Operating Instructions

SHARK Device Platform

ET-xx8 / MT-xx8

Series 400 Panel PCs
Series 500 Thin Clients
Series 600 KVM Systems

STAHL

THE STRONGEST LINK.

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1 General information

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1.2 Legal notice

1.2.1 Trademark

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Any warranty claims are limited to the right to demand amendments. Liability for any damage that might result from the contents of these instructions or all other documentation is limited to clear cases of premeditation.

We reserve the right to amend 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 in the delivery applies.

1.3 About these Operating Instructions

1.3.1 Target group

These operating instructions are intended for the following groups of people:

- Project engineers
- Electricians and fitters
- Operators
- Operating staff
- Maintenance staff

1.3.2 How to use this manual

- Read these operating instructions, especially the safety notes, carefully before use.
- Take note of all other applicable documents (see also chapter 1.4 Further documents).
- Keep the operating instructions throughout the service life of the device.
- Make the operating instructions accessible to operating and maintenance staff at all times.
- Pass the operating instructions on to each subsequent owner or user of the device.
- Update the operating instructions every time R. STAHL issues an amendment.

1.3.3 Application

Operating Instructions version:	01.02.03
Hardware revision:	ET-/MT-4x8: 01.01.04 ET-/MT-5x8: 01.01.04 ET-/MT-6x8: 01.01.03

The following operating instructions apply to the following systems:

ET-xx8 / MT-xx8	SERIES 400 Panel PC SERIES 500 Thin Clients SERIES 600 KVM Systems

The original instructions are the German edition.
They are legally binding in all legal affairs.

1.4 Further documents

- Installation Manual ET-/MT-xx8 (IM_ET_MT-xx8)
- Installation Manual Top Connect ET-/MT-xx8 (IM_Top-Connect_xx8)
- Installation Manual Mounting-Kit xx8 (IM_Mounting-Kit_xx8)
- Installation Manual Module exchange xx8 (IM_Module_exchange_xx8)
- Compilation of Certificates xx8 (CE_ET_MT-xx8)

For documents in other languages see r-stahl.com.

1.5 Conformity with standards and regulations

1.5.1 Certificates

	Certificates and EC Declaration of Conformity: r-stahl.com
	The device has IECEx approval. See IECEx homepage: http://iecex.iec.ch/ to view the certificate
	Further national certificates can be downloaded via the following link: https://r-stahl.com/de/global/support/downloads/

1.5.2 Approvals

The following approvals are valid for all devices:

Synonym	Scope of validity	Certificate number
CE / ATEX	Europe	BVS 14 ATEX E 134 X
IECEx	Global	BVS 14.0116X
EAC	Russia	TC RU C-DE.ME92.B.00843
		EACЭ N RU Д–DEPA01.B.27604/20
NEC	USA	FM 16 US 0278 X
CEC	Canada	FM 16 CA 0141 X
CCC	China	2020312309000286
CNEX		CNEx17.2233X

Synonym	Scope of validity	Device	Certificate number
PESO	India	ET-xx8	A/P/HQ/TN/104/5747 (P436617)
			CCE identification number
			P436617/1
		MT-xx8	**Certificate number**
			A/P/HQ/TN/104/5750 (P436574)
			CCE identification number
			P436574/1

Synonym	Scope of validity	Note
RCM	Australia	according to declaration of conformity

The following approvals are only valid for the SERIES 400 Panel PCs and the SERIES 500 Thin Clients:

Synonym	Scope of validity	Certificate number
ABS	Marine / ship approval	17-HG1687000-PDA
DNV / GL	Marine / ship approval	TAA00001E6

1.5.3 Summary of applied standards

1.5.3.1 ATEX / IECEx ET-xx8

Standard	Classification
IEC 60079-0: 2012 + A1 : 2013	General requirements
IEC 60079-5: 2015	Protection by powder filling "q"
IEC 60079-7: 2015	Protection by increased safety "e"
IEC 60079-11: 2012	Protection by intrinsic safety "i"
IEC 60079-28: 2015	Optical radiation “op is”
IEC 60079-31: 2014	Protected by enclosures "t" (dust)
The product corresponds to requirements from:	
EN IEC 60079-0 : 2018	General requirements
EN IEC 60079-7 : 2015 + A1 : 2018	Protection by increased safety "e"

1.5.3.2 ATEX / IECEx MT-xx8

Standard	Classification
IEC 60079-0: 2012 + A1 : 2013	General requirements
IEC 60079-5: 2015	Protection by powder filling "q"
IEC 60079-7: 2015	Protection by increased safety "e"
IEC 60079-11: 2012	Protection by intrinsic safety "i"
IEC 60079-15: 2010	Type of protection "n"
IEC 60079-28: 2015	Optical radiation “op is”
IEC 60079-31: 2013	Protected by enclosures "t" (dust)
The product corresponds to requirements from:	
EN IEC 60079-0 : 2018	General requirements
EN IEC 60079-7 : 2015 + A1 : 2018	Protection by increased safety "e"
EN IEC 60079-15: 2020	Type of protection "n"

1.5.3.3 EMC directive 2014/30/EU

Standard	Classification
EN 61000-6-2 : 2005 + AC : 2005	Immunity
EN 61000-6-4 : 2007 + A1 : 2011	Emission

1.5.3.4 Radio equipment directive 2014/53/EU

Standard	Classification
ETSI EN 300328 V2.1.1 : 2016	Wideband transmission systems – data transmission equipment operating in the 2.4 GHz ISM band

1.5.3.5 Low voltage directive 2014/35/EU

Standard	Classification
EN 62368-1 : 2016 IEC 62368-1 : 2014	Audio / video, information and communication technology equipment – safety requirements

1.5.3.6 RoHS directive 2011/65/EU

Standard	Classification
EN IEC 63000 : 2018	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

1.5.3.7 FM USA

Standard	Classification
FM Class 3600: 2011	Electric equipment for use in hazardous areas - general requirements
FM Class 3616: 2011	Dust explosion protection electric equipment - general requirement
FM Class 3810: 2005	Electric equipment for the operation of measuring, control and laboratory equipment
ANSI/ISA 60079-0: 2013	General requirements
ANSI/UL 60079-5: 2016	Protection by powder filling "q"
ANSI/UL 60079-7: 2017	Protection by increased safety "e"
ANSI/ISA 60079-11: 2014	Protection by intrinsic safety "i"
ANSI/ISA 60079-15: 2013	Type of protection "n"
ANSI/ISA 60079-28: 2013	Optical radiation “op is”
ANSI/UL 60079-31: 2015	Protected by enclosures "t" (dust)
ANSI/IEC 60529: 2004	Degrees of protection provided by enclosure (IP code)

1.5.3.8 FM Canada

Standard	Classification
CAN/CSA-C22.2 No. 60079-0: 2015	General requirements
CAN/CSA-C22.2 No. 60079-5: 2016	Protection by powder filling "q"
CAN/CSA-C22.2 No. 60079-7: 2016	Protection by increased safety "e"
CAN/CSA-C22.2 No. 60079-11: 2014	Protection by intrinsic safety "i"
CAN/CSA-C22.2 No. 60079-15: 2016	Type of protection "n"
CAN/CSA-C22.2 No. 60079-31: 2015	Protected by enclosures "t" (dust)
CAN/CSA-C22.2 No. 60529: 2016	Degrees of protection provided by enclosure (IP code)
CAN/CSA-C22.2 No. 61010-1: 2004	Safety regulations for electric measuring, control and laboratory equipment - general requirements

1.5.3.9 EAC

Standard	Classification
ГОСТ 31610.0-2014 / IEC 60079-0 : 2011	General requirements
ГОСТ Р МЭК 60079-5-2012	Protection by powder filling "q"
ГОСТ Р МЭК 60079-7-2012	Protection by increased safety "e"
ГОСТ 31610.11-2014 / IEC 60079-11 : 2011	Protection by intrinsic safety "i"
ГОСТ 31610.15-2014 / IEC 60079-15 : 2010	Type of protection "n"
ГОСТ Р МЭК 60079-31-2010	Protected by enclosures "t" (dust)
ГОСТ 31610.28-2012 / IEC 60079-28 : 2006	Optical radiation “op is”
GB3836.1-2010	General requirements
GB3836.3-2010	Protection by increased safety "e"
GB3836.4-2010	Protection by intrinsic safety "i"
GB3836.7-2004	Protection by powder filling "q"
GB3836.8-2014	Type of protection "n"
IEC 60079-28 : 2015	Optical radiation “op is”
IEC 60079-31 : 2013	Protected by enclosures "t" (dust)

2 Explanation of symbols

2.1 Symbols used in these Operating Instructions

Symbol	Meaning
	Handy hint for making work easier, important note
	Reference to another chapter, another section, another documentation or a web page.

2.2 Warning notes

DANGER	Dangerous situation which can result in fatal or severe, life-changing injuries if the safety measures are not complied with.
WARNING	Dangerous situation which can result in severe injuries if the safety measures are not complied with.
CAUTION	Dangerous situation which can result in minor injuries if the safety measures are not complied with.
NOTE	Dangerous situation which can result in material damage if the safety measures are not complied with.

Symbol	Meaning
	Burn hazard
	Laser radiation hazard

2.3 Symbols on the device

Symbol	Meaning
	Device certified for hazardous areas according to ATEX directive.
	Device marking according to EU directive
0158	ID number of monitoring body
	Marking according to WEEE directive 2012/19/EU
	Marking for device approval in Eurasian Economic Union
	Marking according to FM (Factory Mutual) for approval in North America • C stands for Canada • US stands for United States
	Warning - important information
	Warning of hazardous voltage
	Connection for equipotential bonding

3 Safety

The device has been manufactured according to the state of the art of technology while observing recognised safety-related rules. When using the device, it is nevertheless possible for hazards to occur to life and limb of the user or third parties or for the device, environment or material assets to be compromised.

Only use the device under the following conditions:

- If it is not damaged
- As intended, while remaining aware of safety and hazards
- In accordance with these Operating Instructions

3.1 Intended use

The Series xx8 Shark device platform HMIs are operator stations suitable for industrial production in hazardous areas.
Depending on their version, the devices are certified for the following hazardous areas:

Series xx8	Hazardous area	Directive
ET	Zone 1, 2, 21 and 22 (EPL Gb, Db) Class I, Zone 1 & 2; Class I, Division 2; Zone 21 & 22	ATEX directive, IEC and Canadian requirements
	Class II, Division 2	acc. to American requirements
MT	Zone 2 and 22 (EPL Gc, Dc) Class I, Zone 2, Class I, Division 2, Zone 22	ATEX directive, IEC and Canadian requirements
	Class II, Division 2	acc. to American requirements

The SHARK device platform has been designed with particular focus on the harsh conditions prevalent in the oil and gas industry. The device can be used indoors as well as in outdoor areas. It is shock, vibration, saltwater and salt-spray proof.

The approved operating temperature ranges depend on the version:

- Standard: from -10 °C to +65 °C
- Outdoor installation (with integrated heater): from -40 °C to +65 °C

Depending on their configuration, the following versions with the SHARK device platform are available:

- Panel PC - SERIES 400
- Thin Clients - SERIES 500
- KVM Systems (Keyboard - Video - Mouse) - SERIES 600

The SHARK device platform consists of a display and an E-Box module that are mounted together. The display module generally consists of all display components, whereas the E-Box module generally consists of the other electronic parts.
The device platform communicates with automation systems and distributed control systems via Ethernet, WLAN or serial interfaces, and has additional interfaces for peripherals such as keyboards, pointing devices, RFID readers, barcode readers for material inventory or EM-STOP switches.
The device is not a panel-mount module. For applications that require degree of protection Ex e, Ex p or Ex tb, the device must be mounted together with the "xx8 Mounting-Kit".
Two terminal boxes for Ex e and Ex ia circuits are available for the connection of all external cables.
"Intended use" includes complying with these Operating Instructions and the other applicable documents, such as the data sheet. All other uses are only considered to be intended after being approved by R. STAHL.

3.2 Predictable improper use

The device may only be installed and connected by specifically trained personnel.

3.3 Personnel qualification

Qualified specialist personnel is required to perform the activities described in these Operating Instructions. This primarily applies to work in the following areas:

- Product selection and project engineering
- Mounting / dismounting the device
- Installation
- Commissioning
- Maintenance, cleaning

Specialists who perform these tasks must have a level of knowledge that meets applicable national or equivalent country-specific standards and regulations. Additional knowledge is required for any activity in hazardous areas !

R. STAHL recommends having a level of knowledge equal to that described in the following standards:

- IEC/EN 60079-14 (Electrical installations design, selection and erection)
- IEC/EN 60079-17 (Electrical installations, inspections and maintenance)
- IEC/EN 60079-19 (Equipment repair, overhaul and reclamation)

3.4 Special conditions of use

The intrinsically safe circuits are earthed. Equipotential bonding is required for the entire intrinsically safe circuits.

Devices with wireless interface

Type feature for devices with wireless interface:	W02, W05, W22, W55 or W25
Maximum transmission power of antenna	2 W (group IIC)
Connection terminal for antenna:	X36 and X37

The maximum transmission power is the result of: antenna gain, power loss in the cable and transmission power of the transmitter (X36 / X37), according to the data in these operating instructions.
The intrinsically safe circuits at terminals X36 and X37 are earthed. When connecting external antennae, please note the following earthing requirements for intrinsically safe circuits:

- EN 60079-14 of the National Electrical Code ANSI/NFPA 70
- Canadian Electric Code CSA C22.1

Requirements for plug connectors and switches

The covers of the terminal boxes are fitted with cable entries and blind plugs. As an option, they may be fitted with plug connectors and switches.
The devices must be certified individually for the respective type of protection and also have IP66.

Panel mount with xx8 Mounting-Kit

The devices can be mounted inside an enclosure with a suitable cut-out with the aid of fixing frame kits (xx8 Mounting-Kit). Where degree of protection Ex e, Ex p or Ex tb is required, the device must be mounted with a xx8 Mounting-Kit mounting frame (see chapter 8.4 Panel mount with xx8 Mounting-Kit).

3.5 Residual risks

3.5.1 Explosion hazard

Despite the device's state-of-the-art design, explosion hazards cannot be entirely eliminated in hazardous areas.

- Perform all work steps in hazardous areas with the utmost care at all times !

Possible hazards ("residual risks") can be categorised according to the following causes:

Mechanical damage

The device may become damaged during transport, mounting or commissioning. This kind of damage may, for example, render the device's explosion protection partially or completely ineffective. This may result in explosions causing serious or even fatal injury.

- Do not commission a damaged device.
- Only transport the device in special transport packaging that reliably protects the device from external influences. Observe the ambient conditions when selecting the transport packaging (see chapter 17.1 Technical data).
- Do not place any loads on the device.
- Check the packaging and the device for damage. Immediately report any damage to R. STAHL.
- Store the device ideally in its original packaging in a dry place (with no condensation), and make sure that it is stable and protected against the effects of vibrations and knocks.
- Do not damage the device or seals during its installation.

Excessive heat or electrostatic charge

- Operate the device only within the prescribed operating conditions (see chapter 4.7 Markings on the device and chapter 17.1 Technical data).
- Mount and install the device in such a way that it is always operated within the permissible temperature range.
- Do not use the device in strong charge-generating environments.
- Avoid friction and flow of particle streams.
- R. STAHL recommends you equip devices used outdoors or exposed to the elements with a protective roof or wall.
- Regularly inspect the device for a material change. If you spot any changes, test or replace the device.
- Do not paint or repaint the device yourself. Do not have the paintwork touched up by anyone other than the manufacturer.
- Comply with the area specification of EN/IEC 60079-0 when fitting additional plastic adhesive labels.
- Clean the device with a damp cloth only.
- Do not cover the display with protective foil.

Improper mounting, installation, commissioning, maintenance or cleaning

Basic work such as installation, commissioning, maintenance or cleaning of the device must always be performed in accordance with the applicable national regulations of the country of use and only by qualified persons. Otherwise, the explosion protection may be rendered ineffective. This may result in explosions causing serious or even fatal injury.

- Have the assembly, installation, commissioning and maintenance work performed by qualified and authorised persons only (see chapter 3.3 Personnel qualification).
- Prior to commissioning, check the device is mounted correctly (see chapter 8 Mounting and installation).
- Electrical circuits with Ex i type of protection may no longer be operated as electrical circuits with this type of protection after being operated with electrical circuits with other types of protection.
- Even when used in Zones 2 and 22, intrinsically safe devices of Zones 0, 1, 20 and 21 can be connected to the intrinsically safe signal circuits.
- Only connect the device to equipment which does not carry voltages higher than 250 VAC (50 - 60 Hz).
- Connect Ex i devices only to intrinsically safe terminals.
- In hazardous areas, always switch the electrical circuits and devices to a de-energised state before disconnecting or connecting and when mounting / dismounting.
- Do not change or modify the device.
- Any repair on the device is to be performed by R. STAHL only.
- Gently clean the device with a damp cloth only – do not use scratching, abrasive or aggressive cleaning agents or solutions.
- Never clean the device with a strong water jet, such as a pressure washer !

