

Manual for eWin 12" and 15" Panels PCD7.DxxxxWTA010

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0.1 Document Process

Version	Updated	Published	Comments
EN01	2014-10-02	-	- New Document
ENG02	2015-08-10	2015-08-10	- New phone number

0.2 Trademarks

Saia PCD® is a registered trademark of Saia-Burgess Controls AG.

Technical changes are subject to the latest technical developments.

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Published in Switzerland

0.3 Preface

All operator panels have been developed to meet the user interface communication requirements. This manual describes the installation of the operator panel.

1 Safety Instructions

The installer and owner and/or operator of the operator terminal must read and understand this installation manual.

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1.1 General

- Read the Safety Instructions carefully.
- Check the goods immediately on delivery for any damage during transit. Inform the supplier immediately if any damage is detected.
- Do not use the operator panel in explosive atmospheres.
- The supplier accepts no liability for equipment that has been modified, changed or adapted.
- The only replacement parts and accessories permitted are those manufactured in accordance with the supplier's specifications.
- Read the Instructions for Installation and Use carefully before installing, using or repairing the operator panel.
- Fluids, metal filings or pieces of wire must not be allowed to fall into the openings of the operator panel under any circumstances, as this could cause fire or electric shocks.
- The operator panel must only be used by qualified staff.
- If the operator panel is located in an environment where the temperature is either lower or higher than the values recommended in this manual, the liquid crystals in the display may freeze or become isotropic (liquid).
- The LCD contains a liquid which is a strong irritant. Rinse any areas of skin that come into contact with this liquid with plenty of water. If the substance gets into your eyes, keep your eyes open, rinse thoroughly with water and consult a doctor.
- The illustrations in this manual are intended to provide explanations. As a specific installation is influenced by numerous factors, the supplier cannot guarantee that actual practice will match the illustrations.
- Nor can the supplier guarantee that the operator panel will be suitable for your particular application. No form of liability can be accepted for your product design, installation or operation.
- You are recommended to switch the operator terminal off and restart it at least once before any components/cards are installed, or before the operator terminal is connected to any external devices such as, e.g., serial devices.

1.2 UL and cUL Installation

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- This device may only be operated in non-explosive atmospheres in Risk Class 2. [The combination of devices in your system is subject to inspection by the responsible inspection authority at the time of installation].
- All devices must be provided with a Class 2 power supply.



Warning: Only disconnect a device after checking that the power supply has been shut off or if the area is classified as a non-ex area.

- For Canada the following also applies: AVERTISSEMENT – RISQUE D’EXPLOSION – AVANT DE DECONNECTER L’EQUIPEMENT, COUPER LE COURANT OU S’ASSURER QUE L’EMPLACEMENT EST DESIGNÉ NON DANGEREUX.



Warning: Only extension modules with UL and cUL approval may be connected to the extension connection marked “EXPANSION”.



Warning: Only replace an extension device after checking that the power supply has been shut off or if the area is classified as a non-ex area.

- This device contains a battery. The battery may not be replaced within an explosive area.
- Replace the battery with a type BR2032 battery. The use of any other batteries may create a risk of fire or explosion.



Warning: Batteries may explode if handled incorrectly. Do not recharge batteries, open them or burn them.

- For use on a flat surface of protection type 4X (enclosures only).
- Only use a cable that can withstand temperatures of up to 75°C.
- Only use copper cable.
- Install the cable contacts for the power-supply plugs, applying the cable and tightening torque details listed in the following table:

Terminal Block No.	Wire Size AWG	TQ Lb/In
X1/X100 Phoenix plug	AWG30–12	5–7
X1/X100 Anytek plug	AWG24–12	3.5

1.3 Installation instructions

- The operator panel is designed for installation on a fixed site on a flat surface and subject to the following prerequisites:
 - There is no substantial risk of explosion.
 - There are no strong magnetic fields.
 - There is no direct exposure to sunlight.
 - No large or sudden variations in temperature will occur.
- Install the product as described in the attached Installation Instructions.
- Earth the product as described in the attached Installation Instructions.
- The operator panel may only be installed by qualified staff.
- High voltage, signal and power-supply cables must be kept separate from each other.
- Ensure that the voltage and polarity of the power source are correct before connecting the product to the power supply.
- The peripheral equipment must be suitable for the installation location and the intended purpose.

1

1.4 Operation

- Keep the operator panel clean.
- The emergency switch and other safety functions must not be controlled from the operator panel.
- Do not use excessive force and do not use any pointed or sharp items when operating the keys, display, etc.

1.5 Service and Maintenance

- Repairs may only be carried out by specially trained expert personnel.
- Guarantee rights are defined for each specific contract.
- Shut off the power supply to the equipment before carrying out any cleaning or maintenance work.
- Clean the display and the surrounding front cover with a soft cloth and a mild cleaning agent.
- A battery installed the wrong way round may create a risk of explosion. Only use batteries that have been recommended by the supplier.

1.6 Removal and Disposal

- Full or partial recycling of the operator panel must be carried out in accordance with the applicable regulations in force.
- Bear in mind that the following components contain substances that may endanger health and the environment: Lithium battery, electrolytic condensers and screen.

1

1.7 Air in the Touchscreen Monitor

- The layered construction of the touchscreen monitor contains air, and air bubbles may occasionally be visible. This purely aesthetic effect will have no effect whatsoever on the correct functioning of the Operator Panel. This optical effect may occur under certain combinations of environmental factors such as temperature, humidity and atmospheric pressure.

