

PC 443-W

Control Cabinet PC

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Control Cabinet PC**PC 443-W**

The PC 443 is a control cabinet PC with an Intel Celeron G1820 processor that is completely PC-compatible and operates with a standard PC BIOS.

Using the HMI-Link G2 Expansion, HMI-Link G2 terminals can be connected to the PC 443-W. This allows USB and display signals to be transmitted up to 100 m.



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1 Technical Data

1.1 Performance Data

Processor	INTEL Celeron G1820
Hard drive	128 Gbyte Solid State Disk
Main memory (DDR-RAM)	4 Gbyte DDR3 RAM (SODIMM)
Graphics	Intel HD Graphics
Interfaces	2x Ethernet 10/100/1000 Mbit 6x USB 2.0 2x USB 3.0 1x RS232 1x Audio (Line In, Line Out, microphone) 1x PS/2 mouse 1x PS/2 keyboard 1x DVI interface 1x Display port 1x HMI local OUT (HMI-Link G2)
Real-time clock	yes

In order to use the HMI interface, a SIGMATEK HMI display unit of the second generation (G2) is required on the remote station.

1.2 Electrical Requirements

Supply voltage	+18-30 V DC (Class 2 or SELV and limited energy) (connection: 4-pin Phoenix)
IDLE consumption without HMI-Link	30 W
IDLE consumption with HMI-Link	32 W
Max. consumption with HMI-Link	50 W
Inrush current	2.5 A Peak – 15 ms

Caution: The +24 V supply voltage is buffered for 5 ms!

Mise en garde! La tension d'alimentation 24 V est tamponnée pour 5 ms!

1.3 Environmental Conditions

Storage temperature	-20 ... +60 °C	
Environmental temperature	0 ... +50 °C	
Humidity	10-90 %, non-condensing	
EMC tolerance	EN 61000-6-2 (industrial area): EMV resistance EN 61000-6-4: noise emission	
Vibration resistance	EN 60068-2-6	2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²)
Shock resistance	EN 60068-2-27	15 g (150 m/s ²), duration 11 ms, 18 Shocks
Protection Type	EN 60529: protected through the housing	IP20

