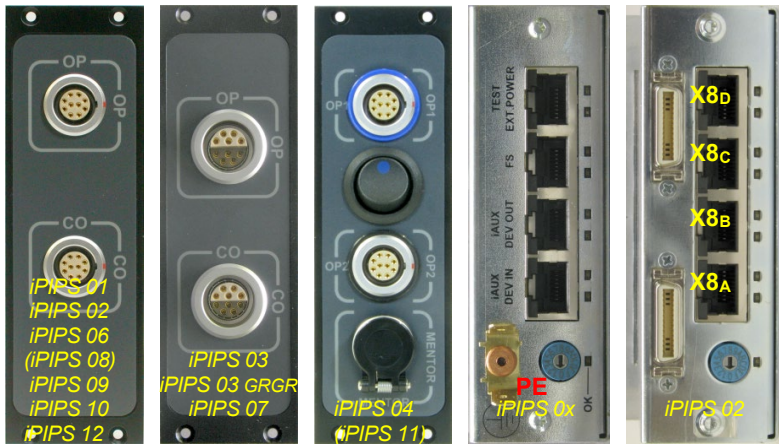



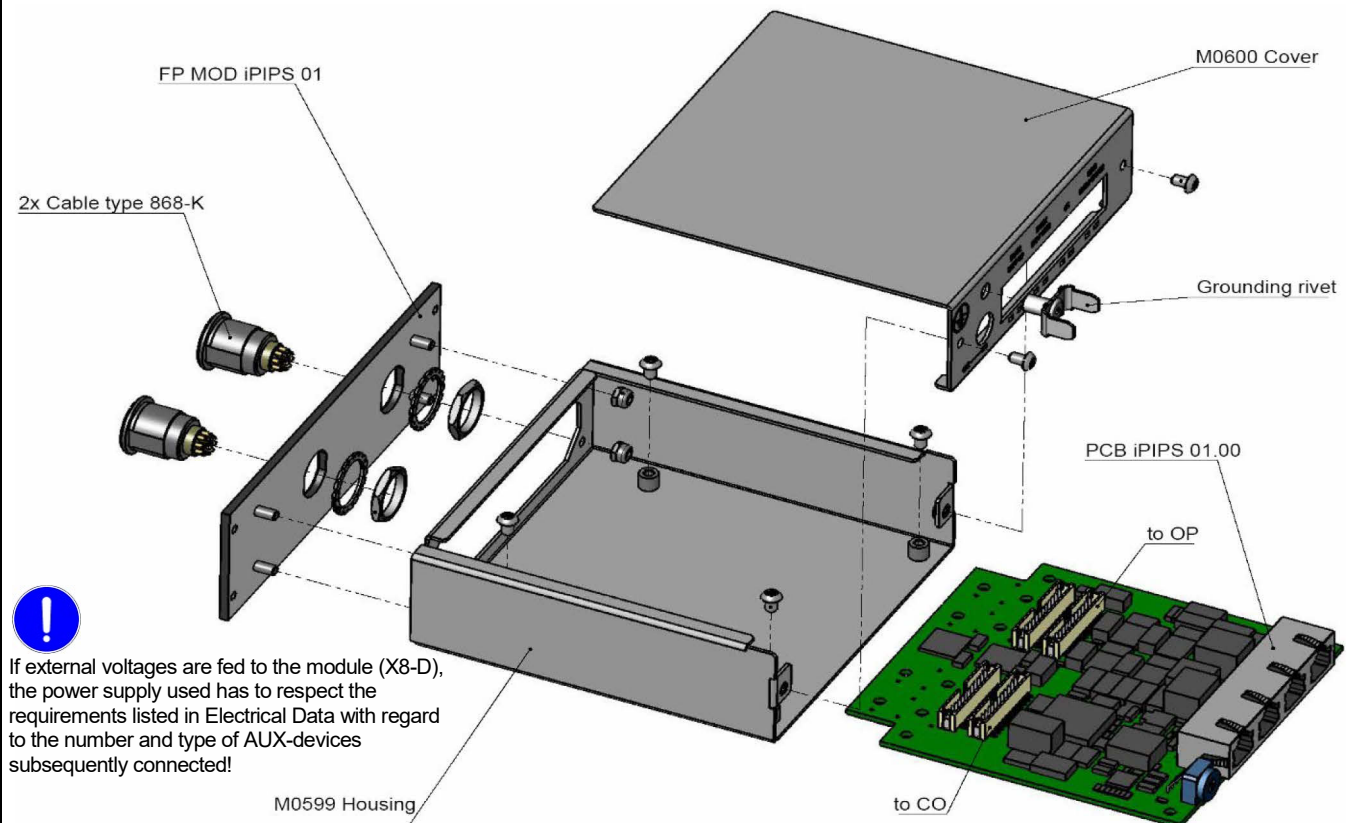


30-060220x		Plug-In Panel for Operator/Coach (Mentor)		iPIPS xy		
ORDER NUMBER		FUNCTION		NAME		
Mechanical Data						
Casing (W × H × D, incl. Faston) 36 × 110 × 120.3 mm ³						
Depth (incl. cable bending) ~170 mm						
Cut-out (W × H, symmetrical) 37 × 111 mm ²						
Front panel						
iPIPS 01 to 11 (W × H; 8 HP × 3 HU) 40.3 × 128.4 mm ²						
Default sheet metal AlMg3, 2.5 mm						
Drillings (Ø 2.8 mm, M2.5, centre/centre) 25.4 × 122.4 mm						
iPIPS 12 (W × H) 54 × 139.5 mm ²						
Default sheet metal AlMg3, 2 mm						
Drillings (Ø 3.4 mm, M3, centre/centre) 27 × 127 mm						
Environment						
Storage		Operation				
Temperature -55 to +70°C		+5 °to +40 C				
Relative humidity (without dewing) 10 to 90 %						
Electrical Data						
Input voltage range (IAUX DEV IN) +24 V DC		+5/-20 %				
Current consumption (idle) 200 mA						
Power consumption (typical, without ext. power) ≤6 W						
Output voltage (IAUX DEV OUT) +24 V DC		+5/-20 %				
Output current ≤0.75 A						
						
