Operating Instructions

Device platform MANTA

IT-xx7

SERIES 400 Panel PC
SERIES 500 Thin Clients
SERIES 600 KVM Systems

STAHL

THE STRONGEST LINK.

HW-Rev. IT-6x7:	**01.02.00**
HW-Rev. IT-4x7-*-BT:	**01.02.05**
HW-Rev. IT-5x7-*-BT:	**01.02.05**
Operating Instructions version:	**01.02.12**
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Publisher

We reserve the right to change our products and their specifications at any time, provided it is in the interest of technical progress. The information in the current manual (online or on CD / DVD / USB stick) or in the operating instructions included with the operator interface applies.

Trademarks
The terms and names used in this document are registered trademarks and / or products of the companies in question.

Specific markings

The markings in these operating instructions refer to specific features that must be noted.

In detail, these are:

⚠ DANGER	This sign alerts users to hazards that **will** result in death or serious injury if ignored !

⚠ WARNING	This sign alerts users to hazards that **may** result in death or serious injury if ignored !

⚠ CAUTION	This sign alerts users to hazards that may damage machinery or equipment or result in injury if ignored !

ⓘ ATTENTION	Information highlighted by this symbol indicates measures for the prevention of damage to machinery or equipment !

ⓘ NOTICE	Information highlighted by this symbol indicates important information of which particular note should be taken !

DOCUMENTATION	Information highlighted by this symbol (with and without lettering) refers to a different chapter or section in this manual or other documentation or a web-page !

Warnings

⚠	Caution ! The HMI device surface may heat up at ambient temperatures higher than +45 °C ! Caution at contact !

Table of contents

1 Preface

These Operating Instructions contain all relevant aspects for the IT-xx7 HMIs - device platform MANTA - (SERIES 400 Open HMI - Panel PC´s, SERIES 500 Thin Clients and SERIES 600 KVM Systems). They also contain information on the connection and installation of these devices. Please also refer to additional documentation, such as the hardware manual, which contains further important information.

ⓘ NOTICE	For the correct operation of all associated components please note, in addition to these operating instructions, all other operating instructions enclosed in this delivery as well as the operating instructions of the additional equipment to be connected !

2 Device function

The IT-xx7 HMIs - device platform MANTA - are intelligent operating and monitoring devices for installation in industrial areas.
The devices are connected to a communication system via the serial interfaces (RS-232, Ethernet) which are routed outwards. Also the USB interfaces for the connection of various peripheral devices are routed outwards. Furthermore, the interfaces for keyboard, mouse, video and audio signals are located here.

2.1 Image sticking

Continuous displaying fixed pattern may include image sticking. It's recommended to use screen saver or moving content periodically if fixed pattern is displayed on the screen.

2.2 Processor types

All devices of 400 and 500 SERIES are fitted with modern, powerful processors. Depending on the type of application, different processor types are used for the HMI devices (see Technical Data).
Starting in 2016, a new Intel® Atom™ processor type of the Bay Trail (BT) platform will gradually replace all previous processor types in the HMI devices, up from HW Revision 01.02.01. This new processor type processes data four times as fast as the previous processors.

2.3 Activation pressure touchscreen

To prevent damage to the touchscreen, activation pressure on the screen with polyester foil must be very low (0.1 to max. 1 N) and on the screen with glass surface must be medium (1.8 to max. 2.5 N) !

2.4 IT-4x7 (SERIES 400 Panel PC)

The IT-4x7 HMIs are fitted with a Windows© operating system and can run any software. Thus made them easy to operate.
The devices are fitted with powerful processors and are thus able to process even large applications on-site. The devices have a back-up and recovery system which can be used to save complete images and load them onto new Panel PCs without requiring specific IT skills.

2.5   IT-5x7 (SERIES 500 Thin Clients)

The IT-5x7 HMIs of the 500 SERIES can be integrated into modern networks as Thin Clients or with a KVM-over-IP box. Digital Ethernet technology is used for the data transfer between the KVM-over-IP box and the Thin Client device.
Up to four Thin Client devices can access one KVM-over-IP box with one software license, thus cost-effectively communicating with several PCs - for example, when monitoring the production process and simultaneously applying Condition Monitoring.
Multi-monitoring with several on-site terminals can as easily be implemented as the application as Thin Client in a server environment with virtual work stations.

2.6   IT-6x7 (SERIES 600 KVM Systems)

The KVM Classic transfer technology is used for the point-to-point connection between a PC and an IT-6x7 HMI device.
There are three versions (DVI1, DVI2 and DVI3) of this transfer technology that have slightly different functionality.

2.7   Overview hardware revision

HW-Rev.	Device type	Technical changing	Changing date hardware	OI version	OI date
01.02.00	IT-xx7-*	Changing fromT-Ind to IT-xx7	01.01.2013	01.02.00	17.04.2013
01.02.01	IT-4x7-*-BT-* IT-5x7-*-BT-*	Bay Trail processor, quad core	01.07.2016	01.02.03	04.01.2016
01.02.02	IT-4x7-*-BT-* IT-5x7-*-BT-*	M.2 memory	14.06.2018	01.02.07	25.07.2018
01.02.05	IT-4x7-*-BT-* IT-5x7-*-BT-*	BIOS update BIOS-V1.63r4 no C6	29.06.2021	01.02.12	24.09.2021

3   Type allocation

Since the beginning of 2013, the T-series devices have been allocated new type names according to the following pattern:
To avoid the bother of having to re-write certifications, the names in the certificates remain the same, but the devices receive new names.
In the interest of a clear link between device type and certificate, both device names are listed on the type plate from 01.04.2013 onwards.

3.1   Type marking

Old (certificate)	New
T-Ind-##*-CAT7*-R2	IT-##7*-TX*
T-Ind-##*-CAT7*-R2	IT-##7*-CAT*
T-Ind-##*-MM*-R2	IT-##7*-MM*
T-Ind-##*-SM*-R2	IT-##7*-SM*

* = random alphanumeric or symbolic characters without relevance to explosion protection.
\# = random numeric character without relevance to explosion protection.

(!) NOTICE	For the exact new device name and model please refer to the type code.

