



Operating Instructions Device platform MANTA

ET-xx7

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

R. STAHL HMI Systems GmbH

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

In detail, these are:







 DANGER	This sign alerts users to hazards that will result in death or serious injury if ignored !
 WARNING	This sign alerts users to hazards that may result in death or serious injury if ignored !
 CAUTION	This sign alerts users to hazards that may damage machinery or equipment or result in injury if ignored !
 ATTENTION	Information highlighted by this symbol indicates measures for the prevention of damage to machinery or equipment !
 NOTICE	Information highlighted by this symbol indicates important information of which particular note should be taken !
 DOCUMENTATION	Information highlighted by this symbol refers to a different chapter or section in this manual or other documentation or a web-page !


Table of contents


	Description	Page
	Publisher	2
	Specific markings	3
	Table of contents	4
1	Preface	6
2	Device function	6
2.1	Processor types	6
2.2	ET-4x7 (SERIES 400 Panel PC)	7
2.3	ET-5x7 (SERIES 500 Thin Clients)	7
2.4	ET-6x7 (SERIES 600 KVM Systems)	7
3	Type allocation	7
3.1	Type marking	7
4	Technical data	8
4.1	Resolution at ET-6x7 (KVM Systems) with DVI3	10
4.2	Additionally for ET-4x7 (Panel PC)	11
4.2.1	All devices up to hardware revision 01.03.00	11
4.2.2	All devices starting from hardware revision 01.03.01	11
4.3	Additionally for ET-5x7 (Thin Clients)	11
4.3.1	All devices up to hardware revision 01.03.00	11
4.3.2	All devices starting from hardware revision 01.03.01	11
5	Conformity to standards	12
5.1	CEC / NEC / CSA	13
6	Certificates	13
6.1	ATEX	14
6.2	IECEX	14
6.3	NEC / CSA	14
6.4	CEC / CSA	14
6.5	TR	14
6.6	KGS	15
6.7	DNV / GL	15
7	Marking	15
8	Power supply	16
8.1	HMI devices	16
9	Permitted maximum values	16
9.1	External, non-intrinsically safe circuits	16
9.2	External inherently safe optical interface	17
9.3	External intrinsically safe circuits	17
10	Type code	18
10.1	ET-4x7 (Panel PC)	18
10.2	ET-4x7-*-BT (Panel PC)	19
10.3	ET-5x7 (Thin Client)	20
10.4	ET-5x7-*-BT (Thin Client)	21
10.5	ET-6x7 KVM System	22
11	Safety information	23
11.1	General Safety Information	23

11.2	Cautionary note	23
11.3	Installation safety information	23
11.3.1	Only for HMI devices with DVI3	25
11.3.2	HMI installation in enclosures with degree of protection "e" or "t"	25
11.3.3	Conditions of safe use according to CEC / NEC / CSA	26
11.4	Safety information for operation	26
11.5	Special conditions	26
12	Assembly and disassembly	26
12.1	General information	26
12.2	Cut-out ET-xx7	26
12.3	Tightening torque	27
13	Operation	27
13.1	General information	27
13.2	Connections	28
14	Data loss	29
15	Maintenance	30
16	Troubleshooting	30
16.1	Repairs / hazardous substances	30
17	Disposal	30
17.1	RoHS directive 2011/65/EC	30
18	Control Drawing CEC / NEC / CSA	31
19	Declaration of EC conformity	33
20	Release notes	35

1 Preface

These Operating Instructions contain all aspects relevant to explosion protection for the ET-xx7 devices - device platform MANTA - (SERIES 400 Open HMI - Panel PC's, SERIES 500 Thin Clients and SERIES 600 KVM Systems). They also contain information on the connection and installation (etc.) of these devices.

 NOTICE	All data relevant to explosion protection from the EC-type examination certificate were copied into these operating instructions.
	For the correct operation of all associated components please note, in addition to these operating instructions, all other operating instructions enclosed in this delivery as well as the operating instructions of the additional equipment to be connected !

 DOCUMENTATION	Please note that all certificates of the HMI devices can be found in a separate document (CE_ET-xx7). You can find this document in the internet at www.stahl-hmi.de or request it from R. STAHL HMI Systems GmbH.
	For more information on the HMIs please also refer to the Manual (available as online manual on www.stahl-hmi.de).

2 Device function

The ET-xx7 units are explosion-protected equipment for installation in hazardous areas and can be operated in zones 1 and 21 with interfaces for zones 0/1/2 and 20/21/22.

The devices are connected to a communication system via the serial interfaces (RS-232, Ethernet) located in their connection box at the rear. The connection box also contains the USB interfaces for the connection of various peripheral devices. Furthermore, the interfaces for keyboard, mouse, video and audio signals are also located here.

2.1 Processor types

All devices of 400 and 500 SERIES are fitted with modern, powerful processors. Depending on the type of application, different processor types are used for the HMI devices (see Technical Data).

Starting in 2016, a new Intel® Atom™ processor type of the Bay Trail (BT) platform will gradually replace all previous processor types in the HMI devices. This new processor type processes data four times as fast as the previous processors.

2.2 ET-4x7 (SERIES 400 Panel PC)

The ET-4x7 HMI panel PCs are intelligent display and operating devices which can run any software and are thus easy to operate.

The devices are fitted with powerful processors and are thus able to process even large applications on-site. The devices have a back-up and recovery system which can be used to save complete images and load them onto new Panel PCs without requiring specific IT skills. The X13 interface is provided for this purpose.

2.3 ET-5x7 (SERIES 500 Thin Clients)

The ET-5x7 devices of the 500 SERIES can be integrated into modern networks as Thin Clients or with a KVM box via KVM-over-IP. Digital Ethernet technology is used for the data transfer between KVM box and Remote System.

Up to four ET-5x7 devices can access one KVM box with one software license, thus cost-effectively communicating with several PCs - for example, when monitoring the production process and simultaneously applying Condition Monitoring.

Multi-monitoring with several on-site terminals can as easily be implemented as the application as Thin Client in a server environment with virtual work stations.

2.4 ET-6x7 (SERIES 600 KVM Systems)

The KVM Classic transfer technology is used for the point-to-point connection between a PC and an ET-6x7 KVM device.

There are three versions (DVI1, DVI2 and DVI3) of this transfer technology that have slightly different functionality.

3 Type allocation

Since the beginning of 2013, the T-series devices have been allocated new type names according to the following pattern:

To avoid having to re-write certifications, the names in the certificates remain the same, but the devices receive new names.