3.5.2 Risk of injury

Falling devices or components

The heavy device or components can fall during transport and mounting, causing severe injury to persons in the form of bruises and contusions.

- Use transporting and lifting equipment suitable for the size and weight of the device when transporting and mounting it.
- Observe the weight and the maximum load-bearing capacity of the device; see specifications on the shipping label or on the packaging.
- Use suitable mounting materials for mounting.

Electric shock

During operation and maintenance, high voltage is at times applied to the device. Because of this, the device must be de-energised during installation. Persons coming into contact with electrical lines carrying excessively high voltage can suffer severe electric shocks and, consequently, injuries.

- Only connect electrical circuits to suitable terminals.

3.5.3 Device damage

As a result of unsuitable operating conditions or careless contact the device or individual components may be damaged so significantly that the device does not operate correctly or fails completely.

- Do not subject the device to external heat sources or direct sunshine. Ensure that the maximum ambient temperature is never exceeded.
- Do not open the enclosure. The enclosure has been sealed permanently.

3.6 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 effective industrial security concepts:

- 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 updates 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.

4 Function and device design

4.1 Features and versions

4.1.1 Options

The SERIES xx8 - SHARK device platform HMIs are Operator Stations designed for applications in the oil and gas industry and in harsh ambient conditions.
Depending on their technology, they perform the following tasks:

Technology	Task
Panel PC - SERIES 400	Industrial PC with computer and monitor
Thin Client - SERIES 500	Remote control of PCs or virtual workstations, for example via Ethernet and WLAN.
KVM System - SERIES 600	Extension of the keyboard, video and mouse interfaces of a workstation from the safe area to the hazardous industrial area.

4.1.2 Display

The SHARK device platform is available with the following types of display:

- Size: 15" or 21.5"
- Design: "VESA 200 Standard" or "VESA 200 Top Connect"
- Multi-touch function (optional)
- Dimmable (for SERIES 400 / 500 via the operating system, for SERIES 600 via keys F7 and F8)

4.1.3 Outdoor Installation

The SERIES xx8 operating devices can be operated in temperatures ranging from -10 °C to +65 °C (outdoor option O0 - standard). For outdoor option O4, the devices will be fitted with an integrated heater, allowing operating temperatures ranging from -40 °C to +65 °C.

4.1.4 Card reader for access control

As an option, the ET-/MT-x98 operating stations can be fitted with an integrated card reader. This card reader is a proximity reader that can read the corresponding transponder media without direct contact and transfer the data to operating devices or any other systems.

Two versions of RFID reader are available for different types of data transfer between reader and a corresponding software.

- CRYPT - version C5: data is transferred via an encrypted bidirectional protocol. This protocol can also be used to describe the transponder media. The connected device must be able to support the data encryption via a suitable application. The protocol description can be provided once a confidentiality agreement has been signed.
- ASCII - version C6: when the transponder medium approaches the reader or is removed from it, the reader actively sends the pre-parameterised content of the medium in the form of characters transformed byte-wise from hex code to ASCII. Applications such as PM Logon from Siemens or LogOnPlus from i.p.a.s. support this protocol.

4.1.5 Other features

- Bluetooth
- Reader interface
- Optional features:
  - WLAN
  - Integrated front camera

These features depend on the technology (see chapter 17.1 Technical data).

4.1.6 Accessories

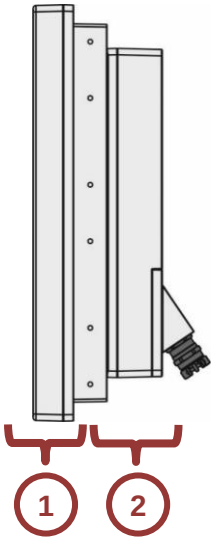
Peripherals:

- Barcode scanner
- Attached keyboard and pointing device (trackball or joystick (Ex ia))
- Desktop keyboard with 105 keys (Ex ia) and optical desktop mouse (Ex ia)
- On / off switch

Terminal boxes are used for connections (see chapter 4.4 Terminal boxes).

For associated operating instructions see r-stahl.com.

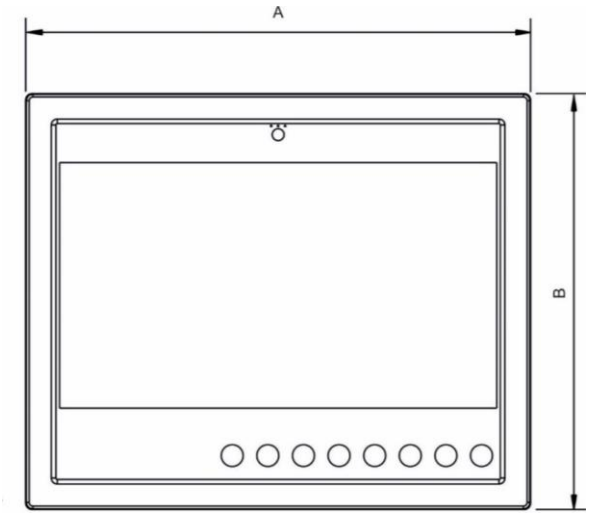
4.2 Device design



Item	Designation
1	Display module
2	E-box module

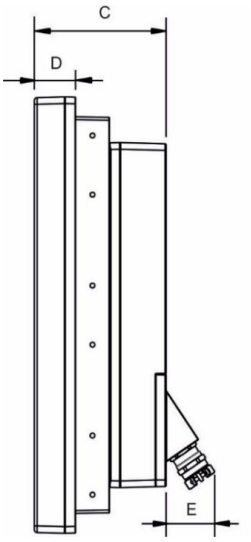
4.3 Dimensions

4.3.1 Front:



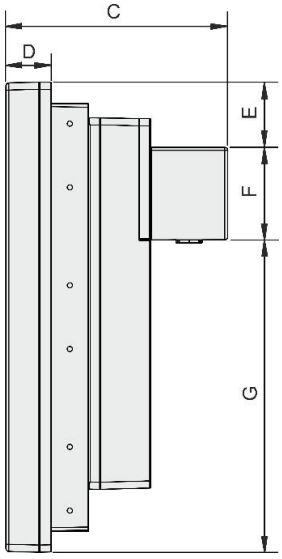
	Dimensions [mm]	
Item	**ET-x38 / MT-x38**	**ET-x98 / MT-x98**
A	380	553
B	394	458

4.3.2 Page - VESA 200 Standard



	Dimensions [mm]	
Item	**ET-x38 / MT-x38**	**ET-x98 / MT-x98**
C	137	141
D	40	44
E	52	52

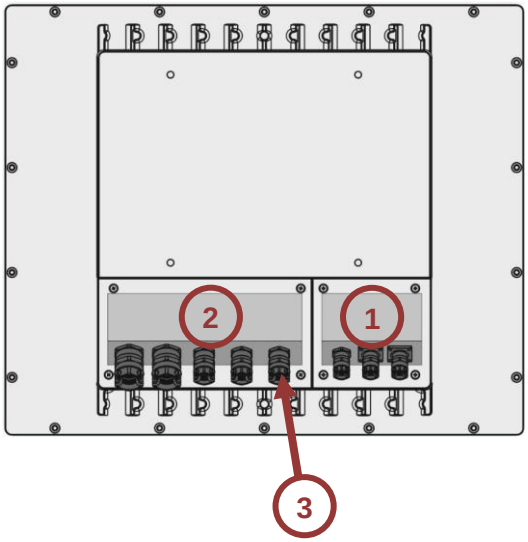
4.3.3 Page - VESA 200 Top Connect



	Dimensions [mm]	
Item	**ET-x38 / MT-x38**	**ET-x98 / MT-x98**
C	212	216
D	40	44
E	46	64
F	90	90
G	257	304

4.4 Terminal boxes

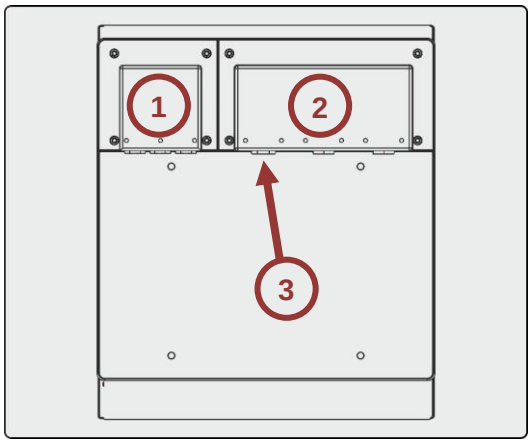
4.4.1 VESA 200 Standard



Item	Designation
1	Cover of Ex i terminal box
2	Cover of Ex e terminal box
3	Cable glands

Cable glands (number, size) see ET-/MT-xx8 Installation Manual (IM_ET_MT-xx8)

4.4.2 VESA 200 Top Connect



Item	Designation
1	Cover of Ex i terminal box
2	Cover of Ex e terminal box
3	Screw plugs

Screw plugs (number, size) see ET-/MT-xx8 Installation Manual (IM_ET_MT-xx8)

4.5 Operating elements

4.5.1 ET-/MT-x38 (15")

Item	Designation
1	LEDs and front camera (optional)
2	Display (optional: with touch function)
3	Function keys F1 to F8

4.5.2 ET-/MT-x98 (21.5")

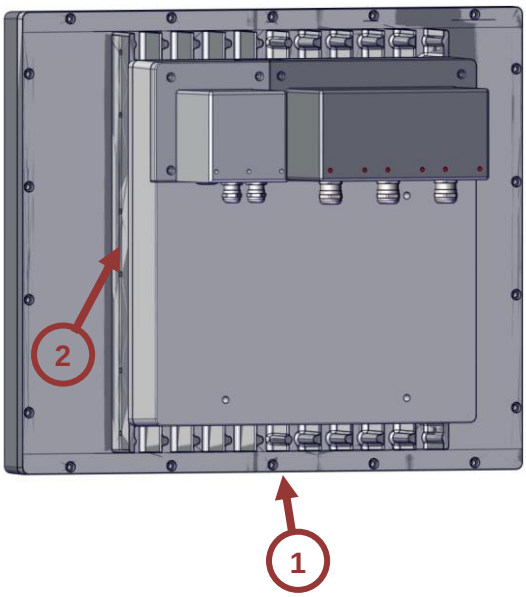
Item	Designation
1	LEDs and front camera (optional)
2	Display (optional: with touch function)
3	Function keys F1 to F8
4	RFID card reader (optional)

4.6 LED status display

Pictogram	LED colour	Status	Meaning
	Blue	lit	For "outdoor installation" version: internal heater is switched on. The device is being heated up.
	Orange	lit	Device is live. Internal power supply ok.
	Green	lit	Internal temperature has reached the required operating temperature level. The device is ready.

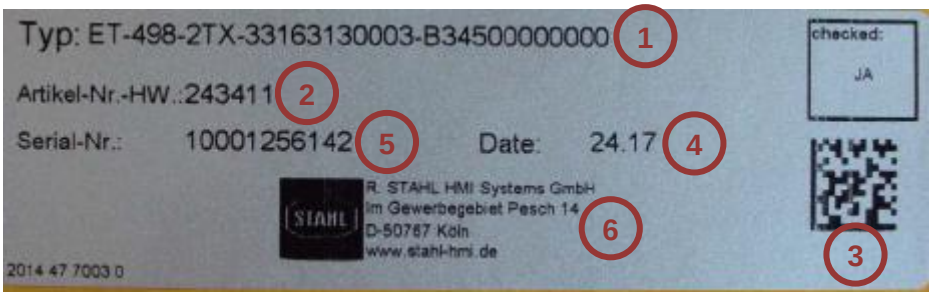
4.7 Markings on the device

4.7.1 Position



Item	Designation
1	Display type and approval label
2	Field system type label

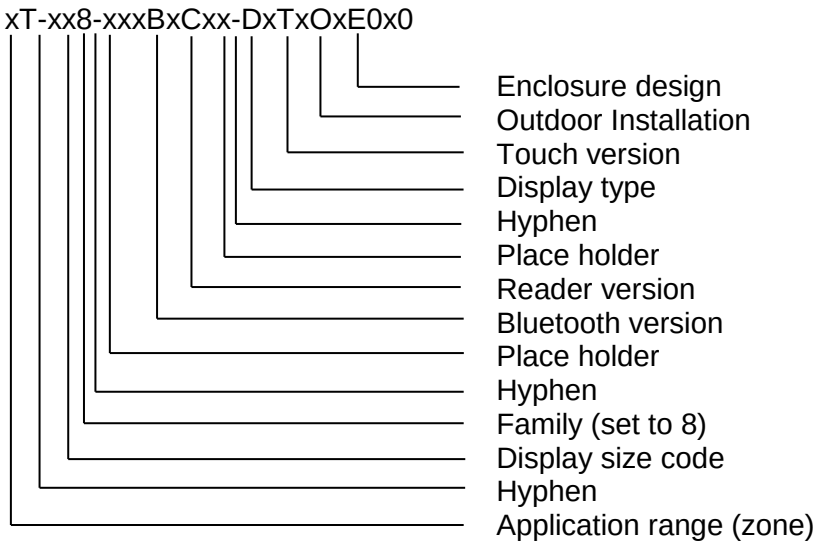
4.7.2 Design of a type label (taking the field system type label as an example)



Item	Designation
1	Type key code (see chapters 4.7.3 to 4.7.5)
2	Article number of hardware
3	QR code
4	Manufacturing date (calendar week.YY)
5	Serial number
6	Address of manufacturer

4.7.3 Display module type key code

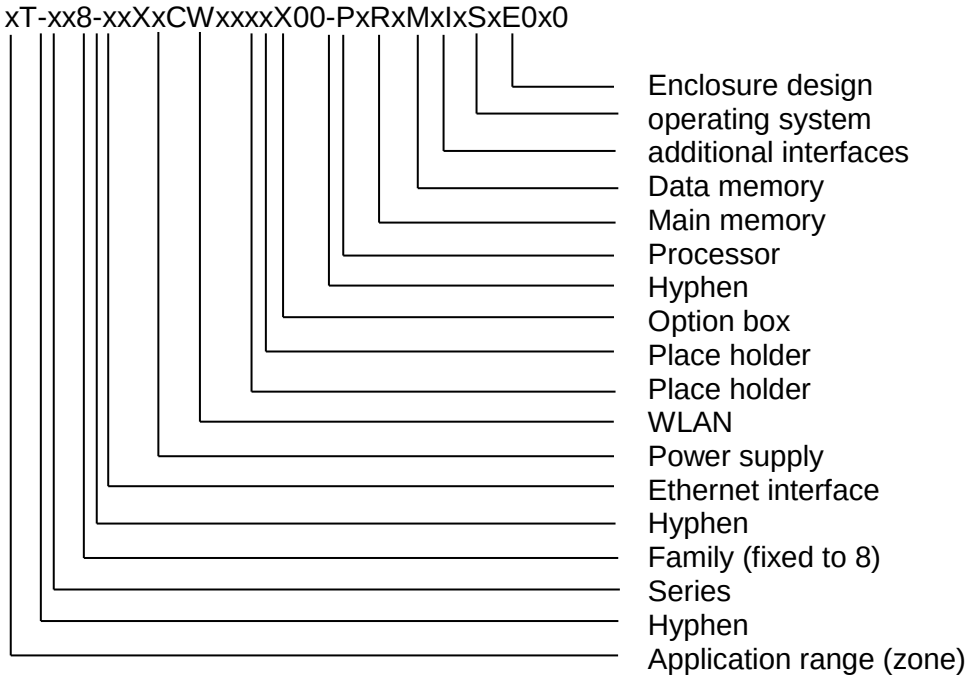
Not all combinations of the type key codes of display and E-box module are technically possible. This section does not list the limits, however. All versions available for sale are contained in the price lists and the configurators. Should you have any questions, please contact R. STAHL HMI Systems GmbH.



