



- Modular amplifier units allow flexible output power configuration
- Configurable mapping of amplifiers to outputs enables cost-effective solutions for multi-circuit applications
- European Safety legislation compliant
- Loudspeaker line monitoring using AC or DC surveillance
- Standby amplifier switchover functions

The X400 Multi-channel Amplifier Mainframe is a 2U rack mount unit which combines amplification, loudspeaker line monitoring, loudspeaker circuit isolation, and standby amplifier switchover functions. The mainframe is designed to operate with dual power supplies: 230 V AC mains supply and 24 V DC battery supply.

Amplification is provided by high efficiency and low quiescent current modular amplifiers using ASL proprietary Adaptive Class D technology. The X400 can be fitted with the ASL MX series 100 V PA/VA amplifier modules in any of the following combinations: 4 x 100 W, 2 x 200 W, 1 x 400 W, or 1 x 200 W + 2 x 100 W. Loudspeaker line monitoring is provided using AC or DC surveillance.

The X400 is designed specifically to meet the requirements of new European Safety legislation that restricts the number of loudspeakers that may be connected to any given speaker circuit. To meet this requirement, the X400 features 16 relay isolated outputs to enable multiple small speaker runs to be fed from single amplifiers. In the event of short circuit the surveillance system identifies and isolates the faulty circuit, which enables the other circuits fed by the same amplifier to operate unaffected.

The X400 is fully configurable in terms of the mapping of the amplifiers to the outputs. For example 4 amplifiers may be fitted, each feeding 4 outputs. Alternatively a single amplifier may be fitted feeding up to 16 outputs. This enables very costeffective solutions to be provided for multi-circuit applications.

The X400 has provision for connection of an external standby amplifier; alternatively one of its own amplifiers may be assigned as the standby.

The X400 connects to the ASL VAR series of Audio Routers for configuration and fault reporting using ASL's Audio-CAN Network. Both X400s and V400s may co-exist on the network. Up to 63 X400 and/or V400 mainframes can be connected to the Audio-CAN Network.

For further details, and for information on other products, please visit www.asl-control.co.uk.

X400^{1,2}

General

Supply Voltage	230 V +/-10% RMS 50Hz AC / IEC320 inlet European standard
Inrush Current (worst case)	24.2 A
Maximum AC Power Consumption	745 VA (X400 fully configured and all amplifier modules delivering 100 V 1 kHz sinewave into rated resistive loads)
DC Supply Voltage	21 to 27.6 V / F25A fuse (from nominal 24 V lead acid battery)
Quiescent DC Current (no amplifiers, @ 24 V supply)	55 mA
Maximum DC Current Consumption	6.25 A per 1 x MX100 12.5 A per 1 x MX200 25 A per 1 x MX400 (21 V supply, modules delivering 100 V 1 kHz sinewave into rated resistive loads)
Format	2U 19-inch rack mounting metal frame
Colour	black front panel with silver annotation
Loudspeaker Line Surveillance	AC ³ or DC ⁴ line surveillance
Earth Resistance Fault Threshold	50 kΩ
Amplifier Configuration ⁵	1 x MX400 400 W Amplifier Module 2 x MX200 200 W Amplifier Module 4 x MX100 100 W Amplifier Module 2 x 100 W + 1 x 200 W Amplifier Modules Internal or external standby amplifier can be configured
Amplifier/Output Configuration ⁶	<ul style="list-style-type: none">Up to 4 amplifiers each feeding up to 4 outputs2 amplifiers each feeding up to 8 outputs1 amplifier feeding up to 4 outputs plus 1 amplifier feeding up to 12 outputs1 amplifier feeding 16 outputs

External Interfaces⁷

Audio Input	up to eight ⁸ dBu sensitivity balanced audio inputs 3-way pluggable Wago cage clamp terminal block
Audio Output	up to sixteen 100 V RMS relay isolated outputs 4-way pluggable Wago cage clamp terminal block
Standby Amplifier Interface:	
– 100 V Audio Input	Dual 2-way pluggable Wago cage clamp terminal block
– Low Level Audio	RJ45 connector

¹ Only MK2 VAR4/12/20 Routers running software V5.3.0520 or later support the X400 Amplifier Mainframe.

² ASL amplifiers on 230 V mains power can produce full output, with normal programme material, into loads 25% greater than those specified. In these conditions, a MX100 will deliver full output with 125 W of load connected, a MX200 will deliver full output with 250 W of load connected, and a MX400 will deliver full output with 500 W of load connected.

³ AC line surveillance is BS EN5839 Part 8 compliant and requires one AEL01 or AEL02 Active End of Line Device used per loudspeaker circuit. The AEL01/AEL02 enables line monitoring of either single (A) or dual A&B loudspeaker circuits without the need for DC blocking capacitors in the loudspeakers. No spurred circuits.