In the interest of a clear link between device type and certificate, both device names are listed on the type plate from 01.04.2013 onwards.

3.1 Type marking

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

* = alphanumeric or symbolic characters without relevance to explosion protection.

= numeric character without relevance to explosion protection.

 NOTICE	For the exact new device name and model please refer to the type code.
---	--

4 Technical data

Function / Equipment	ET-467 ET-567 ET-667	ET-477 ET-577 ET-677	ET-487 ET-587 ET-687
Display type	TFT Color display 16.7 million colours		
Display size	56 cm (22")	61 cm (24")	61 cm (24"WU)
Resolution in pixels	WSXGA+ 1680 x 1050	Full HD 1920 x 1080	WUXGA 1920 x 1200
Format	16:10	16:9	16:10
Display	Glass		
Touch Screen (optional)	Membrane or glass surface 5-wire analogue resistive		
Operating force Foil touch Glass touch	typ. 0.8 N typ. 1.8 N / max. 2.5 N		
Backlight	LED background lighting		
Service life (MTBF) of backlight at 20 °C / -4 °F	Typically 50,000 h		
Brightness	250 cd/m ²	300 cd/m ²	
Contrast	1000 : 1		
Additional keyboard (optional)	107 keys with integrated trackball / joystick / mouse pad or touch pad		
Power supply	Directly in the integrated Ex e connection box		
Rated operational voltage AC	230 V		
Voltage range AC	100 - 240 V		
Frequency range	50 - 60 Hz		
Rated operational voltage DC	24 V		
Voltage range DC	20 - 30 V		
Power	Typically 35 W / max. 150 W (typically 119 BTU / max. 510 BTU)		
Current consumption AC	1 A		
Current consumption DC	3 A		
Connections	via screw terminals, green Flexible cable up to 2.5 mm ² (AWG14) Fixed cable up to 4 mm ² (AWG12)		
Recommended fuses	4 AT		
Max. operating voltage U _m	250 VAC		
Only for ET-4x7 and ET-5x7 Real-time clock Data buffer Battery Capacitor	yes Lithium battery and capacitor buffered, maintenance-free > 5 years at least 4 days		
Interfaces			
Ethernet at ET-4x7 and ET-5x7 Copper (TX)	Either copper or optical fibre 10/100Base-TX, 10/100 Mbit, (Ex e) or 2x 10/100Base-TX, 10/100 Mbit (Ex e) (only BT versions, not 600 SERIES) *		
* Note	If the customer installs an operation system, the driver for the "USB-SK-LAN-Adapter" must be installed. For this, please contact support@stahl-hmi.de . (Driver is part of STAHL images)		
Optical fibre (SX) at ET-6x7	1000Base-SX, 1000 Mbit, multi-mode, intrinsically safe (Ex op is)		
Copper (CAT)	Direct connection, Gigabit		
Optical fibre (FO) (MM / SM)	Direct connection		
USB	2x Ex ia; 1x Ex e		
USB	for keyboard and mouse (Ex ia)		
Serial	RS-232, (Ex e)		
Video in (optional)	FBAS (Ex e)		
Audio	Line out interface (Ex e) (Line in only at ET-6x7)		
Audio sound (optional)	Audio amplifier (mono amplifier) 3.5 W, for 2x loudspeaker connection (Ex e)		
Voltage output	12 V DC, max. 500 mA *		
* Note	The voltage output has an internal fuse that cannot be replaced !		

Cable type optical fibre		
SX	Multi-mode optical fibre cable (50 µm core cross section and 125 µm external cross section)	
MM	Multi-mode optical fibre cable (50 µm core cross section and 125 µm external cross section)	
	Multi-mode optical fibre cable (62.5 µm core cross section and 125 µm external cross section)	
SM	Single mode optical fibre cable (9 µm core cross section and 125 µm external cross section)	
Data cable lengths		
Optical fibre		
SX	up to 550 m (1,804 ft) via 50/125 µm optical fibre cable	
MM	up to 550 m (1,804 ft) via 50/125 µm optical fibre cable, up to 300 m (985 ft) via 62.5/125 µm optical fibre cable	
SM	up to 10,000 m (33,000 ft) via 9/125 µm optical fibre cable	
Copper (TX)	up to 100 m (330 ft) via CAT7 installation cable AWG23 at 1x TX 2x up to 100 m (330 ft) via CAT5 installation cable AWG22 at 2TX	
Copper (CAT)		
for DVI1	up to 140 m (460 ft) via CAT7 installation cable AWG23	
for DVI2	up to 500 m (1,640 ft) via CAT7 installation cable AWG23	
for DVI3	up to 150 m (492 ft) via CAT7 installation cable AWG23	
Enclosure	Steel	
Enclosure protection type	Front IP66 / back IP65	
Permitted ambient temperature range	-30 °C ... +60 °C / [-22 °F ... +140 °F]	
Operating temperature range		
Cold start temperature *	-10 °C ... +50 °C / [+14 °F ... +122 °F]	
Operation **	-20 °C ... +60 °C / [-4 °F ... +140 °F]	
Operation with heater version O30 ***	-30 °C ... +50 °C / [-22 °F ... +122 °F]	
Storage temperature range	-30 °C ... +70 °C / [-22 °F ... +158 °F]	
* Note on cold start temperature	If the device is switched on in an ambient temperature of below -10 °C / [+14 °F], the display will require some time warming up before everything is clearly visible. Depending on how low the actual temperature is, this process may take up to 3 hours.	
** Note on operation	Operation at +60 °C / [+140 °F] for a maximum of 5 hours, at +50 °C / [+122 °F] for continuous operation (24/7)	
*** Note on the O30 version	The O30 version is only available for the AC version devices !	
Operating temperature range for DVI1		
Cold start temperature	+5 °C ... +40 °C / [+41 °F ... +104 °F]	
Operation	+5 °C ... +40 °C / [+41 °F ... +104 °F]	
Storage temperature range	-20 °C ... +70 °C / [-4 °F ... +158 °F]	
Heat dissipation	About 40 % via the front plate and 60 % via the enclosure	
Relative humidity	10 to 90 % at +40 °C / [+104 °F], non-condensing	
for DVI1	20 to 80 % at +40 °C / [+104 °F], non-condensing	
Environmental conditions		
	Level	Test specification
Damp heat (cyclic) (only device with glass touch (TG))	+55 °C (±2 °C) ≥95 %	IEC 60068-2-30 : 2005
Dry heat	+65 °C	IEC 60068-2-2 : 2007 IEC 60068-2-78 : 2012
Vibration (sinus)	5 up to 13.2 Hz: ±1 mm 13.2 up to 100 Hz: ±0.7 g Sweep cycle 1 oct/min Axis X, Y, Z	IEC 60068-2-6 : 2008
	71.7 up to 79.2 Hz: ±0.7 g 120 min. Sweep cycle 1 oct/min Axis X	IEC 60068-2-6 : 2008 Dwell test
	30 Hz: ±0.7 g 90 min. Sweep cycle 1 oct/min Axis Y, Z	