		Approvals				
		Electrical Safety EN 60950-1(06)+A11(09)+A1(10)+A12(11)+A2(13); IEC60950-1(05, 2 nd ed.)+A1(09)+A2(13)				
		EMC 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)				
		EN60068-2-1(Aa,Ad),-2(Ba,Bd),-14(Nb),-78(Ca)				
		Climatic				
Variants						
Order No.	Main Board	FP/Foil Colour	Front Connectors		Mass [g]	
iPIPS 01	30-0602200	iPIPS 01.00	RAL9005/RAL7024	2×10p Lemo EGG 2B	Basic version for 2 split hand-/headsets with PTT	440
iPIPS 02	30-0602201	iPIPS 01.00 iACR 01.00	RAL9005/RAL7024	2×10p Lemo EGG 2B	As iPIPS 01 + 2 rear Mini-D ribbon jacks (RES-Q)	460
iPIPS 03	30-0602202	iPIPS 01.00	RAL9005/RAL7024	2×10p Lemo ERA 3S	Specific Lemo jacks at symmetrical positions	445
iPIPS 03 GRGR	30-0602210	iPIPS 01.00	RAL7035/RAL7035	2×10p Lemo ERA 3S	As iPIPS 03 + modified FP colour	445
iPIPS 04	30-0602203	iPIPS 01.60	RAL9005/RAL7024	2×10p, 1×16p Lemo EGG 2B	Mentor box connection; Toggle for active Mic (OP1/2)	455
iPIPS 06	30-0602205	iPIPS 01.70	RAL9005/RAL7024	2×10-p Lemo EGG 2B	As iPIPS 01 + enhanced FPGA & Flash; specific FW coding	440
iPIPS 07	30-0602206	iPIPS 01.A0	RAL9005/RAL7024	2×10-p Lemo ERA 3S	As iPIPS 03 + enhanced FPGA & Flash; specific FW coding	460
iPIPS 08	30-0602207	iPIPS 01.00	RAL9005/RAL7024	2×10p Lemo EGG 2B	As iPIPS 01 + modified screen print: OP⇒OP1, CO⇒OP2	440
iPIPS 09	30-0602208	iPIPS 01.00	RAL7040 gloss 15	2×10p Lemo EGG 2B	As iPIPS 01 + modified FP colour	440
iPIPS 10	30-0602209	iPIPS 01.00	NCS3010-Y30R gloss 15	2×10p Lemo EGG 2B	As iPIPS 01 + modified FP colour	440
iPIPS 11	30-0602211	iPIPS 01.H0	RAL9005/RAL7024	2×10p, 1×16p Lemo EGG 2B	As iPIPS 04 with enhanced FPGA & Flash	455
iPIPS 12	30-0602212	iPIPS 01.00	RAL7011/RAL9016	2×10p Lemo EGG 2B	As iPIPS 01 with modified FP/Foil colour and size	440
Short Description						
<p>The plug-in panel iPIPS xy connects up to 2 (iPIPS 04: up to 3) audio devices 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 CAT5-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 two 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 a 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 operator's as well as the coach's jack delivers the balanced audio signals of the audio devices, up to 3 PTT signals (with special cabling) and a voltage divider pin for automatic audio device detection.</p> <p>The input stage supports dynamic microphones (max 50 dB gain selectable by SW), but also simple electret microphones (low current) can be used. Microphones with impedance between 200 Ω and 600 Ω are supported by the plug-in-panel. The current consumption of the microphone shall be at least 12 mA, feeding (selectable by SW) for external MIC amplifiers (high current).</p> <p>Speakers with impedances higher than 150 Ω can be connected to the headset output amplifier.</p>						

Connectors & Indications									
iPIPS0x	iPIPS04	iPIPS08	Position	Type	Connection of	LEDs	Description		
OP	OP1	OP1	Front	LEMO, 10p, f	two	-	Connection of an operator's hand-/headset		
CO	OP2	OP2	Front	LEMO, 10p, f	audio devices	-	Connection of a coach's hand-/headset		
SW1			Front	Rocker switch with blue coding point		-	Toggle switch selects/indicates the active microphone (OP1/OP2) to iPOS		
MENTOR			Front	LEMO, 16p, f	Mentor Box MTB 30.20	-	Override function for switching of PTT signalling (iPIPS 04/11 only)		
TEST EXT.POWER			X8-D rear	RJ45, 8-p, f	RS232 serial test IF / 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	Footswitch (up to 2 with appropriate cable)	green	depends on	ON = FS 1 active, e.g.	can be used for reading in various digital inputs
						orange	Audio matrix	ON = FS 2 active, e.g.	
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	After start-up and successful configuration of the FPGA, the LIVE_LED will flash. When the iPOS takes over the control of the LEDs, the LIVE_LED will light.	
						green	Control by iPOS		
						OFF	Device OFF/failure		
TO EMOD			Rear	26p Mini ribbon	EMOD 0x (iPIPS 02 only)	-	Sharing of audio devices (handset, headset,...) between VCS and Radio Emergency System RES-Q (iPIPS 02 only)		
FROM EMOD			Rear	26p Mini ribbon		-			
			Rear	HEX rotary encoder	AUX-device identifier: HEX= 0, 1, ..., F		The accompanying audio packets for a specific AUX-devices of this chain will be identified by means of the applied HEX-code		
			Rear	Faston plug	Earthing	-	Connection to the equipotential bonding system		