⁴ DC surveillance is BS EN5839 Part 8 compliant and requires all loudspeakers to be fitted with DC blocking capacitors, and uses ASL EOL10K End of Line Resistors, with up to ten spurs per amplifier slot. Each spurred circuit to be fitted with one EOL10K resistor (minimum). Spurred circuits can be unevenly distributed over the amplifier outputs.

For example one amplifier feeding 8 outputs can be configured as follows:

- Slot 1 outputs: O/P 1=2 spurs O/P 2=3 spurs
O/P 3=1 spur O/P 4=4 spurs (Total = 10 spurs)
- Slot 2 outputs: O/P 5=2 spur O/P 6=2 spurs
O/P 7=2 spurs O/P 8=2 spurs (Total = 8 spurs)

⁵ The mainframe is fully populated in the standard configurations. However the mainframe does not need to be fully populated with amplifiers, for example three MX100 amplifiers could be fitted, or a single MX200 amplifier.

⁶ 4, 8, 12, 16 output configurations not possible with AC line surveillance.

⁷ All located on the rear panel of the X400.

⁸ Four audio inputs can be connected to the X400 at the time of the publication of this document.



This equipment is designed and manufactured to conform to the following EC standards:

EMC: EN61000-6-4:2007, EN61000-6-2:2005, EN55103-1/E1:1997, EN55103-2/E5:1997, EN50121-4:2006, ENV50204:1996

Safety: EN 60065:2002

Manufacturer

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Override Audio Interface

– Input	0 dBu balanced audio (RJ45 connector)
– Control	relay drive DC, 5 V nominal (RJ45 connector)
Auxiliary DC Supply Output	21 V to 38 V depending on AC or DC supply / T1A fuse 2-way pluggable Wago cage clamp terminal block
Audio-CAN Bus / RS485 Port	up to 63 amplifier mainframes dual 9-way standard D connector

Environmental

Temperature Range (storage and operating)	-5 °C to +50 °C
Humidity Range	0% to 93% non-condensing
Ingress Protection	IP20

Dimensions and Weight

Dimensions (H x W x D) (mm)	86 x 439 x 425 (excluding handles)
Weight	12 kg (X400 frame only) / 18.4 kg (maximum)

MX100

Output Power	100 W @ 100 V RMS ²
Output Voltage and Input Sensitivity	100 V RMS into 100 Ω load for 0 dBu 1 kHz input signal
Regulation	No load to full load, better than 1.5 dB
Efficiency	80%
Quiescent Current (@ 24 V supply)	70 mA (no signal) With one or two AEL units ³ connected..... 115 mA (nominal) With continuous surveillance signal 140 mA (nominal)
Frequency Response	100 Hz – 18 kHz, ±3 dB
THD (@ 100 V RMS output, full load)	<0.5% @ 1 kHz
Residual Noise	Better than 80 dB (A-weighted) below full output
Dimensions (H x W x D) (mm)	79 x 79 x 273 (incl. connectors)
Weight	1.6 kg

MX200

Output Power	200 W @ 100 V RMS ²
Output Voltage and Input Sensitivity	100 V RMS into 50 Ω load for 0 dBu 1 kHz input signal
Regulation	No load to full load, better than 1.5 dB
Efficiency	80%
Quiescent Current (@ 24 V supply)	70 mA (no signal) With one or two AEL units ³ connected..... 115 mA (nominal) With continuous surveillance signal 140 mA (nominal)
Frequency Response	100 Hz – 18 kHz, ±3 dB
THD (@ 100 V RMS output, full load)	<0.5% @ 1 kHz
Residual Noise	Better than 80 dB (A-weighted) below full output
Dimensions (H x W x D) (mm)	79 x 159 x 273 (incl. connectors)
Weight	2.7 kg

MX400

Output Power	400 W @ 100 V RMS ²
Output Voltage and Input Sensitivity	100 V RMS into 25 Ω load for 0 dBu 1 kHz input signal
Regulation	No load to full load, better than 1.5 dB
Efficiency	80%
Quiescent Current (@ 24 V supply)	90 mA (no signal) With one or two AEL units ³ connected..... 125 mA (nominal) With continuous surveillance signal 150 mA (nominal)
Frequency Response	100 Hz – 18 kHz, ±3 dB
THD (@ 100 V RMS output, full load)	<0.5% @ 1 kHz
Residual Noise	Better than 80 dB (A-weighted) below full output
Dimensions (H x W x D) (mm)	79 x 316 x 273 (incl. connectors)
Weight	4.9 kg



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