Dimensions			
Front (w x h)	660 mm x 475 mm (25.98" x 18.70")		
Cut-out (w x h) (+/-0.5 mm) (0.002")	615 mm x 435 mm (24.21" x 17.13")		
Depth of cut-out	110 mm (4.33")		
Wall thickness	≤5 mm (0.02")		
Cut-out dimension for rear mount module (w x h)	475.7 mm x 298.1 mm (18.73" x 11.74")	523 mm x 295 mm (20.59" x 11.61")	520.4 mm x 326 mm (20.49" x 12.83")
Mounting position	Vertical or horizontal		
Weight	32.00 kg (70.55 lbs)		

4.1 Resolution at ET-6x7 (KVM Systems) with DVI3

Function / Equipment	ET-667	ET-677	ET-687
Resolution in pixels	1680 x 1050	1920 x 1080	1920 x 1200
	1280 x 1024	1600 x 1200	1920 x 1080
	1280 x 960	1600 x 1000	1680 x 1050
	1152 x 864	1400 x 1050	1600 x 1200
	1024 x 768	1360 x 768	1280 x 1024
	800 x 600	1280 x 1024	1280 x 960
		1280 x 920	1280 x 800
		1280 x 800	1152 x 864
		1152 x 864	1024 x 768
		1024 x 768	800 x 600
		800 x 600	

4.2 Additionally for ET-4x7 (Panel PC)

4.2.1 All devices up to hardware revision 01.03.00

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

4.2.2 All devices starting from hardware revision 01.03.01

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

4.3 Additionally for ET-5x7 (Thin Clients)

4.3.1 All devices up to hardware revision 01.03.00

Processor	AMD Geode LX 800; 266 MHz
RAM	512 MB
	2 GB *
Data memory	1 GB
	16 GB *
Operating system	Windows Embedded Standard 2009 and Remote Firmware
	Windows Embedded Standard 7, Remote Firmware and Delta V *

! NOTICE	* The combination of 2 GB RAM with 16 GB data memory is only available for the operating system with Delta V !
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4.3.2 All devices starting from hardware revision 01.03.01

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

5 Conformity to standards

The ET-xx7 devices comply with the following standards and directive:

Standard		Classification
2. Supplement		
ATEX directive		
until 19.04.2016	from 20.04.2016	
94/9/EG	2014/34/EU	
EN 60079-0 : 2009		General requirements
EN 60079-5 : 2007		Powder filling "q"
EN 60079-7 : 2007		Increased safety "e"
EN 60079-11 : 2007		Intrinsic safety "i"
EN 60079-26 : 2007		Device protection (EPL) "Ga"
EN 60079-28 : 2004		Optical radiation
EN 60079-31 : 2009		Protected by enclosures "tD" (dust)
EN 61241-11 : 2006		Intrinsic safety "iD" (dust)
The product corresponds to requirements from:		
EN 60079-0 : 2012		General requirements
EN 60079-11 : 2012		Intrinsic safety "i"
EN 60079-31 : 2014		Protected by enclosures "tD" (dust)
Electromagnetic compatibility		
EMV directive		
until 19.04.2016	from 20.04.2016	Classification
94/9/EG	2014/34/EU	
EN 61000-6-2 : 2006		Interference resistance
EN 61000-6-4 : 2007		Interference emission
Low voltage directive		
Directive 2006/95/EC		
EN 50178 : 1997		Fitting power plants with electronic equipment
EN 61010-1 : 2001+		General requirements
RoHS directive		
2011/65/EU		Classification
EN 50581 : 2012		Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

5.1 CEC / NEC / CSA

Standard	Classification
CAN/CSA-C22.2 No. 0-10 August 2011	General requirements Canadian Electrical Code, Part II
CAN/CSA-C22.2 No. 61010-1-12	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements (Third Edition)
CAN/CSA-C22.2 No. 60079-0 : 11 (December 2011)	Explosive atmospheres – Part 0: Equipment General requirements
CAN/CSA-C22.2 No. 60079-5 : 11 (December 2011)	Explosive atmospheres – Part 5: Equipment protection by powder filling “q”
CAN/CSA-C22.2 No. 60079-7 : 12 (February 2012)	Explosive atmospheres – Part 7: Equipment protection by increased safety “e”
CAN/CSA-C22.2 No. 60079-11 : 11 (December 2011)	Explosive atmospheres – Part 11: Equipment protection by intrinsic safety “i”
CAN/CSA-C22.2 No. 60529:05 (Reaffirmed 2010)	Degrees of protection provided by enclosures (IP Code)
ANSI/UL 61010-1 (2012)	Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements (Third Edition)
ANSI/UL 60079-0 (sixth edition July 2013)	Explosive atmospheres – Part 0: Equipment – General requirements
ANSI/UL 60079-5 (third edition November 2013)	Explosive atmospheres – Part 5: Equipment protection by powder filling “q”
ANSI/UL 60079-7 (fourth edition May 2013)	Explosive atmospheres – Part 7: Equipment protection by increased safety “e”
ANSI/UL 60079-11 (sixth edition March 2014)	Explosive atmospheres – Part 11: Equipment protection by intrinsic safety “i”
ANSI/IEC 60529-2004	Degrees of protection provided by enclosures (IP code)

6 Certificates

The ET-xx7 devices are certified for installation in the following areas:

Europe:

according to ATEX Directive
for installation in zones 1, 2, 21 and 22.

