
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
WiFi 802.11n/ac/ax, dual-band
USB Host
4G/5G Internal Module
PoE for VoIP Phones
Embedded Smart Battery

Oxygen *hybridPBX* 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**
- **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**

The Oxygen *hybridPBX* is, however, not only a PBX. It offers also data-routing functionality with different WAN access options (Ethernet, SFP, xDSL, 4G/5G). 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 *hybridPBX* a future-proof platform capable of supporting operator-managed telephony services over both current and future broadband networks.

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 x 10/100/1000/2500 BaseT, Auto-MDIX and/or
- 1 x SFP slot for FTTH (Ethernet, GPON, G.fast) and/or
- 1 x internal LTE/HSPA+ module, Cat.4 or Cat.6 or Cat.12 - GPRS/EDGE/HSPA+/DC-HSPA+/LTE and/or
- 1 x internal 5G/LTE/HSPA+ module, Sub-6 GHz, NSA and SA modes

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 or 4x4)
- 802.11ac 5GHz MIMO (2x2 or 3x3 or 4x4) or
- 802.11ax 2.4/5GHz MIMO (2x2 or 4x4)
- WiFi on/off switch, WPS button
- external antennas
- 2 x USB Host (master) interfaces
- Internal Hard-Disk (optional, 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

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, mobile backup
- Multilink PPP, PPP Server / Proxy
- Dynamic DNS
- Multiple WLAN SSIDs, WLAN Captive Portal
- Radius Server
- 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/mobile upon WAN or VoIP service failure
- SIP Trunking, Media Gateway functionality

Smart Battery Backup > 1h operation (optional)

Speech Codescs

- 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, Patental 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