

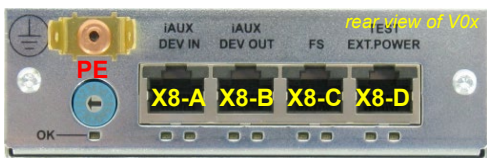



30-070310x				Volume Control for Operator/Monitor		iLAP-D 0x	
ORDER NUMBER				FUNCTION		NAME	
Mechanical Data							
Casing (W × H × D)		36 × 110 × 110 mm ³					
Depth ~120 (incl. Faston) to ~170 (incl. cable bending) mm							
Cut-out (W × H, symmetrical)		37 × 111 mm ²					
Front panel (W × H; 3 HU)		see <i>Variants</i>					
Drillings		see <i>Variants</i>					
Mass		<460 g					
Environment		Temperature +5 to +45° C					
Relative humidity (without dewing)		10 to 90 %					
Electrical Data							
Input voltage range		+24 V DC +5/-20 %					
Current consumption (typical)		54 mA					
Power consumption (without ext. power)		≤1.5 W					
Output voltage		+24 V DC +5/-20 %					
Output current		≤0.75 A					
    							
<div> If external voltages are fed to the module (X8-D), the power supply used has to respect the requirements listed in Electrical Data with regard to the number and type of AUX-devices subsequently connected!</div>				Approvals <u>Electrical Safety</u> EN 60950-1(06)+A11(09)+A1(10)+A12(11)+A2(13); IEC60950-1(05, 2 nd ed.)+A1(09)+A2(13) <u>EMC</u> EN 55022(10)+AC(11); EN 55032(15)+AC(16); CISPR 22(08); FCC part 15 (19); EN55024(10)+A1(15); ICES-003 issue 6 (19;16 upd.17); EN 61000-6-2(19); EN 61000-6-3(07)+A1(11); EN 300386(v2.1.1) <u>Climatic</u> EN60068-2-1(Aa,Ad),-2(Ba,Bd),-14(Nb),-78(Ca)			
Variants	<i>Short</i>	<i>Order Number</i>	<i>Main Board</i>	<i>FP-Colour (frame/screen)</i>	<i>FP Dimensions/ FP Drillings (centre-centre)</i>	<i>Description</i>	
iLAP-D 01	V00	30-0703100	iPIPS	RAL 9005/7024	40.3×128.4×2.5 mm ³ / 25.4×122.4 mm ² , Ø 2.8 mm	Basic version	
iLAP-D 02	V01	30-0703101	01.50	RAL 7040/7040		As V00 with different front panel design	
iLAP-D 03	V02	30-0703102	iPIPS 01.C0	RAL 9005/7024		As V00 with enhanced FPGA & Flash	
iLAP-D 04	V03	30-0703103		As V02 with one potentiometer only			
iLAP-D 05	V04	30-0703104		As V01 with different front panel colour			
iLAP-D 06	V05	30-0703105		RAL 7011/9016	54×139.5×2 mm ³ / 27×127 mm ² , Ø 3.4 mm	As V02 with different front panel colour and size	
iLAP-D 07	V06	30-0703106				As V03 with different front panel colour and size	
Short Description							
<p>The volume control panel iLAP-D 0x enables setting the volume of e.g. operator and coach separately for audio devices which are connected via an Ethernet chain (AUX line) to an iPOS-type touch screen position electronics.</p> <p>The RJ45 sockets on the rear enable a 1:1 connection via patch cables to the next/previous auxiliary (AUX-)device (e.g. Ethernet to another speaker iLSP or a plug-in-panel iPIP(s), or directly to the position electronics iPOS), to up to 2 footswitches, and to a test interface. Data transmission & configuration is done via Ethernet with real-time protocol.</p>				<p>The TEST / EXT.POWER jack (X8-D) shall be used for supplementary external power supply, if otherwise the current consumption of the AUX-devices on the AUX-line would exceed 0.75 A.</p> <p>The adjustment knobs are endless turning rotary type knobs, one for the operator and one for the coach position. If stereo headsets are used, one knob controls the audio of both the left & the right earpiece.</p> <p>Volume may still be adjusted via the sliders on the iPOS. If the sliders for the left and right position are not in the same position when changing the volume at the iLAP-D module, then both sliders will be changed by the same value. Volume changes done via the iLAP-D are displayed on the iPOS. Moving the sliders on the iPOS does not affect the position of the control knobs.</p> <p>The drilling holes are suitable for mounting in a 3 HU/8 HP grid (V00 to V04 only).</p>			

