TAE 2343

Multi-touch Operating Panel

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Translation from German

Multi-touch Operating Panel TAE 2343

The TAE 2343 multi-touch operating panel is used to visualize automated processes. The operation and monitoring of automated procedures are simplified using this display unit.

The projective capacitive touch screen is used to enter process data and parameters. The output is displayed on a 23.8" full HD TFT color display with LED backlighting.

On the PC side, a SIGMATEK HMI-Link of the second generation (G2) is required, which processes the display and USB signal feeds and transmits them to the terminal over a standard Ethernet cable (CAT-5e or CAT-6). A secure connection over distance of up to 100 m between the PC and terminal is therewith possible.

Contents

1 Technical Data

1.1 Performance Data

Interfaces	1x HMI Remote IN (HMI-Link G2) 1x USB 2.0 Type A OUT (left or right) 1x RFID reader HF (13,56 MHz) - multi-Iso protocol-capable
Internal interface connections and devices	1x TFT color display 1x projective capacitive touch screen
Control panel	Touch screen (projective capacitive)
Display	23.8" TFT color display Full HD, 1920 x 1080 Pixels LED Backlight

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

1.2 Electrical Requirements

Supply voltage	typically +24 V DC (+18-30 V DC)	
Supply voltage (UL)	+18-30 V DC Class 2	
Current consumption of power supply at +24 V	typically 1.45 A(1)	maximum 2 A(1)
UL standard	for UL(2) : must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy.	

(1) The current consumption is dependent on the connected load
(2) In US according to Class 2 UL 1310 or UL 61010-1, 3rd edition, chapter 9.4 or LPS (limited power supply) UL 60950-1 or Limited Energy UL 1585

For loading the internal capacitors, power consumption may be increased for a short time (in the microsecond range).
This value is dependent of the input voltage and impedance of the power source

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).

Pour les États-Unis et le Canada:

L'alimentation doit être limitée à:
a) max. 5 A pour des tensions de 0-20 V DC, ou
b) 100 W pour des tensions de 20-60 V DC

Le composant imposant la limite (par exemple, transformateur, alimentation électrique ou fusible) doit être certifié par un NRTL (National Recognized Testing Laboratory, par exemple, UL).

1.3 Terminal

Material	front: glass rear panel including covers: Powder coated steel sheet wrap-around aluminum boarders
Dimensions	385 x 664.6 x 49.3 mm (W x H x D)
Weight incl. mounting bracket	11.5 kg

1.4 Environmental Conditions

Storage temperature	-20 ... +60 °C	
Environmental temperature	0 ... +45 °C	
Humidity	10-90 %, non-condensing	
Operating conditions	Pollution degree 2 Indoor use altitude up to 2000 m	
EMC resistance	according to EN 61000-6-2 (industrial area)	
EMC noise generation	according to EN 61000-6-4 (industrial area)	
Radio	in accordance with ETSI EN 300 330 (2014/53/EU, RED Directive)	
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), duration 11 ms, 18 Shocks
Protection Type	EN 60529: protected through the housing	front: IP54 (no UL-rating) cover: IP20 (no UL-rating)

1.5 Display 23.8"

Type	23.8" TFT color display
Resolution	Full HD, 1920 x 1080 pixels
Color depth	6 Bit + AFRC
LCD mode	normally black
LCD Polarizer	transmissive
Pixel size	0.2745 x 0.2745 mm
Active surface	527.04 x 296.46 mm
Backlighting	LED backlight
Contrast	typically 1000
Brightness	typically 250 cd/m²
Angle CR ≥ 10	left, right, below, above 178°
Life span	after 30,000 hours at an ambient temperature of 25 °C, the brightness reduces to 50% or less of the original power.

Due to the production process of displays, defective pixels cannot be completely excluded!

