Hardware user's manual

This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

1 Cautions

Read Instruction: Read and understand all of the safety and operating instructions before using this equipment.

Retain Instructions: The safety instructions should be kept for future reference.

Follow Warnings: Follow all warnings and instructions marked on the equipment or in the user manual.

Avoid Attachments: Do not use tools or attachments that are not recommended by KISS-BOX Company because they may be hazardous.

Power Source: This equipment should only be operated from the power source indicated on the product.

This equipment is intended to be used with a main power system with a Neutral conductor.

The third (Earth) pin is a safety feature, do not attempt to bypass or disable it.

Never install or use electrical equipment in a wet location or during a lightning storm.

Servicing: Refer all servicing to qualified service personnel.

There are no user-serviceable parts inside.

To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

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3 What's the Kiss-Box?

The Kiss-Box is an embedded networked computer. It uses the Ethernet network to exchange data with other computers, which can be other Kiss-Boxes or an another PC compatible computer, Mac computers, etc…

Compared to other solutions, Ethernet has many advantages:

- Available on most computer platforms (Windows, Mac OS, Linux, etc…)
- No specific driver needed in most cases
- No limit in network length and node connections
- Very high bandwidth
- Peer to peer capability

The Kiss-Box is built around a powerful RISC processor.

Thanks to its specific network coprocessor, the Kiss-Box handles most network tasks with only a small overhead for the main processor. This permits the Kiss-Box to have incredible performances: for example, the RTP-MIDI firmware has a latency of less than 800 microseconds.(worst case scenario)..

That means that a MIDI message that comes from the network is sent to the MIDI connector in less than 800 microseconds (a PC or Mac takes typically between 2 and 4 milliseconds for the same job).

The same processor board is used in all available Kiss-Boxes.

The difference between the various models is the type of extension board:

- Dual MIDI
- DMX/ArtNet
- I/O 3 or 8 slots
- LTC/MTC
- etc…

Of course, the processor runs a different firmware for each of these extension boards. The firmware is updated very simply and quickly directly from the editor via the network - that remains in the Box memory, whatever the firmware used.

Another feature of the Kiss-Box range is the P.O.E. standard compliance (P.O.E. stands for Power Over Ethernet). This standard allows using spare conductors or data conductors in network cable to carry the required power supply for an end device.

Kiss-Boxes are installed and configured using the Editor software. This tool is also used to monitor the status of a Kiss-Box, even if the box is being controlled by other software, running on a different machine.

4 Power Over Ethernet (P.O.E.)

4.1.1 Introduction

Rather than using a dedicated power supply connector, the Kiss-Boxes receive their operating power trough the RJ45 network connector.

This system is called P.O.E. (**P**ower **O**ver **E**thernet).

Power Over Ethernet technology (defined in IEEE802.3af specification) allows Ethernet devices such as the Kiss-Box, IP telephones, wireless LAN Access Points, Camera and many other appliances to receive power as well as data over existing LAN cabling, without needing to modify the existing Ethernet infrastructure.

Power is inserted in the network by means of a P.O.E. power-supply called a Midspan or it's integrated directly into a device such as a switcher or router and called an Endspan.

Midspan or Endspan can be found in a variety of formats, they can be single or multi-port, stand-alone, DIN-rail or 19" rackmount

For more information on P.O.E. you can surf to http://www.poweroverethernet.com

4.1.2 Features

- Only one set of wires to bring to the Kiss-Box simplifies installation and saves space and cost.
- There is no need to pay for an expensive electrician, or delay your installation to meet the electrician's schedule - saves time and money.
- The Kiss-Box can be easily moved, to wherever you can lay a LAN cable - minimal disruption to the workplace.
- Safer - no mains voltages anywhere.
- A UPS can guarantee power to multiple Kiss-Boxes, located at different position during mains power failure..
- Kiss-Box can be shut down or reset remotely - so no need for a power switch.
- P.O.E. use lower voltage (48 Volts) > safe use
- P.O.E. support hot swap (Insert and remove)
- Midspan or Endspan. Both use a signature detection before turning on the power in the cable, which means no P.O.E. device can be destroyed by inadvertaned connections

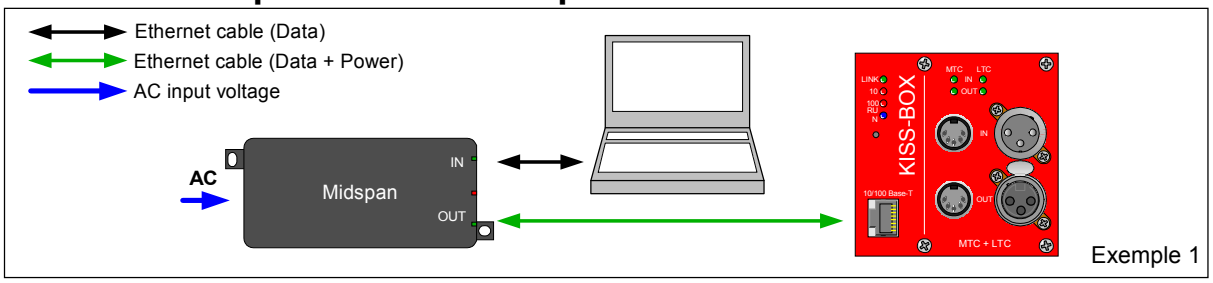
Please note that connecting a Kiss-Box directly to a simple (non P.O.E.) switch/hub/router will simply not work, since these devices do not provide the necessary power over the network cable.

KISS-BOX provides only Midspan and an Endspan is optional:

- the standard delivery is a Midspan from Pihong, which can power only one Kiss-Box.
- The optional switched Endspan SW4POE contains a 4-way switch,one uplink and 4 Endspans that can power up to 4 Kiss-Boxes.

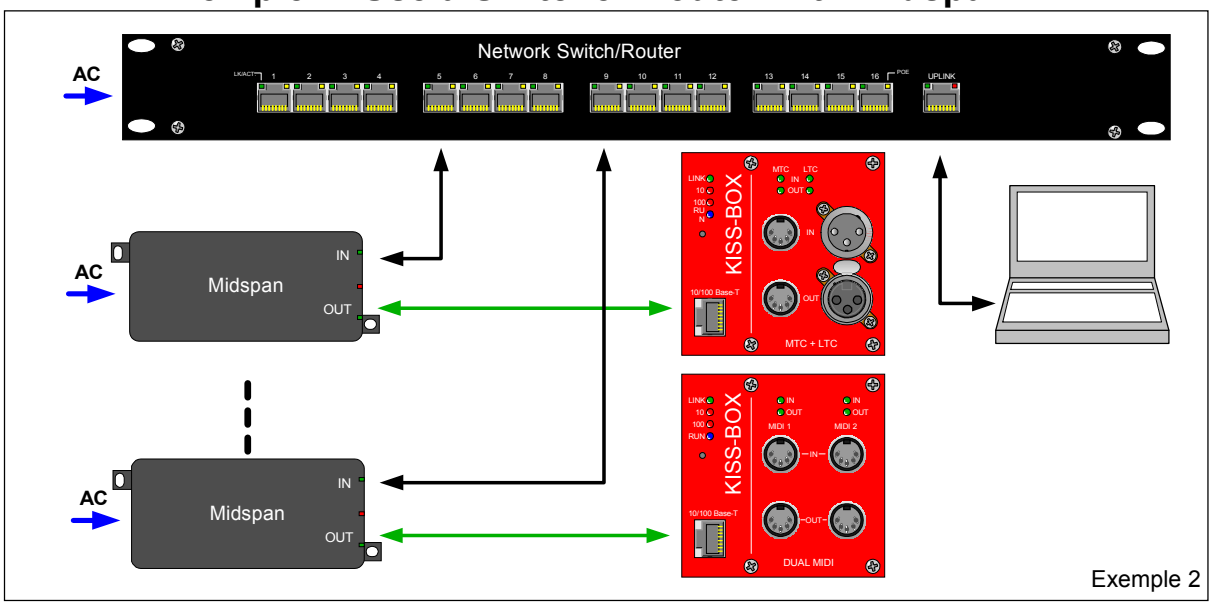
Any other IEEE802.3af compliant Midspan or Endspan can also be used.