Overview iPIPS 01, 06, 08, 09, 10 – Basic Variants

Main Components

	Position / #
● Front Panel	M0597,-8
▪ 2 LEMO jacks, Series 2B, 10-p	OP, CO
▪ 2 Cables 868-K (CO – X16, OP – X18)	17-0868000,-1
● Housing	M0599
● Cover	M0600
▪ 1 Earthing rivet	double Faston
● PCB iPIPS 01.x0 for iPIPS 01, 08	40-0602300
iPIPS 06	40-0602307
▪ 1 Modular jack 4x8-p RJ45	X8-A,-B,-C,-D
▪ 1 Rotary code switch 16-turn	S1

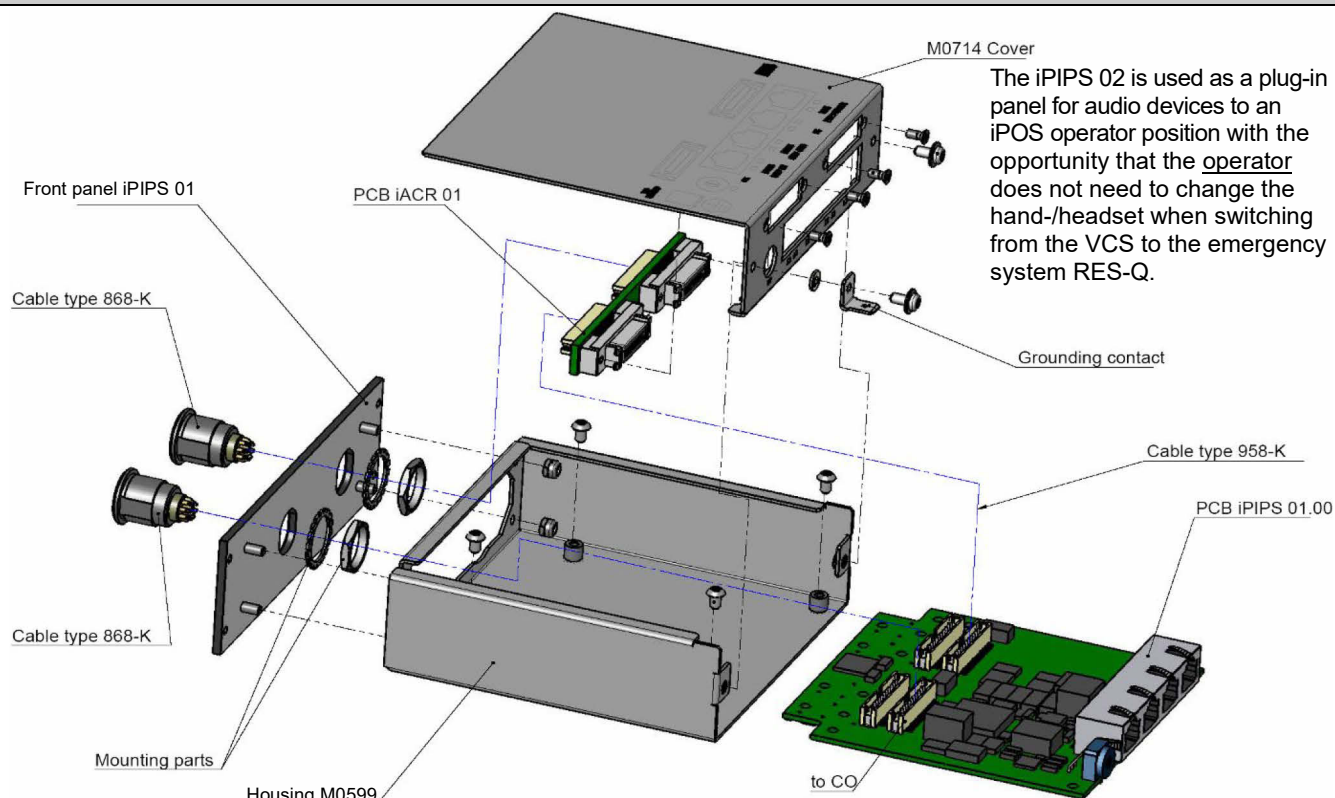
The AUX-devices (Plug-In Panels = PIPs) are connected via Ethernet (cable 713-LSF) in a daisy chain to the iPOS. Using a TDM-like layout, its FPGA sends packets containing the information for all devices in a chain, with all channels for one chain and data included to the 1st connected PIP. Then, each 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 ⇒ 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.

For routing of the corresponding audio to AUX-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).