Connectors & Indications					
Label	Position	Type	Connection of	LEDs	Description
OP	Front	Rotary type		-	Adjustment of the volume of an operator's audio device
CO	Front	Rotary type		-	Adjustment of the volume of a coach's audio device
TEST EXT.POWER	X8-D rear	RJ45, 8-p, f	RS232 serial test interface / external supply	green	ON = RS232 interface of the iPIPS is receiving (RX_DATA active)
				orange	ON = RS232 interface of the iPIPS is transmitting (TX_DATA active)
FS	X8-C rear	RJ45, 8-p, f	not used	green	no indication
				orange	
iAUX DEV OUT	X8-B rear	RJ45, 8-p, f	next AUX device >> termination plug	green	Indicates the Ethernet speed mode (ETH_SPEED): ON=100, OFF=10 MBit/s
				orange	Indicates the Ethernet duplex mode (ETH_DUPLEX): ON=full, OFF=half
iAUX DEV IN	X8-A rear	RJ45, 8-p, f	previous AUX device >> iPOS	green	Indicates the Ethernet port link status (ETH_LINK): ON=OK
				orange	Ethernet signal indicator (ETH_ACTIVE) ON=active
OK	Rear	LED	Live LED	flashing	FPGA configured
				green	Control by iPOS
				OFF	Device OFF/failure
	Rear	HEX rotary encoder	AUX device identification: HEX= 0, 1, ..., F	-	The accompanying audio packets for a specific AUX device of this chain will be identified by means of the applied HEX code
	Rear	Faston plug	Earthing	-	Connection to the equipotential bonding system



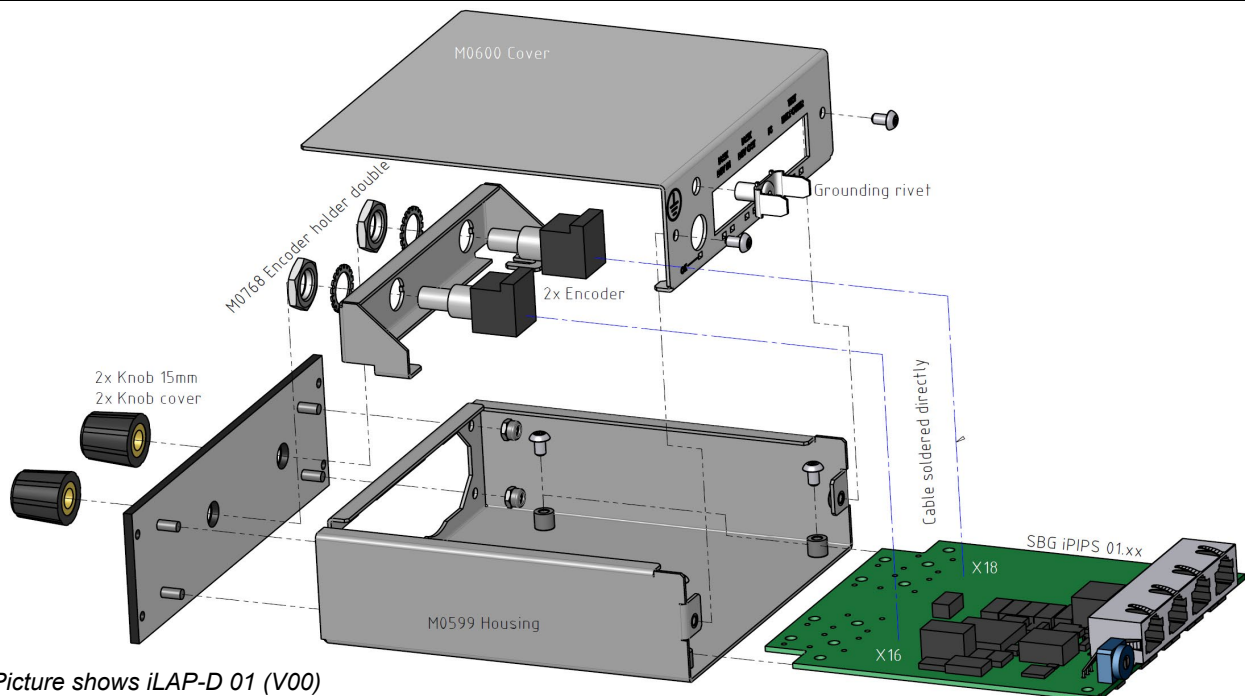
rear view of V0x



front view of V02



Overview iLAP-D 0x



Picture shows iLAP-D 01 (V00)