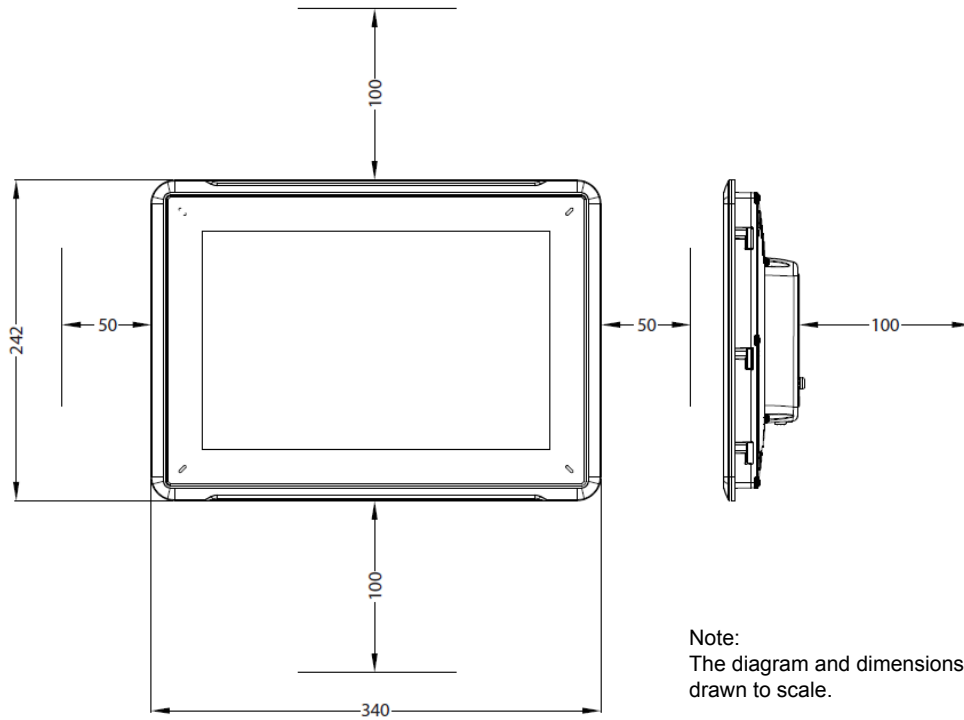
2 Installation

2.1 Space Requirements

- Maximum thickness of the installation plate: 8 mm
- Space required in millimetres for installation of the operator panel:

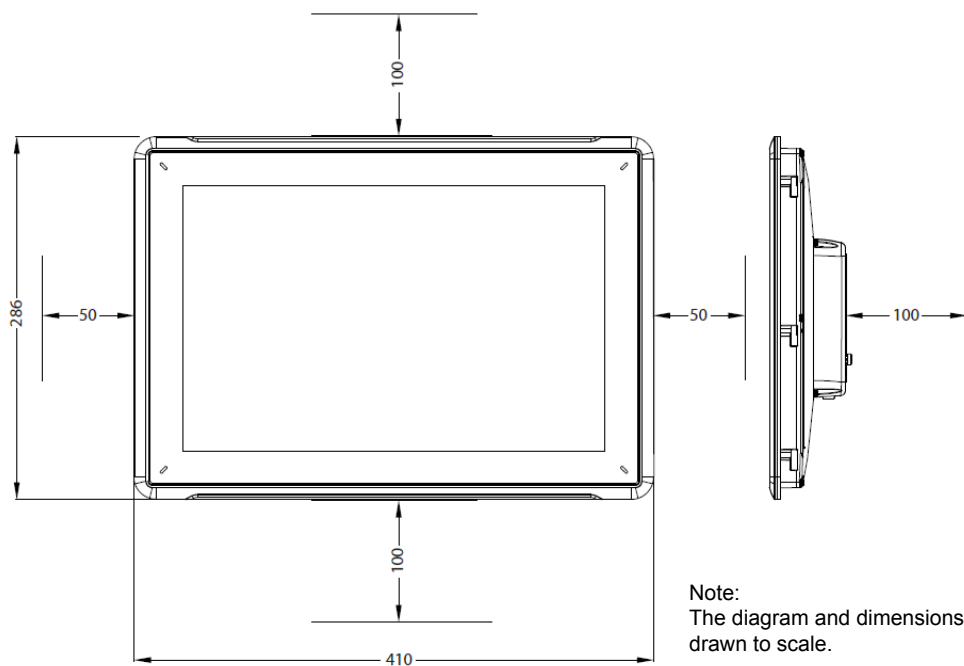
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PCD7.D5/6120WTA010



Note:
The diagram and dimensions are not drawn to scale.

PCD7.D5/6150WTA010



Note:
The diagram and dimensions are not drawn to scale.

2.2 Installation Procedure

The following is required:

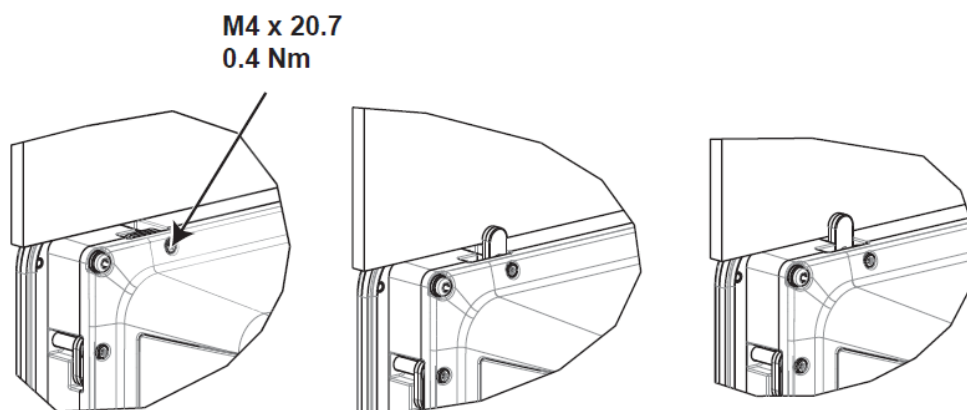
- A Torx TX7 screwdriver

1. Unpack the components supplied and check that they are all present. Inform the supplier of any damage that has occurred.



Note: Place the operator panel on a stable surface during installation. The operator panel may be damaged if it is dropped.

