMF (INFO Method) Call Progress Tone Generation Tone Profile per SIP SP and OBiTALK service Ring Profile per SIP SP and OBiTALK service Star Code Profile per SIP SP and OBiTALK service Full Duplex Audio G.165, 168 Echo Cancelation VAD – Voice Activity Detection Silence Suppression Comfort Noise Generation Three Way Conference Calling with Local Mixing Hook Flash Event Signaling Flash Hook Timer Caller ID – Name & Number per Bellcore, ETSI and DTMF MWI – Message Waiting Indicator Visual Message Waiting Indication (VMWI) Daylight Savings Time Support – North & South Hemispheres Caller ID Enable /Disable Caller ID Number Caller ID Name (Alphanumeric) Call Waiting Maximum Session Control Call Forward - Unconditional Call Forward on Busy Call Forward on No Answer (Ring Count Configurable) Call Transfer Enable / Disable Anonymous Call Block

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	Anonymous Call Do Not Disturb Call Return Repeat Dialing
Call Progress Tones	Configurable Call Progress Tone Call Progress Tone Profiles (2) Dial Tone Busy Tone Ringback Tone Reorder Tone Confirmation Tone Holding Tone Second Dial Tone Stutter Tone Howling Tone Prompt Tone Call Forwarded Tone Conference Tone SIT Tones (1-4) Ringing & Call Waiting Tone Configuration Ring Patterns (10) - Configurable Call Waiting Tone Patterns (10) - Configurable Call Waiting Tone Pattern Profiles (2)
Star Code Configuration	Configurable Start Codes Star Code Profiles (2) Redial Call Return Activate Block Caller ID Deactivate Block Caller ID Block Caller ID Once Unblock Caller ID Once Activate Call Forwarding (All Calls) Deactivate Call Forwarding (All Calls) Activate Call Forward on Busy Deactivate Call Forward on Busy Activate Call Forward on No Answer Deactivate Call Forward on No Answer Activate Block Anonymous Calls Deactivate Block Anonymous Calls Activate Call Waiting Deactivate Call Waiting Activate Do Not Disturb Deactivate Do Not Disturb Activate Repeat Dial Deactivate Repeat Dial

Interfaces & Indicator Lights

Internet (WAN)	1 x 10/100BaseT Ethernet Port (802.3)
Phone (FXS)	1 x RJ-11 FXS Analog Phone Port
Reset Button	Yes – Located on Bottom of Case
LEDs	3 – Power + Status, Ethernet Activity, Phone
LED Indications	Power On, Device Status, Upgrade in Progress Status, Packet RX/TX, Phone Port Status

Certifications

FCC Part 15	Yes – Class B
A-Tick	Yes
CE	Yes

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ICES-003	Yes
RoHS	Yes
WEEE	Yes
UL/cUL	Yes – Power Adapter

Environmental

Operating Temperature	0º to 45º C (32º to 113º F)
Storage Temperature	-25º to 85º C (-13º to 185º F)
Operating Humidity	10% to 90% Non-condensing
Non-operating Humidity	10% to 90% Non-condensing

Physical Attributes

Dimensions: (width x depth x height)	6.5 x 9.0 x 2.2 centimetres 2.6 x 3.5 x 0.9 inches
Unit Weight:	200 grams / 7 ounces
Shipping Weight	312 grams / 12 ounces (Including Power Supply, Cable and Packaging)
Mounting	Desktop Mountable

Power Supply

Type	Universal Switching with Fixed US, EU, UK or AU Style Plug Prongs (Model Dependent)
Input Power	AC Input: 100 to 240 Volts 0.3A 50-60Hz (26-34 VA)
Output Power	DC: +12V 1.0 Amp Max

Carton Specifications

Units Per Carton	20 Units
Carton Dimensions (width x depth x height)	43.2 x 25.4 x 21.6 centimetres 17 x 10 x 8.5 inches
Carton Weight	6.4 Kilograms / 14 pounds
Cartons Per Std. 20 / 40 ft Container	1,170 / 2,430 Cartons – Non-palletized