4.1.3 Exemple 1: Use a Midspan



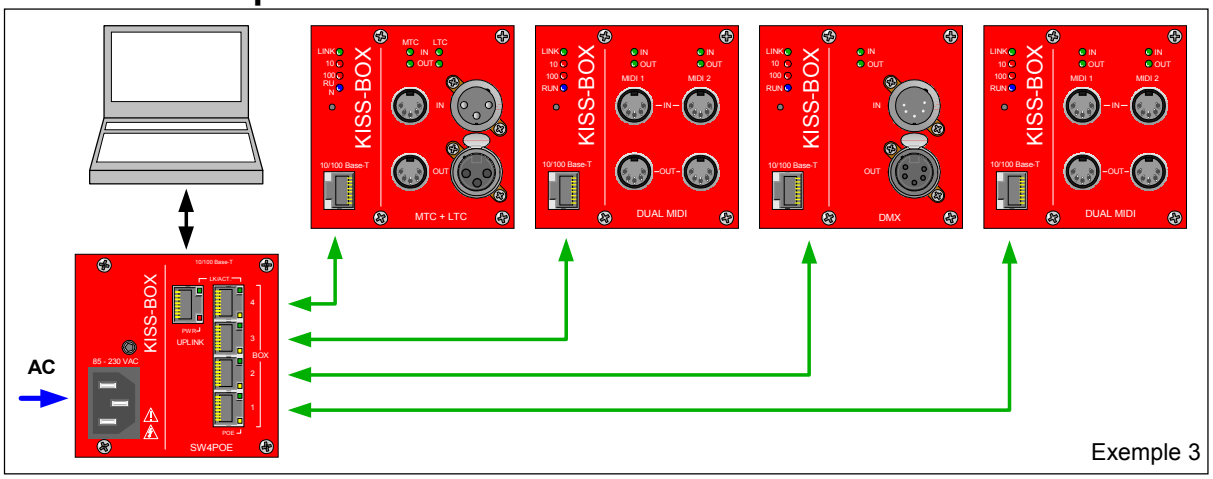
Exemple 1

4.1.4 Exemple 2: Use a Switcher/Router with Midspan



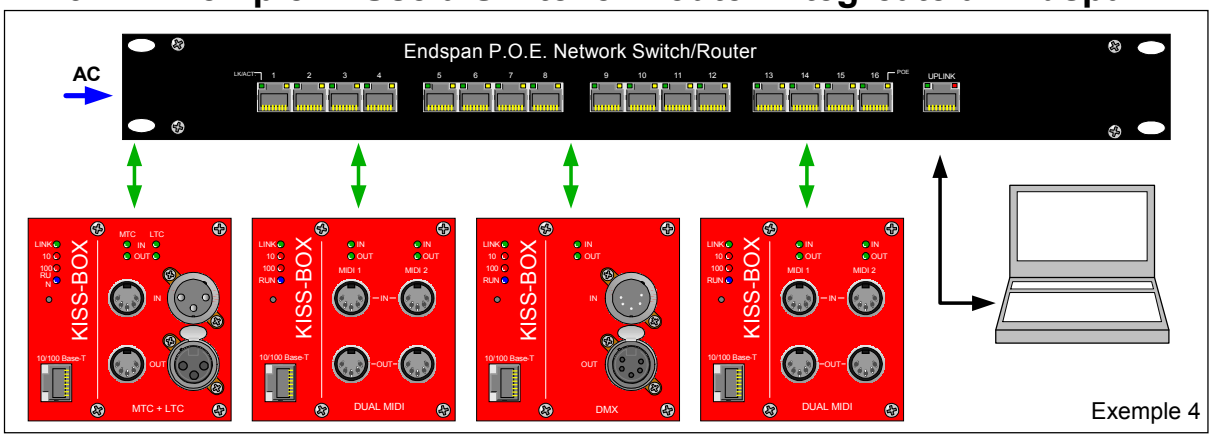
Exemple 2

4.1.5 Exemple 3: Use the SW4POE



Exemple 3

4.1.6 Exemple 4: Use a Switcher/Router integreate a Endspan



Exemple 4

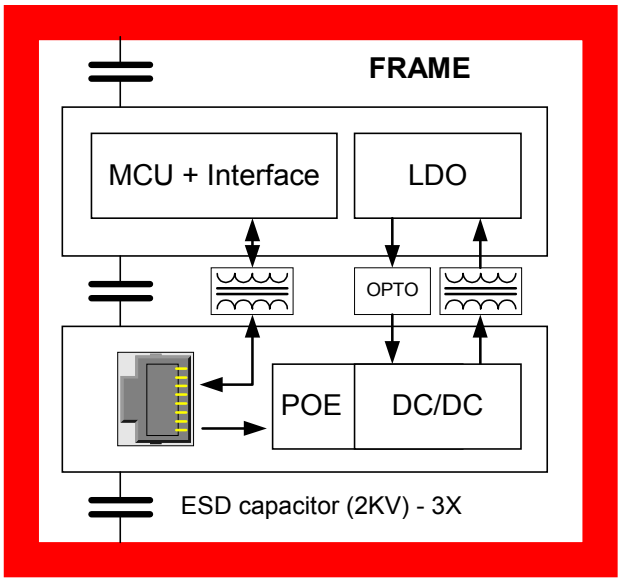
4.1.7 Why choose electrical isolation between Ethernet and Applications?

IEEE802.3af offers:

- Environment A: Ports not isolated from each other.
- Environment B: 1,5KV transient isolation from chassis and port-to-port.

