
Oxygen *hybridPBX* series



Ethernet / SFP / xDSL WAN
Ethernet Switch LAN
IP-PBX/SBG functionality
VoIP Phone support
FXS, FXO Analog Voice
BRI, PRI ISDN Voice
DECT base-station
WiFi 802.11n / ac, dual-band
USB Host
3G/4G Voice Module
PoE for VoIP Phones
Embedded Smart Battery

Oxygen *hybrid*PBX is a platform designed to meet the unique voice and data requirements of the SOHO and SME market.

Based on the Linux OS, it provides IP-enabled PBX functionality with voice features usually met in big enterprise PBXs:

- Full set of supplementary services (Hold, Call Waiting, Transfer, 3-Party Call, Park, Restrictions, ...)
- Very flexible Auto-Attendant application with recorded messages that offer touch-tone choices to outside callers and connect them to local extensions
- DECT base-station for multiple handsets, with separate extension number for each handset
- Personal voice mail with e-mail notifications and conversion of messages to e-mail attachments
- Support for external IP phones, both wired and WiFi, local and remote, with auto-configuration mechanisms



also data-routing functionality with different WAN access options (Ethernet, SFP, xDSL). Adding to this the flexibility for both PSTN (FXS, FXO) and ISDN (BRI, PRI) interfaces and the full support for remote management and troubleshooting, makes the Oxygen *hybrid*PBX a future-proof platform capable of supporting operator-managed telephony services over both current and future broadband networks.

The Oxygen *hybrid*PBX is, however, not only a PBX. It offers

Technical Specifications

Network Interfaces

WAN Access Options

- 1/2 x VDSL1, VDSL2, VDSL2-Vplus (up to 35b) G.993.2 (VDSL2), G.993.1-2004 (VDSL)
- G.INP (G.998.4), ANSI T1.424-2004
- ETSI TS 101 270-1 and TS 101 270-2
- G.992.x (auto ADSL2+, ADSL2, ADSL fallback)
- 8a, 8b, 8c, 8d, 12a, 12b, 17a, 30a, 35b, G.fast*
- and/or
- 1/2/4 x G.SHDSL G.991.2.bis
- and/or
- 1 x 10/100/1000 BaseT, Auto-MDIX
- and/or
- 1 x GPON G.983.1/2/3/4/5, G.984.1/2/3/4, 2.5/1.24Gbps, 1490/1310nm +
- 1 x CATV 75Ω interface 1550-1560nm
- and/or
- 1 x SFP slot for FTTH (Ethernet, GPON, G.fast)
- and/or
- 1 x internal LTE/HSPA+ module, Cat4 or Cat6
- GPRS/EDGE/HSPA+/DC-HSPA+/LTE

LAN Interface Options

- 2/4/8 x Ethernet ports (10/100/1000 BaseT, Auto-MDIX) with 802.3af PoE (optional)
- 802.11b/g/n 2.4GHz MIMO (2x2 or 3x3)
- and/or
- 802.11a/ac 5 GHz MIMO (2x2, 3x3 or 4x4), external antennas
- 2 x USB Host (master) interfaces
- Internal Hard-Disk (field-upgradeable)

Voice Interface Options

- 8/16 x FXS phone ports,
- 5 REN, ringing voltage: min 42 V rms (sine)
- Maximum loop length: > 100m
- Software configured impedance, loop voltage, loop current, ringing frequency
- 2/4/8 x FXO PSTN port
- 4/8 x ISDN BRI, progr. NT or TE mode
- 1/2 x ISDN PRI, progr. NT or TE mode
- ISDN external synchronization port
- ISDN power feeding 1/2W
- DECT support for up to 6 handsets, Cat-iq ready

Routing/Bridging

- RFC 2516 PPPoE
- Per-VLAN Queuing and Traffic Shaping
- VLAN-to-Service mapping support
- 802.1d bridging, 802.1q VLAN, Private VLANs
- RIP v1/v2, OSPF*, BGP*, Static Routing
- DHCP Client/Server/Relay
- SNTP Client/Server
- IPv6 support (dual-stack, DS-lite, MAP-T, MAP-E)
- NAT, PAT and DNS relay agent
- IGMP v1/2/3, proxy, snooping
- IP QoS (ToS/DSCP), Ethernet QoS (802.1p/q CoS)

