Performer

Installation Guide for Mainframes, Panels and Accessories

V1.1

02-000HB01AA-A00

CONTENT

1 Preface

Thank you for choosing a Riedel product.

This Installation-Guide provides detailed information about the Performer Matrix, especially pin outs, mechanical and electrical data. Products with separate manuals are not descried in this Installation-Guide.

For further information, please refer to the Riedel Website or contact your local distributor or the Riedel headquarters in Wuppertal.

THIS GUIDE DESCRIBES THE ACTUAL VERSION OF THE HARDWARE: OLDER HARDWARE MAY VARY IN THE PINOUTS; ELECTRICAL DATA AND INTERNAL CIRCUIT DESIGN.

NOTICE
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02-000HB01AA-A00
Performer Installation-Guide V1.1

1.1 Information

Symbols

The following tables are used to indicate hazards and provide cautionary information in relation to the handling and use of the equipment.

Danger	
	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
	The highlighted line indicates the activity to prevent the danger.

Warning	
	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	The highlighted line indicates the activity to prevent the danger.

Caution	
	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.
	The highlighted line indicates the activity to prevent the danger.

	This text is for generally information. It indicates the activity for ease of work or for better understanding.

Service

- All service has to be undertaken ONLY by qualified service personnel.
- There are no user serviceable parts inside the Power Supply Units or inside the Mainframe.
- Do not plug in, turn in or attempt to operate an obviously damaged unit.
- Never attempt to modify the equipment components for any reason.

Caution	
	**All adjustments have been done at the factory before the shipment of the devices. No maintenance is required and no user serviceable parts are inside the module.**

Voltage

- The power cable should only be connected to a correctly grounded source.
- Do not use any adapters.
- Never bypass a ground contact.

Danger	
	**To reduce the risk of electric shock do not remove cover or expose the products to rain or moisture.**

Caution	
	**Frames do have redundant Power supplies.** **Before you open a unit, remove both power cords.**

Warning	
	Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan.
	Apparatet må tilkoples jordet stikkontakt.
	Apparaten skall anslutas till jordat uttag.

Environment

- Never place the mainframe in an area of high dust particles or humidity.
- Never place containers with any liquids on top of the mainframe or panel/interface.
- If the equipment has been exposed to a cold environment and transferred to a warm environment, condensation may form inside the housing. Wait at least 6 hours before applying any power to the equipment.
- Operating temperature of the system: -5°C ... +55°C.

Ventilation

- Keep front panels of each frame always closed.
- Do not place the mainframe next to a hot source like a radiator.
- Ventilation openings on the left and right side of the frame must never be blocked.

Laser Safety

Various devices or cards can be equipped with optical fiber modules (FOM) for the data transmission over a fiber. Following laser safety information are valid for these products:

FOM-MM / FOM-MM-HP and FOM-SM
The multimode laser transceiver is a class 1 laser product.
It complies with EN 60825-1 and FDA 21 CFR1040.10 and 1040.11.

Caution	
	A class 1 laser is safe under all conditions of normal use. This means the maximum permissible exposure (MPE) cannot be exceeded.
	Do not view directly with optical instruments into the beam.

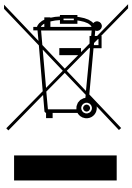
Battery Safety

The CPU cards are fitted with the following battery: Lithium Battery, type CR2450, 3.3 V, 560 mAh.

Warning	
	Risk of explosion if battery is replaced by any other incorrect type.
	Dispose of used batteries according to the instructions. Do not expose to high storage temperatures above 60°C (140°F).

Disposal

Disposal of old Electrical & Electric Equipment (Applicable throughout the European Union and other European countries with separate collection programs)

	This symbol, found on your product or on its packaging, indicates that this product should not be treated as household waste when you wish to dispose of it. Instead, it should be handed over to an applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences to the environment and human health, which could otherwise be caused by inappropriate disposal of this product. The recycling of materials will help to conserve natural resources. For more detailed information about the recycling of this product please contact your local city office.

CE Declaration of Conformity

CE	The Artist devices conform to the EU guideline EMC 2004 / 108 / EC, Low - Voltage 2006 / 95 / EC as attested by the CE mark.

1.2 About Performer

Performer 32 is a powerful and cost-effective digital intercom matrix/stage management system. It is designed for the requirements of stand-alone broadcast applications, opera houses and theatres as well as sports and cultural events. The system is based on a modular concept and can be adapted to the individual requirements of its users.

Performer 32 is available in two sizes and can be modularly equipped. Both versions can build matrices with up to 32 users. In addition to the client cards the compact systems also offer up to 16 or 80 relay switches (Performer 32+16 or Performer 32+80) for the control of intermission signs, cue lights and special effects.

Performer 32 systems are the ideal integration platform for diverse audio and communications sources. Versatile interface solutions allow seamless integration of digital and analog partylines, radios, audio routers, telephones as well as other analog and digital systems. Combined with the digital partyline interface C44plus, the Performer line for the first time offers a completely integrated solution for the combination of matrix systems and conventional partyline applications. The configuration of the partylines is handled with the same configuration software and is thus totally integrated with the matrix environment.

PERFORMER Matrices – key Benefits

- Cost-effective matrix intercom solution
- Modular expansion from 8 x 8 up to 32 x 32 ports
- broadcast quality audio (AES3/EbU) throughout the entire system
- Digital connection to the panels via COAX, CAT5 or fiber
- Redundant power supply, all modules hot-swappable
- Intuitive configuration software
- Individual volume control for each cross-point
- Secure long-term investment made in Germany

Applications

- Stand-alone broadcast Applications
- Theatres
- Sport & Cultural Events
- Exhibition and Convention Centers
- Stadiums & Theme parks

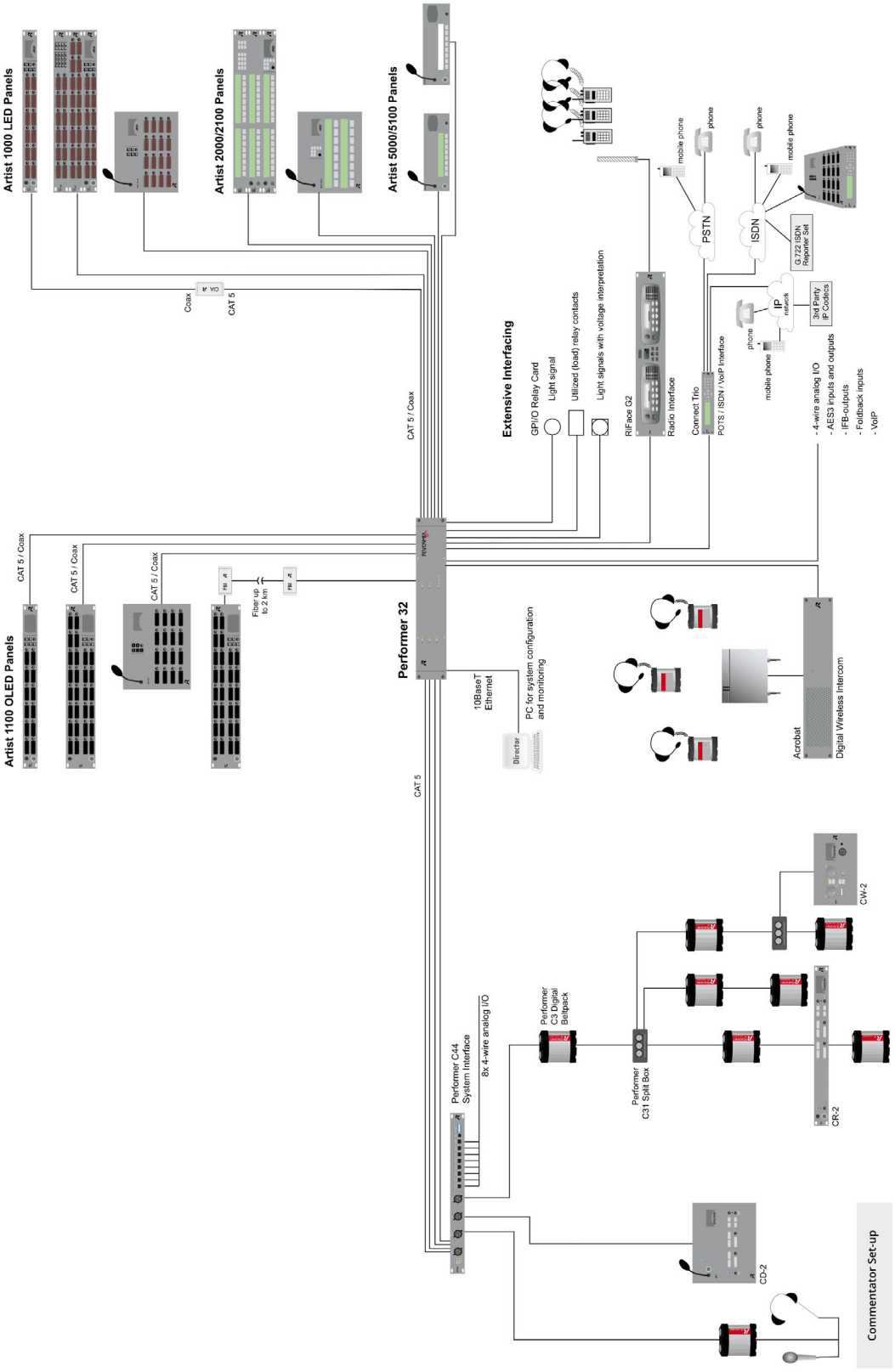


Figure 1: System overview (example)

2 Performer Mainframes

Performer mainframes are designed as light weight – maximum rugged units.
Equipped with two redundant power supplies and high quality fans, the Performer mainframes offer a highly available system. All cards are hot pluggable and are compatible to the Performer frame types 32+80 and 32 +16.

2.1 General

Keep the front panel always closed in order to prevent the installed cards and power supplies from overheating.
For full redundant power supply connect mains from different fuses.

2.1.1 Connectors

PSU-Hardware Alarm

The pin out for the PSU hardware alarm is the same for all kind of frames. The PSU alarm connectors are directly mounted to the frame.

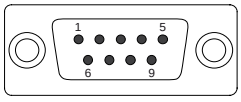


Figure 2: PSU-Alarm D-Sub 9m pinout

Alarm 1	Function
Pin 1	not connected
Pin 2	not connected
Pin 3	Alarm PSU A
Pin 4	Alarm PSU B
Pin 5	not connected
Pin 6	not connected
Pin 7	not connected
Pin 8	not connected
Pin 9	not connected
Shield	Chassis GND

Alarm 2	Function
Pin 1	not connected
Pin 2	not connected
Pin 3	not connected
Pin 4	Alarm PSU 1 A
Pin 5	Alarm PSU 2 A
Pin 6	not connected
Pin 7	not connected
Pin 8	Alarm PSU 1 B
Pin 9	Alarm PSU 2 B
Shield	Chassis GND

All alarm contacts are dry **“normal open”** contacts. If the PSU recognizes any error (AC fail, DC fail or fan fail, a relay realizes the connection at the lower connector between pin 4 and pin 8 (PSU1), pin 5 and pin 9 (PSU2). Furthermore the pins 3 and 4 from the upper connector are connected internally by any error at PSU 1 OR PSU 2.

2.1.2 Technical Data - Performer Mainframes

AC Voltage	90 ... 264 VAC	Width	19" (483 mm)
Frequency	47 ... 63 Hz	Depth *	380 mm
Cos phi	Performer 32+80 : 0.94	Height	Performer 32+80 :3 HE (132 mm)
	Performer 32+16 : 0.73		Performer 32+16 : 2 HE (88 mm)
Power Consumption	Performer 32+80 : 250 W	Empty Weight (with 2 x PSU and Fan)	Performer 32+80 : 3.8 kg (4.1 kg)
	Performer 32+16 : 200W		Performer 32+16 : 3.3 kg (5.1 kg)
Operating Temperature	-5°C ... +55°C		

* without connector

2.2 Performer 32+80

The Performer 32+80 mainframe provides up to 9 client cards and one CPU card. Each client card slot can also be used for a GPI card. The CPU must be placed in Bay A.

Do not use the matrix without fans and keep the front panel always closed.

Bay	Possible Card-Types:
A	CPU-032 / CPU-032M
B	ELA-OP-016, GPI-016
1 ... 4	COAX-008, CAT5-008, AES-008, AIO-008(AIO-009), VoIP-008, ELA-OP-016, GPI-016, AVB-008
5 ... 8	ELA-OP-016, GPI-016

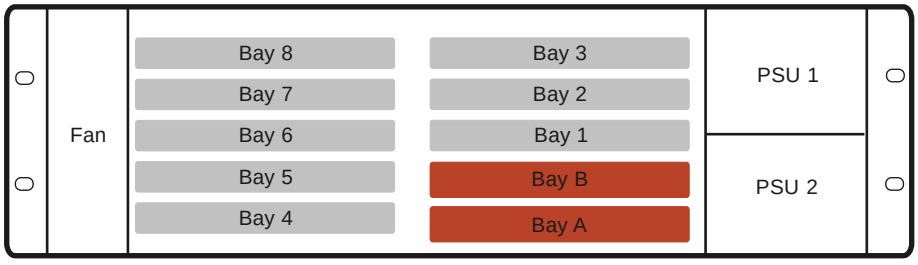


Figure 3: Performer32+80 MFR (front view)

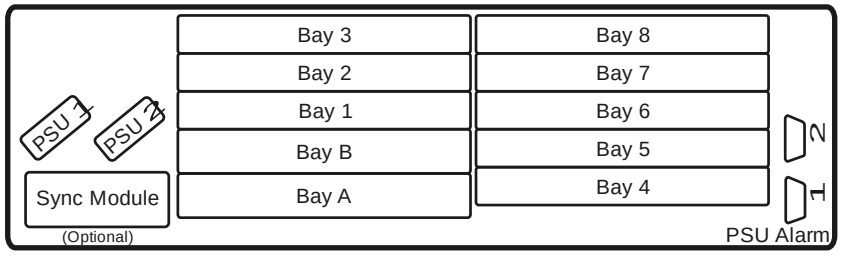


Figure 4:Performer32+80 MFR (rear view)

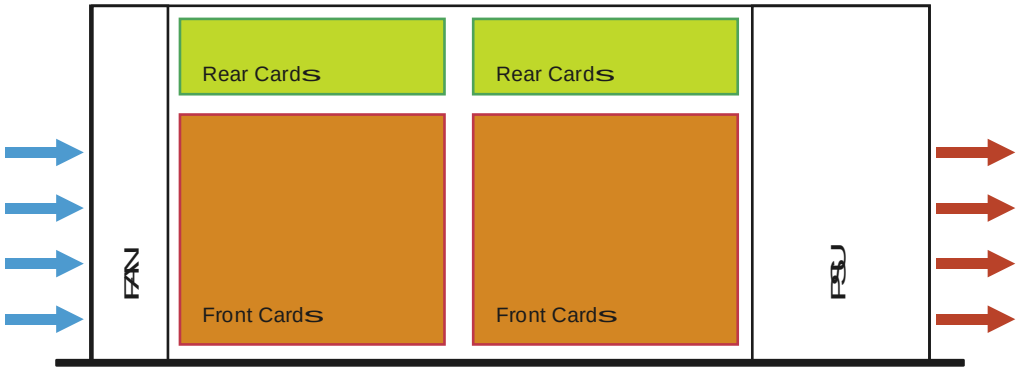


Figure 5: Performer32+80 MFR air flow (top view)

2.2.1 FAN 64

The Performer 32+80 mainframe has a unit with two high quality fans providing a silent but effective air flow through the frame.

Caution	
	Do not use the FAN 64 without dust filters. Do only use original dust filters from Riedel.

Figure 6: Performer 32+80 FAN 64

2.2.2 PSU 64

The Performer 32+80 mainframe has two slots for power supplies. It is recommended that both power supplies are installed and connected to separate AC power (90 ... 264 VAC, 47 ... 63 Hz).
Do not open the PSU at any time.

Figure 7: Performer 32+80 PSU 64

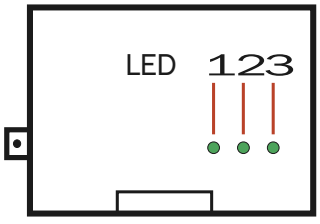


Figure 8: Performer 32+80 PSU 64 Status LEDs

LED	ON	OFF	Blinking
1 - green	OK	No Power	AC In fail
2 - green	OK	No Power	DC Out fail
3 - green	OK	No Power	Fan fail

No Power means that the frame has no power at all.
AC IN fail means that the frame is powered by the second PSU.

2.3 Performer 32+16

The Performer 32+16 mainframe provides up to 5 client cards and one CPU card.
Each client card slot can also be used for a GPI card.
The CPU must be placed in Bay A.

Do not use the matrix without fans and keep the front panel always closed.

Bay	Possible Card-Types:
A	CPU-032 / CPU-032M
B	ELA-OP-016, GPI-016
1 ... 4	COAX-008, CAT5-008, AES-008, AIO-008(AIO-009), VoIP-008, ELA-OP-016, GPI-016, AVB-008

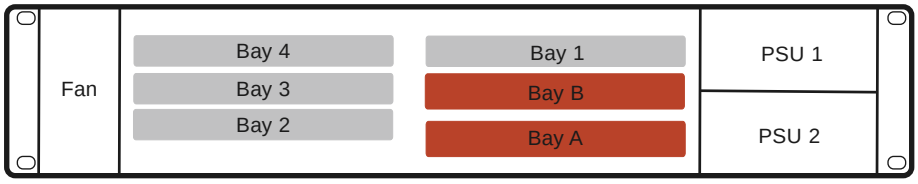


Figure 9: Performer 32+16 MFR (front view)

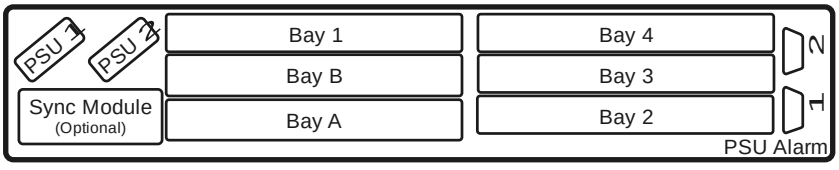


Figure 10: Performer 32+16 MFR (rear view)

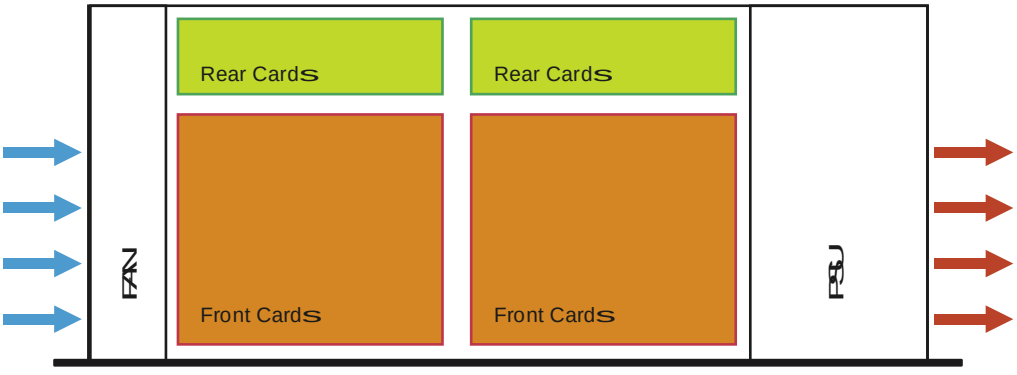


Figure 11: Performer 32+16 MFR air flow (top view)

2.3.1 FAN 32

The Performer 32+16 mainframe has a unit with three high quality fans providing a silent but effective air flow through the frame.

Caution	
	Do not use the FAN 32 without dust filters. Do only use original dust filters from Riedel.

Figure 12: Performer 32+16 FAN 32

2.3.2 PSU 32

The Performer 32+16 mainframe has two slots for power supplies. It is recommended that both power supplies are installed and connected to separate AC power (90 ... 264 VAC, 47 ... 63 Hz).
Do not open the PSU at any time.

Figure 13: Performer 32+16 PSU 32

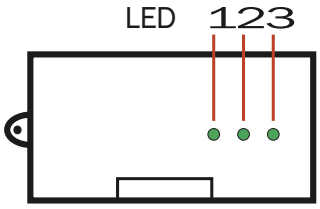


Figure 14: Performer 32+16 PSU 32 Status LEDs

LED	ON	OFF	Blinking
1 - green	OK	No Power	AC In fail
2 - green	OK	No Power	DC Out fail
3 - green	OK	No Power	Fan fail

No Power means that the frame has no power at all.
AC IN fail means that the frame is powered by the second PSU.

3 Performer Cards

3.1 CPU-032 Controller Card

The CPU-032 card is the core of the system. The configuration is stored in the CPU card and transmitted to the client card during the client card boot-procedure. Each CPU card has an Ethernet MAC- and IP address. The IP address of the CPU-032 card is always even.

The default IP address for new systems is **192.168.42.100**.

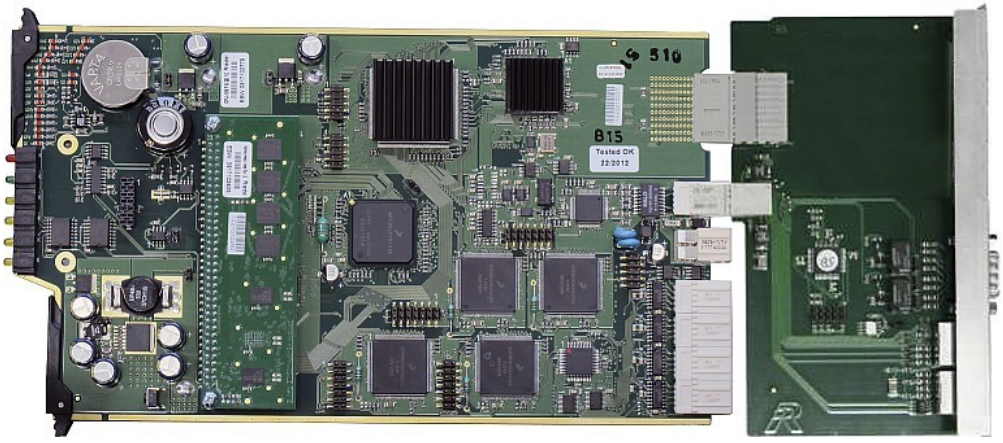
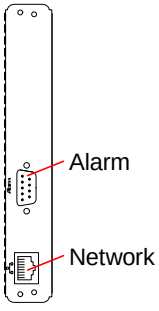


Figure 15: CPU-032 Card

An overview about all Status indicators can be found in chapter "Performer Cards / Status LEDs".



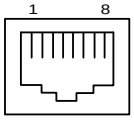
The CPU Card has following connectors:

Ethernet & Alarm contacts

Figure 16: CPU-032 Card (rear view)

Network connector

The Ethernet port has a “PC-Pinning” (TIA 568B). For direct connection to a PC use an X-over cable. For connection to a hub or switch use a 1:1 cable. The Ethernet port is 10, half-duplex compatible.

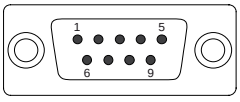


Pin	Signal	Standard Color
1	TxD +	orange/white
2	TxD -	orange
3	RxD +	green/white
4	not connected	blue
5	not connected	blue/white
6	RxD-	green
7	not connected	brown/white
8	not connected	brown

Figure 17: CPU-032 Card Ethernet connector RJ-45 pinout (8P8C)

Alarm connector

Depending on the node properties settings in the Director configuration software, various alarms can be generated at this connector.



Pin	Signal
1	Alarm Out Relay 1A
2	Alarm Out Relay 2A
3	not connected
4	+24 V
5	not connected
6	Alarm Out Relay 1B
7	Alarm Out Relay 2B
8	not connected
9	GND
Shield	Chassis GND

Figure 18: CPU-032 card Software Alarm D-Sub 9 pin pinout

+ 24 V supply (Pin 4) is rated for max. 100 mA and is ***not*** protected (***no*** internal current limit).

- Alarm Out contact rating is 48 V / 1 A maximum
- Normal closed

3.2 COAX-008 Client Card

The COAX-008 client cards are used to connect panels and accessories (CIA, PMX) to the matrix. Each card provides 8 bidirectional ports.

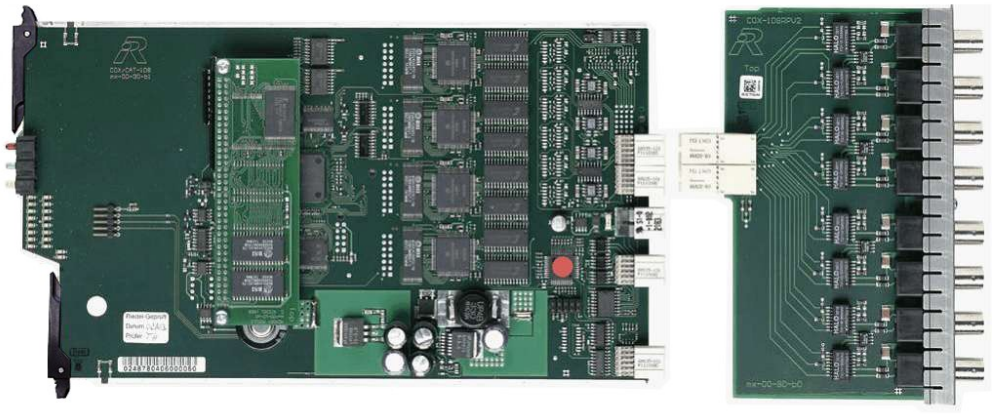


Figure 19: COAX-008 Card

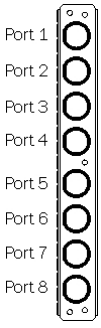
An overview about all Status indicators can be found in chapter "Performer Cards / Status LEDs".

