HGT 1051

Handheld Operating Panel

Instruction Manual

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Publisher: SIGMATEK GmbH & Co KG
A-5112 Lamprechtshausen
Tel.: +43/6274/4321
Fax: +43/6274/4321-18
Email: office@sigmatek.at
WWW.SIGMATEK-AUTOMATION.COM

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Translation of the Original Instruction

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10.1" Handheld Control Panel HGT 1051

The HGT 1051 is an intelligent handheld operating panel used for programming and visualization of automated processes. Process diagnostics, operating and monitoring of processes are thereby simplified.

An emergency stop, key and confirmation switch are implemented as a Safety application.

A touch screen serves as the input medium for process data and parameters. The output is shown on a 10.1" WXGA TFT color display.

With the LSE mask editor, graphics can be created on the PC, then stored and displayed on the handheld control panel.

The available interfaces can be used to exchange process data or configure the handheld operating panel. On the Flash card, the operating system, application and application data are stored.

Table of Contents

1 Essential Components

- 10.1" WXGA TFT color display with LED backlighting
- 10.1“ projected capacitive touch screen
- Confirmation button (mounted on the rear side), 2-channel configuration
- Key switch (mounted top-center), two channel wiring.
- Emergency stop button (mounted top-center), two channel wiring.
- USB socket with cover
- M16 connector (90° swivel)
- Applicable Safety controls:
  - SCP XXX

2 Introduction

2.1 Target Group/Purpose of this Manual

This operating manual contains all information required for operating the product.

This operating manual is intended for:

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

General knowledge of automation technology is required.

Further help and information on training, and 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.

2.2 Important Reference Documentation

- Safety System Handbook
- Operating Panel Connection Cables

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

2.3 Contents of Delivery

1x HGT 1051

3 Basic Safety Guidelines

3.1 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 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 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 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.

3.2 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 and device configuration. The machine operator is responsible for safe handling and 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.

3.3 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 by 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!

If the device does not function as properly or is damaged in a way that could pose a hazard, it must no longer be used!

Regularly check the housing for mechanical damage.

The handheld operating device can only be used in the visible area for the application to control, the system integrator must perform a risk analysis.

The module complies with EN 61131-2.

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

For your safety and that of others, compliance with 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.

3.4 Designated Use

The Safety functions implemented in the product are designed for use with safety applications in a PLC control and meet the required conditions for safe operation in compliance with SIL 3, HFT 1 according to EN IEC 62061 and in compliance with PL e. Cat. 4 in accordance with EN ISO 13849-1.

CAUTION

The instructions contained in this operating manual must be followed.

For error-free operation, proper transport and storage are essential.

Installation, mounting, programming, initial start-up, operation, maintenance and decommissioning can only be performed by qualified personnel.

Qualified personnel in this context are people, who have completed training or have trained under the supervision of qualified personnel and have been authorized to operate and maintain safety-related equipment, systems and facilities in compliance with the strict guidelines and standards of safety technology (functional safety).

For your safety and that of others, use the product for its designated purpose only.

Correct EMC installation is also included under designated use.

Non-designated use consists of:

- any changes made to the module or the use of damaged modules.
- use of the module inconsistent with the technical margins described in this manual or the specifications defined in the technical data.

As required by EN ISO 13850, section 4.1 and EN 60204-1, section 10.7.1, confusion between a functioning and non-functioning handheld operating panel is possible and must be prevented.

3.5 Software/Training

The application is created with the software LASAL CLASS 2 and LASAL SCREEN Editor, the safety application is created using the LASAL SAFETYDesigner. Basic safety information (functional safety) can be found in the Safety System Handbook.

Training for the LASAL development environment, with which the product can be configured, is provided. Information on our training schedule can be found on our website.

4 Norms and Guidelines

4.1 Residual Risks

CAUTION

In the system integrator’s risk analysis, the following residual risks must be taken into consideration for the product:

- Release of environmentally harmful substances, emissions and undesired temperatures
- dangerous contact voltages
- effects of electrical, magnetic and electromagnetic fields produced during operation
- possible effects of information technology devices

4.2 Safety of the Machine or Equipment

Observe all on-site rules and regulations for accident prevention and occupational safety.