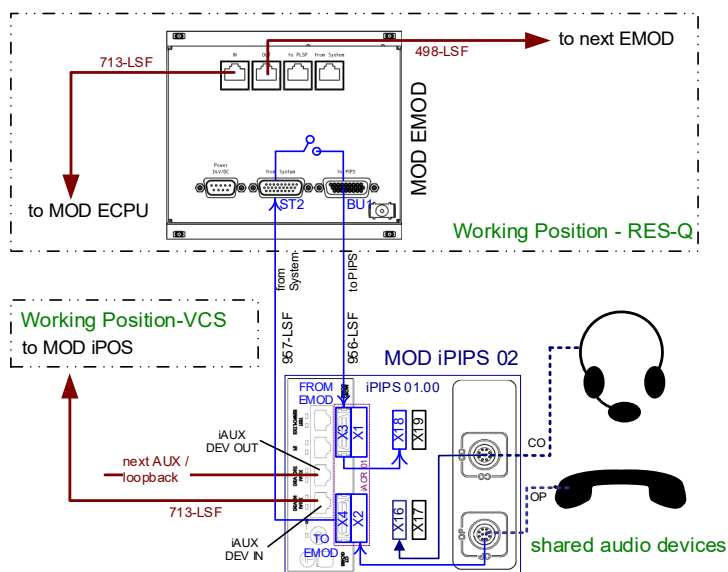
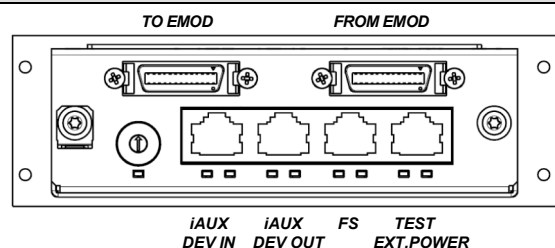
If there is only 1 AUX-device of a certain type the encoder has to be set to 0. For every device (of the same type) added to the system the encoder has to be incremented by 1. This tells the SW where the data of a special audio stream has to be routed.

Overview iPIPS 02

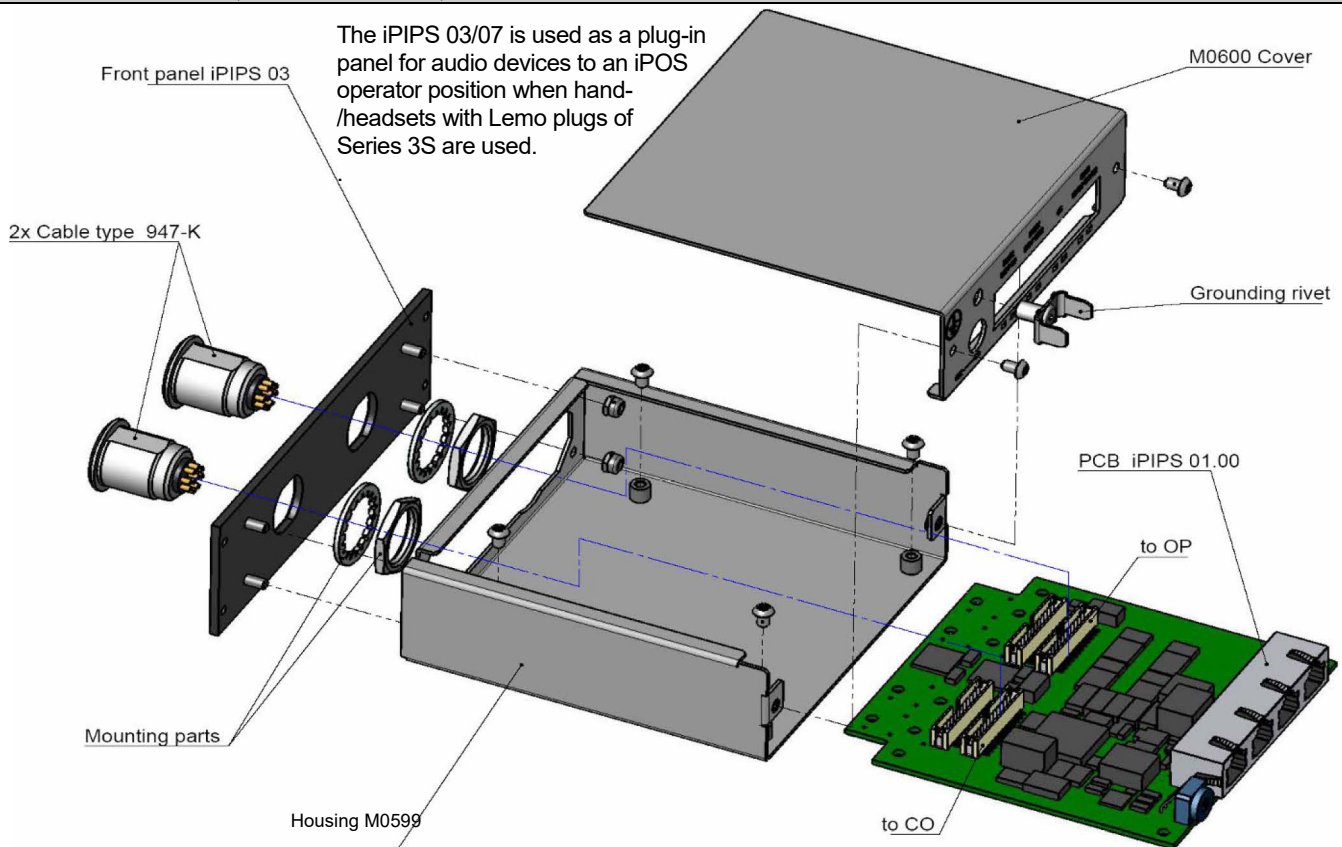


Main Components

- | | Position / # |
|--|---------------|
| ● Front Panel, | M0597,-8 |
| ▪ 2 LEMO jacks, Series 2B, 10-p | OP, CO |
| ▪ 2 Cable 868-K (CO – X16 _{iPIPS} , OP – X3 _{iACR}) | 17-0868000,-1 |
| ▪ 1 Cable 958-K (X4 _{iACR} – X18 _{iPIPS}) | 17-0958000 |
| ● Housing / Cover | M0599 / M0714 |
| ▪ 1 Earthing rivet | double Faston |
| ● PCB iPIPS 01.00 | 40-0602300 |
| ▪ 1 Modular jack 4x8-p RJ45 | X8-A,-B,-C,-D |
| ▪ 1 Rotary code switch 16-turn | S1 |
| ● PCB iACR 01.00 | 40-0702600 |