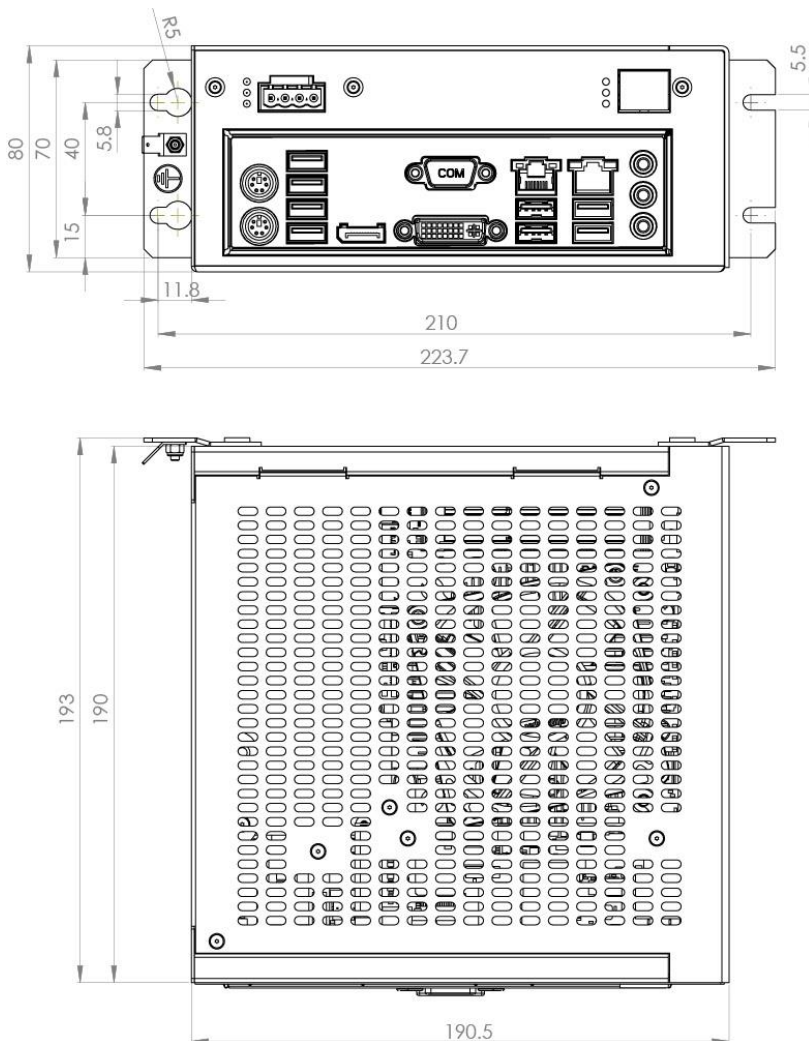
1.4 Miscellaneous

Article number	01-310-443-W
Hardware version	1.x
Dimensions	80 x 223.7 x 193 mm (W x H x D)
Standard	designed according to UL
Approbations	UL, cUL, CE

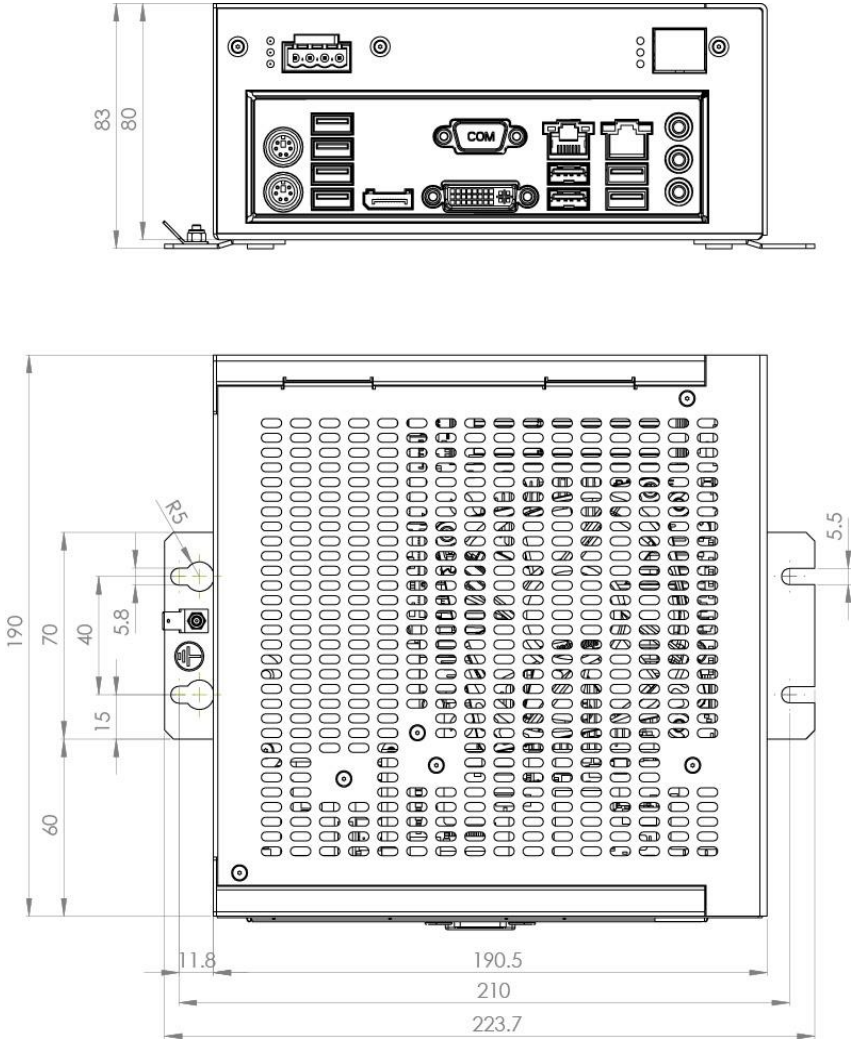
In order to use the HMI interface, a SIGMATEK HMI-Link of the second generation (G2) is required on the remote station.