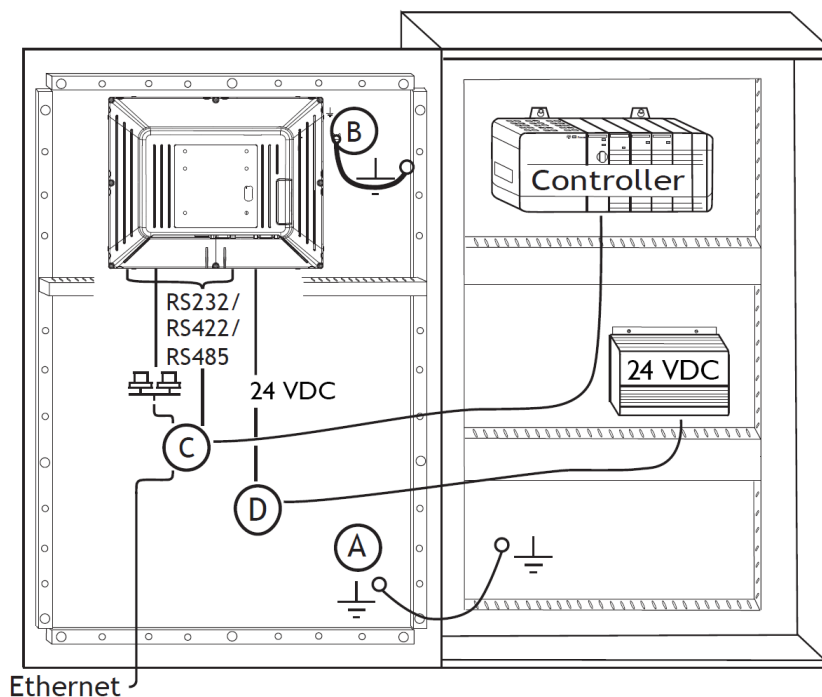
2. Use the cut-out dimensions in the overview drawing in the operator panel section diagrams and in the technical data sheet to cut the correct size of opening in the cabinet.
3. Fix the operator panel in its installed position using M4 Torx screws, and fix the integrated clamps tightly against the operator panel.



4. Connect the cables in the sequence indicated (see drawing and steps in sequence below).

Warning:

- Ensure that the operator panel and controls share the same electrical earth (reference potential) to avoid communication errors.
- The operator panel must be at ambient temperature before start-up. If there is a risk of condensation forming, make sure the operator panel is dry before connecting to the mains power.
- Check that the voltage and polarity of the power supply are correct.
- Use shielded communication cables only.
- High-voltage cables must be kept separate from the signal and supply circuits.



2

- Connect cable A.
- Connect cable B. To do this, use an M5 screw and an earth conductor (as short as possible) with a minimum cross section of 2.5 mm².
- Connect cable C.
- Connect cable D. The recommended cable cross section is 1.5 mm².

5. Carefully remove the plastic film from the operator panel display to avoid damage from static electricity.

2.2.1 Connections to the Controller

You can find more information about the cables connecting the operator panel and the controller(s) in the help file for the relevant driver.

2.2.2 Other Connections and Peripheral Devices

Cables, peripheral equipment and accessories must be designed to suit the application and the existing environmental conditions. Your supplier can provide you with more information and recommendations.

3 Technical Data

Parameters	PCD7.D5/6120WTA010	PCD7.D5/6150WTA010
Front cover, W×H×D	340 × 242 × 79 mm	410 × 286 × 83 mm
Cut-out dimensions, W×H	324 × 226 mm	394 × 270 mm
Installation depth	72 mm (172 mm including clearance)	76 mm (176 mm including clearance)
Individual mountings	VESA 75 × 75 Note: The maximum screw length for the VESA fitting is 4 mm. Using longer screws may cause damage.	
Front cover protection class	IP 65	
Rear side protection class	IP 20	
Material for touch display	Polyester on glass, resistant coating: Autoflex EBA 180L ⁽¹⁾ .	
Touchscreen contacts:	1 million touchscreen contacts	
Protective material on the rear side	Powder-coated aluminium	
Frame material	Powder-coated aluminium	
Weight	2.6 kg	3.85 kg
Serial connection for COM1 RS-232 and COM2 RS-485	9-pin D sub-connection using RS-232 RTS/CTS, fitted socket with standard fixing screws 4-40 UNC	
Serial connection for COM3 RS-232 and COM4 RS-485	9-pin D sub-connection using RS-232 RTS/CTS, fitted socket with standard fixing screws 4-40 UNC	
Ethernet	1 × 10/100/1000 Mbit/s and 1 × 10/100 Mbit/s shielded RJ45	
USB	3 × USB Host 2.0, max. output current 500 mA	
Processor	Intel® Atom	
External storage media	1 × SD card (optional). Only compatible with the standard SD format with a storage capacity of up to 2 GB.	
RAM	1 GB	
LED	1 × Multicolour	
Real-time clock	Yes (on chip)	
Battery	Lithium battery type BR 2032 (or CR 2032), replaceable	
Electrical consumption at nominal voltage	22 W	24 W
Fuse	3.15 A slow	
Power supply	+24 VDC (18-32 VDC) CE: The power supply must meet the requirements of IEC 60950 and IEC 61558-2-4. UL and cUL: The power must be supplied under the conditions for power supply Class II.	
Display	TFT-LCD with backlit LED. 1280 × 800 pixels, 262 k colours.	
Active display area, W×H	261.12 × 163.2 mm	331.2 × 207.0 mm

Operating temperature	-10°C – +50°C
Storage temperature	-20°C – +70°C
Relative humidity	5% – 85% non-condensing
Approvals and certifications	Information is available at www.sbc-support.com

⁽¹⁾ You will find further information in the section relating to chemical resistance.

4 Resistance to Chemicals

4.1 Metal Casings

Frames and casings are made from powder-coated aluminium. This powder coating resists the impact of the following chemicals without any visible effects:

Acetic acid 10%	Phosphoric acid 4%
Citric acid 10%	Phosphoric acid 10%
Diesel	Sea water
Distilled water	Sodium chloride 20%
Edible oils	Sulphuric acid 20%
Heating oil	Tap water
Hydrogen peroxide 3%	

4

The powder coating partially resists the effect of the following chemicals at room temperature:

Butanol	Nitric acid 10%
Hydrochloric acid 5%	Phosphoric acid 43%
Isopropyl alcohol	Turpentine
Sodium hypochlorite 10%	



Note: If contact with one of the above chemicals is unavoidable, it is advisable to test the effect of the substance prior to use on a part of the metal casing that is not highly visible.

The powder coating does not resist or barely resists the effect of the following chemicals at room temperature:

Concentrated acetic acid	Methyl ethyl ketone	Toluene
Acetone	Nitric acid 30%	Trichlorethylene
Ammoniac 5%	Phenol	Xylene
Concentrated ammoniac	Sodium hydroxide 30%	Petrol, 97 octane, unleaded
Ethyl acetate		Petrol, 98 octane, leaded

4.2 Touch Display and Coating

4.2.1 Autoflex EBA180L

Autoflex EBA180L covers the coating surrounding the touch display.

