

WorldCast IP Audio Codecs

The new wave in world-class audio transport

With an extensive installed base in the audio networks of many major and regional broadcasters worldwide, APT's audio codecs are renowned for delivering exceptional quality audio with consistently high reliability utilizing synchronous circuits. With the launch of the new WorldCast range, APT now offers the same quality and reliability to those broadcasters migrating to IP audio delivery.

Ranging from the entry-level WorldCast Horizon offering Enhanced apt-X coding over IP links to the richly featured, multi-algorithm WorldCast Eclipse offering IP, X.21 / V.35 and ISDN transport options, the WorldCast range offers a wide selection of codecs to suit many different applications and budgets.

New to the range is the WorldCast Horizon HD, designed specifically for HD Radio™ STL applications .



Delivering Exceptional Audio Quality

- Fully duplex stereo audio codec
- Available audio bandwidths from 10Hz through to 22.5kHz, for FM, AM and HD Radio™/DAB applications
- 16 and 24 bit word resolution
- Dynamic Range of up to >120dB
- Analog and AES/EBU I/O (AES3), Digital Reference In
- Simultaneous Analog and Digital Outputs*
- Enhanced apt-X algorithm as standard
- Multi-Algorithm suite including MPEG 1/2 Layer II/III, MPEG 4 AAC, CCITT G.722, G.711*
- Linear PCM 16 bit and 24 bit resolution on IP connections

Ensuring Extensive Connectivity

- High quality audio transport over IP networks using RTP/UDP and SIP/SDP
- X.21/V.35 interface enables easy connection to permanent digital links such as leased lines, T1 / E1, fractional T1/E1, Satellite or Microwave*
- 4 ISDN interfaces provide up to 8 B channels for high quality audio connection or back-up**
- Auxiliary data for transmission of RBDS / RDS or PAD (can be embedded in audio stream at 1200 - 9600 baud or sent via separate IP connection at 1,200 - 115,200 baud)
- Up to 8 Opto-coupled Inputs and up to 8 Relay Outputs
- Compatible with codecs from Telos, Mayah, Prody, Musicam, etc

Enabling Expert Audio over IP Networking

- Support for Unicast, Multiple Unicast & Multicast applications for flexible IP configuration
- Support for SIP and SDP protocols to enable easy connection to all compliant IP codecs
- "Autosync™" feature of Enhanced apt-X ensures consistent high quality and robust connection under stressed network conditions and super fast, automatic reconnection when link is dropped
- Codec Management System (CMS) Software enables extensive management of network conditions such as packet size, jitter buffers and QoS levels for optimum audio performance

Providing a Robust Professional Platform

- DSP-based architecture for 24/7/365 reliability
- Automatic link back-up and restore on user-defined performance level
- "Send on audio" feature (packet generated when audio exceeds user-defined level) - no need for manual re-connects and re-boot
- Adjustable Silence Detection with alarm output

Allowing Simple Management and Monitoring

- Front Panel Operation for easy on-site access*
- Highly Intuitive Codec Management Software (CMS) enables remote configuration and management of multiple units
- User-defined audio profiles enable you to set algorithm and data rates in your most frequently used configurations*
- Up to 150 ISDN and 150 IP speed dial memory locations for 'one-click connection'
- User-definable access levels and logins maintain network security

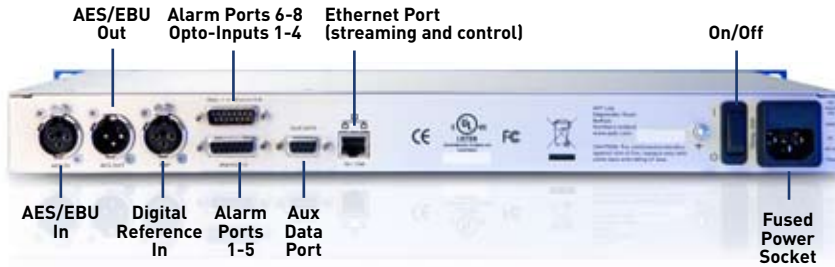
* WorldCast Meridian & WorldCast Eclipse only

** WorldCast Eclipse Only

WorldCast Horizon

The WorldCast Horizon delivers real-time, bi-directional, broadcast-grade audio over IP networks using linear audio or Enhanced apt-X coding.