4.3 Regular Technical Inspection of the Safety-Related Switches

CAUTION

According to the machine guideline, mechanical and electromechanical safety-oriented components (e.g. relays, switches, etc.) must be regularly checked for correct function.

Emergency stop switch: at least 1x/month

Key switch: at least 1x/year

Confirmation switch: at least 1x/year

Please note the requirements of your machine. Due to Type C standards or other guidelines, requirements could differ regionally.

4.4 Guidelines

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

4.4.1 Functional Safety Standards

EN IEC 62061	Safety of machinery - Functional safety of safety-related control systems
EN ISO 13849-1	Safety of machinery - Safety-related components of controls - Part 1: General Design Principles
EN ISO 13849-2	Safety of machinery - Safety-related components of controls - Part 2: Validation
EN ISO 13850	Safety of machines - Emergency stop function - design principles

4.4.2 EU Conformity Declaration

CE

EU Conformity Declaration

The HGT 1051 conforms to the following European guidelines:

- **2006/42/EG** Machine 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. They can be found in the download area of the respective product.

4.5 Safety-relevant Parameters

The use of the specified parameters requires a risk analysis of the end application.

Input Module	Safety Ratings (SIL 3, HFT 1, PL e / Cat. 4)[1)]
HGT 1051 Including Safe CPU (SCP XXX)	PFH = 1.1E-11 (1/h) $MTTF_D$ = 306 years DC = 99 %

Confirmation Switch	B_{10D} = 100,000
Emergency stop switch	B_{10D} = 325,000
Key Switch	B_{10D} = 10,000

[1)] Depending on the application, the probability of failure must be determined for the electromechanical components included based on the B_{10D} values listed here and integrated into the calculation for the entire system.

5 Type Label

Exemplary nameplate (symbol image)

HW: Hardware version
SW: Software version

6 Technical Data

6.1 Performance Data

Processor	EDGE2 Technology
Processor cores	2[1)]
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-Kbyte L2 Cache
Internal program and data memory (DDR3 RAM)	512-Mbyte
Internal remnant data memory	128-kbyte MRAM
Internal storage device	4-Gbyte microSD card (3D-TLC pSLC technology)[2)]
Internal I/O	no
Interfaces	2x Ethernet 1x USB 2.0 Type A 1x Safety interface
Internal interface connections and devices	1x TFT color display 1x USB (touch connection)
Operating panel	Touch screen (projective capacitive) Confirmation switch (2 normally open, 3-stage) key switch (2 normally open) Emergency stop switch (2 normally closed contacts)
Display Resolution	10.1" TFT color display 800 x 1280 Pixel
Signal generator	no
Real-time clock	yes (buffered circa 10 days via gold foil capacitor)
Cooling	passive (fanless)

[1)] Caution: When programming (with LASAL) on multi-core CPUs, particular focus must be placed on thread security!

[2)] The 4 Gbyte microSD card is formatted to 1 Gbyte in order to achieve the lifetime of a standard SLC card. A format change to the full 4 Gbyte is not allowed and will result in a massive reduction of the microSD card's lifetime.

CAUTION

The Safety interface must be used exclusively with the SIGMATEK SCP XXX! The status of the Safety-related inputs (confirmation, key, emergency stop switches) is sent to the SCP XXX.

The function of the confirmation, key and emergency stop switches must be tested at least once per month!

6.2 Electrical Requirements

Supply voltage	typically +24 V DC (PELV)	
	minimum +24 V DC (PELV)	maximum +30 V DC (PELV)
Supply voltage (UL)	+24-30 V DC (NEC Class 2 or LVLC)	
Current consumption Power supply +24 V	typically 408 mA (without externally connected devices)	maximum 464 mA (with external devices connected)
Protection class	III	
Inrush current	maximum 12.4 A for 60 µs	
USB current load	maximum 0.5 A	

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).