Main Components

	Position / #
■ Front panel	
varnished, colour: see variants	M0597,-8 (V00 to V04)
varnished, colour: see variants	M1454 (V05, V06)
■ 1 or 2 Two shot soft touch collet knobs	OP, CO
■ Housing	M0599
■ Cover incl. Faston earthing rivet	M0600
■ Encoder holder	M0767
■ up to 2 rotary encoders (3.3 V, 16 pos.)	10-0007541
■ SBG iPIPS 01.xy	
V00, V01	40-0602305
V02 to V06	40-0602312
■ 1 Modular jack 4x8-p RJ45	X8-A,-B,-C,-D
■ 1 Encryption switch HEX-axial 16-turn	S1

The AUX devices (e.g. plug-in panels = PIPs) are connected via Ethernet in a daisy chain to the iPOS. Using a TDM-like layout, its FPGA sends packets containing the information for all devices in a chain, with all channels for one chain and data included to the 1st connected PIP. Then, each PIP exchanges its own sub-frame with its own data, and re-transmits the packet to the next PIP. The last PIP transmits back to the iPOS.

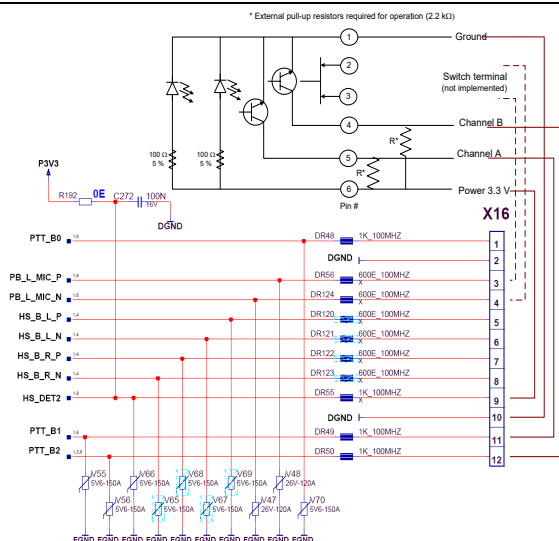
Per audio bus, 4 PIPs may be connected with 2 stereo headset plugs each \Rightarrow 16 timeslots (TS) for output to headsets, 8 TS for microphone inputs, 8 TS for loop-back of recording voice (optional PIP dependent). The functionality is limited to simple TS switching between 128 input TS to 130 output TS. No conferencing or level adjustment is needed.

The switched connections depend on the connected PIP-types.



The iLAP-D functionality covers no audio path but uses the digital I/Os of the FPGA, normally used for PTT or footswitch, to connect up to 4 optically coupled rotary encoders. This will be done in a way that allows connecting the encoders to the 12-pin JST connector normally used for connecting LEMO connectors for the headsets. A rotary encoder delivers a 2-bit gray-coded pattern which informs about the amount of rotation and the direction (count up or down).

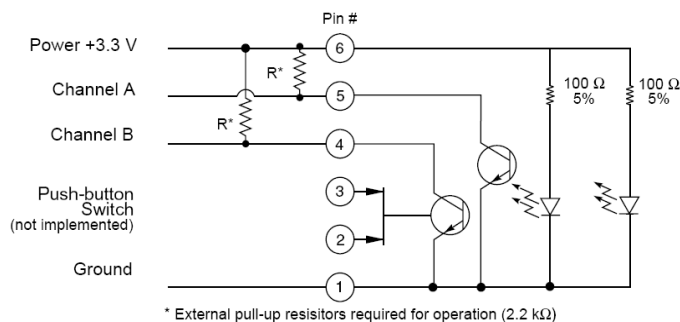
Connecting an encoder to the FPGA, for its supply the 1 k Ω pull-up of the headset detection is replaced with a 10 Ω resistor. Since there is already a blocking capacitor no further filtering is necessary.