BNC Coax

Pin	Signal
1	TxRx +
2	TxRx -

Z = 75 Ω

Figure 20: COAX-008 Card BNC pinout



Each COAX digital client card supports 8 mono channels.
This means support of 8 one-channel panels or 4 panels in two-channel mode.
If the 2nd audio channel of a panel is used (stereo mode) , the panel must be connected to any odd port (1, 3, 5, 7) and the following even port (2, 4, 6, 9) has to be left free.

Figure 21: COAX-008 Card (rear view)

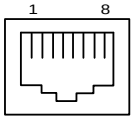
3.3 CAT5-008 Client Card

The CAT5-008 client cards are used to connect panels or synchronous digital AES/EBU3 audio signals @ 48kHz. Each card provides 8 mono inputs and 8 mono outputs.

Figure 22: CAT5-008 Card

An overview about all Status indicators can be found in chapter "Performer Cards / Status LEDs".

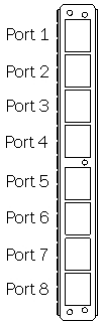
RJ45 AES



Pin	Signal
1	RxD +
2	RxD -
3	TxD +
4	not connected
5	not connected
6	TxD-
7	not connected
8	not connected

Z = 110 Ω
Fs = 48 kHz
N = 16 bit
Emphasis = no ID

Figure 23: CAT5-008 Card RJ45 pinout



Each CAT5 digital client card supports 8 mono channels.
This means support of 8 one-channel panels or 4 panels in stereo mode.
If the 2nd audio channel of a panel is used (stereo mode), the panel must be connected to any odd port (1, 3, 5, 7) and the following even port (2, 4, 6, 9) has to be left free.

Figure 24: CAT5-008 Card (rear view)

3.4 AIO-008/009 Client Card

The AIO-008 or the AIO-009 client cards are used to connect analog audio signals to the matrix. Each card provides 8 mono inputs and 8 mono outputs. The Sub-D version offers all inputs and all outputs on two Sub-D 25pin connectors.

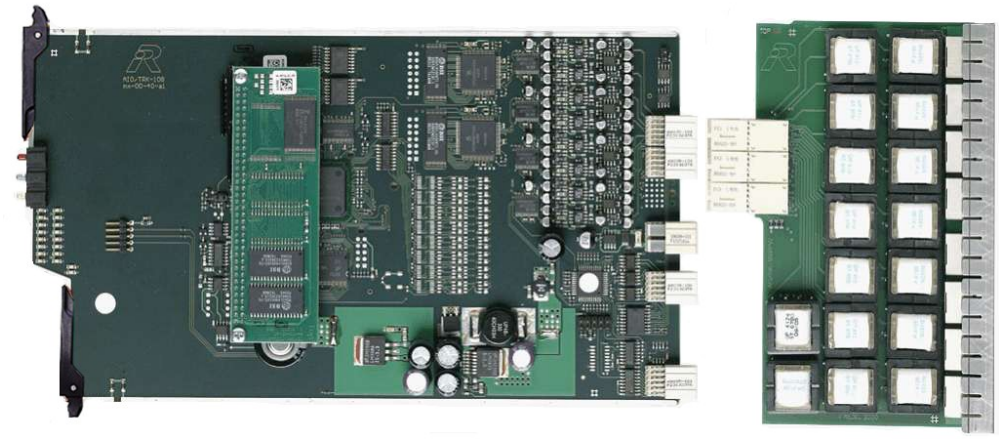
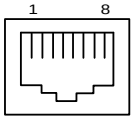


Figure 25: AIO Card (with AIO-008 Rear-Card)

An overview about all Status indicators can be found in chapter "Performer Cards / Status LEDs".

3.4.1 AIO-008/009

RJ45 AIO



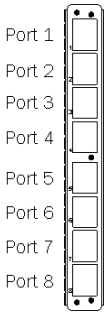
Pin	Signal
1	not connected
2	not connected
3	not connected
4	Audio In +
5	Audio In -
6	not connected
7	Audio Out +
8	Audio Out -

AIO 008
Zin= ca. 10 kΩ
Zout= < 100 Ω
f = 30 Hz ... 20 kHz

AIO 009
Zin = ca. 10 kΩ
Zout= < 25 Ω
f = 10 Hz ... 20 kHz

Figure 26: AIO Card RJ45 pinout

The system nominal level is +6 dBu
The maximum level is +18 dBu (in+out)
Gain error: +/- 0.5 dB from 100 Hz... 20 kHz



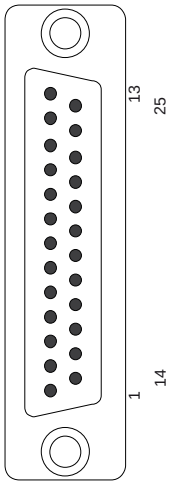
The AIO-008 client rear card has 8 transformer balanced mono in- and outputs.

The AIO-009 client rear card has 8 electrical balanced mono in- and outputs.

Figure 27: AIO Card (rear view)

3.4.2 AIO-008 D-Sub

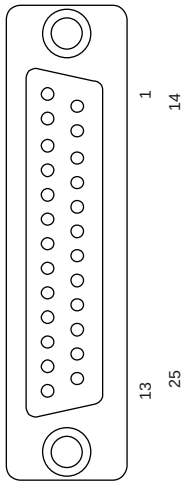
Sub-D 25 male Input



Pin	Signal	Pin	Signal
1	In 1 +	14	In 1 -
2	GND	15	In 2 +
3	In 2 -	16	GND
4	In 3 +	17	In 3 -
5	GND	18	In 4 +
6	In 4 -	19	GND
7	In 5 +	20	In 5 -
8	GND	21	In 6 +
9	In 6 -	22	GND
10	In 7 +	23	In 7 -
11	GND	24	In 8 +
12	In 8 -	25	GND
13	not connected		

Figure 28: AIO-008 Sub-D Input pinout

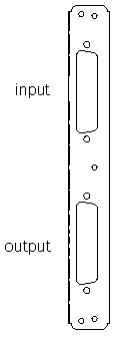
Sub-D 25 female Output



Pin	Signal	Pin	Signal
1	Out 1 +	14	Out 1 -
2	GND	15	Out 2 +
3	Out 2 -	16	GND
4	Out 3 +	17	Out 3 -
5	GND	18	Out 4 +
6	Out 4 -	19	GND
7	Out 5 +	20	Out 5 -
8	GND	21	Out 6 +
9	Out 6 -	22	GND
10	Out 7 +	23	Out 7 -
11	GND	24	Out 8 +
12	Out 8 -	25	GND
13	not connected		

Figure 29: AIO-008 Sub-D Output pinout

This pinout is compatible to TASCAM DA88 connectors.



The AIO-008 Sub-D card has 8 transformer balanced inputs and 8 transformer balanced outputs.

Figure 30: AIO Card Sub-D (rear view)

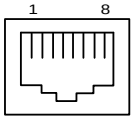
3.5 AES-008 Client Card

The AES-008 client cards are used to connect asynchronous digital AES/EBU3 audio signals with different sample rates to the matrix. The sample rate can variegate for each port from 32 up to 48 kHz. Each card provides 8 mono inputs and 8 mono outputs.

Figure 31: AES-008 Card

An overview about all Status indicators can be found in chapter "Performer Cards / Status LEDs".

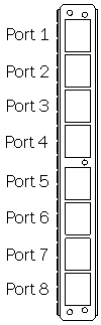
RJ45 AES



Pin	Signal
1	RxD +
2	RxD -
3	TxD +
4	not connected
5	not connected
6	TxD-
7	not connected
8	not connected

Z = 110 Ω
Fs = 32 ... 48 kHz
N= 16 bit
Emphasis = no ID
Mode = professional

Figure 32: AES-008 Card RJ45 pinout



Each AES digital client card supports 8 mono channels.
If a stereo signal was chosen in the director by enabling the 2nd audio channel, the AES audio signal must be connected to any odd port (1, 3, 5, 7) and the following even port (2, 4, 6, 8) has to be left free.

Figure 33: AES-008 Card (rear view)

3.6 ELA-OP-016 Client Card

The ELA-OP-016 client cards are used to receive 16 potential free open/close signals from external switches, relays, e.g. “ON Air” signals. They are also used for switching 16 tasks (e.g. lamps, PTT from transmitters, relays).

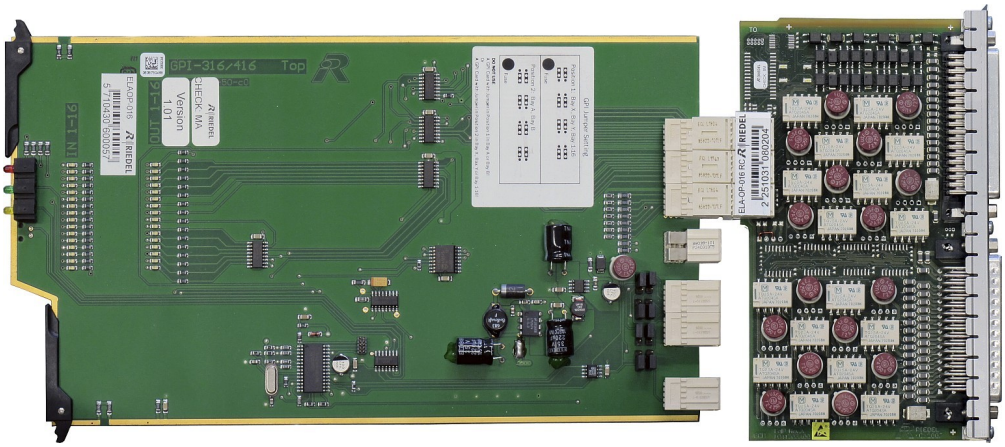


Figure 34: ELA-OP-016 Card

An overview about all Status indicators can be found in chapter "Performer Cards / Status LEDs".

- The +24 V output supplies 100 mA maximum.
- The GPI output contact rating is 2 A, 100 VDC maximum (protected by **none** self healing fuse)
- The GPI input voltage range is +5 ...+48 VDC (internal optocoupler).
- The polarity of the input is important. The higher potential must be connected to “+” of each channel.
- The polarity of the output has no preference.

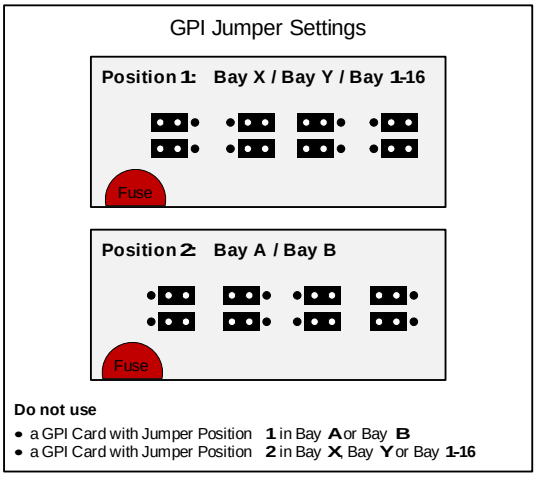


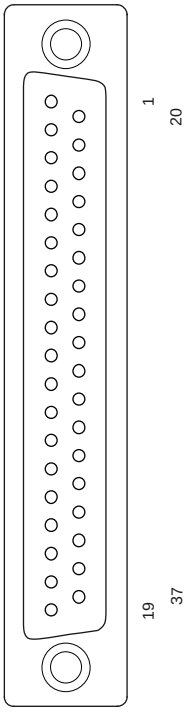
Figure 35: ELA-OP-016 Card settings

Depending of the used bay, the jumpers on the GPI card have to be set correctly.
By default the GPI Card is set to Position 1.

If the GPI Card is used in Bay B, the Jumper needs to be set to Position 2.

Do not operate the GPI Card with incorrect Jumper settings.

Sub-D 37 female Input



Pin	Signal	Pin	Signal
1	GPI In 1 +	20	GPI In 1 -
2	GPI In 2 +	21	GPI In 2 -
3	GPI In 3 +	22	GPI In 3 -
4	GPI In 4 +	23	GPI In 4 -
5	GPI In 5 +	24	GPI In 5 -
6	GPI In 6 +	25	GPI In 6 -
7	GPI In 7 +	26	GPI In 7 -
8	GPI In 8 +	27	GPI In 8 -
9	GPI In 9 +	28	GPI In 9 -
10	GPI In 10 +	29	GPI In 10 -
11	GPI In 11 +	30	GPI In 11 -
12	GPI In 12 +	31	GPI In 12 -
13	GPI In 13 +	32	GPI In 13 -
14	GPI In 14 +	33	GPI In 14 -
15	GPI In 15 +	34	GPI In 15 -
16	GPI In 16 +	35	GPI In 16 -
17	+24 V	36	GND
18	+24 V	37	GND
19	not connected		

Figure 36: ELA-OP-016 Card Sub-D Input pinout

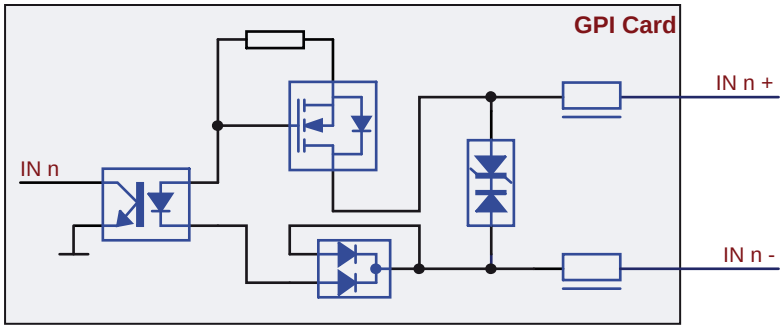
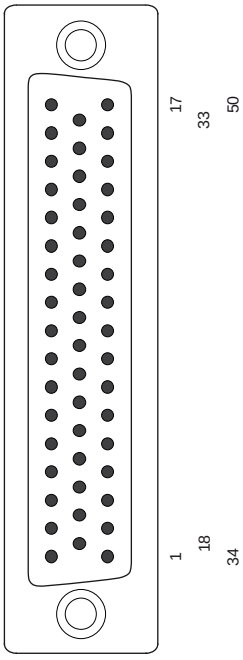


Figure 37: ELA-OP-016 Card IN (circuit)

Sub-D 50 male Output



Pin	Signal	Pin	Signal	Pin	Signal
1	n/o 1 (A)	18	com 1 (C)	35	n/c 2 (B)
2	n/o 2 (A)	19	com 2 (C)	36	n/c 3 (B)
3	n/o 3 (A)	20	com 3 (C)	37	n/c 4 (B)
4	n/o 4 (A)	21	com 4 (C)	38	n/c 5 (B)
5	n/o 5 (A)	22	com 5 (C)	39	n/c 6 (B)
6	n/o 6 (A)	23	com 6 (C)	40	n/c 7 (B)
7	n/o 7 (A)	24	com 7 (C)	41	n/c 8 (B)
8	n/o 8 (A)	25	com 8 (C)	42	n/c 9 (B)
9	n/o 9 (A)	26	com 9 (C)	43	n/c 10 (B)
10	n/o 10 (A)	27	com 10 (C)	44	n/c 11 (B)
11	n/o 11 (A)	28	com 11 (C)	45	n/c 12 (B)
12	n/o 12 (A)	29	com 12 (C)	46	n/c 13 (B)
13	n/o 13 (A)	30	com 13 (C)	47	n/c 14 (B)
14	n/o 14 (A)	31	com 14 (C)	48	n/c 15 (B)
15	n/o 15 (A)	32	com 15 (C)	49	n/c 16 (B)
16	n/o 16 (A)	33	com 16 (C)	50	GND
17	+24 V	34	n/c 1 (B)		

Figure 38: ELA-OP-016 Card Sub-D Output pinout

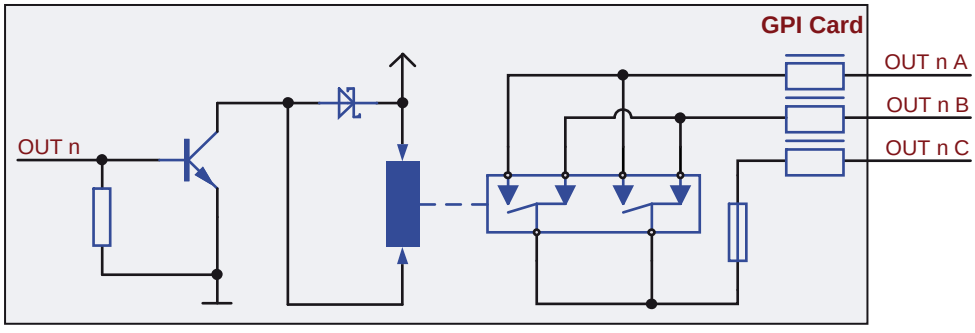


Figure 39: ELA-OP-016 Card OUT (circuit)

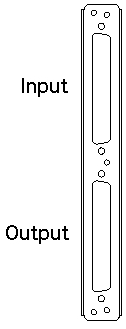
3.7 GPI-016 Client Card

The General Purpose Interface (GPI) cards are used to receive open/close signals from external switches, relays, e.g. “ON Air” signals. They are also used for switching tasks (e.g. lamps, PTT from transmitters, relays).

Figure 40: GPI-016 Card

An overview about all Status indicators can be found in chapter "Performer Cards / Status LEDs".

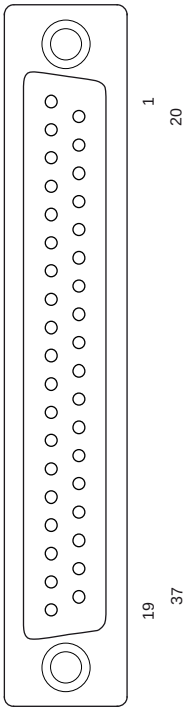
- The +24 V output supplies 100 mA maximum.
- The GPI output contact rating is 300 mA, 60 VDC maximum (protected by self healing fuse), MOSFET technology.
- The GPI input voltage range is +5 ...+48 VDC (internal optocoupler).
- The polarity of the input is important. The higher potential must be connected to “+” of each channel.
- The polarity of the output has no preference.



Each GPI card provides 16 opto-isolated inputs and 16 opto-isolated outputs.

Figure 41: GPI-016 Card (rear view)

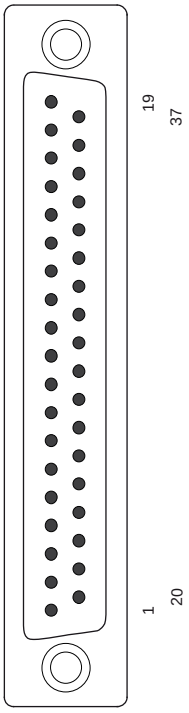
Sub-D 37 female Inputs



Pin	Signal	Pin	Signal
1	GPI In 1 +	20	GPI In 1 -
2	GPI In 2 +	21	GPI In 2 -
3	GPI In 3 +	22	GPI In 3 -
4	GPI In 4 +	23	GPI In 4 -
5	GPI In 5 +	24	GPI In 5 -
6	GPI In 6 +	25	GPI In 6 -
7	GPI In 7 +	26	GPI In 7 -
8	GPI In 8 +	27	GPI In 8 -
9	GPI In 9 +	28	GPI In 9 -
10	GPI In 10 +	29	GPI In 10 -
11	GPI In 11 +	30	GPI In 11 -
12	GPI In 12 +	31	GPI In 12 -
13	GPI In 13 +	32	GPI In 13 -
14	GPI In 14 +	33	GPI In 14 -
15	GPI In 15 +	34	GPI In 15 -
16	GPI In 16 +	35	GPI In 16 -
17	+ 24 V	36	GND
18	+ 24 V	37	GND
19	not connected		

Figure 42: GPI-016 Card Sub-D Input pinout

Sub-D 37 male Output



Pin	Signal	Pin	Signal
1	GPI 1 OUT A	20	GPI 1 OUT B
2	GPI 2 OUT A	21	GPI 2 OUT B
3	GPI 3 OUT A	22	GPI 3 OUT B
4	GPI 4 OUT A	23	GPI 4 OUT B
5	GPI 5 OUT A	24	GPI 5 OUT B
6	GPI 6 OUT A	25	GPI 6 OUT B
7	GPI 7 OUT A	26	GPI 7 OUT B
8	GPI 8 OUT A	27	GPI 8 OUT B
9	GPI 9 OUT A	28	GPI 9 OUT B
10	GPI 10 OUT A	29	GPI 10 OUT B
11	GPI 11 OUT A	30	GPI 11 OUT B
12	GPI 12 OUT A	31	GPI 12 OUT B
13	GPI 13 OUT A	32	GPI 13 OUT B
14	GPI 14 OUT A	33	GPI 14 OUT B
15	GPI 15 OUT A	34	GPI 15 OUT B
16	GPI 16 OUT A	35	GPI 16 OUT B
17	+ 24 V	36	GND
18	+ 24 V	37	GND
19	not connected		

Figure 43: GPI-016 Card Sub-D Output pinout

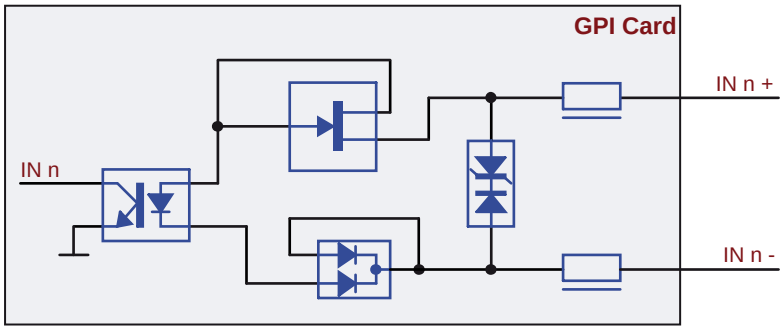


Figure 44: GPI-016 Card IN (circuit)

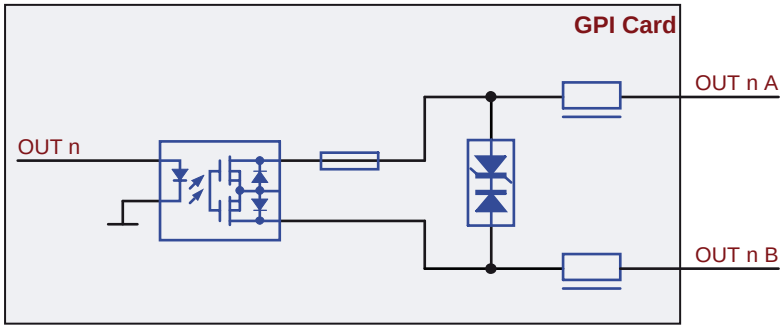


Figure 45: GPI-016 Card OUT (circuit)

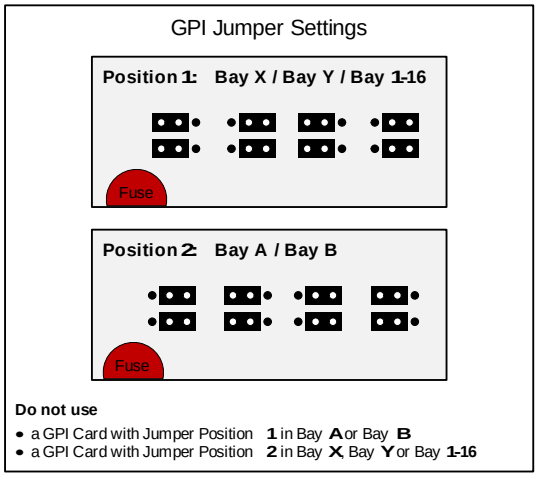


Figure 46: GPI-016 Card settings

Depending of the used bay, the jumpers on the GPI card have to be set correctly.
By default the GPI Card is set to Position 1.

If the GPI Card is used in Bay B, the Jumper needs to be set to Position 2.

Do not operate the GPI Card with incorrect Jumper settings.