4 Technical Data

Function / Equipment	IT-467 IT-567 IT-667	IT-477 IT-577 IT-677	IT-487 IT-587 IT-687
Display type		TFT Color display 16.7 million colours	
Display size	56 cm (22")	61 cm (24")	61 cm (24"WU)
Resolution in pixels	WSXGA+ 1680 x 1050	Full HD 1920 x 1080	WUXGA 1920 x 1200
Format	16:10	16:9	16:10
Viewing angle	at CR ≥ 5	at CR ≥ 5	at CR ≥ 10
Horizontal	178°	178°	178°
Vertical	170°	170°	178°
Display		Glass	
Touchscreen (optional)		Polyester foil or glass surface 5-wire analogue resistive	
Backlight		LED background lighting	
Service life (MTBF) of backlight at 20 °C / 68 °F		typically 50,000 h	
Brightness	250 cd/m²	300 cd/m²	
Contrast		1000 : 1	
Anti-reflective display		Devices without touchscreen: chemically coated Devices with foil touchscreen: lightly anti-reflective (foil is abraded for slight milky effect) Device with glass touchscreen: not anti-reflective, glass is too thin for chemical or mechanical treatment	
Touchscreen activation		Foil touch: low activation pressure (0.1 up to max. 1 N) Glass touch: medium activation pressure (1.8 up to max. 2.5 N)	
Touchscreen input method		Finger, gloved finger or stylus	
Touchscreen durability		Foil touch: Polyester foil is easily scratched, with high pressure force the spacer dots could be damaged. Glass touch: Quite good, but with high pressure force the spacer dots could be damaged.	
Touchscreen scratch hardness MoHS		Foil touch: - Glass touch: >5	
Touchscreen scratch hardness pencil hardness test ISO 15184		Foil touch: 3H Glass touch: 9H	
Touchscreen transmissivity / optics		Foil touch: small milky effect due to the foil Glass touch: very good	
Touchscreen surface contaminants		Unaffected	
Touchscreen abrasive resistance		36 million times with a silicone rubber of R8 finger, hitting rate 250 g at 2 times per second	
Additional keyboard (optional)		107 keys with integrated trackball / joystick / mouse pad or touch pad	
Power supply			
Rated operational voltage AC		230 V	
Voltage range AC		100 - 240 V	
Frequency range		50 - 60 Hz	
Rated operational voltage DC		24 V	
Voltage range DC		20 - 30 V	
Power		Typically 50 W / 100 W at O30 / max. 150 W (typically 170 BTU / 341 BTU at O30 / max. 510 BTU)	
Current consumption AC		1 A	
Current consumption DC		3 A	
Connections		via standard plug	
AC		IEC plug (female)	
DC		STAK 200 (female)	
Recommended fuses		4 AT	
Max. operating voltage Um		250 VAC	

Interfaces	
Ethernet	Either copper or optical fibre
at IT-4x7 and IT-5x7	
Copper (TX)	10/100Base-TX, 10/100 Mbit, (Ex e)
	or
	2x 10/100Base-TX, 10/100 Mbit (Ex e) (only BT versions, not 600 SERIES) *
* Note	If the customer installs an operation system, the driver for the "USB-SK-LAN-Adapter" must be installed. For this, please contact support.dehm@r-stahl.com. (Driver is part of STAHL images)
Optical fibre (FX)	100Base-FX, 100 Mbit
at IT-6x7	
Copper (CAT)	Direct connection, gigabit
Optical fibre (FO) (MM / SM)	Direct connection
USB	2 x Hub, 1 x Root / USB 2.0 / 480 Mbit/s
USB	2 x Hub for keyboard and mouse / USB 2.0 / 480 Mbit/s
Serial	RS-232
Video in (optional)	FBAS
Audio	Line out interface (Line in only for IT-6x7)

Only for IT-4x7 and IT-5x7
  Real-time clock
  Data buffer
  Battery
  Capacitor
	
	Yes
	Lithium battery and capacitor buffered, maintenance-free
	> 5 years
	at least 4 days

Cable type optical fibre	
at IT-4x7 and IT-5x7	Multi-mode optical fibre cable (62.5 µm core cross section and 125 µm external cross section)

at IT-6x7
    MM
 	
    SM
	
	Multi-mode optical fibre cable (50 µm core cross section and 125 µm external cross section)
	Multi-mode optical fibre cable (62.5 µm core cross section and 125 µm external cross section)
	Single mode optical fibre cable (9 µm core cross section and 125 µm external cross section)

Data cable lengths	
Optical fibre FX	up to 2000 m (6,561.68 ft) via 62.5 / 125 µm optical fibre cable
Optical fibre MM	up to 550 m (1,804 ft) via 50 / 125 µm optical fibre cable, up to 300 m (985 ft) via 62.5 / 125 µm optical fibre cable
Optical fibre SM	up to 10,000 m (33,000 ft) via 9 / 125 µm optical fibre cable
Copper (TX)	up to 100 m (330 ft) via CAT7 installation cable AWG23
for DVI1 CAT	up to 140 m (460 ft) via CAT7 installation cable AWG23
for DVI2 CAT	up to 500 m (1,640 ft) via CAT7 installation cable AWG23
for DVI3 CAT	up to 150 m (492 ft) via CAT7 installation cable AWG23
Enclosure	Steel / aluminium
Enclosure protection type	Front IP66 / Back IP20
HMI Types	PM = PanelMount = panel mount device OS = Operator Station
HMI Types comment	Panel mount device (PM): devices without additional enclosure (HSG) and without additional accessories Operator Station (OS): devices mounted inside additional enclosure (HSG)
Permitted ambient temperature range	-30 °C … +60 °C / [-22 °F … +140 °F]
Operating temperature range	
Cold start temperature *	-10 °C / [+14 °F]
Operation	-20 °C … +60 °C ** / [-4 °F … +140 °F **]
Operation with heater version O30 ***	-30 °C … +60 °C ** / [-22 °F … +140 °F **]
Storage temperature range	-30 °C … +70 °C / [-22 °F … +158 °F]
* Note on cold start temperature	If the device is switched on in an ambient temperature of below -10 °C / [+14 °F], the display will require some time warming up before everything is clearly visible. Depending on how low the actual temperature is, this process may take up to 3 hours.
** Note	Operation at +60 °C / [+140 °F] for a maximum of 5 h, +50 °C / [+122 °F] for continuous operation (24/7)
*** Note on the O30 version	The O30 version is only available for the AC version devices !
Operating temperature range for DVI1	
Cold start temperature	+5 °C [+41 °F]
Operation	+5 °C … +40 °C / [+41 °F … +104 °F]
Storage temperature range	-20 °C … +70 °C / [-4 °F … +158 °F]
Heat dissipation	About 40 % via the front plate and 60 % via the enclosure
Relative humidity	10 to 90 % at +40 °C / [+104 °F], non-condensing
for DVI1	20 to 80 % at +40 °C / [+104 °F], non-condensing

Dimensions			
Front (w x h)	660 mm x 475 mm (2.165 ft x 1.558 ft)		
Cut-out (w x h) (+/- 0.5 mm) (+/- 0.0016 ft)	615 mm x 435 mm (2.018 ft x 1.427 ft")		
Depth of cut-out	110 mm (0.361 ft)		
Wall thickness	≤ 5 mm (0.016 ft)		
Cut-out dimension for rear mount module (w x h)	475.7 mm x 298.1 mm (18.73" x 11.74")	523 mm x 295 mm (20.59" x 11.61")	520.4 mm x 326 mm (20.49" x 12.83")
Mounting position	vertical or horizontal		
Weight	10.00 kg (22.05 lbs)		

4.1 Additionally for IT-4x7 (Panel PC)

4.1.1 All devices up to hardware revision 01.02.00

Processor	Intel Atom N270; 1.6 GHz
RAM	1 or 2 GB
Data memory	4 or 16 GB
	128 GB MLC
	128 GB SLC
Type of data memory	Flash memory (SATA)
Operating system	Windows XP Embedded / Windows XP Professional / Windows 7 Ultimate (32 bit)
Global language support	Via Multi-Language interface of Windows XP Embedded (25 languages)