International / Australia:

IECEX (International Electrotechnical Commission System for Certification to
Standards for Electrical Equipment for Explosive Atmospheres)

USA:

according to NEC
for installation in
Class I, Zone 1

carried out by:
CSA (Canadian Standard Association)

Canada:

according to CEC
for installation in
Class I, Division 2

carried out by:
CSA (Canadian Standard Association)

Russia / Kazakhstan / Belarus:

TR (Technical Regulation of the Eurasian Customs Union (EAC))

Korea

KGS (Korea Gas Safety Corporation)

Marine certification:

DNV / GL (Det Norske Veritas / Germanischer Lloyd)

6.1 ATEX


The ATEX certification is listed under the following certificate number:

Certificate number: BVS 11 ATEX E 102 X

6.2 IECEX

The IECEX certification is listed under the following certificate number:

Certificate number: IECEX BVS 11.0075X

 DOCUMENTATION	<p>You can access all IECEX certificates on the official website of the IEC under their certificate number. http://iecex.iec.ch/iecex/iecexweb.nsf/welcome?openform.</p>
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6.3 NEC / CSA


The NEC / CSA certification is listed under the following certificate number:

Certificate number: 70011698

6.4 CEC / CSA

The CEC / CSA certification is listed under the following certificate number:

Certificate number: 70011698

 NOTICE	<p>Note: The HMIs are certified according to Ex e q [ia] IIC T4 Gb. According to the CEC Part 1 each device with these protection types may be operated in Class I, Division 2 areas. For more details on this, please refer to the CEC.</p>
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6.5 TR


The TR certificate is listed under the following certificate number:

Certificate number: TC RU C-DE.ГБ04.В00478


6.6 KGS

The KGS certification is listed under the following certificate number:

Certificate number: 12-GA4BO-0617X

 NOTICE	<p>In order to be able to operate these HMI devices in Korea, each device type additionally requires a KCC certificate. Actually the following devices has such a certificate: T-Ex-22 (ET-x67), T-Ex-22-DVI3 (ET-667-DVI3), T-Ex-24T (ET-x77 with touch screen (membrane))</p>
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6.7 DNV / GL

 NOTICE	<p>NB: Only the HMI devices type: ET-667-DVI3-yM-FO-TFT-TG-AC-O30-AL ET-677-DVI3-yM-FO-TFT-TG-AC-O30-AL ET-687-DVI3-yM-FO-TFT-TG-AC-O30-AL have DNV / GL certification! with y: M = FO direct connection multi-mode S = FO direct connection single mode</p>
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The DNV / GL certification is listed under the following certificate number:

Certificate number: TAA00000BK

7 Marking

Manufacturer	R. STAHL HMI Systems GmbH	
Type code	ET-4x7 / ET-5x7 / ET-6x7	
CE classification:	 0158	
Testing authority and certificate number:	BVS 11 ATEX E 102 X	
Ex classification:		II 2(1) G Ex e q [ia op is Ga] IIC T4 Gb
ATEX guideline		II 2(1) D Ex tb IIIC [ia op is Da] IP65 T110°C Db
IECEX		Ex e q [ia op is Ga] IIC T4 Gb Ex tb IIIC [ia op is Da] IP65 T110°C Db
NEC / CSA		Class I, Zone 1 AEx e q [ia] IIC T4 Gb
CEC / CSA		Ex e q [ia] IIC T4 Gb Class I, Division 2
TR		1Ex e q [ia op is Ga] IIC T4 Gb X Ex tb IIIC [ia op is Da] IP65 T110°C Db
KGS		Ex e q IIC T4 Ex tb IIIC IP64 T110°C Ex ia IIC T4 Ex ia IIIB T110°C

8 Power supply

8.1 HMI devices

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

9 Permitted maximum values

9.1 External, non-intrinsically safe circuits

Input voltage "PWR" (X10):

Nominal voltage:	20 ...240 VAC/VDC (depending on type)
Power consumption I_{max}	≤ 5 A
Power P_{max}	≤ 150 W
Max. operating voltage U_m	≤ 250 VAC
Short-circuit current I_k	≤ 1500 A

USB (X13):

Rated voltage	5 VAC/VDC (± 10 %)
Max. operating voltage U_m	≤ 250 VAC

12 V (X14):

Rated voltage	12 VAC/VDC (± 10 %)
Power consumption I_{max}	≤ 400 mA
Max. operating voltage U_m	≤ 250 VAC

RS-232 "SER" (X97):

Rated voltage	15 VAC/VDC (± 10 %)
Max. operating voltage U_m	≤ 250 VAC

Video "CAM" (X101):

Rated voltage	5 VAC/VDC (± 10 %)
Max. operating voltage U_m	≤ 250 VAC

Audio "AUD" (X105):

Rated voltage	100 VAC/VDC (± 10 %)
Max. operating voltage U_m	≤ 250 VAC

Copper Ethernet (CAT7 1) (X16):

Rated voltage	5 VAC/VDC (± 10 %)
Max. operating voltage U_m	≤ 250 VAC

9.2 External inherently safe optical interface

Ethernet optical fiber (FO 1) (X18)

Multi-mode

Wavelength	850 nm
Radiant power	0.22 mW
max. radiant power:	35 mW

Single mode

Wavelength	1310 nm
Radiant power	0.22 mW
max. radiant power:	35 mW

9.3 External intrinsically safe circuits

Keyboard (X11)

The maximum values are:

U_i	=	5.5	V		U_o	=	5.5	V
I_i	=	3	A		I_o	=	309	mA
P_i	=	2	W		P_o	=	629	mW
C_i	=	negligible	μ F		C_o	=	50	μ F
L_i	=	negligible	mH		L_o	=	40	μ H

Pointer device (X12):

The maximum values are:

U_i	=	5.5	V		U_o	=	5.5	V
I_i	=	3	A		I_o	=	309	mA
P_i	=	2	W		P_o	=	629	mW
C_i	=	negligible	μ F		C_o	=	50	μ F
L_i	=	negligible	mH		L_o	=	40	μ H

USB1i (X24):

The maximum values are:

U_i	=	5.5	V		U_o	=	5.5	V
I_i	=	3	A		I_o	=	309	mA
P_i	=	2	W		P_o	=	629	mW
C_i	=	negligible	μ F		C_o	=	50	μ F
L_i	=	negligible	mH		L_o	=	40	μ H

USB2i (X25):