3.8 VoIP-008 Client Card

The VoIP-008 client cards are used to connect panels and accessories as well as 4-wire Audio to the matrix. Each card provides 8 individual addressable, bidirectional ports. It is 10/100 Mbit/s compatible and provides the Auto MDIX functionality. Therefore, the card can be used with X-over or straight cable in all applications. High quality and Low bandwidth modus is supported as well as SIP. The counterpart of a port of the VoIP-008 card can be:

- ConnectIPx8, ConnectIPx2
- VCP-1004 / VCP-1012 Softpanel
- SIP conform PBX Phone-Server

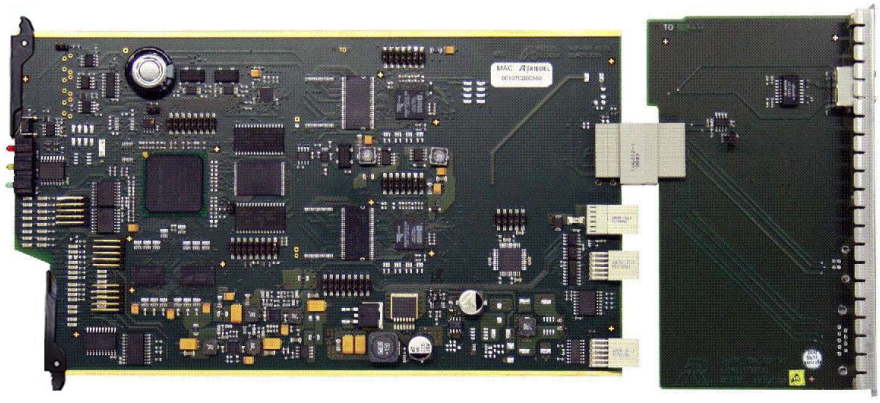
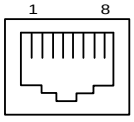


Figure 47: VoIP-008 Card

An overview about all Status indicators can be found in chapter "Performer Cards / Status LEDs".

RJ45 VOIP



Pin	Signal
1	Tx/Rx +
2	Tx/Rx -
3	Rx/Tx +
4	not connected
5	not connected
6	Rx/Tx -
7	not connected
8	not connected

The VoIP Card supports 10/100 Mbit/s Ethernet.
Standard IP: **192.168.42.120**
Auto MDIX functionality (even /X-Over)
Auto Negotiation (10/100 Mbit-detect)

yellow LED (connector on the rear card):
off: 10 Mbit/s detected
on: 100 Mbit/s or no connection
green LED: (connector on the rear card):
on: Ethernet traffic

Figure 48: VoIP-008 Card RJ45 pinout

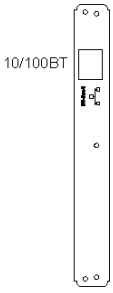


Figure 49: VoIP-008 Card (rear view)

3.9 AVB-008 Rear Card

The AVB-008 Rear card converts eight Artist matrix ports to AVB streams and vice versa. The client card communicates with Riedel's Connect AVB-X8/Connect AVB-C8 panel interfaces. The Riedel AVB solution is designed to transport AES3/EBU audio in real-time with guaranteed bandwidth over Ethernet-based local area networks.
The AVB-008 Rear Card can be used in combination with a CAT5-008 Front Card.

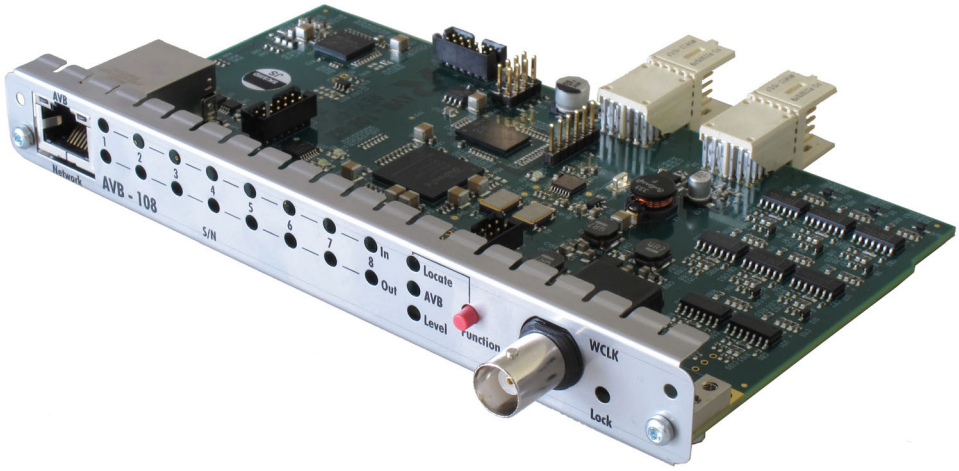


Figure 50: AVB-008 Rear-Card

An overview about all Status indicators can be found in chapter "Performer Cards / Status LEDs".

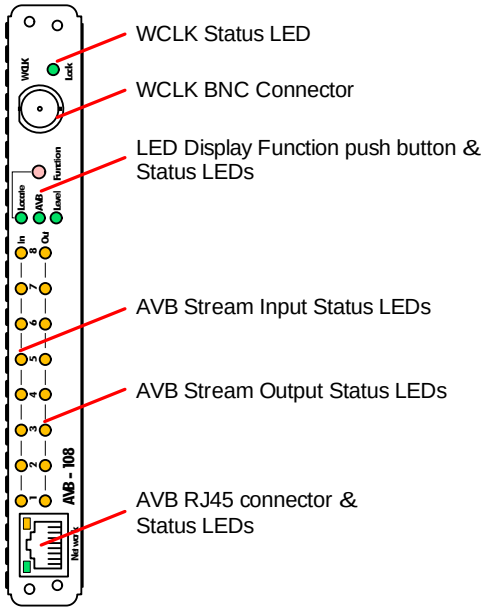


Figure 51: AVB-008 Card (rear view)

The unit provides a Word Clock Output BNC connector.
Clock Source Options:

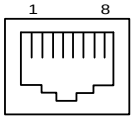
- AES Input 1 from the frame backplane
- AVB Input Stream 1-8
- AVB Media Clock Stream

Pressing the push button toggles the LED display content between *AVB Stream/Port Status* indication and *Signal Level* indication.

Pressing the function push button for more than 2 seconds activates the *Locate / IO Setup* indication for 5 seconds. AVB Controllers like the Riedel AVB Manager use this function to identify a device. In AVB Manager a device is flashing while Locate is active.
The Locate function works in both directions. When the Locate function of AVB Manager is triggered, all Input/Output status LEDs are flashing for 5 seconds.

i	In order to synchronize the Artist Matrix to an AVB Network the Word Clock Output has to be connected to an ASM G2 Sync module.

RJ45 AVB Network



Pin	Signal
1	Tx/Rx_A +
2	Tx/Rx_A -
3	Rx/Tx_B +
4	Rx/Tx_C +
5	Rx/Tx_C -
6	Rx/Tx_B -
7	Rx/Tx_D +
8	Rx/Tx_D -

Figure 52: AVB-008 Card RJ45 pinout

BNC WCLK

Pin	Signal
1	Tx +
2	Tx -

Word Clock output: TTL / 75 Ω
Sample Rate: 48 kHz ±10%

Figure 53: AVB-008 Card BNC pinout

3.10 ASM G2 Sync Module

The ASM (Artist Sync Module) is used to synchronize the system to an external AES or 48kHz signal.
Therefore the AES sync signal can be connected to the XLR 3 pole female plug. A 48kHz square signal can be connected to the BNC jack. A valid signal is shown by the green LEDs next to the jack.
Please connect either the XLR 3 f jacket OR the BNC jack. If both jackets are connected, the AES signal has the higher priority and will be taken as clock source.

	Note that the green LEDs indicate a valid signal, NOT that the System is in Sync.

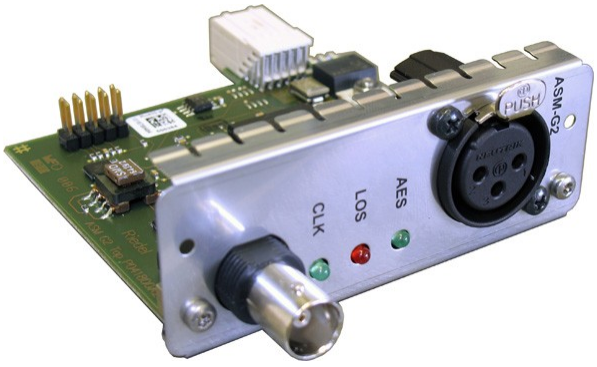
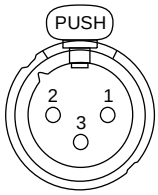


Figure 54: ASM G2 Card

Pin	Signal
1	Signal
2	Shield

Z = 75 Ω
Square Wave

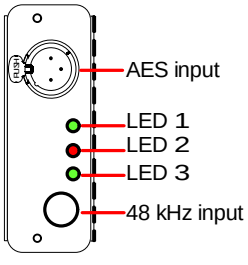
Figure 55: ASM G2 Card BNC-pinout



Pin	Signal
1	Shield
2	Signal +
3	Signal -

Z = 110 Ω
AES ref signal

Figure 56: ASM G2 Card XLR-pinout



LED	Status
1 - green	AES Sync detected
2 - red	no signal
3 - green	48kHz Sync detected

Figure 57: ASM Card (rear view)

3.11 Status LEDs - Performer Cards

CPU

LED	Off	On	Blinking	Flashing temporarily	Flashing all together
red	OK	Error	--	--	Reset /FW update
green	--	--	--	--	Reset /FW update

Client

LED	Off	On	Blinking	Flashing temporarily	Flashing all together
red	OK	Error	--	--	Reset /FW update
green	--	Error	OK	No CPU	Reset /FW update
yellow	--	No Configuration FW Conflict	--	--	Reset /FW update

GPI

LED	Off	On	Blinking	Flashing temporarily
red	OK	Error	--	--
green	No Configuration or No Connection to CPU	OK, Card is configured	--	No CPU
yellow	OK	No Configuration or No Connection to CPU	--	OK

AVB

LED	off	green	yellow	red
AVB Network connector				
left LED	No connection	Ethernet connection ok	--	--
right LED	No traffic	--	Flashing while Transmitting	--
STATUS LED (In / Out 1 ... 8)				
In function setting **Locate**: I/O Setup indication (temporary display for 5 sec.)	At non active Ports	Flashing at active Ports	--	--
In function setting **AVB**: Indicates the status of streams and ports	Inactive state, no function expected	Port is configured to send and receive a stream.		Port is set up to stream audio, but an error has occurred. Errors are: 1. Stream isn't flowing although expected to do so 2. Invalid format
		Stream is active and valid.	On Input: No sender (Talker) active. On Output: No receiver (Listener).	
In function setting **Level**: Signal present and Clip indication for audio	--	Signal Level >-50 dBFS (200 ms hold time)	--	Signal Level >-1 dBFS (200 ms hold time)
WCLK				
Lock	--	Unit Locked	--	Sync Error

AVB Audio Ports Status Table

	LED Color	Talker / Listener Exists	AES Input Data Valid	Talker / Listener Subscribed	Talker / Listener Flowing
State 1	off	No	--	--	--
State 2	red	Yes	No	--	--
State 3	red	Yes	Yes	Yes	No
State 4	yellow	Yes	Yes	No	--
State 5	green	Yes	Yes	Yes	Yes
Logic		Yes = at least one Talker/Listener exists.	--	Yes = at least one Talker/Listener subscribed.	Yes = at least one subscribed Talker/ Listener; stream is flowing No = subscribed stream indicates an error.

3.12 Technical Data - Performer Cards

Type	Weight	Voltage	Fuse	Description
CPU-032	350 g	24 V	1 A	Central Processing Unit
COAX-008	400 g	24 V	1 A	Digital Card (BNC) for Panels and Accessories
CAT5-008	350 g	24 V	1 A	Digital Card (RJ45) for Panels and Accessories
AIO-008 AIO-009	600 g 250 g	24 V	1 A	Analog Audio Card, (008 transformer balanced, 009 elec. balanced)
AES-008	350 g	24 V	1 A	Digital Audio Card
ELA-OP-016	300 g	24 V	1 A	General Purpose Interface Card
GPI-016	300 g	24 V	3.15 A	General Purpose Interface Card
VOIP-008	300 g	24 V	1 A	8 Channel VoIP Card
AVB-008 RC	120 g	24 V	--	8 Channel AVB Rear Card
ASM	60 g	24 V	0.3 A	Sync Module

4 Panels

Riedel offers several categories of control panels.

- 1100 OLED series with 140 dpi resolution and 65.000 colors OLED keys and full option.
- 1000 LED series with bright LED keys and full options.
- 2300 Smartpanel
- 2000 LCD series with LCD display.
- 3000 series with label stripes.
- 5000 series low budget desktop version.

All panels are connected digitally to the matrix and offer broadcast quality audio.
Please find common descriptions of function key blocks and summarized technical data for each panel at the end of this chapter.

4.1 1100 OLED Series

The 1100 series are Riedel's next generation control key panels for digital matrix intercoms. Following Riedel's intuitive concept of integrated displays in the panel keys, the 1100 series features high-res color OLEDs. With 65,000 colors and a resolution of 140 dpi these new displays provide excellent readability and are able to show highly detailed characters and icons of up to 24x24 pixels. Definable marker colors for the keys complete the labeling options and provide instant function identification and signalization, e.g. for an incoming call.

The panel provides individual rotary encoders to adjust the listen level of each talk key. Furthermore all 1100 Series control key-panels provide 5 dedicated function keys, a built-in high-power loudspeaker, two headset and microphone connectors. 3 GPIs and 3 GPOs are available for system-wide programming as standard. Two sets of balanced line level audio inputs and outputs are also provided as standard.

An expansion slot for additional modules prepares the control panel for future technology developments. For the entirely digital connection to the matrix via AES the panel provides both BNC and CAT-5 connectors as standard. The second audio channel of the AES signal allows the panel to transport broadcast quality audio in addition to the intercom application – an ideal feature for commentary positions. The efficient circuit design of the 1100 series panel results in ultra-compact design with an integrated power-supply, 50 per cent less power consumption and less heat generation.

4.1.1 RCP-1112

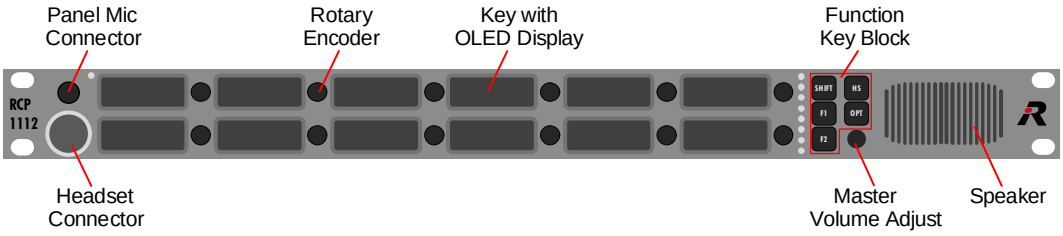


Figure 58: RCP-1112 (front view)

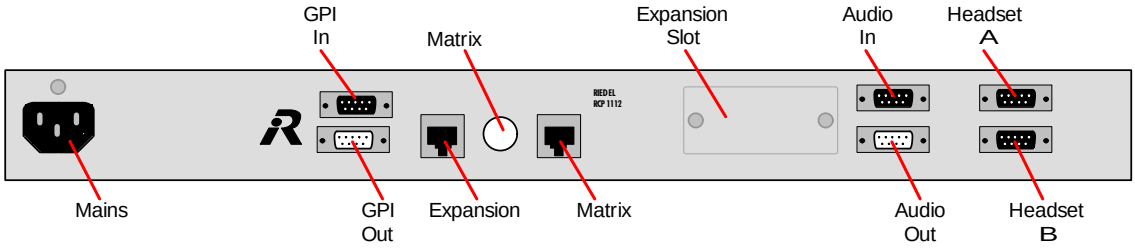


Figure 59: RCP-1112 (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.1.2 RCP-1128

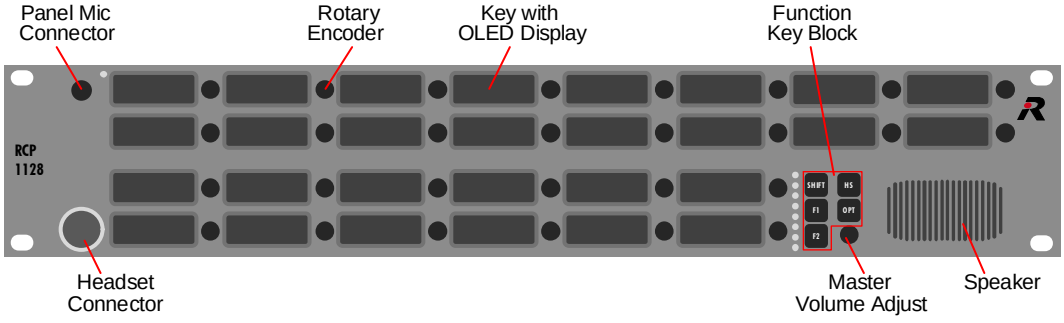


Figure 60: RCP-1128 (front view)

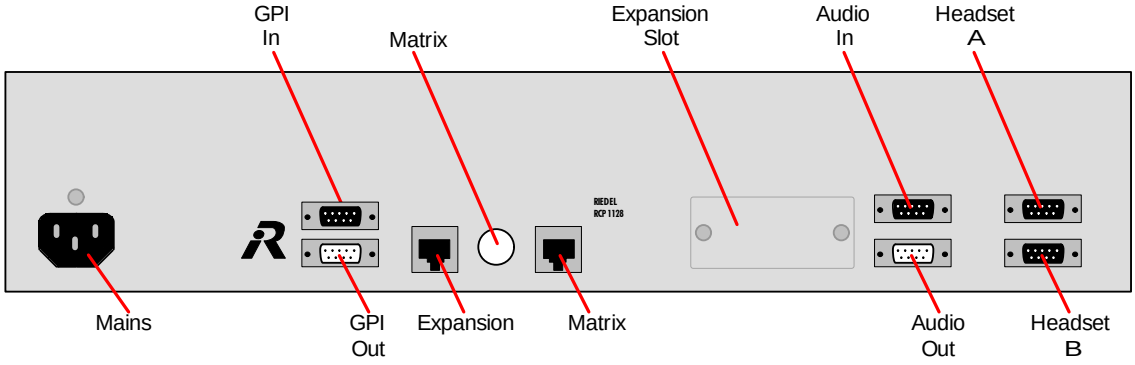


Figure 61: RCP-1128 (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.1.3 ECP-1116

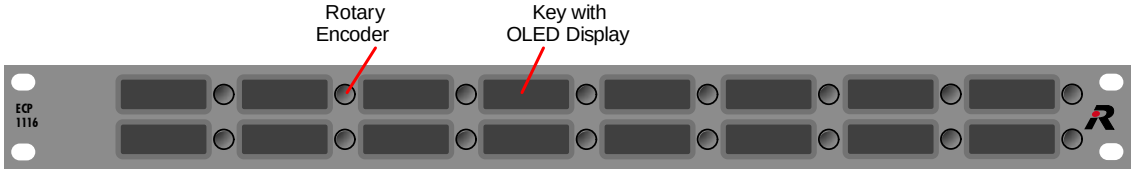


Figure 62: ECP-1116 (front view)

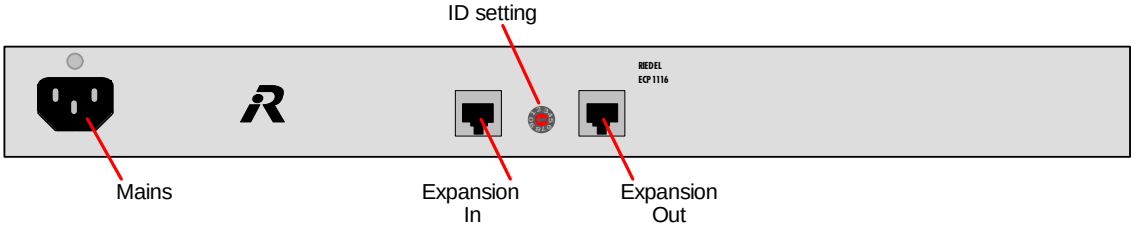


Figure 63: ECP-1116 (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.1.4 ECP Panel setup 1100 Series

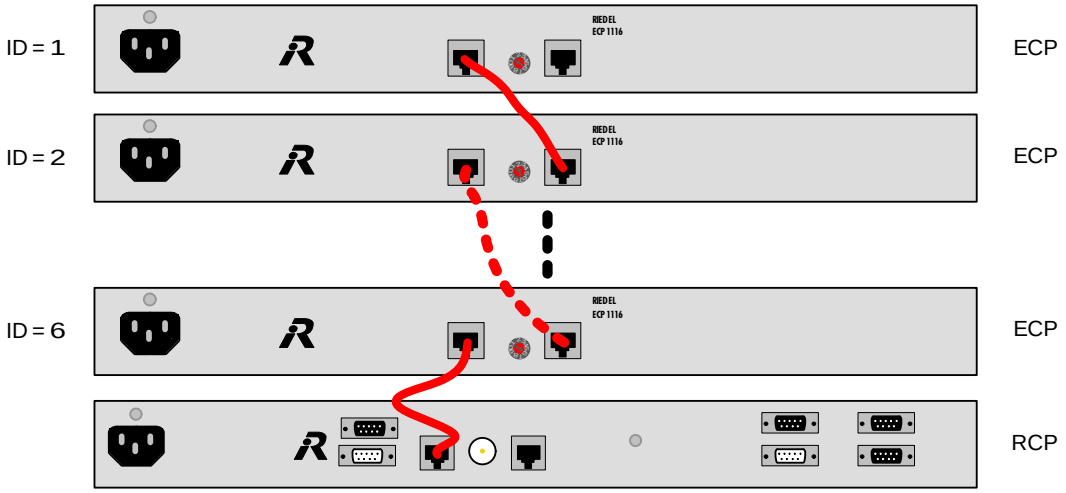


Figure 64: ECP Panel setup 1100 Series

	Up to 6 ECP panels can be daisy chained.

ID setting must be unique and set to the corresponding address in the director configuration file.
Use 1:1 CAT5 FTP cables for all connections. The cable MUST be shielded.

4.1.5 DCP-1116

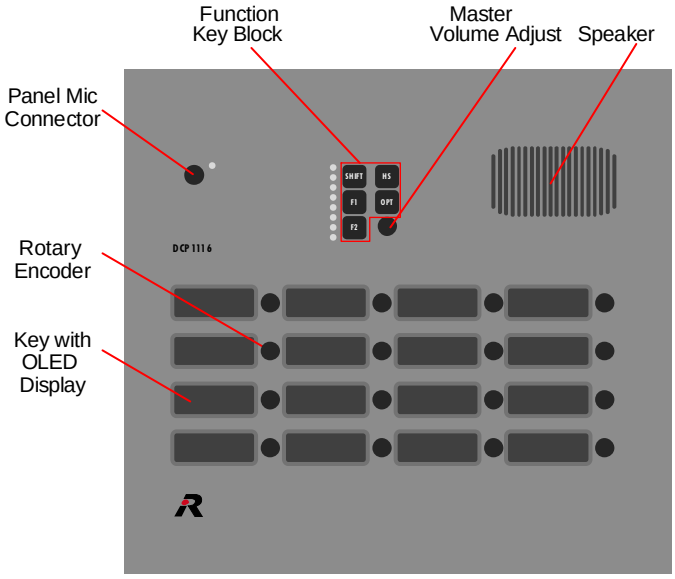


Figure 65: DCP-1116 (top view)

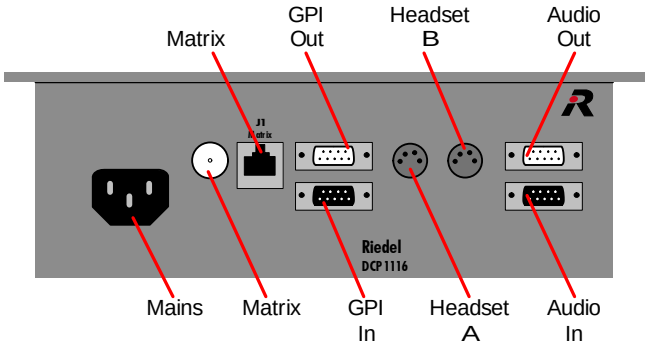


Figure 66: DCP-1116 (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.1.6 CCP-1116

The Riedel CCP-1116 is the next generation commentary unit for two commentators with integrated intercom functionality for Digital Matrix Intercom systems. The unit provides up to two commentary positions with high-quality microphone preamps as well as all the intercom features from the renowned 1100 series intercom panels.
Built in a compact housing and connected via a single CAT5 or COAX cable, the CCP-1116 is fast and easy to install. A standalone/emergency mode as well as a redundant power supply solution ensures maximum reliability. The CCP-1116 features a high-quality microphone preamp with 48V phantom power, a +6dBu Limiter and a level meter per commentator. Large “On Air” and “Cough/Mic Mute” keys with LED indicators make operation quick and easy – even under difficult lighting conditions. An additional programmable and remote-controllable mono line-input offers a connection point to feed in local playback sources. The monitor mix section features three source level controls plus side-tone and master level controls. All sources are routable for split-ear operation of the commentary headphones.
The intercom section features 16 freely assignable control keys with individual level controls. To allow for two-user operation the control panel keys can be split into two. Following Riedel’s intuitive concept of integrated displays in the panel keys, the 1100 series features the next generation of high-res color OLEDs. With 65,000 colors and a resolution of 140 dpi these new displays provide excellent readability and are able to show up to eight highly detailed characters of up to 24x24 pixels. Definable marker colors for the keys complete the labeling options and provide instant function identification and signalization, e.g. for incoming calls.