4.1.2 All devices starting from hardware revision 01.02.01

Processor	Intel Bay Trail (BT) Atom E3845 Quad Core; 1.91 GHz		
RAM	4 GB		
Data memory	Size	TBW	Test profile
	64 GB MLC	18.75	JESD218 Client profile
	128 GB MLC	37.5	
Type of data memory	Flash memory (Solid state drive - SSD) (internal via CF-Slot)		
Graphics controller	Integrated Intel Gen. 7 HD Graphics		
Operating system	Windows Embedded Standard 7 (64 bit) / Windows 7 Ultimate (64 bit)		
Global language support	Via Windows operating system		

4.1.3 All devices starting from hardware revision 01.02.02

Type of data memory	Flash memory M.2 (Solid State Drive - SSD) (internal via SATA)
Operating system	Windows 10 IoT Enterprise (64 bit) (included in standard delivery) Windows 10 IoT Enterprise (32 bit) (optional on USB stick)

4.2 Additionally for IT-5x7 (Thin Clients)

4.2.1 All devices up to hardware revision 01.02.00

Processor	Intel Atom N270; 1.6 GHz
RAM	512 MB
	2 GB *
Data memory	1 GB
	16 GB *
Operating system	Windows Embedded Standard 2009 and Remote Firmware
	Windows Embedded Standard 7, Remote Firmware and Delta V *

ⓘ NOTICE	*	The combination of 2 GB RAM with 16 GB data memory is only available for the operating system with Delta V !

4.2.2   All devices starting from hardware revision 01.02.01

Processor	Intel Bay Trail (BT) Atom E3845 Quad Core; 1,91 GHz
RAM	4 GB
Data memory	64 GB
Type of data memory	Flash memory (SATA)
Graphics controller	Integrated Intel Gen. 7 HD Graphics
Operating system	Windows 10 IoT Enterprise and Remote Firmware

4.2.3   All devices starting from hardware revision 01.02.02

Type of data memory	Flash memory M.2 (Solid State Drive - SSD) (internal via SATA)

5   Conformity to standards

The IT-xx7 operator interfaces comply with the following standards and directives:

Standard	Classification
Electromagnetic compatibility	
directive 2014/30/EU	
EN 61000-6-2 : 2005 + AC : 2005	Interference resistance
EN 61000-6-4 : 2007 + A1 : 2011	Interference emission
Low voltage directive	
directive 2014/35/EU	
EN 62368-1 : 2016 IEC 62368-1 : 2014	Audio / video, information and communication technology equipment - Safety requirements
RoHS directive	
2011/65/EU	**Classification**
EN IEC 63000 : 2018	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

6   FSB notification

> The FSB notification of the MANTA field systems can be reviewed under this link:
> https://portal.eaeunion.org/sites/odata/_layouts/15/Portal.EEC.Registry.Ui/DirectoryForm.aspx?ViewId=859ec98d-f4fe-423a-b6bc-d01b53fd4b7c&ListId=0e3ead06-5475-466a-a340-6f69c01b5687&ItemId=232#f=STAHL

7   Marking

Manufacturer	R. STAHL HMI Systems GmbH
Type code	IT-4x7 / IT-5x7 / IT-6x7
CE classification:	CE

8   Power supply

8.1   Operator interfaces

```
Power supply                  24 VDC or 100 – 240 VAC, 50 – 60 Hz
max. power consumption        at 24 VDC              3 A
                              at 100 - 240 VAC       1 A
```

9   Type code

9.1   IT-4x7 (Panel PC)

ⓘ NOTICE	These versions apply to all Panel PC's up to hardware revision 01.02.00, with Atom N270 processor.

IT-4x7-aa-bb-cc-dd-ee-ff-gg-hh

Front design
Outdoor Option
Voltage supply
Data memory
Working memory
Touch screen
Display type
Ethernet interface
467 / 477 / 487
middle digit ≙ display size
6 ≙ 56 cm / 22" display
7 ≙ 61 cm / 24" display
8 ≙ 61 cm / 24"WU display
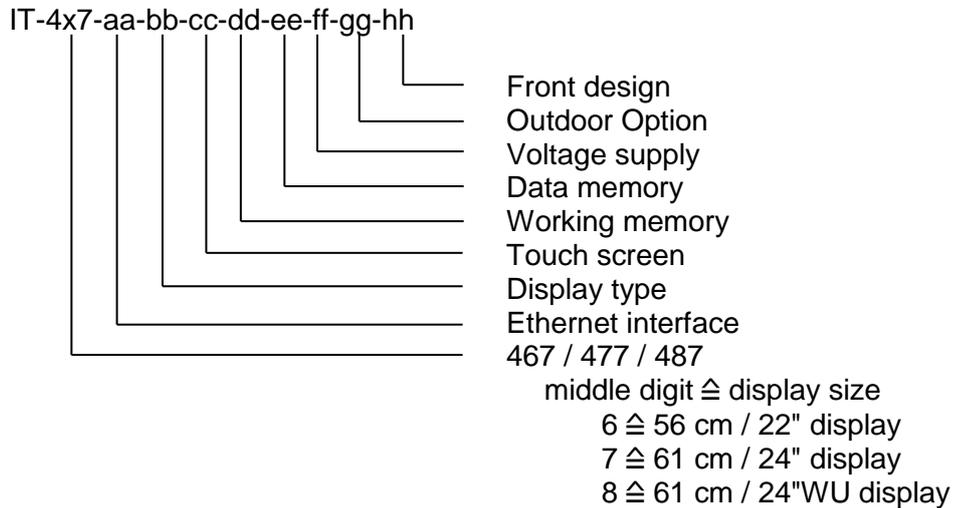
Product type:

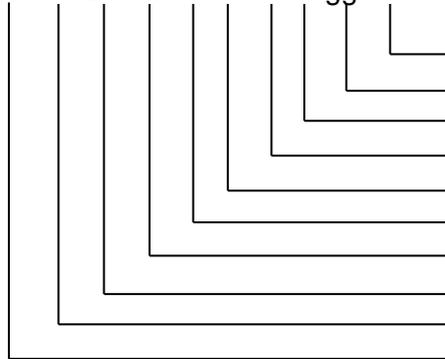| Product key structure	Description
	Type with
IT-4x7-**FX**-bb-cc-dd-ee-ff-gg-hh	Optical fiber Ethernet interface 100Base-FX, multi-mode
IT-4x7-**TX**-bb-cc-dd-ee-ff-gg-hh	Copper Ethernet interface 10/100Base-TX
IT-4x7-aa-**TFT**-cc-dd-ee-ff-gg-hh	TFT display (standard)
IT-4x7-aa-bb-**T**-dd-ee-ff-gg-hh	Touch screen (membrane)
IT-4x7-aa-bb-**TG**-dd-ee-ff-gg-hh	Touch screen glass
IT-4x7-aa-bb-cc-**R1**-ee-ff-gg-hh	Working memory 1 GB
IT-4x7-aa-bb-cc-**R2**-ee-ff-gg-hh	Working memory 2 GB
IT-4x7-aa-bb-cc-dd-**4GB**-ff-gg-hh	4 GB Solid State Drive
IT-4x7-aa-bb-cc-dd-**16GB**-ff-gg-hh	16 GB Solid State Drive
IT-4x7-aa-bb-cc-dd-**128GBM**-ff-gg-hh	128 GB Solid State Drive MLC
IT-4x7-aa-bb-cc-dd-**128GBS**-ff-gg-hh	128 GB Solid State Drive SLC
IT-4x7-aa-bb-cc-dd-ee-**AC**-gg-hh	Power supply 100 - 240 VAC, 50 - 60 Hz
IT-4x7-aa-bb-cc-dd-ee-**DC**-gg-hh	Voltage supply 24 VDC
IT-4x7-aa-bb-cc-dd-ee-ff-**O30**-hh	Outdoor installation -30 °C [-22 °F] *
IT-4x7-aa-bb-cc-dd-ee-ff-gg-**AL**	Aluminium front plate
IT-4x7-aa-bb-cc-dd-ee-ff-gg-**RM**	Rear mount module

ⓘ NOTICE	* The O30 option is only available for AC devices !