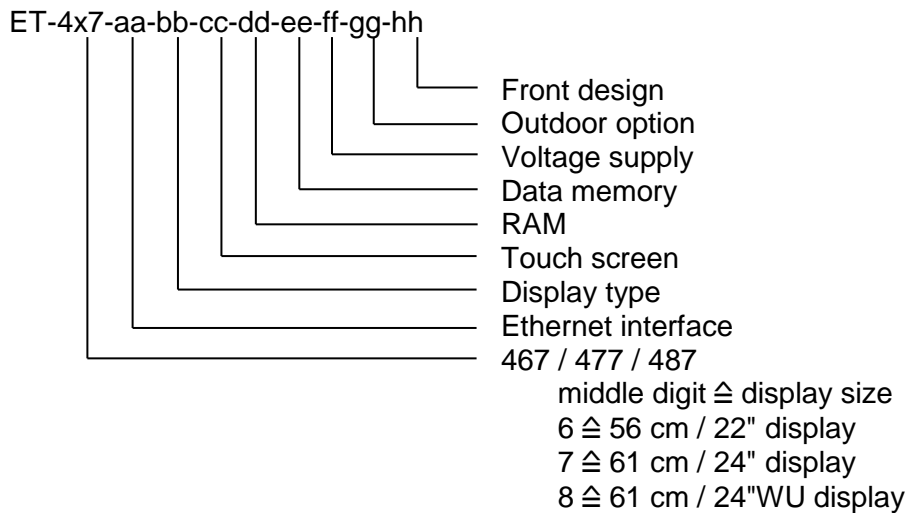
The maximum values are:

U_i	=	5.5	V		U_o	=	5.5	V
I_i	=	3	A		I_o	=	309	mA
P_i	=	2	W		P_o	=	629	mW
C_i	=	negligible	μ F		C_o	=	50	μ F
L_i	=	negligible	mH		L_o	=	40	μ H

10 Type code

10.1 ET-4x7 (Panel PC)

! NOTICE	These versions apply to all Panel PC's up to hardware revision 01.03.00, with Atom N270 processor.
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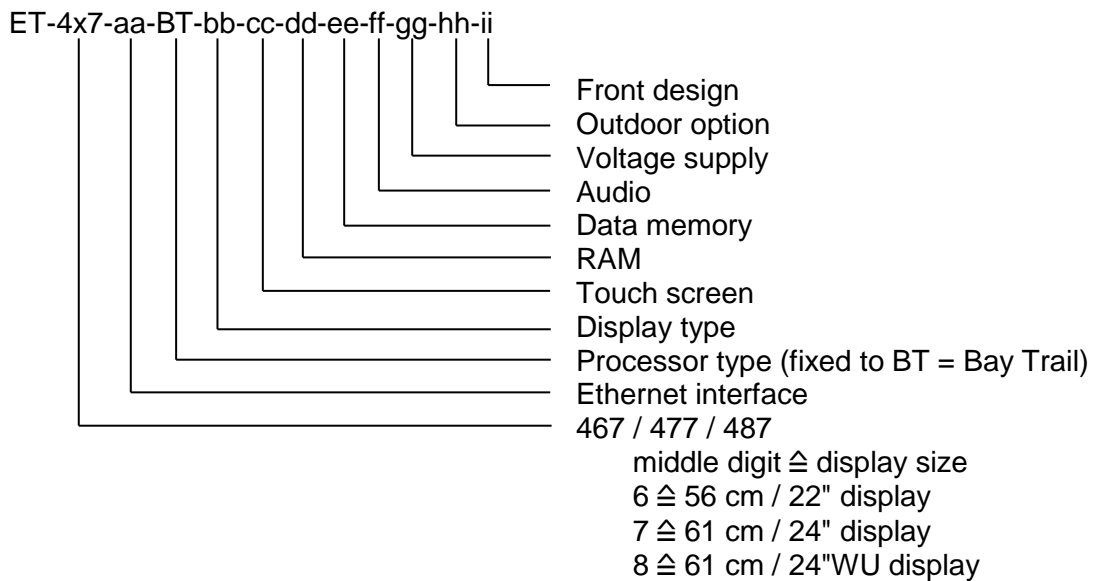
Device variant:

Classification product key	Description
	Type with
ET-4x7- SX -bb-cc-dd-ee-ff-gg-hh	Optical fiber Ethernet interface 1000Base-SX (Ex op is), multi-mode
ET-4x7- TX -bb-cc-dd-ee-ff-gg-hh	Copper Ethernet interface 10/100Base-TX (Ex e)
ET-4x7-aa- TFT -cc-dd-ee-ff-gg-hh	TFT display (standard)
ET-4x7-aa-bb- T -dd-ee-ff-gg-hh	Touch screen (membrane)
ET-4x7-aa-bb- TG -dd-ee-ff-gg-hh	Touch screen glass
ET-4x7-aa-bb-cc- R1 -ee-ff-gg-hh	1 GB RAM
ET-4x7-aa-bb-cc- R2 -ee-ff-gg-hh	2 GB RAM
ET-4x7-aa-bb-cc-dd- 4GB -ff-gg-hh	4 GB Solid State Drive
ET-4x7-aa-bb-cc-dd- 16GB -ff-gg-hh	16 GB Solid State Drive
ET-4x7-aa-bb-cc-dd- 128GBM -ff-gg-hh	128 GB Solid State Drive MLC
ET-4x7-aa-bb-cc-dd- 128GBS -ff-gg-hh	128 GB Solid State Drive SLC
ET-4x7-aa-bb-cc-dd- 100GB -ff-gg-hh	100 GB hard disk (internal)
ET-4x7-aa-bb-cc-dd-ee- AC -gg-hh	Power supply 100 - 240 VAC, 50 - 60 Hz
ET-4x7-aa-bb-cc-dd-ee- DC -gg-hh	Voltage supply 24 VDC
ET-4x7-aa-bb-cc-dd-ee-ff- O30 -hh	Outdoor installation -30 °C [-22 °F] *
ET-4x7-aa-bb-cc-dd-ee-ff-gg- AL	Aluminium front plate
ET-4x7-aa-bb-cc-dd-ee-ff-gg- RM	Rear mount module

! NOTICE	* The O30 option is only available for AC devices !
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10.2 ET-4x7-*-BT (Panel PC)