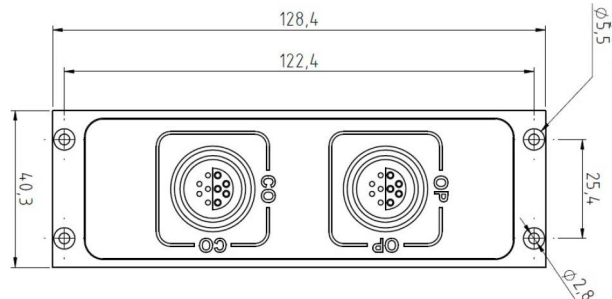


Overview iPIPS 03, iPIPS 03 GRGR, iPIPS 07

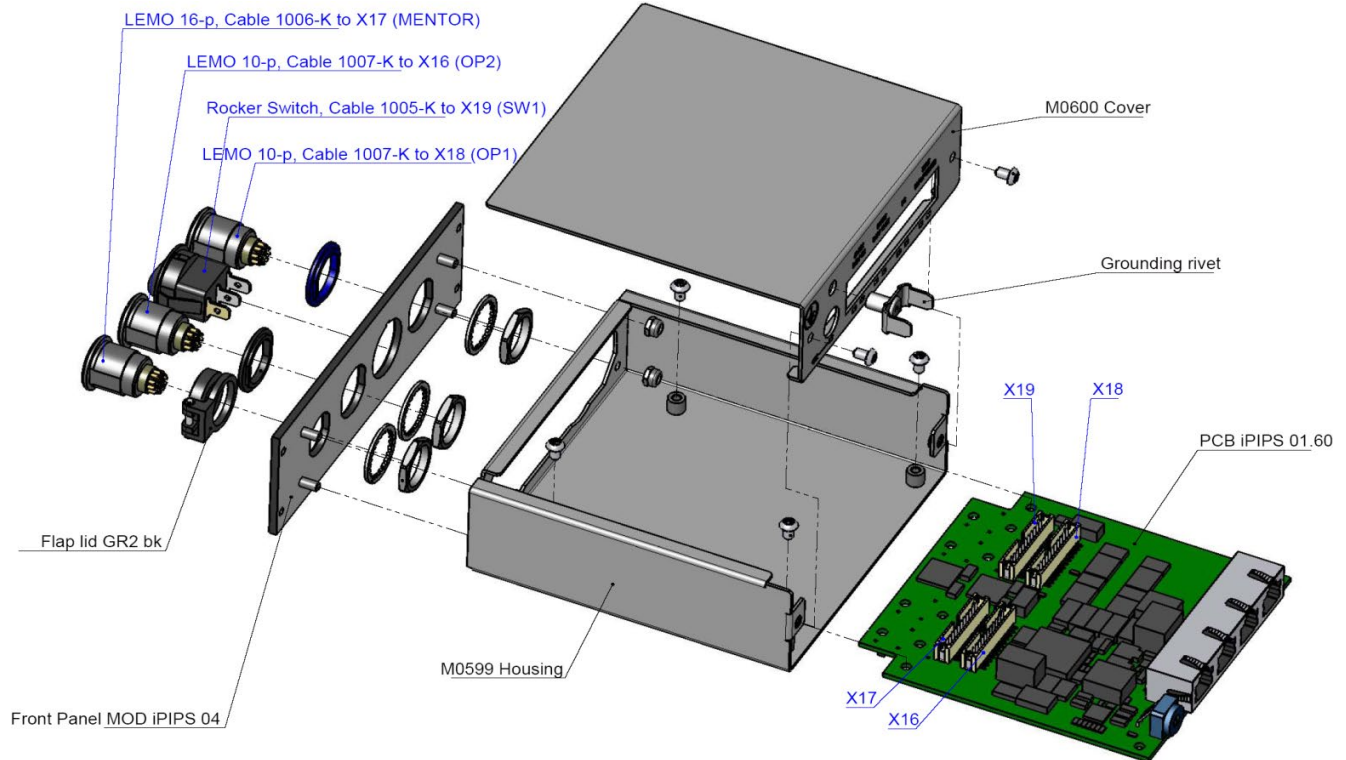


Main Components

	Position / #
● Front Panel, varnished with foil	M0597,-8
▪ 2 LEMO jacks, Series 3S, 10-p	OP, CO
connected to sub-board iPIPS 01.00 via	
▪ 2 Cables 947-K (CO - X16, OP - X18)	17-0947000,-1
● Housing, Cover	M0599, M0600
▪ 1 Earthing rivet	double Faston
● PCB iPIPS 01.X0 for iPIPS 03	40-0602300
iPIPS 07	40-0602310
▪ 1 Modular jack 4x8-p RJ45	X8-A,-B,-C,-D
▪ 1 Rotary code switch 16-turn	S1