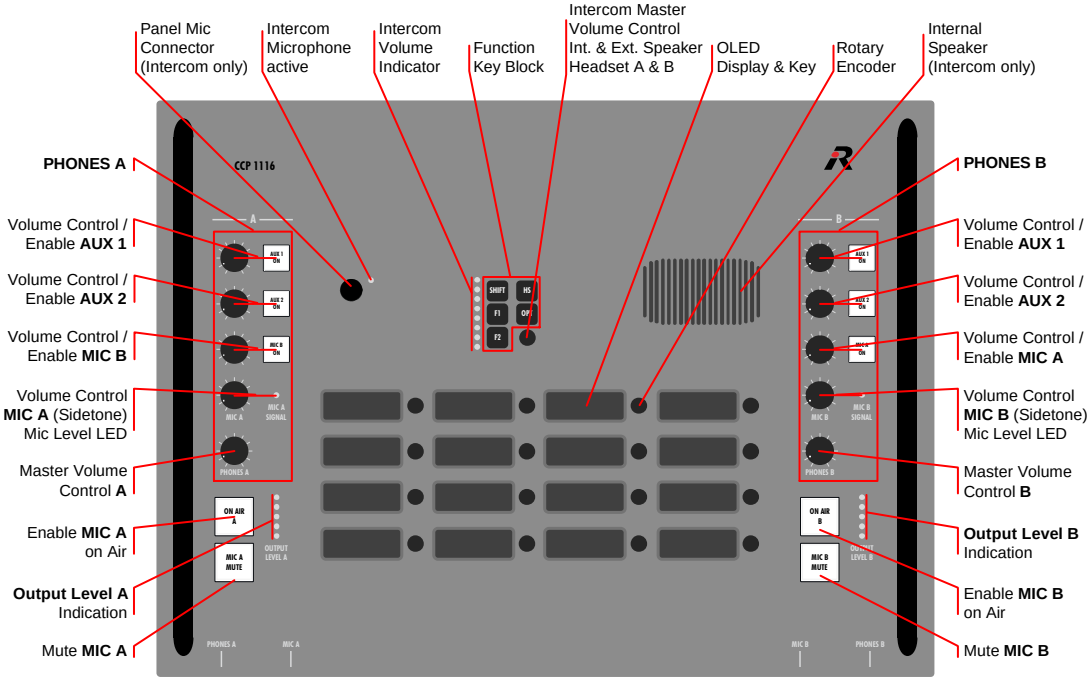


Figure 67: CCP-1116 (top view)

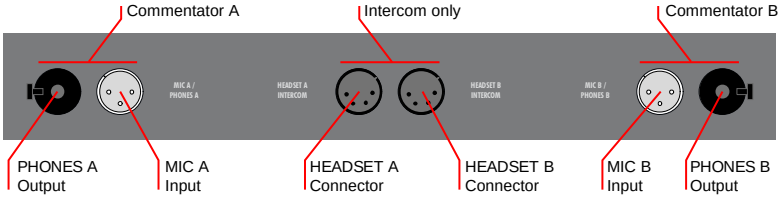


Figure 68: CCP-1116 (front view)

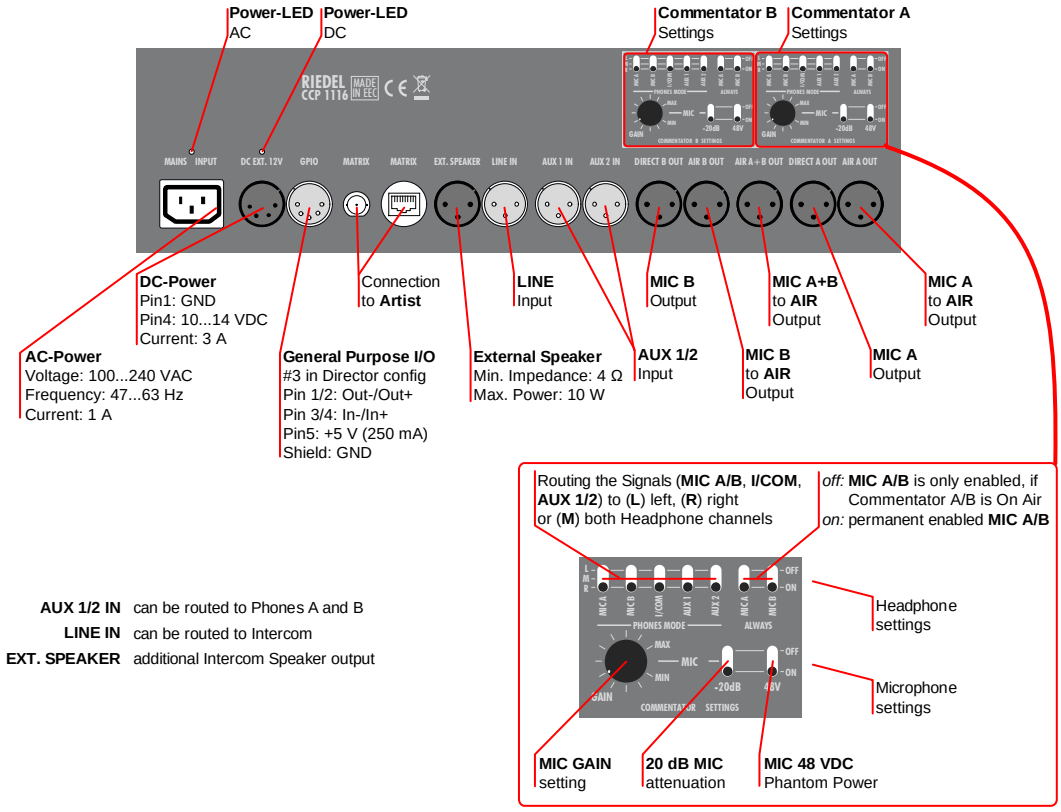


Figure 69: CCP-1116 (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

Intercom Master Volume Control / Indicator

These parts are only affecting the connected Intercom headsets and are not changing the volume level of the commentator headphones A and B.

MIC SIGNAL level LED

The LED will light green while receiving signal amplitude up to +6 dBu. Signal levels above are indicated by a yellow color. The MIC SIGNAL LED is permanent active as long as a signal on the microphone is detected.

OUTPUT LEVEL Indicator

The 5 LEDs are separated in three ranges. The 3 LEDs on the bottom are indicating an output level of up to 0 dBu. The fourth yellow LED will light at +6 dBu and is indicating the Limiter-Threshold. The red LED on the top indicates a level of +18 dBu close to clipping. The OUTPUT LEVEL LEDs are only active while the commentator is ON AIR.

4.2 1000 LED Series

The 1000 Series are the classic control key-panels from Riedel and are available in 19“ rack-mount, desktop and modular (Danner) versions. All control key-panels feature bright, dimmable 8-digit alphanumeric in-key LED displays, individual rotary encoder for listen level control and LED level indication for each talk key. In addition, all 1000 Series control key-panels provide 5 dedicated function keys, built-in loudspeaker, XLR headset connector and a removable gooseneck microphone. 3 GPIs and 3 GPOs are available for system-wide programming as standard. Two sets of balanced line level audio inputs and outputs are also provided as standard. All control key-panels are equipped with a “shift”-page, essentially doubling up the number of keys. Up to 6 expansion keys panels can be daisy-chained to the 19” rack-mount control panels for up to a total of 248 keys.

4.2.1 RCP-1012E

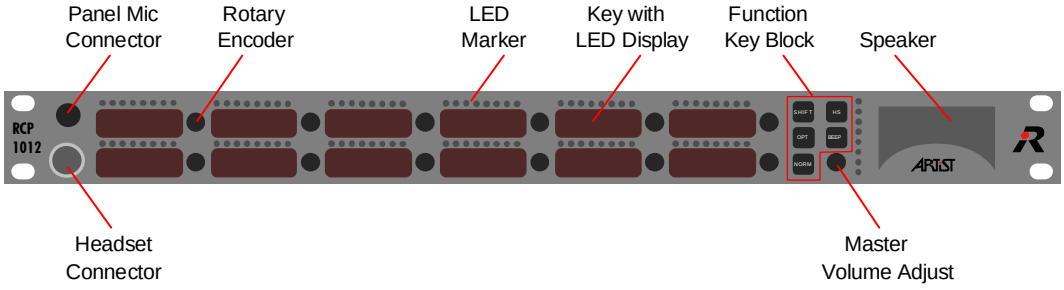


Figure 70: RCP-1012E (front view)

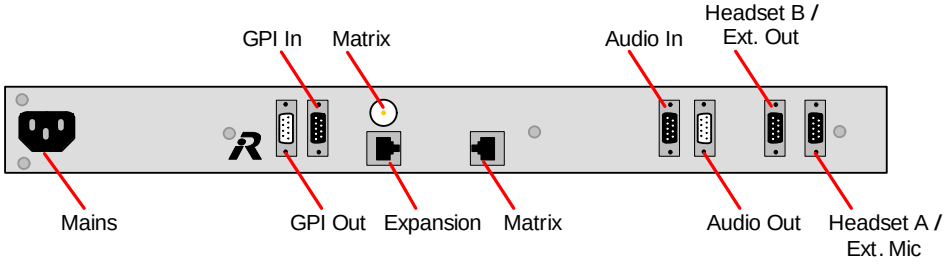


Figure 71: RCP-1012E (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.2.2 RCP-1028E

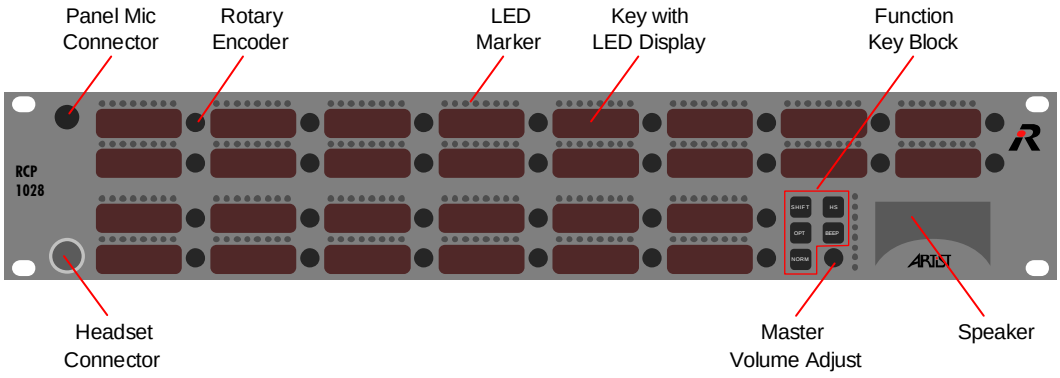


Figure 72: RCP-1028E (front view)

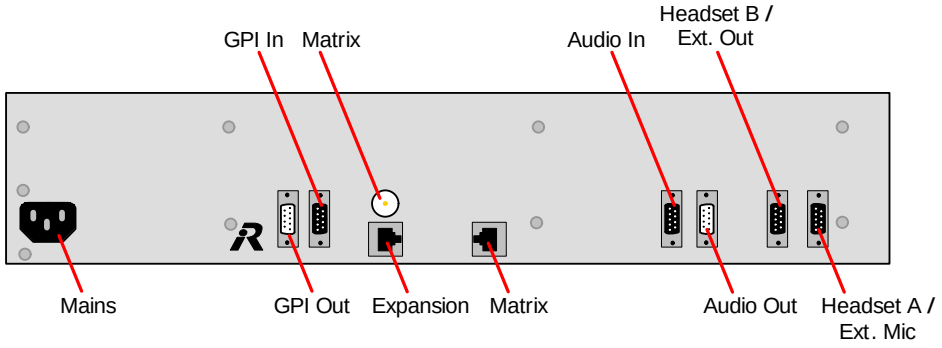


Figure 73: RCP-1028E (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.2.3 ECP-1016

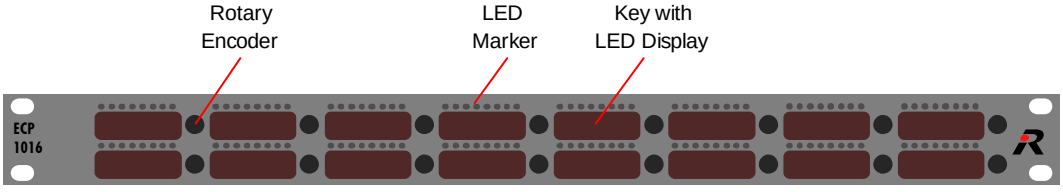


Figure 74: ECP-1016 (front view)

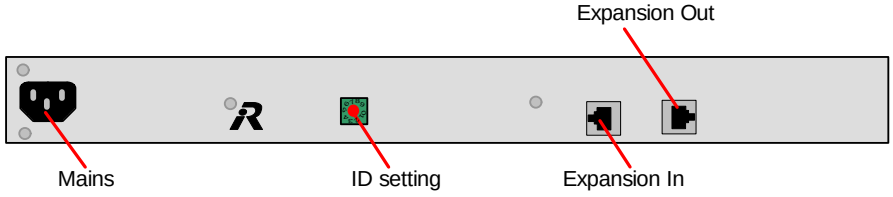


Figure 75: ECP-1016 (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.2.4 ECP-1012ET

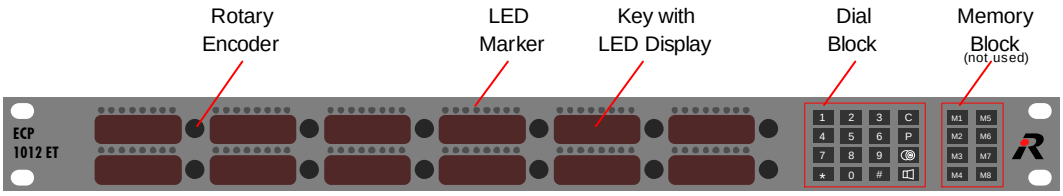


Figure 76: ECP-1012ET (front view)

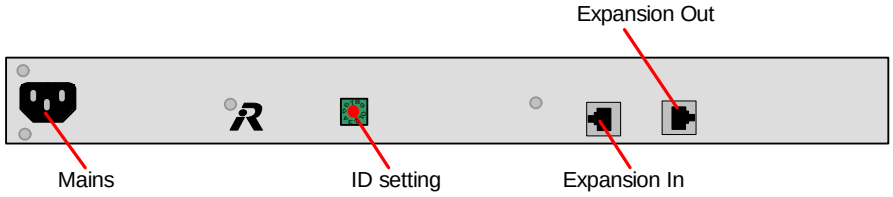


Figure 77: ECP-1012ET (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.2.5 ECP Panel setup 1000 Series

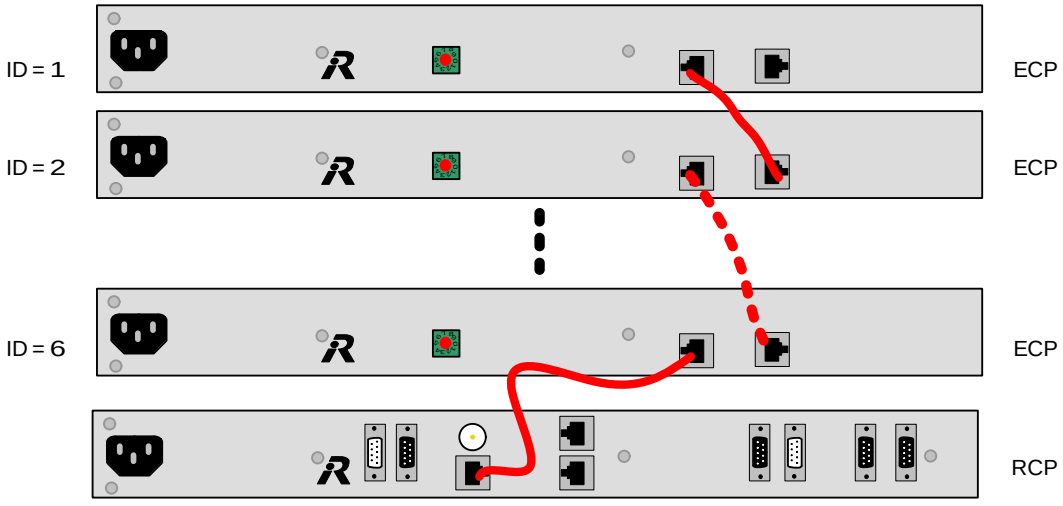


Figure 78: ECP Panel setup 1000 Series

i	Up to 6 ECP panels can be daisy chained.

ID setting must be unique and set to the corresponding address in the director configuration file.
Use 1:1 CAT5 FTP cables for all connections. The cable MUST be shielded.

4.2.6 DCP-1016E

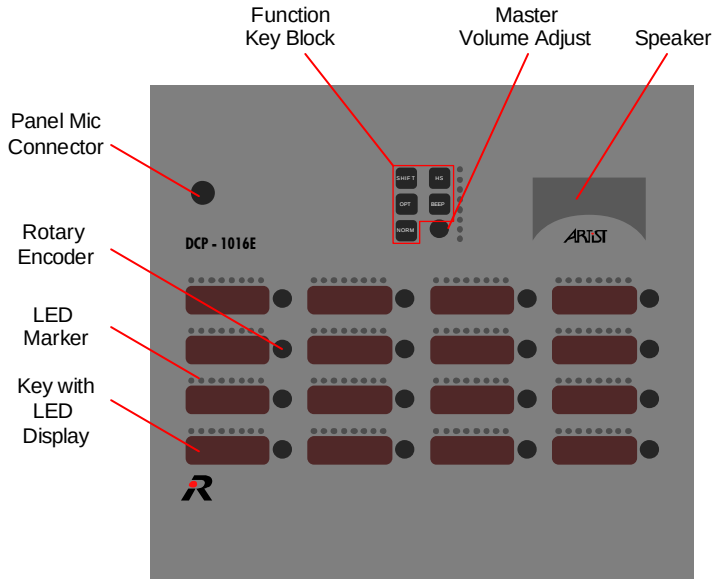


Figure 79: DCP-1016E (top view)

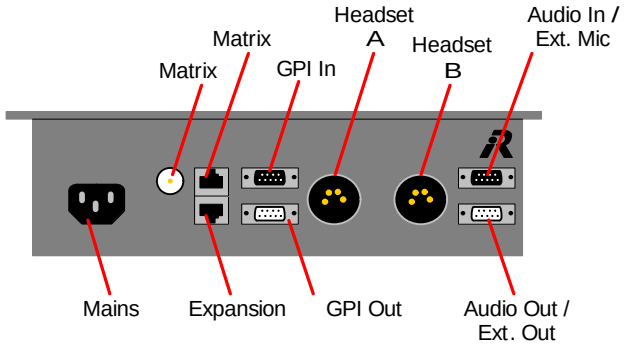


Figure 80: DCP-1016E (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.2.7 DCP-1016ES

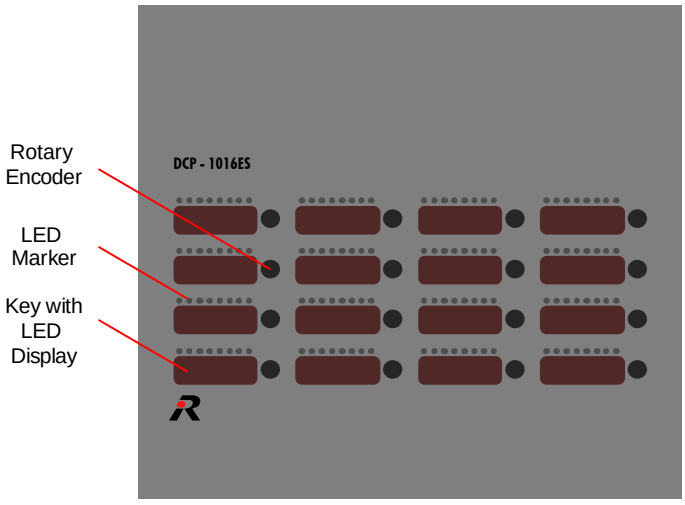


Figure 81: DCP-1016ES (top view)

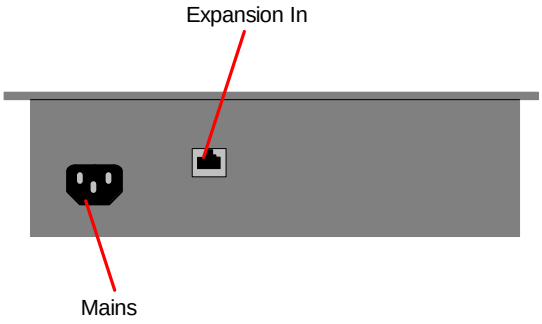


Figure 82: DCP-1016ES (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.3 2300 Smartpanel

Figure 83: RSP-2318 (front view)

Figure 84: RSP-2318 (rear view)

The 2300 Smartpanels user manual is a separate document and available for registered users on the Riedel Website.

4.4 2000 LCD Series

The 2000 Series control key-panels fulfill all requirements of high-quality versatile and economical intercom control key-panels. The 2000 Series are available in 1RU rack mount and desktop versions. They feature 8-digit, high-contrast, fully graphical LCD displays, showing label and cross-point level for each talk key. Each talk key has individual listen level control and LCD level indication. All control key-panels are equipped with a “shift”-page, essentially doubling up the number of keys. Up to three expansion panels can be daisy-chained to the 19” rack-mount control key-panels providing up to 64 control keys with displays.

4.4.1 RCP-2016P

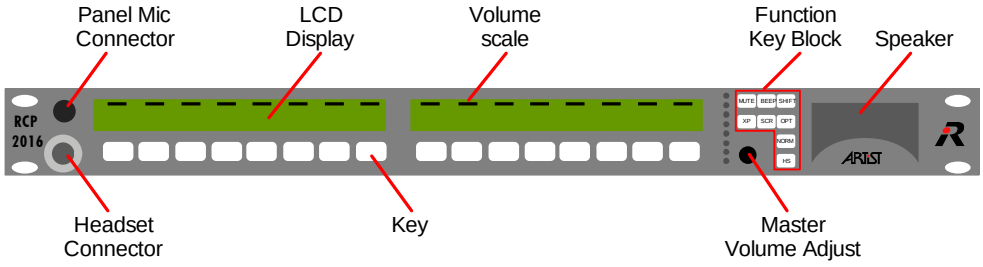


Figure 85: RCP-2016P (front view)

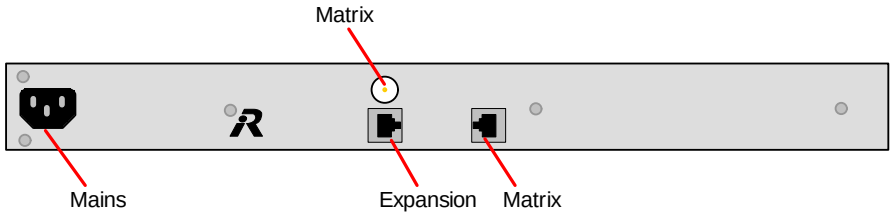


Figure 86: RCP-2016P (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.4.2 RCP-2116P

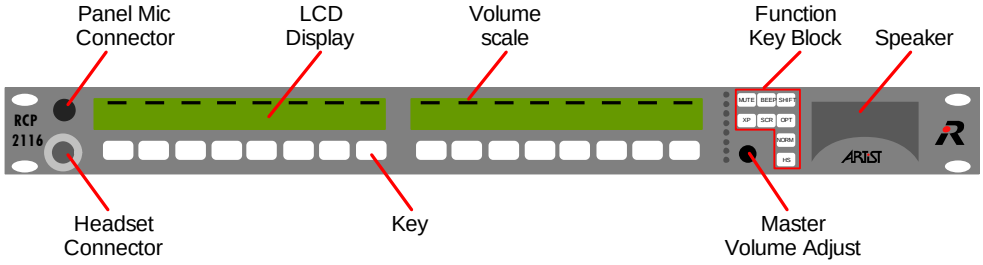


Figure 87: RCP-2116P (front view)

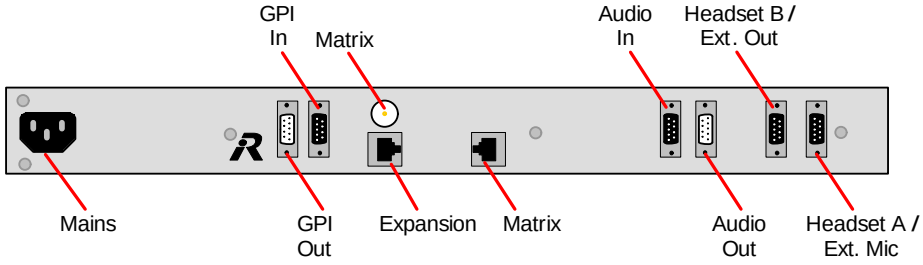


Figure 88: RCP-2116P (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.4.3 ECP-2016P

The expansion panel can be used to expand the number of keys.
They are powered from a RCP-2016P/RCP-2116P.
A maximum of 3 ECP-2016P/ECP-2016PT may be connected at the RCP-2016P/RCP-2116P.