Position in type key	Possible value	Description
xT	ET	Devices for Zone 1, Zone 21, EPL Gb, Db
	MT	Devices for Zone 2, Zone 22, EPL Gc, Dc
-	-	Hyphen
xx	x3	15" display
	x8	24" WU display
	x9	21.5" display
8	8	Generation 8
-	-	Hyphen
xxx	xxx	Place holder
Bx	B0	no Bluetooth
	B1	integrated Bluetooth
Cx	C0	no integrated reader interface
	C1	Integrated RFID 13.56 MHz reader interface
	C2	Integrated RFID 2.4 GHz reader interface
	C3	Integrated RFID 13.56 MHz reader interface MIFARE / DESFire / EV1, CRYPT
	C4	Integrated reader interface RFID 13.56 MHz, MIFARE / DESFire / EV1, ASCII
	C5	Integrated reader interface RFID 13.56 MHz, LEGIC, MIFARE / DESFire / EV1, CRYPT
	C6	Integrated reader interface RFID 13.56 MHz, LEGIC, MIFARE / DESFire / EV1, ASCII
	C7	Integrated reader interface RFID 13.56 MHz, NFC
x	x	Place holder
-	-	Hyphen

Dx	D0	Display type TFT
	D1	Display type "sunlight readable"
Tx	T0	no touch screen
	T3	Capacitive multi-touchscreen (glass)
Ox	O0	Outdoor installation -10 °C
	O4	Outdoor installation -40 °C
E0x0	E000	Enclosure design Exicom VESA 200
	E010	Enclosure design Exicom VESA 200 without camera
	E100	Enclosure design Exicom Top Connect
	E110	Enclosure design Exicom Top Connect without camera

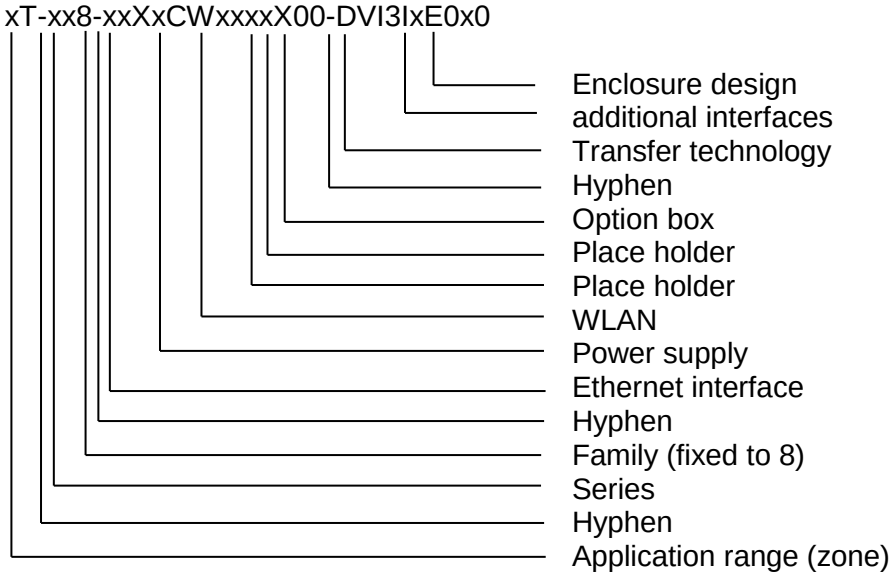
4.7.4 Type key code E-box module SERIES 400 / 500



Position in type key	Possible value	Description
xT	ET	Devices for Zone 1, Zone 21, EPL Gb, Db
	MT	Devices for Zone 2, Zone 22, EPL Gc, Dc
-	-	Hyphen
xx	4x	E-box SERIES 400
	5x	E-box SERIES 500
8	8	Generation 8
-	-	Hyphen
xxx	xxx	Place holder
xxX	1TX	1x 1000Base-TX Copper Ethernet
	2TX	2x 1000Base-TX Copper Ethernet
	2FX	2 100Base-FX FO Ethernet
xC	AC	AC power supply 100 - 240 VAC
	DC	DC power supply 24 VDC

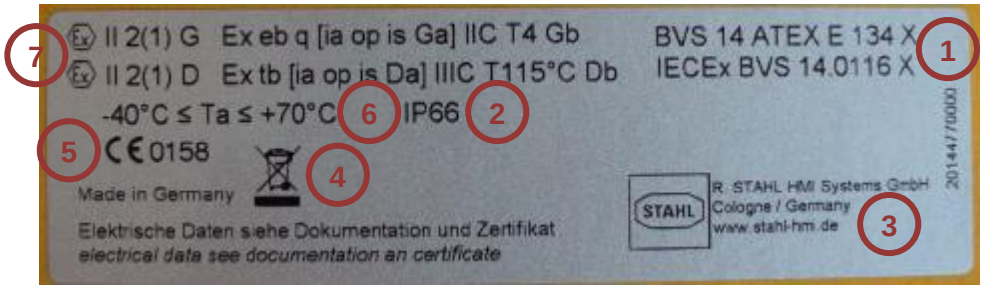
Wxx	W00	no WLAN interface
	W02	WLAN interface RF 2.4 GHz
	W05	WLAN interface RF 5 GHz
	W22	WLAN interface 2x RF 2.4 GHz
	W55	WLAN interface 2x RF 5 GHz
	W25	WLAN interface RF 2.4 GHz and RF 5 GHz
x	x	Place holder
x	x	Place holder
X00	X00	No option box
-	-	Hyphen
Px	P0	Processor provision
	P2	AMD processor
	P3	Intel i7 processor
	P4	Intel i7 processor with TPM
	P5	Intel i5 processor
	P6	Intel i5 processor with TPM
Rx	R3	4 GB main memory
	R4	8 GB main memory
	R5	16 GB main memory
Mx	M5	60 GB memory
	M6	80 GB memory
	M9	128 GB memory
	MB	160 GB memory
	MC	240 GB memory
	MD	300 GB memory
	ME	480 GB memory
Ix	I0	no optional interface
	I4	CAN-Bus interface (open CAN) - no longer available
Sx	S0	No operating system
	S3	Windows 7 Ultimate
	S4	Windows Embedded Standard 7
	S5	Windows 10 IoT Enterprise 2016 LTSB
	S8	Windows 10 IoT Enterprise 2016 LTSB with Remote software V5
	S9	Windows 10 IoT Enterprise 2019 LTSC with Remote software V6
E0x0	E000	Enclosure design Exicom VESA 200
	E020	Enclosure design Exicom VESA 200 ST plug
	E100	Enclosure design Exicom Top Connect

4.7.5 Type key code E-box module SERIES 600



Position in type key	Possible value	Description
xT	ET	Devices for Zone 1, Zone 21, EPL Gb, Db
	MT	Devices for Zone 2, Zone 22, EPL Gc, Dc
-	-	Hyphen
xx	6x	E-box SERIES 600
8	8	Generation 8
-	-	Hyphen
xxX	1TX	1x 100/1000Base-TX Copper Ethernet
	1SX	1x 1000Base-SX FO Ethernet, multi-mode
	1LX	1x 1000Base-LX FO Ethernet, single mode
xC	AC	AC power supply 100 - 240 VAC
	DC	DC power supply 24 VDC
Wxx	W00	no WLAN interface
x	x	Place holder
x	x	Place holder
X00	X00	No option box
-	-	Hyphen
DVI3	DVI3	DVI3 KVM Technology
Ix	I0	no optional interface
E0x0	E000	Enclosure design Exicom VESA 200
	E020	Enclosure design Exicom VESA 200 ST plug
	E100	Enclosure design Exicom Top Connect

4.8 Approval label



Item	Designation
1	Certificate numbers
2	Degree of protection
3	Address of manufacturer
4	Marking according to WEEE directive 2012/19/EU
5	CE number
6	Approved ambient temperature
7	Ex classification ATEX / IECEx

4.8.1 Ex classification ATEX / IECEx

Ex marking ATEX / IECEx according to IEC 60079-0 and ATEX directive 2014/34/EU.

ET-xx8 HMI series

Version	2014/34/EU prefix	Ex marking
Gas	Ex II 2(1) G	Ex eb q [ia op is Ga] IIC T4 Gb
Dust	Ex II 2(1) D	Ex tb [ia op is Da] IIIC T115°C Db

MT-xx8 HMI series

Version	2014/34/EU prefix	Ex marking
Gas	Ex II 3(1) G	Ex ec nR [ia op is Ga] IIC T4 Gc
Dust	Ex II 3(1) D	Ex tc [ia op is Da] IIIC T115°C Dc

4.8.2 Ex classification EAC

ET-xx8 HMI series

Version	Ex marking
Gas	1Ex e q [ia op is Ga] IIC T4 Gb X
Dust	Ex tb [ia op is Da] IIIC T115°C Db X

MT-xx8 HMI series

Version	Ex marking
Gas	2Ex e nR [ia op is Ga] IIC T4 Gc X
Dust	Ex tc [ia op is Da] IIIC T115°C Dc X

4.8.3 Ex classification FM USA

US-American Ex classification according to ANSI/UL 60079-0.

ET-xx8 HMI series

Version	Ex marking
Gas	Class I, Zone 1 AEx eb q [ia op is Ga] IIC T4 Gb
	Class I, Div. 2 Groups A, B, C, D T4
Dust	Zone 21, AEx tb [ia op is Da] IIIC T115°C Db
	Class II, Div. 2 Groups F, G T4
	Class III

MT-xx8 HMI series

Version	Ex marking
Gas	Class I, Zone 2 AEx nA nR [ia op is Ga] IIC T4 Gc
	Class I, Div. 2 Groups A, B, C, D T4
Dust	Zone 22, AEx tc [ia op is Da] IIIC T115°C Dc
	Class II, Div. 2 Groups F, G T4
	Class III

4.8.4 Ex classification FM Canada

Canadian Ex classification according to CAN/CSA-C22.2 No.60079-0.

ET-xx8 HMI series

Version	Ex marking
Gas	Ex eb q [ia Ga] IIC T4 Gb
	Class I, Div. 2 Groups A, B, C, D T4
Dust	Zone 21, Ex tb [ia Da] IIIC T115°C Db
	Class II, Div. 1 Groups E, F, G T4
	Class III

MT-xx8 HMI series

Version	Ex marking
Gas	Ex nA nR [ia Ga] IIC T4 Gc
	Class I, Div. 2 Groups A, B, C, D, T4
Dust	Zone 22, Ex tc [ia Da] IIIC T115°C Dc
	Class II, Div. 2 Groups E, F, G T4
	Class III

4.8.5 Ex classification CCC China

Chinese CCC classification according to GB3836.x.

ET-xx8 HMI series

Version	Ex marking
Gas	Ex e q [ia Ga] IIC T4 Gb
Dust	Ex tD [iaD] A21 IP66 T115°C

MT-xx8 HMI series

Version	Ex marking
Gas	Ex e nR [ia Ga] IIC T4 Gc
Dust	Ex tD [iaD] A22 IP66 T115°C

4.8.6 Ex classification CNEX China

Chinese Ex classification according to GB3836.x.

ET-xx8 HMI series

Version	Ex marking
Gas	Ex eb q [ia op is Ga] IIC T4 Gb
Dust	Ex tb [ia op is Da] IIIC T115°C Db

MT-xx8 HMI series

Version	Ex marking
Gas	Ex ec nR [ia op is Ga] IIC T4 Gc
Dust	Ex tc [ia op is Da] IIIC T115°C Dc

4.8.7 Ex classification PESO

PESO classification according to IECEx

ET-xx8 HMI series

Version	Ex marking
Gas	Ex eb q [ia op is Ga] IIC T4 Gb

MT-xx8 HMI series

Version	Ex marking
Gas	Ex ec nR [ia op is Ga] IIC T4 Gc

5 Operating systems and drivers

5.1 UPDD touch driver

The UPDD touch driver is a copyrighted, licensed software for the exclusive use with R. STAHL HMI Systems GmbH touch systems.

- Do not load this driver on or use with other devices !

5.2 Up to Windows 7

5.2.1 Licensing issues

Panel PC - SERIES 400
The Windows operating system is usually pre-installed. Please note that under the terms of the license issued for Windows the application of these systems as office PCs is not permitted.

	Please also note the information on the licensing terms 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, or online under r-stahl.com.

5.3 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™

Panel PC - SERIES 400
The license for the Windows 10 IoT Enterprise 2019 LTSC operating system is included in the image. 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 2029-01-09.

5.3.1 Recovery

	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.

5.3.2 Proprietary Windows installations and drivers

	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.

5.4 Data back-up

5.4.1 Recovery Stick

	A recovery stick is required to restore the Panel PC devices to their factory state. This recovery stick (USB drive, also available as an intrinsically safe option) contains the factory image, with which the system can be restored to factory state within a very short time.

You can restore the HMI devices to their factory state only with the aid of this recovery stick.
As an option, the recovery stick can also contain a backup software, with which you can back up your own device configuration.

5.4.2 Back-up

It is the sole responsibility of the operator to generate a back-up of the HMI devices and their overall function !

- Any back-ups generated of the HMI devices must always be stored on external storage media !

5.4.3 Switching off / closing down

	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. It is therefore important for the safe and correct operation that the HMI device is "shut down" properly (see illustration below) and **NOT** simply switched off.

Otherwise the existing image of the HMI device may be damaged, rendering the device non-functioning. After the data has been stored, Windows informs the user that the HMI device can now be switched off.

- Only switch off the HMI device when prompted to do so by a system message !

5.4.4 Loss of data

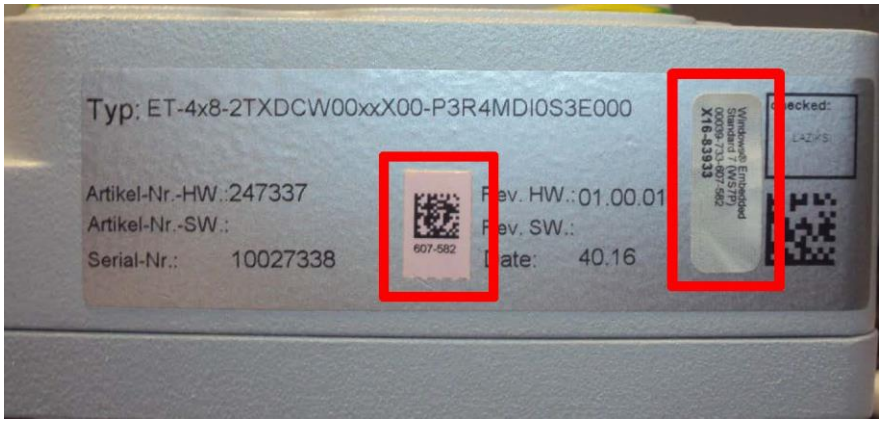
- In the case of applications that require constant writing into memory, use external storage media (USB sticks, network servers) for these write processes !
- Avoid cyclical writes (log files, databases, etc.) to the SSD !

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.

5.5 License sticker

The license sticker for the Windows 7 Ultimate operating system is located inside the E-box terminal box.

The license sticker for the Windows Embedded and Windows 10 IoT operating systems is located on the outside of the device on the type label.



6 Transport and storage

NOTE	**No or damaged packaging during transport and storage** If the device is transported or stored without packaging, shocks, vibrations, pressure and humidity can directly impact the device. Damaged packaging indicates that the device has been subjected to and possibly been damaged by outside influences. This may result in faulty functionality. • Check the state of the packaging. • Report any damage sustained in transport to the haulier responsible and have it confirmed. • Transport and store the device in undamaged packaging, ideally the original packaging.

- Transport and store the device carefully and in accordance with the safety notes (see chapter 3 Safety).
- Transport and store the device in undamaged packaging, ideally the original packaging.
- Ensure specified storage temperature range is not exceeded (see chapter 17.1.4 Ambient conditions).
- Store the device in a dry place free of vibrations.
- Do not drop the device.

7 Unpacking

- Unpack the device at its final destination.
- Check the contents are complete and undamaged.
- Contact the manufacturer if the contents are incomplete, damaged or not what you have ordered.
- Dispose of the packaging materials according to local regulations.

8 Mounting and installation

8.1 Note on mounting and installation

Observing the following points will ensure a professional and safe assembly and installation:

- Only use threads or holes already present in the enclosure or the outer cooling fins of the display modules.
- Mount the device carefully and strictly in accordance with the safety notes (see chapter 3 Safety).
- Study the installation conditions and assembly instructions in these operating instructions carefully and follow them to the letter.

8.2 Requirements for site of installation

	Mount and install the device in such a way that it is always operated within the permissible temperature range.