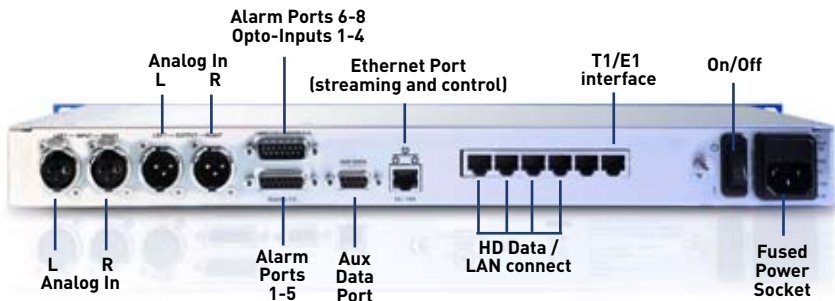
Perfect for unattended sites, STLs and as back up for STL and satellite applications, the WorldCast Horizon enables broadcasters to utilize cost-effective data communication links such as Wide Area and Local Area Networks using RTP over UDP/IP and SIP/SDP. A 10Base-T /100Base-TX RJ45 interface is used for both audio transport and remote control/supervision. Auxiliary data can be embedded into the audio or sent as a separate IP stream.



Based on DSP architecture for round the clock reliability, the WorldCast Horizon provides contact closures and opto-couplers for remote status alarms. Both analog and digital (AES/EBU with external reference) units are available. Supplied with CMS software, the WorldCast Horizon provides extensive control and monitoring capabilities to manage your audio, data and network conditions.

WorldCast Horizon HD

Designed specifically for HD Radio™ applications, the WorldCast Horizon HD is a duplex stereo codec enabling the delivery of both FM and HD1 content from studio to transmitter site. The unit can also provide a LAN extension to a remote site.

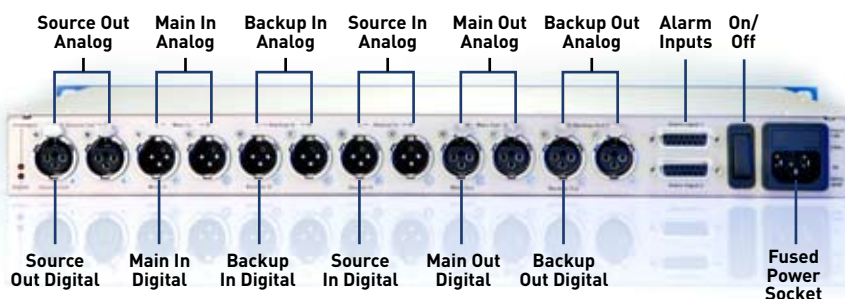


Offering both a T1/E1 and ethernet interface, Broadcasters can utilize existing T1 and E1 links for the FM transport and send their HD1 content as a UDP stream embedded in the T1/E1 link. At the remote/transmitter link, the HD1 content is presented back on the IP port.

As a fully duplex device, WorldCast Horizon HD allows off-air monitoring or an independent channel to backhaul RPU feeds. An RS232 port is available for PAD and contact closures for remote control.

Audio Switcher

For mission critical applications where an additional layer of redundancy is required, APT's Audio Switcher provides the ability to monitor audio output and /or input and automatically switch to a second codec system upon loss of sync. This two-channel unit will switch two outputs (typically stereo pairs) between two pairs of inputs and, in the reverse direction, switch two inputs between two pairs of outputs.



The control inputs to the switchover box will typically be connected to the sync alarm of the main audio codec. The Audio Switcher Unit also provides control outputs in the form of voltage signaling. These will typically be connected to the codec's opto-isolator inputs and will interface with the Codec Management System software. They will therefore be used to display the state of the Audio Switcher (i.e. Main or Backup operation) to the CMS operator.

Unit is also available with AES/EBU interfaces.