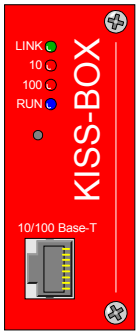
KISS-BOX uses only the Environment B, offering many advantages for the user

- No ground loop
- Can't be destroyed by a differential voltage on different Ground/Earth
- Safer - if connected device present default isolation
- Better noise immunity



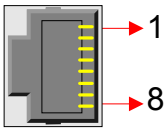
5 Box

5.1.1 Description of front panel:



- *LINK* - Green LED: Light On if a link with a server is established
- *10* - Red LED: Flash On (Off for Version 1) to indicate LAN activity with a network at 10Mbits/S
- *100* - Red LED: Flash On (Off for Version 1) to indicate LAN activity with a network at 100Mbits/S
- *RUN* - Blue LED:
  - Off > the BOX is not ready > BOX Resetting
  - Blink 50% - each second > BOX running
  - Blink 10% - each second > BOX malfunction or protocol error
  - Fast blinking > Firmware uploader Mode
- Push button (Press the button behind the small hole in Kiss-Box front panel, using for example a pen tip)
  - At the power up and maximum 2 secondes > Firmware uploader mode
  - Less as 4 seconds > Reset
  - More as 4 secondes > Out of factory reset
- 10/100 Base-T connector – Type RJ45

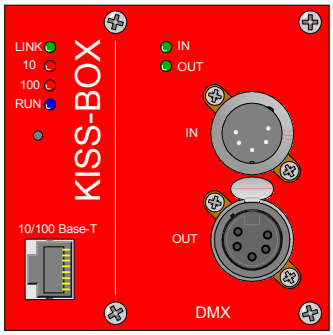
Pin	Function
1	TX+
2	TX-
3	RX-
4, 5, 7 & 8	P.O.E.
6	RX+



5.1.2 Specifications:

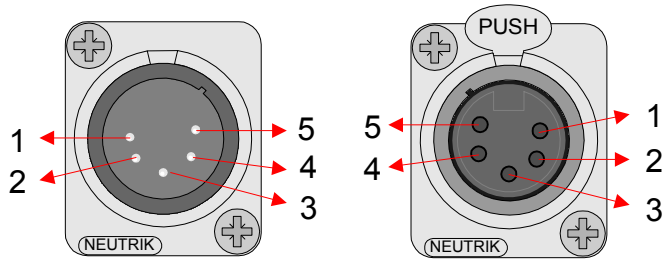
- 10-100 Base-T
- Auto-MDIX (auto crossing cable)
- Full compliant with IEEE802;3af
  - Class: 2
  - Environment B: 1,5KV transient isolation from chassis and port-to-port
- Size square BOX: 86 X 86 X 56mm (W x H x D - excludes connectors.)
- Size wide BOX: 172 X 86 X 56mm (W x H x D - excludes connectors.)
- Weight: 400 to 600 gr.
- Operating temperature: -20°C to +70°C
- Storage temperature: -40°C to +85°C
- Operating humidity: 5 to 95% RH, non-condensing
- Listings: UL, RoHS
- Compliances: CE, FCC Class A

5.2 DMX-512 transceivers Box

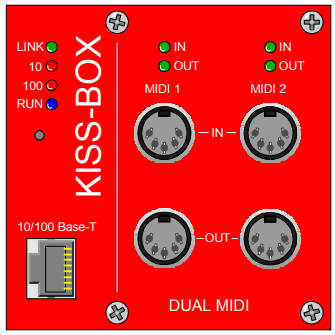


- Full 512 channels In and Out support
- ARTNET compliant or TCP-UDP/IP transport
- Peer-to-peer function (under Artnet mode)
- Merge, Unmerge, Freeze, Continue & Clear functions (under TCP/IP)
- Break time & Mark After Break programmable
- LED activity for DMX input and output
- 1,5KV Transient isolation

Pin	Function
1	Ground
2	Signal -
3	Signal +
4	not used
5	not used

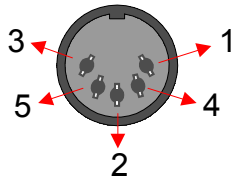


5.3 Dual MIDI transceivers Box

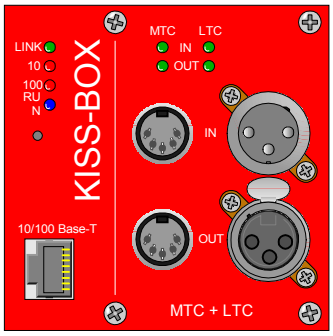


- RTP-MIDI compliant
- Directly compatible with MAC OS X (native)
- WIN driver available from KISS-BOX, supporting up to 16 nodes
- Allows peer to peer between BOX without computer
- LED activity for each MIDI input and output
- 1,5KV Transient isolation

Pin	Function
1	Not used
2	Ground
3	Not used
4	Data +
5	Data -

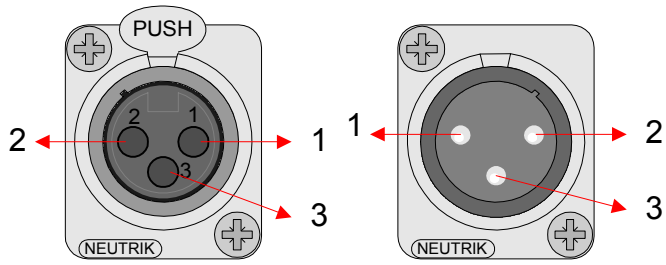


5.4 LTC + MTC transceivers Box

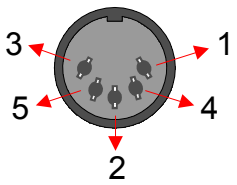


- RTP-MIDI compliant
- Directly compatible with MAC OS X (native)
- WIN driver available from KISS-BOX, supporting up to 16 nodes
- LTC Reads & Writes EBU/SMPTE LTC at rates: 30, 29.97, 25 & 24 f/s
- LTC Drop frame, Jam Sync, Freewheeling, error bypass/correction
- Automatic Gain LTC input
- LTC Programmable output level
- MTC 1/4 Frame messages
- Allows peer to peer between BOX without computer
- LED activity for LTC and MIDI, input and output
- 1,5KV Transient isolation
- 1KV isolation between LTC In & LTC Out

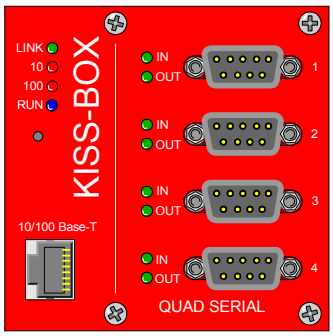
Pin	Function
1	Ground
2	Signal +
3	Signal -



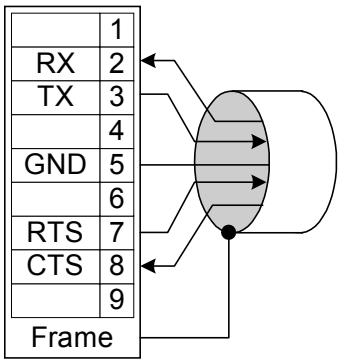
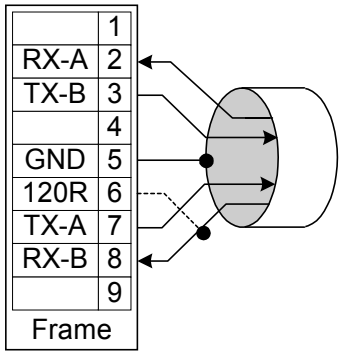
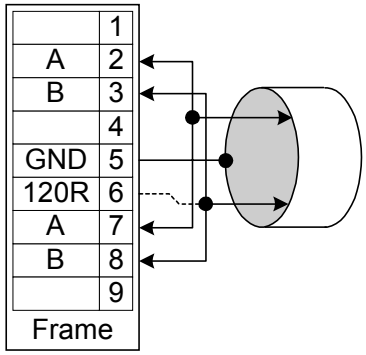
Pin	Function
1	Not used
2	Ground
3	Not used
4	Data +
5	Data -