- Observe the stipulated hazardous zones: MT devices may only be installed in Zone 2 and Zone 22.
- The site of installation must be stable and suitable for the dimensions of the device, and able to bear the load of its weight and that of any necessary attachments.
- Avoid touch screen contamination by saltwater: conductive liquids on the touch display can result in incorrect or phantom operations. This applies in particular to salt water.
- Protect the device against rain, snow and splashes: excessive amounts of standing or running water will disrupt operation and may cause erratic cursor movement. This protection can be achieved by using a canopy or some other protective roof-type construction. Offshore, strong winds, saltwater and rain will have to also be taken into consideration.

8.3 Mounting types

The device may be installed and operated in any position. R. STAHL recommends the following types of mounting:

Yoke and wall-mounting, handle and feet, sun protection roof, panel mount (with xx8 Mounting-Kit)

	For a detailed description of the types of mounting refer to the Installation Manual stored on the CD / DVD / USB stick included in the delivery or online at r-stahl.com.

8.4 Panel mount with xx8 Mounting-Kit

The SHARK device platform can be mounted inside an enclosure with a suitable cut-out with the aid of an xx8 fixing frame set (mounting kit). This mounting kit is approved for installation in Ex e, Ex p or Ex tb enclosures.
With correct assembly according to the instructions "IM_Mounting-Kit_xx8", the IP protection of the enclosure is retained up to a maximum of IP66.
The xx8 mounting kit consists of sealing material and a fixing frame. The sealing material is applied to the back of the xx8 device. The fixing frame is used to fix the device inside the cover cut-out of the enclosure. It is mounted from the back.
For a detailed description of the panel mount with xx8 Mounting-Kit see chapter 23.1 Panel mount with xx8 Mounting-Kit.

Tightening torque	
Fixing frame screws	1.5 Nm to 2 Nm

For instructions on other types of mounting, see Installation Manual "IM_Mounting-Kit_xx8" on the CD / DVD / USB stick included in the delivery or online at r-stahl.com.

NOTE	
	If the surrounding seal of the device is damaged, the manufacturer will tick the “No hazloc approved panel mount“ option on the device.
	The device is only approved for installation inside an Ex e, Ex p or Ex tb enclosure if no "No hazloc approved panel mount" option is indicated on the device. If the "No hazloc approved panel mount" option is indicated on the device, certification according to NEC / CEC is no longer possible or becomes void !

8.5 Installation

DANGER	**Explosion hazard due to improper installation !**
	Non-compliance may result in fatal or serious injuries.
	• Ensure the atmosphere is non-explosive.
	• Make sure that the device is not damaged.
	• If the device is connected to the mains:
	  ○ Disconnect the device from the power supply.
	  ○ Isolate supply and all Ex e circuits and wait 5 minutes before opening the terminal boxes.

WARNING 	**Danger of laser radiation at emitting diode (TD-A, TD-B) or at the end of the fibre optic cable.** Eye injury The laser diodes in the Exicom operating devices, media converters and switches emit invisible laser radiation: 100Base-FX - 1300 nm FO-MM / 1000Base-SX - 770 … 860 nm FO-SM / 1000Base-LX - 1270 … 1355 nm According to EN 60825-1, the laser diode is assigned to the laser class 1M. • Do not view the laser radiation directly (within a distance of 100 mm) with optical instruments (e.g. magnifiers, microscopes).

CAUTION	**Explosion hazard due to electrostatic charg e!** • Do not apply protective foil to touch display.

8.5.1 General information on electric connection

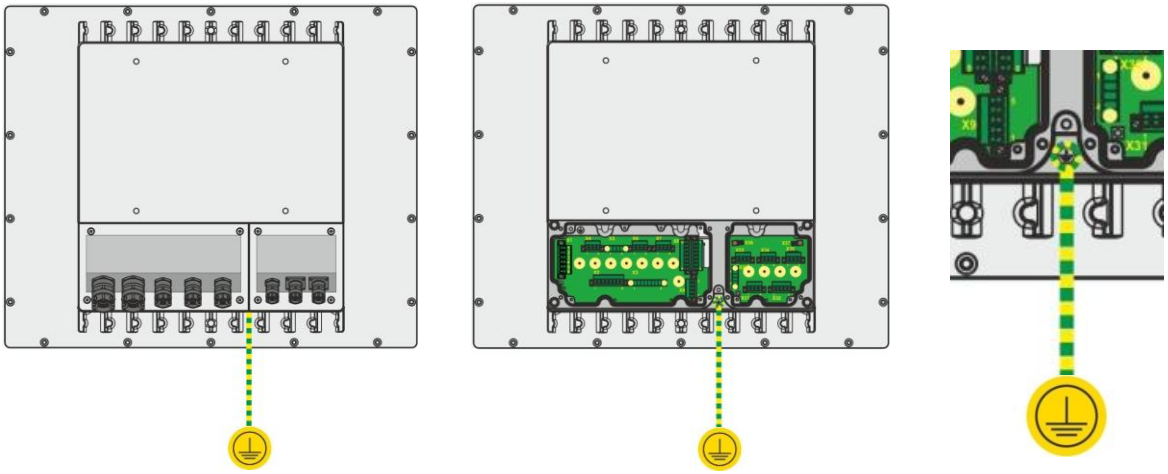
- Connect cables carefully.
- Do not screw down on the cable insulation.
- Do not switch cables.
- Observe code of practice when connecting cables.
- Firmly screw down wires.
- Pay attention to the voltage specified on the device:
  - Connect DC devices to 24 VDC only.
  - Connect AC devices to 100 to 240 VAC only.
- Pay attention to specified torques for screws to avoid damage to threads.
- Suitable measures against electrical surge during lightning strike may be necessary.

8.5.2 Connecting device to power supply

1. Open the cover of the Ex e terminal box (see chapter 4.4 Terminal boxes).
2. Connect cable to terminal X1 POWER (see chapter 19.1 Connection overview terminal assignment). Ensure correct polarity and power supply (AC or DC).

8.5.3 Grounding the device

- Open the cover of the Ex i terminal box (see chapter 4.4 Terminal boxes).
- Ground the devices with a core cross section of at least 4 mm² or in line with applicable standards.
- Using external earth connection:



8.5.4 Connecting data cable

- Connect the data cables according to the terminal diagram (for copper connections) or connect them to the sockets (for FO connections).

	For detailed instructions see Installation Manual "IM_Mounting-Kit_xx8" on the CD / DVD / USB stick included in the delivery or online under r-stahl.com.

8.5.5 Mounting the cover of the terminal boxes

Tightening torque	
Terminal box cover screws	1 Nm to 1.5 Nm

8.5.6 Connecting associated equipment

The cover of the terminal boxes (Ex i / Ex e / Ex nA) includes mounting options for associated equipment such as cable glands, cable connectors, buttons.
The associated equipment to be mounted inside the cover of the terminal boxes must meet the following requirements:

Ingress protection:	IP66
Ex e terminal boxes:	IEC, ANSI/UL or CSA C22.2 number 60079-7
Ex i terminal boxes:	IEC, ANSI/UL or CSA C22.2 number 60079-11
Ex nA terminal boxes:	ANSI/UL or CSA C22.2 number 60079-15

- Observe the specific requirements of the associated equipment used (e.g. permitted cable diameter for cable glands, tightening torques, cable clamps).
- Observe country-specific regulations, in particular any ambient parameters that may be different (e.g. ambient temperature range).
- In the case of AC devices, IEC 60950 stipulates that an easily accessible disconnection mechanism must be located outside of the device which can be used to interrupt the power supply.

- Close unused openings with a blind plug.
- Mount cable glands with conical threads with at least three thread turns.
- Cable glands with parallel threads must have the following characteristics:
  - Tolerance class 6H or higher
  - additional seal

8.5.7 Cable glands

In their factory state, the devices are equipped with cable glands or screw plugs. They have been chosen to comply with all relevant certifications of the device. The device's ex-relevant markings also cover the bushings, which are not necessarily separately marked when included in the delivery.

- Unused cable glands must be sealed with certified screw plugs.
- Close any open enclosure holes without cable glands with a certified screw plug. Such certified screw plugs must be approved for the following areas or higher:
  - Certified zone
  - Permitted temperature range
  - Country approval (e.g. ATEX for Europe) of the device
- Alternative, similar and certified cable glands may be used provided they have an equal or higher area of certification (zone) and permitted temperature range, and the same country approval (e.g. ATEX for Europe) as the HMI device.
- Use cable glands with cap nut and without strain relief clamp for permanently installed cables and electrical lines only.
- Ensure required strain relief is in place.
- Observe recommended tightening torques. Too low or too high tightening torques might have a negative impact on the type of protection, sealing or strain relief.
- Before commissioning, check any screws that are already mounted and tighten them if necessary.

Tightening torque	
Cable glands	Depending on cables used: • Individually determine and apply required tightening torques.
Cable glands (installed ex-factory)	In the case of factory-supplied systems, all components are installed correctly and in accordance with applicable standards.

8.5.8 Electric connections of interfaces X1 ... X9 and X31 ... X35

Stripping length	7	mm
Mounting torque	0.5 ... 0.6	Nm

Connectable conductor cross section		
• rigid	0.2 ... 2.5 (24 ... 12)	mm² (AWG)
• flexible	0.2 ... 2.5 (24 ... 12)	mm² (AWG)
Multi-conductor connection (two conductors with the same cross section and conductor type)		
• rigid	0.2 ... 1.5 (24 ... 16)	mm² (AWG)
• flexible	0.2 ... 1.0 (24 ... *1)	mm² (AWG)
Multi-conductor connection for X1 as screw terminal (two conductors with the same cross section and conductor type):		
• rigid	0.2 ... 1.5 (24 ... 16)	mm² (AWG)
• flexible	0.2 ... 0.75 (24 ... 18)	mm² (AWG)

* No direct equivalent AWG size listed in IEC 60079-7.

Notes on plug and screw connectors:

- The plug connectors are designed to be readily connected or disconnected without load.
- Tighten the plug connector screws.
- Ensure that the following maximum rated current values are not exceeded:
  - The maximum rated current value for every contact of the X1 plug connector is 12 A.
  - The maximum rated current value for every contact of the X1 screw connector is 16 A.
- Values that must not be exceeded at the place of installation:
  - Voltage: max. 250 V
  - Short-circuit current: max. 1500 A
- Only use copper wires with the following characteristics for connections to the device:
  - For ambient temperatures <60 °C: copper wires approved for at least 90 °C
  - For ambient temperatures >60 °C (up to permitted maximum temperature): copper wires approved for 105 °C

Observe and apply tightening torques recommended for connection terminals.

8.5.9 Details for electrical connection of Interface X10

- Use connector X10 with connectors / devices approved by the manufacturer only.

8.6 Using USB interfaces

Hardware and connection					
Connection to	intrinsically safe USB devices			non-intrinsically safe equipment	
	safe area	hazardous area	Device	safe area	hazardous area
X33 (Ex i)	x	x	e.g. KBDi-USB-*-xx8-* keyboard cable	–	–
X34 (Ex i)	x	x	e.g. KBDi-USB-*-xx8-* pointing device cable	–	–
X35 (Ex i)	x	x	e.g. USBi drive	–	–
X6 (Ex e)	–			any USB device	explosion-protected but non-intrinsically safe devices

Functionality and application			
ET-/MT-4x8-*	Restoring factory state	USBi drive	device function
	Creation of user / OEM backup		
	Software installation		
	Operation	KBDi-USB-*-xx8-*	
ET-/MT-5x8-*	Restoring factory state	USBi drive	
	Import / export parameters		
	Operation	KBDi-USB-*-xx8-*	
ET-/MT-6x8-*	Data memory	USBi drive	
	Operation	KBDi-USB-*-xx8-*	

9 Initial start-up

Conditons:

The device has been installed correctly.
The device has been connected to the equipotential bonding.

1. Since factors such as storage or temperature can have an impact on the cables and cable glands, check the following connections:
   - Connection terminals
   - Existing screw connections
2. Switch on power supply.
   - The device will start up in its standard configuration.
3. Follow the instructions on the screen.

10 (Re-) Commissioning

1. Check the device is correctly installed:
   - Connection terminals
   - Existing screw connections
2. Check the device for visible damage.
   - Only commission the device if there is no visible damage and if it has been correctly installed.
3. Switch on power supply.
   - The device will start up with the configuration saved last.
   - If the connected systems can be reached, communication will be established within the existing parameters.

11 Operation

WARNING 	**Hot surfaces !** Non-compliance may result in minor burns. In ambient temperatures exceeding +45 °C the surface of the device may heat up. • Do not touch the device.

CAUTION	**Explosion hazard due to damaged device !** In case of damage or changes to the factory state (for example if the device is leaking small glass beads) • Decommission device immediately. • Contact manufacturer.

CAUTION	**Explosion hazard due to electrostatic charge !** • Do not apply protective foil to touch display.

NOTE	**Display damage due to permanent display of identical pattern** Non-compliance may result in screen burn-in • Use screen savers or regularly move the screen pointer if a specific pattern is displayed permanently.

11.1 Operating the touch display

NOTE	**Touching the touch screen with pointed or sharp items** Non-compliance may result in damage to the touch display, shorter life-span or total breakdown ! • Only operate the touchscreen with your finger or a touch pen specifically intended for capacitive touch displays.

Incorrect operation of the touch display may result in accidental functions and errors. The device will then be unable to execute orders, may execute them incorrectly or in a way not intended.

- Do not realise safety-relevant functions via the touch display.
- Avoid accidental multiple touches.
- Do not touch the touch display across a large section.
- Only use fingers, thin gloves or special gloves or a conductive touch pen for operation.
- Before operating the device, thoroughly acquaint yourself with the multi-touch functions of the operating system and the application.
- Avoid contamination of the touch display with salt water.

11.2 Switching the device on and off

11.2.1 Without optional on/off switch

The device is switched on and off via the power supply.
For SERIES 400 and 500 devices, R. STAHL recommends you switch off the devices via the respective Windows / Remote Image function.

11.2.2 With optional on/off switch (for SERIES 400 and 500 only)

Switch the device on and off with the connected on/off switch. The switch function is defined via the operating system and functions like a notebook switch.
For SERIES 400 and 500 devices, R. STAHL recommends you switch off the devices via the respective Windows / Remote Image function.

11.3 Teaming function

For SERIES 500 only

Teaming function			
Processor	Interface		
	1TX / Wi-Fi	2TX	2FX
AMD	No	Yes	No
i5	No	Yes	Yes
i7	No	Yes	Yes

- Providing redundancy with an 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.

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

12 Maintenance, overhaul and repair

⚠ CAUTION	**Explosion hazard due to damaged seal or leaking of filling material !** Non-compliance may result in fatal or serious injuries ! • In case of damage or changes to the factory state immediately decommission the device. • Contact manufacturer. • If the device leaks filling material (small glass beads) it must be decommissioned immediately !

⚠ DANGER	**Explosion hazard due to incorrect maintenance or repair !**
	Non-compliance may result in fatal or serious injuries !
	• Ensure the atmosphere is non-explosive.
	• Make sure that the device is not damaged.
	• Do not open the enclosure.
	• If the device is connected to the mains:
	  ○ Disconnect the device from the power supply.
	  ○ Isolate supply and all Ex e circuits and wait 5 minutes before opening the terminal boxes.

⚠ WARNING 	**Hot surfaces !** Non-compliance may result in minor burns ! In ambient temperatures exceeding +45 °C the surface of the device may heat up. • Do not touch the device.

Additional for MT-xx8 HMIs:

Do not open, service or repair in an area where an explosive atmosphere may be present.

12.1 Changing the battery

The internal battery must only be replaced by the manufacturer.

12.2 Servicing

The enclosure is sealed and cannot be opened.
When servicing the device, check the following points in addition to those stipulated in the national regulations:

- Damage to seals: cracks or other visible damage to the device enclosure and / or the protective enclosure.
- All cables and conductors securely connected: cables tightly clamped
- All cables and conductors undamaged
- Compliance with permitted temperature range
- Mounting fits securely, all screws tightened fast
- Ensure the device is used as intended

12.3 Maintenance

The devices are maintenance-free across their entire lifespan.

12.4 Repair

The display and E-box modules cannot be repaired by the customer.

- Any repair on the device is to be performed by R. STAHL only.
- The modules may be sent back separately.
- The modules must be dismounted by qualified staff only (see chapter 3.3 Personnel qualification).

12.4.1 Mounting / dismounting the modules

The xx8 SERIES HMIs consist of a display and an E-Box module which are mounted together. These modules can be replaced for repair purposes.

Dismounting modules:

- Disconnect all circuits from the power supply.
- Remove cover of terminal boxes.
- Disconnect cable and earthing, see Installation Manual "Module exchange xx8 (IM_Module_exchange_xx8)".
- Loosen the screws.