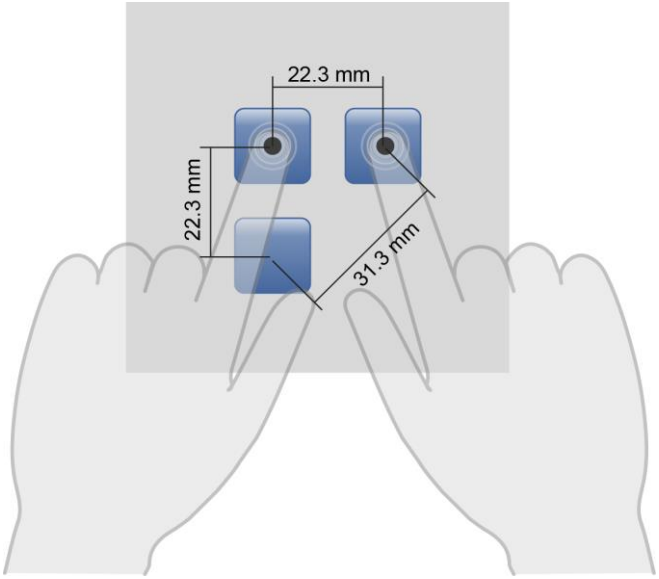
1.6 Control Unit

Touch panel	projective capacitive glass touch panel
Sensor type	Film glass
Cleaning	see chapter: Cleaning the Touch Screen

The TAE 2343 has a projective capacitive touch screen built in, with which 10-finger input, Zoom and gesture functions can be implemented. Data can be input using fingers, a projective capacitive touch pen and while wearing thin gloves. The device must always have a good ground connection so that the function of the touch screen is stable. In addition, it may be necessary to calibrate the touch screen for the respective environmental conditions.

Distance needed for operating elements in multi-touch applications:

In order to guarantee smooth operation in multi-touch applications, buttons and control elements, which should be operated at the same time, must have the minimum distance shown below (depending on the estimated touch point).



The size of the buttons and operating elements directly affect the operability of the application. Small operating elements should therefore be avoided.

1.7 Miscellaneous

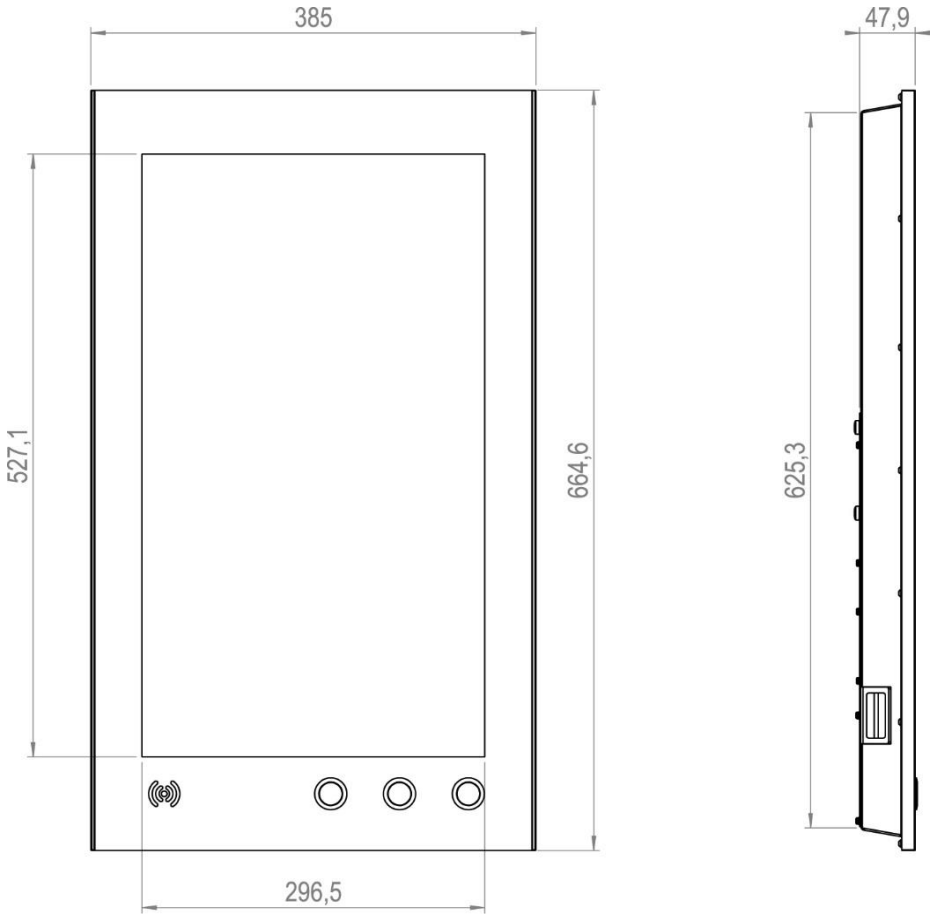
Article number	12-200-2343
Hardware version	1.x
Software version	1.x
Touch pen	01-690-059-3
Standard	UL (E247993)
Approvals	CE, cULus
FCC remote terminals	the unit contains an FCC-certified device with the ID 2ACQNPHR001