- Queuing, rate limitation, fragmentation
- Low latency handling of VoIP/Video services
- Multihoming, Load-balancing, 3G/4G backup
- Multilink PPP
- Dynamic DNS
- Multiple WLAN SSIDs, WLAN Captive Portal
- Radius Server
- PPP Server / Proxy
- VRRP

Telephony Options

Embedded IP-PBX

- SIP, H.323 (optional), MGCP (optional)
- Full IP-PBX functionality
- Individual number per FXS port & DECT handset
- Automatic provisioning of external VoIP phones
- Automatic fallback to PSTN/ISDN/FXO/3G/4G upon WAN or VoIP service failure
- SIP Trunking, Media Gateway functionality

Smart Battery Backup > 1h operation (optional)

Speech Codecs

- G.711 A-law & u-law, G.726-32*, GSM*, G.729ab*, G.723.1*, G.722*, AMR*
- Packet Loss Concealment, VAD / CNG
- Adaptive Dynamic Jitter Buffer
- G.168, variable tail length echo cancellation

Fax/modem

- Fax/modem tone detection & codec switching
- G.711 pass-through, T.38 fax-relay

DTMF support

- According to ETSI ES 201235-3
- RFC 2833 / RFC 2976 relay

Supplementary services

- Country specific tones and suppl. service codes
- Call Forward (Unconditional, Busy, No Answer)
- Call Hold, Call Waiting, Call Park
- Message Waiting Indication (with LED)
- Call Transfer (Blind, with Consultation)
- 3-Party Call
- Anonymous Call Block, Black List, DND
- CLIP (DTMF and FSK), CLIR
- Line Hunting, Hunt Groups
- Voice Prompts
- Advice of Charge (FXS 12/16KHz, ISDN AOC)
- RFC 4040, Unrestricted Digital ISDN Call

Dial-plan

- Web based control of call-routing
- Abbreviated-Dialing (Speed-Dialing) numbers
- Call Detail Records (CDR)
- MSN / DDI / IVR support
- Built in answering machine (optional)

- Unified Voice Mail: e-mail, wav-format (optional)
- Emergency call routing
- PIN for call access-control

Security

- Enhanced policy-based and SPI firewall
- Standard and Extended Access Lists
- URL Filter, Virtual Server, DMZ
- MAC filtering
- VPN IPsec*, TLS/SSL OpenVPN, L2TP, L2TPv3*, PPTP*, GRE, VPN pass-through
- WLAN: WEP 64/128-bit, WPA, WPA2, 802.1x, WPS

Management

- DSL Forum TR-069, TR-098, TR-104, TR-181
- Multilevel Web-based graphical user interface
- Embedded modem for remote dial-in (optional)
- SSH/Telnet remote access to CLI
- Local RJ45 console port
- SNMP v1/2c/3
- EFM 802.3ah* OAM
- Automatic LAN device detection and provision
- Diagnostic and performance monitoring
- Connection test (end-user), ping, traceroute
- Local management through telephone
- Remote management through SMS*
- E-mail / SMS alerts
- Syslog with network support
- Packet capturing (sniffer)
- Configuration backup and restore
- Zero-touch deployment mechanism
- Automatic remote firmware upgrades
- Dual firmware image support
- WiFi Protected Setup (WPS), WDS
- UPnP IGD, NAT-PMP
- Wake on LAN
- Time-of-day Schedule, Paternal control

USB Services

- Print Server support
- File Server support (FTP, SMB/CIFS)
- UPnP Media Server support
- Data-backup through external LTE modem

Additional specifications

- Flash/RAM: 128MB-1GB / 128MB-1GB
- Functional LED indicators
- Power on/off switch, Factory reset pin
- External power adaptor: 12V DC, 2 or 3A / 90-240V AC, 50-60Hz
- or
- Embedded 802.3af PoE module, with external power adaptor: 52V DC, 2A
- Temperature: 0 to 45°C (oper.), -20 to 70°C (stor.)
- Humidity (non-cond.): 10-90% (oper.), 5-95% (stor.)
- Dimensions: 249x168x42mm
- CE Mark, IEC 60950, EN 60950, K.21, RoHS

(*) Optional