 NOTICE	These versions apply to all Panel PC's starting from hardware revision 01.03.01, with Bay Trail Atom E3845 processor.
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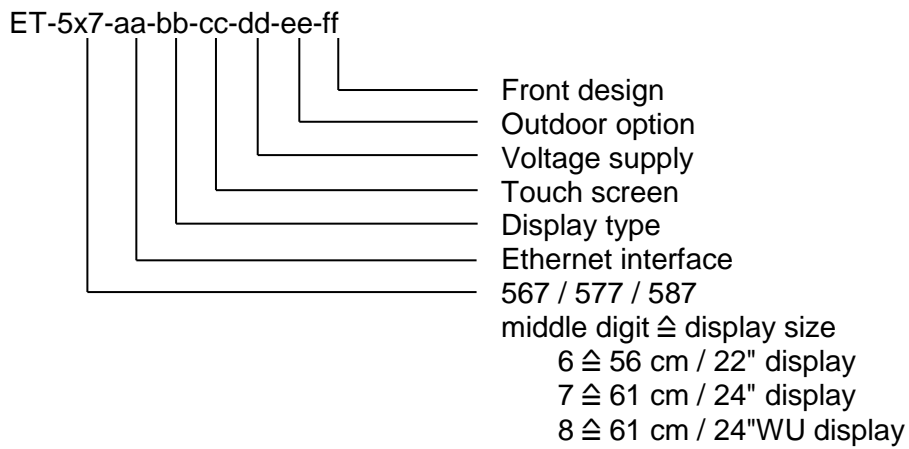
Device variant:

Classification product key	Description
	Type with
ET-4x7- SX -BT-bb-cc-dd-ee-ff-gg-hh-ii	Optical fiber Ethernet interface 1000Base-SX (Ex op is), multi-mode
ET-4x7- TX -BT-bb-cc-dd-ee-ff-gg-hh-ii	Copper Ethernet interface 10/100Base-TX (Ex e)
ET-4x7- 2TX -BT-bb-cc-dd-ee-ff-gg-hh-ii	2x Copper Ethernet interface 10/100Base-TX (Ex e)
ET-4x7-aa-BT- TFT -cc-dd-ee-ff-gg-hh-ii	TFT display (standard)
ET-4x7-aa-BT-bb- T -dd-ee-ff-gg-hh-ii	Touch screen (membrane)
ET-4x7-aa-BT-bb- TG -dd-ee-ff-gg-hh-ii	Touch screen glass
ET-4x7-aa-BT-bb-cc- R3 -ee-ff-gg-hh-ii	4 GB RAM
ET-4x7-aa-BT-bb-cc-dd- 64GB -ff-gg-hh-ii	64 GB Solid State Drive
ET-4x7-aa-BT-bb-cc-dd- 128GBM -ff-gg-hh-ii	128 GB Solid State Drive MLC
ET-4x7-aa-BT-bb-cc-dd-ee- SND -gg-hh-ii	Audio amplifier (mono amplifier) 3.5 W
ET-4x7-aa-BT-bb-cc-dd-ee-ff- AC -hh-ii	Power supply 100 - 240 VAC, 50 - 60 Hz
ET-4x7-aa-BT-bb-cc-dd-ee-ff- DC -hh-ii	Voltage supply 24 VDC
ET-4x7-aa-BT-bb-cc-dd-ee-ff-gg- O30 -ii	Outdoor installation -30 °C [-22 °F] *
ET-4x7-aa-BT-bb-cc-dd-ee-ff-gg-hh- AL	Aluminium front plate
ET-4x7-aa-BT-bb-cc-dd-ee-ff-gg-hh- RM	Rear mount module

 NOTICE	* The O30 option is only available for AC devices !
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10.3 ET-5x7 (Thin Client)

NOTICE These versions apply to all Thin Client's up to hardware revision 01.03.00, with AMD Geode LX processor.




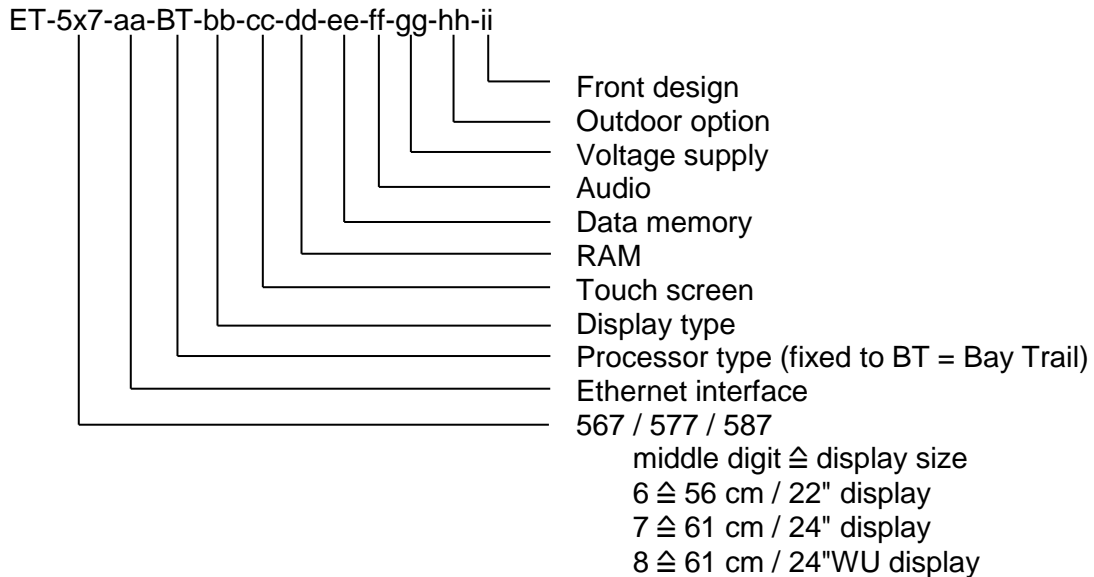
Device variant:

Classification product key	Description
	Type with
ET-5x7- SX -bb-cc-dd-ee-ff	Optical fiber Ethernet interface 1000Base-SX (Ex op is), multi-mode
ET-5x7- TX -bb-cc-dd-ee-ff	Copper Ethernet interface 10/100Base-TX (Ex e)
ET-5x7-aa- TFT -cc-dd-ee-ff	TFT display (standard)
ET-5x7-aa-bb- T -dd-ee-ff	Touch screen (membrane)
ET-5x7-aa-bb- TG -dd-ee-ff	Touch screen glass
ET-5x7-aa-bb-cc- AC -ee-ff	Power supply 100 - 240 VAC, 50 - 60 Hz
ET-5x7-aa-bb-cc- DC -ee-ff	Voltage supply 24 VDC
ET-5x7-aa-bb-cc-dd- O30 -ff	Outdoor installation -30 °C [-22 °F] *
ET-5x7-aa-bb-cc-dd-ee- AL	Aluminium front plate
ET-5x7-aa-bb-cc-dd-ee- RM	Rear mount module