Miscellaneous

Requirements	Active Internet Connection Analog Touch Tone Phone Access to Internet Via a Switched Ethernet Port on Home or Office Router (Optional) Active Internet Phone Service Subscription with All Required SIP Credentials to Make & Receive Calls
Documentation	Quick Start / Installation Guide User / Administrative Guide Implementation Guide for Service Providers **
Package Contents	OBi100 Voice Service Bridge and Telephone Adapter Power Adapter 1 x RJ-45 Ethernet Cable (80 inches / 203 centimeters) Quick Start / Installation Guide
Warranty	1-Year Hardware (Limited)
Engineering & Design Location	California, USA
Country of Origin	China
HST Code	8517.62.00
Data Sheet State	All content subject to change. This data sheet is not a warranty.
Data Sheet Version	140911.100.1

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OBi110

General

Brand	Obihai Browse Obihai Devices
Manufacturer	Obihai
Hardware Designer	Obihai Technology, Inc.
Model Name	OBi110
Release Date	November 2010

Microprocessor

Chip Vendor	Obihai SoC
Width of Machine Word	32 bit
Instruction Set	MIPS

FXS SLIC (Subscriber Line Integrated Circuit) & FXO Subsystem

Ringer Specifications	Ring Frequency: 14Hz – 68Hz Ring Waveform: Trapezoidal, Sinusoidal Ring Voltage: 55v – 85v
Maximum Ring Load	5 REN (Ringer Equivalence Number)
FXS (PHONE Port) Configuration Settings	Recursive Digit Map & Associated Outbound Call Routing On-Hook Tip Ring Voltage: 30v – 52v Off-Hook Current Max: 15mA – 45mA Impedance: 12 Independent Settings DTMF Playback Level: -90 dBm – 3dBm Caller ID Method (FSK Bell202, FSK V.23, DTMF FI/SE/DK) Caller ID Trigger (Before / After First Ring, Polarity Reversal) Channel Tx Gain: -12dB – 12dB Channel Rx Gain: -12dB – 12dB Silence Detect Sensitivity Hook--Flash Time Max HookFlash Time Min CPC Delay Time CPC Duration Idle Polarity Connect Polarity
FXO (LINE Port) Configuration Settings	Recursive Digit Map & Associated Inbound Call Routing Ring Delay Detect CPC CPC Time Threshold Detect Polarity Reversal Detect Far End Long Silence Detect Near End Long Silence Silence Detect Sensitivity Silence Time Threshold Detect Disconnect Tone Disconnect Tone Pattern – Programmable AC Impedance: 16 Settings On-Hook Speed: 0.5ms, 3ms (ETSI), 26 (AU) Tip-Ring Voltage: 3.1v, 3.2v, 3.35v, 3.5v Min Operational Loop Current: 10mA, 12mA, 14mA, 16mA Current Limiting Enable Channel Tx Gain Channel Rx Gain Line In-Use Voltage Threshold Line In-Use Current Threshold

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	Caller ID Detect Method: FSK (Bell 202), FSK (V.23), DTMF (FI, SE, DK) DTMF Playback Level
FXO (LINE Port) Ring Detection	Ring Detection Ring Frequency Min Ring Frequency Max Ring Threshold: 40.50-49.50 Vrms, 19.35-23.65 Vrms, 13.50-16.50 Vrms Ring Validation Time: 8 Settings Ring Indication Delay Time: 8 Settings Ring Timeout: 15 Settings Ringer Impedance: High, Synthesized

Management – Configuration

Local Access Interface	IVR, Web Page – Password Protected (Admin & User Level Log-in)
Remote Access Interface	Syslog (Multi-Level Granularity), Invokable via SIP Notify, Web, Provisioning
Device Web Page Standard	HTTP v1.1, XML v1.0
Remote Provisioning	XML via TFTP or HTTP, TR069 / TR104
Secure Remote Provisioning	SSL via HTTPS , Encrypted XML via HTTP or TFTP – Dedicated User Name & Password
Secure Remote Firmware Update	Encrypted Binary File via TFTP or HTTP + Dedicated User Name & Password
Customization	OBi-ZT: Obihai Zero-Touch Automatic Customization & Configuration **
Call History (CDRs)	Call Detail Records on OBi Web Page, Export to XML
LED Indications	Power, Device Status, Upgrade in Progress Status, Ethernet Activity, PHONE Port Status, LINE Port Status
RTP Statistics	RTP Transport Type Audio Codec Type (Tx/Rx) RTP Packetization - ms (Tx/Rx) RTP Packet Count (Tx/Rx) RTP Byte Count (Tx/Rx) Peer Clock Differential Rate - PPM Packets In Jitter Buffer Packets Out-Of-Order Packets Interpolated Packets Late (Dropped) Packets Lost Packet Loss Rate % Packet Drop Rate % Jitter Buffer Length - ms Received Interarrival Jitter - ms DTMF Digits Received Jitter Buffer Underruns Jitter Buffer Overruns Sequence Number Discontinuities Skew Compensation - ms
Session Information	SIP Session Status OBiTALK Status Phone Port Status Line Port Status
Primary SIP Service Set-Up Wizard	Dedicated Device Web Page for Quick ITSP Account Set-Up
System Settings Back-Up / Restore	Save & Restore Configuration via XML file to / from a Local Folder