Mounting modules:

The steps for mounting the modules are those described in "Dismounting modules" in reverse.

Tightening torque	
Screws (in the terminal boxes) connecting the display and the E-box	10 Nm

13 Returning the device

Only return or package the devices after consulting R. STAHL. Contact the responsible representative from R. STAHL. R. STAHL's customer service is available to handle returns if repair or service is required.

Contact customer service via E-mail or telephone:

- E: service.dehm@r-stahl.com
- T: +49 221 76806 3000

Requesting a RMA ticked via our website:

- Go to r-stahl.com.
- Under "Support" > "RMA form", select "Request RMA ticket".
- Fill in and send the form.
- You will automatically receive and E-mail with an RMA ticket (PDF).
- Print out the RMA ticket.
- Clearly copy the RMA number onto the outside of the package.
- Send the device with the RMA ticket included in the package to R. STAHL HMI Systems GmbH (see chapter 1.1 Manufacturer for the address).

14 Cleaning

- Check the device for damage before and after cleaning it. Decommission damaged devices immediately.
- Devices located in hazardous areas may only be cleaned with a damp cloth to avoid electrostatic charge.
- When cleaning with a damp cloth, use water or mild, non-abrasive, non-scratching cleaning agents.
- Do not use abrasive detergents or solvents.
- Never clean the device with a strong water jet, such as a pressure washer.

15 Disposal

- Observe national, local and statutory regulations regarding disposal.
- Separate materials for recycling.
- Ensure environmentally friendly disposal of all components according to statutory regulations.

16 Accessories

NOTE	**Malfunction or damage to the device due to the use of non-original components.** Non-compliance may result in material damage ! • Only use original manufacturer accessories.

17 Appendix A

17.1 Technical data

17.1.1 General

Function / Equipment	ET-438 MT-438	ET-538 MT-538	ET-638 MT-638	ET-498 MT-498	ET-598 MT-598	ET-698 MT-698
HMI-type	Operator Station					
Enclosure type	Rugged Panel Design (RP)					
Enclosure design	VESA 200 Standard, VESA 200 Top Connect					
Weight	ET 25 kg MT 18 kg			ET 35 kg MT 25 kg		
Material (front)	Seawater resistant and coated aluminium, hardened glass					
Material (back)	Seawater-resistant powder coated aluminum					
Degree of protection (IP)	IP66					
Front enclosure protection type (IP)	IP66					
Enclosure back protection type (IP)	IP66					

17.1.2 Electrical data

Function / Equipment	ET-438 MT-438	ET-538 MT-538	ET-638 MT-638	ET-498 MT-498	ET-598 MT-598	ET-698 MT-698
AC rated operational voltage	230 V					
Voltage range AC	100 – 240 V					
DC rated operational voltage	24 V					
Voltage range DC	20 – 30 V					
Power consumption AC 1	0.6 A at 230 VAC (0.8 A with heater)					
Power consumption AC 2	1.1 A at 110 VAC (1.7 A with heater)					
Current consumption DC	4.6 A at 24 VDC (6.9 A with heater)					
Frequency range	50 – 60 Hz					
Rated operational power	typically 100 W / max. 150 W (typically 340 BTU / max. 510 BTU)					
Fuses AC	5 A					
Fuses DC	12 A					
Terminal box	Power supply direct in integrated Ex e terminal box					
Connections	Via plug-in screw terminals, green					
Conductor type	Flexible conductors 0.2 to 2.5 mm² (AWG24 to AWG14) Rigid conductors 0.2 to 2.5 mm² (AWG24 to AWG14)					
max. operating voltage Um	250 VAC					
Bluetooth	Yes					
RFID reader	-			optionally integrated C5 or C6		
RFID reader panel-mount type	-			PRIMO-A-1200-A		
RFID data transfer C5	-			CRYPT; 13.56 MHz; LEGIC, MIFARE / DESFire / EV1		
RFID data transfer C6	-			ASCII; 13.56 MHz; LEGIC, MIFARE / DESFire / EV1		
Supported transponder media	-			see Transponder media table		
Plug version USB	USB-A connector					
Status displays	LEDs - on / off (green) - power supply on / power supply OK (orange) - heater on					

17.1.3 Display

Function / Equipment	ET-438 MT-438	ET-538 MT-538	ET-638 MT-638	ET-498 MT-498	ET-598 MT-598	ET-698 MT-698
Display-Version	TFT colour display or Sunlight readable display			Sunlight readable display		
Display version 2	16.7 million colours					
Display size inch	15			21.5		
Display size cm	38			55		
Display resolution	XGA			Full HD		
Display total pixels	1024 x 768			1920 x 1080		
Display dimensions	4:3			16:9		
Display brightness	TFT 450 cd/m² SR 1200 cd/m²			1000 cd/m²		
Display contrast	TFT 500:1 SR 600:1			1100:1		
Backlight	LED technology					
Life expectancy backlight	70,000 h at +25 °C					
Function keys	8, of which 2 brightness keys					
Display with touch function (optional)						
Touch monitor	optional, glass touch					
Touch screen technology	projected, capacitive (PCAP), multi-touch					
Touch controller	AMT is supported from - operating system Open HMI Win10 IoT Enterprise 1607 64-bit Rev 1.4.3 onwards - Image Remote HMI V5.70.xx 64-bit					
Touchscreen activation	No activation pressure required					
Touchscreen input method	Fingers, thin glove or special glove, conductive touch pen					
Touch screen durability	very good					
Touchscreen resistance to scratching Mohs scale	6					
Touchscreen resistance to scratching pencil hardness test ISO 15184	9H					
Touchscreen transmissivity / optics	very good					
Touchscreen surface contaminants	unaffected (however, can be affected by conductive fluids such as saltwater)					
Touchscreen abrasion resistance	no abrasion by finger or rubber					

17.1.4 Ambient conditions

Function / Equipment	ET-438 MT-438	ET-538 MT-538	ET-638 MT-638	ET-498 MT-498	ET-598 MT-598	ET-698 MT-698
Heater operation	Automatic					
Operating temperature range	-10 °C … +65 °C					
	-40 °C … +65 °C (with heater)					
Storage temperature	-40 °C … +70 °C					
Cold start temperature *1	- 10 °C or - 40 °C (with heater)					
Heat disspation	via heat pipes and cooling fins					
Damp heat	+55 °C / 95 %					
Damp heat cyclic (2x 24 h)	+55 °C (±2 °C) ≥ 95 % Humidity location class B					

Corrosion resistance	Saltwater 5 % NaCl / +20 °C / 2 h 93 % RH / +40 °C / 168 h ISA-S71.04-1985, severity G3
Vibration (sinusoidal)	5 to 13.2 Hz: ±1 mm 13.2 to 100 Hz: ±0.7 g Change cycle 1 oct/min X, Y, Z axes
Vibration (sinusoidal) 1	5 to 58 Hz: ±0.075 mm 58 to 500 Hz: ±1 g Change cycle 1 oct/min X, Y, Z axes
Vibration (sinusoidal) 2	5 to 1000 Hz 5 g
Shock	18 shocks 25 g / 6 ms X, Y, Z axes

*1 The cold-start temperature depends on the type of outdoor installation (with / without heater).

	Cold start temperature: If the HMI device is switched on at temperatures below -10 °C, the electronics and the display will need a certain warm-up time before everything works smoothly and the display starts to be legible. Depending on how low the temperature is, this process may last up to 3 hours.
	Devices with AMD processor cannot be warm-started in temperatures above +55 °C.

17.1.5 Mounting

Function / Equipment	**ET-438 MT-438**	**ET-538 MT-538**	**ET-638 MT-638**	**ET-498 MT-498**	**ET-598 MT-598**	**ET-698 MT-698**
Wall cut-out (W x H)	no panel-mount module					
Mounting orientation	any					
Mounting option	Yoke and wall-mounting, handle and feet, sun protection roof, panel mount (with xx8 Mounting-Kit)					
Mounting type	when switched on: a fixed device (stationary, non-portable equipment)					

17.1.6 Mechanical data VESA 200 Standard

Function / Equipment		**ET-438 MT-438**	**ET-538 MT-538**	**ET-638 MT-638**	**ET-498 MT-498**	**ET-598 MT-598**	**ET-698 MT-698**
Dimensions (W x H x D)		380 mm x 394 mm x 137 mm (+52 mm for cable entries)			553 mm x 458 mm x 141 mm (+52 mm for cable entries)		
Cable gland	Type	HSK-MZ-Ex					
	Number	3x M16, 3x M20, 2x M25					
	Thread size	M16 x 1.5 / M20 x 1.5 / M25 x 1.5					
	Clamping range	M16 = 4 … 8 mm / M20 = 10 … 14 mm / M25 = 14 … 18 mm					
	Width across flats	M16 = SW 19 / M20 = SW 22 / M25 = SW 30					

17.1.7 Mechanical data VESA 200 Top Connect

Function / Equipment		ET-438 MT-438	ET-538 MT-538	ET-638 MT-638	ET-498 MT-498	ET-598 MT-598	ET-698 MT-698
Dimensions (W x H x D)		380 mm x 394 mm x 212 mm			553 mm x 458 mm x 216 mm		
Cable gland	Type	Screw plug					
	Number	3x M16, 3x M20					
	Thread size	M16 x 1.5 / M20 x 1.5					

17.2 Additional data for SERIES 400 / 500

17.2.1 General

Function / Equipment	ET-438 MT-438	ET-498 MT-498	ET-538 MT-538	ET-598 MT-598
Technology	Panel PC		Thin client	

17.2.2 Electrical data

Function / Equipment		ET-438 MT-438	ET-498 MT-498	ET-538 MT-538	ET-598 MT-598
Processor type		AMD GX-222GC Intel® Core™ i7-3517UE Intel® Core™ i7-3517UE mit TPM Intel® Core™ i5-6442EQ Intel® Core™ i5-6442EQ with TPM			
Processor details		AMD: 2.2 GHz; Dual Core, 10W TDP Intel i7: 1.7 GHz; Dual Core, 4 threads, 3. Generation Ivy Bridge, 17W TDP Intel i5: 1.9 GHz (2.7 GHz); Quad Core, 4 threads, 6 MB Cache, 25W TDP			
Graphics controller		AMD: integrated AMD Radeon R5E graphics Intel i7: integrated Intel HD graphics 4000 Intel i5: integrated Intel HD graphics 530			
Main memory		AMD: 4 GB i7: 4 GB / 8 GB i5: 4 GB / 16 GB			
Data memory	AMD	60 GB 128 GB			
	i7 / i5	240 GB 480 GB and i7 with 8 GB RAM / i5 with 16 GB RAM			
operating system	AMD	Windows Embedded Standard 7 Windows 7 Ultimate (64 Bit) * Windows 10 IoT Enterprise 2019 LTSC (64 Bit) *			
	i7	Windows 7 Ultimate (64 Bit) * Windows 10 IoT Enterprise 2019 LTSC (64 Bit) *			
	i5	Windows 10 IoT Enterprise 2019 LTSC (64 Bit) *			
Language support		Multilanguage operating system: en, de, fr, es, it, br, ru, kr		via operating system	
Image		-		Remote firmware	

* For Windows 7 Ultimate and Windows 10 IoT the 64 Bit version is preinstalled on the device. Additionally, the 32 Bit version of each Windows version is installed on the recovery stick included in the delivery.

17.2.3 Interfaces

Function / Equipment		**ET-438 MT-438**	**ET-498 MT-498**	**ET-538 MT-538**	**ET-598 MT-598**
Ethernet note		Either TX, 2TX or 2FX			
Ethernet / Data		1x 100/1000Base-TX (Ex e) 2x 100/1000Base-TX (Ex e) 2x 100Base-FX (Ex op is)			
Copper TX	Data cable	CAT7 installation cable AWG 23			
	Length of data cable	max. 100 m			
	Interface medium	CAT7 Data transmission			
Fibre optic FX	Data cable	FO cable 50/125 µm or 62.5/125 µm			
	Length of data cable	max. 5000 m (for core cross section 50 and use of 9721/13-11-14) max. 4000 m (for core cross section 62.5 and use of 9721/13-11-14)			
	Interface medium	multi-mode optical fibre cable			
USB interface		3x USB (Ex ia) 1x USB (Ex e)			
Serial interface		1x RS-232 / RS-422 / RS-485 (Ex e)			
Optional interface 1		WLAN 2.4 GHz (Ex i) WLAN 5 GHz (Ex i) Standard 802.11 abgn			
Audio interface		1x Audio line out (Ex e) (only with AMD)			
Interface reader		1x reader / barcode reader interface (Ex i)			
WLAN		optional (only together with 1x 100/1000Base-TX)			
Bluetooth		Standard			
Front camera		optional, 5 megapixels, in-built			
Further connections		12 / 24 V DC output 2x Fan On/off switch			
Plug version FO		SC duplex socket			

17.3 Additional data for SERIES 600 KVM Systems

17.3.1 General

Function / Equipment	**ET-638 MT-638**	**ET-698 MT-698**
Technology	KVM System	

17.3.2 Electrical data

Function / Equipment	**ET-638 MT-638**	**ET-698 MT-698**
Transfer Technology	KVM-DVI3	
operating system	independent	
Language support	User menu: English	

17.3.3 Interfaces

Function / Equipment		**ET-638 MT-638**	**ET-698 MT-698**
Ethernet note		Either TX, SX or LX	
Ethernet / Data		1x 100/1000Base-TX (Ex e) 1x 1000Base-SX (Ex op is) 1x 1000Base-LX (Ex op is)	
Copper TX	Data cable	CAT7 installation cable AWG 23	
	Length of data cable	max. 150 m	
	Interface medium	CAT7 Data transmission	
Optical fibre SX	Data cable	FO cable 50/125 µm or 62.5/125 µm	
	Length of data cable	max. 550 m (with core diameter of 50 µm) max. 300 m (with core diameter of 62.5 µm)	
	Interface medium	multi-mode optical fibre cable	
Optical fibre LX	Data cable	FO cable 9/125 µm	
	Length of data cable	max. 10,000 m	
	Interface medium	Single mode optical cable	
USB interface		3x USB (Ex ia) 1x USB (Ex e)	
Serial interface		1x RS-232 / RS-422 / RS-485 (Ex e)	
Audio interface		1x Audio line out (Ex e)	
Interface reader		1x reader / barcode reader interface (Ex i)	
Front camera		optional, 5 megapixels, in-built	
Further connections		12 / 24 V DC output 2x Fan	
Plug version FO		SC duplex socket	

17.4 Transponder media table

Transponder media	**Reader technology**
MIFARE Classic, 1k / 4k	MIFARE Classic
DESFire, 4k	MIFARE DESFire
DESFire EV1, 2k / 4k / 8k	MIFARE DESFire EV1
LEGIC MIM 22 / MIM 256 / MIM 1024	LEGIC prime
LEGIC ATC512-MP110 (ISO 14443A) LEGIC ATC2048-MP110 (ISO 14443A) LEGIC ATC4096-MP310 (ISO 14443A) LEGIC ATC4096-MP311 (ISO 14443A) LEGIC AFS4096-JP10 / JP11 (ISO 14443A) LEGIC ATC128-MV210 (ISO 15693) LEGIC ATC256-MV210 (ISO 15693) LEGIC ATC1024-MV110 (ISO 15693)	LEGIC advant
ISO 14443A transponder (UID / CSN) ISO 15693 transponder (UID / CSN) Sony FeliCa subset INSIDE Secure (UID / CSN) Transparent, NFC Forum Type 2 Tag Transparent, NFC Forum Type 3 Tag	General

17.5 Overview Hardware Revision ET-xx8 / MT-xx8

HW-Rev.	Device type	Technical modifications	Modification date Hardware	BA version	BA date
01.00.00	ET-xx8 MT-xx8	Certification status	2014-10-06	01.00.01	2014-11-14
01.01.00	ET-xx8 MT-xx8	Certificate 1. Supplement	2017-04-28	01.01.00	2017-05-29
01.01.01	ET-xx8 MT-xx8	Modification module C5 and C6 Ship approvals	2017-11-27	01.01.04	2017-12-19
01.01.02	ET-/MT-4x8 ET-/MT-5x8	New AMD processor	2018-07-01	01.01.07	2018-07-24
01.01.03	ET-xx8 MT-xx8	New touch controller	05/2020	01.01.12	2020-05-15
01.01.04	ET-/MT-4x8 ET-/MT-5x8	i5 processor	06/2020	01.01.12	2020-05-15

18 Appendix B

18.1 Connection values

Nominal voltage	Input voltage range	Rated frequency	max. power consumption
100 – 240 VAC	85 – 250 VAC	50 – 60 Hz	5 A (with heater on)
24 V DC	20 – 30 VDC	–	8 A (with heater on)

18.2 Intrinsically safe interfaces (Ex ia)

For field wiring refer to Control Drawing 11100025 Taken together with this document, the Control Drawing contains information on the connection and the electric parameters.