Resistance to solvents

In accordance with DIN 42115 part 2, Autoflex EBA180L is resistant to the following chemicals for more than 24 hours, without displaying visible effects:

Acetonitrile	Diesel Downey / Lenor ⁽¹⁾	Phosphoric acid (<30%)
Dissolved scouring powder (Ajax/Vim)	Ethanol	Potassium ferrocyanide/ ferricyanide
Alkaline carbonate solution ⁽¹⁾	Glycerine	Potassium hydroxide (<30%)
Ammoniac (<40%) ⁽¹⁾	Glycol	Pure turpentine
Acetic acid (<50%)	Gumption ⁽¹⁾	SBP 60/95 ⁽¹⁾
Dissolved Ariel powder ⁽¹⁾	Hydrochloric acid (<36%)	Sulphuric acid (<10%)
Bleach ⁽¹⁾	Linseed oil	Tomato ketchup
Castor oil	Methanol	Trichloroacetic acid (<50%)
Sodium hydroxide (<40%) ⁽¹⁾	Nitric acid (<10%)	White spirit
Drilling oil	Paraffin oil	Windex ⁽¹⁾
Cyclohexanol	Dissolved Persil powder ⁽¹⁾	Wisk
Diacetone alcohol	White spirit ⁽¹⁾	-

⁽¹⁾ An extremely faint shine was observed on the structure.

In line with DIN 42115 part 2 Autoflex EBA180L is resistant for maximum 1 hour to glacial acetic acid without displaying visible effects.

Autoflex EBA180L is not resistant to high-pressure steam at over 100°C or to the following chemicals:

Concentrated inorganic acids	Benzyl alcohol
Concentrated etching solution	Methylene chloride

4.2.2 Touch Display Surface

The surface of the touch display on the operator panel is resistant to the following solvents without displaying visible effects:

Solvent	Time
Acetone	10 min
Isopropanol	10 min
Toluene	5 hrs

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4.2.3 Autoflex EBA180L

The use of the Autoflex EBA180L touchscreen protective film is recommended.

Resistance to solvents

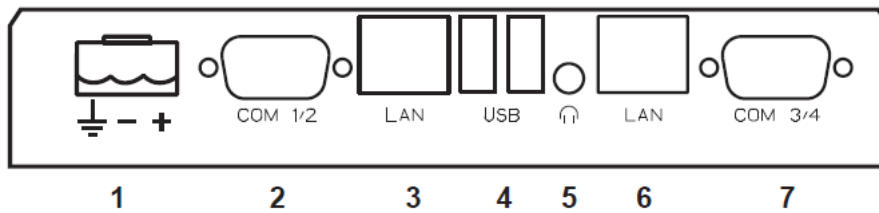
Autoflex EBA180L resists the effects of the same chemicals as Autotex F157 or F207 as described in the section on Autoflex EBA 180L.

Use outdoors

Like all polyester-based films, Autoflex EBA 180L must not be exposed to direct sunlight for any length of time.

5 Operator Panel Diagrams

5.1 Connections



Pos.	Connection	Description
1	Power supply	+24 VDC (18-32 VDC)
2	COM 1/2	Communications connections
3	LAN port (connection 2)	1 × 10/100 Base-T (shielded RJ-45)
4	USB	2 × USB Host 2.0, max. output current 500 mA
5	Headphones	Headphone connection
6	LAN port (connection 1)	1 × 10/100/1000 Base-T (shielded RJ-45)
7	COM 3/4	Communications connections

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5.2 Communications Connections

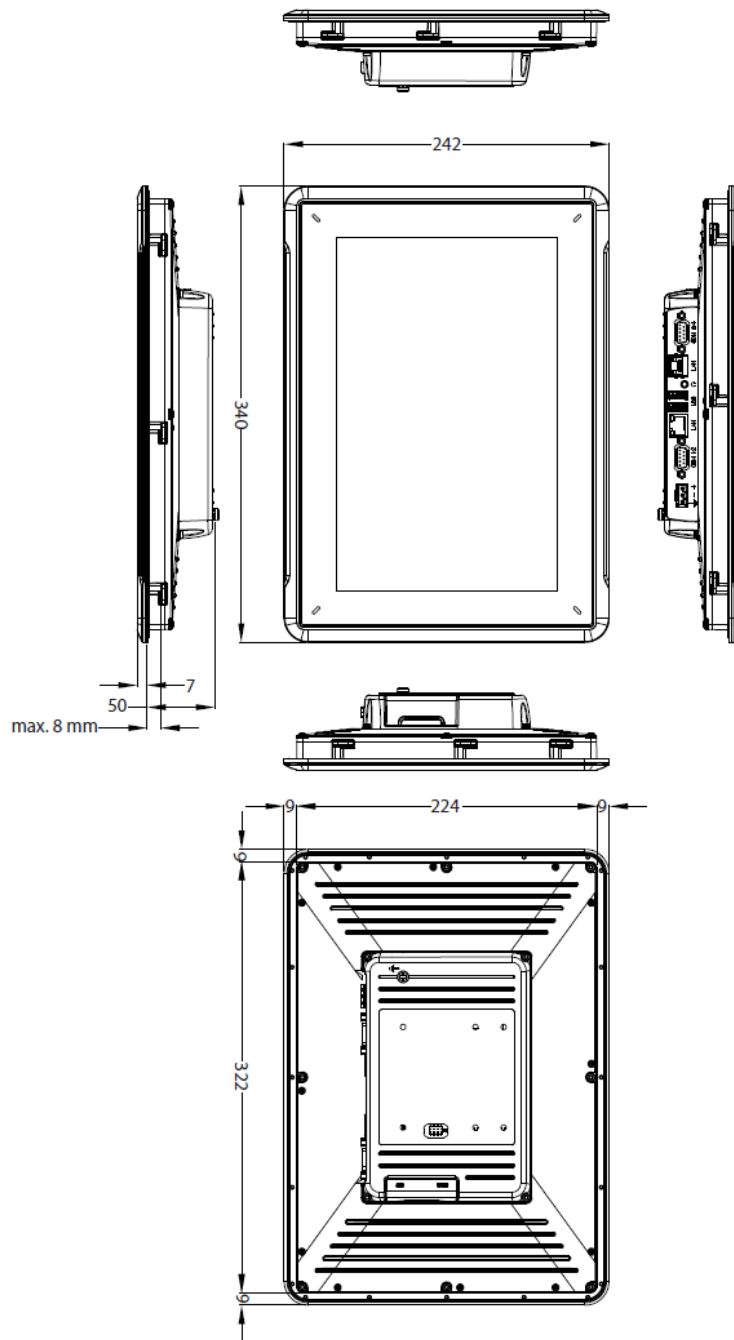
Pin	Serial connection, 9-pin socket		Serial connection, 9-pin socket	
	COM1	COM2	COM3	COM4
1	-	RS-485 Tx+/Rx+	-	RS-485 Tx+/Rx+
2	RS-232 RxD	-	RS-232 RxD	-
3	RS-232 TxD	-	RS-232 TxD	-
4	-	-	-	-
5	GND	GND	GND	GND
6	-	RS-485 Tx-/Rx-	-	RS-485 Tx-/Rx-
7	RS-232 RTS	-	-	-
8	RS-232 CTS	-	-	-
9	-	-	-	-



Note: A Y splitter cable CAB109 is required to run two communications ports over the same physical connection.