Security

Local Access Interface	IVR Password
Remote Access Interface	User Name & Password Access via HTTP, TFTP – HTTPS
Device Web Page Standard	HTTP v1.1, XMLv1.0
Secure Remote Provisioning	TFTP, HTTP, HTTPS

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Network – Application Details

Data Networking	MAC Address (IEEE 802.3) UDP (RFC 768) TCP (RFC 793) IP version 4 (RFC 791) – Static IP and DHCP Support ICMP (RFC 792) ARP - Address Resolution Protocol RTP (RFC 1889, 1890) RTCP (RFC 1889) DHCP Client (RFC 2131) DiffServ (RFC 2475) – Independently Configured: Service, SIP & Media ToS (RFC 791, 1349) – Independently Configured: Service, SIP & Media VLAN Tagging (802.1p) – Independently Configured: Service, SIP & Media SNTP (RFC 2030) – Primary & Secondary NTP Servers
VoIP	SIPv2 (RFC 3261, 3262, 3263, 3264) SIP over UDP SIP over TCP SIP over TCP with TLS 2 SIP Service Provider Service Sessions – Concurrent Operation 2 XMPP (Google Voice) Sessions 1 OBiTALK Service Session SIP Proxy Redundancy – Local or DNS Based SVR, Primary & Secondary Fallback List Restrict Source IP Address Fail-over to FXO on Primary and/or Secondary SP Reg Failure - Selectable Maximum Number of Sessions – Independent per Service Trunk Groups (4) Voice Gateway – Direct Dialing (8) G.711 A-Law G.711 μ-Law G.726 (40/32/24/16) G.729a Codec Pre-selection Code Voice Processing per SIP Service – TX/RX Audio Gain, Echo Cancellation Adjustable Audio Frames per Packet Codec Name Assignment Codec Profile per SIP SP (2) & OBiTALK Service Dynamic Audio Payload Packet Loss Concealment Jitter Buffer (Adaptive) STUN ICE SUBSCRIBE / NOTIFY Framework (RFC 3265) NOTIFY Dialog, Line Status SUBSCRIBE Message Summary VoIP NAT Interworking DATE Header Support ALERT-INFO Header Support Remote-Party-ID (RPID) P-Asserted-Identity (PAID) RTP Statistics in BYE Message Media Loopback Support
Telephony	Configurable Contact List (Inbound Call Routing) Automatic Attendant (English) with Configurable Answer Delay PIN Access Control to AA (Up to 4 PINs) Recursive Digit Map for Call Routing (AA, Line, Phone, Voice Gateways, Trunk Groups) AA Configurable Outbound Call Routing Rule