18.2.1 X30 PB – on/off switch

X30: PB, on/off switch (X30-1, X30-2) parallel wiring, GND (X30-3, X30-4):

Max. output voltage	U_o	=	5.36	VDC	
Max. output current	I_o	=	46	mA	
Max. output power	P_o	=	0.061	W	
Trapezoidal output characteristics					
Max. external capacitance	C_o	=	65	10	µF
Max. external inductance	L_o	=	1	20	µH

C_o and L_o pairs directly above / underneath each other may be used.

18.2.2 X31 - Fan

X31 Fan power (X31-1), (X31-3) per circuit, GND (X31-2, X31-4):

Max. output voltage	U_o	=	15.75	VDC	
Max. output current	I_o	=	189	mA	
Max. output power	P_o	=	1.092	W	
Trapezoidal output characteristics					
Max. external capacitance	C_o	=	0.29	0.478	µF
Max. external inductance	L_o	=	100	20	µH

C_o and L_o pairs directly above / underneath each other may be used.

18.2.3 X32 – Barcode / card reader

- Devices connected to X32 may be connected to the supply circuit via: 10.4 V (X32-1) or 5.36 V (X32-2).
- Terminals 1 and 2 may not be used simultaneously.
- Terminal block X32 contains a joint terminal (X32-5) for the GND of the supply and data line.
- If the connection cable of the connected device uses only a joint GND line, the joint current must be taken into account when determining external inductances.

X32 – Barcode / card reader 10.4 V supply (X32-1), GND (X32-5):

Max. output voltage	U_o	=	10.4	VDC	
Max. output current	I_o	=	391	mA	
Max. output power	P_o	=	2.253	W	
Trapezoidal output characteristics					
Max. external capacitance	C_o	=	2.52	1.2	µF
Max. external inductance	L_o	=	20	100	µH

C_o and L_o pairs directly above / underneath each other may be used.

X32 – Barcode / card reader 5.36 V supply (X32-2), GND (X32-5):

Max. output voltage	U_o	=	5.36	VDC	
Max. output current	I_o	=	420	mA	
Max. output power	P_o	=	1.213	W	
Trapezoidal output characteristics					
Max. external capacitance	C_o	=	65	45	µF
Max. external inductance	L_o	=	1	2	µH

C_o and L_o pairs directly above / underneath each other may be used.

X32 – Barcode / card reader data line TXD (X32-3), RXD (X32-4) per circuit, GND (X32-5):

Max. output voltage	U_o	=			
between RxD and GND or TxD and GND			±5.35	VDC	
between RxD and TxD			±10.70	VDC	
Effective internal capacitance	C_i	=	negligible		
Effective internal inductance	L_i	=	negligible		
Max. output current	I_o	=	16	mA	
Max. output power	P_o	=	0.022	W	
Max. input voltage	U_i	=	±12.5	VDC	
Trapezoidal output characteristics					
Max. external capacitance	C_o	=	2.23	2.23	µF
Max. external inductance	L_o	=	1	20	µH

C_o and L_o pairs directly above / underneath each other may be used.

The stated external capacitances and inductances were calculated for the maximum voltage of 10.7 V.

If only one of the two signals, RxD or TxD, are connected, the maximum voltage to be used for calculations is reduced to 5.35 V. The following values are permissible:

Max. external capacitance	C_o	=	65	45	µF
Max. external inductance	L_o	=	1	2	µH

18.2.4 X33 / X34 – USB KB/M

X33 / X34 – USB KB/M terminals + (X33/34-1), D- (X33/34-2), D+ (X33/34-3), GND (X33/34-4):

Max. output voltage	U_o	=	5.36	VDC				
Max. output current	I_o	=	249.85	mA				
Max. output power	P_o	=	0.518	W				
Trapezoidal output characteristics								
Max. external capacitance	C_o	=	65	46	32	25	21	µF
Max. external inductance	L_o	=	0.68	1.68	2.68	3.68	4.68	µH

C_o and L_o pairs directly above / underneath each other may be used.

18.2.5 X35 – USB

X35 – USB terminals + (X35-1), D- (X35-2), D+ (X35-3), GND (X35-4):

Max. output voltage	U_o	=	5.36	VDC				
Max. output current	I_o	=	1.264	A				
Max. output power	P_o	=	2.949	W				
Trapezoidal output characteristics								
Max. external capacitance	C_o	=	65	44	30	23	19	µF
Max. external inductance	L_o	=	0.68	1.68	2.68	3.68	4.68	µH

C_o and L_o pairs directly above / underneath each other may be used.

18.2.6 X36 / X37 – RF1 / RF2

X36 / X37 – RF1 / RF2, Typ W02, W05, W22, W55, W25 per circuit:

Radio frequency	f_o	=	2.4 … 5	GHz
Max. RF threshold power	P_o	=	17 (50)	dBm (mW)

Calculating the RF threshold power

- Make sure that the RF threshold power radiated from the antenna does not exceed 33 dBm (2 W) for Gas Group IIC.
- The calculation of the threshold power should take into account the output power of the interface and the gain of the antenna. Any losses from the cable can also be included in this calculation.

Example of RF threshold power calculation:

Output power of the interface X36 / X37	17 dBm (50 mW)
Coaxial cable power dissipation	2dB
Antenna gain	5 dBi

RF threshold power radiated from the antenna =
17 dBm – 2 dB + 5 dBi = 20 dBm (100 mW)

In this example, the coaxial cable and the antenna comply with the requirements of Gas Group IIC, since 20 dBm (100 mW) <33 dBm (2 W).

Requirements for Wi-Fi antennae

Subject	Required value	Directive
Earthing requirement	–	IEC 60079-14 : 2014 section 16.2.3 local installation requirements (such as NEC or CEC)
Radio frequency	2.4 Ghz	ETSI EN 300 328 V2.1.1 (2016-11)
Radio frequency inside buildings	5 Ghz	Australian RCM and ACMA directives

18.3 Bluetooth – B1

Radio frequency	f_o	=	2.4	GHz
Max. RF threshold power	P_o	=	33 (2)	dBm (W)

18.4 RFID reader interface – RF1, RF2

Radio frequency				
• Type RF1	f_o		13.56	MHz
• Type RF2	f_o	=	2.4	GHz
Max. RF threshold power	P_o	=	33 (2)	dBm (W)

18.5 Inherently safe optical interfaces (Ex op is)

18.5.1 X20 / X21 – FO 1 / FO 2 type FX

Wavelength	=	1310	nm
Nominal optical radiated power	=	0.344	mW
Max. optical radiated power under fault conditions	=	35	mW

18.5.2 X20 / X21 – FO 1 / FO 2 type SX

Wavelength	=	850	nm
Nominal optical radiated power	=	0.22	mW
Max. optical radiated power under fault conditions	=	35	mW

18.5.3 X20 / X21 – FO 1 / FO 2 type LX

Wavelength	=	1310	nm
Nominal optical radiated power	=	0.22	mW
Max. optical radiated power under fault conditions	=	35	mW

18.5.4 X22 – FO 3 type OSX

Wavelength	=	850	nm
Nominal optical radiated power	=	0.22	mW
Max. optical radiated power under fault conditions	=	35	mW

18.5.5 X22 – FO 3 type OLX

Wavelength	=	1310	nm
Nominal optical radiated power	=	0.22	mW
Max. optical radiated power under fault conditions	=	35	mW

18.6 Non intrinsically safe interfaces (Ex e)

18.6.1 X1 – Power supply

Nominal voltage				
• Device version AC		=	100 … 240	VAC
• Device version DC		=	20 … 30	VDC
Nominal current				
• Device version AC		=	Max. 5	A
• Device version DC		=	Max. 8	A
Nominal power		=	150	W
Max. input voltage	U_m	=	250	VAC
Frequency for AC		=	50 – 60	Hz

18.6.2 X2 / X3 – copper1 / copper2

Nominal voltage		=	5	VAC / VDC
Max. input voltage	U_m	=	250	VAC

18.6.3 X4 – DC out

Nominal voltage terminal 1		=	12	VDC
Nominal voltage terminal 4			24	VDC
Max. input voltage	U_m	=	250	VAC

18.6.4 X5 – CAN

Nominal voltage		=	5	VAC / VDC
Max. input voltage	U_m	=	250	VAC

18.6.5 X6 – USB

Nominal voltage		=	5	VAC / VDC
Max. input voltage	U_m	=	250	VAC

18.6.6 X7 – RSxxx

Nominal voltage		=	12	VAC / VDC
Max. input voltage	U_m	=	250	VAC

18.6.7 X8

NOTE	**Not in use !** Do not connect anything !

18.6.8 X9 – Audio / Video

Nominal voltage		=	5	VAC / VDC
Max. input voltage	U_m	=	250	VAC

18.6.9 X10 – SATA

Nominal voltage		=	5	VAC / VDC
Max. input voltage	U_m	=	250	VAC

19 Appendix C

19.1 Connection overview terminal assignment

19.1.1 Ex e terminal box / terminals

Terminal	Pin	Designation (PCB) / view		typical colour coding / plug type	Connection / function
X1	1	+24 V / L		Black	Power supply of the HMI device (either AC or DC)
POWER	2	+24 V / L		Black	
	3	GND / N		Blue	
	4	GND / N		Blue	
	5	PE / earth		Green / yellow	
	6	PE / earth		Green / yellow	
X2 *		1000Base-TX	100Base-TX		Data cable
CAT1	1	D1+	TX+	Orange / White	Copper connection 1
	2	D1-	TX-	Orange	
	3	D2+	RX+	Green / White	
	4	D2-	RX-	Green	
	5	D3+		White / Blue	
	6	D3-		Blue	
	7	D4+		White / Brown	
	8	D4-		Brown	
X3 *		1000Base-TX	100Base-TX		Data cable
CAT2	1	D1+	TX+	Orange / White	Copper connection 2 (2. Connection not possible for SERIES 600)
	2	D1-	TX-	Orange	
	3	D2+	RX+	Green / White	
	4	D2-	RX-	Green	
	5	D3+		White / Blue	
	6	D3-		Blue	
	7	D4+		White / Brown	
	8	D4-		Brown	
X20 * FO 1				SC duplex connector	Data cable FO connection 1 for SERIES 400 / 500 Type FX (100Base-FX) for SERIES 600: Type SX (1000Base-SX) or Type LX (1000Base-LX)

X21 * FO 2			SC duplex connector	Data cable FO connection 2 (2. Connection not possible for SERIES 600) for SERIES 400 / 500 Type FX (100Base-FX)

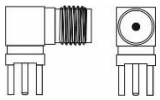
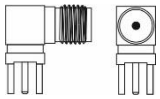
* Ethernet connection is available in two versions: copper or fibre optic (see order versions).
SERIES 600 devices only have one Ethernet connection. Although SERIES 600 devices have the X3 terminal block (CAT2), this is not assigned / connected.

Terminal	Pin	Designation (PCB) / view			typical colour coding / plug type	Connection / function
X4 DC out	1	+12 V				12 and / or 24 VDC Output max. load 500 mA per output
	2	GND				
	3	GND				
	4	+ 24 V				
X5 CAN	1	CAN1 L				CAN bus connection (no longer available)
	2	CAN1 H				
	3	CAN2 L				
	4	CAN2 H				
X6 USB	1	+5 V			Red	USB connection
	2	D -			White	
	3	D +			Green	
	4	GND			Black	
X7 RSxxx		RS-232	RS-422	RS-485		Serial interface (COM) RS-232 / RS-422 / RS-485
	1	TxD	TxD-A	A		
	2	RxD	RxD-B			
	3	RTS	TxD-B	B		
	4	CTS	RxD-A			
	5	GND				
X8						Not in use

X9 Audio / Video				Audio / video connection
	1	L out		Line out left
	2	R out		Line out right
	3	GND		(audio only for AMD and SERIES 600)
	4	Video		Video input (not possible for SERIES 600)
	5	GND		

19.1.2 Ex i terminal box / terminals

Terminal	Pin	Designation (PCB) / view	typical colour coding / plug type	Connection / function
X30 PB	1	PB		on/off switch connection (not possible for SERIES 600)
	2	GND		
	3	GND		
	4	GND		
X31 FAN	1	+FAN		Fan connection
	2	GND		
	3	+FAN		
	4	GND		
X32 RS232 / Power	1	+10.4V		Barcode / card reader connection
	2	+5.4V		
	3	GND		
	4	RxD		
	5	TxD		
X33 USB	1	+5 V	Red	USB connection
	2	D -	White	
	3	D +	Green	
	4	GND	Black	
X34 USB	1	+5 V	Red	USB connection
	2	D -	White	
	3	D +	Green	
	4	GND	Black	
X35 USB	1	+5 V	Red	USB connection (Terminals or sockets)
	2	D -	White	
	3	D +	Green	
	4	GND	Black	
			USB socket Type A	

X36			SMA reverse socket	WLAN Antenna connection 1 (not possible for SERIES 600) (for 2.4 GHz antenna)
X37			SMA reverse socket	WLAN Antenna connection 2 (not possible for SERIES 600) (for 5 GHz antenna)

20 Appendix D

20.1 Variation of operating temperature range

The devices' operating temperature range is impacted by how they are mounted, and the minimum and maximum permitted operating temperature may vary depending on their mounting type.

These values are listed in the table below.

NOTE	Exposure to direct sunlight might contribute to a further heating up of the device and may result in a further reduction of the maximum permitted operating temperature ! We recommend you protect the device from direct sunlight !
	Wind may cool down the device and thus have an impact on the minimum operating temperature.

The storage temperature is not impacted by the type of installation.

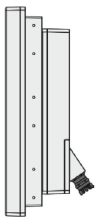
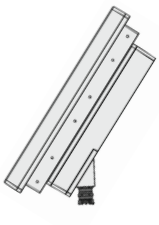
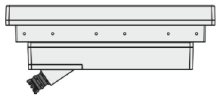
As a rule:

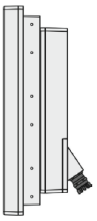
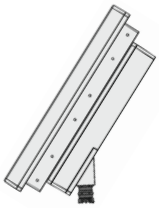
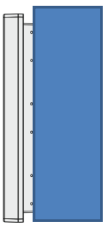
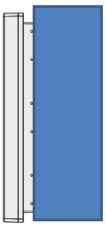
LTC = Lower ambient temperature in °C
- -40 °C for devices with integrated heater
- -10 °C for devices without heater

LTF = Lower ambient temperature in °F
- -40 °F for devices with integrated heater
- +14 °F for devices without heater

HTC = Highest permissible ambient temperature in °C

HTF = Highest permissible ambient temperature in °F

Display orientation	Inclination	Description	Highest permissible ambient temperature
		Landscape, horizontal 90°, standing free	HTC = +65 °C HTF = +149 °F
		Landscape, horizontal 45°, standing free	HTC = +60 °C HTF = +140 °F
		Landscape, horizontal 0°, standing free, minimum gap 10 cm below device	HTC = 60 °C HTF = +140 °F

Display orientation	Inclination	Description	Highest permissible ambient temperature
		Portrait, vertical 90°, standing free	HTC = +60 °C HTF = +140 °F
		Portrait, vertical 45°, standing free	HTC = +60 °C HTF = +140 °F
		Landscape, horizontal, installation in enclosure, inclination independend	HTC = +50 °C HTF = +122 °F
		Portrait, horizontal, installation in enclosure, inclination independend	HTC = +50 °C HTF = +122 °F

21 Appendix E

21.1 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.

21.1.1 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)

21.1.1.1 Declarable substance groups

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

SCIP number: 6645ed62-9ed5-4379-a02d-1e99e5be3300

Component	Name	Mass (g)	Declarable Substance Groups and Substances (IEC 62474 database)	CAS No.	Mass %	Exemption (acc. to directive)
BR2032	Lithium button cell battery AMD boards	2.6	Dimethoxyethane (1,2 Dimethoxyethane / DME)	110-71-4	3.6104	-
BR2450A	Lithium button cell battery i5 boards	4.9	no SVHC			-
BR-1/2AA	Lithium button cell battery i7 boards	25.5	no SVHC			

21.1.1.2 ROHS directive 2011/65/EC

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

21.1.1.3 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).

22 Appendix F

22.1 Defective pixels

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

22.1.1 Terminology

Defective pixels — Pixels or sub-pixels that do not perform as expected and are either always on or always off.