HMI-Link devices of the 2nd generation (G2), can only be operated with remote terminals of the same system family.
HMI-Link of the 1st and 2nd generation are not compatible!

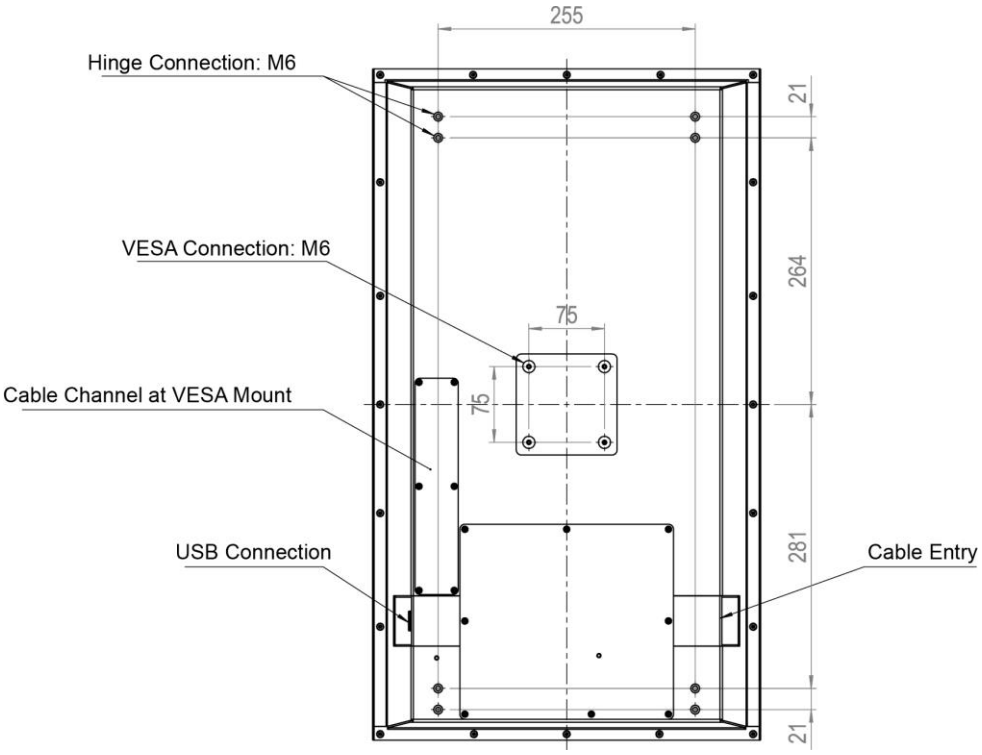
Before the PC is switched on, the terminal or manual control unit must be powered and the HMI cable connected, since otherwise correct initialization of the terminal or manual control unit cannot be guaranteed.