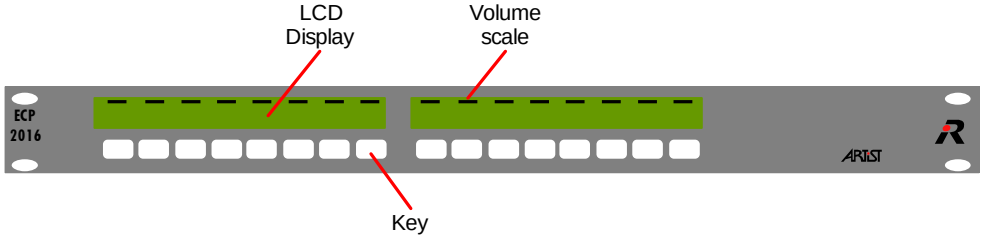


Figure 89: ECP-2016P (front view)

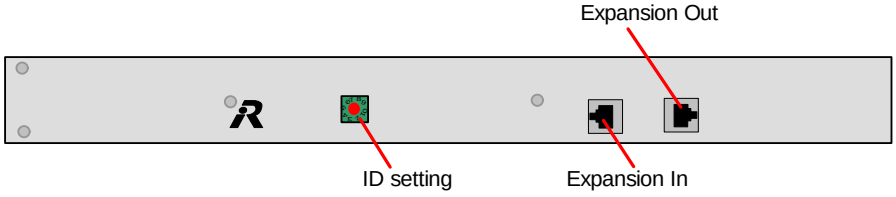


Figure 90: ECP-2016P (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.4.4 ECP-2016PT

The ECP-2016PT is powered from the RCP-2016P/RCP-2116P.
A maximum of 3 ECP-2016P/ECP-2016PT may be connected at the RCP-2016P/RCP-2116P.

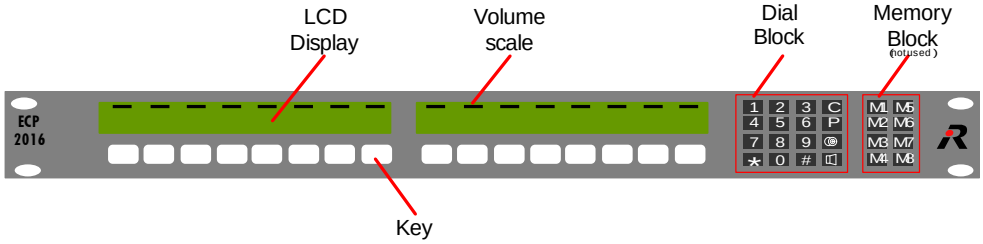


Figure 91: ECP-2016PT (front view)

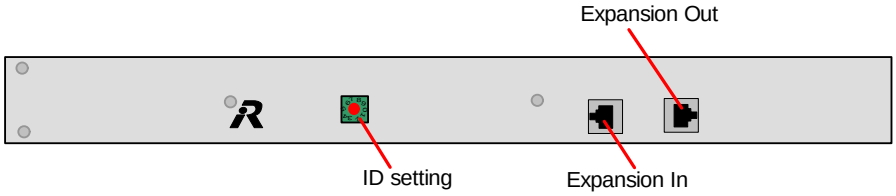


Figure 92: ECP-2016PT (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.4.5 ECP Panel setup 2000 Series

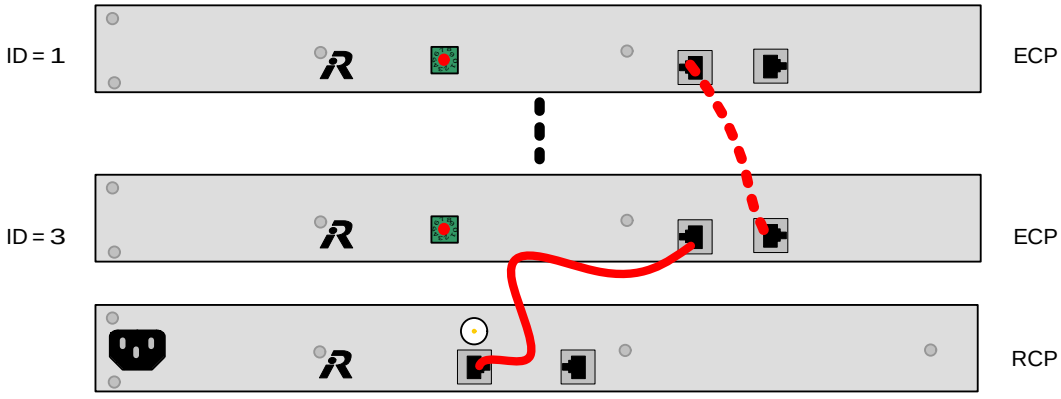


Figure 93: ECP Panel setup 2000 Series

	Up to 3 ECP panels can be daisy chained.

ID setting must be unique and set to the corresponding address in the director configuration file.
Use 1:1 CAT5 FTP cables for all connections. The cable MUST be shielded.

4.4.6 DCP-2016P

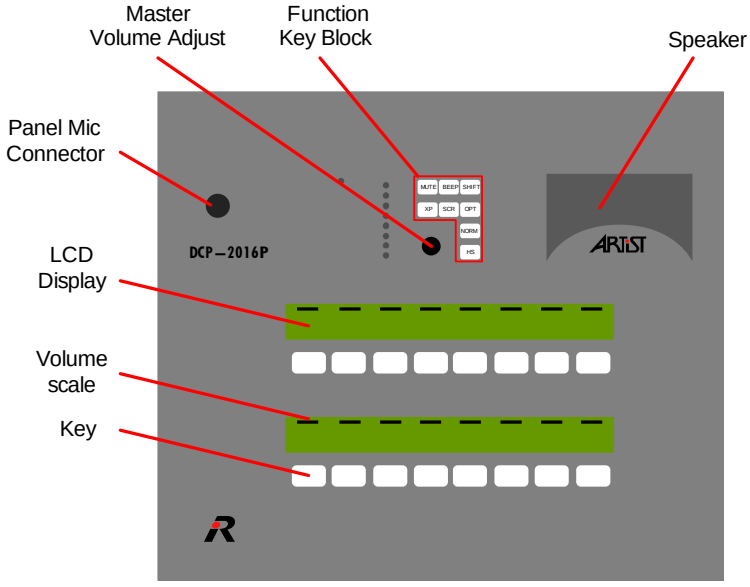


Figure 94: DCP-2016P (top view)

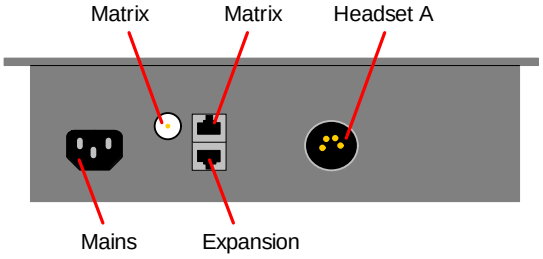


Figure 95: DCP-2016P (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.4.7 DCP-2116P

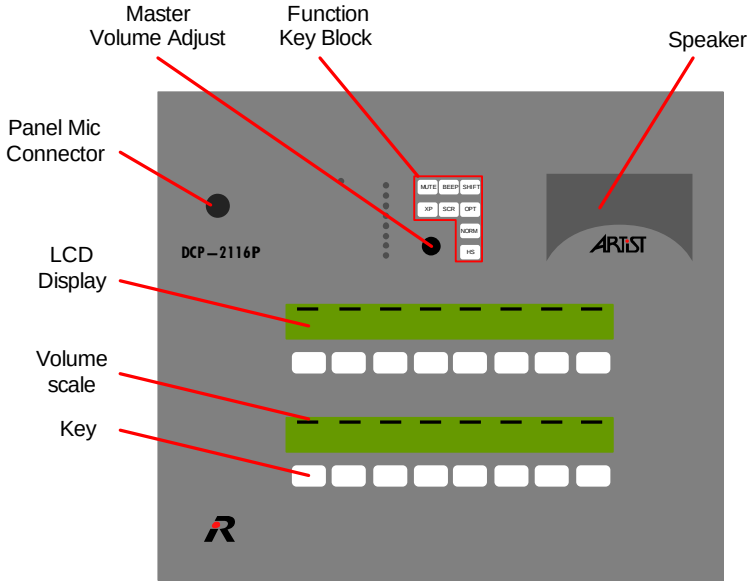


Figure 96: DCP-2116P (top view)

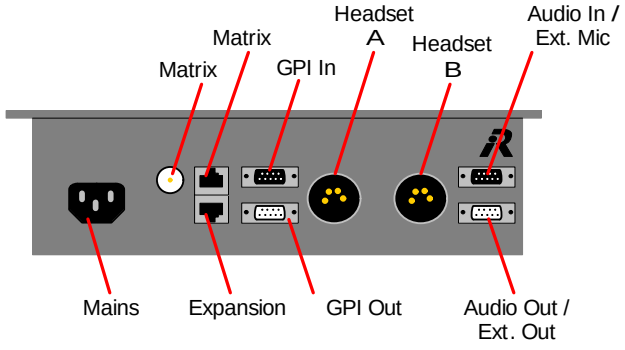


Figure 97: DCP-2116P (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.4.8 DCP-2016PS

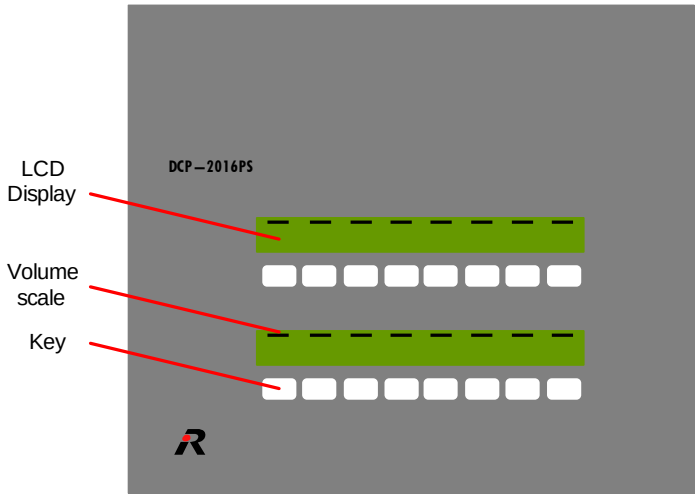


Figure 98: DCP-2016PS (top view)

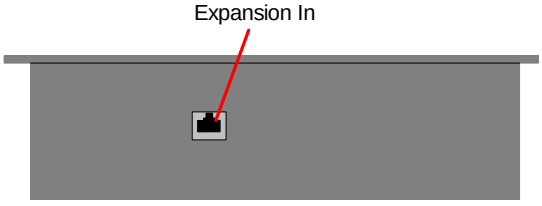


Figure 99: DCP-2016PS (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

The DCP-2016PS is powered from the DCP-2016P/DCP-2116P.
Use 1:1 CAT5 FTP cables for all connections. The cable MUST be shielded.

4.5 3000 Series without Display

NOTE: discontinued product.

The 3000 series control key-panels are the cost-effective entry to the Matrix platform. Fulfilling all requirements of a versatile intercom control key-panel the panels comprise the 2000 Series illuminated color indication of the push-buttons and provide marker stripes for easy labeling of the keys.

4.5.1 RCP-3016P

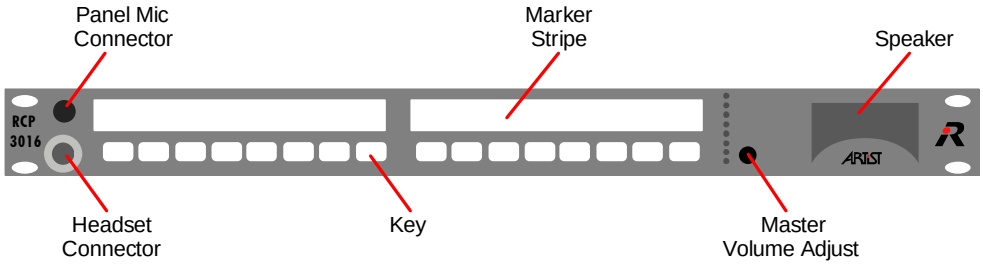


Figure 100: RCP-3016P (front view)

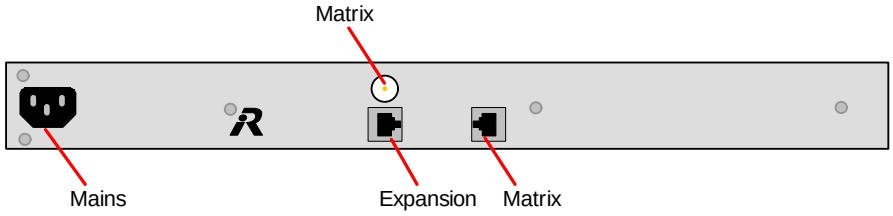


Figure 101: RCP-3016P (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.5.2 ECP-3016P

The expansion panel can be used to expand the number of keys.
They are powered from a RCP-3016P.
Connect maximum 3 ECP-3016P to one RCP-3016P.

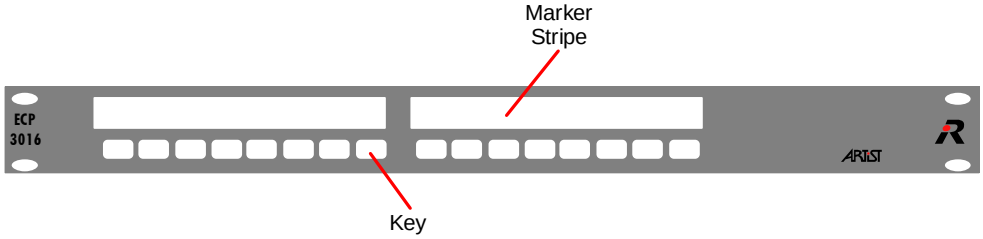


Figure 102: ECP-3016P (front view)

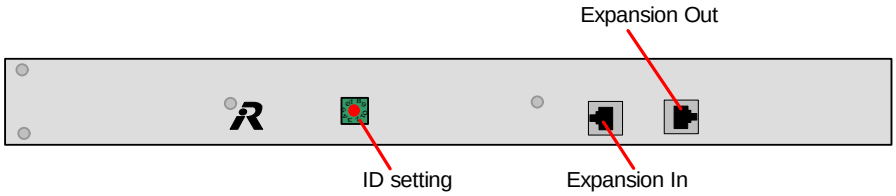


Figure 103: ECP-3016P (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

For the ECP-3016P setup please refer the ECP Panel setup 2000 Series.

4.5.3 DCP-3016P

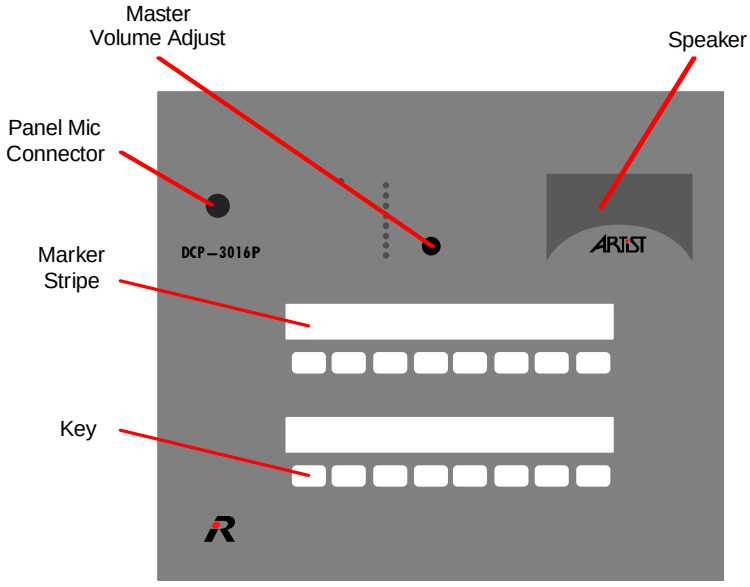


Figure 104: DCP-3016P (top view)

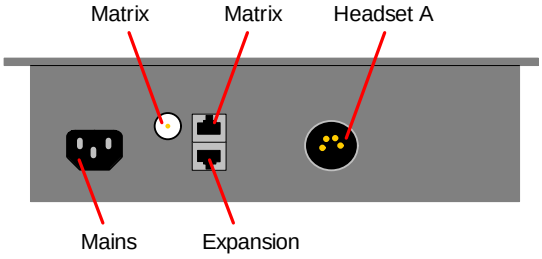


Figure 105: DCP-3016P (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.5.4 DCP-3016PS

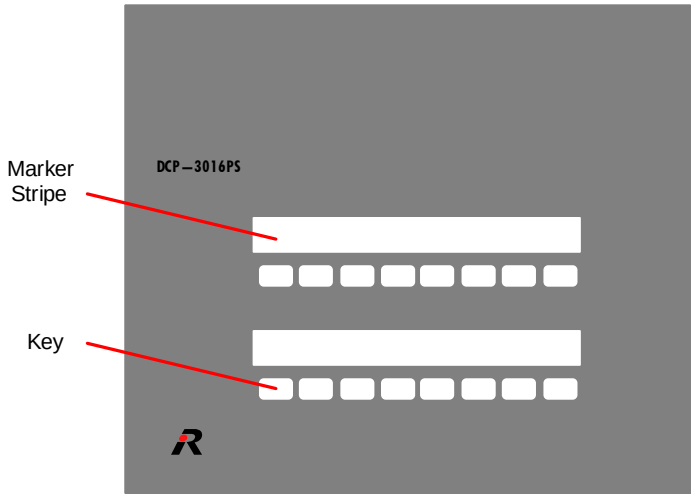


Figure 106: DCP-3016PS (top view)

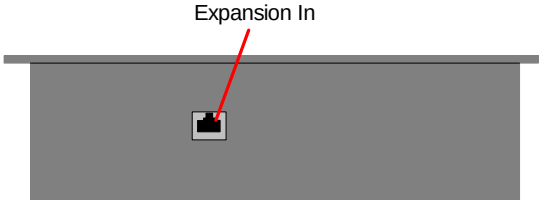


Figure 107: DCP-3016PS (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

The DCP-3016PS is powered from the DCP-3016P.
Use 1:1 CAT5 FTP cables for all connections. The cable MUST be shielded.

4.6 5000 Series

The 5x08 control key-panels are the most cost-effective entry to the digital Performer platform.
It is available with (5108) or without (5008) display.
Both versions have automatic headset detection that can be overwritten by a long push on the Master Volume Adjust Button.
A short push on the Master Volume Adjust button changes between the standard page and the shift page (DCP-5108 with Display ONLY).
The optional available 19”rack mount kit (DCP-RA) allows the panel to be mounted into a standard 19”, 2RU rack mount space.
The optional available wall mount kit (DCP-WA) allows the panel to be mounted at a wall.
The mount kits can be mounted at the customer side.

i	The microphone of both panels is fix mounted and can NOT be exchanged by the customer.

4.6.1 DCP-5008 (without Display)

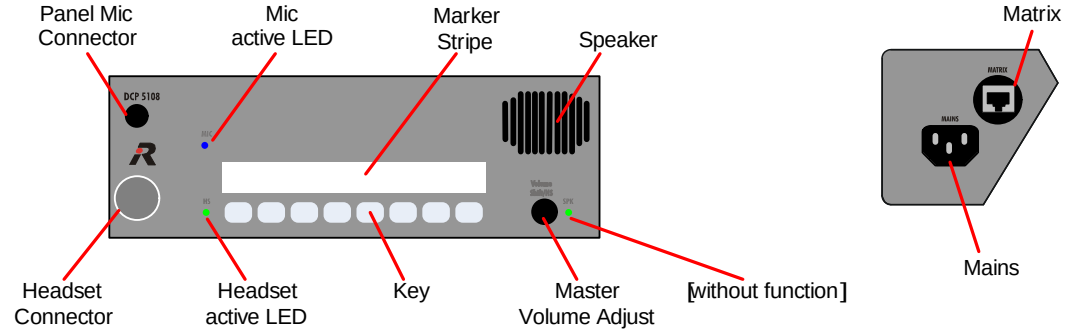


Figure 108: DCP-5008 (top view) *(view from right side)*

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.6.2 DCP-5108 (with Display)

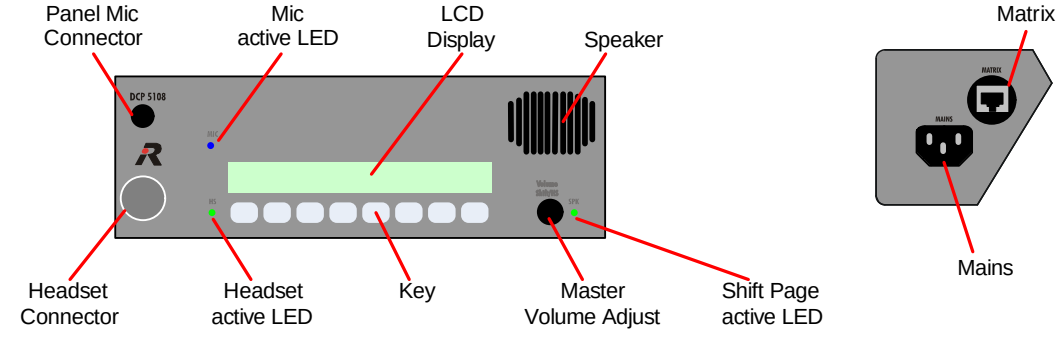


Figure 109: DCP-5108 (top view) *(view from right side)*

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.7 Modular Panels

Based on the 1000 Series Control Panels the Modular Panel has been designed to fit into consoles based on the popular 190x40mm mechanics. In addition, it provides a modular panel system for any type of custom application.

The displays work in horizontal or vertical mode so that labeling can be easily recognized.

4.7.1 DIF-1000

The Danner Interface is used for the connection between the modular panels and the Matrix. All DSP functionality and external option interfaces like GPI and Audio in/out as known from the LED panel series are also available at the DIF-1000.

Figure 110: DIF-1000 (front view)

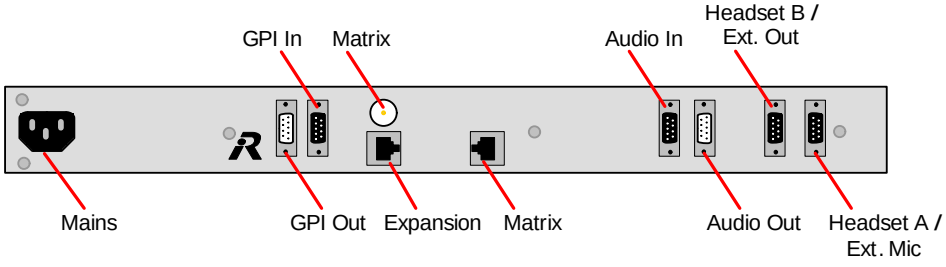


Figure 111: DIF-1000 (rear view)

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.7.2 DBM-1004E

The base module DBM-1004E provides four keys with integrated 8-digit LED displays, individual listen level controls and LED level indication for each talk key.
Similar to the 1000 series control panels, the DBM-1004E also features 5 function keys plus master volume control.
The number of keys can be expanded by additional DEM-1006E.

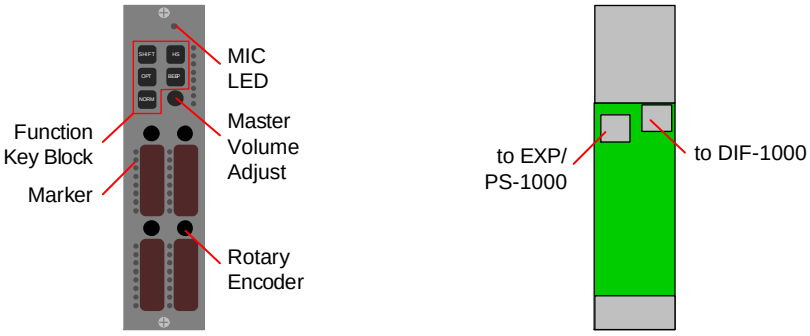


Figure 112: DBM-1004E (front view / rear view)

4.7.3 DEM-1006E

The Danner extension module DEM-1006E offers 6 additional keys. Up to 6 DEM-1006E can be daisy chained to a DBM-1004E. The last open RJ45 jack has to be connected to the DPS-1000 power supply.

Each DEM-1006E needs a unique ID, set by the rotary switch at the rear side. The first DEM (next to the DBM) has to be set to 1, further DEM-1006E have to be set to 1+n.

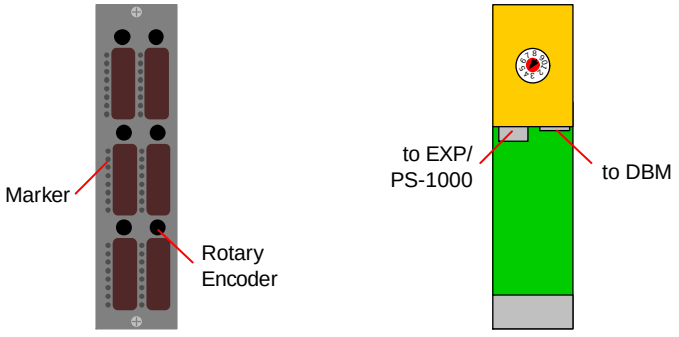


Figure 113: DEM-1006E (front view / rear view)

4.7.4 Modular Panels setup

Connect the DIF-1000 via Coax or CAT5 to the Matrix and connect at least one DBM to the expansion port. Up to 6 additional DEM-1006E can be connected to the DBM. The last open RJ45 jack has to be connected to the DPS-1000 power supply.

Please connect the DPS to the DBM/DEM prior connecting the DIF-1000 to mains.