To keep a unified firmware for all variants of the sub-board iPIPS 01.x0, the new version of the firmware is able to read these strapped pins and decide to perform the requested function.

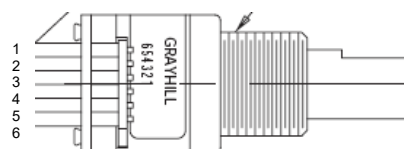


Pinning References of Encoder Connections

Pin	Label /Signal	Type	Reference Onboard Pin	Reference Signal	Description	Ref. Connector / Encoder Pin	Connector Plan
X18 Pad array 12-p Connected to rotary encoder OP							
1	PTT_A0				not used		
2	DGND				used		
3	PA_L_MC_P	AF	Codec1 ₄₁	INP2	Switch terminal	pin 2	
4	PA_L_MC_N	AF	Codec1 ₄₀	INM2	(not used)	pin 3	
5	HS_AL_P		Codec1 ₃₉	OUTP2	not used		
6	HS_AL_N		Codec1 ₃₈	OUTM2			
7	HS_AR_P ²⁾		Codec1 ₄	OUTP3			
8	HS_AR_N ²⁾		Codec1 ₃	OUTM3			
9	HS_DET0	LVTTTL	IC16 ₅	ADC_CH0	Power	pin 6	
10	DGND	GND			Earth	pin 1	
11	PTT_A1/A0 ²⁾				Channel A	pin 5	
12	PTT_A2/A3 ²⁾				Channel B	pin 4	
X16 Pad array 12-p connected to rotary encoder CO							
1	PTT_B0		IC1		not used		
2	DGND				used		
3	PB_L_MC_P	AF	Codec2 ₄₁	INP2	Switch terminal	pin 2	
4	PB_L_MC_N	AF	Codec2 ₄₀	INM2	(not used)	pin 3	
5	HS_B_L_P		Codec2 ₃₉	OUTP2	not used		
6	HS_B_L_N		Codec2 ₃₈	OUTM2			
7	HS_BR_P ²⁾		Codec2 ₄	OUTP3			
8	HS_BR_N ²⁾		Codec2 ₃	OUTM3			
9	HS_DET2	LVTTTL	IC15 ₅	ADC_CH2	Power	pin 6	
10	DGND	GND			Earth	pin 1	
11	PTT_B1/B0 ²⁾				Channel A	pin 5	
12	PTT_B2/B3 ²⁾				Channel B	pin 4	