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

2 Mechanical Dimensions



2.1 Mounting Holes



Mounting screws for VESA mount or hinge attachment	M6 – 8.8
Minimum screw depth rear panel	6 mm
Tightening torque	9.5 Nm
A locking device must be used: (e.g. locking screw, lock washers, medium strength thread lock fluid)	
Thread depth in rear panel	7.8 mm

3 Chemical Resistance

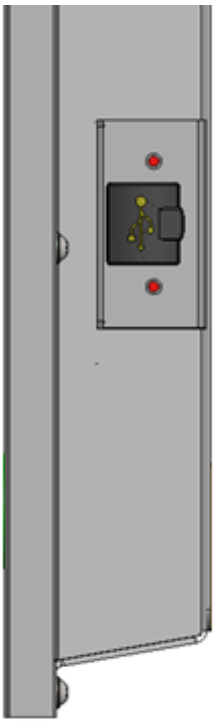
3.1 Glass Front

Solution	Effect over time	
	1 hour	24 hours
Methyl, ethyl, ketone	none	None
Cyklothexanol	None	None
Acetone	None	None
Ethanol	None	None
Benzyl alcohol	None	None
Trichloroethane	None	None
Perchloroethylene (Perklone)	None	None
Trichloroethylene	None	None
Methylene chloride	None	None
Diethyl ether	None	None
Toluene	None	None
Xylene	None	None
Benzine	None	None
Diesel oil	None	None
Nitric acid <10 %	None	Dosage
Sodium hydroxide <10 %	None	Dosage
Turpentine	None	None
Ethyl acetate	None	None

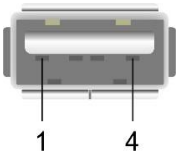
Solution	Visual effect after 1 hour exposure
Coal tar oil / toluene	none
Trichloroethylene	none
Acetone	none
Alcohol	none
Benzine	none
Machine oil	none
Ammonia	Dosage
Glass cleaner	none
Mayonnaise	none
Ketchup	none
Wine	none
Salad oil	none
Vinegar	Dosage

4 Connector Layout

4.1 Side View (optional right or left)

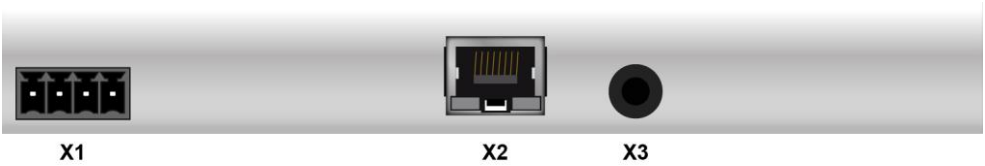


X4: USB 2.0 (Type A)

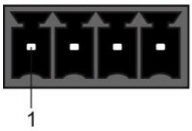


Pin	Function
1	+5 V
2	D-
3	D+
4	GND

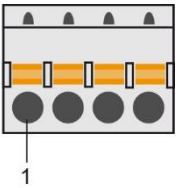
4.2 Backside



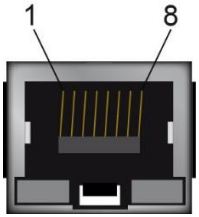
X1: Supply (4-pin Phoenix RM 3.5)



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



X2: HMI Remote IN (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

X3: Service Interface (jack plug 3.5 mm 4-pin according to IEC 60603-11)

Pin	Function
1	GND
2	TxD
3	RxD
4	n.c.

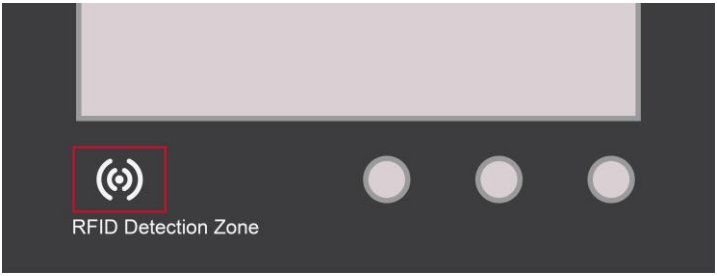
n.c. = do not use

(for service purposed only)

On the service interface X3, only a separate cable that can be ordered from SIGMATEK, may be used.
Using a different cable can lead to malfunction and damage.