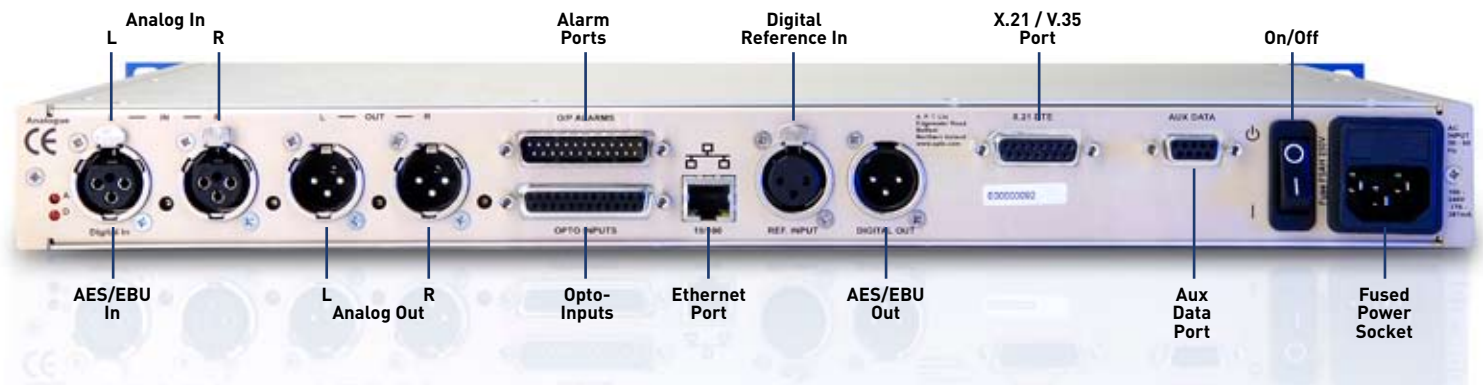
WorldCast Meridian

A multi-algorithm, multi-interface, fully duplex, stereo audio codec, the WorldCast Meridian is a robust and flexible solution for linking studios and transmitter sites in mission-critical applications.

In addition to the standard IP interface enabling unicast and multicast connections over Wide Area and Local Area Networks, WorldCast Meridian can also connect to high speed fixed synchronous networks using X.21/V.35 or fractional T1/E1 links. Either interface can be configured for primary and back-up connections.

Standard 16 bit apt-X, Enhanced 16 & 24 bit apt-X are supplied as standard and an optional multi-algorithm suite incorporating 16 and 24 bit linear PCM, MPEG 1/2 Layer II/III, MPEG 2/4 AAC, G.711 and G.722 is also available.

The system offers an array of professional features including Automatic Back-up, Silence Detect, Contact Closures, Alarm Ports and DSP architecture. APT's CMS Software offers easy management and monitoring over multiple units throughout a network.



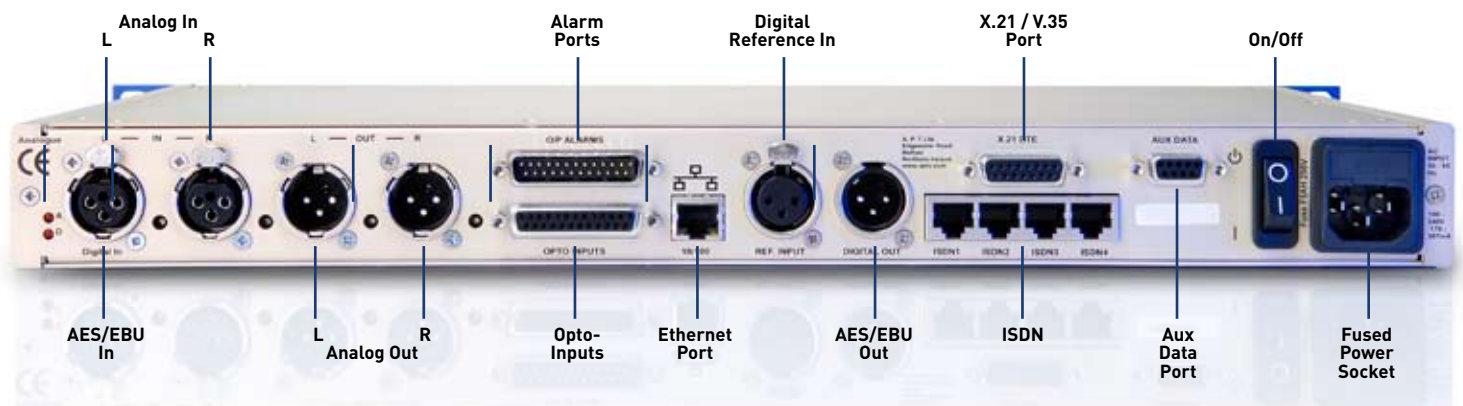
WorldCast Eclipse

The WorldCast Eclipse is the ultimate in flexibility and choice offering IP, X.21/V.35 and ISDN interfaces as well as a selection of popular coding algorithms including Enhanced apt-X, MPEG I/II Layer 2/3, MPEG 2/4 AAC, G.711 and G.722 on a single, robust codec platform.

The professional solution for high quality remotes, STLs and studio head end, the WorldCast Eclipse enables access to a wide range of networks such as IP, Leased Line, fractional T1/E1, Satellite, Microwave and Dial-up ISDN.

All the features you expect from a professional broadcast codec are supplied as standard: analog and AES/EBU I/Os, adjustable silence detection, alarm ports, contact closures, speed dials, embedded auxiliary data, etc.