2 Mechanical Dimensions

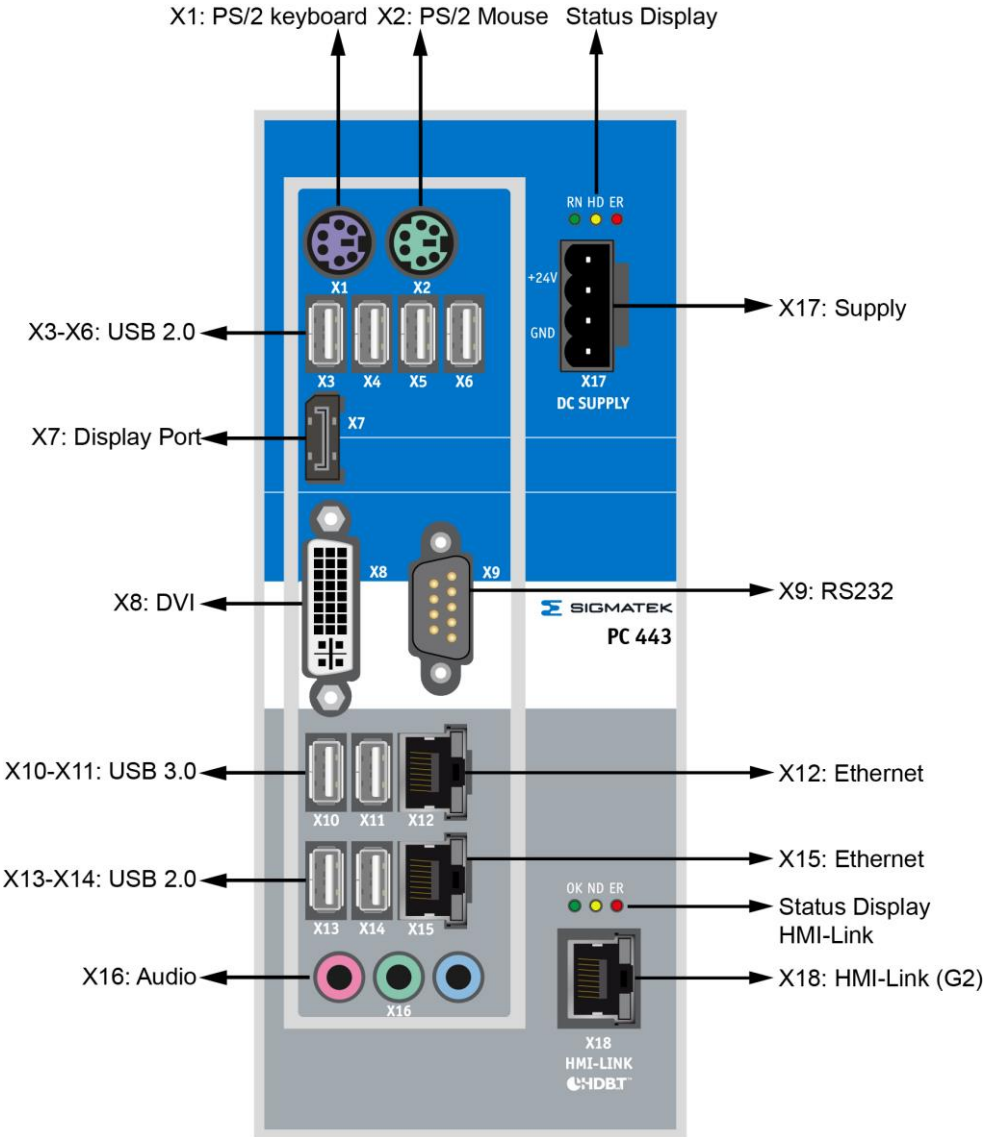
2.1 Horizontal



2.2 Vertical



3 Connector Layout



X1: PS2 keyboard



Pin	Function
1	KEYBOARD DATA
2	MOUSE DATA
3	GND
4	+5 V
5	KEYBOARD CLOCK
6	MOUSE CLOCK

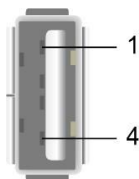
X2: PS2 mouse



Pin	Function
1	MOUSE DATA
2, 6	n.c.
3	GND
4	+5 V
5	MOUSE CLOCK

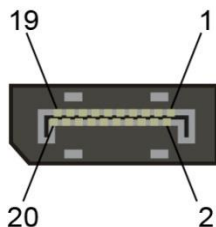
n.c. = do not use

X3-X6: USB 2.0 (Type A)



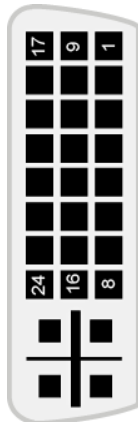
Pin	Function
1	+5 V
2	D0-
3	D0+
4	GND

X7: Display port

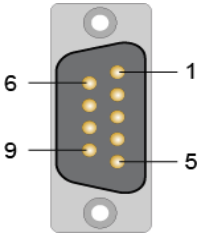


Pin	Function
1	Lane 0 (p)
2	GND
3	Lane 0 (n)
4	Lane 1 (p)
5	GND
6	Lane 1 (n)
7	Lane 2 (p)
8	GND
9	Lane 2 (n)
10	Lane 3 (p)
11	GND
12	Lane 3 (n)
13	Config1
14	Config2
15	AUX CH (p)
16	GND
17	AUX CH (n)
18	Hot Plug
19	Return
20	DP_VCC_3V3

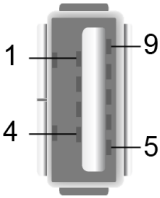
X8 DVI (24-pin DVI)



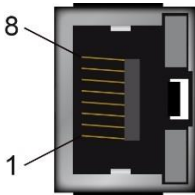
Pin	Function	Pin	Function
1	DVI2	13	DVI3+
2	DVI2+	14	+5 V
3	GND	15	GND
4	DVI4-	16	Hot Plug Detect
5	DVI4+	17	DVI0-