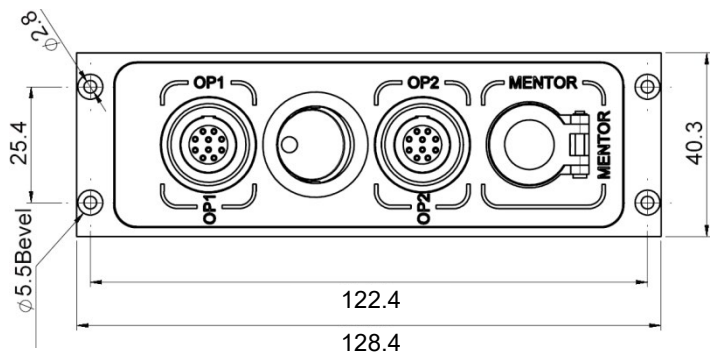


Overview iPIPS 04, iPIPS 11

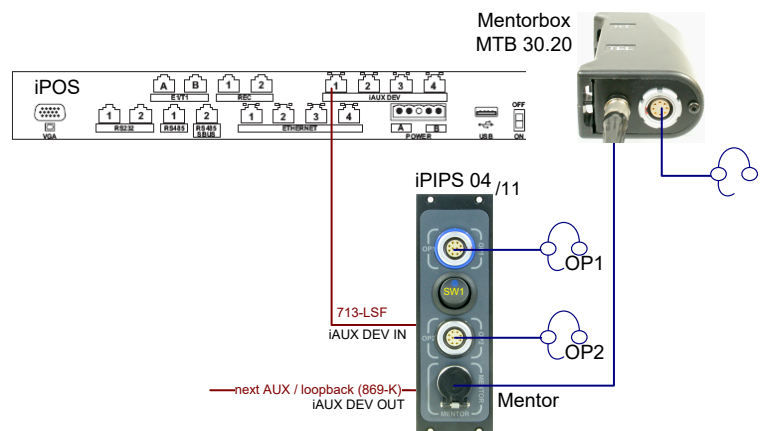


Main Components

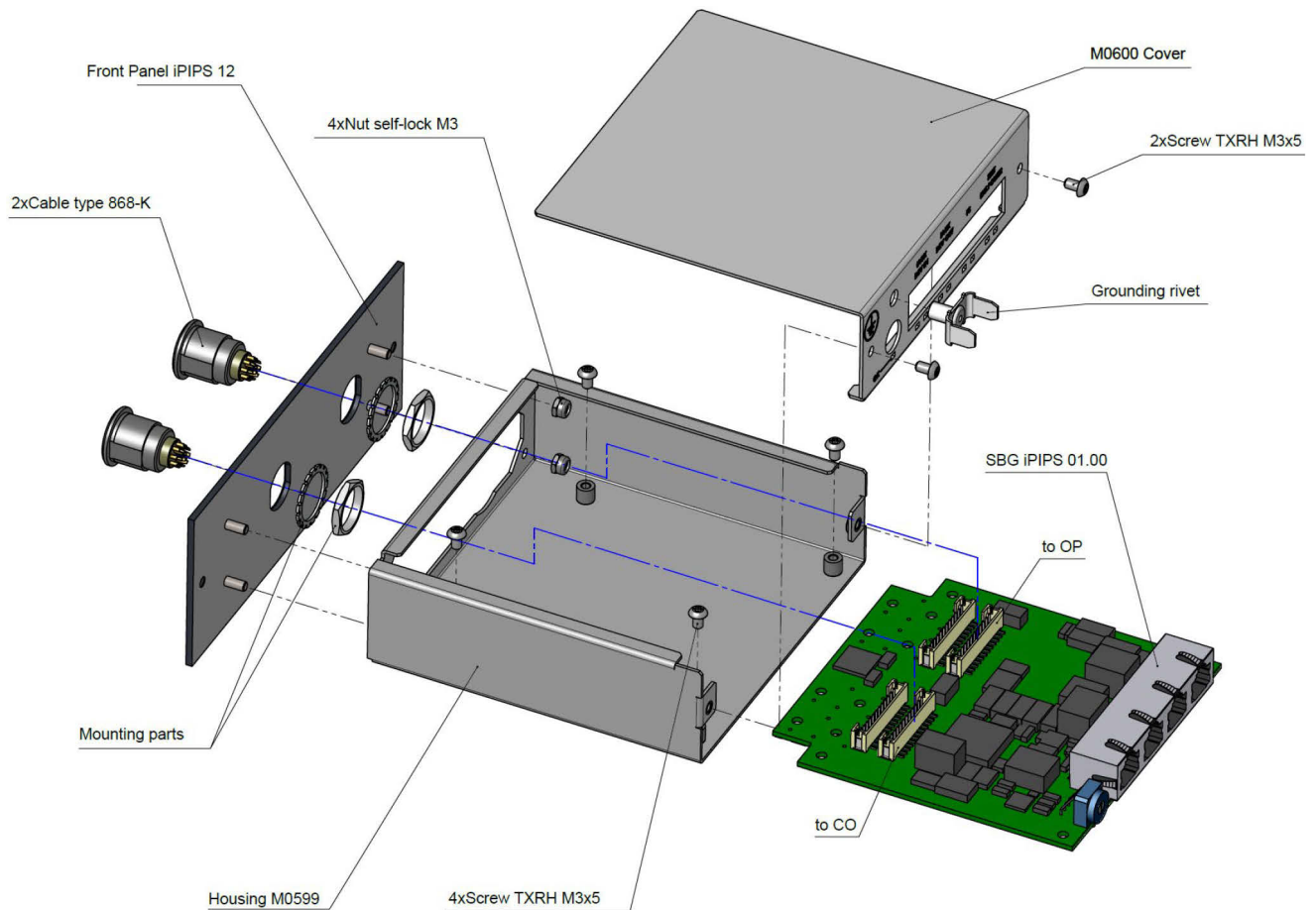
	Position / #
● Front Panel, varnished RAL9005, foil RAL7024	
	M0776, M0777
▪ 2 LEMO jacks, Series 2B, 10-p	OP, CO
▪ 1 LEMO jack, Series 2B, 16-p	Mentor
▪ 1 Rocker switch (OP1/OP2)	SW1
▪ 2 Cable 1007-K (OP1,2 – X16,18 _{iPIPS})	17-1007000,-1
▪ 1 Cable 1006-K (Mentor– X17 _{iPIPS})	17-1006000
▪ 1 Cable 1005-K (S1– X19 _{iPIPS})	17-1005000
● Housing / Cover	M0599 / M0600
▪ 1 Earthing rivet	double Faston
● PCB iPIPS 01.60 iPIPS 04	40-0602306
PCB iPIPS 01.H0 iPIPS 11	40-0602317
▪ 1 Modular jack 4×8-p RJ45	X8-A,-B,-C,-D
▪ 1 Rotary code switch 16-turn	S1