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	SIP Service Configurable Inbound Call Routing Rule (2) Direct / Single-Stage Dialing (Route to Voice Gateway) Fax Pass Through (G.711) Modem Pass Through (G.711) In-Band DTMF (G.711) Out of Voice Band DTMF (RFC 2833) Out of Voice Band DTMF (INFO Method) Call Progress Tone Generation Tone Profile per SIP SP and OBiTALK service Ring Profile per SIP SP and OBiTALK service Star Code Profile per SIP SP and OBiTALK service Full Duplex Audio G.165, 168 Echo Cancelation VAD – Voice Activity Detection Silence Suppression Comfort Noise Generation Three Way Conference Calling with Local Mixing Hook Flash Event Signaling Flash Hook Timer Caller ID – Name & Number per Bellcore, ETSI and DTMF MWI – Message Waiting Indicator Visual Message Waiting Indication (VMWI) Daylight Savings Time Support – North & South Hemispheres Caller ID Enable /Disable Caller ID Number Caller ID Name (Alphanumeric) Call Waiting Maximum Session Control Call Forward - Unconditional Call Forward on Busy Call Forward on No Answer (Ring Count Configurable) Call Transfer Enable / Disable Anonymous Call Block Anonymous Call Do Not Disturb Call Return Repeat Dialing
Call Progress Tones	Configurable Call Progress Tone Call Progress Tone Profiles (2) Dial Tone Busy Tone Ringback Tone Reorder Tone Confirmation Tone Holding Tone Second Dial Tone Stutter Tone Howling Tone Prompt Tone Call Forwarded Tone Conference Tone SIT Tones (1-4) Ringing & Call Waiting Tone Configuration Ring Patterns (10) - Configurable Call Waiting Tone Patterns (10) - Configurable Call Waiting Tone Pattern Profiles (2)
Star Code Configuration	Configurable Start Codes Star Code Profiles (2) Redial

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	Call Return Activate Block Caller ID Deactivate Block Caller ID Block Caller ID Once Unblock Caller ID Once Activate Call Forwarding (All Calls) Deactivate Call Forwarding (All Calls) Activate Call Forward on Busy Deactivate Call Forward on Busy Activate Call Forward on No Answer Deactivate Call Forward on No Answer Activate Block Anonymous Calls Deactivate Block Anonymous Calls Activate Call Waiting Deactivate Call Waiting Activate Do Not Disturb Deactivate Do Not Disturb Activate Repeat Dial Deactivate Repeat Dial

Interfaces & Indicator Lights

Internet (WAN)	1 x 10/100BaseT Ethernet Port (802.3)
Phone (FXS)	1 x RJ-11 FXS Analog Phone Port
Line (FXO)	1 x RJ-11 FXO Analog Line Port
Reset Button	Yes – Located on Bottom of Case
LEDs	4 – Power + Status, Ethernet Activity, Phone, Line
LED Indications	Power On, Device Status, Upgrade in Progress Status, Packet RX/TX, Phone Port Status (Enabled, In-Use), Line Port Status (Enabled, In-Use)

Certifications

FCC Part 15	Yes – Class B
FCC Part 68	Yes – FCC ID: OBIITO.OBOBI110
A-Tick	Yes
CE	Yes
ICES-003	Yes
RoHS	Yes
WEEE	Yes
UL/cUL	Yes – Power Adapter

Environmental

Operating Temperature	0º to 45º C (32º to 113º F)
Storage Temperature	-25º to 85º C (-13º to 185º F)
Operating Humidity	10% to 90% Non-condensing
Non-operating Humidity	10% to 90% Non-condensing

Physical Attributes

Dimensions (width x depth x height)	11.5 x 11.0 x 3.0 centimetres 4.5 x 4.2 x 1.2 inches
Unit Weight	255 grams / 9 ounces
Shipping Weight	400 grams / 14 ounces (Including Power Supply, Cables and Packaging)
Mounting	Desktop or Wall Mountable

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Power Supply

Type	Universal Switching with Fixed US, EU, UK or AU Style Plug Prongs (Model Dependent)
Input Power	AC Input: 100 to 240 Volts 0.3A 50-60Hz (26-34 VA)
Output Power	DC: +12V 1.0 Amp Max

Carton Specifications

Units Per Carton	20 Units
Carton Dimensions (width x depth x height)	48.0 x 29.0 x 29.0 centimetres 19.0 x 11.4 x 11.4 inches
Carton Weight	8.6 Kilograms / 19 pounds
Cartons Per Std. 20 / 40 ft Container	768 / 1,613 Cartons – Non-palletized