6.3 Terminal

Dimensions	226 x 264 x 76 mm (W x H x D) (without emergency/key switch)
Material	housing: PC/ASA color: RAL7024
Weight	1.1 kg without connector cable

6.4 Environmental Conditions

Storage temperature	-10 ... +60 °C	
Environmental temperature	0 … +50 °C	
Humidity	10-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
Noise emissions	≤ 70 dB	
EMC resistance	EN 61000-6-2 (industrial area) (increased requirements according to EN IEC 62061)	
EMC noise generation	EN 61000-6-4 (industrial area)	
Shock resistance	EN 60068-2-27	150 m/s²
Vibration tolerance	10 m/s²	
Protection type	EN 60529	IP54 (only with all protective caps in place)
Free fall (without packaging)	DIN EN 60068-2-31	500 mm

6.5 Display

Type	10.1” TFT LCD color display
Resolution	WXGA 800 x 1280 pixels
Color depth	24-bit RGB
LCD mode	normal black
LCD Polarizer	transmissive
Pixel size	0.1695 x 0.1695 mm
Backlighting	LED
Contrast	typically 800 : 1
Brightness	typically 300 cd/m²
Angle CR ≥ 10	85° from all sides

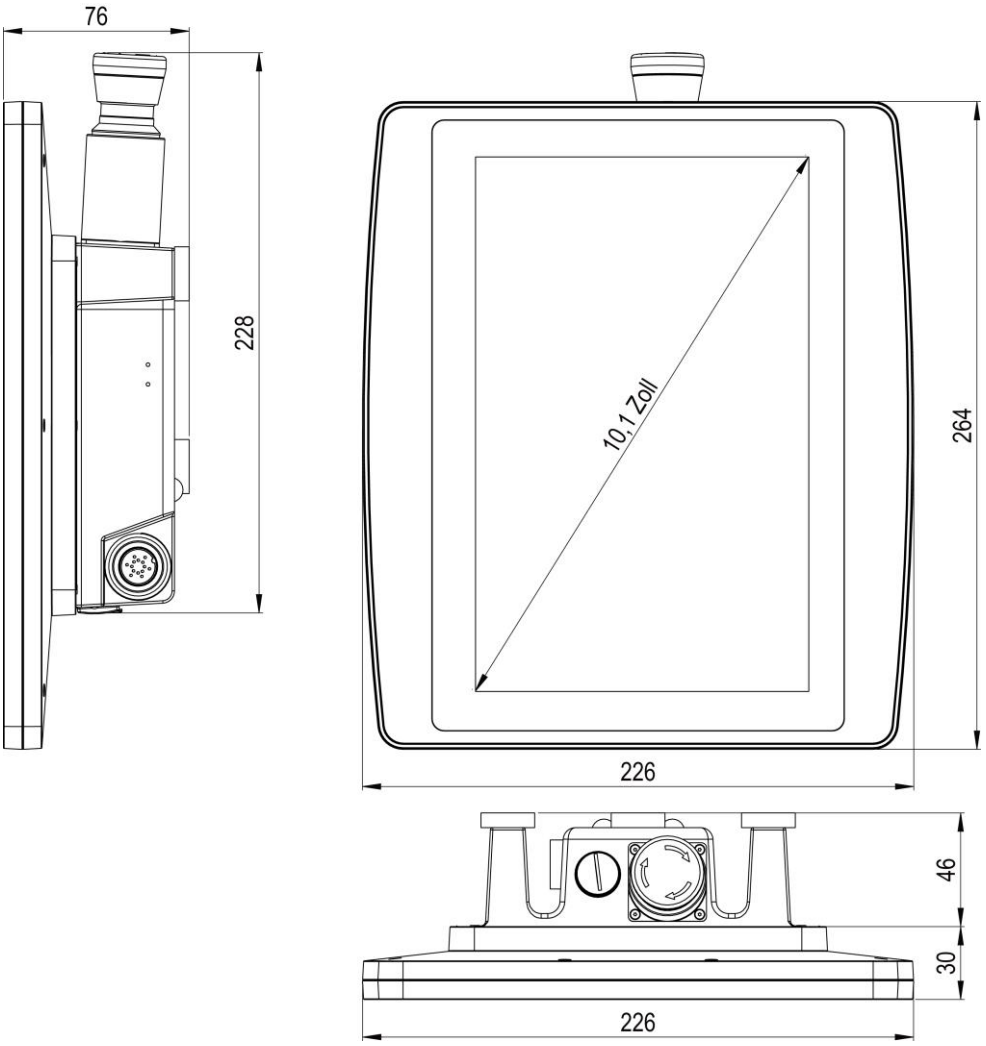
6.6 Terminal Requirements

Connection technology	M16 plug (see X2 on page 24)
	Special connector cable minimum bend radius: 147 mm

