

HMI-Link G2.1 Device

PC 301-E12

Operating Manual

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HMI-Link G2.1 Device

PC 301-E12

Using HMI-Link G2.1 Device allows HMI-Link G2.1 display units to be connected with a SIGMATEK IPC. This allows the transmission of USB and display signals up to 100 m.



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1 Introduction

1.1 Target Group/Purpose of this Operating Manual

This operating manual contains all information required to operate this product.

This operating manual is intended for:

- Project planners
- Technicians
- Commissioning engineers
- Machine operators
- Maintenance/test technicians

General knowledge of automation technology is required.

Further help and training information, as well as the appropriate accessories can be found on our website www.sigmatek-automation.com

Our support team is happily available to answer your questions.
Please see our website for our hotline number and business hours.

1.2 Important Reference Documentation

This and additional documents can be downloaded from our website or obtained through SIGMATEK Support.

1.3 Contents of Delivery

1x HMI-Link G2.1 Device PC 301-E12

2 Basic Safety Guidelines

2.1 Symbols Used

The following symbols are used in the operator documentation for warning and danger messages, as well as informational notes:

DANGER



Danger indicates that death or serious injury **will occur**, if the specified measures are not taken.

⇒ To avoid death or serious injuries, observe the all guidelines.

Danger indique une situation dangereuse qui, faute de prendre les mesures adéquates, **entraînera** des blessures graves, voire mortelles.

⇒ Respectez toutes les consignes pour éviter des blessures graves, voire mortelles.

WARNING



Warning indicates that death or serious injury **can** occur, if the specified measures are not taken.

⇒ To avoid death or serious injuries, observe the all guidelines.

Avertissement d'une situation dangereuse qui, faute de prendre les mesures adéquates, **entraînera** des blessures graves, voire mortelles.

⇒ Respectez toutes les consignes pour éviter des blessures graves, voire mortelles.

CAUTION



Caution indicates that moderate to slight injury **can** occur, if the specified measures are not taken.

⇒ To avoid moderate to slight injuries, observe the all guidelines.

Attention indique une situation dangereuse qui, faute de prendre les mesures adéquates, **peut** entraîner des blessures assez graves ou légères.

⇒ Respectez toutes les consignes pour éviter des blessures graves, voire mortelles.



INFORMATION

Provides important information on the product, handling or relevant sections of the documentation, which require attention.



Danger for ESD-sensitive components. Les signes de danger pour les composants sensibles aux décharges électrostatiques.

2.2 Disclaimer



The contents of this operating manual were prepared with the greatest care. However, deviations cannot be ruled out. This operating manual is regularly checked and required corrections are included in the subsequent versions. The machine manufacturer is responsible for the proper assembly, as well as device configuration. The machine operator is responsible for safe handling, as well as proper operation.

The current operating manual can be found on our website. If necessary, contact our support.

Subject to technical changes, which improve the performance of the devices. The following operating manual is purely a product description. It does not guarantee properties under the warranty.

Please thoroughly read the corresponding documentation and this operating manual before handling a product.

SIGMATEK GmbH & Co KG is not liable for damages caused through non-compliance with these instructions or applicable regulations.

2.3 General Safety Guidelines

The safety guidelines in the other sections of this operating manual must be observed. These instructions are visually emphasized by symbols.



According to EU Guidelines, the operating instructions are a component of a product.

This operating manual must therefore be accessible in the vicinity of the machine since it contains important instructions.

This operating manual should be included in the sale, rental or transfer of the product, or its online availability indicated.

Maintain this operating manual in readable condition and keep it accessible for reference.

Regarding the requirements for Safety and health connected to the use of machines, the manufacturer must perform a risk assessment in accordance with machine guidelines 2006/42/EG before introducing a machine to the market.

Before commissioning this product, check that conformance with the provisions of the 2006/42/EG guidelines is correct. As long as the machine with which the product should be used does not comply with the guideline, operating this product is prohibited.

Operate the unit with devices and accessories approved by SIGMATEK only.

CAUTION



Handle the device with care and do not drop or let fall.

Prevent foreign bodies and fluids from entering the device.

The device must not be opened, otherwise it could be damaged!

The module complies with EN 61131-2.

In combination with a machine, the machine builder must comply with EN 60204-1 standards.

For your own safety and that of others, compliance with the environmental conditions is essential.

The control cabinet must be connected to ground correctly.

To perform maintenance or repairs, disconnect the system from the power supply.

3 Norms and Guidelines

3.1 Guidelines

The product was constructed in compliance with the following European Union guidelines and tested for conformity.