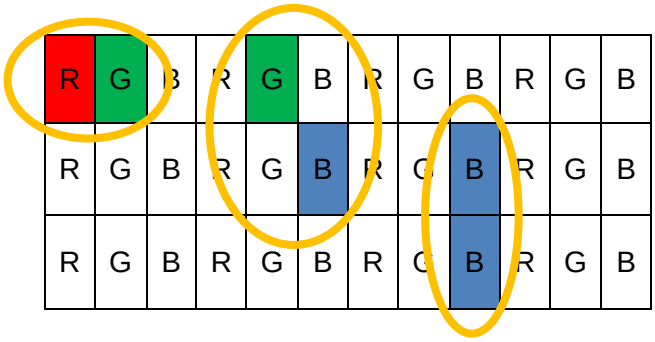
Pixel — Image point on the display consisting of 3 sub-pixels in the basic colours red, green and blue.

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

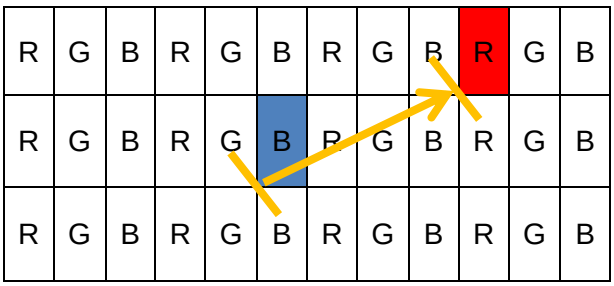
Bright — Sub-pixel (dot) to which light is passing through, creating a bright dot that is on

Dark off — Sub-pixel (dot) to which no light is passing through, creating a dark dot that is

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)

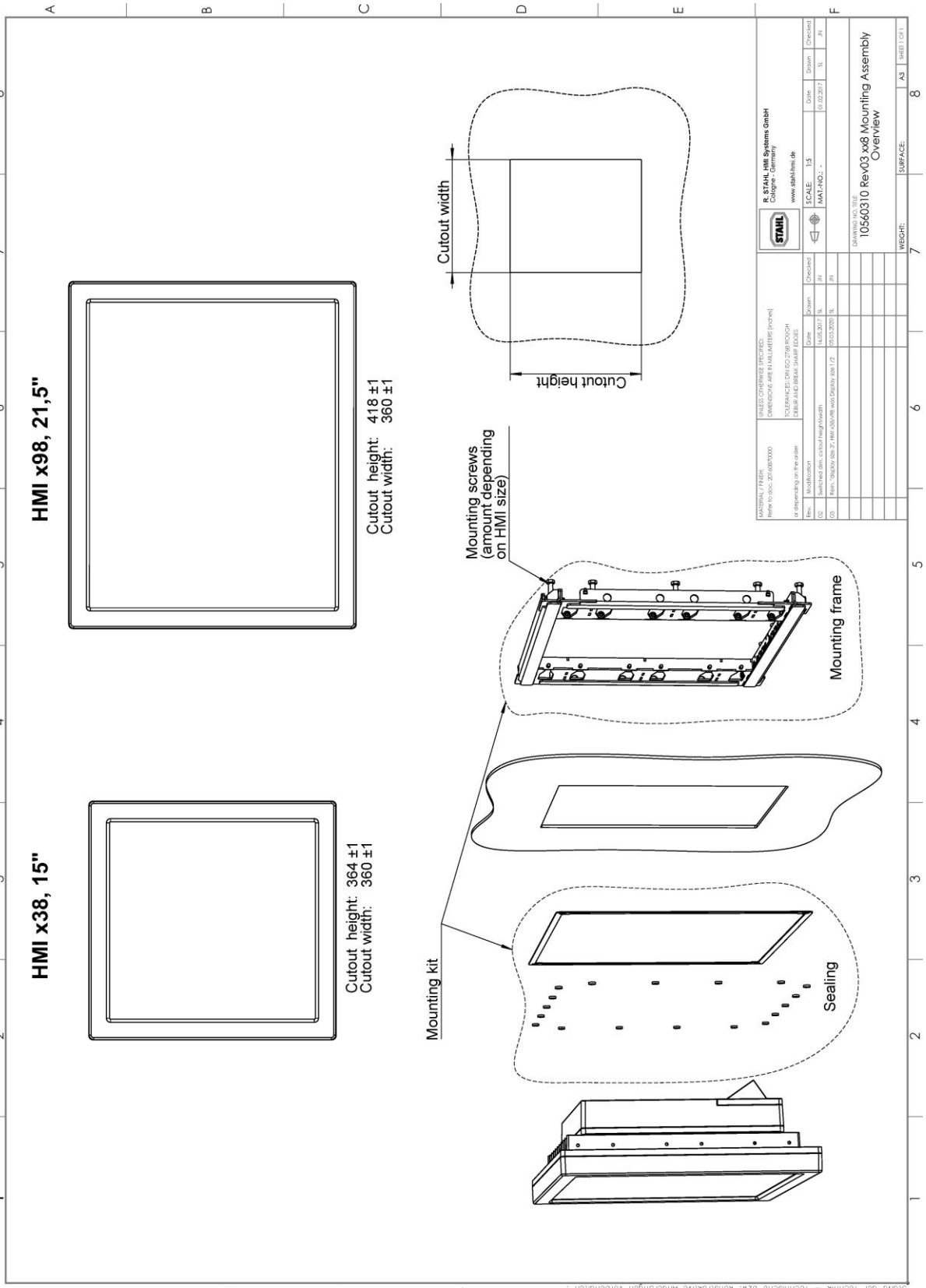


22.1.2 Display specification

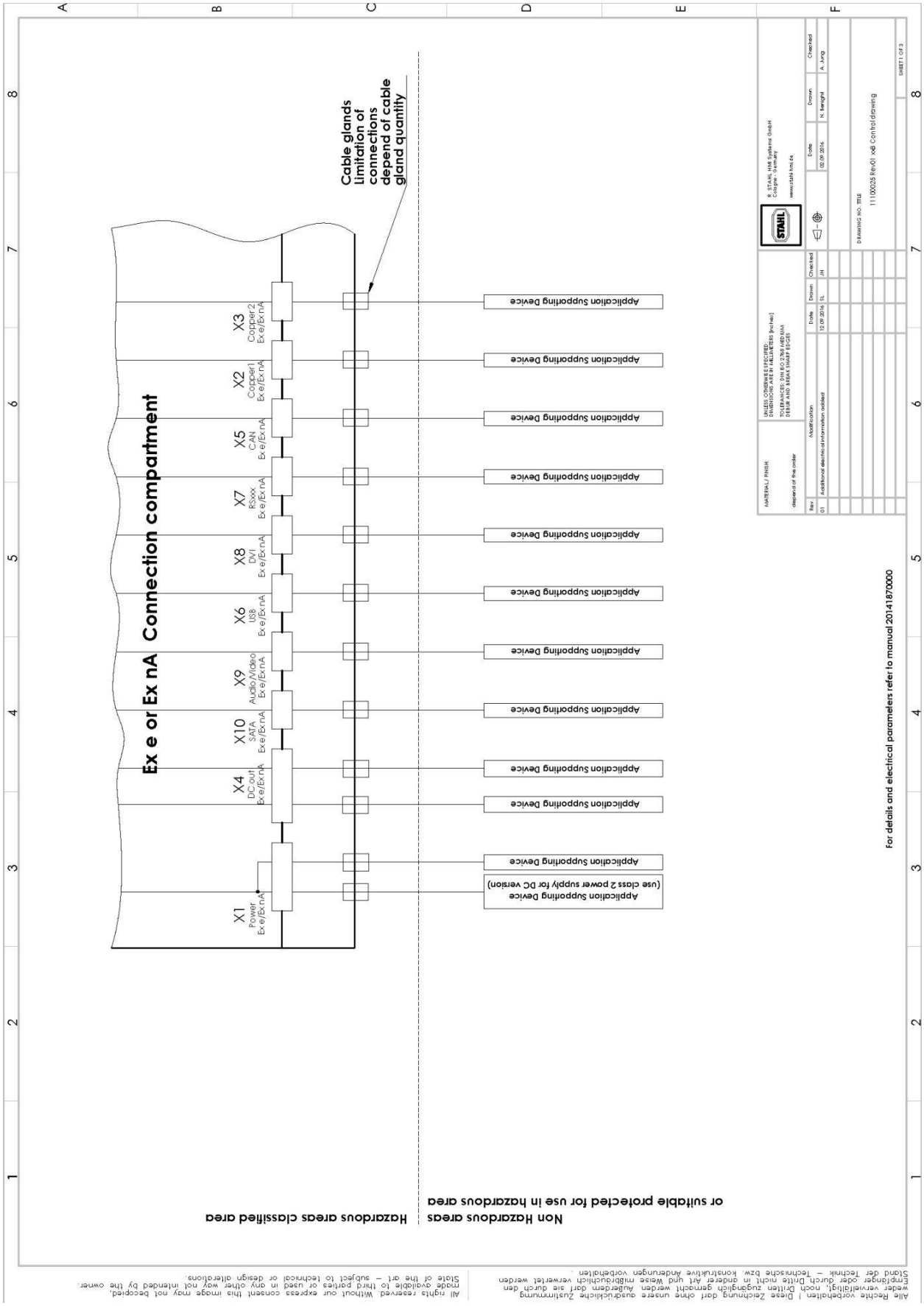
Type of defect / description	max. number of permitted defects		
	15" SR Display	15" display	21.5" SR Display
Linear defect (horizontal, vertical)	not acceptable		
Defective pixels			
bright dots	≤ 3	≤ 2	≤ 2
dark dots	≤ 3	≤ 3	≤ 5
total number of dots	≤ 5	≤ 3	≤ 5
adjacent dots			
2 bright dots	≤ 1 pair	≤ 0 pair	≤ 1 pair
more than 3 bright dots	not acceptable		
2 dark dots	≤ 1 pair	≤ 1 pair	≤ 2 pairs
more than 3 dark dots	not acceptable		
Distance between the dots			
between 2 bright dots	not defined	≥ 15 mm	≥ 15 mm
between 2 dark dots	not defined	≥ 15 mm	≥ 15 mm
between 1 bright and 1 dark dot	not defined	≥ 15 mm	≥ 15 mm
ND filter for mura effects, bright and dark dots	View with 5% filter	View with 5% filter	View with 6% filter

23 Appendix G

23.1 Panel mount with xx8 Mounting-Kit

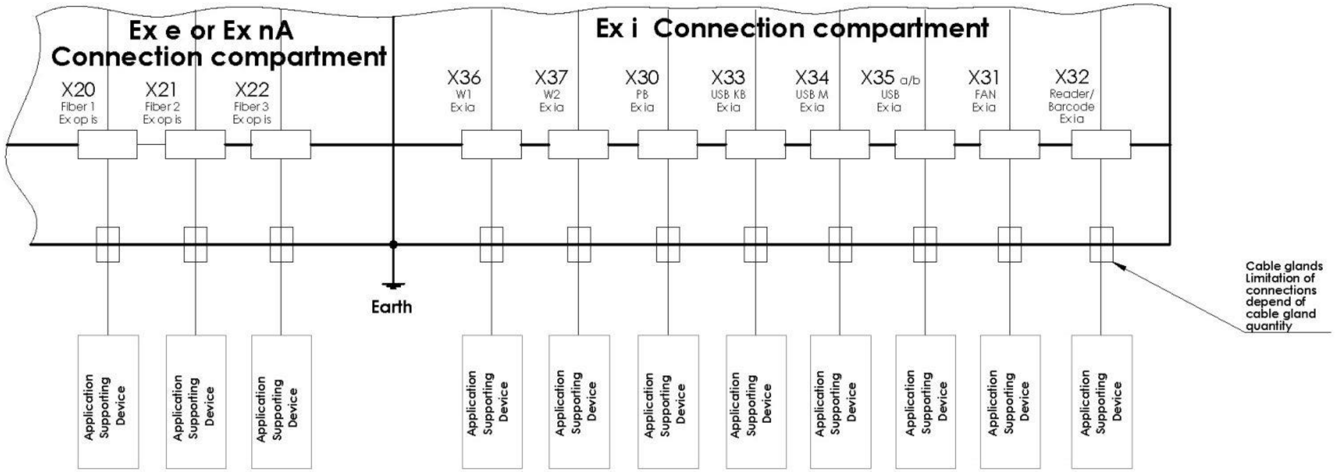


23.2 Control Drawing – FM USA / Canada



Hazardous areas classified area

Non Hazardous areas or suitable hazardous area protected



X20 / X21
Fiber 1 / Fiber 2

for HMI series type xx8-*FX*:
Wavelength = 1310nm
Nominal optical radiated power = 0,344mW
Max. optical radiated power under fault conditions = 35mW

for HMI series type xx8-*SX*:
Wavelength = 850nm
Nominal optical radiated power = 0,22mW
Max. optical radiated power under fault conditions = 35mW

for HMI series type xx8-*LX*:
Wavelength = 1310nm
Nominal optical radiated power = 0,22mW
Max. optical radiated power under fault conditions = 35mW

X22:
Fiber 3

for HMI series type xx8-*XSX*:
Wavelength = 850nm
Nominal optical radiated power = 0,22mW
Max. optical radiated power under fault conditions = 35mW

for HMI series type xx8-*XLX*:
Wavelength = 1310nm
Nominal optical radiated power = 0,22mW
Max. optical radiated power under fault conditions = 35mW

X31
Fan power Terminals 1(+), 2(GND) and 3(+), 4(GND)

Max. output voltage Uo = DC 15,75V
Max. output current Io = 189mA
Max. output power Po = 1,092W
Trapezoidal output characteristics
Max. external capacitance Co = 0,290uF
For max. external inductance Lo = 100uH
or
Max. external capacitance Co = 0,478uF
For max. external inductance Lo = 20uH

X33 / X34
USB KB/M Terminals
1(+), 2(D-), 3(D+), 4(GND)

Max. output voltage Uo = DC 5,36V
Max. output current Io = 249,85mA
Max. output power Po = 0,518W
Trapezoidal output characteristics
Max. external capacitance Co = 65uF
for max. external inductance Lo = 0,68uH
or
Max. external capacitance Co = 46uF
for max. external inductance Lo = 1,68uH
or
Max. external capacitance Co = 32uF
for max. external inductance Lo = 2,68uH
or
Max. external capacitance Co = 25uF
for max. external inductance Lo = 3,68uH
or
Max. external capacitance Co = 21uF
for max. external inductance Lo = 4,68uH

X35
USB Terminals 1(+), 2(D-), 3(D+), 4(GND)

Max. output voltage Uo = DC 5,36V
Max. output current Io = 1,264A
Max. output power Po = 2,949W
Trapezoidal output characteristics
Max. external capacitance Co = 65uF
for max. external inductance Lo = 0,68uH
or
Max. external capacitance Co = 44uF
for max. external inductance Lo = 1,68uH
or
Max. external capacitance Co = 30uF
for max. external inductance Lo = 2,68uH
or
Max. external capacitance Co = 23uF
for max. external inductance Lo = 3,68uH
or
Max. external capacitance Co = 19uF
for max. external inductance Lo = 4,68uH

X36 / X37
Wireless, for HMI series type xx8-*W02*, xx8-*W05*, xx8-*W22*, xx8-*W55*, xx8-*W25* each circuit:

Radio frequency fo = 2,4GHz...5GHz
Max. RF Threshold power Po = 17dBm (50mW)

It is responsible of the installer to ensure that the RF threshold power radiated from the antenna must be limited to max. 33dBm (2W) for Gas Group IIC.
The calculation of this should take into account of output power of the interface and the gain of the antenna. It is permissible to consider losses in the cable in this calculation.