6.7 Miscellaneous

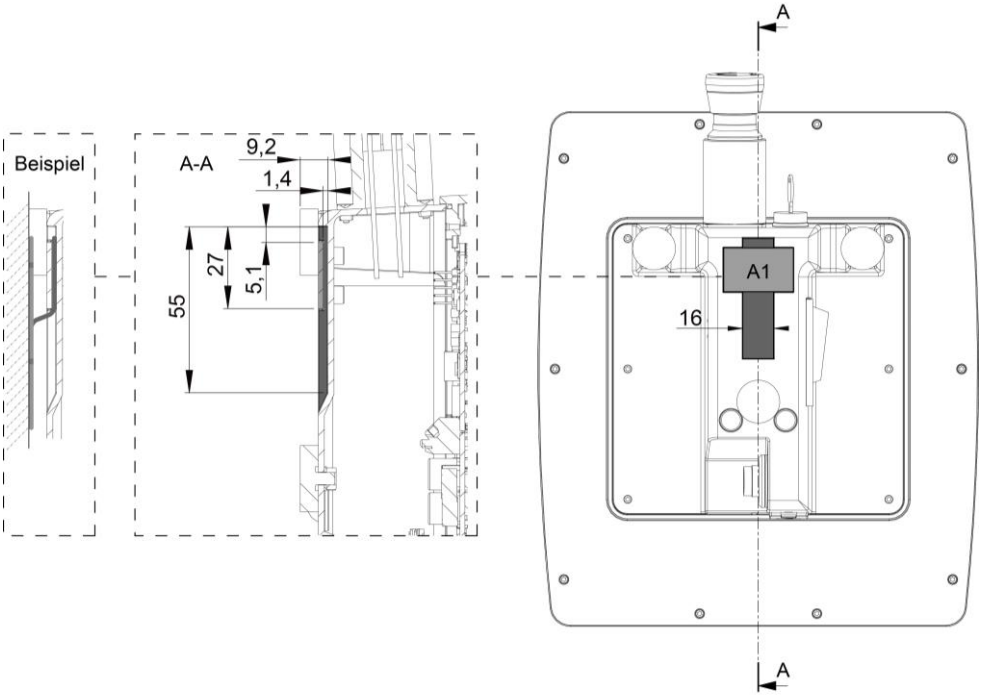
Article number	01-245-1051
Connector cable	optionally available (see documentation Connection Cables for Operating Devices)
Standard	UL 508 (E247993) in preparation
Approvals	CE, TÜV EC type tested, $_{c}$UL$_{US}$ in preparation
Mission time	20 years

7 Mechanical Dimensions



7.1 Wall Mount

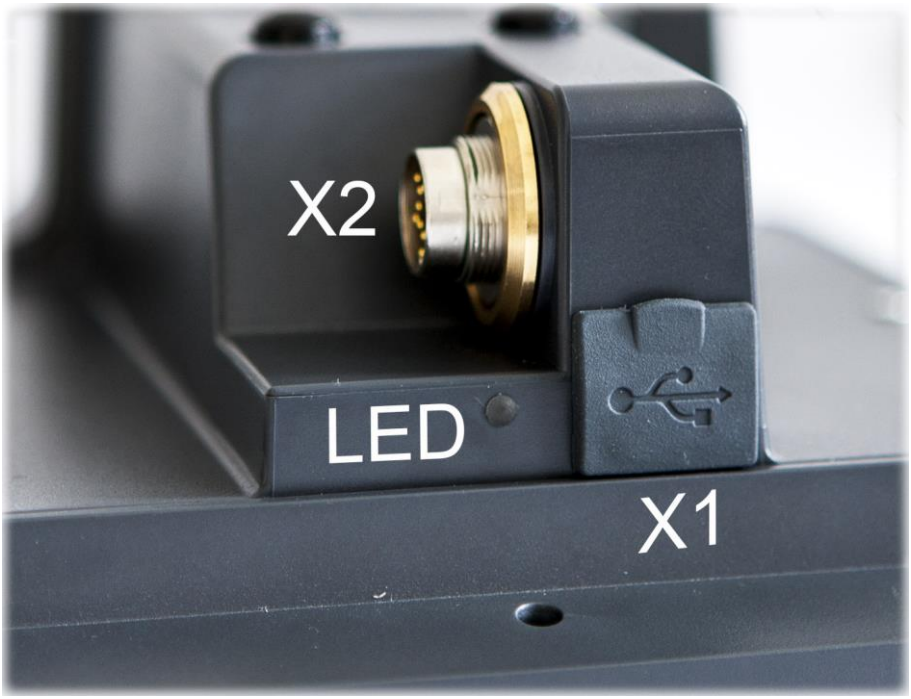
Using the corresponding wall mount, the panel can be attached to the provided holder (A1) on the back (see dimensions for counter piece)