3.1.1 EU Declaration of Conformity



EU Declaration of Conformity

The product HMI-Link G2.1 Device PC 301 E12 conforms to the following European guidelines:

- **2014/35/EG** Low-voltage guideline
- **2014/30/EU** “Electromagnetic Compatibility” (EMC guideline)
- **2011/65/EU** “Restricted use of certain hazardous substances in electrical and electronic equipment” (RoHS Guideline)

The EU Conformity Declarations are provided on the SIGMATEK website. See Products/Downloads or use the search function and the keyword “EU Declaration of Conformity”.

4 Technical Data

4.1 Performance Data

Interfaces	1x HMI Local OUT (HMI-Link G2.1) 1x USB 2.0 (Type B) IN 1x DisplayPort IN
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In order to use the HMI-Link, a second-generation SIGMATEK HMI-Link (G2.1) display unit is required on the remote station.

4.2 Electrical Requirements

Supply voltage	typically +24 V DC $\pm 20\%$ (SELV/PELV)
Supply voltage (UL)	+24 V DC $\pm 20\%$ (NEC Class 2 or LVLC) ⁽¹⁾
Current consumption at 24 V DC	maximum 170 mA

⁽¹⁾ For USA and Canada:

The supply must be limited to:

- a) max. 5 A at voltages from 0-20 V DC, or
- b) 100 W at voltages from 20-60 V DC.

The limiting component (e.g. transformer, power supply or fuse) must be certified by an NRTL (Nationally Recognized Testing Laboratory).

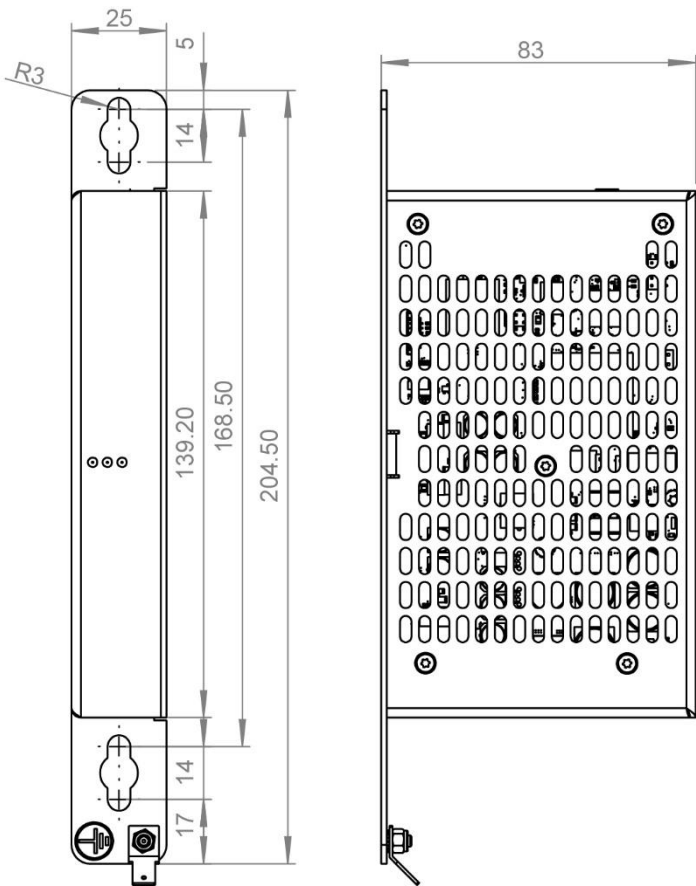
4.3 Environmental Conditions

Storage temperature	-20 ... +60°C	
Environmental temperature	0 ... +50°C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	2-9 Hz amplitude 3.5 mm 9-200 Hz 1 g (10 m/s²)
Shock resistance	EN 60068-2-27	15 g (150 m/s²)
Protection type	EN 60529	IP20

4.4 Miscellaneous

Article number	01-310-301-E12	
Hardware version	1.x	
Approvals	CE, designed according to UL	

5 Mechanical Dimensions

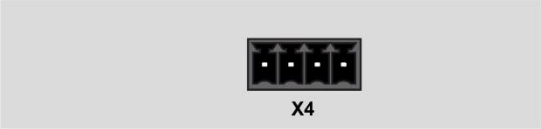


Dimensions	25 x 204.5 x 83 mm (W x H x D)
Material	housing: Aluminum anodized Natural C0
Weight	0.20 kg