In addition to front panel operation and audio level monitoring, the unit also offers CMS software – APT's powerful and intuitive user interface for extensive monitoring and management capability over IP.



Codec Management Software

Supplied as standard with all WorldCast units, APT's Codec Management Software (CMS) package is a powerful and intuitive graphical user interface which enables extensive remote monitoring and management capability of up to six units deployed throughout a network. For larger networks and multi-unit control, APT's Network Management Software (NMS) extends the functionality of the CMS and offers a complete, professional network management solution.

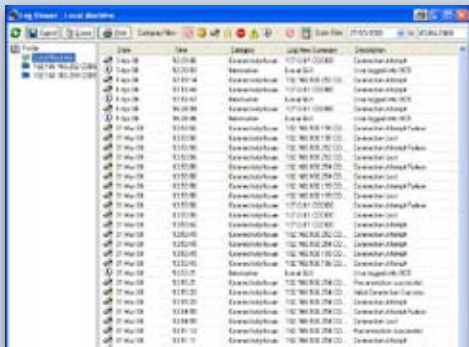
Mode / Status View ▶

Click on any unit to see detailed configuration and connection settings. Graphical representation shows live status view of level bars and enables configuration of primary and back-up connections as well as Master/ Slave status.



Network Overview ▲

At-a-glance view of multiple units throughout your audio network enables easy monitoring of multiple sites and provides immediate notification of alarms, alerts and other network issues.



Alarm and Event Logs ▲

View and save logs of all connection activity and alarms through this screen. Logs can be filtered by event category e.g. major, minor or critical or by individual codec.

Connection Settings ▶

Configure your IP network settings to transmit or receive unicast, multicast or multiple unicast streams. You can also set packet size, QoS and buffer levels to compensate for network jitter. Store up to 150 fully configured IP Speed Dials for simple, fast connection to frequently-used locations. X.21/V.35 and ISDN settings can also be extensively managed through this screen.



◀ Audio Settings

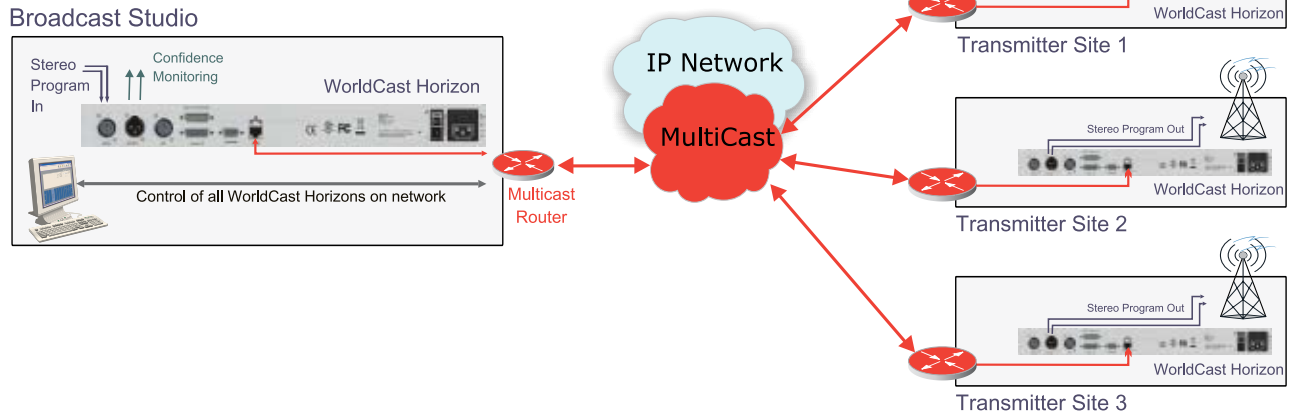
This screen enables you to configure audio alarm levels and time-outs, set algorithms and data rates and establish pre-set configurations (audio profiles) which can be assigned to connection speed dials for 'one-click connection'.