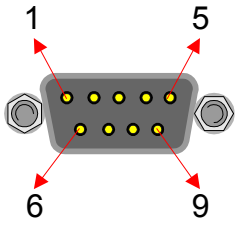
5.5 Quad Serial transceivers Box



- Quad UART 16550 - 16 Bytes receive & transmit FIFO
- Software selected RS-232, RS-422 & RS-485 on each channel
- Baud rate, Start & Stop bit, # data bits & parity programmable
- Allows peer to peer between BOX without computer
- LED activity for each COM, input and output
- 30KV ESD protection
- 1,5KV Transient isolation

RS-232	RS-422	RS-485
		

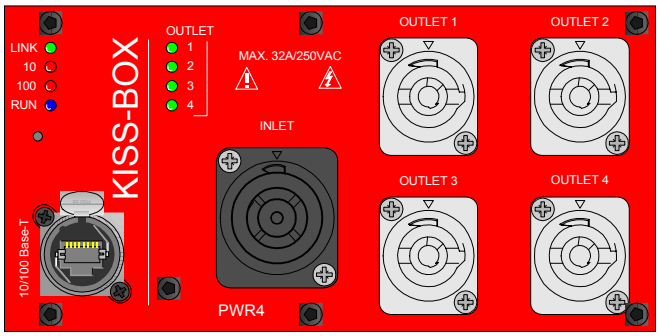
Shield of the cable must be wired on the frame of the connector, in only 1 side
For RS-422/485, terminator 120 Ω available on each COM, connected between pin 2 and 6 (see dashed line)



5.6 PWR-4 Box (PowerCon®)

The PWR-4 offer upto switching 4 high-power switcher with PowerCon® Outlet

- 2 Firmwares available : TCP/UDP or ARTNET
- Rating for each relay 12 A/250V (resisitive load)
- Total rating 32A/250V
- 4 KV Transient isolation
- RJ45 Ethercon® connector for harsh environment



CAUTION: always place a fuse of maximum 32A in uplink

CAUTION: The PowerCon® is certified as connector without breaking capacity according IEC 61984 / VDE 0627.

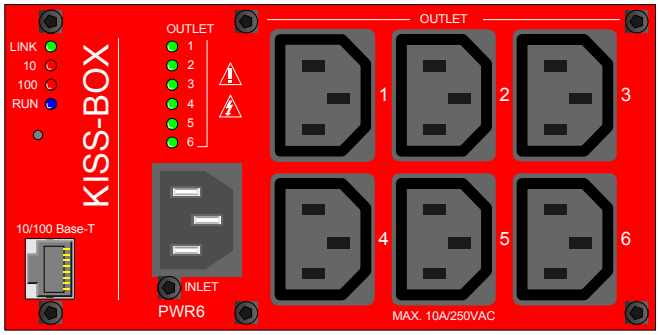
In this standard the term connector (without breaking capacity) refers to components which in normal use are not to be engaged or disengaged when under load or live.

See chapter §8.2 for more information about the PowerCon® connectors

5.7 PWR-6 Box (IEC)

The PWR-6 offer upto switching 6 power switcher with IEC Outlet

- 2 Firmwares available : TCP/UDP or ARTNET
- Rating for each relay 5 A/250V (resisitive load)
- Total rating 10A/250V
- 4 KV Transient isolation



CAUTION: always place a fuse of maximum 10A in uplink

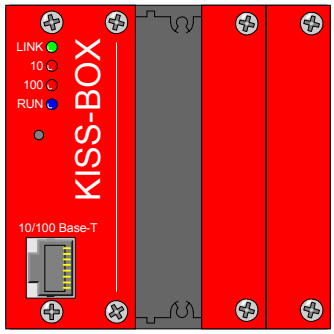
CAUTION : IEC connector which in normal use are not to be engaged or disengaged when under load or live.

Do not open the PWR-4 or PWR-6, due to uninsulated dangerous voltage inside.

Possibilty of electric shock is present

The third (Earth) pin is a safety feature, **never** attempt to bypass or disable it.

5.8 I/O 3 transceivers Box

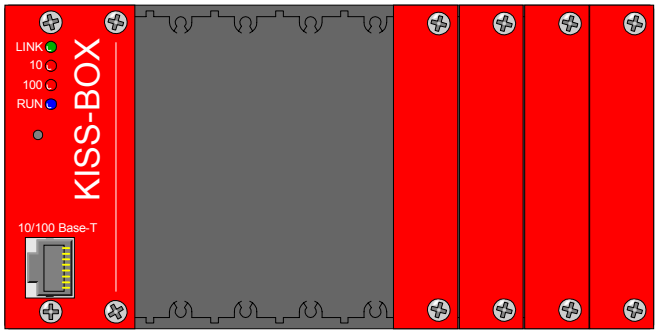


- 2 Firmwares available : TCP/UDP or ARTNET
- 3 Slots - up to 24 versatile I/O
- Hot-swap I/O card supported
- Low power (no power calculations)
- No external power supply needed (except for power card)
- Delivery with 2 blank panel

Don't touch the electronic parts or contacts inside of the IO3 BOX with your fingers or with any object

See chapter §6 for more information about the IO Card

5.9 I/O 8 transceivers Box



- 2 Firmwares available : TCP/UDP or ARTNET
- 8 Slots - up to 64 versatile I/O
- Hot-swap I/O card supported
- Low power (no power calculations)
- No external power supply needed (except for power card)
- Delivery with 4 blank panel

Don't touch the electronic parts or contacts inside of the IO8 BOX with your fingers or with any object.

See chapter §6 for more information about the IO Card

6 IO Card

6.1 General

6.1.1 Caution

Before I/O Card Installation or Removal, always remove the I/O connector, we do not recommend to do this during operation

Before I/O Card Installation or Removal, it's preferable to disconnect the RJ-45 (Ethernet) connector!

6.1.2 Warning

External power supply input terminals are not protected against reverse voltage polarity.

Some features of the IO card could be compromised by such protection.

Connecting power with reversed polarity will definitely damage the IO card.

6.1.3 Anti-Static Handling

The I/O card contains CMOS devices that could be damaged in the event of static electricity being discharged through them – Take hold of the IO card only by the allumminum front panel.

At all times, please observe anti-static precautions when handling the card and always unpack and install it in an anti-static working area (no carpet or Polar ☹).

See also chapter §8.1.

6.1.4 I/O Card Installation

If neccessary, remove the blank panel with a screwdriver.

When inserting I/O Card into I/O BOX, align the PC board of the I/O Card with the inside grooves on the top and bottom of the I/O BOX.

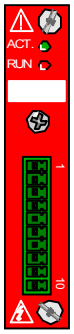
Push the I/O Card straight into the I/O BOX until it is firmly seated in the backplane connector.

Once the I/O Card is inserted, fasten the two captive screws with a screwdriver, to firmly secure the I/O Card to the I/O BOX

6.1.5 I/O Card Removal

Unfasten both captive screws with a screwdriver , now you can remove the card by way of pulling on the two captive screws.