6	DDC-CLOCK	18	DVI0+
7	DDC-DATA	19	GND
8	V-Sync	20	DVI5-
9	DVI1	21	DVI5+
10	DVI1+	22	GND
11	GND	23	DVI-CLOCK+
12	DVI3	24	DVI-CLOCK-
C1	Red	C4	H-Sync
C2	Green	C5	GND
C3	Blue		

X9: RS232 (9-PIN DSUB PLUG)

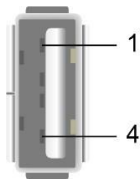
Pin	Function
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

X10-X11: USB 3.0 (Type A)

Pin	Function
1	+5 V
2	D0-
3	D0+
4	GND
5	USB3 Rx-
6	USB3 Rx+
7	GND
8	USB3 Tx-
9	USB3 Tx+

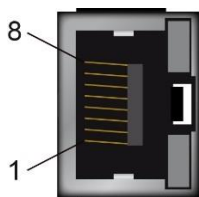
X12: Ethernet 10/100/1000

Pin	Function
1	DA+
2	DA-
3	DB+
4	DC+
5	DC-
6	DB-
7	DD+
8	DD-

X13-X14: USB 2.0 (Type A)

Pin	Function
1	+5 V
2	D0-
3	D0+
4	GND

X15: Ethernet 10/100/1000



Pin	Function
1	DA+
2	DA-
3	DB+
4	DC+
5	DC-
6	DB-
7	DD+
8	DD-

X16: Audio



Socket	Function
Pink	Microphone
Green	Line Out
Blue	Line In

Line IN, Line OUT



Pin	Function
L	Stereo left
R	Stereo right
GND	GND

Microphone

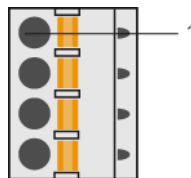


Pin	Function
SIG	microphone IN
GND	GND

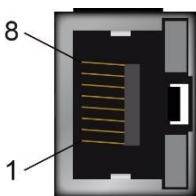
X17: Power supply (4-pin Phoenix)