Applications

Studio Transmitter Links using Multicast IP

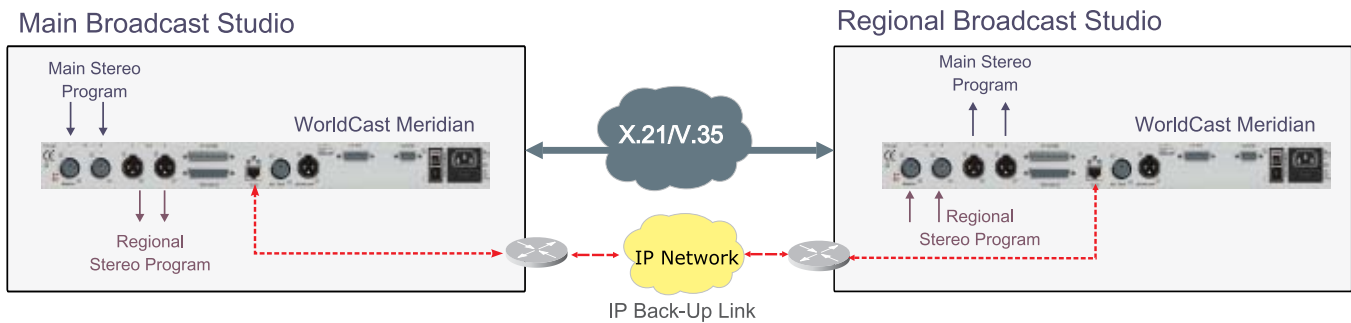
All WorldCast units provide support for both point-to-point and point-to-multi-point configurations. In this example, a station is taking advantage of the highly-efficient multicasting technique to send audio and data from a single source to multiple destinations using the IP infrastructure.

A unicast stream can also be set up to provide a confidence monitoring feed as is shown at Transmitter Site 1.



Studio To Studio Linking Over Leased Line

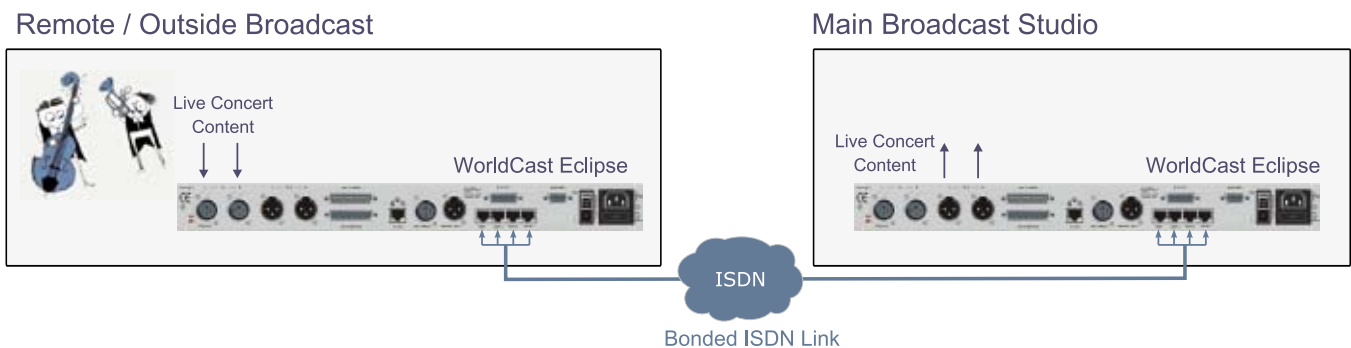
Permanent digital links such as X.21, V.35, T1/E1, fractional T1/E1, Satellite and Microwave are frequently chosen by broadcasters for the reliability and guaranteed bandwidth they offer. In this application, the Worldcast Meridian is enabling the contribution and distribution of audio between two studio sites over a leased line. In the case of network outages and failures, the unit can be configured to automatically back-up to the secondary IP connection and restore, again automatically, when certain user-defined conditions are met.



Remote Broadcast over ISDN

WorldCast units take the stress and pain out of setting-up Remote Broadcasts. With low latency Enhanced apt-X compression as standard, WorldCast codecs enable true real-time remotes and talk-back applications with no annoying delays and 'over-talk'.

A wide choice of other coding algorithms ensures that the units can connect to other manufacturers' equipment in the field. The WorldCast Eclipse provides a flexible, highly interoperable solution offering maximum connectivity whether you need to arrange a simple mono feed on the public internet or a high quality broadcast of live concert music over bonded ISDN.