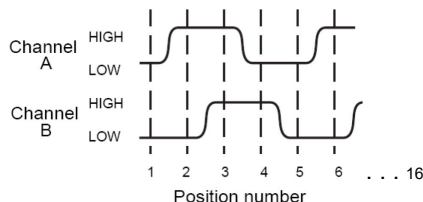


Rotary Encoder Pinning



Clockwise Rotation		
Position	Output A	Output B
1		
2	●	
3	●	●
4		●

● = logical HIGH



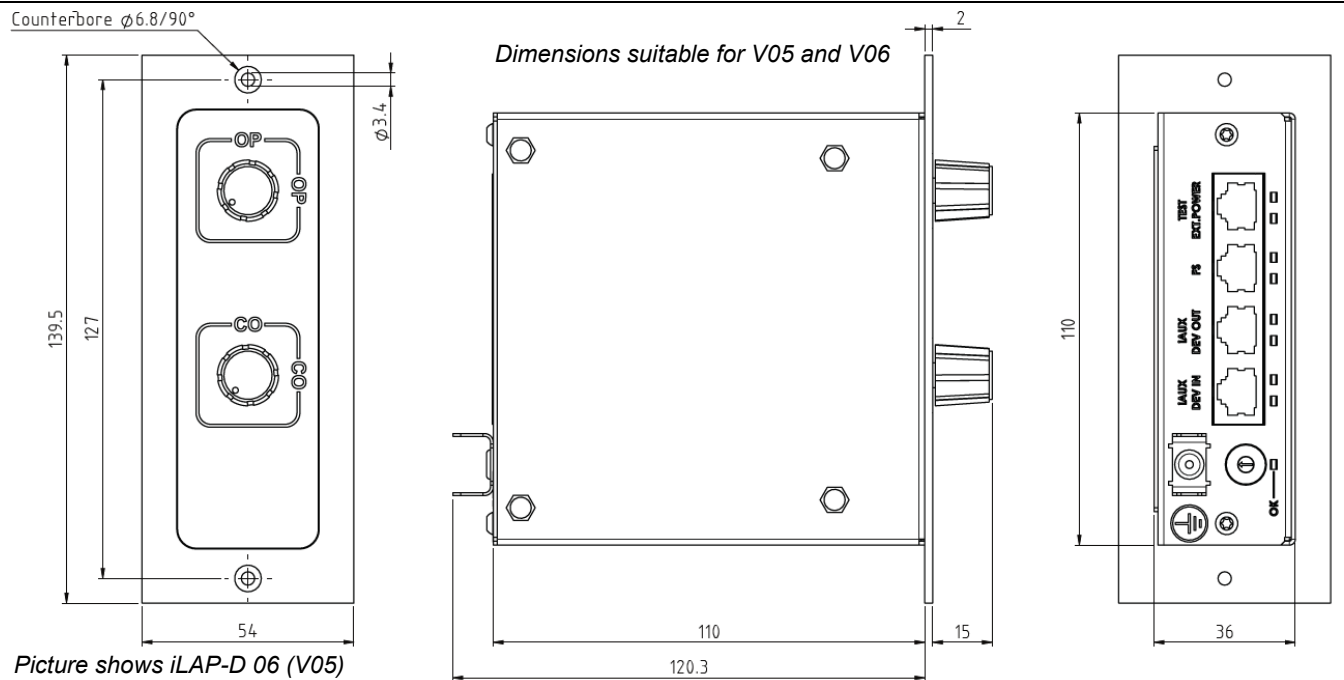
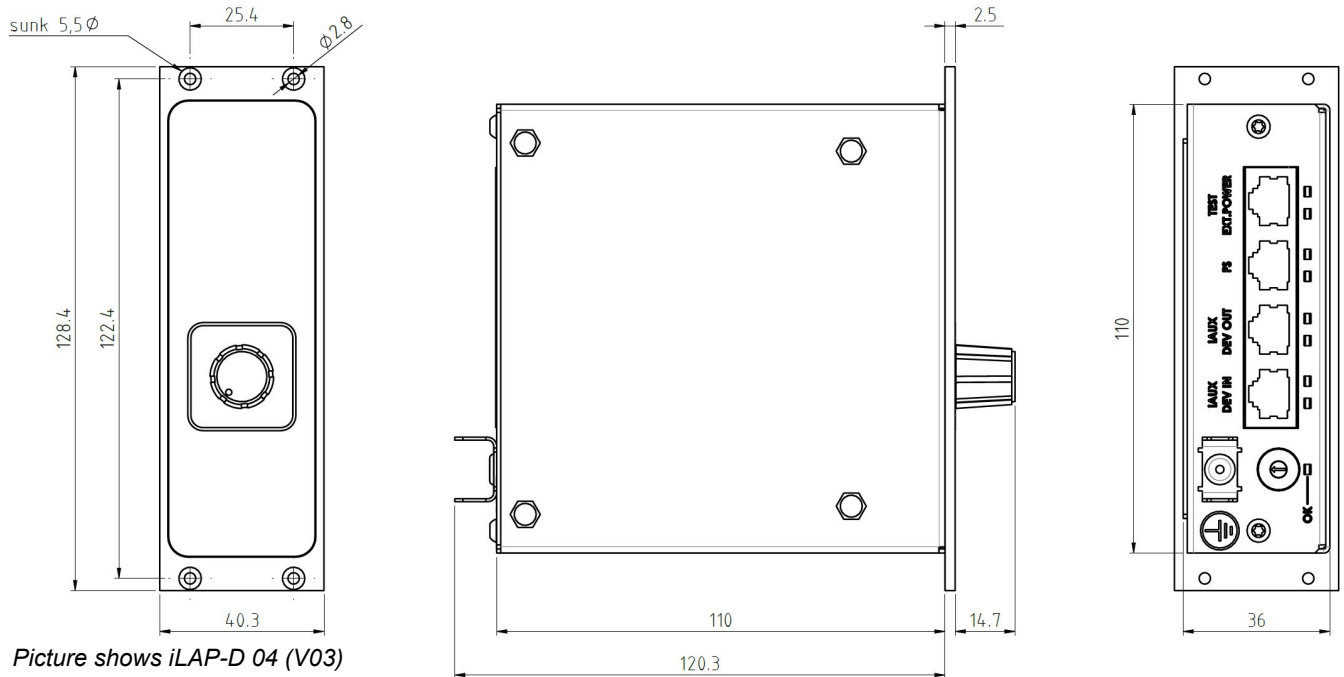
Each different phase relation is used to trigger an event for volume control via software. If the functionality of a push-button is necessary, it is possible to connect the switch terminal pins of the encoder to the microphone pins of X16 and X18, respectively. Feeding has to be turned on to be able to detect the closed contact. To the software, this will be signaled as the corresponding BUBEL.