4.3 Front

In the front shown below, three dummy covers are provided. The dummy covers can be replaced with standardized installation elements, such as key switches and buttons.



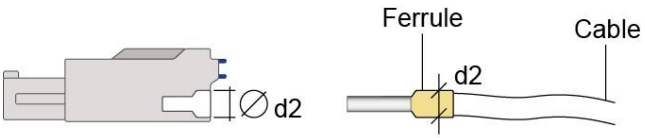
4.4 Applicable Connectors

Connectors:
X1: Phoenix Contact FK-MCP 1.5/ 4-ST-3.5 (not included with delivery)
X2: RJ45 connector plug, at least CAT5e 8-pin (not included in delivery)
X3: Service interface with 3.5 mm jack plug 4-pin according to EN 60603-11
X4: USB Type A connector

The complete plug set is available from SIGMATEK with the article number 12-600-216.

Connection guideline:

Stripping length:	10 mm
Mating direction:	parallel to the conductor axis or circuit board
Conductor cross section rigid:	0.2-1.5 mm^2
Conductor cross section flexible:	0.2-1.5 mm^2
Conductor cross section AWG/kcmil:	24-16
Conductor cross section flexible with ferrule without plastic sleeve:	0.25-1.5 mm^2
Conductor cross section flexible with ferrule with plastic sleeve:	0.25-0.75 mm^2 (reason for reduction d2 of the ferrule)

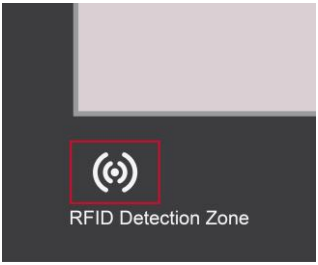


d2 = max. 2.8 mm

5 Peripheral Devices

5.1 RFID Reader

An HF-RFID reader (13.56 MHz, IOS15693) is built into the unit. To read, as well as write to an RFID card, it must be held closely to the unit at the location provided on the front as shown in the following image.



The RFID reader is certified or released in compliance with the following standards:

EMC resistance	EN61000-6-2 (industrial area)
EMC noise generation	EN61000-6-4 (industrial area)
Radio frequency conformity CE	ETSI EN 302 291-1/EN 300 330 Class 1
Radio frequency conformity FCC	FCC CFR 47 Part 15
Product safety	EN 60950-1:2006

Further information on use, as well as the technical data can be found the separate handbook of the RFID reader RFID022 SIGMATEK article number: 01-691-022