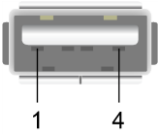
An additional option consists of using the magnetic feet on the panel to hang it onto a magnetic surface.

8 Interfaces

8.1 Rear Connectors



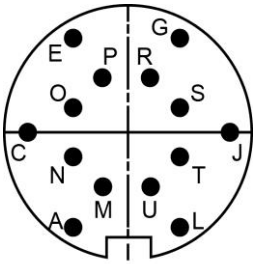
X1: USB interface 2.0 type A



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

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 may cause the device to malfunction. It is also possible that these devices will not be detected at the USB port or function correctly. It is therefore recommended that every USB stick or USB supply be tested before actual use.

X2: Cable Connector M16



Pin	Wire Color	Function	
L	Pink	Safety interface H	
J	Gray	Safety interface L	
G	shield	Safety interface shield	
E	Red	+24 V DC	
C	Black	GND	
A	shield	ETH shield	
And	Orange/white	Ethernet1 Ethernet2	ETH1_Rx+
T	Blue		ETH2_Rx-
S	Blue/white		ETH2_Rx+
R	Brown		ETH2_Tx-
P	Brown/white		ETH2_Tx+
O	Green		ETH1_Tx-
N	Green/white		ETH1_Tx+
M	Orange		ETH1_Rx-

The appropriate connector cables are available as accessories. See documentation Connection Cables for Operating Devices.

LED

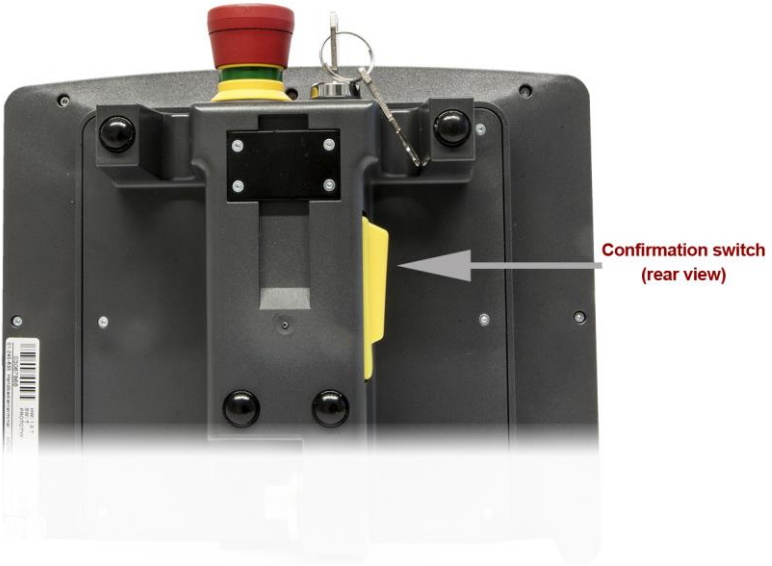
LED Status	Meaning
LED lights green	DC OK

8.2 Key Switch

The key switch is two-stage and read via the SCP XXX connected to the Safety interface. In the SCP XXX the "HBG0811_K" module is used; inputs 5 and 6 are assigned to the key switch.

8.3 Confirmation Switch

The confirmation switch is three stage. If the switch is not pressed or pressed only partially, it is inactive. The switch is active when simply pressed (middle stage). In the SCP XXX, the “HBG0811_K" module is used and inputs 1 and 2 are used for the confirmation switch.