Pin	Function
1	+24 V DC supply
2	+24 V DC supply
3	GND
4	GND



X18: HMI Local OUT (HMI-Link G2, RJ45)



Pin	Function
1	HMI_P0
2	HMI_N0
3	HMI_P1
4	HMI_P2
5	HMI_N2
6	HMI_N1
7	HMI_P3
8	HMI_N3

Before the PC is switched on, the terminal or manual control unit must be powered and the HMI cable connected, since otherwise a correct initialization of the terminal or the manual control unit cannot be guaranteed.

If a terminal or manual control unit connected to the PC with a HMI-Link cable is exchanged with a device with a different resolution during operation, the PC must be restarted so the new device with the different resolution is correctly identified and initialized.

Avant l'allumage du PC, le terminal ou l'unité de commande manuelle doit être alimenté et le câble HMI doit être connecté, car sinon une correcte initialisation du terminal ou de l'unité de commande manuelle ne peut pas être garantie.

Si le terminal ou l'unité de commande manuelle connectée au PC avec un câble HMI-Link est échangé pendant le fonctionnement pour un dispositif avec une résolution différente, le PC doit être redémarré. Ainsi, le nouveau dispositif avec la résolution différente est correctement identifié et initialisé.

3.1 Applicable Connectors

USB: Type A

PS/2: 6-pin PS/2 connector

DVI: 24-pin DVI connector

Display port: 20-pin display port connector

RS232: 9-pin D-Sub socket

Ethernet: 8-pin RJ45 CAT5e / CAT6

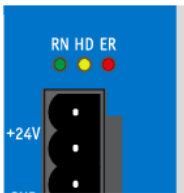
Audio: jack connector

Power supply: 4-pin Phoenix Contact FKC 2.5/ 4-ST-5.08

HMI-Link 8-pin RJ45 CAT5e / CAT6

4 Status Displays

4.1 PC Status Display



Power	Green	Power supply
HD	Yellow	access to the SSD
Error	Red	alarm signal (e.g. exceeding the maximum temperature)

4.2 HMI-Link Status Display



ER	red	ON	No HMI-Link connection between PC and terminal Check HMI-Link cable
ND	yellow	OFF	
OK	green	OFF	

ER	red	OFF	HMI-Link connection between PC and terminal available No video signal available Check display port cable
ND	yellow	ON	
OK	green	OFF	

ER	red	ON	HMI-Link connection between PC and terminal available Video signal available No USB signal HMI-Link connection between PC and terminal available
ND	yellow	OFF	
OK	green	ON	

ER	red	OFF	HMI-Link connection between PC and terminal available Video signal available No valid EDID data Restart PC and terminal
ND	yellow	ON	
OK	green	ON	

ER	red	OFF	System ready
ND	yellow	OFF	
OK	green	ON	

5 SSD (Solid State Disk) Exchange

Disconnect the PC 443-W from the supply.

To exchange the SSD, the locking screw must be removed with a Tx- 8 screwdriver.



Carefully lift the plug-in.



Carefully open the hard drive plug-in upwards. Disconnect the two connector cables. Loosen the 4 locking screws using a Tx- 10 screw driver and remove the hard drive from the hard drive plug in. Connect the new hard drive and screw down the hard drive plug-in using a thread lock fluid (Loctite 270 or similar) on the screws.

Caution: Place spacer sleeves in between!



4 Tx 10 locking screws



**A solid-state disk cannot be exchanged while voltage is applied!
(Disconnect 24 V DC supply!)**

**Un disque à semi-conducteurs ne peut pas être échangé sous la tension!
(Débranchez l'alimentation 24 V DC!)**

6 Exchanging the BIOS Battery

The exchangeable buffer battery ensures that the clock time is preserved in the absence of a supply voltage. A lithium battery is installed at the manufacturer.