9.2   IT-4x7-*-BT (Panel PC)

(!) NOTICE	These versions apply to all Panel PC's starting from hardware revision 01.02.01, with Bay Trail (BT) Atom E3845 processor.

IT-4x7-aa-BT-bb-cc-dd-ee-ff-gg-hh

Front design
Outdoor option
Voltage supply
Data memory
Working memory
Touch screen
Display type
Processor type (fixed to BT = Bay Trail)
Ethernet interface
467 / 477 / 487
    middle digit ≙ display size
        6 ≙ 56 cm / 22" display
        7 ≙ 61 cm / 24" display
        8 ≙ 61 cm / 24"WU display

Product type:

Product key structure	Description
	Type with
IT-4x7-**FX**-BT-bb-cc-dd-ee-ff-gg-hh	Optical fiber Ethernet interface 100Base-FX, multi-mode
IT-4x7-**TX**-BT-bb-cc-dd-ee-ff-gg-hh	Copper Ethernet interface 10/100Base-TX
IT-4x7-**2TX**-BT-bb-cc-dd-ee-ff-gg-hh	2x Copper Ethernet interface 10/100Base-TX
IT-4x7-aa-BT-**TFT**-cc-dd-ee-ff-gg-hh	TFT display (standard)
IT-4x7-aa-BT-bb-**T**-dd-ee-ff-gg-hh	Touch screen (membrane)
IT-4x7-aa-BT-bb-**TG**-dd-ee-ff-gg-hh	Touch screen glass
IT-4x7-aa-BT-bb-cc-**R3**-ee-ff-gg-hh	4 GB RAM
IT-4x7-aa-BT-bb-cc-dd-**64GB**-ff-gg-hh	64 GB Solid State Drive
IT-4x7-aa-BT-bb-cc-dd-**128GBM**-ff-gg-hh	128 GB Solid State Drive MLC
IT-4x7-aa-BT-bb-cc-dd-ee-**AC**-gg-hh	Power supply 100 - 240 VAC, 50 - 60 Hz
IT-4x7-aa-BT-bb-cc-dd-ee-**DC**-gg-hh	Voltage supply 24 VDC
IT-4x7-aa-BT-bb-cc-dd-ee-ff-**O30**-hh	Outdoor installation -30 °C [-22 °F] *
IT-4x7-aa-BT-bb-cc-dd-ee-ff-gg-**AL**	Aluminium front plate
IT-4x7-aa-BT-bb-cc-dd-ee-ff-gg-**RM**	Rear mount module

(!) NOTICE	* The O30 option is only available for AC devices !

9.3   IT-5x7 (Thin Client)

! NOTICE	These versions apply to all Thin Client's up to hardware revision 01.02.00, with ATOM N270 processor.

IT-5x7-aa-bb-cc-dd-ee-ff

Front design
Outdoor option
Voltage supply
Touch screen
Display type
Ethernet interface
567 / 577 / 587
middle digit ≙ display size
6 ≙ 56 cm / 22" display
7 ≙ 61 cm / 24" display
8 ≙ 61 cm / 24"WU display
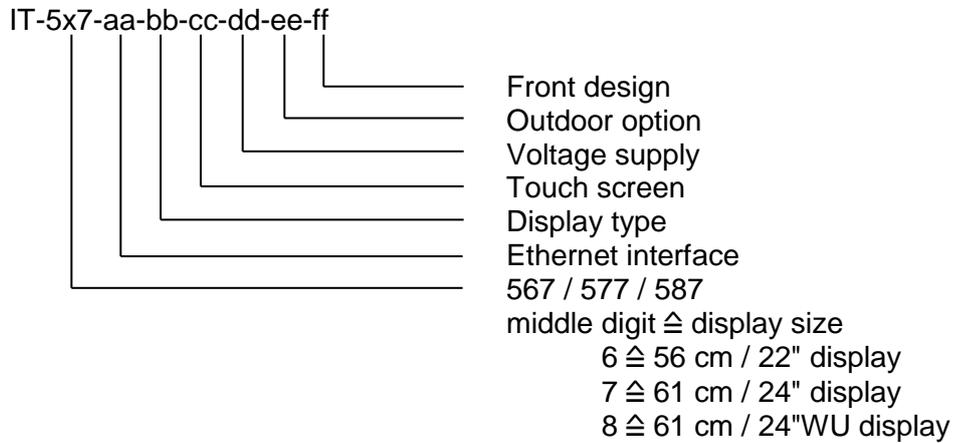
Product type:

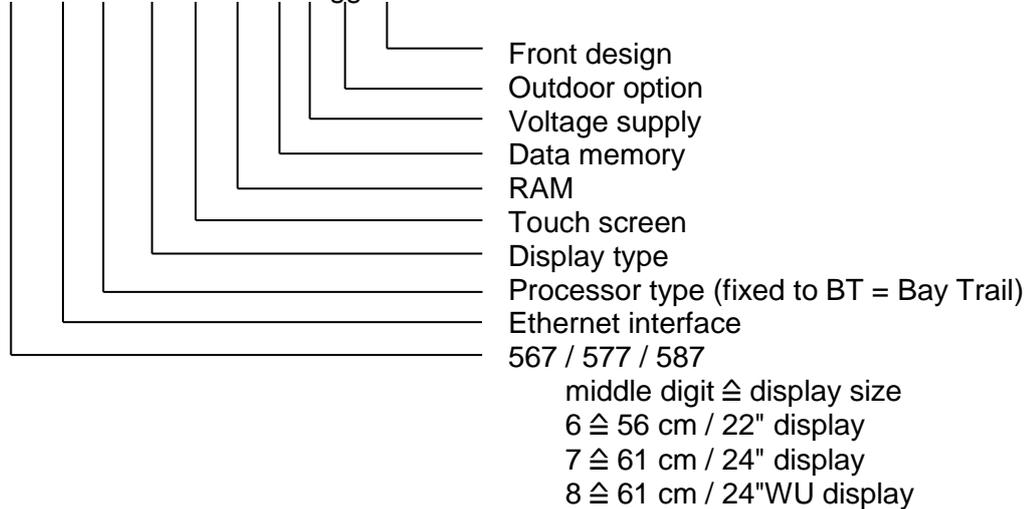| Product key structure	Description
	Type with
IT-5x7-**FX**-bb-cc-dd-ee-ff	Optical fiber Ethernet interface 100Base-FX, multi-mode
IT-5x7-**TX**-bb-cc-dd-ee-ff	Copper Ethernet interface 10/100Base-TX
IT-5x7-aa-**TFT**-cc-dd-ee-ff	TFT display (standard)
IT-5x7-aa-bb-**T**-dd-ee-ff	Touch screen (membrane)
IT-5x7-aa-bb-**TG**-dd-ee-ff	Touch screen glass
IT-5x7-aa-bb-cc-**AC**-ee-ff	Power supply 100 - 240 VAC, 50 - 60 Hz
IT-5x7-aa-bb-cc-**DC**-ee-ff	Voltage supply 24 VDC
IT-5x7-aa-bb-cc-dd-**O30**-ff	Outdoor installation -30 °C [-22 °F] *
IT-5x7-aa-bb-cc-dd-ee-**AL**	Aluminium front plate
IT-5x7-aa-bb-cc-dd-ee-**RM**	Rear mount module

! NOTICE	* The O30 option is only available for AC devices !