6.2 Description of front panel:



- *ACTIVITY* - Green LED > Flash On to indicate a state change on one or several I/O
- *RUN* - Red LED
  - Light Off > I/O card doesn't work
  - Light Blink > I/O card working
  - Light Flashing > I/O card Error
- Green Connector 10 pins
  - Connector Voltage rating: 130V (DIN VDE 0110)
  - Connector Current rating: 8 A by contact
  - Conductor cross-section rigid or flexible: 0,14 to 1,5 mm² (16 to 28 AWG)

6.2.1 Spare plug-in connector 10 poles:

- On request to KISS-BOX
- Euroclamp: SH10-3.5
- Phoenix: 1840447 (MC1,5/10-G-3,5)
- or any others manufacturer (Raster 3,5mm – 10 pins)

6.2.2 How to wiring the plug-in connector ?

When wiring of the I/O Card, strip off approximately 7 to 8mm of the insulating cable, insert the copper wire in the plug-in connector and turn the screw firmly.

6.2.3 How to wiring the plug-in connector for Vibration Application ?

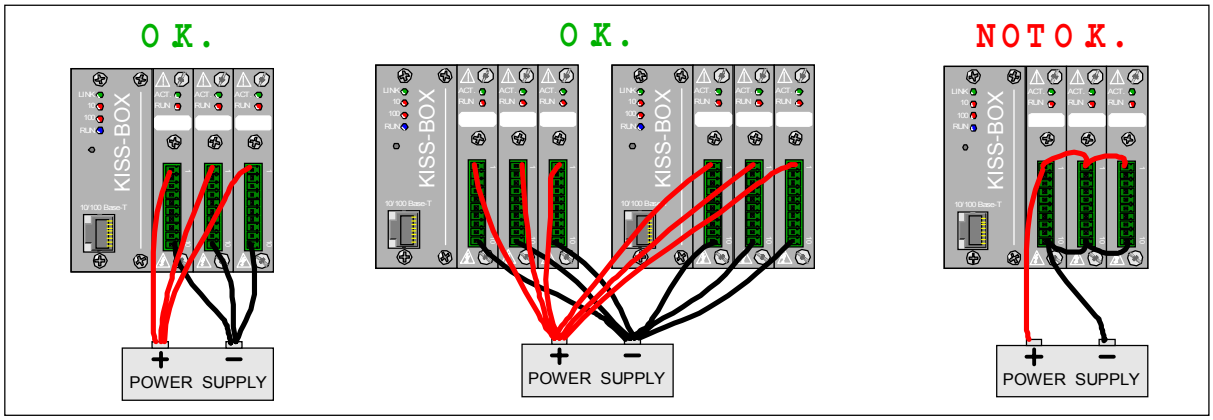
If an application is subject to vibration, Kiss-Box recommands that you either use ferrules to terminated wire to the detachable screw terminal connector.

6.2.4 How to powering the IO card ?

Several type of IO card need a external regulated "**P**ower **S**upply **U**nit" to working correctly

The Power inputs are always located at the same place: Positive on Pin #1 and Negative on Pin #10

- Always deliver electrical power using Star Topology.
- A single PSU can be used to power multiple IO 3/8 Box, thanks to insulation between Kiss-Box.
- Never connect the power supply in parallel.
- Minimum conductor cross-section : 1,5 mm² (28 AWG)
- Standard wire code colors: positive in RED, negative in BLACK



The current can increase up to 8A for maximal rating applications.

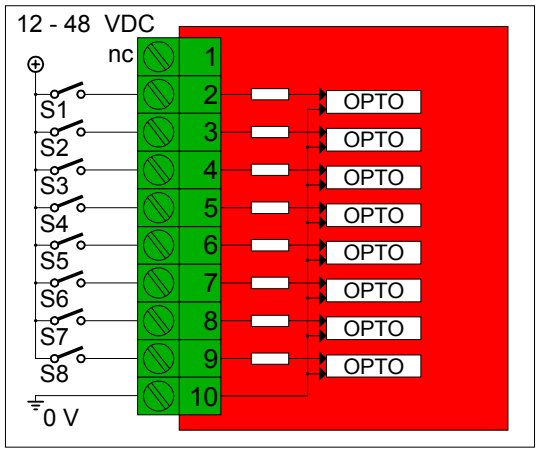
Take care to use the right wire cross-section regarding the estimated current needs.

Powered IO Card Type	Isolation with Backplane	Max Current	Positive Pin #	Negative Pin #
DO8SK	Y	2,4 A	1	10
DO4HM	Y	8A	1	10

6.3 DI8DC Card

The "**D**igital **I**nput **8** channel **DC**" Card provide connections for 8 contact closure, end course, push button, voltage detection, ...

- Voltage range: 12 to 48 VDC
- Voltage rating: 60 VDC
- Common Ground (source)
- Threshold level:voltage: ±5 VDC
- Turn on time: 5 mS
- Turn off time: 5 mS
- Overvoltage protection: ±60 V
- 4 KV Transient isolation with backplane

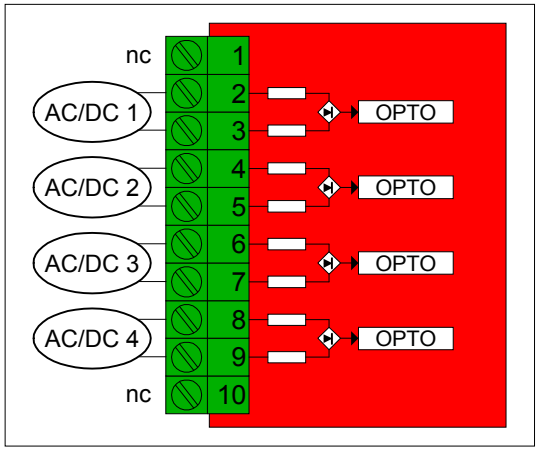


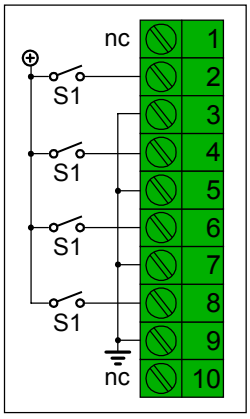
6.4 DI4AC Card

The "**D**igital **I**nput **4 AC**" card provide versatile connections for 4 AC and/or DC input voltage.

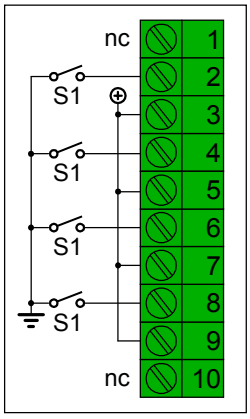
The inputs can be cabling input-to-input isolation and/or common ground (Source) and/or common positive (Sink).

- Voltage range: 12 to 48 VAC/DC
- Voltage rating: 60 VAC/DC
- Switching threshold level: ±5 V
- 50 & 60 Hz compliant
- Turn on time: 5 mS
- Turn off time: 25 mS
- Inputs protection: ±60 V
- 4 KV Transient isolation with backplane
- 1 KV Transient isolation chanel-to-channel





Common Source

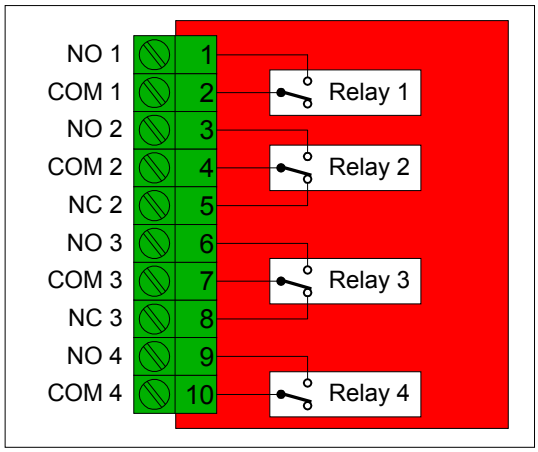


Common Positive

6.5 DO4PR Card

The "**D**igital **O**utput **4** channels **P**ower **R**elay" card provide 4 power relay.