6 Connector Layout

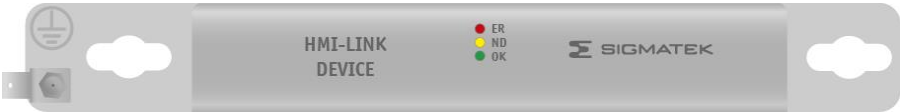


top

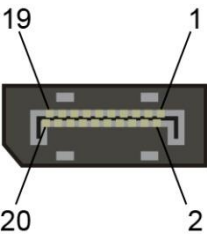


bottom

Front View



6.1 X1: Display port IN



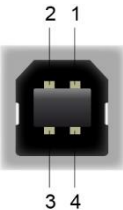
Pin	Function
1	n.c.
2	GND
3	n.c.
4	n.c.
5	GND
6	n.c.
7	Lane 1 (n)
8	GND
9	Lane 1 (p)
10	Lane 0 (n)
11	GND
12	Lane 0 (p)
13	Config1
14	Config2
15	AUX CH (p)
16	GND
17	AUX CH (n)
18	Hot Plug
19	Return
20	n.c.

n.c. = do not use



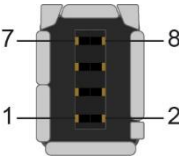
The respective display resolution is transmitted via AUX CH (p) and AUX CH (n) per i2C protocol.

6.2 X2: USB 2.0 IN (Type B)



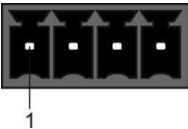
Pin	Function
1	+5 V
2	D0-
3	D0+
4	GND

6.3 X3: HMI Local OUT (HMI-Link G2.1, Mini-I/O)

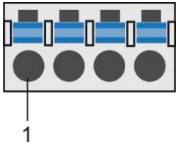


Pin	Function
1	HMI_P0
2	HMI_N0
3	HMI_P1
4	HMI_P2
5	HMI_N2
6	HMI_N1
7	HMI_P3
8	HMI_N3

6.4 X4 Supply voltage



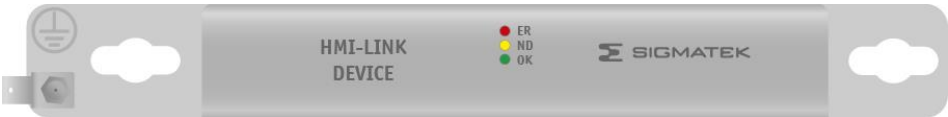
Pin	Function
1	+24 V
2	+24 V
3	GND
4	GND



6.4.1 Applicable Connectors

- USB:** Type B
- Display port:** 20-pin display port connector
- HMI-Link:** 8-pin Tyco Mini I/O Type 1
- Supply voltage** Phoenix Contact FK-FMC 1.5/ 4-ST-3.5

7 Status Displays



LED 1	red	ON	No HMI-Link connection between PC and terminal Check HMI-Link cable
LED 2	yellow	OFF	
LED 3	green	OFF	

LED 1	red	OFF	HMI-Link connection between PC and terminal available No video signal available Check display port cable
LED 2	yellow	ON	
LED 3	green	OFF	

LED 1	red	ON	HMI-Link connection between PC and terminal available Video signal available No USB signal Check USB cable
LED 2	yellow	OFF	
LED 3	green	ON	

LED 1	red	OFF	HMI-Link connection between PC and terminal available Video signal available No valid EDID data ⁽¹⁾ Restart PC and terminal
LED 2	yellow	ON	
LED 3	green	ON	

LED 1	red	OFF	System ready
LED 2	yellow	OFF	
LED 3	green	ON	

⁽¹⁾ EDID data (Extended Display Identification Data) contain exact information for the installed display. Using this data, the control of the display is configured at the signal source (e.g.: SIGMATEK IPC).

8 Assembly/Installation

8.1 Check Contents of Delivery

Ensure that the contents of the delivery are complete and intact. See chapter 1.3 Contents of Delivery for more information.



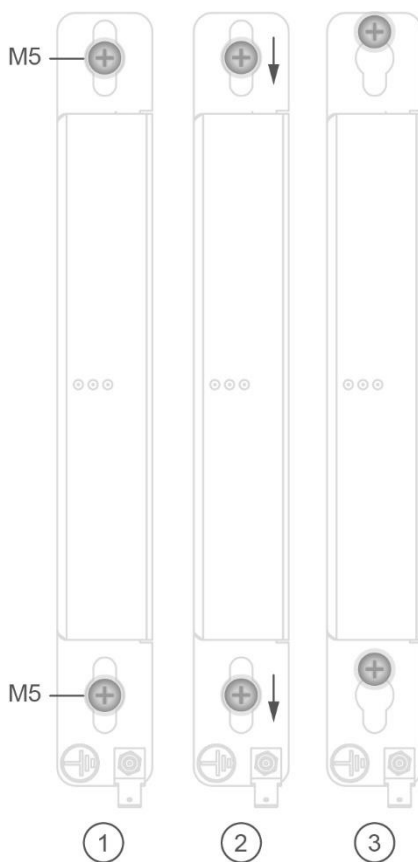
On receipt and before initial use, check the device for damage. If the device is damaged, contact our customer service and do not install the device in your system.