5.3 Overview

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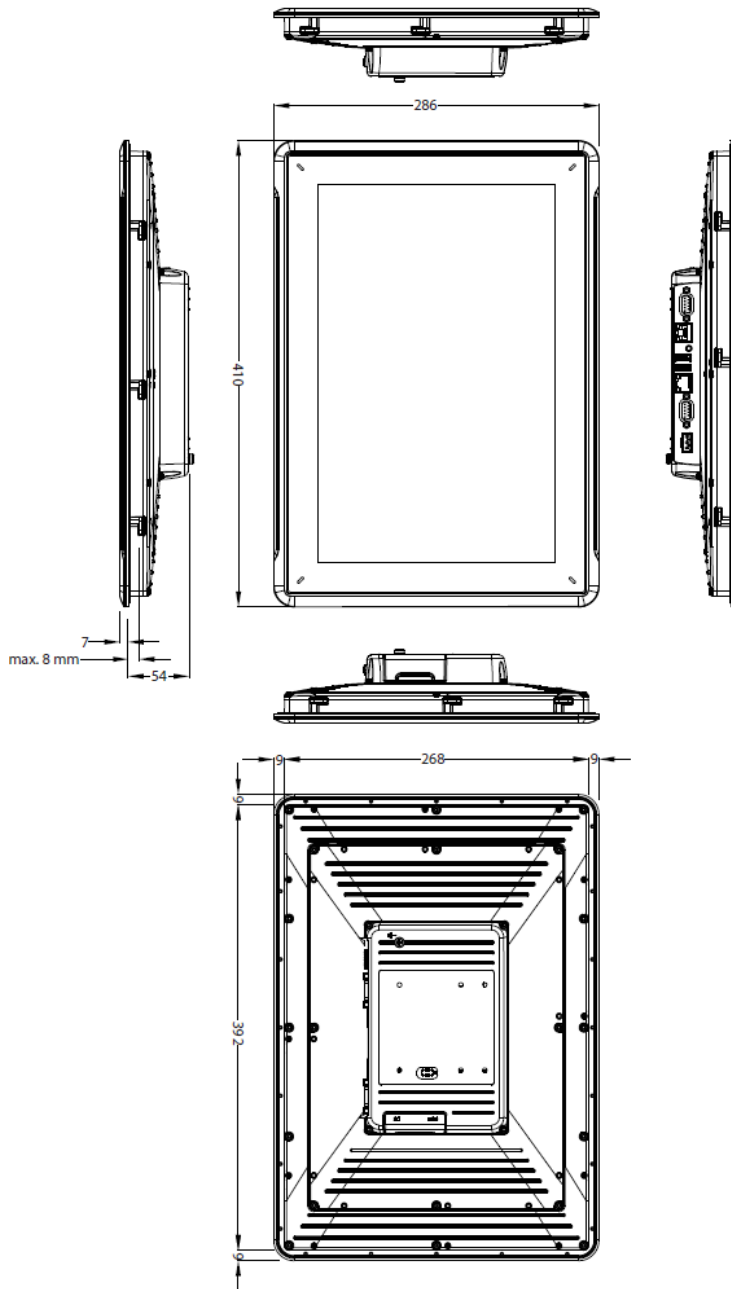


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Note: A Step CAD file is available on the website at www.sbc-support.com

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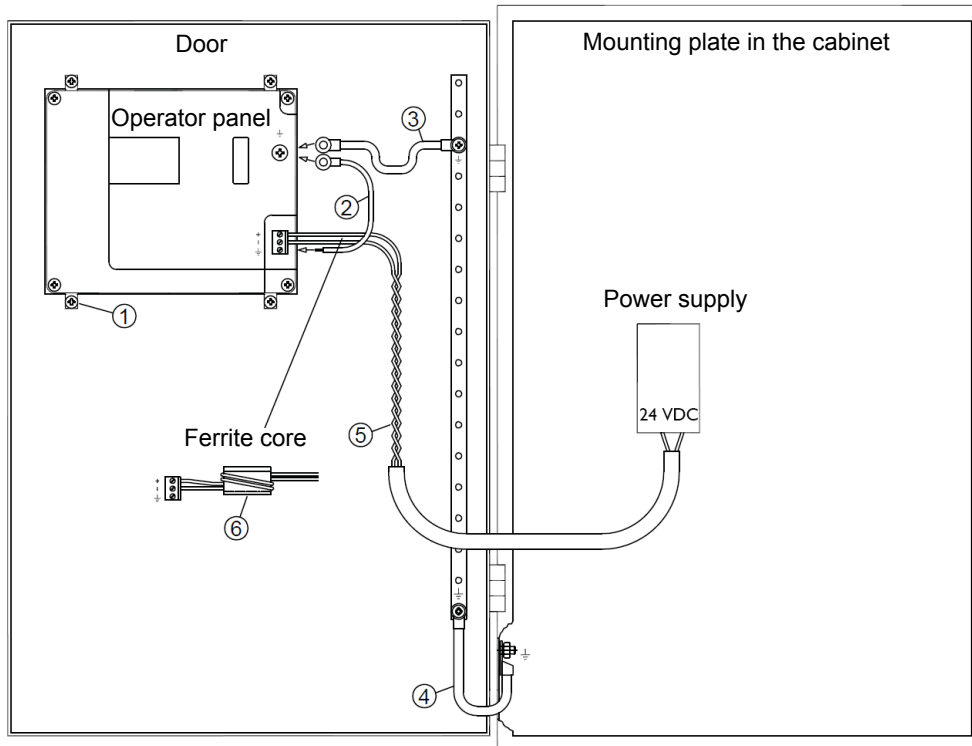


Note: A Step CAD file is available on the website at www.sbc-support.com

6 Additional Installation Instructions

Please follow the recommendations below if communication problems occur, for example in environments with interference or at temperatures close to the limits.