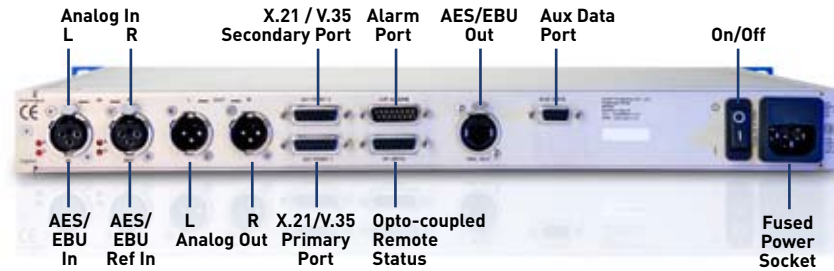


WorldNet Codec Solutions

Outstanding Audio Quality and Reliable Connections over Synchronous Links

WorldNet Rio

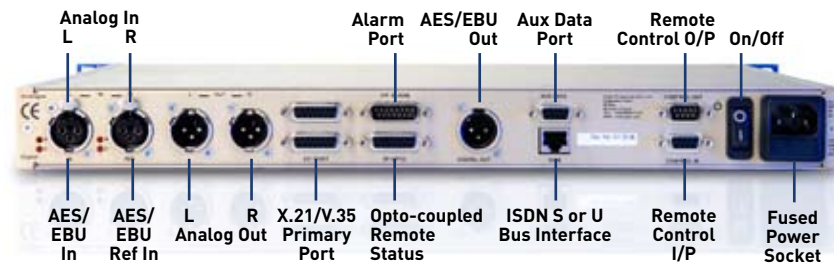
WorldNet Rio is a fully-featured, multi-algorithm audio codec enabling bi-directional stereo audio transport over high speed fixed synchronous networks. The unit connects to X.21/V.35 or fractional T1/E1 links at rates up to 576kbps with a second X.21 interface offering automatic backup should the primary connection fail. An optional T1 / E1 interface can also be added. Incorporating low delay Standard apt-X (16 bit) and Enhanced apt-X (16 and 24 bit) algorithms, the WorldNet Rio also offers the option of MPEG Layer II coding, ensuring compatibility with a wide range of audio codecs.



Asynchronous auxiliary data can be embedded at rates of up to 9,600 baud. Opto-coupled inputs on the unit are capable of driving up to five relay outputs and the onboard relays on the WorldNet Rio will also indicate various alarm conditions. Configuration and control is straightforward; the front panel comprises a numeric keypad, menu navigation keys and an LCD display. Audio input and output levels are easily monitored via the headphone socket and audio level bars.

WorldNet Ohio

WorldNet Ohio is a full duplex, low delay, stereo audio codec designed for Studio to Transmitter Links and inter-studio networking. The unit's primary X.21 / V.35 data interface enables connection to high speed synchronous networks including T1/E1, fractional T1/E1, satellite or microwave links at rates of up to 576kbps. The alternative ISDN connections (up to 2 'B' channels) can be used as the primary link or to back-up the X.21 / V.35 line. WorldNet Ohio can also enable dual destination links, allowing separate mono streams to be sent to two independent ISDN numbers.

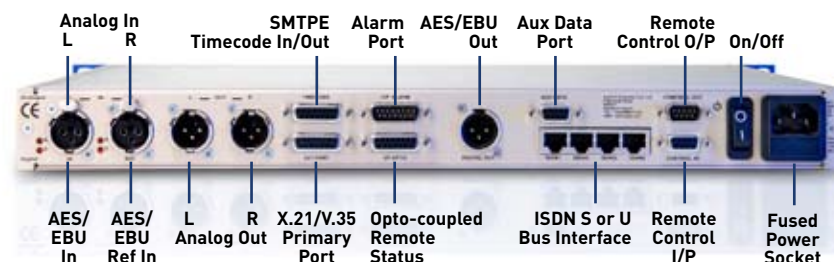


Incorporating both Standard apt-X (16 bit) and Enhanced apt-X (16, 20 and 24 bit) algorithms, the WorldNet Ohio offers exceptional audio quality for AM, FM, DAB and HD Radio broadcasting.

Front panel controls with LCD screen, numeric keypad, audio level bars and headphone socket enable easy configuration, control and monitoring.

WorldNet Milano

The WorldNet Milano is a full duplex, two channel audio codec offering both fixed line and ISDN connections. Delivering professional quality audio on up to 8 bonded 'B' channels or digital links such using X21 / V35, the WorldNet Milano has been designed to meet the needs of the most demanding post-production facilities, studio to transmitter links and remote broadcast / OB applications. Either connection can be employed as the primary link with the other providing seamless backup. The unit will support mono, stereo and dual destination calling, ideal for 3 way inter-working.



Incorporating both Standard apt-X (16 bit) and Enhanced apt-X (16, 20 and 24 bit) algorithms, the WorldNet Milano offers exceptional audio quality for both broadcast and pro audio applications. An unparalleled delay of under 2ms means that Enhanced apt-X coding is ideal for ADR applications, remote talent dial-ins, outside broadcasts / remotes and live talk back applications. Optional SMPTE timecode enables audio to video synchronization.