The battery has enough capacity to preserve data in the absence of a supply voltage for up to 5 years.

Battery order number: **01-690-055**

	Company	Data
Lithium battery	RENATA	3.0 V/235 mAh

Use batteries from RENATA with the number CR2032 only!

WARNING! Incorrect use of the batteries could result in fire or explosion! Do not recharge, disassemble or throw batteries in fire!

N'utilisez que des piles RENATA CR2032!

ATTENTION! La pile peut exploser en cas d'un usage non-conforme. Ne pas recharger, démonter ou jeter au feu.

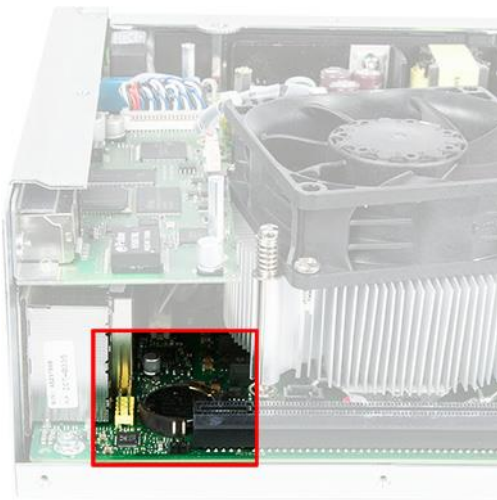
**The BIOS battery cannot be exchanged while voltage is applied!
(Disconnect 24 V DC supply!)**

**La pile BIOS ne peut pas être échangée sous la tension!
(Débranchez l'alimentation 24 V DC!)**



To exchange the BIOS battery, the 9 screws must be loosened with a Tx 8 screwdriver and the cover removed. If necessary, when hand tools are insufficient, the screw can be heated locally to approx. 250 °C. Dismantle while warm.

The remaining 3 screws are located on this side!



With a screwdriver, carefully push the metal battery holder back. The battery can now be removed and replaced. Replace the cover and using a locking fluid – Loctite 221 or similar – tighten the locking screws.

The clock time must then be reset.

7 Mounting Instructions

The PC 443-W has 4 mounting holes to allow mounting onto the back wall of the control cabinet. This is the preferred mounting position, since the cool air can flow from the bottom to the top of the module and ensure optimal cooling.

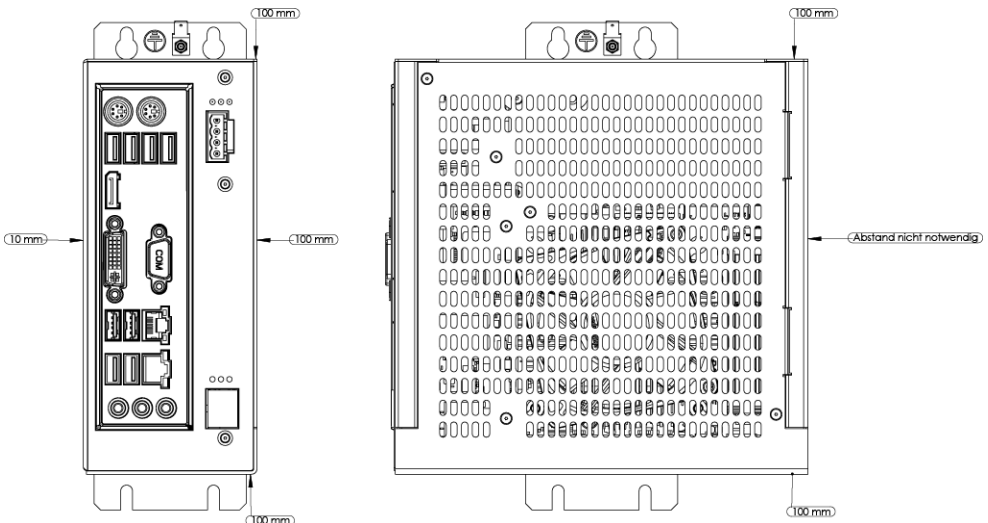
- When changing the position of the mount, the 4 cylinder screws with hexagon socket and extremely low head (Bossard BN1206 M5 with a maximum length of 6 mm) must be used. The tightening torque is 1.6 Nm.