- Rated relay switching : 5A at 130 VAC (resisitive load)
- Turn on time: 5 mS
- Turn off time: 2 mS
- 4 KV Transient isolation with backplane
- 1KV Transient isolation Relay to Relay

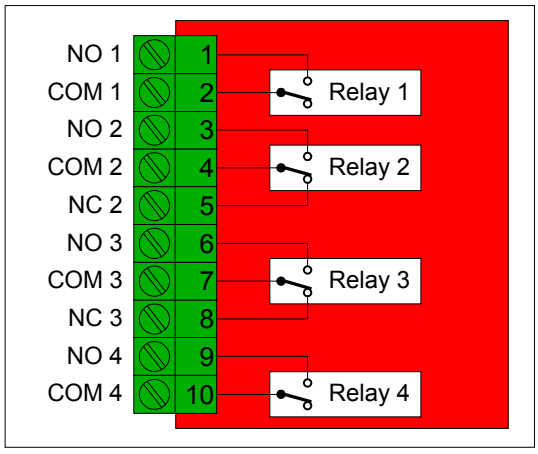


6.6 DO4AR Card

The "**D**igital **O**utput **4** channels **A**nalog **R**elay" card provide 4 low signal relay.

Main applications: Audio, low signal

- Rated load : 1A/120 VAC or 2A/130 VDC (resistive load)
- Turn on/off time: 3 mS
- 4 KV Transient isolation with backplane
- 1KV Transient isolation Relay-to-Relay



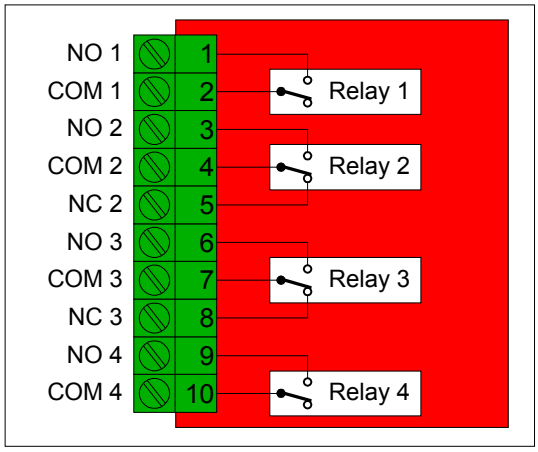
6.7 DO4BR Card

The "**D**igital **O**utput **4** channels **B**istable **R**elay" card provide 4 low signal relay.

Keep state if the I/O Box shutdow

The state of each relay can be read at anytime

- Rated load : 1A/120 VAC or 2A/130 VDC (resistive load)
- Turn on/off time: 3 mS
- 4 KV Transient isolation with backplane
- 1KV Transient isolation Relay-to-Relay

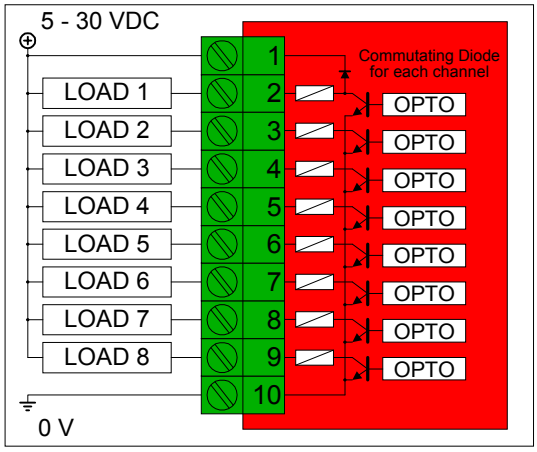


6.8 DO8SK Card

The "**D**igital **O**utput **8** channels **S**in**K**" card provide connections for 8 output.

Main applications: Low Power Solenoid, LED, lamp, Relay, High speed and repetitive commutation

- Common ground (Sink)
- Voltage range: 5 to 30 VDC
- Voltage rating: 50VDC
- Maximum current driver: 0,3A /30 VDC (resistive load)
- Protected by resettable Fuses
- 4 KV Transient isolation with backplane



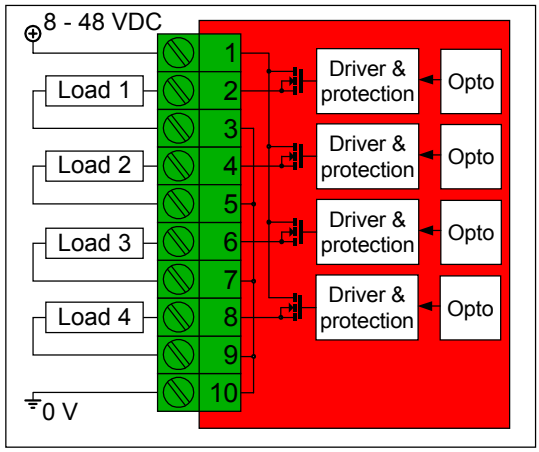
The only way to rearm the resettable fuse is turning off the power for a few seconds

6.9 DO4HM Card

The "**D**igital **O**utput **4** channel **H**igh-Side **M**OSFET" card provide connections for 4 solid-state power MOSFET stage

Main applications: High Power Solenoid, DC motor, LED, Lamp, Relay, High speed commutation

- Common positive (High-Side)
- Voltage range: 8 to 48 VDC
- Voltage Rating: 60VDC
- Maximum current driver: 2A/channel
- Temperature protection
- Auto restart electronic fuse
- 4 KV Transient isolation with backplane

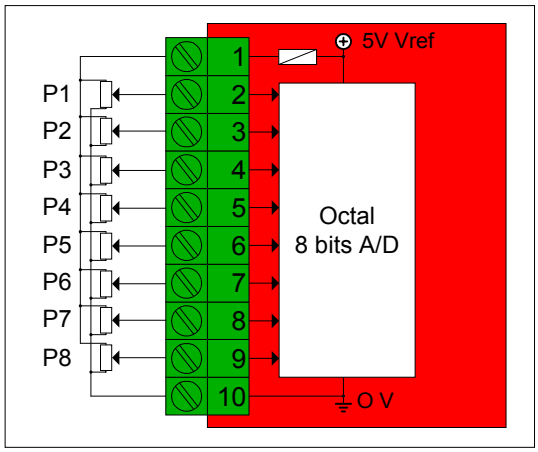


6.10 AI8RA Card

The "**A**nalog **I**nput **8** channel **Ra**tiometric" converter card provide 8 analog ratiometric inputs

Main applications: Potentiometers reader, analog detection, sensor, ...