9.4   IT-5x7-*-BT (Thin Client)

| ⓘ NOTICE	These versions apply to all Thin Client's starting from hardware revision 01.02.01, with Bay Trail (BT) Atom E3845 processor.

IT-5x7-aa-BT-bb-cc-dd-ee-ff-gg-hh

```
                                          Front design
                                          Outdoor option
                                          Voltage supply
                                          Data memory
                                          RAM
                                          Touch screen
                                          Display type
                                          Processor type (fixed to BT = Bay Trail)
                                          Ethernet interface
                                          567 / 577 / 587
                                              middle digit ≙ display size
                                              6 ≙ 56 cm / 22" display
                                              7 ≙ 61 cm / 24" display
                                              8 ≙ 61 cm / 24"WU display
```

Product type:

Product key structure	Description
	Type with
IT-5x7-**FX**-BT-bb-cc-dd-ee-ff-gg-hh	Optical fiber Ethernet interface 100Base-FX, multi-mode
IT-5x7-**TX**-BT-bb-cc-dd-ee-ff-gg-hh	Copper Ethernet interface 10/100Base-TX
IT-5x7-**2TX**-BT-bb-cc-dd-ee-ff-gg-hh	2x Copper Ethernet interface 10/100Base-TX
IT-5x7-aa-BT-**TFT**-cc-dd-ee-ff-gg-hh	TFT display (standard)
IT-5x7-aa-BT-bb-**T**-dd-ee-ff-gg-hh	Touch screen (membrane)
IT-5x7-aa-BT-bb-**TG**-dd-ee-ff-gg-hh	Touch screen glass
IT-5x7-aa-BT-bb-cc-**R3**-ee-ff-gg-hh	4 GB RAM
IT-5x7-aa-BT-bb-cc-dd-**64GB**-ff-gg-hh	64 GB Solid State Drive
IT-5x7-aa-BT-bb-cc-dd-**128GB**-ff-gg-hh	128 GB Solid State Drive
IT-5x7-aa-BT-bb-cc-dd-ee-**AC**-gg-hh	Power supply 100 - 240 VAC, 50 - 60 Hz
IT-5x7-aa-BT-bb-cc-dd-ee-**DC**-gg-hh	Voltage supply 24 VDC
IT-5x7-aa-BT-bb-cc-dd-ee-ff-**O30**-hh	Outdoor installation -30 °C [-22 °F] *
IT-5x7-aa-BT-bb-cc-dd-ee-ff-gg-**AL**	Aluminium front plate
IT-5x7-aa-BT-bb-cc-dd-ee-ff-gg-**RM**	Rear mount module

ⓘ NOTICE	* The O30 option is only available for AC devices !

9.5   IT-6x7 (KVM System)

IT-6x7-aa-bb-cc-dd-ee-ff
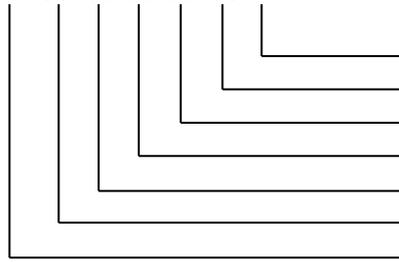
- Front design
- Outdoor option
- Voltage supply
- Touch screen
- Display type
- Transfer technology
- 667 / 677 / 687
  - middle digit ≙ display size
  - 6 ≙ 56 cm / 22" display
  - 7 ≙ 61 cm / 24" display
  - 8 ≙ 61 cm / 24"WU display

Product type:

Product key structure	Description
	Type with
IT-6x7-**DVI1-CAT**-bb-cc-dd-ee-ff	DVI1 KVM, with direct copper connection, Gigabit
IT-6x7-**DVI1-MM**-bb-cc-dd-ee-ff	DVI1 KVM, with direct optical fibre connection, multi-mode
IT-6x7-**DVI1-SM**-bb-cc-dd-ee-ff	DVI1 KVM, with direct optical fibre connection, single mode
IT-667-**DVI2-CAT**-bb-cc-dd-ee-ff	DVI2 ** KVM, with direct copper connection, Gigabit
IT-6x7-**DVI3-CAT**-bb-cc-dd-ee-ff	DVI3 KVM, with direct copper connection, Gigabit
IT-6x7-**DVI3-MM-FO**-bb-cc-dd-ee-ff	DVI3 KVM, with direct optical fibre connection, multi-mode
IT-6x7-**DVI3-SM-FO**-bb-cc-dd-ee-ff	DVI3 KVM, with direct optical fibre connection, single mode
IT-6x7-aa-**TFT**-cc-dd-ee-ff	TFT display (standard)
IT-6x7-aa-bb-**T**-dd-ee-ff	Touch screen (membrane)
IT-6x7-aa-bb-**TG**-dd-ee-ff	Touch screen glass
IT-6x7-aa-bb-cc-**AC**-ee-ff	Power supply 100 - 240 VAC, 50 - 60 Hz
IT-6x7-aa-bb-cc-**DC**-ee-ff	Voltage supply 24 VDC
IT-6x7-aa-bb-cc-dd-**O30**-ff	Outdoor installation -30 °C [-22 °F] *
IT-6x7-aa-bb-cc-dd-ee-**AL**	Aluminium front plate
IT-6x7-aa-bb-cc-dd-ee-**RM**	Rear end module

ⓘ NOTICE	*	The O30 option is only available for AC devices !
	**	The DVI2 KVM solution is only available together with the IT-667 HMI device !

10 Safety information

⚠ CAUTION	The notes listed below in section 9. must be heeded to avoid injury and damage to equipment !

10.1 General Safety Information

- All relevant accident prevention regulations and the rules for electric installations have to be observed during installation, maintenace and operations. All persons involved in installation, commission, maintenance and repairs of this device and its accessories must be qualified accordingly and must have familiarised themselves with this manual and any associated documentation.

- In case of non-compliance or contravention of the above protection is no longer guaranteed and all warranty claims shall be null and void.

- National safety and accident prevention rules apply.

- Use the device for its intended purpose only.

- No changes to the device are permitted. The enclosure may only be opened by R. STAHL HMI Systems GmbH.

10.2 Warning

⚠ ATTENTION	This is an EN 55022 Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

10.3 Installation safety information

- The in each case valid national assembly and installation rules and the generally accepted technical rules must be observed. The device and its accessories must be connected and operated according to applicable standards, directives and installation guidelines. Only qualified personnel or personnel that has been instructed accordingly are allowed to install the device.

- The HMI device has been certified as a fixed installed device. It must be fixed with a bracket or be secured in another way at a specified position.