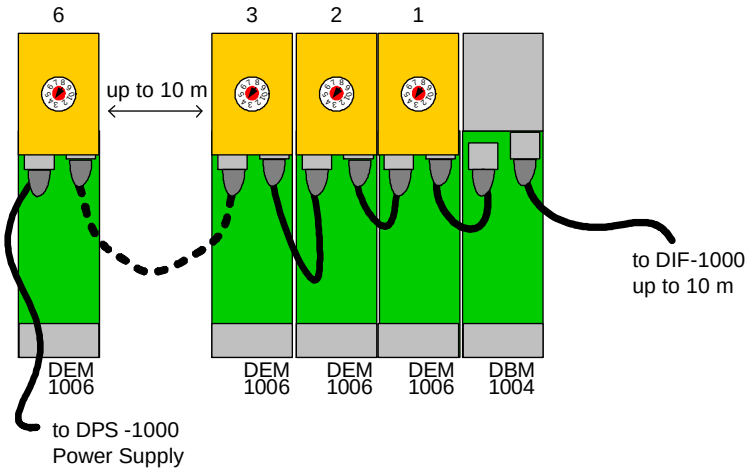


Figure 114: Modular Panels setup (rear view)

ID setting must be unique and set to the corresponding address in the director configuration file.
Use 1:1 CAT5 FTP cables for all connections. The cable MUST be shielded.

4.7.5 DEM-1106

The Danner extension module DEM-1106 offers 6 additional keys. The module will be daisy chained like an expansion-panel to a RCP-1112, RCP-1128 or ECP-1116 panel. Each DEM-1106 need to be powered via external power supply DPS-1000.

This module is offered in 3 different versions of the frontpanel: Danner, Lawo and DHD.

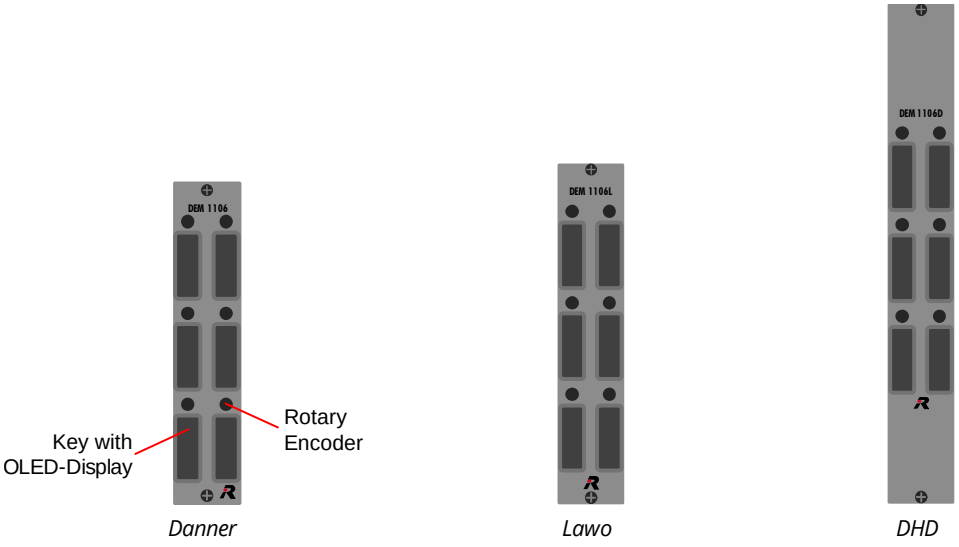


Figure 115: DEM-1106 (front view)

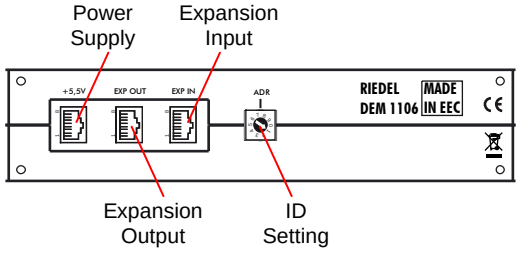


Figure 116: DEM-1106 (rear view)

Each DEM-1106 needs a unique ID, set by the rotary switch at the rear side. The first Expansion panel has to be set to "1", further panels have to be set to 1+n.

The daisy chain setup of DEM-1106 modules are analog the ECP-panels and can be found in chapter "ECP Panel setup 1100 Series".

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.7.6 DEM-2008

The Danner extension module DEM-2008 offers 8 additional keys. The module will be daisy chained like an expansion-panel to a RCP-2x16P or ECP-2016P(T) panel. Each DEM-2008 need to be powered via external power supply DPS-1000.

This module is offered in 3 different versions of the frontpanel: Danner, Lawo and DHD.

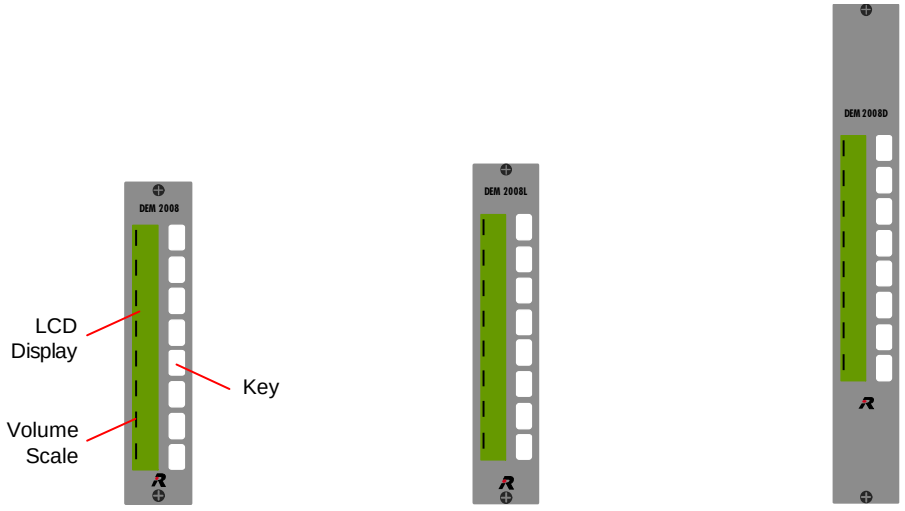


Figure 117: DEM-2008 (front view)

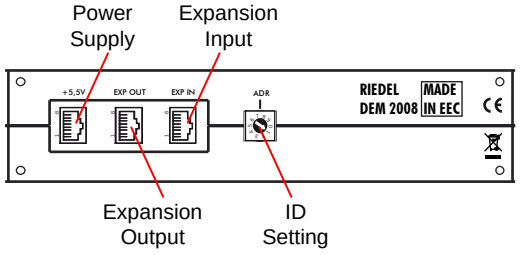


Figure 118: DEM-2008 (rear view)

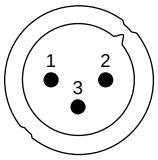
Each DEM-2008 needs a unique ID, set by the rotary switch at the rear side. The first Expansion panel has to be set to "1", further panels have to be set to 1+n.

The daisy chain setup of DEM-2008 modules are analog the ECP-panels and can be found in chapter "ECP Panel setup 2000 Series".

An overview about all connectors can be found in chapter "Panels / Panel Connectors".

4.8 Panel Connectors

XLR 3 male Audio Connector CCP-1116

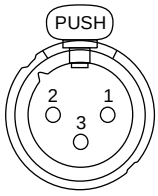


Pin	Ext. Speaker	Audio Output
1	Shield	Shield
2	Speaker +	Signal + (hot)
3	Speaker -	Signal - (cold)

Ext. Speaker Out: 2 W, 4 Ω
Audio Out Norm Level = +6 dBu
Audio Out Max. Level = +18 dBu

Figure 119: Panel XLR 3 male pinout

XLR 3 female Audio Connector CCP-1116

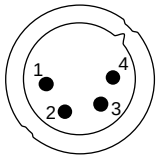


Pin	Audio Input
1	Shield
2	Signal + (hot)
3	Signal - (cold)

Norm Level = +6 dBu
Max. Level = +18 dBu

Figure 120: Panel XLR 3 female pinout

XLR 4 male Headset Connector / DC Power CCP-1116

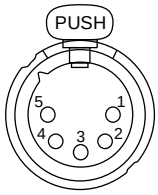


Pin	Headset *	DC-Power CCP-1116
1	Shield (MIC -)	GND
2	MIC + (+4 VDC)	NC
3	Phones -	NC
4	Phones +	+10 ... +14 VDC (3 A)

* Mic power will be switched on/off according to the setting in the panels audio patch in the Director software

Figure 121: Panel XLR 4 male pinout

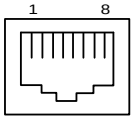
XLR 5 female GPIO Connector CCP-1116



Pin	GPIO
1	Output -
2	Output +
3	Input -
4	Input +
5	+5 V (250 mA / Shield = GND)

Figure 122: Panel XLR 5 female pinout

RJ 45 Matrix/Expansion Connector



Pin	Matrix	Expansion 1000 Series	Expansion 2000/2100/ 3000 Series
1	TxD +	Data +	Data +
2	TxD -	Data -	Data -
3	RxD +		
4			
5			
6	RxD -		
7			GND
8			+5 V
Case	Chassis GND	Chassis GND	Chassis GND

Figure 123: Panel RJ-45 pinout

BNC Matrix Connector

Pin	Coax
1	TxRx Data +
2	TxRx Data -

Figure 124: Panel BNC pinout

Sub-D 9 female Headset Connector

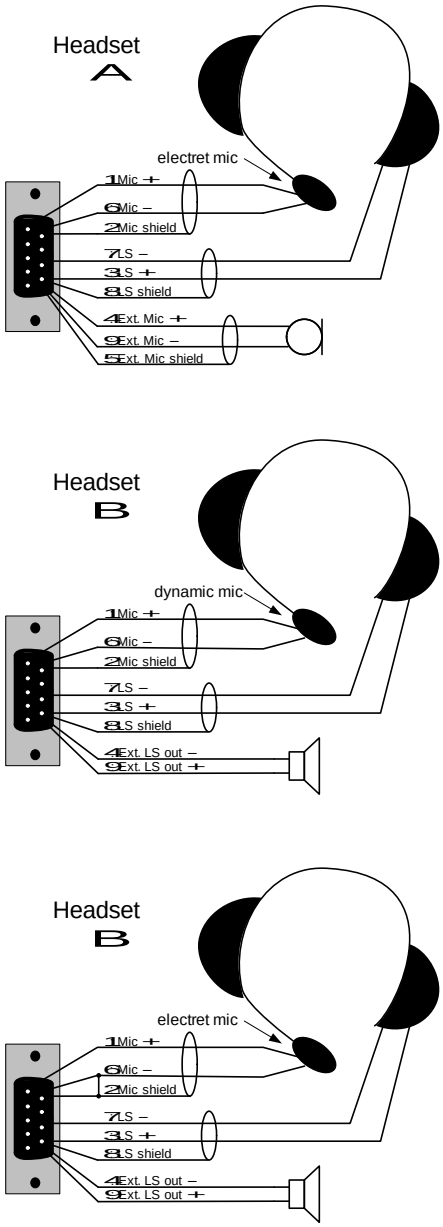


Figure 125: Panel Sub-D 9 female Headset A/B pinout

Pin	Headset A	Headset B
1	HS MIC +, **+5 V**	HS MIC +, **+5 V**
2	Chassis (MIC Shield)	Chassis (MIC Shield)
3	HS Phones +	HS Phones +
4	Ext. MIC +, **+5 V**	Ext. Speaker Out -
5	Chassis (Ext. MIC Shield)	NC
6	HS MIC -	HS MIC -, **+5 V**
7	HS Phones - (GND)	HS Phones - (GND)
8	Chassis (HS Phones Shield)	Chassis (HS Phones Shield)
9	Ext. MIC -, **+5 V**	Ext. Speaker Out +
Case	Chassis	Chassis

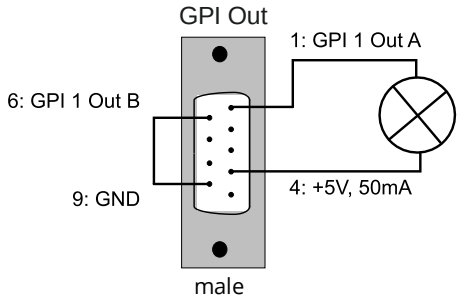
Ext. Speaker Out: 2 W, 4 Ω

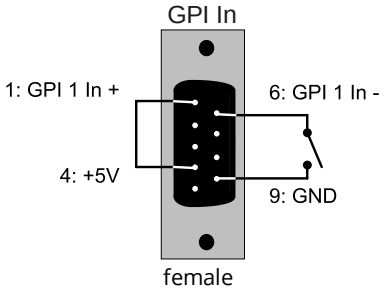
MIC **Headset A** is **unbalanced** and optimized for **electret** microphones. If a dynamic MIC is used at Headset A connector, the signal noise ratio quality is reduced.

MIC **Headset B** is **balanced** and optimized for **dynamic** microphones.

To connect an **electret** microphone to **Headset B**, connect **MIC +** to **pin 1** and **MIC - & shield** to **pin 2 & 6**.

D-Sub 9 GPI Connector





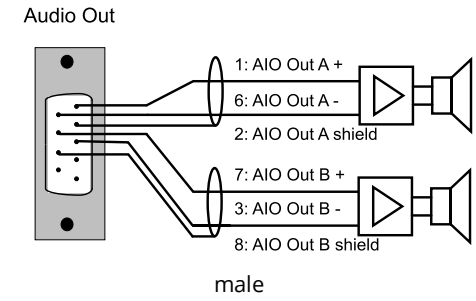
Examples for external connections

Pin	GPI OUT	GPI IN
1	GPI 1 Out A	GPI 1 In +
2	GPI 2 Out A	GPI 2 In +
3	GPI 3 Out A	GPI 3 In +
4	+5 V, max 50 mA	+5 V, max. 50 mA
5		
6	GPI 1 Out B	GPI 1 In -
7	GPI 2 Out B	GPI 2 In -
8	GPI 3 Out B	GPI 3 In -
9	GND	GND
Case		

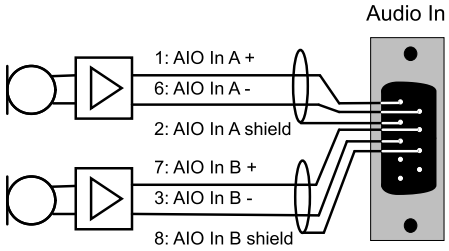
Uin = +5 ... +48 V
Output: max. 60 V / 300 mA
(protected by self-healing fuse)

Figure 126: Panel Sub-D 9 female/male GPI IN/OUT pinout

Sub-D 9 Audio Connector



male



female

Examples for external connections

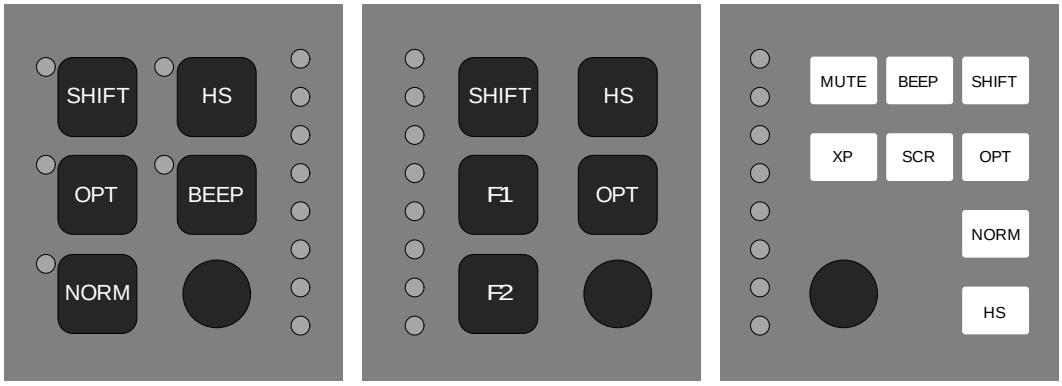
Pin	Audio OUT	Audio IN
1	Audio Out A +	Audio In A +
2	Audio A Shield	Audio A Shield
3	Audio Out B -	Audio In B -
4	Ext. Out + *	Ext. MIC + *
5	Ext. Out Shield *	Ext. MIC Shield *
6	Audio Out A -	Audio In A -
7	Audio Out B +	Audio In B +
8	Audio B Shield	Audio B Shield
9	Ext. Out - *	Ext. MIC - *
Case		

* DCP only (refer to Sub-D 9 Headset for connection)

Z in = > 20 kΩ
Z out = < 10 Ω
Norm Level = +6 dBu
Max. Level = +18 dBu

Figure 127: Panel Sub-D 9 female/male Audio IN/OUT pinout

4.9 Panel Function Keys



1000 Series *1100 Series* *2000 Series*

Figure 128: Function Keys of panels

Master Volume Knob
The master volume knob is used to change the volume level.
Double click on the master volume knob will force all keys to the default volume.

Panel-Reset - 1000 Series
Push SHIFT + OPT + NORM simultaneously. The panel will reset when connected to a matrix or change to demo mode (if not connected to a matrix).

Panel-Reset - 1100 Series
The panel will reset by pushing SHIFT + F1 + F2 simultaneously. If F1 will be still pushed while releasing SHIFT + F2, the panel can be set to demo mode after pushing the OLED key "DEMO".

Panel-Reset - 2000 Series
To reset the panel push key 9, 16 and the master volume knob simultaneously.

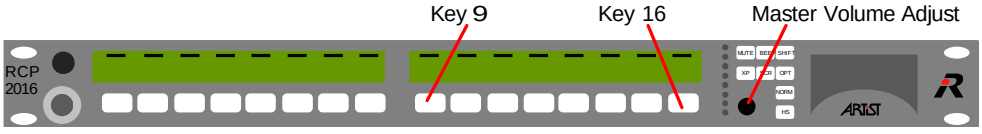


Figure 129: LCD Panel Reset

4-wire mode (= standalone without matrix connection /only 1000 and 1100 Series)
The 4-wire modus is supported starting panel monitor 3.15. It is initiated by pushing OPT, BEEP and NORM (1000 series) or F1, OPT and F2 (1100 series) simultaneously while powering the unit. In this mode, the panel offers direct Audio In- and Output from the MIC to Audio OUT A (Call A) and Audio OUT B (Call B). Pressing “Call” will send the Audio to Audio OUT A and Audio OUT B. Audio IN A and Audio IN B are connected to the speaker. The Headset function is still supported and can be selected by pressing HS.
In the HS mode, the sidetone can be adjusted by the encoder next to the key labeled with “Sidetone”. Using the key “int. MIC” / ”ext. MIC” switches between the panel microphone and the external MIC input at the AUDIO IN connector.

Function Key	Panel Series	Function
SHIFT	1000 / 1100 / 2000	**Changes to shift page** The Shift page virtually doubles the number of keys on the panel. Pressing SHIFT toggles between the main page and the shift page not only on the control panel but also on all expansion panels which are connected to the control panel.
OPT	1000 / 1100 / 2000	**Displays the options of keys** This key displays the Client card firmware version and other information in the LCD display. Using the OPT button in SHIFT mode shows additional information like NODE, IP address, Port, Bay etc.
NORM	1000 / 2000	**Sets crosspoint to unity gain** Pushing NORM and a key 1-12 / 1-16 forces the volume of the used key to unity gain.
HS *	1000 / 1100 / 2000	**Toggles between Headset-Mode an Speaker-Mode** This function key toggles between panel speaker mode and headset mode. By default, the built-in loudspeaker and the gooseneck microphone are switched off while headset Mic and headset speaker are activated in headset mode. Panel behavior in speaker and headset mode can be edited using the Director configuration software on a panel by panel basis. To indicate headset mode the master volume LED indication is switched from amber to green and the HS function key LED is switched on.
F1/F2 *	1100	**User programmable function keys** The function of these keys can be set in the Director Software.
BEEP	1000 / 2000	**Generates a beep at the destination panel** This function key causes an audible call (beep) at the selected destination panel. Push & hold BEEP and press destination key. The beep volume can be adjusted (and switched off) using the Director configuration software on a panel by panel basis. Press BEEP and simultaneously a key 1-16. A beep will be generated at the destination. Beeps to groups or conferences are not possible.
SCR *	2000	**Enables scroll - list** Enables the user to call to members which are not programmed on a specific key. The first step is to program a scroll list in the Director configuration software and to define a key on the panel as “scroll list key”. Press SCR and the “scroll list key”. Then use the volume knob to scroll through the functions: C2 port = call to port L2 port = listen to port C2 Group = call to group Route = set Crosspoint When the correct connection appears (e.g. C2 Port) press the master volume adjust button. Now the select menu appears in the LCD display. Using the master volume adjust knob offers different destinations (from the scroll list). Select the entry by pressing the master volume adjust knob for 1 second.
MUTE	2000	**Mutes crosspoint in combination with talk key** Press Mute and simultaneously key 1-16.The member on that key will be muted. Repeat this in order to unmute the member. The volume will return to the previously adjusted value.
XP	2000	**Adjust crosspoint gain** Press XP and simultaneously key 1-16. Release both knobs and use the master volume to adjust the crosspoint gain.

* please refer the Director configuration software / the Director software manual

4.10 How to...

Key + Encoder
The 8-digit displays are part of the keys: pressing the display activates the key. The encoder next to the display (right hand side) adjusts the individual crosspoint volume. Turn left to reduce the listen level from this destination, turn right to increase the listen level. A short press of the encoder („click“) mutes the crosspoint. Click again to return to the previous listen level. The mute-function of the encoder can be disabled using the Director configuration software. To reset the crosspoint volume to the default value, press & hold NORM and press the display/key.
Double-click on the master volume encoder resets all crosspoint volumes of the panel to the default value. For 2000 series, press XP and simultaneously key 1-16. Release both knobs and use the master volume to adjust the crosspoint.

Signalizing / Key status indication (system default)
To indicate an outgoing call (call to port) the LED-bar above the key shines green while the volume LED shines red. An incoming call is indicated by an amber LED-bar again but the volume LED shines red. For 2000 and 3000 series panels, the key appears blue for outgoing call to ports and yellow for incoming calls. „Busy“ and „in use“ indications are also supported (if configured). All command-related LED-bar indications can be edited using the NET properties in the Director configuration software. This enables the user to adapt to custom requirements or keep existing signaling habits.

Answer-back key (REPLY)
There is no dedicated answer-back key on the panel. Instead, any key, on both main and shift page can be configured as the REPLY key. An incoming call shows up on the Reply key including the label of the caller. Pressing the Reply key answers the call regardless if the caller is configured to a key of the panel or not. The Reply key label displays the last caller and times out to „Reply“ after 10 seconds. The Reply function remains assigned to the last caller and pressing the reply key after the timeout calls up the last callers display label again. The timeout can be adjusted using the configuration software.

Double-clicking on the encoder of the Reply key calls up the answer back stack which holds the 10 most recent callers. Turning the encoder scrolls through the list and pressing the encoder for approx.1 seconds confirms the selection, hence re-assigning the Reply key to the selected destination.

4.11 Technical Data - Panels

All Panel Types

AC Voltage	90 ... 264 VAC
Frequency	47 ... 63 Hz
Operating Temperature	-5°C ... +55°C

1000 LED Series

Panel Type	Dimensions	Weight	Power consumption
RCP-1012E	19" x 1 HE x 56 mm	1.0 kg	Max. 30 VA
RCP-1028E	19" x 2 HE x 56 mm	1.8 kg	Max. 48 VA
ECP-1016	19" x 1 HE x 56 mm	1.0 kg	Max. 30 VA
ECP-1012ET	19" x 1 HE x 56 mm	1.0 kg	Max. 30 VA
DCP-1016E	255 x 77 x 235 mm	1.6 kg	Max. 30 VA
DCP-1016ES	255 x 77 x 235 mm	1.6 kg	Max. 30 VA
DIF-1000	19" x 1 HE x 70 mm	1.2 kg	Max. 30 VA
DBM-1004E	40 x 190 x 60 mm	0.33 kg	Max. 8 VA
DEM-1006E	40 x 190 x 60 mm	0.37 kg	powered via DBM

1100 OLED Series

Panel Type	Dimensions	Weight	Power consumption
RCP-1112	19" x 1 HE x 110 mm	1.6 kg	Max. 30 VA
RCP-1128	19" x 2 HE x 105 mm	2.2 kg	Max. 34 VA
ECP-1116	19" x 1 HE x 93 mm	1.3 kg	Max. 14 VA
DCP-1116	255 x 80 x 225 mm	1.6 kg	Max. 31 VA
CCP-1116	390 x 108 x 290 mm	5.2 kg	Max. 40 VA
DEM-1106	40 x 190 x 45 mm (Danner) 40 x 200 x 45 mm (Lawo) 40 x 293 x 45 mm (DHD)	0.27 kg	Max. 5 VA

2000 LCD Series

Panel Type	Dimensions	Weight	Power consumption
RCP-2016P	19" x 1 HE x 56 mm	1.0 kg	Max. 30 VA
RCP-2116P	19" x 1 HE x 56 mm	1.0 kg	Max. 30 VA
ECP-2016P	19" x 1 HE x 56 mm	1.42 kg	powered via xCP-20xx
ECP-2016PT	19" x 1 HE x 56 mm	1.45 kg	powered via xCP-20xx
DCP-2016P	255 x 77 x 235 mm	1.6 kg	Max. 45 VA
DCP-2116P	255 x 77 x 235 mm	1.6 kg	Max. 30 VA
DCP-2016PS	255 x 77 x 235 mm	1.6 kg	powered via xCP-20xx
DEM-2008	40 x 190 x 45 mm (Danner) 40 x 200 x 45 mm (Lawo) 40 x 293 x 45 mm (DHD)	0.38 kg	Max. 5 VA

3000 Series without Display

Panel Type	Dimensions	Weight	Power consumption
RCP-3016P	19" x 1HE x 56 mm	1.0 kg	Max. 20 VA
ECP-3016P	19" x 1HE x 56 mm	1.8 kg	powered via xCP-30xx
DCP-3016P	255 x 77 x 235 mm	1.6 kg	Max. 20 VA
DCP-3016PS	255 x 77 x 235 mm	1.6 kg	powered via xCP-30xx

5000 Series

Panel Type	Dimensions	Weight	Power consumption
DCP-5008	283 x 95 x 115 mm		Max. 27 VA
DCP-5108	283 x 95 x 115 mm	1.55 kg	Max. 27 VA

5 Accessories

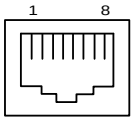
5.1 Network Interfacing

5.1.1 CPX-AVB Expansion Card

The CPX-AVB Expansion Card is a small unit, which is plugged in the expansion slot of a RCP-1112 or RCP-1128. It converts the panel signal into AVB and vice versa. It is designed to connect the control panel in one or two-channel mode to the matrix via IP-based LANs. The CPX-AVB Expansion card is the perfect teammate to Riedel's AVB-008 G2 eight channel AVB client card, which is installed directly within the mainframe.