WorldCast & WorldNet Stereo Codec Specifications

	WorldCast Horizon & Horizon HD	WorldCast Meridian	WorldCast Eclipse	WorldNet Rio	WorldNet Ohio & Milano	
Physical	Size	1U x 19" Rackmount	1U x 19" Rackmount	1U x 19" Rackmount	1U x 19" Rackmount	
	Dimensions	44mm x 482mm x 255mm 1.75" x 19" x 10"	44mm x 482mm x 255mm 1.75" x 19" x 10"	44mm x 482mm x 255mm 1.75" x 19" x 10"	44mm x 482mm x 255mm 1.75" x 19" x 10"	44mm x 482mm x 255mm 1.75" x 19" x 10"
	Weight	2.25Kg / 5lbs	2.25Kg / 5lbs	2.25Kg / 5lbs	2.25Kg / 5lbs	2.25Kg / 5lbs
	Power Supply	100-250VAC, 50-60Hz (optional 48VDC Supply)	100-250VAC, 50-60Hz (optional 48VDC Supply)	100-250VAC, 50-60Hz (optional 48VDC Supply)	100-250VAC, 50-60Hz (optional 48VDC Supply)	100-250VAC, 50-60Hz (optional 48VDC Supply)
	Power Consumption	<25W	<25W	<25W	<15W	<25W
	Environmental	0°C to +55°C, 95% humidity	0°C to +55°C, 95% humidity	0°C to +55°C, 95% humidity	0°C to +55°C, 95% humidity	0°C to +55°C, 95% humidity
Interfaces	IP	Ethernet 1 x RJ45, (HD 4 x RJ45) RTP/UDP, SIP/SDP	Ethernet 1 x RJ45, RTP/UDP, SIP/SDP	Ethernet 1 x RJ45, RTP/UDP, SIP/SDP	-	-
	X.21 / V.35 (Data Rates)	-	15 Way D Type DTE RS442 levels Rates 64-576 kbits/s	15 Way D Type DTE RS442 levels Rates 64-576 kbits/s	15 Way D Type DTE RS422 levels Rates 56-576 kbits/s	15 Way D Type DTE RS422 levels Rates 64-576 kbits/s
	ISDN (Data Rates)	-	-	S or U interface, 4x RJ45 Rates 64-512 kbits/s	-	S or U interface, Milano - 4 x RJ45 (56-512kbit/s) Ohio - 1 x RJ45 (56-128kbit/s)
	T1 / E1 (Data Rates)	RJ45 T1 (1.544Mbit/s) MLPP Protocol E1 (2.048Mbit/s) MLPP Protocol	Optional -RJ45 T1 (1.544Mbit/s) E1 (2.048Mbit/s)	-	Optional -RJ45 T1 (1.544Mbit/s) E1 (2.048Mbit/s)	-
	Aux Data	9 pin D Type, RS232 level	9 pin D Type, RS232 level	9 pin D Type, RS232 level	9 pin D Type, RS232 level	9 pin D Type, RS232 level
	Data Rates (embedded)	1200, 2400,4800, 9600 Baud	1200, 2400,4800, 9600 Baud	1200, 2400,4800, 9600 Baud	1200, 2400,4800, 9600 Baud	1200, 2400,4800, 9600 Baud
	Data Rates (via IP)	1200, 2400, 4800, 9600, 19200, 38400, 76800, 115200 Baud	1200, 2400, 4800, 9600, 19200, 38400, 76800, 115200 Baud	1200, 2400, 4800, 9600, 19200, 38400, 76800, 115200 Baud	-	-
	Control	CMS Software	Front Panel or CMS Software	Front Panel or CMS Software	Front panel or SNMP	Front Panel or RS232/RJ45
	Digital Audio I/O	AES/EBU, Balanced XLR-3, Impedance 110 Ohms	AES/EBU, Balanced XLR-3, Impedance 110 Ohms	AES/EBU, Balanced XLR-3, Impedance 110 Ohms	AES/EBU, Balanced XLR-3, Impedance 110 Ohms	AES/EBU, Balanced XLR-3, Impedance 110 Ohms
	Digital Ref Input	XLR-3	XLR-3	XLR-3	XLR-3	XLR-3
	Analog Audio I/O	Balanced XLR-3, Input Impedance >10k / 600 Ohms Output Impedance <50 / 600 Ohms	Balanced XLR-3, Input Impedance >10k / 600 Ohms Output Impedance <50 / 600 Ohms	Balanced XLR-3, Input Impedance >10k / 600 Ohms Output Impedance <50 / 600 Ohms	Balanced XLR-3, Input Impedance >10k / 600 Ohms Output Impedance <50 / 600 Ohms	Balanced XLR-3, Input Impedance >10k / 600 Ohms Output Impedance <50 / 600 Ohms