Miscellaneous

Requirements	Active Internet Connection Analog Touch Tone Phone Access to Internet Via a Switched Ethernet Port on Home or Office Router (Optional) Access to an Analog Telephone (POTS) Line. (Optional) Active Internet Phone Service Subscription with All Required SIP Credentials to Make & Receive Calls
Documentation	Quick Start / Installation Guide User / Administrative Guide Implementation Guide for Service Providers **
Package Contents	OBi110 Voice Service Bridge and Telephone Adapter Power Adapter 1 x RJ-45 Ethernet Cable (80 inches / 203 centimeters) 1 x RJ-11 Telephone Cable (45 inches / 113 centimeters) Quick Start / Installation Guide
Warranty	1-Year Hardware (Limited)
Engineering & Design Location	California, USA
Country of Origin	China
HST Code	8517.62.00
Data Sheet State	All content subject to change. This data sheet is not a warranty.
Data Sheet Version	140911.110.1

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OBi202 / OBi302

General

Brand	Obihai Browse Obihai Devices
Manufacturer	Obihai
Hardware Designer	Obihai Technology, Inc.
Model Name	OBi202 / OBi302
Release Date	April 2012 / June 2012

Microprocessor

Width of Machine Word	32 bit
Instruction Set	ARM

FXS SLIC (Subscriber Line Integrated Circuit): Phone 1 / Phone 2

Ringer Specifications	Ring Frequency: 14Hz – 68Hz Ring Waveform: Trapezoidal, Sinusoidal Ring Voltage: 55v – 85v
Maximum Ring Load	5 REN (Ringer Equivalence Number)
FXS (PHONE Port) Configuration Settings	Recursive Digit Map & Associated Outbound Call Routing On-Hook Tip Ring Voltage: 30v – 52v Off-Hook Current Max: 15mA – 45mA Impedance: 12 Independent Settings DTMF Playback Level: -90 dBm – 3dBm Caller ID Method: Bellcore, ETSI (FSK or DTMF) Caller ID Trigger (Before / After First Ring, Polarity Reversal) Channel Tx Gain: -12dB to 6 dB at 1 dB Resolution Channel Rx Gain: 12dB to 6 dB at 1 dB Resolution Silence Detect Sensitivity Hook Flash Time Max Hook Flash Time Min CPC Delay Time CPC Duration Idle Polarity Connect Polarity

Management – Configuration

Local Access Interface	IVR, Web Page – Password Protected (Admin & User Level Log-in)
Remote Access Interface	Syslog (Multi-Level Granularity), Invokable via SIP Notify, Web, Provisioning
Device Web Page Standard	HTTP v1.1, XML v1.0
Remote Provisioning	XML via TFTP or HTTP, TR069 / TR104
Secure Remote Provisioning	SSL via HTTPS , Encrypted XML via HTTP or TFTP – Dedicated User Name & Password
Secure Remote Firmware Update	Encrypted Binary File via TFTP or HTTP + Dedicated User Name & Password
Customization	OBi-ZT: Obihai Zero-Touch Automatic Customization & Configuration **
Call History (CDRs)	Call Detail Records on OBi Web Page, Export to XML
LED Indications	Power, Device Status, Upgrade Progress Status, Ethernet Activity, PHONE Status
RTP Statistics	RTP Transport Type Audio Codec Type (Tx/Rx) RTP Packetization - ms (Tx/Rx) RTP Packet Count (Tx/Rx) RTP Byte Count (Tx/Rx) Peer Clock Differential Rate - PPM Packets In Jitter Buffer Packets Out-Of-Order

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	Packets Interpolated Packets Late (Dropped) Packets Lost Packet Loss Rate % Packet Drop Rate % Jitter Buffer Length - ms Received Interarrival Jitter - ms DTMF Digits Received Jitter Buffer Underruns Jitter Buffer Overruns Sequence Number Discontinuities Skew Compensation - ms
Session Information	SIP Session Status OBiTALK Status Phone Port Status (Phone 1 and Phone 2)
Primary SIP Service Set-Up Wizard	Dedicated Device Web Page for Quick ITSP Account Set-Up
System Settings Back-Up / Restore	Save & Restore Configuration via XML file to / from a Local Folder

Security

Local Access Interface	IVR Password
Remote Access Interface	User Name & Password Access via HTTP, TFTP – HTTPS
Device Web Page Standard	HTTP v1.1, XMLv1.0
Secure Remote Provisioning	TFTP, HTTP, HTTPS