Figure 130: CPX-AVB Expansion Card

RJ45 CPX-AVB Expansion card



Pin	Signal
1	Tx/Rx_A +
2	Tx/Rx_A -
3	Tx/Rx_B +
4	Tx/Rx_C +
5	Tx/Rx_C -
6	Tx/Rx_B -
7	Tx/Rx_D +
8	Tx/Rx_D -

Figure 131: CPX-AVB Expansion Card RJ45 pinout

5.1.2 Connect IPx2

The Connect IP x2 is available in two versions: AIO for analog audio signals and CAT for digital audio signals/ panels. The Connect IPx2 required ALWAYS a VoIP card inside a mainframe. See VoIP Application Guide. The device needs to be powered via external power supply DPS-1000.

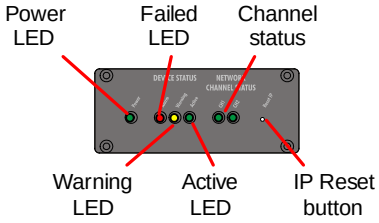


Figure 132: CONNECT IPx2 (front view)

LED	Function	Description
green	Power LED	The Connect IP is connected to power supply
red	Fail LED	Major error, perform a power cycle (also on during LED test within boot sequence)
yellow	Warning LED	Emergency-Software running / Unit booted but errors present (see logfile of webinterface)
green	Active LED	on: device is booting blinking: device is active
red / green	Channel State LED	off: nothing configured red: port configured but not connected green: port configured and connected to matrix red/green moving light: Emergency-Software running all green blinking: Update in progress

Pressing the IP Reset button for several seconds resets the IP-address to the default value **192.168.42.160**.

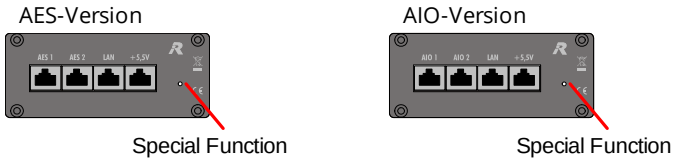
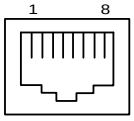


Figure 133: CONNECT IPx2 (rear view)

RJ45 IPx2



Pin	AES	AIO	LAN	Power
1	RxD +		TxD +	
2	RxD -		TxD -	
3	TxD +		RxD +	
4		Ain +		Vin (+5 .. +6 V)
5		Ain -		Vin (+5 .. +6 V)
6	TxD -		RxD -	
7		Aout +		GND
8		Aout -		GND
Case	Chassis	Chassis	Chassis	Chassis

Figure 134: CONNECT IPx2 RJ45 pinout

5.1.3 Connect IPx8

The Connect IPx8 is a 19”/1RU unit which converts eight AES or analogue signals into IP data and vice versa. The device is available in three versions, offering different interface options on the rear of the unit. The CAT5 and COAX versions are for connecting panels and other AES signals, while the AIO version is perfect for the connection of 4-wires and other analogue sources. The Connect IPx8 can flawlessly connect up to eight standard 1000, 2000 or 3000 series control panels with full functionality to a matrix via an IP-network.

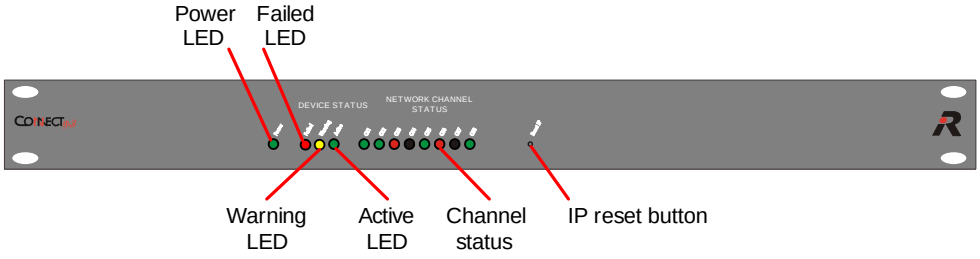


Figure 135: CONNECT IPx8 (front view)

LED	Function	Description
green	Power LED	The Connect IP is connected to mains
red	Fail LED	Major error, perform a power cycle (also on during LED test within boot sequence)
yellow	Warning LED	Emergency-Software running / Unit booted but errors present (see logfile of webinterface)
green	Active LED	on: device is booting blinking: device is active
red / green	Channel State LED	off: nothing configured red: port configured but not connected green: port configured and connected to matrix red/green moving light: Emergency-Software running all green blinking: Update in progress

Pressing the IP Reset button for several seconds resets the IP-address to the default value **192.168.42.160**.

The Connect IPx8 – VoIP multiplexer is available with different rear cards:

Card Type	Signal	Application	Connector
AIO	analog	Audio	RJ45
CAT5	digital	Audio/Panel	RJ45
COAX	digital	Panel	BNC

The rear cards must be assembled at the factory side.

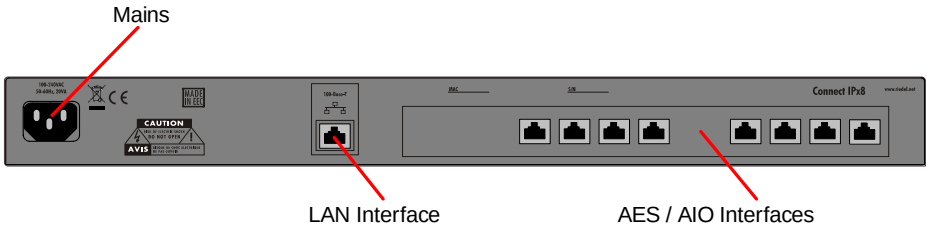
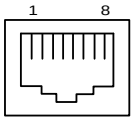


Figure 136: CONNECT IPx8 RJ45 (rear view)

LED	Function	Description
green	Connection LED	AES device connected
off	Connection LED	no device connected

RJ45 IPx8



Pin	CAT	AIO	LAN
1	RxD +		TxD +
2	RxD -		TxD -
3	TxD +		RxD +
4		Ain +	
5		Ain -	
6	TxD -		RxD -
7		Aout +	
8		Aout -	
Case	Chassis	Chassis	Chassis

Figure 137: CONNECT IPx8 RJ45 pinout

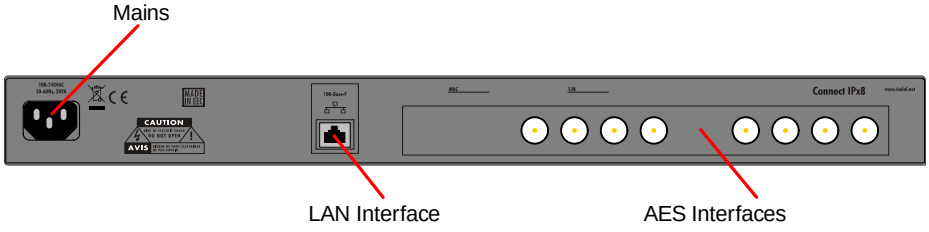


Figure 138: CONNECT IPx8 BNC (rear view)

BNC IPx8

Pin	Signal
1	TxRx Data +
2	TxRx Data -

Figure 139: IPx8 BNC pinout

5.1.4 Connect AVB X8

The Connect AVB X8 convert's eight AES signals to AVB streams and vice versa. Built in a compact 9.5”/1RU housing the device provides eight RJ45 ports to connect up to eight control panels in one or two-channel mode to the matrix via IP-based LANs.

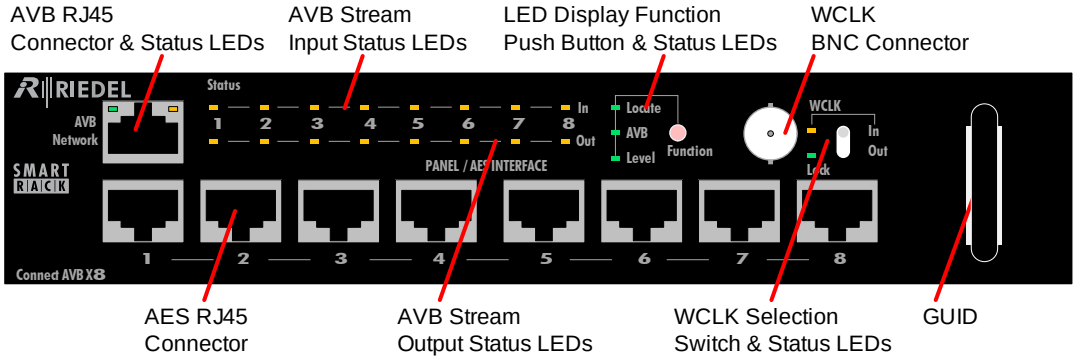


Figure 140: Connect AVB X8 (front view)

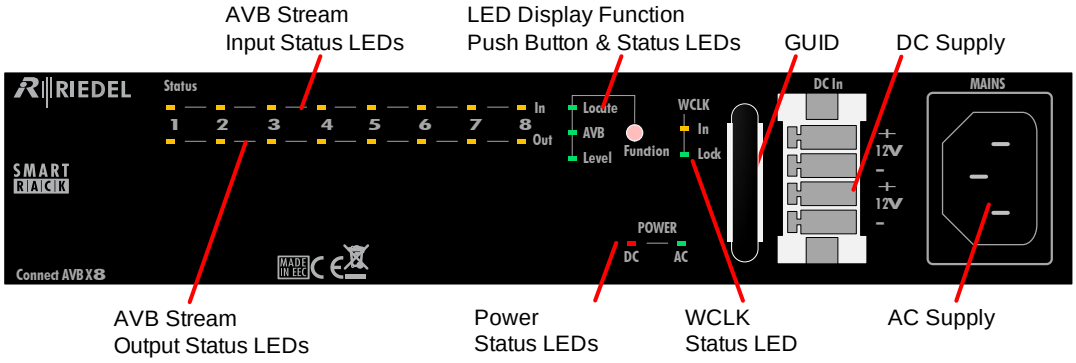


Figure 141: Connect AVB X8 (rear view)

The unit has a switchable WordClock input or output.

The GUID of the unit is printed on the front side and rear side behind the handles. This makes it possible to identify the unit without power.

Pressing the "Function" push button toggles the Status LED content between *AVB Stream/Port Status* mode and *Signal Level* mode.
Pressing the button for more than 2 seconds displays the *Locate / IO Setup* mode for 5 seconds. AVB Controllers like the Riedel AVB Manager use this function to identify a device. In AVB Manager a device is flashing while Locate is active.
The Locate function works in both directions. When the Locate function of AVB Manager is triggered, all Input/Output status LEDs are flashing for 5 seconds.

The unit provides two power supply connections (230 VAC / 12 VDC) which can be used for redundancy.

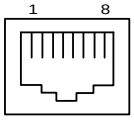
AVB Status LEDs

LED	off	green	yellow	red
AVB Network connector				
left LED	No connection	Ethernet connection ok	--	--
right LED	No traffic	--	flashing while transmitting	--
STATUS LED (In / Out 1 ... 8)				
In function setting **Locate**: I/O Setup indication (temporary display for 5 sec.)	At non active Ports	Flashing at active Ports	--	--
In function setting **AVB**: Indicates the status of streams and ports	Inactive state	Port is configured to send and receive a stream.		Port is set up to stream audio, but an error has occurred. Errors are: 1. Stream isn't flowing 2. Invalid format
		Stream is active and valid.	On Input: No sender (Talker) active. On Output: No receiver (Listener).	
In function setting **Level**: Signal present and Clip indication for audio	--	Signal Level >-50 dBFS (200 ms hold time)	--	Signal Level >-1 dBFS (200 ms hold time)
WCLK				
In	No Input Signal	Valid Input Signal	[In] is *not* selected as source and carries an invalid Input Signal.	[In] is selected as source and carries an invalid Input Signal.
Lock	--	Unit locked	--	Sync Error
Power				
DC / AC	No Supply Voltage	Supply Voltage ok	--	Supply Voltage out of range

AVB Audio Ports Status Table

	LED Color	Talker / Listener Exists	AES Input Data Valid	Talker / Listener Subscribed	Talker / Listener Flowing
State 1	off	No	--	--	--
State 2	red	Yes	No	--	--
State 3	red	Yes	Yes	Yes	No
State 4	yellow	Yes	Yes	No	--
State 5	green	Yes	Yes	Yes	Yes
Logic		Yes = at least one Talker/Listener exists.	--	Yes = at least one Talker/Listener subscribed.	Yes = at least one subscribed Talker/ Listener; stream is flowing No = subscribed stream indicates an error.

RJ45 AVB X8



Pin	Network	Panel / AES
1	Tx/Rx_A +	RxD +
2	Tx/Rx_A -	RxD -
3	Tx/Rx_B +	TxD +
4	Tx/Rx_C +	
5	Tx/Rx_C -	
6	Tx/Rx_B -	TxD -
7	Tx/Rx_D +	
8	Tx/Rx_D -	

Figure 142: Connect AVB X8 RJ45 pinout

BNC AVB X8

Pin	WCLK
1	Rx / Tx +
2	Rx / Tx -

Word Clock In-/Output: TTL / 75 Ω
Sample Rate: 48 kHz ±10%

Figure 143: Connect AVB X8 BNC pinout

5.1.5 Connect AVB C8

The Connect AVB C8 convert's eight AES signals to AVB streams and vice versa. Built in a compact 9.5”/1RU housing the device supports both bi-directional AES for intercom panels and unidirectional transport for broadcast AES.

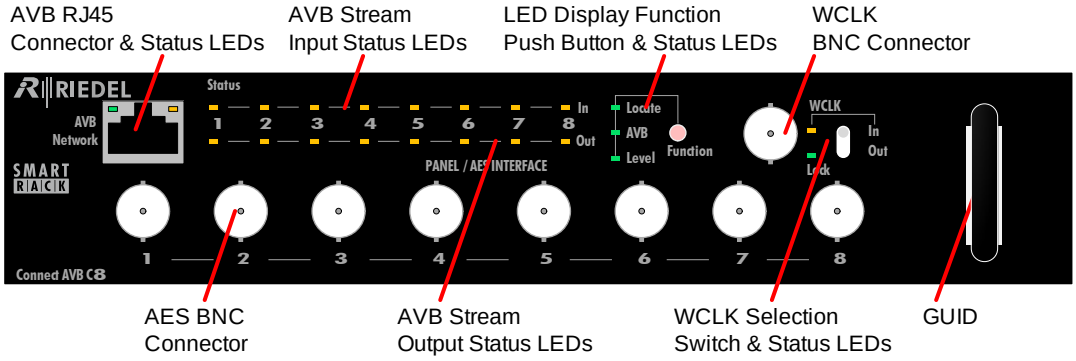


Figure 144: Connect AVB C8 (front view)

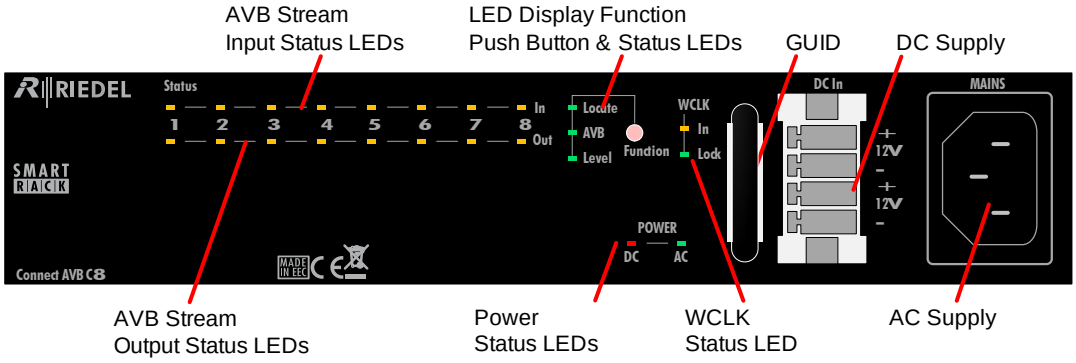


Figure 145: Connect AVB C8 (rear view)

The unit has a switchable WordClock input or output.

The GUID of the unit is printed on the front side and rear side behind the handles. This makes it possible to identify the unit without power.

Pressing the "Function" push button toggles the Status LED content between *AVB Stream/Port Status* mode and *Signal Level* mode.
Pressing the button for more than 2 seconds displays the *Locate / IO Setup* mode for 5 seconds. AVB Controllers like the Riedel AVB Manager use this function to identify a device. In AVB Manager a device is flashing while Locate is active.
The Locate function works in both directions. When the Locate function of AVB Manager is triggered, all Input/Output status LEDs are flashing for 5 seconds.

The unit provides two power supply connections (230 VAC / 12 VDC) which can be used for redundancy.

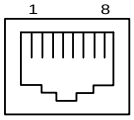
AVB Status LEDs

LED	off	green	yellow	red
AVB Network connector				
left LED	No connection	Ethernet connection ok	--	--
right LED	No traffic	--	flashing while transmitting	--
STATUS LED (In / Out 1 ... 8)				
In function setting **Locate**: I/O Setup indication (temporary display for 5 sec.)	At non active Ports	Flashing at active Ports	--	--
In function setting **AVB**: Indicates the status of streams and ports	Inactive state	Port is configured to send and receive a stream.		Port is set up to stream audio, but an error has occurred. Errors are: 1. Stream isn't flowing 2. Invalid format
		Stream is active and valid.	On Input: No sender (Talker) active. On Output: No receiver (Listener).	
In function setting **Level**: Signal present and Clip indication for audio	--	Signal Level >-50 dBFS (200 ms hold time)	--	Signal Level >-1 dBFS (200 ms hold time)
WCLK				
In	No Input Signal	Valid Input Signal	[In] is *not* selected as source and carries an invalid Input Signal.	[In] is selected as source and carries an invalid Input Signal.
Lock	--	Unit locked	--	Sync Error
Power				
DC / AC	No Supply Voltage	Supply Voltage ok	--	Supply Voltage out of range

AVB Audio Ports Status Table

	LED Color	Talker / Listener Exists	AES Input Data Valid	Talker / Listener Subscribed	Talker / Listener Flowing
State 1	off	No	--	--	--
State 2	red	Yes	No	--	--
State 3	red	Yes	Yes	Yes	No
State 4	yellow	Yes	Yes	No	--
State 5	green	Yes	Yes	Yes	Yes
Logic		Yes = at least one Talker/Listener exists.	--	Yes = at least one Talker/Listener subscribed.	Yes = at least one subscribed Talker/ Listener; stream is flowing No = subscribed stream indicates an error.

RJ45 AVB C8



Pin	Network
1	Tx/Rx_A +
2	Tx/Rx_A -
3	Tx/Rx_B +
4	Tx/Rx_C +
5	Tx/Rx_C -
6	Tx/Rx_B -
7	Tx/Rx_D +
8	Tx/Rx_D -

Figure 146: Connect AVB C8 RJ45 pinout

BNC AVB C8

Pin	WCLK / Panel/AES
1	Rx / Tx +
2	Rx / Tx -

Word Clock In-/Output: TTL / 75 Ω
Sample Rate: 48 kHz ±10%

Figure 147: Connect AVB C8 BNC pinout

5.1.6 Connect AVB A8

The Connect AVB A8 convert's eight analog audio signals to AVB streams and vice versa. Built in a compact 9.5”/1RU housing the device provides eight RJ45 ports to connect up to eight analog signals to the matrix via IP-based LANs.

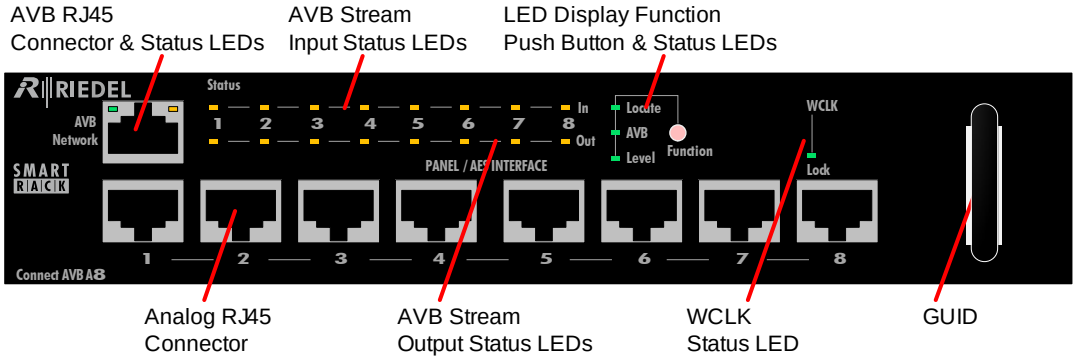


Figure 148: Connect AVB A8 (front view)

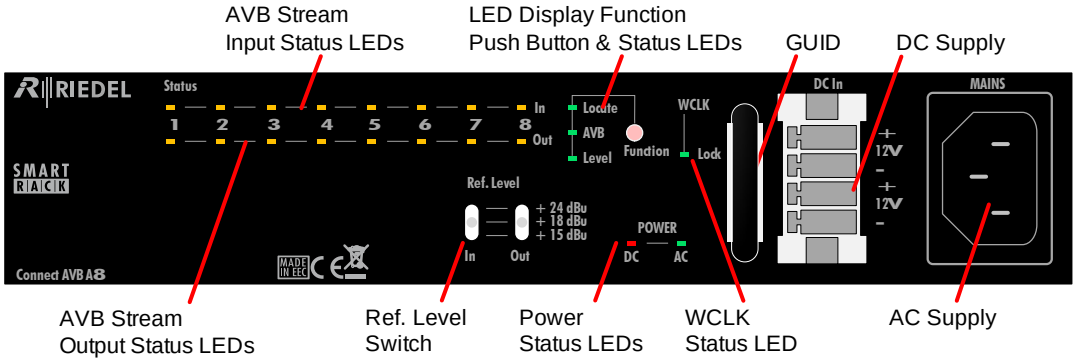


Figure 149: Connect AVB A8 (rear view)

The GUID of the unit is printed on the front side and rear side behind the handles. This makes it possible to identify the unit without power.

Pressing the "Function" push button toggles the Status LED content between *AVB Stream/Port Status* mode and *Signal Level* mode.
Pressing the button for more than 2 seconds displays the *Locate / IO Setup* mode for 5 seconds. AVB Controllers like the Riedel AVB Manager use this function to identify a device. In AVB Manager a device is flashing while Locate is active.
The Locate function works in both directions. When the Locate function of AVB Manager is triggered, all Input/Output status LEDs are flashing for 5 seconds.

The input and output levels can be set independently with the "Ref.Level" switches to +15, +18 or +24 dBu.

The unit provides two power supply connections (230 VAC / 12 VDC) which can be used for redundancy.

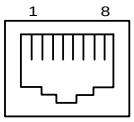
AVB Status LEDs

LED	off	green	yellow	red
AVB Network connector				
left LED	No connection	Ethernet connection ok	--	--
right LED	No traffic	--	flashing while transmitting	--
STATUS LED (In / Out 1 ... 8)				
In function setting **Locate**: I/O Setup indication (temporary display for 5 sec.)	At non active Ports	Flashing at active Ports	--	--
In function setting **AVB**: Indicates the status of streams and ports	Inactive state	Port is configured to send and receive a stream.		Port is set up to stream audio, but an error has occurred. Errors are: 1. Stream isn't flowing 2. Invalid format
		Stream is active and valid.	On Input: No sender (Talker) active. On Output: No receiver (Listener).	
In function setting **Level**: Signal present and Clip indication for audio	--	Signal Level >-50 dBFS (200 ms hold time)	--	Signal Level >-1 dBFS (200 ms hold time)
WCLK				
Lock	--	Unit locked	--	Sync Error
Power				
DC / AC	No Supply Voltage	Supply Voltage ok	--	Supply Voltage out of range

AVB Audio Ports Status Table

	LED Color	Talker / Listener Exists	AES Input Data Valid	Talker / Listener Subscribed	Talker / Listener Flowing
State 1	off	No	--	--	--
State 2	red	Yes	No	--	--
State 3	red	Yes	Yes	Yes	No
State 4	yellow	Yes	Yes	No	--
State 5	green	Yes	Yes	Yes	Yes
Logic		Yes = at least one Talker/Listener exists.	--	Yes = at least one Talker/Listener subscribed.	Yes = at least one subscribed Talker/ Listener; stream is flowing No = subscribed stream indicates an error.