Damaged components can disrupt or damage the system.

8.2 Mounting Instructions

The HMI-Link G2.1 Device has 2 mounting holes for installation 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 for optimal cooling.

8.3 Installation

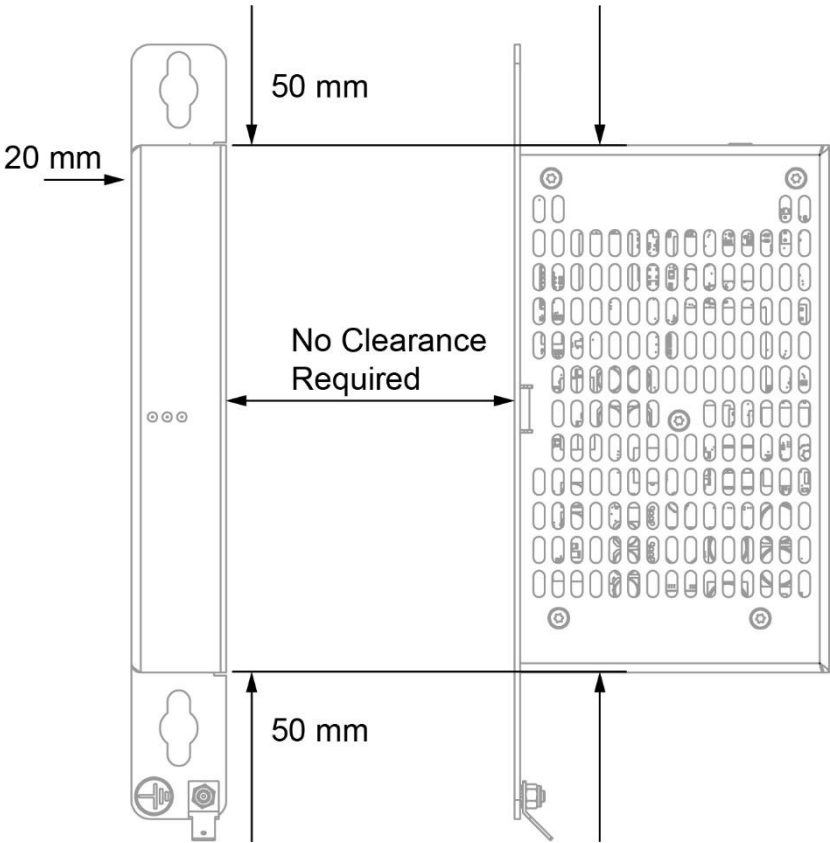


A different mounting position is not recommended, as the specified environmental temperature cannot be guaranteed.

8.4 Mounting Material

- 2 x M5 screws
- 2x M5 washers (EN ISO 7089-5-200HV)