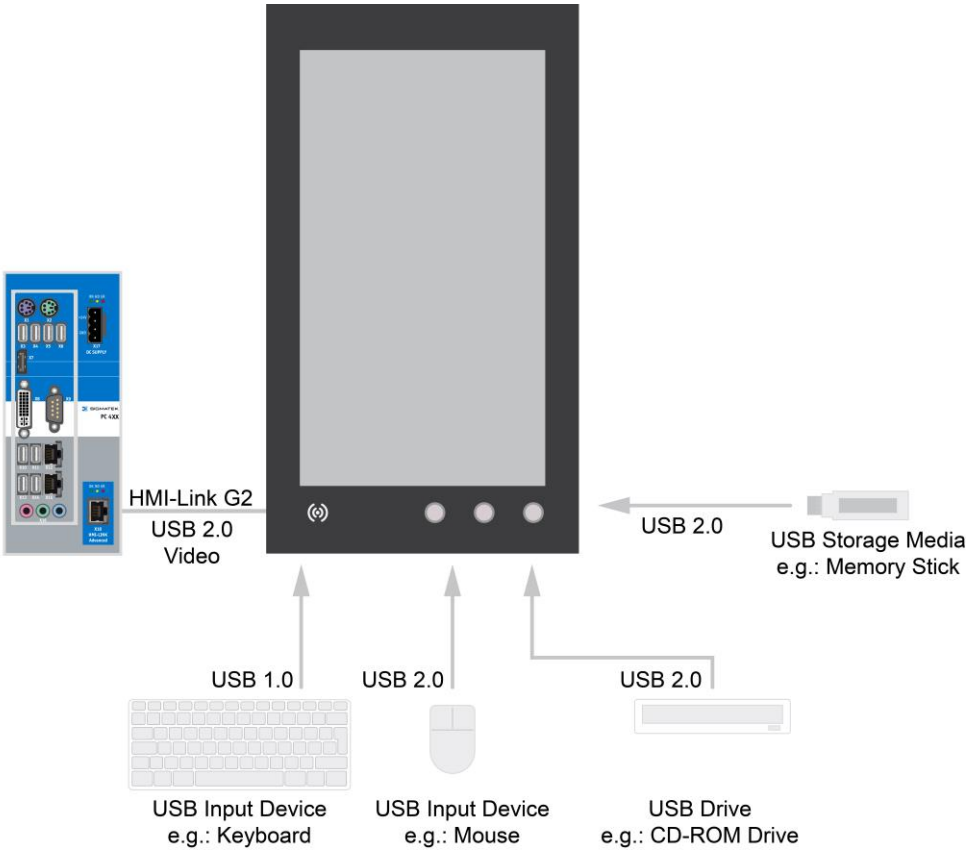
Technical changes to the device, as well as improper use can lead to the loss of the FCC license and generate interference, which can affect the function of nearby devices.
Please note the national standardization when operating the wireless device.

5.2 USB Devices

The TAE 2343 has an internal USB hub with multiple USB ports, of which, 1 USB interface is configured for user access.
USB devices can only be connected directly (without hub) to the external USB interface X4.

The maximum current capacity of the USB-interface X4 is 500 mA and is protected by a circuit breaker.

It should be noted that the maximum cable length of 5 m cannot be exceeded. The transmission of the USB interface is configured according to the USB 2.0 standard.



It should be noted that many of the USB devices on the market do not comply with USB specifications; this can lead to device malfunctions. This can lead to malfunction of the device. It is also possible that these devices will not be detected at the USB port or function correctly. Therefore, it is recommended that every USB stick be tested before actual use.

5.3 Terminal Controller

In the TAE 2343, a USB-connected control unit is integrated with the following functions:

- Regulation of the display brightness
- Reading serial number, hardware status, Firmware version, device type

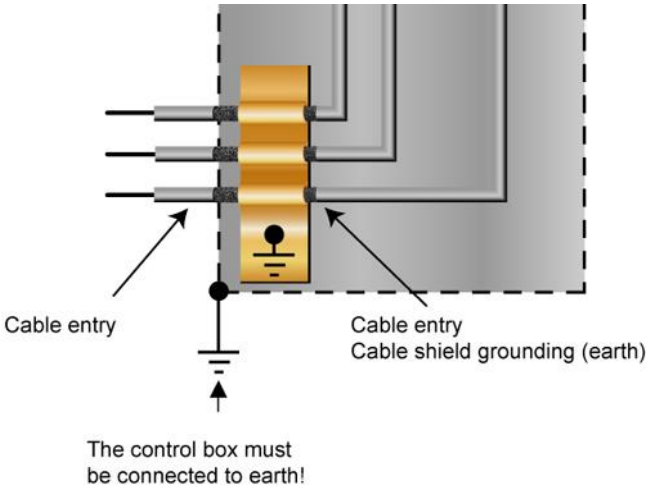
To control the terminal controller, a library in the form of a DLL (Dynamic Link Library) as well the corresponding header file is available. With this library, the available function can be used. This can be requested from SIGMATEK separately.

6 Wiring Guidelines

6.1 Ground

The terminal must be connected to ground through the assembly on the control cabinet or over the connection 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 terminal over external cables must be filtered through the ground connection. High frequency noise can also be dissipated with a large electrical surface (skin effect).



6.2 ESD Protection

Typically, USB devices (keyboard, mouse) are not equipped with shielded cables. These devices are disrupted by ESD and in some instances, no longer function.