6.1 Earthing the Operator Panel



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The fixing clamps for the operator panel do not provide a safe earth connection between the panel and the equipment cabinet; see 1 in the above diagram.

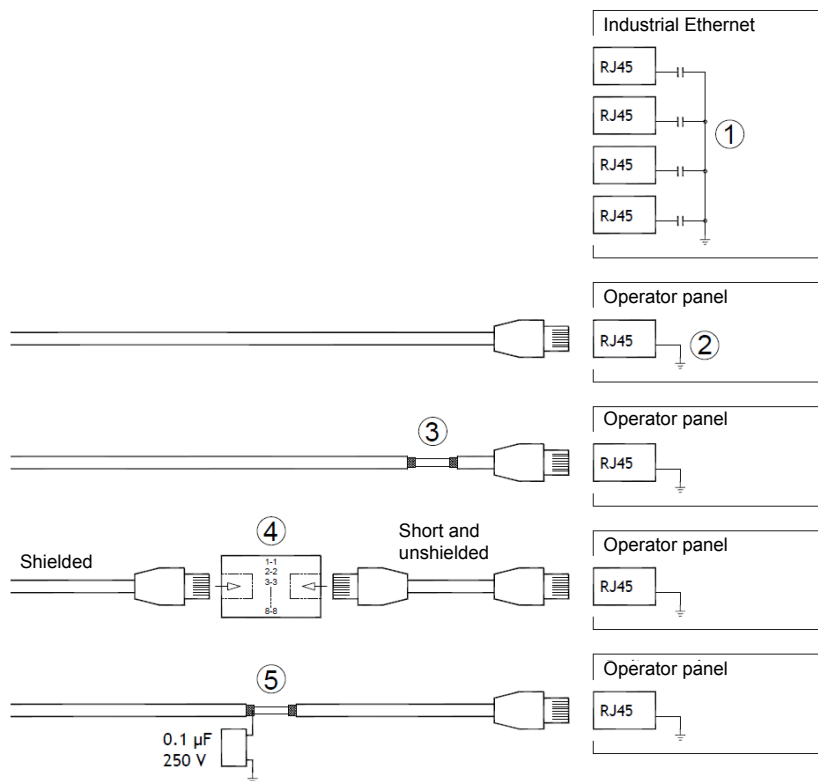
1. Connect a 2.5-mm² cable between the quick-connect socket and the operator panel casing; see 2 in the above diagram.
2. Connect a 6-mm² or 4-mm² cable or an earth strap between the housing of the operator panel and nearest earth point on the door; see 3 in the above diagram.
3. Attach a strong but short earthing braid between the door and the equipment cabinet; see 4 in the above diagram.
4. Twist the cable and insert it into the 24 VDC supply; see 5 in the above diagram. The minimum cross section of the cable must be 2.5 mm². Two turns around the ferrite core will provide four times the suppression of a single turn. Three turns around the ferrite core will provide nine times the suppression of a single turn.

A ferrite core suppresses interference to the 24 V power supply; see 6 in the above diagram.



Note: The earth wires must be short and have a large cross section. A long, thin earth wire will have very high impedance (resistance) at high frequencies and will not earth interference. Multi-core cables are preferable to single core with the same cross section. A braided cable with the same cross section is even better. The ideal solution is a short but strong earthing braid.

6.2 Ethernet Connection in the operator panel



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In some industrial Ethernet installations the shielding of the RJ45 connection is attached to the casing via a condenser; see 1 in the above diagram.

The Ethernet shielding for the operator panel is directly connected to the casing; see 2 in the above diagram.

1. Check whether the shielding for the other Ethernet entity is earthed directly or via a condenser.



Note: In many cases it is not recommended to connect both ends of shielded Ethernet cables to the casing. This could cause a humming or earth loop. Even unshielded cable would create fewer communication errors.

One suitable solution is to use a shielded Ethernet cable, whose shielding is only connected at one end. Another option is to remove the shielding; see 3 in the above diagram.

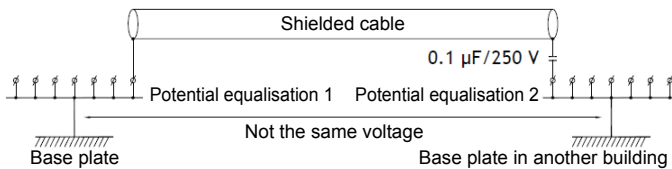
A more elegant solution is to extend the shielded Ethernet cable with a length of unshielded Ethernet cable; see 4 in the above diagram.

You can earth the shielding using a 0.1- μ F/250 V external plastic condenser; see 5 in the above diagram. This connects the high frequency fluctuations to earth.

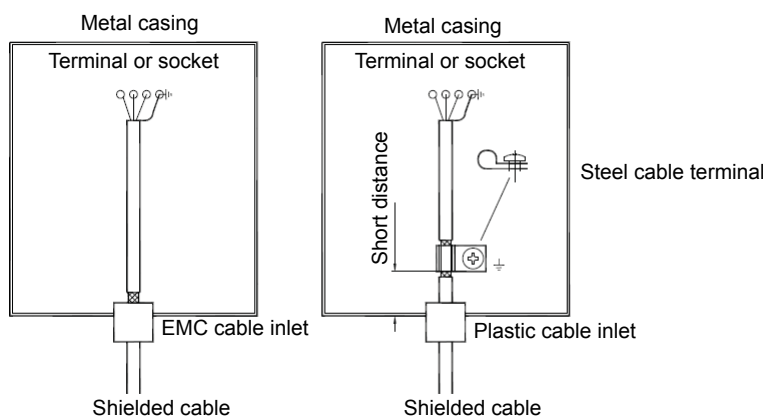
6.3 Improved EMC Protection

- First use the original cable supplied with the device.
- For RS-232 communications use a shielded cable.
- For RS-422 and RS-485 communications, use a twisted pair cable and a shielded cable.
- Use the appropriate cable for each type of bus: Ethernet, Profibus, CC-Link, CAN, DeviceNet, etc.
- Carry out the installation and connections in accordance with the specification that applies for the bus standard involved.
- Use shielded Ethernet cable, if possible with foil and a braid shield.
- The shielding for the D-sub connector must be connected all the way round (360°) the connector housing.
- Connect the shielding at both ends.