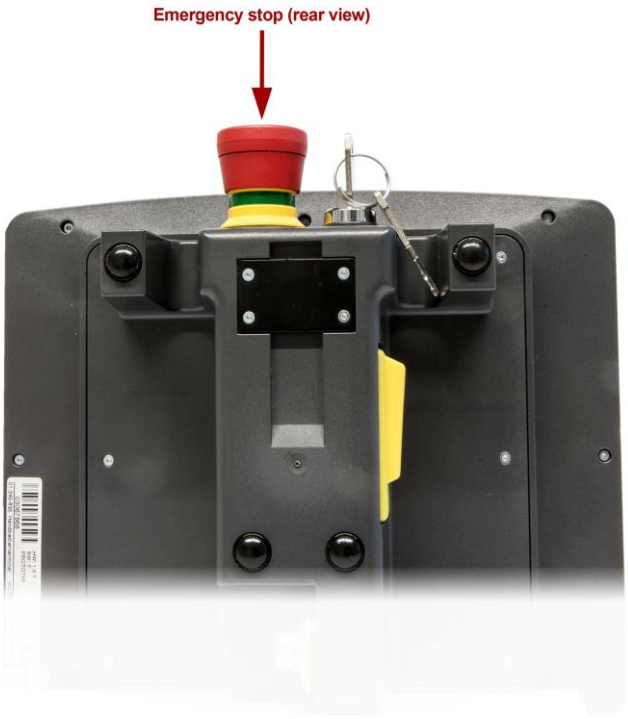


With the "HGT1051" hardware class, it is possible on the HGT 1051 among other things,

to evaluate the Safety number of the connected SCP XXX.

8.4 Emergency Stop

The Emergency Stop is two-stage. In the SCP XXX, the “HBG0811_K" module is with the inputs 3 and 4.



9 Assembly/Installation

9.1 Check Contents of Delivery

Ensure that the contents of the delivery are complete and intact. See chapter 2.3 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.

10 Wiring

10.1 ESD Protection

The operator must ensure that no ESD disturbances affect the product.

10.2 USB Interface

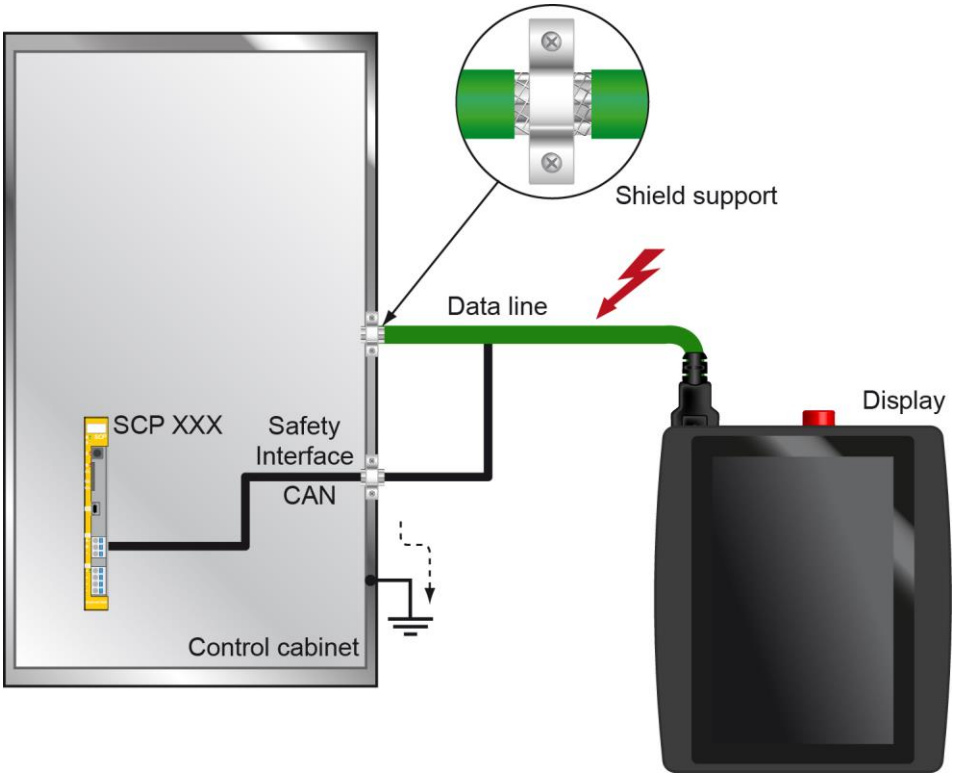
The handheld operating panel has a USB interface. This interface has a USB interface connection that can be used to connect various USB devices (keyboard, mouse, storage media, hubs, etc.).