7.1 Mounting Material

- Disks EN ISO 7089-5-200HV
- Lock washer DIN 7980, galvanized spring steel, size 5
- Screws M5x10-8.8 (10 mm minimum length)
- Torque 6 Nm

A different mounting position is not recommended, since the specified ambient temperature cannot be guaranteed. In addition, a clearance of 10 cm between the nearest components (control cabinet wall) must be ensured.

7.2 Minimum Clearance to the Next Components

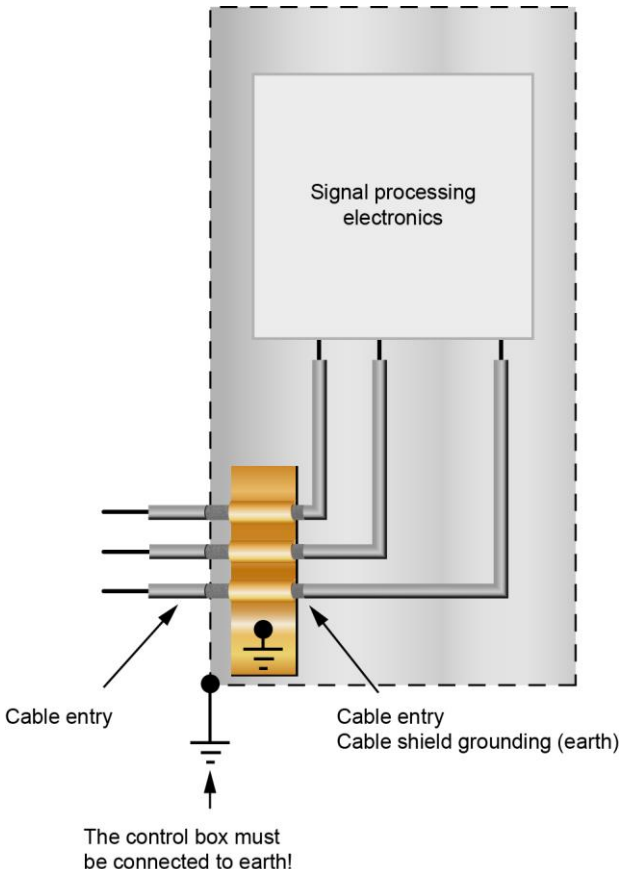


8 Wiring Guidelines

8.1 Ground

The signal-processing electronics must be connected to ground through the mounting on control cabinet or over the ground terminal provided. It is important to create a low-ohm ground connection, only then can error-free operation be guaranteed. The ground connection should have a maximum cross section and the largest (electrical) surface possible.

Any noise signals that reach the signal-processing electronics over external cables must be filtered through the ground connection. High frequency noise can also be dissipated with a large electrical surface (skin effect).



8.2 Shielding

The wiring for the COM1, display port, Ethernet, VGA, and DVI must be shielded. The low-ohm shielding is either connected at the entry to the control cabinet or directly before the PC 443 over a large, low-ohm surface (cable grommets, grounding clamps)!

Noise signals can therefore be prevented from reaching the electronics and affecting the function.

8.3 ESD Protection

Typically, the PS/2 devices (keyboard, mouse) are not equipped with shielded cables. The same applies to the USB keyboard and mouse. These devices are disrupted by ESD and in some instances, no longer function.

Before any device is connected to or disconnected from the PC 443, the potential should be equalized (by touching control cabinet or ground terminal). This will allow the dissipation of electrostatic loads (caused by clothing/shoes).