The plug-in panels iPIPS 04/11 serve as a connector unit to the operational touch screen position iPOS for 2 hand-/headsets and a Mentor Box, a handheld unit that provides override facility for radio and telephone and a headset connector for a mentor. The different type of the Mentor Box (MTB 30.20) socket prevents a headset being plugged into directly. With switch SW1 it is possible to switch the microphone input, the hand-/headset detection and the PTT between OP1 and OP2 (OP1 when pressed on the blue coding point's side). Any audio signal for the hand-/headset speaker is always routed to all 3 sockets. When the override facility (radio or telephone) on the Mentor Box is pressed, the MENTOR microphone will become the active one and the former active microphone of the operator will be muted.

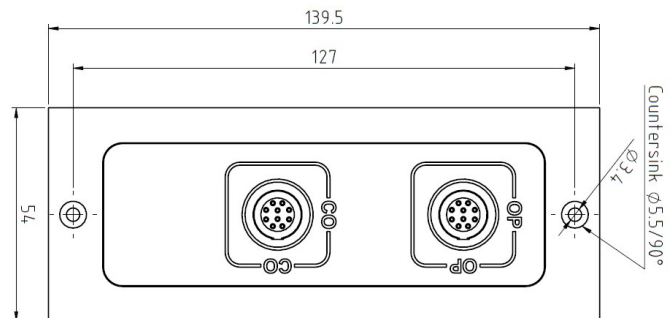


Overview iPIPS 12



Main Components

	Position / #
● Front Panel	M0599
▪ 2 LEMO jacks, Series 2B, 10-p	OP, CO
connected to sub-board iPIPS 01.x0 via	
▪ 2 Cables 868-K (CO – X16, OP – X18)	17-0868000
● Housing	M0599
● Cover	M0600
▪ 1 Earthing rivet	double Faston
● PCB iPIPS 01.00	40-0602300
▪ 1 Modular jack 4×8-p RJ45	X8-A,-B,-C,-D
▪ 1 Rotary code switch 16-turn	S1



This document is subject to change without notice.

Installation

Dimensions in mm

Mounting of iPIPS 01 to iPIPS 11

Designed for mounting in a 3HU grid, also no specific mounting set is needed for mounting the iPIPS xy 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).

Mounting of iPIPS 12

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).

In order to be on the safe side, provide at least 17 cm mounting depth (for connectors and cable bending) behind the iPIPS xy. Connect the module via the rear Faston to the site's equipotential bonding system. For cabling, see below.

Cabling of MOD iPIPS xy (Examples)

#	FROM	Cable Type	Length [m]	Order No.	Destination	TO	Description
1	TEST	993-LSF	2	17-0993000	Testing device (RS232)	PC, Notebook	Serial test cable RJ45 <> Sub-D 9p
		RJ45-USBA	3	20-0003110			Serial test cable RJ45 <> USB A
1	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	iPIP(S), iLSP, iLAP-D, ...	to module N+1 resp. loop back; AUX-line for up to 4 auxiliary devices (PIP, LSP)
		869-K		17-0869000	last module	-"	Loop back
1	iAUX DEV IN (Module M)	713-LSF	various	17-071300x	iAUX DEV OUT	iPIP(S), iLSP, iLAP-D, ...	to module M-1)
1	TO EMOD (iPIPS 02 only)	957-LSF	various	17-095700x	from System	EMOD	Radio Emergency System RES-Q connected
		772-LSF	various	17-077200x	FROM EMOD	iPIPS	without RES-Q
1	FROM EMOD (iPIPS 02 only)	956-LSF	various	17-095700x	to PIPS	EMOD	Radio Emergency System RES-Q connected
		772-LSF	various	17-077200x	TO EMOD	iPIPS	without RES-Q

i

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 CATx cables.

Power Supply

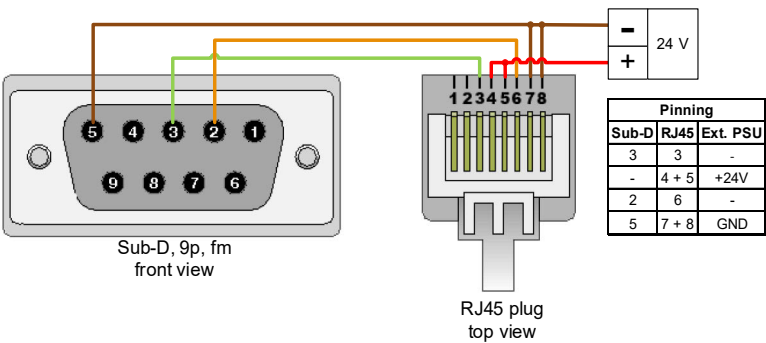


The module is solely intended for use in SELV-circuits. All outputs are short-circuit-proof, but a short circuit or overload can impact the proper operation of the board! Proper fusing of the supply lines is required. To avoid cable burn-out due to short circuits (in case of negative DC supply voltage) 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 Testinterface cable (20-0003110) is necessary.