Network – Application Details

Data Networking	MAC Address (IEEE 802.3) UDP (RFC 768) TCP (RFC 793) IP version 4 (RFC 791) – Static IP and DHCP Support ICMP (RFC 792) ARP - Address Resolution Protocol Domain Name System (DNS) A Records (RFC 1706) & SRV Records (RFC 2782) RTP (RFC 1889, 1890) RTCP (RFC 1889) DHCP Client (RFC 2131) LAN (Computer) Port May be Configured as a Router or Bridge DHCP Server (RFC 2131) DHCP Client Reservation PPPoE (Point-to-Point Protocol over Ethernet) client (RFC 2516) MAC Address Cloning Port Forwarding DiffServ (RFC 2475) – Independently Configured: Service, SIP & Media ToS (RFC 791, 1349) – Independently Configured: Service, SIP & Media VLAN Tagging (802.1p) – Independently Configured: Service, SIP & Media SNTP (RFC 2030) – Primary & Secondary NTP Servers Firewall with: - DRDOS Attack Protection - VPN Pass Through - NAT Redirection DMZ Mode QoS Features - Upstream Data Rate Allocation - Highest Priority (Voice) Bandwidth Allocation - Priority Class Assignments (4) for Bandwidth Allocation - DiffServ Code Point (DSCP) to Priority Class Mapping VPN Pass-Thru - IPsec ESP (IP Security encapsulating security payload)

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	- PPTP (Point-to-Point Tunneling Protocol) - L2TP (Layer 2 Tunneling Protocol)
VoIP	Four (4) Service Provider Configuration Profile Assignments (ITSP 1-4) Four (4) Service /Trunk Subscription Profile Assignments (SP 1-4) SIPv2 (RFC 3261, 3262, 3263, 3264) SIP over UDP SIP over TCP SIP over TCP with TLS 4 SIP Service Provider Service Sessions – Concurrent Operation 4 XMPP (Google Voice) Sessions (OBi202 Only) 2 OBiTALK Service Session SIP Proxy Redundancy – Local or DNS Based SVR, Primary & Secondary Fallback List Restrict Source IP Address Maximum Number of Sessions – Independent per Service Trunk Groups (4) Voice Gateway – Direct Dialing (8) G.711 A-Law (64 kbps) G.711 µ-Law (64 kbps) G.726 (32 kbps) G.729a (8 kbps) iLBC (13.3, 15.2 kbps) Codec Pre-selection Code Voice Processing per SIP Service – TX/RX Audio Gain, Echo Cancellation Adjustable Audio Frames per Packet Codec Name Assignment Codec Profile per SIP SP (2) & OBiTALK Service Dynamic Audio Payload Packet Loss Concealment Jitter Buffer (Adaptive) STUN ICE SUBSCRIBE / NOTIFY Framework (RFC 3265) NOTIFY Dialog, Line Status SUBSCRIBE Message Summary VoIP NAT Interworking DATE Header Support Remote-Party-ID (RPID) P-Asserted-Identity (PAID) RTP Statistics in BYE Message Media Loopback Support
Telephony	Configurable Contact List (Inbound Call Routing) Automatic Attendant (English) with Configurable Answer Delay PIN Access Control to AA (Up to 4 PINs) Recursive Digit Map for Call Routing (AA, Phone, Voice Gateways, Trunk Groups) AA Configurable Outbound Call Routing Rule SIP Service Configurable Inbound Call Routing Rule (2) Direct / Single-Stage Dialing (Route to Voice Gateway) Fax Pass Through (G.711) T.38 Fax Relay for Real-Time Fax over IP Modem Pass Through (G.711) In-Band DTMF (G.711) Out of Voice Band DTMF (RFC 2833) Out of Voice Band DTMF (INFO Method) Call Progress Tone Generation Tone Profile per SIP SP and OBiTALK service Ring Profile per SIP SP and OBiTALK service Star Code Profile per SIP SP and OBiTALK service Full Duplex Audio G.165, 168 Echo Cancelation VAD – Voice Activity Detection