RJ45 AVB A8



Pin	AUDIO IN/OUT
1	not connected
2	not connected
3	not connected
4	Audio In +
5	Audio In -
6	not connected
7	Audio Out +
8	Audio Out -

Zin= ca. 100 kΩ
Zout= < 600 Ω
f = 30 Hz ... 20 kHz

Figure 150: Connect AVB A8 RJ45 pinout

5.2 GPI Interfacing

5.2.1 RIF-1032

The RIF-1032 offers a solution of interfacing to external equipment. The module will be daisy chained like an expansion-panel to a RCP/ECP-10xx or RCP/ECP-2xxx panel. Up to 6 RIF-1032 can be connected in a daisy chain to a DIF-1000 or RCP panel. 32 potential free GPI Inputs and 32 GPI Outputs as known from the GPI-016 G2 card are provided.

Figure 151: RIF-1032 (front view)

The green LED indicates the power supply.

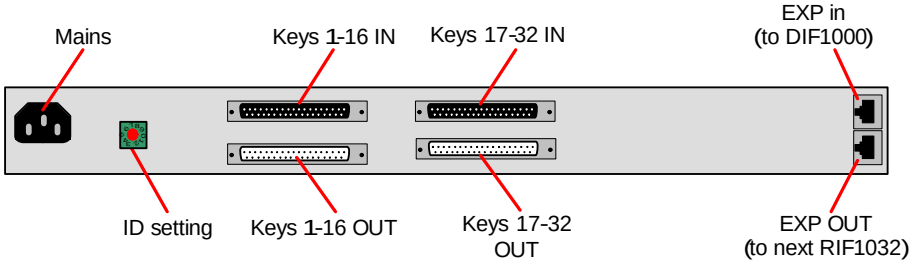


Figure 152: RIF-1032 (rear view)

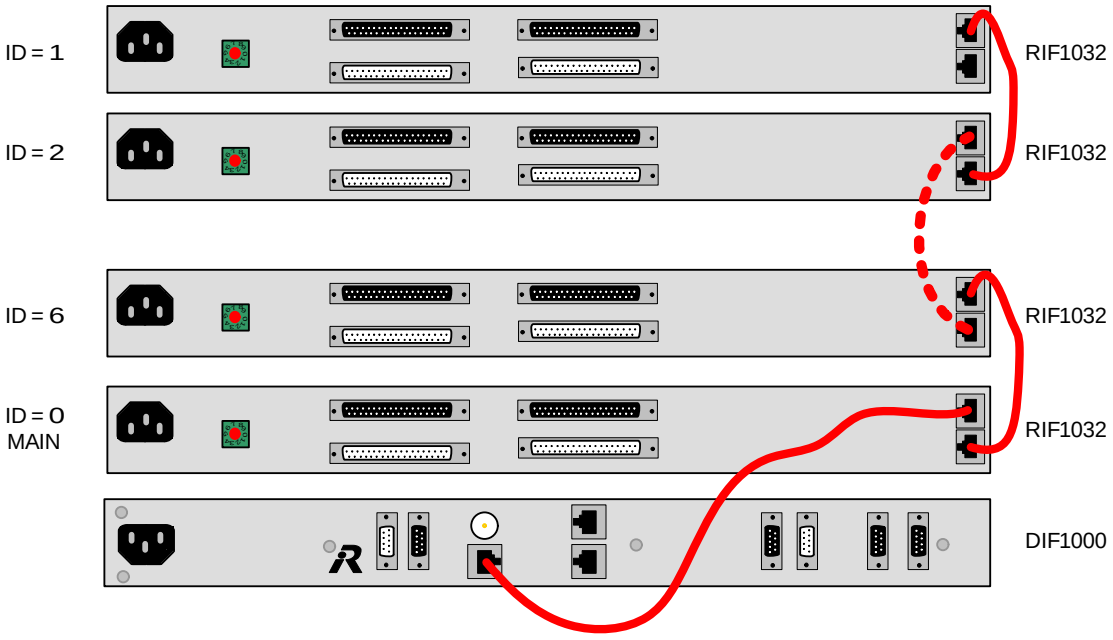
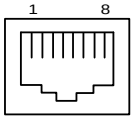


Figure 153: RIF-1032 setup

ID setting must be unique and set to the corresponding address in the director configuration file.
Use 1:1 CAT5 FTP cables for all connections. The cable MUST be shielded.

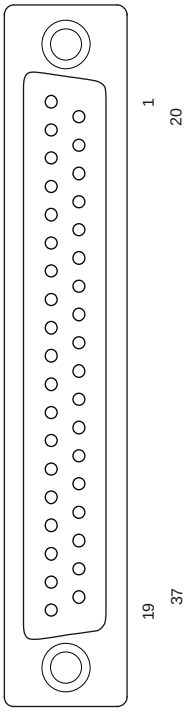
RJ45 Expansion



Pin	Expansion IN	Expansion OUT
1	Data +	Data +
2	Data -	Data -
3	GND	GND
4	+5 V in	+5 V out
5	GND	GND
6	+5 V in	+5 V out
7	GND	GND
8	+5 V in	+5 V out
Case	Chassis GND	Chassis GND

Figure 154: RIF-1032 EXP RJ45 pinout

Sub-D 37 female Inputs

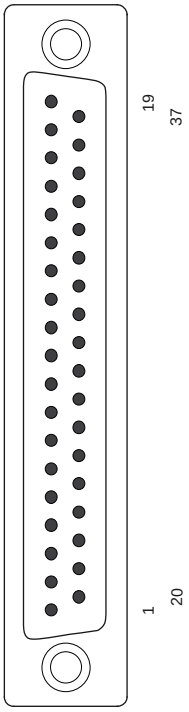


Pin	Signal	Pin	Signal
1	In 1 +	20	In 1 -
2	In 2 +	21	In 2 -
3	In 3 +	22	In 3 -
4	In 4 +	23	In 4 -
5	In 5 +	24	In 5 -
6	In 6 +	25	In 6 -
7	In 7 +	26	In 7 -
8	In 8 +	27	In 8 -
9	In 9 +	28	In 9 -
10	In 10 +	29	In 10 -
11	In 11 +	30	In 11 -
12	In 12 +	31	In 12 -
13	In 13 +	32	In 13 -
14	In 14 +	33	In 14 -
15	In 15 +	34	In 15 -
16	In 16 +	35	In 16 -
17	+5 V out	36	GND
18	+5 V out	37	GND
19	--		

Figure 155: RIF-1032 Sub-D 37 female Inputs

- Each +5V output supplies 300 mA maximum (protected by self healing fuses).
- The GPI input voltage range is +5 ...+48 VDC (internal optocoupler).
- The polarity of the input is important. The higher potential must be connected to “+” of each channel.

Sub-D 37 male Outputs



Pin	Signal	Pin	Signal
1	1 OUT A	20	1 OUT B
2	2 OUT A	21	2 OUT B
3	3 OUT A	22	3 OUT B
4	4 OUT A	23	4 OUT B
5	5 OUT A	24	5 OUT B
6	6 OUT A	25	6 OUT B
7	7 OUT A	26	7 OUT B
8	8 OUT A	27	8 OUT B
9	9 OUT A	28	9 OUT B
10	10 OUT A	29	10 OUT B
11	11 OUT A	30	11 OUT B
12	12 OUT A	31	12 OUT B
13	13 OUT A	32	13 OUT B
14	14 OUT A	33	14 OUT B
15	15 OUT A	34	15 OUT B
16	16 OUT A	35	16 OUT B
17	--	36	--
18	--	37	--
19	--		

Figure 156: RIF-1032 Sub-D 37 Outputs

- The GPI output contact rating is 140 mA, 48 VDC maximum (protected by self healing fuse), MOSFET technology.
- The polarity of the output has no preference.

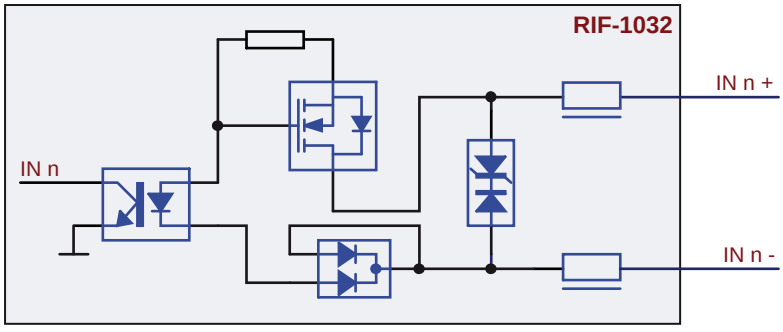


Figure 157: RIF-1032 IN (circuit)

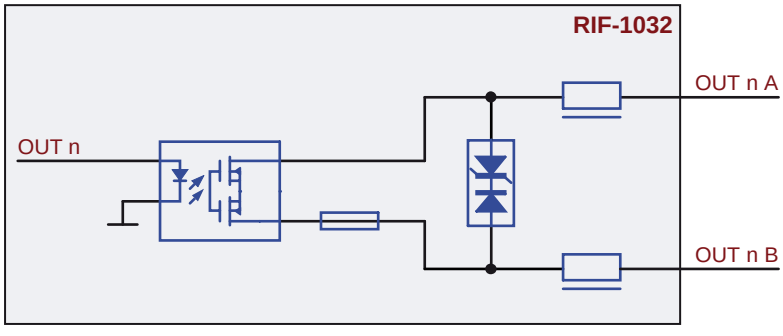


Figure 158: RIF-1032 OUT (circuit)

5.3 Panel Accessories

5.3.1 PMX-Panel Multiplexer

The PMX-Series panel multiplexers are used to remote up to four (PMX-2004) respectively eight (PMX-2008) intercom panels from the intercom matrix using a fiber link. The system allows operation of a group of intercom panels over a distance of up to 2,000 m (SM), in a cost-effective way while reducing setup time to a minimum.
Two different types are available: PMX-2004 multiplexes 4 panel signals to one dual fiber, PMX-2008 multiplexes 8 panel signals to two dual fiber lines.

Figure 159: PMX-2004 (front view)

LED	Function	Description
yellow	Mainframe	The PMX is located at the matrix
yellow	Panel	The PMX is located at the panel
blue	Signal detect	Fiber connection established (also without any port connections)
red	Links Error	No link established (e.g. Client card not configured, no connection to client card)

The PMX - panel multiplexer is available with different LC - fiber modules:

FOM-Type	Mode	Nom. Distance	Max. Distance	Fiber	Wavelength	Min. Pout	Min. opt. Budget
PMX-MM-1310-155Mbit/s	Multi Mode	500 m	up to 2 km	50/125 µm	1310 nm	-20 dBm	12 dB
PMX-SM-1310-155Mbit/s	Single Mode	2 km	up to 10 km	9/125 µm	1310 nm	-15 dBm	19 dB

Use crossed duplex fiber lines for the connection of two PMX units.
Do not use the FOM for Artist CPU 128 F G2 because of different bit rates.

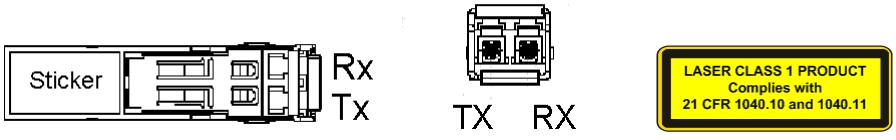


Figure 160: FOM (top view / front view)

The PMX has a switch at the rear side where the position of the multiplexer has to be specified. The multiplexer can be placed next to the mainframe (switch position “Matrix”) or at the panel side (switch position “panel”).

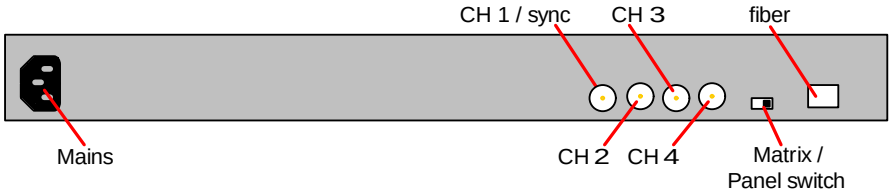


Figure 161: PMX-2004 (rear view)

At least channel 1 (CH 1) has to be used for synchronization purpose.

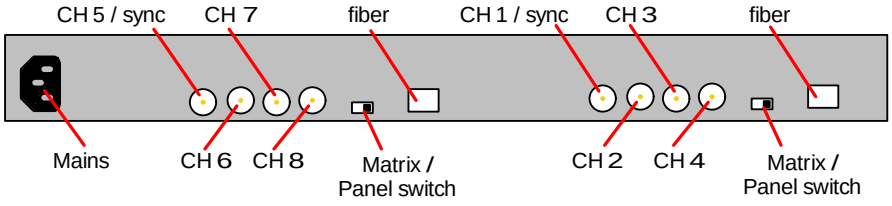


Figure 162: PMX-2008 (rear view)

At least channel 1 and channel 5 (CH 1 + CH 5) have to be used for synchronization purpose.

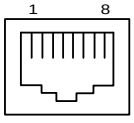
5.3.2 FBI-Fiber Interface Adapter

The Fiber Interface Adapter converts a panel port from CAT5 to fiber in a bidirectional way providing long distance operation of control panels. As the unit offers both connectors, for the matrix and for the panel, it can be inserted on either side. The interface may also be used for the bidirectional transmission of an AES3 signal. Distances up to 2 km (MM) or 30 km (SM) can be realized using duplex multimode or singlemode fiber. The device needs to be powered via external power supply (PS-FBI/CIA/IPx2/DCA-1000).

Figure 163: FBI

The green LED indicates correct power. The yellow LED indicates an established link.
Using the FBI next to the mainframe, connect the Frame to “CLIENT” and the power supply to “PANEL”.
Using the FBI next to a panel, connect the panel to “PANEL” and the power supply to “CLIENT”.

RJ45 Client/Panel



Pin	Client	Panel
1	TxD +	RxD +
2	TxD -	RxD -
3	RxD +	TxD +
4	+5 V	+5 V
5	+5 V	+5 V
6	RxD -	TxD -
7	GND	GND
8	GND	GND
Case		

Figure 164: FBI RJ45 pinout

The FBI is available with following SC fiber modules:

FOM-Type	Max. Distance	Fiber	Wavelength	Min. Pout	Max. Loss
Multi Mode	2 km	50/125 µm	1310 nm	-14 dBm	11 dB
Single Mode	30 km	9/125 µm	1310 nm	-8 dBm	19 dB

Crossed duplex fiber lines need to be used for the connection between two FBI’s.

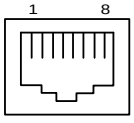
5.3.3 CIA-Coax Interface Adapter

The Coax Interface Adapter converts a panel port from CAT5 to 75 Ω Coax and vice versa. Since control panels provide both CAT5 and coax interfaces for connection to the matrix, CIA's can be used to adapt a matrix port to the existing infrastructure, especially useful for OB-vans and mobile applications. Distances up to 500 m (1,800 ft.) can be realized using 0.8/4.9 video cable. The device needs to be powered via external power supply (PS-FBI/CIA/IPx2/DCA-1000).

Figure 165: CIA

The green LED indicates correct power.
Using the CIA next to the mainframe, connect the frame to "CLIENT", and the power supply to "PANEL".
Using the CIA next to a panel, connect the panel to "PANEL", and the power supply to "CLIENT"

RJ45 Client/Panel



Pin	Client	Panel
1	TxD +	RxD +
2	TxD -	RxD -
3	RxD +	TxD +
4	+5 V	+5 V
5	+5 V	+5 V
6	RxD -	TxD -
7	GND	GND
8	GND	GND
Case		

Figure 166: CIA RJ45 pinout

5.3.4 DCA-1000

The Riedel DCA-1000 expands the possible length of coax links. The standard maximum distance between a control panel and a matrix mainframe over a single coax cable is up to 300 meters.
The new Riedel DCA-1000 is a tiny converter box that enables panels to be connected to matrix mainframes via coax over a distance of up to 1,000 meters (3,300 ft.). The device needs to be powered via external power supply (PS-FBI/CIA/IPx2/DCA-1000).

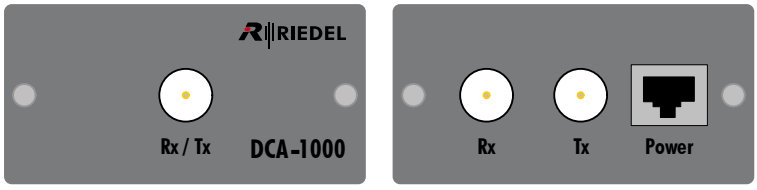


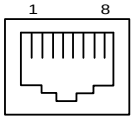
Figure 167: DCA-1000

BNC DCA-1000

Pin	Signal
1	TxRx Data +
2	TxRx Data -

Figure 168: DCA-1000 BNC pinout

RJ45 DCA-1000



Pin	Power
1	
2	
3	
4	+5 V
5	+5 V
6	
7	GND
8	GND
Case	

Figure 169: DCA-1000 RJ45 pinout

5.4 Matrix Accessories

5.4.1 XLR Patchfield

The XLR patchfield converts RJ45 (from analogue or digital cards) into standard XLR3 pole jackets.

Figure 170: XLR Patchfeld (front view)

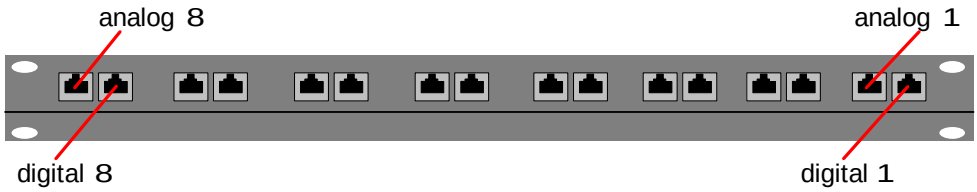


Figure 171: XLR Patchfeld (rear view)

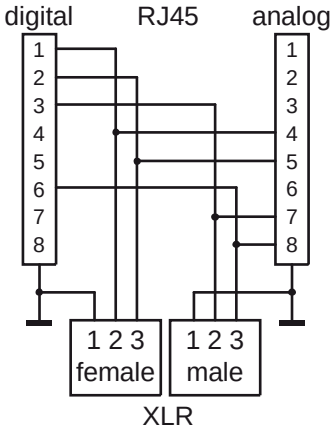


Figure 172: XLR Patchfield circuit

5.5 Technical Data - Accessories

All Accessories

AC Voltage	100 ... 240 VAC
Frequency	47 ... 63 Hz
Operating Temperature	-5°C ... +55°C

Network Interfacing

Type	Dimension	Weight	Power consumption
Connect IPx2	200 x 105 x 45 mm	600 g	11 VA *1
Connect IPx8	19" x 1 HE x 170 mm	2310 g	20 VA
Connect AVB X8	202 x 40 x 263 mm	880 g	10 VA *2
Connect AVB C8	202 x 40 x 263 mm	880 g	10 VA *2

GPI Interfacing

Type	Dimension	Weight	Power consumption
RIF-1032	19" x 1 HE x 160 mm	1600 g	10 VA

Panel Accessories

Type	Dimension	Weight	Power consumption
PMX-2004	19" x 1 HE x 160 mm	1950 g	10 VA
PMX-2008	19" x 1 HE x 160 mm	2100 g	15 VA
FBI	110 x 55 x 25 mm	150 g	4 VA *1
CIA	110 x 55 x 25 mm	150 g	0.5 VA *1
DCA-1000	54 x 80 x 42 mm	250 g	5 VA *1

Matrix Accessories

Type	Dimension	Weight	Power consumption
XLR Patchfeld	19" x 1 HE x 90 mm	1070 g	--

*1 supplied via external power supply (5.5 V / 3 A)
*2 additional supply via external power supply possible (10 ... 25 VDC / 2 A)

6 Appendix

6.1 Cables

Cable	Connector	Type	Cable length
CAT5	RJ 45	FTP (4x2 AWG 24)	Up to 300 m (Matrix - Panel) 1xxx -Series: 10 m (Panel - Expansion) 2xxx/3xxx - Series: 30 cm (Panel - Expansion)
Coax	BNC 75 Ω	RG 59 - 20AWG 75 Ω /0,8 / 4,9 DZ	Up to 350 m
Coax	BNC 75 Ω	75 Ω / 0,6 / 3,7	Up to 300 m
Coax	BNC 75 Ω	RG59 / digital / 0.8/3.7	Up to 350 m
Fiber	LC or SC	9/125 µm	PMX - up to 10 km FBI - up to 30 km
Fiber	LC or SC	50/125 µm	PMX - up to 550 m FBI - up to 550 m

All cable length can vary with the number of connectors, patchfields and attenuation on the line.
All panels can be connected with CAT5 cable OR Coax cable (DCP-5x08 only with CAT5).

Caution

Crossed duplex fiber lines need to be used for al fiber connections.
1:1 CAT5 cables need to be used for all CAT5 connections (except Ethernet from the CPU when connected directly to a PC). The cables MUST be shielded.

6.2 Glossary

AVB	Audio Video Bridging
Bay	Position of CPU-, Client- and GPI Card in the Mainframe.
DHCP	Dynamic Host Configuration Protocol. The IP-Address, Subnet Mask and DNS-Address of network devices can be automatically assigned by the DHSC-Server.
DNS	DNS (Domain Name System) allows identifying a network user by a unique name. The associated IP-Address is stored in a DNS-Server.
DSP	Digital Signal Processor. A fast central processing unit especially for digital audio applications.
Ethernet	10BaseT Ethernet Network Interface of the Mainframe, 10Mbit half duplex.
GPI	General Purpose Interface (Inputs and Outputs). An interface for electrical signals (contact information, e.g. Relays).
GUID	Globally Unique Identifier is a unique reference number used as an identifier.
ISDN	Integrated Services Digital Network. Digital Telecommunication Standard.
Matrix	Digital Processing Platform for the distribution of analog audio, digital audio and Ethernet data signals.
Net	The complete local communication system, which can consist of one or more Matrix platforms (connected via fiber).
Node	A single Matrix.
Panel	Communication device for audio transmission and to trigger events in the System. Panels will be connected to digital Client Cards.
PC	Personal Computer
Port	Analog or digital interface to the Matrix to connect i.e. Panels or 4-Wires.
SIP	SIP (Session Initiation Protocol) is a Network protocol to connect, control and disconnect a communication session between one or more subscriber (common protocol by IP phones).
TCP/IP	Transmission Control Protocol/Internet Protocol. Standard Network Protocol for Data transmission, i.e. for the Internet.
TCP	Transmission Control Protocol. Reliable, connection oriented, packet-switched used in PC networks. Part of the basic internet protocols.
UDP	User Datagram Protocol. Standard Network Protocol for Data transmission, i.e. for the Internet. UDP offers a connectionless, non-reliable data transmission. There is no guaranty that a sent packet will be received or packets will be received in the same order of transmitting. Applications using UDP need to be robust against loss or unsorted packets or need to have corrections implemented.

6.3 Maintenance Recommendations

Following points are strongly recommended to prevent malfunction of the system.

General

- Front plates of matrices must be closed.
- Unloaded bays of matrices must be covered by blind plates.
- Check if all fans are running (fault will be shown by blinking LED and alarm on the dry contacts of the mainframe).
- Check Director screen log and Alarm Window for unexpected warnings and errors.
- A permanently connected PC running the Director Configuration Software set to “Full Log” and 20 files of 10MB each is recommended.
- Set “Autosave” in the Director software.

Warning		
		**Do not look into the ends of any optical fiber if the other end is connected.**

Daily

- See if power is attached to both power supply units.
- Check ASM module on valid signal (green LED).

Weekly

None

Monthly

- Check fan dust filters and exchange them if necessary.
- Set System time (by Director to PC time).

Yearly

None

Other

- Every two years, all batteries should be checked for voltage and be replaced if necessary.
- Every three years, the fan filters should be exchanged due to an aging process even if they are not dusty or if the system was not in operation.

6.4 Service

If you have any further questions, we offer comprehensive customer service options for this product including:

- Telephone Service
- Email Service
- Skype Service
- Fax Service
- Configuration Support
- Trainings
- Repair

Your primary point of contact for any service issues is your local dealer.
In addition, Riedel Customer Service in Wuppertal, Germany is also available to assist you.

Telephone: +49 (0) 202 292 9400
(Monday - Friday, 8am – 5pm, Central European Time)

Fax: +49 (0) 202 292 9419

Skype: riedel.communications.service

Or use the contact form on our website:
www.riedel.net > Company > Riedel Communications > Contact > Wuppertal (Headquarters)

For repairs, please contact your local dealer. Your dealer will be able to help process your repair as fast as possible and/or arrange for the delivery of spare parts.

The address for repairs sent directly to Riedel Communications GmbH is:

Riedel Communications GmbH & Co. KG
- Repairs -
Uellendahler Str. 353
D-42109 Wuppertal
Germany

Please add a completed repair form to all your repairs.
The form can be found at the Riedel website:
www.riedel.net > Company > Services > Support > Contact

Notes

Notes