- The HMI device must be disconnected from the mains for a change of position. The EPL must be adhered to.

- The HMI device's front should be protected by a canopy against permanent exposure to UV light. This increases the front membrane's lifespan. The canopy **<u>MUST NOT</u>** be too close to the front plate and sufficient air circulation must be ensured.

- Only appropriate tools must be used for the installation.

- According to IEC 60950, a suitable, easily accessible circuit breaker must be installed outside of the xx7 (version AC) which can cut the power line.

- The wire used for earthing must have a minimum cross section of 4mm² ! Make sure that there is equipotential bonding between the devices.

- We recommend you use screened cables with the device. Routing of the data cable may reduce performance.

- At the place of installation voltage must not exceed 250 V and short-circuit current must not exceed 1500 A.

- Before starting up the device you must ensure that it has been installed according to regulations and that neither the device nor its cables are damaged.

10.4   Industrial Security

Our products with Industrial Security functions support the secure operation of plants, systems and equipment. Protection against cyber threats requires an all-encompassing Industrial Security concept. The key to a successful concept is integrated implementation, continuous maintenance and state-of-the-art technology. This is the responsibility of the plant operator.

The following are key issues for an effective Industrial Security concept:

- Prevention of unauthorised access to plants, systems, equipment and networks

- Systems, equipment and components should only be connected to the company intranet or the internet if and when required

- Employ protective measures such as firewalls and network segmentation

- Only use the latest software product versions

- Carry out software updates as soon as new versions are available

- Use standard user accounts for regular operation

- Use secure passwords

- Appropriate safeguarding of administrator accounts

- Application of security guidelines

- Other measures to be taken as required

R. STAHL is constantly working on enhancing its products, thereby contributing to plant security and to minimizing the risk of cyber threats.

10.5   Safety information for operation

- Operate the device only if it is clean and undamaged. If the device is in any way damaged, do not touch it to avoid injury. In the case of any damage that may compromise ingress protection (e.g. cracks, holes or broken components) the device must be taken out of commission immediately. Before the device is recommissioned the damaged components must be replaced.

- In general, and particularly when opening and closing enclosures, users must take care not to get injured by getting caught / trapped.

11 Assembly and disassembly

11.1 General information

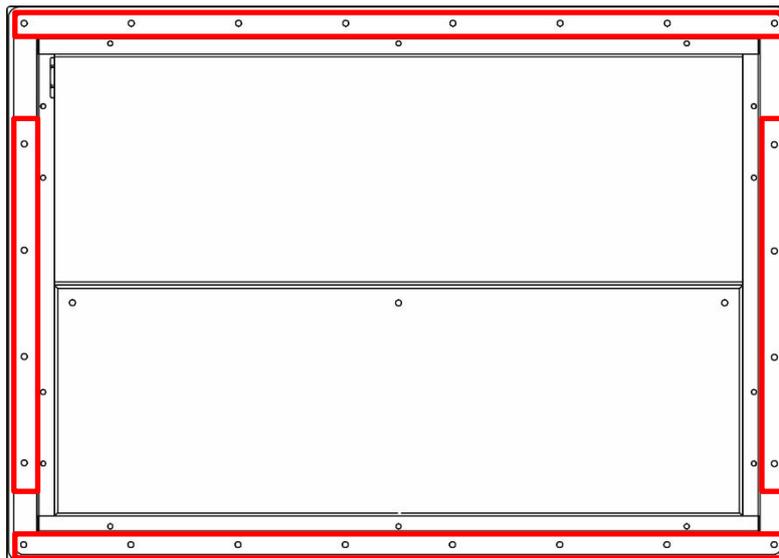| ⓘ NOTICE	Assembly and disassembly are subject to general technical rules. Additional, specific safety regulations apply to electronic and pneumatic installations.

11.2 Cut-out IT-xx7

Make a cut-out with the following dimensions:

Width	Height	Depth of cut-out	Material thickness	Unit
615 ± 0.5	435 ± 0.5	110	up to 5	mm
24.21 ± 0.002	17.13 ± 0.002	4.33	up to 0.02	inch (")

11.3 Tightening torque

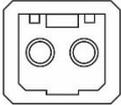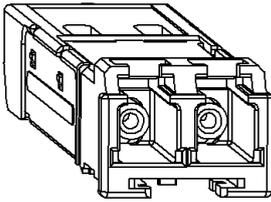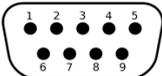| ⓘ NOTICE	The tightening torque of the nuts for the fixing bolts of the MT-4x7/5x7/6x7/ panel mount devices is **1.2 Nm (+- 0.2 Nm) !**

12 Operation

12.1 General information

ⓘ NOTICE	When operating the devices, particular care shall be taken that: • the HMI device has been properly installed according to instructions, • the device is undamaged, • all screws are tightened fast, • before switching the HMI device on, its external PE terminal is properly connected to the equipotential bonding system at its place of use.

12.2   Connections

Definition	View	Connection	Definition
PWR (Power)		IEC connector	Power supply of the HMI, variant AC *
PWR (Power)	1…2	STAK socket	Power supply of the HMI, variant DC * 1 = +24 VDC 2 = 0 VDC
USB 3 x		USB-A connector	USB interface, connection type A 2 x Hub, 1 x Root
USB 2 x		USB-A connector	USB interface, connection type A for keyboard and mouse
CAT5 (Data)	1……8	RJ-45 connector	Ethernet interface copper **
FO 1 (Data)	TX RX	LC duplex connector	Ethernet optical fiber interface **
SER (serial)	1 2 3 4 5 6 7 8 9	Sub-D 9 pin socket (male)	Serial interface RS-232
AUD (Audio)		TRS socket (stereo) 2 x 3.5 mm	Audio Line in / out interface ***

⊕ NOTICE	* Please note that the power supply connection is designed **either** for AC **or** DC (depending on the version ordered) !
	 ** Please note that the Ethernet connection is designed either for an optical fibre connection (FO) or for a copper connection (CAT5), depending on the version ordered.
	 In the case of an optical fibre connection the following cable is recommended:
	     Multi-mode optical fibre cable
	      50 µm core cross section and 125 µm external cross section
	     Single mode optical fibre cable
	      9 µm core cross section and 125 µm external cross section
	 Recommended cable length for USB, keyboard, mouse, RS-232 and Audio:
	     max. 3 m (10 ft)
	 *** Audio Line in only functional for IT-6x7 devices.

13 General Information

13.1 Touch driver

① NOTICE	The UPDD touch driver is copyrighted licensed software supplied strictly for use with original R. STAHL HMI Systems GmbH touch systems and under no circumstances should this driver be downloaded or used on any other equipment !

13.2 IT-4x7 (Panel PC) and IT-5x7 (Thin Client)

13.2.1 Up to Windows 7 operating systems

13.2.1.1 Licensing issues

The HMI devices SERIES 400 and 500 which are pre-installed with a Windows operating system are equipped with a license sticker.
The license sticker is affixed on the back of the HMI device, next to the type plate.
Please note that according to the license issued for Windows the application of this system as an Office PC is not permitted.

DOCUMENTATION	Please also note the information on the licensing stipulations for Windows operating systems contained in the "TechNote Windows Operating Systems" file located on the CD / DVD / USB stick, which is part of the delivery.