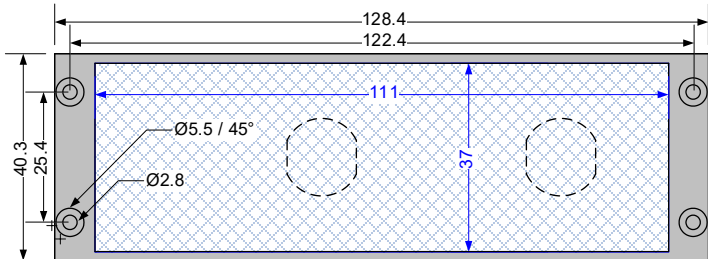
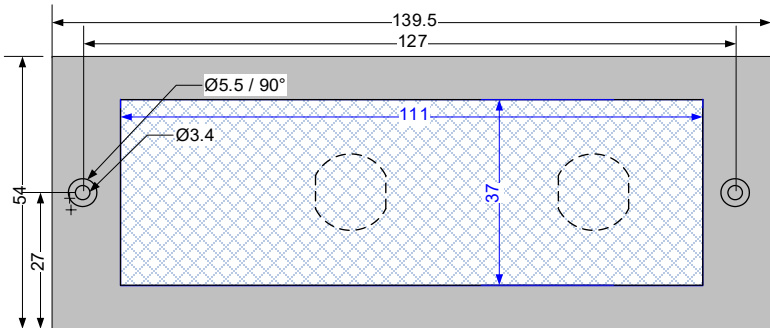
²⁾ optional for use with specific audio devices

Installation of iLAP-D 0x

Mounting

Dimensions in mm



Mounting		Dimensions in mm
iLAP-D 01 (V00) to iLAP-D 05 (V04) Designed for mounting in a 3HU grid, also no specific mounting set is needed for mounting the iLAP-D 0x into a desk cut out since the panel can simply be fastened with 4 appropriate mounting screws (countersunk M2.5 × 11 mm e.g., drilling Ø 2.8 mm).	 <p>Technical drawing of the iLAP-D 01 (V00) to iLAP-D 05 (V04) module. It shows a rectangular panel with a grid pattern. Dimensions include a total width of 128.4 mm and 122.4 mm, a total height of 40.3 mm and 25.4 mm, and a central width of 111 mm. Mounting points are indicated with Ø5.5 / 45° and Ø2.8 mm holes. Two circular cutouts are shown with a diameter of 37 mm.</p>	
iLAP-D 06 (V05) and iLAP-D 07 (V06) No specific mounting set is needed for mounting the iPIPS 12 into a desk cut out since the panel can simply be fastened with 2 appropriate mounting screws (countersunk M3 × 8 mm e.g., drilling Ø 3.4 mm).	 <p>Technical drawing of the iLAP-D 06 (V05) and iLAP-D 07 (V06) module. It shows a rectangular panel with a grid pattern. Dimensions include a total width of 139.5 mm and 127 mm, a total height of 54 mm and 27 mm, and a central width of 111 mm. Mounting points are indicated with Ø5.5 / 90° and Ø3.4 mm holes. Two circular cutouts are shown with a diameter of 37 mm.</p>	
In order to be on the safe side, provide at least 10 cm mounting depth (for connectors and cable bending) behind the iLAP-D 0x.	Connect the module via the rear Faston to the site's equipotential bonding system. For a wiring diagram, please refer to the last page.	
For routing of the corresponding audio to auxiliary devices of the same type, the iPOS identifies the AUX device by means of the setting of the 16-turn HEX rotary encoder setting (4 Bit).	If there is only 1 auxiliary device of a certain type, the encoder has to be set to 0. For every device (of the same type) added to the system, the encoder has to be incremented by 1. This tells the software where the data of a special audio stream has to be routed.	