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	Silence Suppression Comfort Noise Generation Three Way Conference Calling with Local Mixing Hook Flash Event Signaling Flash Hook Timer Caller ID – Name & Number per Bellcore, ETSI and DTMF MWI – Message Waiting Indicator Visual Message Waiting Indication (VMWI) Daylight Savings Time Support – North & South Hemispheres Caller ID Enable /Disable Caller ID Number Caller ID Name (Alphanumeric) Call Waiting Maximum Session Control Call Forward - Unconditional Call Forward on Busy Call Forward on No Answer (Ring Count Configurable) Call Transfer Enable / Disable Anonymous Call Block Anonymous Call Do Not Disturb Call Return Repeat Dialing
Call Progress Tones	Configurable Call Progress Tone Call Progress Tone Profiles (2) Dial Tone Busy Tone Ringback Tone Reorder Tone Confirmation Tone Holding Tone Second Dial Tone Stutter Tone Howling Tone Prompt Tone Call Forwarded Tone Conference Tone SIT Tones (1-4) Ringing & Call Waiting Tone Configuration Ring Patterns (10) - Configurable Call Waiting Tone Patterns (10) - Configurable Call Waiting Tone Pattern Profiles (2)
Star Code Configuration	Configurable Start Codes Star Code Profiles (2) Redial Call Return Activate Block Caller ID Deactivate Block Caller ID Block Caller ID Once Unblock Caller ID Once Activate Call Forwarding (All Calls) Deactivate Call Forwarding (All Calls) Activate Call Forward on Busy Deactivate Call Forward on Busy Activate Call Forward on No Answer Deactivate Call Forward on No Answer Activate Block Anonymous Calls Deactivate Block Anonymous Calls Activate Call Waiting Deactivate Call Waiting

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	Activate Do Not Disturb Deactivate Do Not Disturb Activate Repeat Dial Deactivate Repeat Dial

Interfaces & Indicator Lights

Internet (WAN)	1 x 10/100BaseT Ethernet Port (802.3)
LAN	1 x 10/100BaseT Ethernet Port (802.3)
Phone (FXS)	2 x RJ-11 FXS Analog Phone Port
USB	USB 2.0
Reset Button	Yes – Located on Bottom of Case
LEDs	5 – Power/Status, Ethernet Activity (WAN), Ethernet Activity (LAN), Phone 1, Phone 2
LED Indications	Power On, Status, Upgrade in Progress Status, Packet RX/TX, Phone Port Status

Certifications

FCC Part 15	Yes – Class B
A-Tick	Future
CE	Yes
ICES-003	Yes
RoHS	Yes
WEEE	Yes
UL/cUL	Yes – Power Adapter

Environmental

Operating Temperature	0º to 45º C (32º to 113º F)
Storage Temperature	-25º to 85º C (-13º to 185º F)
Operating Humidity	10% to 90% Non-condensing
Non-operating Humidity	10% to 90% Non-condensing

Physical Attributes

Dimensions: (width x depth x height)	10.5 cm x 11.4 cm x 3.0 cm 4.1 in x 4.5 in x 1.2 in
Unit Weight:	255 grams / 9 ounces
Shipping Weight	390 grams / 14 ounces (Including Power Supply, Ethernet Cable and Packaging)
Mounting	Wall & Desktop Mountable

Power Supply

Type	Universal Switching with Fixed US, EU, UK Style Plug Prongs (Model Dependent)
Input Power	AC Input: 100 to 240 Volts 0.3A 50-60Hz (26-34 VA)
Output Power	DC: +12V 1.0 Amp Max

Carton Specifications

Units Per Carton	20 Units
Carton Dimensions	36.0 cm x 33.0 cm x 26.8 cm – 14.2 in x 13 in x 10.5 in
Carton Weight	8.2 Kilograms / 18 pounds
Cartons Per Std. 20 / 40 ft Container	896 / 1,848 Cartons – Non-palletized

Miscellaneous

Requirements	Active Internet Connection

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	Analog Touch Tone Phone Access to Internet Via a Switched Ethernet Port on Home or Office Router (Optional) Active Internet Phone Service Subscription with All Required SIP Credentials to Make & Receive Calls
Documentation	Quick Start / Installation Guide User / Administrative Guide Implementation Guide for Service Providers **
Package Contents	OBi202 Voice Service Bridge and Telephone Adapter Power Adapter 1 x RJ-45 Ethernet Cable (80 inches / 203 centimeters) Quick Start / Installation Guide
Warranty	1-Year Hardware (Limited)
Engineering & Design Location	California, USA
HST Code	8517.62.00
Data Sheet State	All content subject to change. This data sheet is not a warranty.
Data Sheet Version	100411.202.2

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