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

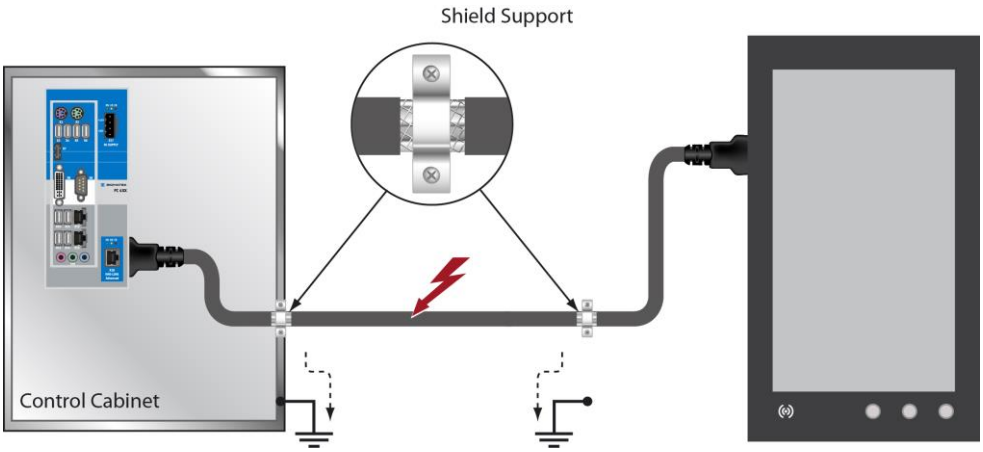
7 HMI-Link G2 Wiring

7.1 Ground

For the HMI 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.



7.2 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

7.3 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 is 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.

8 Cleaning the Touch Screen

Caution!
Before cleaning the touch screen, the terminal must first be turned off to avoid unintentionally triggering functions or commands!

The front of the terminal can only be cleaned with a soft, damp cloth. A screen cleaning solution such as an anti-static foam, water with a mild detergent or alcohol should be used to dampen the cloth. The cleaning solution should be sprayed onto the cloth and not directly onto the terminal.

No erosive cleaning solutions, chemicals, abrasive cleansers or hard objects that can scratch or damage the glass surface may be used.

If the terminal comes into contact with toxic or erosive chemicals, carefully clean the terminal immediately to prevent corrosion!

To ensure the optimal function of the terminal, the touch screen should be cleaned at regular intervals!

9 FCC Statement

This Device Contains FCCID: 2ACQNPHR001

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Section 15.21 Information to user

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Section 15.105 (b)

Note: This equipment has been tested and found to comply with the Limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television Reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The unit complies with the applicable CE requirements and FCC part 15.

Sigmatek Product Name:	**Sigmatek RFID022**
Sigmatek Part number:	**01-691-022**
FCC ID:	**2ACQNPHR001**

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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
24.10.2016	13	4.2 Backside	Emergency stop deleted
	14	4.4 Applicable Connectors	Plug set added
23.01.2017	4	1.2 Electrical Requirements	Table content changed
	5	1.4 Environmental Conditions	
		1.7 Miscellaneous	
	7		
27.07.2017	1		Text addition “G2”
	4	1.1 Performance Data	Text addition “G2”
	7	1.7 Miscellaneous	Text addition “G2”
	13	4.2 Backside	Text addition “G2”, added cable note
	14	4.4 Applicable Connectors	Added Connection guideline
	16	5.2 USB Devices	graphic replaced
	19	7 HMI-Link Wiring	Text addition “G2”
		7.1 Griound	Text addition “G2”
	20	7.2 HMI-Link Cable Specifi-cations	Text addition “G2”
		7.3 HMI-Link Wires in the Cable Strand	Text addition “G2”
10.08.2018		entire document	X7 changed to X4
17.10.2018	4	1.2 Electrical Requirements	UL information added
		1.7 Miscellaneous	
	6		
12.02.2019	5	1.4 Environmental Conditions	Radio norm assimilated