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


10.4 ET-5x7-*-BT (Thin Client)

 NOTICE	These versions apply to all Thin Client's starting from hardware revision 01.03.01, with Bay Trail Atom E3845 processor.
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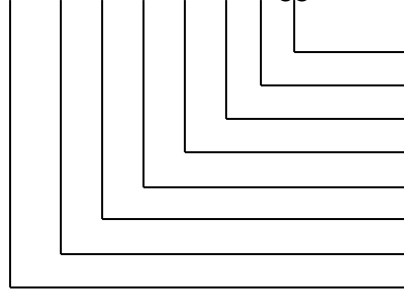
Device variant:

Classification product key	Description
	Type with
ET-5x7- SX -BT-bb-cc-dd-ee-ff-gg-hh-ii	Optical fiber Ethernet interface 1000Base-SX (Ex op is), multi-mode
ET-5x7- TX -BT-bb-cc-dd-ee-ff-gg-hh-ii	Copper Ethernet interface 10/100Base-TX (Ex e)
ET-5x7- 2TX -BT-bb-cc-dd-ee-ff-gg-hh-ii	2x Copper Ethernet interface 10/100Base-TX (Ex e)
ET-5x7-aa-BT- TFT -cc-dd-ee-ff-gg-hh-ii	TFT display (standard)
ET-5x7-aa-BT-bb- T -dd-ee-ff-gg-hh-ii	Touch screen (membrane)
ET-5x7-aa-BT-bb- TG -dd-ee-ff-gg-hh-ii	Touch screen glass
ET-5x7-aa-BT-bb-cc- R3 -ee-ff-gg-hh-ii	4 GB RAM
ET-5x7-aa-BT-bb-cc-dd- 64GB -ff-gg-hh-ii	64 GB Solid State Drive
ET-5x7-aa-BT-bb-cc-dd-ee- SND -gg-hh-ii	Audio amplifier (mono amplifier) 3.5 W
ET-5x7-aa-BT-bb-cc-dd-ee-ff- AC -hh-ii	Power supply 100 - 240 VAC, 50 - 60 Hz
ET-5x7-aa-BT-bb-cc-dd-ee-ff- DC -hh-ii	Voltage supply 24 VDC
ET-5x7-aa-BT-bb-cc-dd-ee-ff-gg- O30 -ii	Outdoor installation -30 °C [-22 °F] *
ET-5x7-aa-BT-bb-cc-dd-ee-ff-gg-hh- AL	Aluminium front plate
ET-5x7-aa-BT-bb-cc-dd-ee-ff-gg-hh- RM	Rear mount module

 NOTICE	* The O30 option is only available for AC devices !
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10.5 ET-6x7 KVM System

ET-6x7-aa-bb-cc-dd-ee-ff-gg



- Front design
- Outdoor option
- Voltage supply
- Audio
- Touch screen
- Display type
- Transfer technology

667 / 677 / 687
 middle digit ≙ display size
 6 ≙ 56 cm / 22" display
 7 ≙ 61 cm / 24" display
 8 ≙ 61 cm / 24"WU display

Device variant:

Classification product key	Description
	Type with
ET-6x7- DVI1-CAT -bb-cc-dd-ee-ff-gg	DVI1 KVM, with direct copper connection, Gigabit (Ex e)
ET-6x7- DVI1-MM -bb-cc-dd-ee-ff-gg	DVI1 KVM, with direct optical fibre connection (Ex op is), multi-mode
ET-6x7- DVI1-SM -bb-cc-dd-ee-ff-gg	DVI1 KVM, with direct optical fibre connection (Ex op is), single mode
ET-667- DVI2-CAT -bb-cc-dd-ee-ff-gg	DVI2 ** KVM, with direct copper connection, Gigabit (Ex e)
ET-6x7- DVI3-CAT -bb-cc-dd-ee-ff-gg	DVI3 KVM, with direct copper connection, Gigabit (Ex e)
ET-6x7- DVI3-MM-FO -bb-cc-dd-ee-ff-gg	DVI3 KVM, with direct optical fibre connection (Ex op is), multi-mode
ET-6x7- DVI3-SM-FO -bb-cc-dd-ee-ff-gg	DVI3 KVM, with direct optical fibre connection (Ex op is), single mode
ET-6x7-aa- TFT -cc-dd-ee-ff-gg	TFT display (standard)
ET-6x7-aa-bb- T -dd-ee-ff-gg	Touch screen (membrane)
ET-6x7-aa-bb- TG -dd-ee-ff-gg	Touch screen glass
ET-6x7-aa-bb-cc- SND -ee-ff-gg	Audio amplifier (mono amplifier) 3.5 W
ET-6x7-aa-bb-cc-dd- AC -ff-gg	Power supply 100 - 240 VAC, 50 - 60 Hz
ET-6x7-aa-bb-cc-dd- DC -ff-gg	Voltage supply 24 VDC
ET-6x7-aa-bb-cc-dd-ee- O30 -gg	Outdoor installation -30 °C [-22 °F] *
ET-6x7-aa-bb-cc-dd-ee-ff- AL	Aluminium front plate
ET-6x7-aa-bb-cc-dd-ee-ff- RM	Rear end module

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

11 Safety information



The notes listed in section 11. must be heeded to avoid injury and damage to equipment !

11.1 General Safety Information

- All relevant accident prevention regulations and the rules for electric installations have to be observed during installation, maintenance and operations. All persons involved in installation, commission, maintenance and repairs of this device and its accessories must be qualified accordingly and must have familiarised themselves with this manual and any associated documentation.
- In case of non-compliance or contravention of the above explosion-protection is no longer guaranteed and all warranty claims shall be null and void.
- National safety and accident prevention rules apply.
- Use the device for its intended purpose only.
- No changes to the device are permitted. The enclosure may only be opened by R. STAHL HMI Systems GmbH.
- The first four digits of the serial number on the type plate stand for the year of manufacture.