Cabling of MOD iLAP-D 0x (Examples)							
#	FROM	Cable Type	Length [m]	Order No.	Destination	TO	Description
≤1	TEST	993-LSF	2	17-0993000	Testing device	Notebook	Serial test interface (RS232)
		RJ45-USBA	3	20-0003110	device (RS232)		Serial test interface cable RJ45 <-> USB A
	EXT.POWER		iPIPS side:<1.5 Line side: var.*)	t.b.d.	additional DC supply	e.g. PSU AC TRH70	*) cables on the line side are concern of the customer: requires RJ45 connector!
≤1	FS	integrated	various		Footswitch	FS 30, FSB 0x,	Footswitch
		434-LSF	various	17-043400x	Distribution fr.		Digital in-/outputs
≤1	iAUX DEV OUT (Module N)	713-LSF	various	17-071300x	iAUX DEV IN (Module N+1 resp. loop back)	iPIP(S), iLSP, iLAP-D, ...	AUX-line for up to 4 auxiliary devices (plug-in panel, loudspeaker, etc.)
		869-K		17-0869000	last module only	-	Loop back
1	iAUX DEV IN (Module M)	713-LSF	various	17-071300x	iAUX DEV OUT (Module M-1)	iPIP(S), iLSP, iLAP-D, ...	AUX-Line for up to 4 auxiliary devices (plug-in panel, loudspeaker, ...)



Use only Frequentis cables for maintenance purposes. Please note that the twisted wire pairs on the RJ45 connections are not always side-by-side in commercially available CAT5 cables.

Power Supply

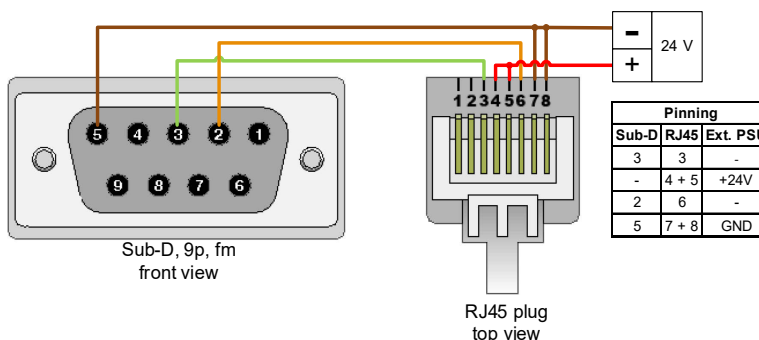


The module is solely intended for use in SELV circuits. All outputs are short-circuit-proof, but a short circuit or overload can impact the proper operation of the board! Proper fusing of the supply lines is required.
To avoid cable burn-out due to short circuits (in case of negative DC supply voltage) and/or to avoid cross currents, a DC/DC converter has to be interconnected on the supply line.

Power configurations without direct supply from iPOS have to be agreed with Frequentis. The TEST / EXT.POWER jack (X8-D) on the rear can be used for supplementary external 24V DC power supply, if otherwise the current consumption of the AUX-devices on the AUX-line would exceed 0.75 A.

To comply with the approved standards, Frequentis recommends in case of primary AC the AC/DC converter PSU AC TRH70 (order no. 20-0003297, max. current 3A) or MOD PHUB 01 (30-0802800).

For testing of spare parts or in case of non-running iPOS, AUX-devices like iLSP require also an external 24V power supply. In that case, the test interface cable needs additional pins for 24 V external power (see picture right).



For notebooks without serial interface port, the USB-to-RJ45 Test interface (20-0003110) cable is necessary.



To comply with the EMC standards, the cable length between the module and the voltage converter must not exceed 10 m!