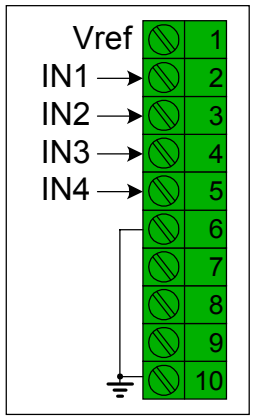
- Low cost
- Resolution: 8 bits
- Sampling rate:
- Voltage reference available on pin #1
- Input voltage range: 0 to 5 VDC
- Input voltage protection: ±30 VDC
- No Isolation with the backplane



6.10.1 precaution for unused inputs

In case all inputs are not needed, it is recommended to use consecutive inputs starting IN1 (pin #2), then wire first unused to pin #10 (0 Volts or Ground) in order to avoid A/D converter noise issues.

Exemple: 4 inputs wired on IN1 to IN4, IN5 must be connected to Ground



6.10.2 Voltage reference

The AI8RA card delivers a 5 VDC (50mA max.) voltage reference on pin #1.

This reference can be used directly to power potentiometers or sensors.

Never connect Vref or 0 V to any current source or bridge to other IO cards.

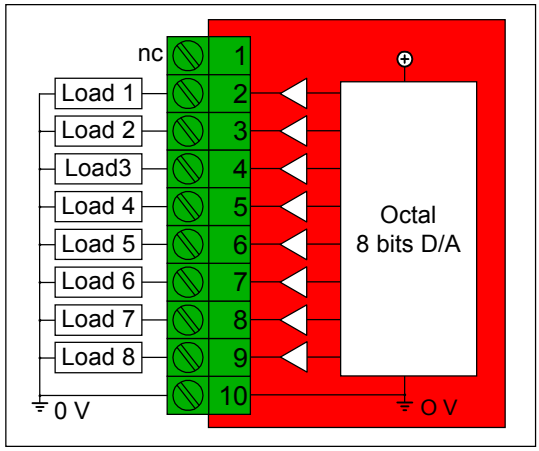
The only way to rearm the resettable fuse is turning off the power for a few seconds

6.11 AO8DA Card

The "**A**nalog **O**utput **8** channel **D**igital to **A**nalog" converter card provide connections for Octal analog output.

Main applications: CV generation, 0-10V Dimmer, Motor control, ...

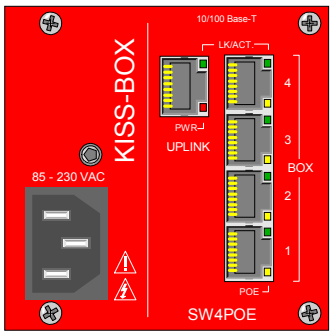
- Low cost
- DAC resolution: 8 bits
- Output voltage range: 0 -10 VDC
- Maximum current driver: 4 mA/channel
- Protection short circuit: Indefinitely
- Protection overvoltage: ±30 V
- No Isolation with the backplane



Never connect 0 V in parallel with any other circuits or other AI8RA cards.

7 Accessories

7.1 SW4POE Switcher



The SW4POE Box integreated a 5 ports unmanaged switcher and 4 P.O.E. Endspan

- Reliable and Low cost compare a classic solution
- Replace up to 5 devices, 7 Ethernet cables & 5 power cables
- AC Input voltage range: 90 to 230 VAC auto-sensing
- Maximum Output power: 30 Watts
- Industrial Chipset swicher (Micrel KX8995XA)
- Compact size
- LED Power and Link/Act. for Uplink Jack
- LED P.O.E. and Link/Act. for BOX Jacks

P.O.E. Port Status	LED Flash Code	Flash pattern
Non-Powered Device	Off	LED Off
Port Open	Off	LED Off
Port On	On	LED On
Low Signature Resistance	1 Flash	
High Signature Resistance	2 Flashs	
Port Overload Fault	5 Flashs	
Allocation Exceeded	9 Flashs	

The SW4POE can deliver power for only 4 devices in Class 2, if you connect other devices that need Class 3 or Class 4, the power management, automatically limits the number of devices powered.

Don't install or use the SW4POE in a wet location or during a lightning storm.

Do not open the SW4POE, due to uninsulated dangerous voltage inside.

Possibilty of electric shock is present

The third (Earth) pin is a safety feature, **never** attempt to bypass or disable it.

7.2 DIN rail clip kit

Kiss-Box modules are delivered with one (square Box) or two (double wide Box) DIN rail clip kit.

Each Kit contains one DIN Rail clip and two M4X10 (type DIN 965) screws to be fixed on the back side.

The clip lock (white color) must be located below.

7.3 Rack Mount

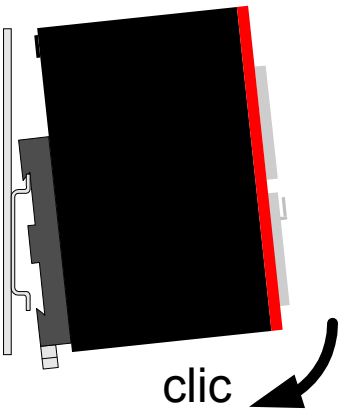
You can put up to 5 Kiss-Box in a 19 " Rack mount from KISS-BOX

7.3.1 How to fixing a Box in a Rack Mount

First, fix the DIN Rail support (see § 7.2)

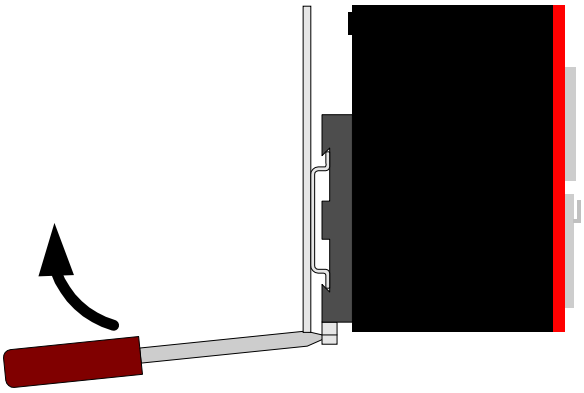
Then insert the top edge of the DIN rail into the deeper opening of the DIN rail clip.

Press down firmly on the Box to compress the spring until the clip lock in place on the DIN rail.



7.3.2 How to remove a Box in a Rack Mount

Use a simple screwdriver like a lever to open the clip lock.



8 Miscelleanious

8.1 Static Electricity, ESD

Electrostatic discharge (ESD) can cause malfunction and/or damage to electronic devices if discharged into the device.

Even KISS-BOX products have built-in protections, ESD exists and might built up at levels that could harm your equipment.

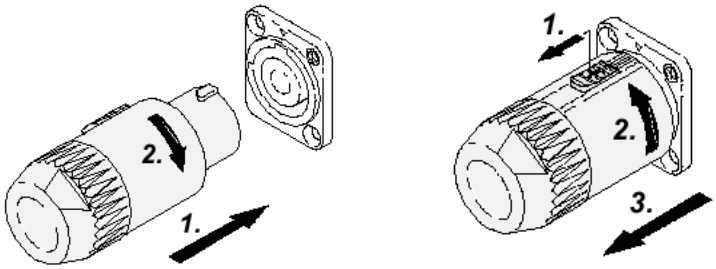
8.1.1 Some tips and precautions for ESD sensitive environment

Make sure to discharge any built-up static electricity from yourself and your KISS-BOX before touching or connecting one KISS-BOX to another

- Ground yourself by touching a earth grounded metal surface before handling KISS-BOX and other equipments.
- For fixed installations, put the KISS-BOX products in a grounded metallic rack.
- Ensure air relative humidity is minimum 60%.
- Install ESD specific prevention items, such as grounding mats.
- Reduce movement speed on handling or (dis)connecting KISS-BOX products.