8.5 Minimum Clearance to the Next Components

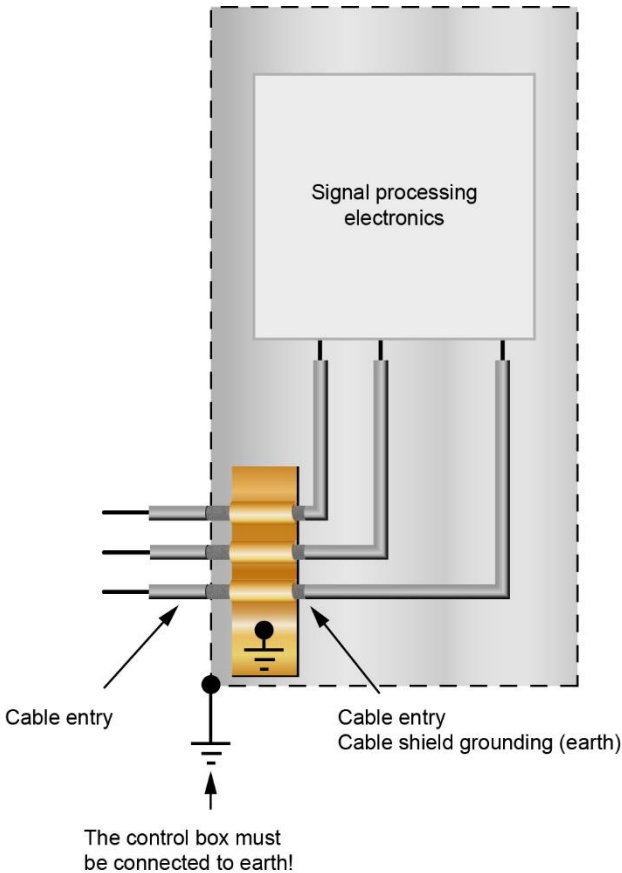


9 Wiring Guidelines

9.1 Ground

The signal-processing electronics must be connected to ground via the mount 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 must be made with the maximum cross section and 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 over a large (electrical) surface (skin effect).



9.2 Shielding

The wiring of all data lines must be shielded. The low-ohm shielding is either connected at the entry to the control cabinet or directly before the device over a large surface (cable grommets, grounding clamps)!

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

9.3 ESD Protection

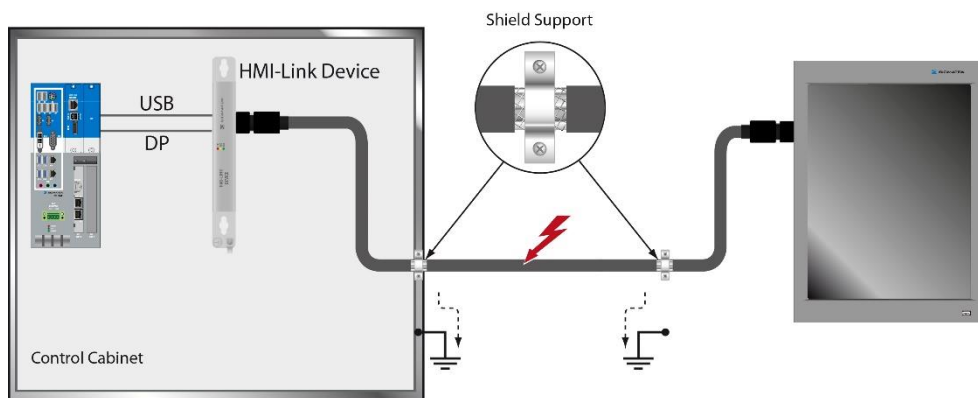


Before any device is connected to, or disconnected from the product, the potential should be equalized (by touching the control cabinet or ground terminal). Electrostatic loads (through clothing and shoes, etc.) can thereby be dissipated.

10 HMI-Link G2.1 Wiring

10.1 Shielding

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



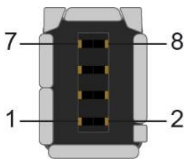
10.2 HMI-Link G2.1 Cable Specification

For the HMI-Link G2.1 line, CAT5e or CAT6 cables with shielded connectors must be used.

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

The HMI-Link G2.1 cable must be wired 1:1. A Tyco Mini I/O Type 1 connector plug must be used.

10.2.1 Tyco Mini I/O 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
shield	Cable shielding	shield

10.3 HMI-Link G2.1 Cable Routing

For CAT5e cables, the total allowable length is limited to 90 m. To utilize the maximum 100 m length of the HMI-Link G2.1, at least, CAT6 cable must be used.

To ensure correct function, it is important to ensure that in the cable strand, the wires do not run parallel over long distances. It is recommended that a cable equivalent to or better than the CAT6A standard be used.

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

These specifications must be observed to avoid crosstalk between the data lines (and the resulting interference).

11 Transport/Storage



This device contains sensitive electronics. During transport and storage, high mechanical stress must therefore be avoided.

For storage and transport, the same values for humidity and vibration as for operation must be maintained!

During transport, temperature and humidity fluctuations may occur. Ensure that no moisture condenses within or on the device by letting the device climatize to the room temperature while turned off.

12 Maintenance



During maintenance as well as servicing, observe the safety instructions from chapter 2.

12.1 Service

This product was constructed for low-maintenance operation.

12.2 Repair



When sent for repair, the panel should be transported in the original packaging if possible. Otherwise packaging should be selected that sufficiently protects the product from external mechanical influences, such as cardboard filled with air cushioning.

In the event of a defect/repair, send the panel with a detailed error description to the address listed at the beginning of this document.

13 Disposal



Should you need to dispose of the device, the national electronic scrap regulation must be observed.

The panel cannot be discarded with domestic waste.



Documentation Changes

Change date	Affected page(s)	Chapter	Note
06.08.2020	Document		General redesign
04.07.2024	Document		HMI-Link G2 changed to HMI-Link G2.1