13.2.1.2 Note on Windows Embedded operating systems

When using the Windows Embedded operating systems (XP or Windows Standard 2009 / 7) on the Panel PC devices SERIES 400, the C:\ system drive can be protected from unauthorised writing (EWF).

① NOTICE	This is **NOT** the case with other Windows operating systems !

⚠ ATTENTION	R. STAHL HMI Systems GmbH recommends you leave the write protection filter on at all times !

DOCUMENTATION	For further information regarding this Write Protection (EWF), please refer to the OpenHMI_help_en.chm help file in the "STAHL" folder on the device or on the CD / DVD / USB stick that is included in the delivery.

13.2.2 Windows® 10 IoT Enterprise 2019 LTSC operating system

The operating system is based on Windows 10 for PC platforms with 64 bit x86 processors. For the LTSC (Long Term Servicing Channel) versions, Microsoft guarantees 10 years of security updates and new builds with feature updates only every 2-3 years, with these being optional. The LTSC versions are ideal for industrial applications and feature additional security components such as write filters (UWF) and HORM (start of a system snapshot from the RAM plus write protection).

From 2016 LTSB onwards, Microsoft has tied its licensing model to the processor performance:
ENTRY   for AMD® GX and ATOM™
VALUE   for Intel® Core i5™
HIGH   for Intel® Core i7™

The Panel PC SERIES 400 HMI devices with Windows 10 IoT Enterprise 2019 LTSC operating systems have the license provided as part of the image, with the corresponding label affixed to the back of the device. When delivered, the devices have already been registered and activated.

The EOL (End of Life) date for Windows 10 IoT Enterprise 2019 LTSC for support and updates has been set by Microsoft to 09.01.2029.

13.2.2.1 Recovery

ⓘ NOTICE	If a Panel PC is reset to the factory state (recovered) it will remain registered but will have to be reactivated ! This requires an active internet connection to a Microsoft server !

13.2.2.2 Company-specific Windows installations

ⓘ NOTICE	The Windows 10 IoT license key is tied to STAHL images ! The installation of own Windows 10 IoT operating systems requires a separate license key !
	All necessary drivers are provided by R.STAHL HMI Systems GmbH. Please contact our Support department.

13.2.3 Initial start-up IT-4x7 (Panel PC)

When the device is started for the first time, the Windows installation assistant starts where users have to select certain settings.
Please follow the instructions of the installation assistant.

13.2.4 Recovery Stick

ⓘ NOTICE	To restore your Panel PC device to its original state you will need a Recovery Stick, which is part of the delivery. This recovery stick (USB-drive) contains the factory image, with which the system can be restored to delivery status within a very short time. Please note that you can restore the HMI devices to their original state only with the aid of the Recovery Stick
	As an option, the recovery stick can also contain a backup software, with which you can back up your own device configuration.

13.2.5 Back-up

ⓘ NOTICE	Please note that it is the sole responsibility of the operator to generate a back-up of the HMI devices and their overall function.
	We strongly recommend such a back-up to be stored on an external storage medium or on the company network.

13.2.6   Switching off / closing down

ⓘ NOTICE	The Microsoft Windows operating system stores key data in the main memory, regardless of the application, and has to store this data on the hard disk before the HMI device is switched off.

⚠ ATTENTION	It is therefore important for the safe and correct operation that the HMI device is closed down properly (see illustration below) and **NOT** simply switched off. Otherwise the existing image of the device may be damaged, rendering the HMI device non-functioning.

13.2.7   Data loss

ⓘ NOTICE	In the case of applications that require constant writing into memory, R. STAHL HMI systems recommends you use external storage media (USB sticks, network servers) for these write processes.

⚠ ATTENTION	Try and avoid cyclical writes (log files, databases, etc.) to the SSD ! The endurance of an SSD depends on the number of write cycles (TBW / terabytes written). Writing to the SSD with a simultaneous drop in voltage is most likely going to result in data loss !

13.3   Teaming function

ⓘ NOTICE	For SERIES 500 an devices with 2TX interface only

- Providing redundancy due to automatic switch to a different network adapter.

- Using the Ethernet adapters in the team as standby adapters, realising redundancy, making the system more fail-safe.

- Bundling the speed of the Ethernet adapters in order to increase performance.

🛰 DOCUMENTATION	For a description of the function and its settings refer to the Remote HMI V6 software manual (industrial-grade Thin Client firmware).

14 Maintenance

Because the transmission of the devices remains reliable and stable over long periods of time, regular adjustments are not required.

Keep the units clean so that the enclosure locks and screws remain accessible. Maintenance may be required for the enclosure seal.

System maintenance should focus on the following:
a. Seal wear
b. Display damage
c. All screws are tightened fast
d. All cables and lines are properly connected and undamaged

⚠CAUTION	If the device in its factory state is damaged or altered in any way, decommission it immediately and contact the manufacturer !

15 Troubleshooting

15.1 Repairs / hazardous substances

An error description must be enclosed with any units returned to R. STAHL HMI Systems GmbH for repairs.

Remove all material residues. Please pay particular attention to the seal grooves and slits where material residues may be lodged. We have to ask you not to return a unit if you are unable to completely remove any hazardous substances. We shall bill you for any costs arising from insufficiently cleaned units, such as disposal or damage to persons (chemical burns, etc.).

16 Disposal / Restricted substances

Disposal of old electric and electronic devices, packaging and used parts is subject to regulations valid in whichever country the device has been installed.
For countries under the jurisdiction of the EU the corresponding WEEE directive applies.

The devices are classified according to the table below:

Directive	WEEE II directive 2012/19/EU
Valid	from 2018-08-15
Category	SG2 screens, monitors, devices with monitors >100 cm²

R. STAHL HMI Systems GmbH meets the requirements of directive 2012/19/EU (WEEE) and is registered under the number DE 15180083.

We shall take back our devices according to our General Terms and Conditions.

16.1 Declaration of substances and restricted substances

The present declaration is based on the procedure described in the international standard and directives as listed in the table below:

- IEC 62474 : 2018 (DIN EN IEC 62474 : 2019-09)

- (EG) Nr. 1907/2006 (REACH)

- Directive 2011/65/EU (RoHS)

- Resolution MEPC.269(68) "International Maritime Organization" (IMO); particularly "2015 Guidelines for the Development of the Inventory of the Hazardous Materials" (IHM)

16.1.1 Declarable substance groups

ECHA Legal Entity UUID of the R. STAHL HMI Systems GmbH:
 ECHA-a4dd94d5-bcd2-405d-8fdd-010a535d7e87

SCIP number: c335aec6-42c1-4204-8edf-b5b8d26ee81e

Component	Designation	Mass (g)	Declarable Substance Groups and Substances (IEC 62474 database)	CAS Nr.	Mass %	Exemption (acc. to directive)
BR2032	Lithium coin cell	2.6	Ethylenglycoldimethyl-ether (1.2-Dimethoxyethan / EGDME)	110-71-4	3.6104	-
BR2330	Lithium coin cell	3.2	Ethylene glycol dimethyl ether (1.2-Dimethoxyethan / EGDME)	110-71-4	3.8100	-

16.1.2 RoHS directive 2011/65/EC

The devices meet the requirements of RoHS Directive 2011/65/EU.