8.2 About the PowerCon® connectors?

8.2.1 PowerCon® Handling

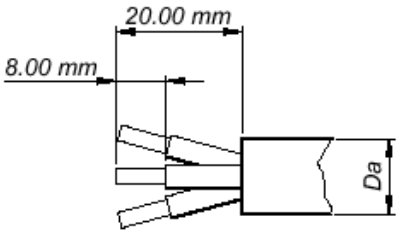


Engagement & Separation

8.2.2 20A PowerCon® Cable assembly

Da= 5,00 to 11,00mm, use the white chuck

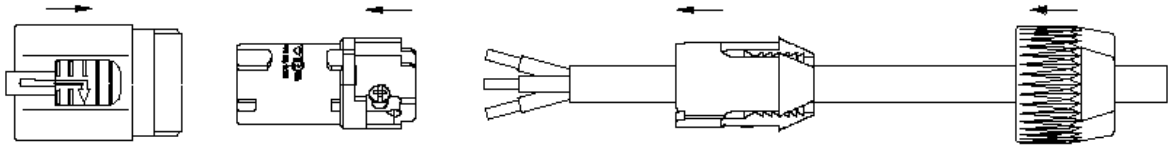
Da= 9,50 to 15,00mm, use the black chuck



Color code for cables :

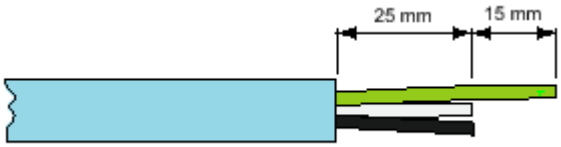
- Green/Yellow : Earth
- Blue : Neutral
- Black or Brown : Line

8.2.3 20A PowerCon® Final assembly

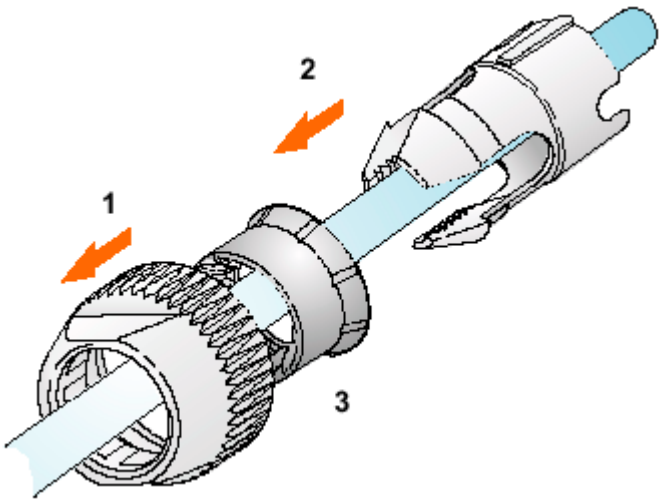


1. Put bushing and chuck onto the cable.
2. Prepare cable as show above.
3. Insert the wire into the terminals and fasten the clamping device by a flat screw driver.
4. Push insert and chuck into housing (pay attention to the guiding keyway)
5. Fasten bushing by means of a fork wrench 3/4", minimum torque 2.5Nm

8.2.4 32A PowerCon® Cable preparation

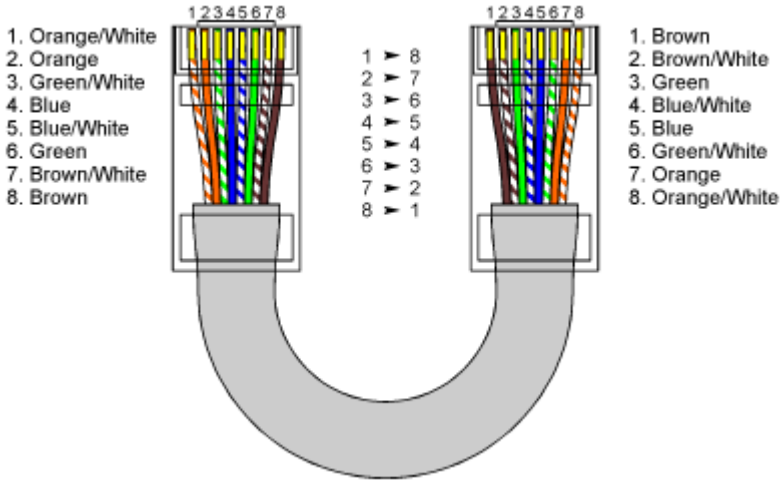


8.2.5 32A PowerCon® Final assembly

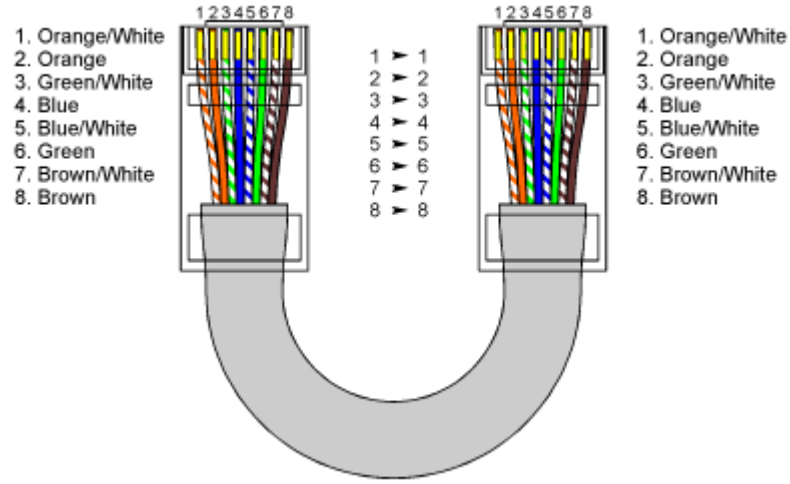


8.3 How to wiring the Ethernet cable ?

CAT5 Cross



CAT5 1/1



8.4 WEEE

Waste **E**lectrical and **E**lectronic **E**quipment
(applicable for E.U. Customers or others countries with separate collection systems)

This marking shown on the product or its literature, indicates that it should not be disposed with other household wastes at the end of its working life.

To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources.

Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take this item for environmentally safe recycling.

8.5 Warranty and repair

KISS-BOX b.v. warrants to you, the original purchaser, that each of its products will be free of charge from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by other than repair personnel authorized by KISS-BOX b.v., or which have been subject to misure, abuse, accident or improper installation.

KISS-BOX b.v. assumes no liability as a consequence of such events under the terms of this Warranty.

Please consult your dealer for more details.

8.6 Revision history

Issue	Date	Comments
1.0	11/2006	First release
1.1	10/2008	
1.4	01/2009	Translation verification
1.5	09/2009	Add ESD, WEEE, chapter Add PWR4/6 Box