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With longer distances there is a risk of a difference in the earth potential. In this case, the shielding should be connected at one end only. Alternatively, the other end of the shielding may be earthed using a 0.1-μF/250 V plastic condenser. If subjected to HF, then both ends must be earthed, for LF only one end to avoid 50/60-Hz earth loops.



1. Use an EMC cable connector or a normal plastic cable connector, remove the outer sleeve and attach the shielding to the installation plate using a 360° metal cable clamp.

- Lay the 24 VDC and communication cables in one channel, and the 230/380 VAC cable in a different one. If you have to cross the cables, only do so at 90°.

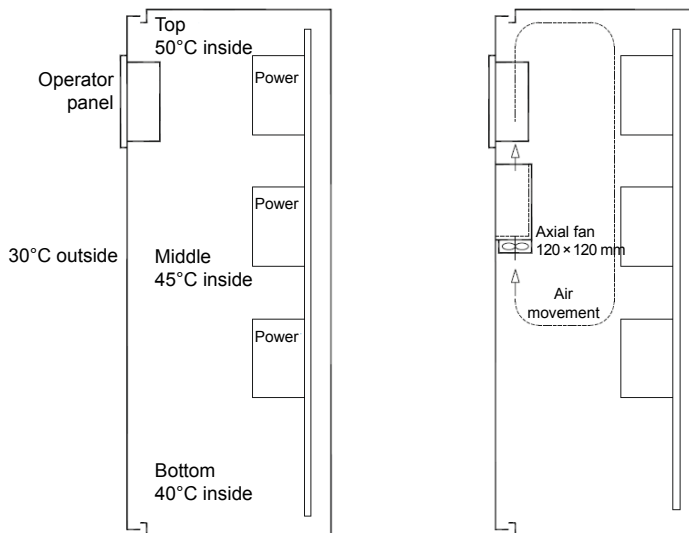
Avoid combining cables for stronger 24 VDC outputs with the communication cable.

Ferrite cores connected to the shielded cables can be used to suppress minor interference. Large pieces of ferrite connected to unshielded cables in locations where the wires can be wrapped two to four times around the core are 5 to 25 times more effective.

6.4 Ambient temperature

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The maximum ambient temperature for the operator panel can be found in the specifications. The ambient temperature refers to the temperature in the equipment cabinet which cools the electronic elements of the operator panel.



In most cases the ambient temperature for the operator panel is significantly higher than the ambient temperature for the equipment cabinet. If the cabinet is large and contains several pieces of equipment that generate heat, the temperature in the upper part of the cabinet will be noticeably higher than the theoretically anticipated rise in temperature. All electronic components are sensitive to heat. The useful life of an electrolytic condenser is reduced by 50% by an increase in temperature of 8 to 10°C. A rise in temperature of 15 to 20°C reduces its useful life by 75%, etc.

Rittal offers a practical program for estimating the likely average temperature in the cabinet and also a program to control the temperature in the equipment cabinet.

An enamelled steel cabinet gives a radiation heat value of 5.5 W/m² and °C.

The temperature can be balanced by installing a fan in the cabinet, and moving air

also has a considerably greater cooling effect than static air.

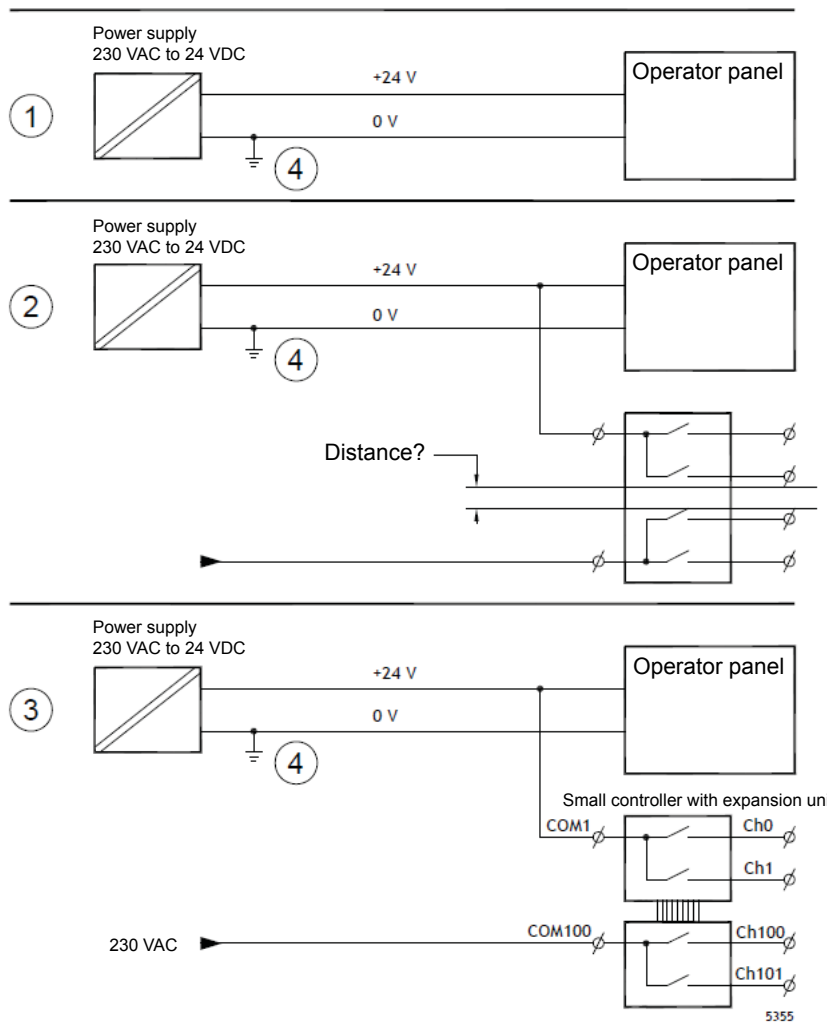
Install the fan in the cooler area so that it blows cold air onto the operator panel. If the fan is mounted at the top and sucks warm air upwards, the operating temperature of the fan itself will be increased, reducing its service life.

The power dissipation of the operator panel equals the power supply voltage multiplied by the current. Effectively no current flows to external consumers and the inputs do not give rise to any power loss.