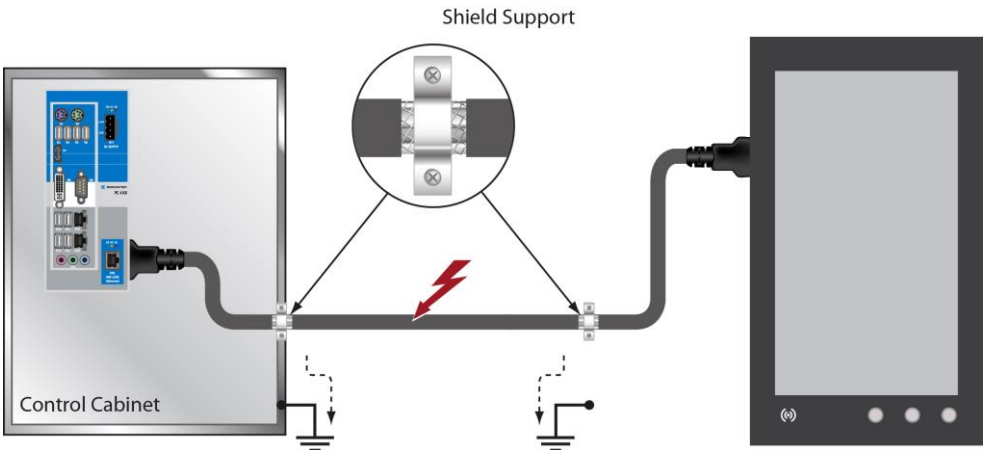
9 HMI-Link G2 Wiring

9.1 Ground

For the HM Link G2 line, CAT5e or CAT6 cables with shielded RJ45 connectors must be used.

The cable shielding must be connected to ground on both sides to prevent noise signals from reaching the electronics and affecting the function.

For CAT5e cables, the total allowable length is limited to 90 m. To utilize the maximum 100 m length of the Link system, at least a CAT6 cable must be used.



9.2 HMI-Link G2 Cable Specifications

The RJ45 cable must be wired 1:1 in accordance with the EIA568A standard.

Self-fabricated cables must be tested for compliance with the limit values corresponding to the cable class (CAT5e/CAT6...).



EIA 568A Pin Assignment		
Pin	Wire Color	Signal
1	White/green.	HMI P0
2	green	HMI N0
3	White/orange	HMI P1
4	blue	HMI P2
5	White/blue	HMI N2
6	Orange	HMI N1
7	White/brown	HMI P3
8	Brown	HMI_N3

9.3 HMI-Link G2 Wires in the Cable Strand

To guarantee correct function, it is important to ensure that in the cable strand, the wires do not run parallel over long distances. This especially applies to fast data lines such as Ethernet, VARAN, as well as the HMI-Link. Here, it is recommended to use a cable that is equal to or better than the CAT6A standard.

When multiple HMI-Link cables run in parallel, the following limit values for the maximum length of the parallel wiring apply:

Cable type	30 m	50 m	70 m	100 m
CAT5e/CAT6	6	4	2	1
CAT6a/CAT7	6	6	6	6

Crosstalk between the data lines and the interference it causes, which are coupled between the wires should be monitored. The highest number of cables allowed in a cable strand with multiple HMI-Link cables, which are run over a defined distance, is specified.

10 Disposal

To dispose of the product, the respective, possibly country-dependent, guidelines must be met and followed.

Documentation Changes

Change date	Affected page(s)	Chapter	Note
03.03.2017	20	8.1 Ground	Graphic exchanged
27.07.2017	1		Text addition "G2"
	4	1.1 Performance Data	Table corrected; note added
	6	1.4 Miscellaneous	Text addition "G2"
	9	3 Connector Layout	Graphic replaced
	14	3 Connector Layout	Corrected X18 name
	23	9 HMI-Link Wiring	Text addition "G2"
		9.1 Ground	Text addition "G2"
	24	9.2 HMI-Link Cable specifications	Text addition "G2"
		9.3 HMI-Link wires in the Cable Strang	Text addition "G2"
12.03.2018	21	7 Mounting Instructions	Addition mount
28.03.2018	17	4.2 HMI-Link Status Display	Extended
22.06.2020		6 Exchanging the BIOS Battery	Table extended