X30
PB, Power button
Terminals 1(+), 2/3/4(GND)

Max. output voltage Uo = DC 5,36V
Max. output current Io = 46mA
Max. output power Po = 0,061W
Trapezoidal output characteristics
Max. external capacitance Co = 65uF
For max. external inductance Lo = 1uH
or
Max. external capacitance Co = 10uF
For max. external inductance Lo = 20uH

For further details and electrical parameters refer to manual 20141870000

X32
Reader/Barcode 10,4V power, Terminals 1(+), 3(GND):

Max. output voltage Uo = DC 10,4V
Max. output current Io = 391mA
Max. output power Po = 2,253W
Trapezoidal output characteristics
Max. external capacitance Co = 2,52uF
for max. external inductance Lo = 20uH
or
Max. external capacitance Co = 1,2uF
for max. external inductance Lo = 100uH

Reader/Barcode 5,36V power, Terminals 2(+), 3(GND):

Max. output voltage Uo = DC 5,36V
Max. output current Io = 420mA
Max. output power Po = 1,213W
Trapezoidal output characteristics
Max. external capacitance Co = 65uF
for max. external inductance Lo = 1uH
or
Max. external capacitance Co = 45uF
for max. external inductance Lo = 2uH

Reader/Barcode data, Terminals 4(RXD), 5(TXD), 3(GND):

Max. output voltage (RXD-gnd resp. TXD-gnd) Uo = ± 5,35V
Max. output voltage (RXD-TXD) Uo = ± 10,70V
Max. output current Io = 16mA
Max. output power Po = 0,022W
Max. internal capacitance Ci = negligible
Max. internal inductance Li = negligible
Max. input voltage Ui = ± 12,5V
Trapezoidal output characteristics
Max. external capacitance Co = 2,23F
for max. external inductance Lo = 1uH
or
Max. external capacitance Co = 2,23uF
for max. external inductance Lo = 20uH

Note:
The external capacitances and inductances were calculated for the maximum voltage of 10,7 V. If only one of the two signals RXD or TXD is connected, only a reduced voltage of 5,35 V has to be considered. Therewith, the following values are permissible:

Max. external capacitance Co = 65uF
for max. external inductance Lo = 1uH
or
Max. external capacitance Co = 45uF
for max. external inductance Lo = 2uH

MATERIAL / FINISH: depend of the order

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS [inches]
TOLERANCES: DIN ISO 2768 MEDIUM
DEBUR AND BREAK SHARP EDGES

R. STAHL HMI Systems GmbH
Cologne - Germany
www.stahl-hmi.de

Rev.	Modification	Date	Drawn	Checked
01	Additional electrical information added	12.09.2016	SL	JN

Date	Drawn	Checked
02.09.2016	N. Benighi	A. Jung

DRAWING NO. TITLE
11100025 Rev01 xx8 Control drawing

SHEET 2 OF 3

Security Advices

1. No revision to drawing prior to certification body.
2. The Associated Apparatus must be approved by a NRTL.
3. Manufacturer's installation drawing must be followed when installing associated apparatus.
4. Interconnection of equipment apparatus type of protection „I.S." with associated apparatus is allowed when the following is true:

I.S. Equipment Associated Apparatus

Vmax	≥	Uo
Imax	≥	Io
Pi	≥	Po
Ci + Ccable	≤	Co
Li + Lcable	≤	Lo

WARNING:
- Substitution of components may impair Safety.
- To prevent ignition of flammable or combustible atmospheres disconnect power and wait a minimuum of 5min. before servicing.

The ET-xx8 operator interfaces and connected devices must be integrated in the same system of potential equalization.
As an alternative to this, only devices hat are isolated from earth potential may be connected.

All circuits must be wired as specified in the:
National Electric Code NFPA70 for installation within United State.
Canadian Electric Codefor installation within Canada.

Calculation of cable length

1.) Determination of maximum possible capacitance of cable:

Cmax = Co - Ci (associated Apparatus)

Determination of maximum possible inductance of cable:

Lmax = Lo - Li (associated Apparatus)

2.) Determination of maximum possible cable length by capacitance and inductance of cable:

$$\text{length } C = \frac{Cmax}{Ccable\ (*1)}$$

$$\text{length } L = \frac{Lmax}{Lcable\ (*1)}$$

3.) Determination of maximum length of cable:
length C or lenght L, whatever is less.

(*1) when cable parameters are unknown, the following values may be used:

Ccable = 60 pF/ft. (200 pF/m)
Lcable = 0.2 µH/ft. (0.66 µH/m)

Rev.	Modification	Date	Drawn	Checked
01	Additional electrical information added	15.09.2016	SL	JH

R. STAHL HMI Systems GmbH
Cologne - Germany
www.stahl-hmi.de

Date: 02.09.2016 | Drawn: N. Neuphil | Checked: A. Jung

DRAWING NO.: TITLE
111000025 Rev01 xx8 Control drawing

SHEET 3 OF 3

24 Attachment H

24.1 Declarations of EC conformity

24.1.1 EU

24.1.1.1 ET-xx8

EG/EU-Konformitätserklärung
EC/EU Declaration of Conformity
Déclaration de Conformité CE/UE

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: *that the product:* *que le produit:*	Bedien- und Beobachtungsgeräte *Operating and Monitoring Devices* *Consoles de commande et de visualisation*
Typ(en), *type(s), type(s):*	ET-438-..., ET-538-..., ET-638-..., ET-738-... ET-498-..., ET-598-..., ET-698-..., ET-798-...

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)*
2014/34/EU **ATEX-Richtlinie** *2014/34/EU* *ATEX Directive* *2014/34/UE* *Directive ATEX*	EN 60079-0: 2012 + A11:2013 EN 60079-5: 2015 EN 60079-7: 2015 EN 60079-11: 2012 EN 60079-28: 2015 EN 60079-31: 2014
Kennzeichnung, *marking, marquage:*	Ⓔx **II 2(1) G Ex eb q [ia op is Ga] IIC T4 Gb** **II 2(1) D Ex tb [ia op is Da] IIIC T115°C Db** CE 0158
EG/EU-Baumusterprüfbescheinigung: *EC/EU Type Examination Certificate:* *Attestation d'examen CE/UE de type:*	**BVS 14 ATEX E 134 X** (DEKRA EXAM GmbH Dinnendahlstraße 9, 44809 Bochum, Germany, NB0158)
2014/30/EU **EMV-Richtlinie** *2014/30/EU* *EMC Directive* *2014/30/UE* *Directive CEM*	EN 61000-6-2:2005 + AC:2005 EN 61000-6-4:2007 + A1:2011
2014/53/EU **Funkanlagen-Richtlinie** *2014/53/EU* *Radio Equipment Directive* *2014/53/UE* *Directive Équipement Radioélectrique*	ETSI EN 300 328 V2.1.1 (2016-11)
Produktnormen nach Niederspannungsrichtlinie: *Product standards according to Low Voltage Directive:* *Normes des produit pour la Directive Basse Tension:*	EN 60950-1:2006 + A11:2009 + A12:2011 + A1:2010
Produktnormen nach RoHS-Richtlinie (2011/65/EU): *Product standards according to RoHS Directive:* *Normes des produit pour la Directive RoHS:*	EN 50581:2012

Köln, 2018-03-19
Ort und Datum
Place and date
Lieu et date

i.V. Joachim Düren
J. Düren
Technical Director

i.V. A. Jung
A. Jung
Ex Representative

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24.1.1.2 MT-xx8

EG/EU-Konformitätserklärung
EC/EU Declaration of Conformity
Déclaration de Conformité CE/UE

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: *that the product:* *que le produit:*	Bedien- und Beobachtungsgeräte *Operating and Monitoring Devices* *Consoles de commande et de visualisation*
Typ(en), *type(s), type(s):*	MT-438-..., MT-538-..., MT-638-..., MT-738-... MT-498-..., MT-598-..., MT-698-..., MT-738-...

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)*
2014/34/EU **ATEX-Richtlinie** *2014/34/EU* *ATEX Directive* *2014/34/UE* *Directive ATEX*	EN 60079-0: 2012 + A11:2013 EN 60079-5: 2015 EN 60079-7: 2015 EN 60079-11: 2012 EN 60079-28: 2015 EN 60079-31: 2014
Kennzeichnung, *marking, marquage:*	**Ⓔx II 3(1) G Ex ec nR [ia op is Ga] IIC T4 Gc** **II 3(1) D Ex tc [ia op is Da] IIIC T115°C Dc** **CE0158**
EG/EU-Baumusterprüfbescheinigung: *EC/EU Type Examination Certificate:* *Attestation d'examen CE/UE de type:*	**BVS 14 ATEX E 134 X** (DEKRA EXAM GmbH Dinnendahlstraße 9, 44809 Bochum, Germany, NB0158)
2014/30/EU **EMV-Richtlinie** *2014/30/EU* *EMC Directive* *2014/30/UE* *Directive CEM*	EN 61000-6-2:2005 + AC:2005 EN 61000-6-4:2007 + A1:2011
2014/53/EU **Funkanlagen-Richtlinie** *2014/53/EU* *Radio Equipment Directive* *2014/53/UE* *Directive Équipement Radioélectrique*	ETSI EN 300 328 V2.1.1 (2016-11)
Produktnormen nach Niederspannungsrichtlinie: *Product standards according to Low Voltage Directive:* *Normes des produit pour la Directive Basse Tension:*	EN 60950-1:2006 + A11:2009 + A12:2011 + A1:2010
Produktnormen nach RoHS-Richtlinie (2011/65/EU): *Product standards according to RoHS Directive:* *Normes des produit pour la Directive RoHS:*	EN 50581:2012

Köln, 2018-03-19 — i.V. Joachim Düren — i.V. A. Jung

Ort und Datum
Place and date
Lieu et date

J. Düren
Technical Director

A. Jung
Ex Representative

20153070012 Konformitätserklärung MT-xx8.docx

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24.1.2 RCM

Supplier's declaration of conformity

Australian Government | acma Australian Communications and Media Authority

As required by the following Notices:

- *Radiocommunications (Compliance Labelling - Devices) Notice 2014* made under section 182 of the *Radiocommunications Act 1992*;
- *Radiocommunications Labelling (Electromagnetic Compatibility) Notice 2017* made under section 182 of the *Radiocommunications Act 1992*
- *Radiocommunications (Compliance Labelling – Electromagnetic Radiation) Notice 2014* made under section 182 of the *Radiocommunications Act 1992* and
- *Telecommunications (Labelling Notice for Customer Equipment and Customer Cabling) Instrument 2015* made under section 407 of the *Telecommunications Act 1997*.

Instructions for completion

- ***Do not return this form to the ACMA.*** This completed form must be retained by the supplier as part of the documentation required for the compliance records and must be made available for inspection by the ACMA when requested.

Supplier's details (manufacturer, importer or authorised agent)

Company Name (OR INDIVIDUAL)

R. STAHL Australia Pty Ltd
TRADING AS R. STAHL HMI Systems GmbH

ACN/ARBN

ABN 81150955838

OR

New Zealand IRDN

Street Address (AUSTRALIAN or NEW ZEALAND)

848 Old Princes Highway
Sutherland, NSW
POSTCODE 2232
Phone: +61 2 4254 4777

Product details and date of manufacture

Product description – brand name, type, current model, lot, batch or serial number (if available), software/firmware version (if applicable)

Operating and Monitoring Devices ET-438-..., ET-538-..., ET-638-..., ET-738-..., ET-498-..., ET-598-..., ET-698-..., ET-798-...
Operating and Monitoring Devices MT-438-..., MT-538-..., MT-638-..., MT-738-..., MT-498-..., MT-598-..., MT-698-..., MT-738-...

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Compliance – applicable standards and other supporting documents

Evidence of compliance with applicable standards may be demonstrated by test reports, endorsed/accredited test reports, certification/competent body statements.

Having had regard to these documents, I am satisfied the above mentioned product complies with the requirements of the relevant ACMA Standards made under the *Radiocommunications Act 1992* and the *Telecommunications Act 1997*.

List the details of the documents the above statement was made, including the standard title, number and, if applicable, number of the test report/endorsed test report or certification/competent body statement

EN 61000-6-4:2007 + A1:2011; EN 55032 (based on an ETSI EN 301 489-1 test report, refered to ACMA statement from 07.09.2018, Ref: CSC2018-27820, CRM:001214006281)

Declaration

I hereby declare that:

1. I am authorised to make this declaration on behalf of the Company mentioned above,
2. the contents of this form are true and correct, and
3. the product mentioned above complies with the applicable above mentioned standards and all products supplied under this declaration will be identical to the product identified above.

Note: Under section 137.1 of the *Criminal Code Act 1995*, it is an offence to knowingly provide false or misleading information to a Commonwealth entity.
Penalty: 12 months imprisonment

SIGNATURE OF SUPPLIER OR AGENT	Managing Director POSITION IN ORGANISATION
John Zagame PRINT NAME	2018-10-15 DATE

The *Privacy Act 1988* (Cth) (the Privacy Act) imposes obligations on the ACMA in relation to the collection, security, quality, access, use and disclosure of personal information. These obligations are detailed in the Australian Privacy Principles.

The ACMA may only collect personal information if it is reasonably necessary for, or directly related to, one or more of the ACMA's functions or activities.

The purpose of collecting the personal information in this form is to ensure the supplier is identified in the 'Declaration of conformity'. If this Declaration of Conformity is not completed and the requested information is not provided, a compliance label cannot be applied.

Further information on the Privacy Act and the ACMA's Privacy Policy is available at www.acma.gov.au/privacypolicy. The Privacy Policy contains details about how you may access personal information about you that is held by the ACMA, and seek the correction of such information. It also explains how you may complain about a breach of the Privacy Act and how we will deal with such a complaint.

Should you have any questions in this regard, please contact the ACMA's privacy contact officer on telephone on 1800 226 667 or by email at privacy@acma.gov.au.

24.1.3 EAC

EAC

EURASIAN ECONOMIC UNION
DECLARATION OF CONFORMITY

Applicant: Limited Liability Company «R.Stahl».
The main state registration number is 5087746541493.
Location (address of the legal entity) and the address of the place of business: 129085, Russia, Moscow, Zvezdny Boulevard, building 21, building 1, floor 6, room 1, room 12; phone number: +74956150473, E-mail address: info@stahl.ru.com.

represented by General Director Makhmudov Alexander Dzhamaleddinovich

declares that Control terminals of series ET and MT according to Appendix No. 1 on one sheet of this declaration.

manufacturer: R.STAHL HMI Systems GmbH,
Location (address of the legal entity) and address of the place of business activity: Adolf-Grimme-Allee 8, 50829 Koeln, Germany.
Products manufactured in accordance with the technical documentation R.STAHL HMI Systems GmbH.
HS Code: 8537 10 990 0
Serial release.

meets the requirements
TR EAEU 037/2016 On restriction of the use of certain hazardous substances in electrical and electronic equipment

The declaration of conformity was adopted on the basis of Test Reports № 121-HMI-20 28.02.2020 of the Testing Laboratory of the R.STAHL HMI Systems GmbH; operation manuals. Declaration scheme 1d.

Additional Information
Storage conditions of products in accordance with the requirements of GOST 15150-69. The shelf life (service, shelf life) is specified in the operational documentation attached to the product.

The declaration of conformity is valid from the date of registration to 22.03.2025 inclusive.

(Signature) Stamp — Makhmudov Alexander Dzhamaleddinovich (full name the Applicant)

Registration number of the declaration of conformity: ЕАЭС N RU Д-DE.PA01.B.27604/20

Date of registration of the declaration of conformity: 23.03.2020

ЕВРАЗИЙСКИЙ ЭКОНОМИЧЕСКИЙ СОЮЗ
ПРИЛОЖЕНИЕ № 1
К ДЕКЛАРАЦИИ О СООТВЕТСТВИИ ЕАЭС N RU Д-DE.PA01.B.27604/20

Перечень продукции, на которую распространяется действие декларации о соответствии

HS Code	Name and designation of products and (or) other designation	Name and designation of the document (s) in accordance with which the products are manufactured
8537 10 990 0	Control terminals of series ET and MT: ET-**6-A-*-***, MT-**6-A-*-***, terminal type (ET or MT); ** type of operating system (3 = EAGLE (STAHL operating system); 4 = OPEN HMI (Windows, Linux OS); 5=REMOTE HMI (Windows); display size (0 = 10″ VGA display; 1 = 10″ SVGA display; 3 = 15″ display; 5 = 19″ display); 6 - fixed type code; A is the hardware version; *Ethernet interface (FX - fiber-optic cable; TX - cable with copper conductors); ***additional symbols that do not affect the design and means of explosion protection. T-Ex displays, MT - ##7 * - R2 * = any alphanumeric or symbolic character, without relevance tor explosion protection # = one numeric character, without relevance for explosion protection ET-208 ET-xx8, MT-xx8 First x = one numeric character, without relevance for explosion protection Second x = one numeric character reflect display size, without relevance for explosion protection	Products manufactured in accordance with the technical documentation R.STAHL HMI Systems GmbH

(Signature) Stamp Makhmudov Alexander Dzhamaleddinovich (full name the Applicant)

25 Appendix I

25.1 Release notes

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

Version 01.02.03

- Contents identical to those in "OI_ET_MT-xx8_de_V_01_02_03.docx"

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E: (Sales Support) sales.dehm@r-stahl.com
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exicom.de