6.5 Safety

Most operator panels are supplied with 24 VDC.

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No problem will arise if you install a power supply that meets the safety standards and which only supplies the operator panel. See 1 in the above diagram.

But if you are using a 24 V unit that also supplies other units, you must take the

appropriate measures; see 2 in the above diagram. The operator panel does not have insulation as required by the safety requirements in the event of a short circuit between 230 VAC and 24 VDC. It is assumed that providing 24 V power is safer, e.g. SELV in accordance with EN60950 (protection from electric shocks) and UL950.

Example:

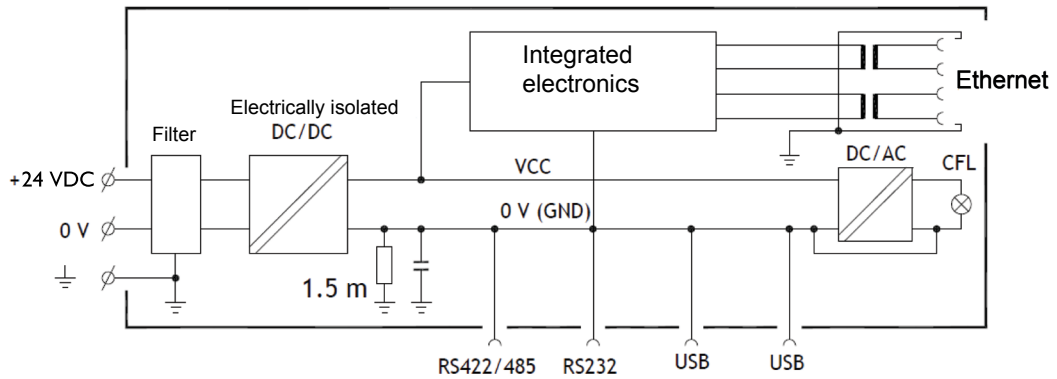
the following example explains why a safe 24 VDC supply can be disrupted if a 24 VDC relay contact is combined with a 230 VAC relay contact in a small controller. Make sure that the distances and the creepage distance between 24 VDC and 230 VAC comply with EN60950 or UL950. If this is not the case, then provide the operator panel with its own 24 V unit.

If there is an adequate distance between the relay contacts for 24 VDC and 230 VAC then one and the same 24 V unit can be used to supply everything. See 3 in the above diagram.

Connect 0 V to the 24 V unit with the earth. There are three benefits to this:

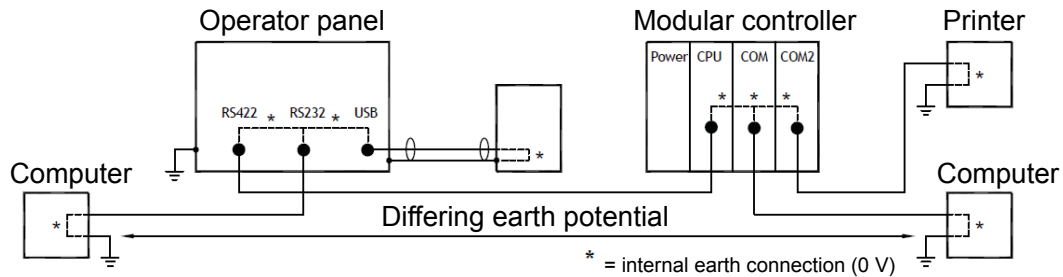
- Increased safety. The 24 V supply is not live if there is a faulty connection or a short circuit between 0 V (24 V) and the 230 V phase.
- Fluctuations in the 24 V supply are earthed.
- There is no risk of the 24 V supply showing a high value compared to earth. This is not unusual due to the presence of high static electricity.

6.6 Galvanic Insulation



The operator panel has galvanic insulation for the 24 VDC supply, but not galvanic insulation between the communication connectors for RS-232, RS-422/485 and USB. Only the Ethernet connector has galvanic insulation.

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If a PC is connected to the operator panel, the internal 0 V (GND) of the operator panel is connected via the PC to a protective earth. The shielding for multiple USB devices can be linked to the protective earth. Here the 0 V (GND) of the operator panel is linked to the protective earth, if for example a USB stick, keyboard or similar device is attached.

If several devices are connected that have a 0 V protection as well as earth protection and these are linked to different earthing points, this increases the potential risk. Earth currents flow through communication cables, the back cover of the controller and internally within the operator panel, and these may generate errors.

Use external units to improve communication and to create galvanic insulation. Westermo provides recommended industry standard insulators that are also insulated from the 24 VDC power supply.



Note: You absolutely must ensure that the 24 V power supply is not connected to one of the communication connections in the external insulation unit. If there is not 100% insulation from the 24 V power supply, interference and earth currents from the 0 V connection to the 24 V side will lead to breakdowns in communication. Using this type of unit solves one problem, but only at the price of creating a far greater one! A sub-standard installation may work, but problems may occur once devices are connected.

6.7 Cable and Bus RS-485 Terminals

- Shielded, twisted-pair cables must be used to be able to use the maximum transmission distance and the maximum transmission speed. The mutual capacitance must not exceed 52.5 pF/m and the cable cross section must be at least 0.25 mm² (AWG24).
- 0 V, the reference voltage for communications should be in the cables. Install two pairs for bi-directional communication: one for the communication and one for 0 V.
- The shielding must be earthed at one end. The other end would normally also be earthed. Over longer distances, or with a difference in the earth potential, the shielding should be earthed using a 0.1- μ F/250 V plastic condenser to avoid earth current along the shielding braid. Some manufacturers recommend earthing the shielding at each node. Different manufacturers offer different systems for the end of the bus.

Depending on the receiver construction, the bus cables may be on a single level or require pull-up or pull-down resistors to avoid false signals being recognised when the bus is in sleep mode (when all transmission units are off).

A Annex

A.1 Icons



This symbol indicates that further information exists on this topic in this or another manual or in technical documents. There are no direct links to these documents.



This symbol indicates instructions that must be strictly adhered to.



This symbol warns the reader that touching components may lead to damage from electrostatic discharge.
Recommendation: at least touch the system's negative terminal (PGU port casing) before touching the electronic components. But it is better to wear an earthed strap on your wrist connected to the system's negative terminal.



The explanations beside this symbol are only valid for the Saia PCD® classic series.



The explanations beside this symbol are only valid for the Saia PCD® xx7-series.

A.2 Contact Details

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