10.3 Recommended Cable Shielding

For applications in which the bus is operated outside the control cabinet, the correct shielding is required. Especially when for structural reasons, the bus line must be placed next to sources of strong electromagnetic interference. It is recommended that wiring the connector cable in parallel with power cables be avoided whenever possible.

10.3.1 Connection from the Control Cabinet to the HGT

It is recommended that the shielding be mounted at the entry point of the control cabinet housing. Noise can then be deflected from the electronic components before reaching the module.



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 in or on the device, by allowing the device to acclimate to the room temperature while turned off.

When sent, the device 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.

12 Storage

When not in use, store the operating panel according to the storage conditions. See Chapter 11.

During storage, ensure that all protective covers are placed correctly, so that no contamination, foreign bodies or fluids enter the device.

13 Maintenance

During maintenance and service, observe the safety guidelines in Chapter 3.

13.1 Cleaning and Disinfection of the Touchscreen

CAUTION

Before cleaning and disinfecting the touch screen, the ETV must be turned off in order to prevent triggering functions or commands unintentionally!

The touch screen can only be cleaned with a soft, damp cloth. To dampen the cloth, a mild cleaning solution such as an anti-static foam cleaner is recommended. To avoid fluids/cleaning solutions from getting into the housing, the device must not be sprayed directly. To clean, no erosive cleaning solutions, chemicals, abrasive cleansers or hard objects that can scratch or damage the touch screen may be used. The use of steam jets or compressed air is prohibited.

Alcohol-based surface disinfectants, which do not contain any refatting agents, can be used for disinfection. For error-free function of the touch screen, the disinfectant cannot leave residue on the screen.

WARNING

If the device is contaminated with toxic or erosive chemicals, it must be carefully cleaned as quickly as possible to prevent personal injury and machine damage!

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

To avoid damaging the touch screen, using either the fingers or a stylus to operate the panel is recommended.

13.2 Service

This product was constructed for low-maintenance operation.

13.3 Repair

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.

For transport conditions, see chapter Transport/Storage.

14 Storage Media

It is recommended that only storage media provided by SIGMATEK (CompactFlash cards, microSD cards etc.) be used.

The number of read and write actions have a significant influence on the lifespan of the storage media.

The microSD card is not intended as an exchangeable medium and should therefore be removed from the cardholder for maintenance purposes only.

15 Disposal

Should you need to dispose of the device, the national electronic waste regulations must be observed.

The device appliance must not be disposed of as household waste.

Documentation Changes

Change date	Affected page(s)	Chapter	Note
16.08.2018	11	3.1 Performance Data	Note corrected
02.11.2018	16	4.1 Wall Mount	Diagram
25.06.2019	16	4.1 Wall Mount	Measurement added
17.12.2019		9.1 Connection from the Control Cabinet	Graphic expanded
08.09.2020	12 13	3.2 Electrical Requirements 3.4 Environmental Conditions	Protection class added For protection type (only with all protective caps in place) added
18.11.2020	11	3.1 Performance Data	Core footnote (programming) added
26.02.2021	10	2.8 Safety-Relevant Parameters	PFH and DC values changed
13.03.2023	5	2 Basic Safety Guidelines	Norms specified
23.03.2023	14	4.6 Safety-Relevant Parameters Document	Safety-related values modified Documentation expanded
07.06.2024	7	3 Basic Safety Guidelines	Norms specified
	17	6.1 Performance Data	microSD card updated
	20	6.7 Miscellaneous	Mission time added
	33	13.2 Service	Chapter added
		Document	Documentation expanded Wording of standards corrected