	Alarms	8 Alarms on 25 pin D Type	8 Alarms on 25 pin D Type	8 Alarms on 25 pin D Type	5 Alarms on 15 pin D Type	5 Alarms on 15 pin D Type
	Opto-Coupler	25 way D Type, 4 Inputs driving 4 Relay Outputs	25 way D Type, 8 Inputs driving 8 Relay Outputs	25 way D Type, 8 Inputs driving 8 Relay Outputs	15 way D Type, 4 Inputs driving 4 Relay Outputs	15 way D Type, 4 Inputs driving 4 Relay Outputs
	Timecode I/O	-	-	-	-	Optional - 15 pin D Type
	Digital Operation	32kHz, 44.1kHz*, 48kHz	32kHz, 44.1kHz*, 48kHz	32kHz, 44.1kHz*, 48kHz	32kHz, 44.1kHz, 48kHz	32kHz, 44.1kHz, 48kHz
	Digital Audio Bandwidth	10Hz through to 22.5kHz mono & stereo	10Hz through to 22.5kHz mono & stereo	10Hz through to 22.5kHz mono & stereo	10Hz through to 22.5kHz mono & stereo	10Hz through to 22.5kHz mono & stereo
	Analog Operation	8kHz-48kHz	8kHz-48kHz	8kHz-48kHz	8kHz-48kHz	8kHz-48kHz
	Analog Audio Bandwidth	10Hz through to 22.5kHz mono & stereo	10Hz through to 22.5kHz mono & stereo	10Hz through to 22.5kHz mono & stereo	10Hz through to 22.5kHz mono & stereo	10Hz through to 22.5kHz mono & stereo
	Sample Rate Converter	3:1 (with bypass modes)	3:1 (with bypass modes)	3:1 (with bypass modes)	3:1 (with bypass modes)	3:1 (with bypass modes)
	A/D Converter	24-bit/96kHz sigma-delta	24-bit/96kHz sigma-delta	24-bit/96kHz sigma-delta	24-bit/96kHz sigma-delta	24-bit/96kHz sigma-delta
Standard Coding	Enhanced apt-X 16-Bit & 24-Bit, Linear PCM 16 & 24 Bit	Standard, apt-X, Enhanced apt-X Linear PCM - 16 & 24 Bit	Standard, apt-X, Enhanced apt-X Linear PCM - 16 & 24 Bit	Standard apt-X, Enhanced apt-X 16-Bit & 24-Bit	Standard apt-X, Enhanced apt-X 16-Bit, 20-Bit & 24-Bit	
Multi-Algorithm Pack 1	-	ISO/MPEG 1/2 Layer II	ISO/MPEG 1/2 Layer II	ISO/MPEG 1/2 Layer II	-	
Multi-Algorithm Pack 2	-	ISO/MPEG 1/2 Layer III, ISO/MPEG 2/4 AAC LC, AAC LD, G.711, G.722	ISO/MPEG 1/2 Layer III, ISO/MPEG 2/4 AAC LC, AAC LD, G.711, G.722	-	-	
Compression Ratio	apt-X: 4:1	apt-X: 4:1 others: variable	apt-X: 4:1 others: variable	apt-X: 4:1 others: variable	apt-X: 4:1	
Coding Delay	Enhanced apt-X 1.9ms @48kHz Fs	Standard apt-X 2.5ms @48kHz Fs Enhanced apt-X 1.9ms @48kHz Fs	Standard apt-X 2.5ms @48kHz Fs Enhanced apt-X 1.9ms @48kHz Fs	Standard apt-X 2.5ms @48kHz Fs Enhanced apt-X 1.9ms @48kHz Fs	Standard apt-X 2.5ms @48kHz Fs Enhanced apt-X 1.9ms @48kHz Fs	
Dynamic Range	16 Bit > 85dB 24 Bit > 120dB	16 Bit > 85dB 24 Bit > 120dB	16 Bit > 85dB 24 Bit > 120dB	16 Bit > 85dB 24 Bit > 120dB	16 Bit > 85dB 24 Bit > 120dB	
Phase Response Linear	DC to Fs/2	DC to Fs/2	DC to Fs/2	DC to Fs/2	DC to Fs/2	
Pass Band Ripple	< 0.2dB	< 0.2dB	< 0.2dB	< 0.2dB	< 0.2dB	

* 44.1 kHz not available on Linear PCM 16 and 24