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

Pinning of Front Connectors

Pin	Label/Signal	Type	Description	Ref. on PCB iPIPS	Schematic
OP / OP1_{iPIPS04/08} LEMO-jack 10p to X18 _{iPIPS(stereo)}					
1	HS A L P	AF	Ear capsule left+ (a)		
2	HS A L N	AF	Ear capsule left - (b)		
3	PTT A0	iPIPS 04: PTT A2	LVTTL Push-to-talk 0		
4	DGND	GND	Earth		
5	HS A R P	AF	Ear capsule right + (a)		
6	HS A R N	AF	Ear capsule right - (b)		
7	PA L MC P	AF	Microphone + (a)		
8	PA L MC N	AF	Microphone - (b)		
9	HS DET0	LVTTL	Headset detection		
10	DGND	GND	Earth		
CO / OP2_{iPIPS04/08} LEMO-jack 10p to X16 _{iPIPS(stereo)}					
1	HS B L P	AF	Ear capsule left+ (a)		
2	HS B L N	AF	Ear capsule left - (b)		
3	PTT B0	iPIPS 04: PTT B2	LVTTL Push-to-talk 0		
4	DGND	GND	Earth		
5	HS B R P	AF	Ear capsule right + (a)		
6	HS B R N	AF	Ear capsule right - (b)		
7	PB L MC P	AF	Microphone + (a)		
8	PB L MC N	AF	Microphone - (b)		
9	HS DET2	LVTTL	Headset detection		
10	DGND	GND	Earth		
iPIPS 04/11 only: MENTOR LEMO-jack 16p to X17_{iPIPS(mono)}					
1	HS B L P	Speaker left +	8 PB R MC N	Microphone -	
2	HS B L N	Speaker left -	9 PTT_B0	PTT (e.g.phone)	
3	PTT B1	PTT (e.g. radio)	10 -	n.c.	
4	DGND	Earth	11 PTT_B3	PTT (e.g.ICOM)	
5	HS B R P	Speaker right +	12-14 -	n.c.	
6	HS B R N	Speaker right -	15 HS_DET3	HS-detection	
7	PB_R_MC_P	Microphone +	16 DGND	Earth	

Pinning of Rear Connectors

			Label (rear)
X8-D_{iPIPS} RJ45 TEST / EXT.POWER			
1	RTS	OUT	Request to send
2	CTS	IN	Clear to send
3	RXD	IN	Receive data
4	P24V_EXT	IN	p4 connected to p5
5	P24V_EXT	IN	+24 V input (+5/-20 %); <1 A
6	TXD	OUT	Transmit data
7	DGND	IN	Digital earth
8	DGND	IN	Digital earth
X8-C_{iPIPS} RJ45 FS (count of realized contacts depends on iPOS audio matrix)			
1	PTT_A2	IN	Push-to-talk 2, a (option)
2	PTT_A3	IN	Push-to-talk 3, a (option)
3	FTSW0	IN	Footswitch 0, a
4	PTT_B2	IN	Push-to-talk 2, b (option)
5	PTT_B3	IN	Push-to-talk 3, b (option)
6	DGND	SELV	Footswitch 0, b
7	DGND	SELV	Footswitch 1, b
8	FTSW1	IN	Footswitch 1, a
X8-B_{iPIPS} RJ45 IAUX DEV OUT			
1	AUX_TX_P	OUT	Ethernet to AUX _{N+1} /terminat.
2	AUX_TX_N	OUT	Ethernet to AUX _{N+1} /terminat.
3	AUX_RET_P	IN	Return path for Ethernet, a
4	P24V_OUT	OUT	p4 connected to p5;
5	P24V_OUT	OUT	+24 V input (+5/-20 %); <1 A
6	AUX_RET_N	IN	Return path for Ethernet, b
7	DGND	IN	Digital earth
8	DGND	IN	Digital earth (p7 to p8)
X8-A_{iPIPS} RJ45 IAUX DEV IN			
1	AUX_RX_P	IN	Ethernet from AUX _{N-1} /iPOS
2	AUX_RX_N	IN	Ethernet from AUX _{N-1} /iPOS
3	AUX_RET_P	OUT	Return path for Ethernet, a
4	P24V_IN	IN	+24 V input (+5/-20 %); <1 A
5	P24V_IN	IN	p5 connected to p4
6	AUX_RET_N	OUT	Return path for Ethernet, b
7	DGND	IN	Digital earth
8	DGND	IN	Digital earth (p7 to p8)

Wiring Diagram

Legend for Pinning
Blue = analog lines
Red = digital lines
Green = supply & earth

Working Position - RES-Q

Working Position - VCS

Levels
PTT, FTSW dry contact, detect TTL vs. GND
0 V ≤ U_I ≤ 0.8 V, 3.0 V ≤ U_H ≤ +5 V
Ethernet complies with IEEE 802.3

MOD iPIPS 04 Headset Outputs
Speaker impedance >150 Ω
Amplification -54 to 0 dB
P_{OUTmax} (150 Ω, 0 dB) 13 mW
P_{OUTmax} (3.3 v supply) 2.35 V
Microphone Inputs
Frequency range (acc.ITU-T.6.712) 300 - 3400 Hz
Level incoming -49 to 0 dB configurable
Distortion recommended lower than 1%
Phantom feed. V_{Mic} = ±12 V

MOD iLSP 03
only with iLSP 03 or iPIPS 02, resp.
only with iPIPS 04