16.1.3 IMO Resolution MEPC.269(68)

The devices meet the requirements of the MEPC.269(68) Resolution of the "International Maritime Organization" (IMO), in particular the "2015 Guidelines for the Development of the Inventory of the Hazardous Materials" (IHM).

17 Defective pixels

As a result of the manufacturing process (production tolerances and errors) for the displays they may be delivered with defective pixels. Provided they are within the range of the specification below these potential defective pixels are not a display or HMI error or defect.

17.1 Terminology

|	
Defective pixels	Pixels or sub-pixels that do not perform as expected and are either always on or always off
Pixel	Image point on the display consisting of 3 sub-pixels in the basic colours red, green and blue

|	
Dot	Sub-pixel in the basic colour red, green or blue

Bright	Sub-pixel (dot) to which light is passing through, creating a bright dot that is on
Dark	Sub-pixel (dot) to which no light is passing through, creating a dark dot that is off
adjacent dots	dots positioned next to one another, horizontally, vertically or diagonally, bright or dark (e.g. the following pattern and sub-pixels)
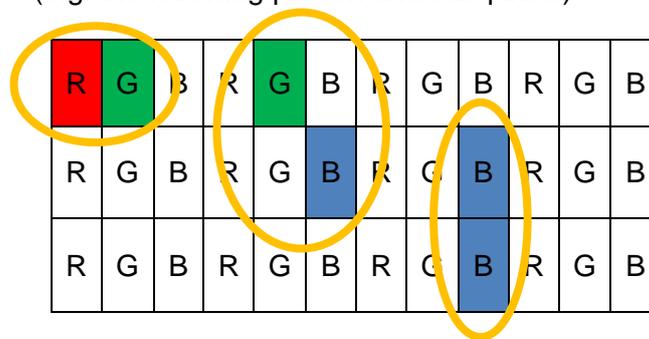
Distance between Dots	Definition of distance between two defective dots horizontal, vertical or diagonal, bright or dark (e.g. the following pattern and sub-pixels)
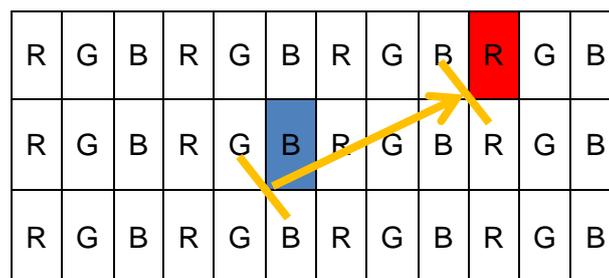
17.2   Display specification IT-x77

Type of defect / description	max. number of permitted defects
	24" display
Linear defect (horizontal, vertical, diagonal)	not permitted
Defective pixels	
bright dots	≤ 2
dark dots	≤ 5
total number of dots	≤ 5
adjacent dots	
2 bright dots	≤ 1 pair
more than 3 bright dots	not permitted
2 dark dots	≤ 2 pairs
more than 3 dark dots	not permitted
Distance between the dots	
between 2 bright dots	≥ 15 mm
between 2 dark dots	≥ 15 mm
between 1 bright and 1 dark dot	≥ 15 mm
ND filter for mura effects, bright and dark dots	view with 8% filter

18 Declaration of EC conformity

EU-Konformitätserklärung
EU Declaration of Conformity
Déclaration de Conformité UE

STAHL

R. STAHL HMI Systems GmbH • Adolf-Grimme-Allee 8 • 50829 Köln, Germany
erklärt in alleiniger Verantwortung,   *declares in its sole responsibility,*   *déclare sous sa seule responsabilité,*

dass das Produkt:	Bedien- und Beobachtungsgeräte
that the product:	*Operating and Monitoring Devices*
que le produit:	*Consoles de commande et de visualisation*

Typ(en), *type(s), type(s):*	IT-467-..., IT-567-..., IT-667-...
	IT-477-..., IT-577-..., IT-677-...
	IT-487-..., IT-587-..., IT-687-...
	KBD-USB-TB50...
	KBD-USB-M...
	KBD-USB-P...
	KBD-USB-J...
	KVM-*

mit den Anforderungen der folgenden Richtlinien und Normen übereinstimmt.
is in conformity with the requirements of the following directives and standards.
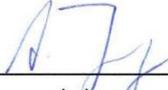*est conforme aux exigences des directives et des normes suivantes.*

Richtlinie(n) / *Directive(s)* / *Directive(s)*		Norm(en) / *Standard(s)* / *Norme(s)*
Kennzeichnung, *marking, marquage:*		C€
EMV-Richtlinie	**2014/30/EU**	EN 61000-6-2:2005 + AC:2005
EMC Directive	*2014/30/EU*	EN 61000-6-4:2007 + A1:2011
Directive CEM	*2014/30/UE*	
Niederspannungsrichtlinie	**2014/35/EU**	DIN EN 62368-1:2016, IEC 62368-1:2014 (Second Edition)
Low Voltage Directive	*2014/35/EU*	
Directive Basse Tension	*2014/35/UE*	
Produktnormen nach RoHS-Richtlinie (2011/65/EU):		EN IEC 63000:2018
Product standards according to RoHS Directive:		
Normes des produit pour la Directive RoHS:		

Für spezifische Merkmale und Bedingungen siehe Betriebsanleitung.
For specific characteristics and conditions see operating instructions.
Pour les caractéristiques et conditions spécifiques, voir le mode d'emploi.

Köln, 2020-12-17	i.V. *Joachim Düren*	i.V.
Ort und Datum	**J. Düren**	**A. Jung**
Place and date	Technical Director	Ex Representative
Lieu et date		

19 Release notes

The chapter entitled "Release Notes" contains all the changes made in every version of the operating instructions.

Version 01.02.10

- Removal of previous release notes
- Changing layout cover
- Changing disclaimer, new mail addresses
- Adaption address field verso
- Addition of attribute "Anti-reflective display" in "Technical Data"
- Addition of 2TX in "Technical Data"
- Addition of attribute "HMI Types" in "Technical Data"
- Correction upper temperature value at "Operation with heater version O30" in "Technical Data"
- Addition of 2TX in "Type code" at BT versions
- Removal of "digits of the serial number stand for the year of manufacture" in "General Safety Information"
- Addition of sentence "According to IEC 60950 - circuit breaker " in "General Safety
- Addition of note "Caution" in "Maintenance, overhaul"
- Addition of section "Industrial Security"
- Addition of section "Defective pixels"
- Addition of section "Material declaration"
- Addition of sub section "RoHS" in section "Material declaration"
- Formal changes

Version 01.02.11

- Addition of ND filter in "Display specification"
- Renew EC declaration of conformity
- Adaption of "Conformity to standards"
- Adaption and changing of section "Disposal" and "Material declaration"
- Addition of section "Teaming function"
- Removal of LTSB in "Technical Data"
- Changing Windows 10 LTSB into LTSC
- Formal changes

Version 01.02.12

- Changing HW rev. at cover
- Addition of "FSB notification"
- Changing text (with and without lettering) according to documentation note in "Specific markings"
- Addition of safety information "protection by a canopy" in "Installation safety information"
- Addition of table "Overview hardware revision"
- Addition of values for USB interfaces in "Technical Data"
- Formal changes

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