11.2 Cautionary note



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

11.3 Installation safety information

- The in each case valid national assembly and installation rules and the generally accepted technical rules must be observed. The device and its accessories must be connected and operated according to applicable standards, directives and installation guidelines. Only qualified personnel or personnel that has been instructed accordingly are allowed to install the device.
- The HMI device has been certified as a fixed installed device. It must be fixed with a bracket or be secured in another way at a specified position.
- The HMI device must be disconnected from the mains for a change of position. The EPL must be adhered to.
- Only appropriate tools must be used for the installation.
- The screws on the lid of the Ex e connection box must be fastened with a torque of 1 N.
- The cable connections of the connection box must be in line with country-specific regulations and may have to be adapted accordingly. Potential changes to the ambient parameters such as temperature must be taken into account.


- The cable entries in the connection box must have ingress protection IP66 or may have to be adapted to meet country-specific requirements. The pre-assembled cable entry threads are:
 - 2x M16x1,5
 - 1x M20x1,5
 - 3x M25x1,5The wall of the terminal box where the cable entries are mounted has a thickness of at least 4 mm.
- The cable connections must be tightened fast according to regulations. Unused cable connections must be sealed with appropriate blind plugs. Only permanently laid cables may be connected to the pre-mounted ATEX cable connections.
- The outer cable diameters must correspond to the cable connection specifications.
 - Cable entry M16 for round cable, outside cable cross-section 5...9 mm (0.2"...0.35")
 - Cable entry M20 for round cable, outside cable cross-section 9...13 mm (0.35"...0.51")
 - Cable entry M25 for round cable, outside cable cross-section 11...16 mm (0.43"...0.63")
- The HMI device must not be opened, maintained or repaired in hazardous atmospheres (sole exception: the Ex e connection box).
- Before opening the Ex e connection box, ensure that all Ex e and Ex i circuits are fully de-energised and isolated. You must also ensure that the power supply circuit is isolated. The cable diameter must meet the terminal specifications. The Ex e connection box must be tightly sealed.
- All Ex e and Ex i circuits must be completely de-energised before the HMI device is connected. After the Ex e and Ex i circuits have been de-energised, wait for at least seven minutes before opening the Ex e connection box. The Ex e connection box must not be opened if the HMI device is energised.
- The earth / ground (equipotential bonding) connector at the back of the HMI's enclosure must be connected to the equipotential bonding conductor of the hazardous area. The earthing cable must have a minimum cross section of 4 mm² and be fitted properly. To prevent equalizing currents flowing to the earth / ground (equipotential bonding) system of the HMI device it is necessary to safely isolate any connected devices from earth or to integrate them into the earth / ground (equipotential bonding) system of the HMI device.
- We recommend you use screened cables with the HMI device. Routing of the data cable may reduce performance. Cables for intrinsically safe wiring have to pass a test voltage of AC 500 V / DC 750 V. Use the values 200 pF/m and 1 µH/m at unknown cable properties.
- We recommend you use a PG fitting (e.g. UNI_Dicht_HF™) for the screen connection over a large surface of the data cable between the 6x7-KVM-DVI3 transmission unit and the HMI device. In this case, the data cable's scree must not be connected again inside the HMI device at the screen connection rail.
- If display types ET-xx7-DVI1-MM or ET-xx7-DVI1-SM are used, terminal X16 remains unused.
- To establish a secure earthed connection between HMI device and plant and to prevent inadvertent loosening of the cables, each cable with its screen must be connected to the corresponding earthing bracket located in the Ex e connection box close to the associated terminal.
- At the place of installation voltage must not exceed 250 V and short-circuit current must not exceed 1500 A.

- A tick close to the X10 terminal indicates the voltage type (AC / DC). For the 24 VDC types the cable cross-sections depend on the cable length of the voltage supply cable, as follows:

Cable length in metres (ft)	Cable cross-section in mm ² (AWG)
max. 55 m (180 ft)	1.5 mm ² (AWG16)
max. 90 m (295 ft)	2.5 mm ² (AWG14)
max. 150 m (492 ft)	4 mm ² (AWG12)
max. 225 m (738 ft)	6 mm ² (AWG10)
max. 375 m (1230 ft)	10 mm ² (AWG8)
max. 600 m (1968 ft)	16 mm ² (AWG6)

If the cable's cross section is greater than the maximum possible for the terminals, the cable needs to be routed according to regulations via a smaller cable cross section before being inserted into the connection box (possibly using the Ex e terminal box).

- When the interface of intrinsically safe devices / partial intrinsically safe devices was or is connected to not intrinsically safe interfaces, the license will become void and it must be operated as a not intrinsically safe device. If the device was operated on an intrinsically safe interface with a lower level of international protection (e.g. an Ex ia device on an Ex ib interface), it must not be operated afterwards in applications for a higher level of international protection (e.g. Ex ia).
- If the HMI device is being used in a dust atmosphere and must be replaced, the device or the enclosure in which it is mounted must be disconnected from the mains first and then, according to regulations, be left to cool down. Before opening the HMI device or its enclosure and whilst they are open, the environment must be kept dust-free so that no dust can intrude into the inside of the enclosure. When mounting new components please ensure that all seals are undamaged and fit tightly.
- Before starting up the HMI device you must ensure that it has been installed according to regulations and that neither the device nor its cables are damaged.

 ATTENTION	The audio Interface (X105) can handle high voltage up to 100 V. For installation and wiring the national standards must be observed and a properly insulation needed to prevent a hazard.
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11.3.1 Only for HMI devices with DVI3

- The USB interfaces of the ET-6x7-DVI3 devices are only certified for the connection of keyboards and pointer units from R. STAHL HMI Systems GmbH.

11.3.2 HMI installation in enclosures with degree of protection "e" or "t"

If the ET-xx7 HMI devices are mounted inside an enclosure with degree of protection Ex e or Ex t, the mechanical impact protection and the IP of the enclosure (up to IP65) is retained even after the device has been installed. The internal separation requirements and the temperature conditions of the Ex e enclosure must adhere to the applicable directives. The distance between the terminals of the HMI devices and other, insulated, conductive parts (except earth) within the Ex e enclosure must be at least 50 mm.

11.3.3 Conditions of safe use according to CEC / NEC / CSA

- Application supporting devices connected to the intrinsically safe input / outputs of connection points X101, X105, X97, X13, X14, and X16 shall be installed in a non-hazardous location (see control drawing 11100024) or must be suitable protected by an explosionproof or Ex p enclosure.
- Connection point X10 shall be connected to a Class 2 supply for the DC model.
- All connections to the display unit shall be installed using a CSA certified or us ULc listed Ex e cable gland suitable for the end installation and shall carry a minimum IP rating of IP65.
- Any non-metallic parts of the HMI device that can accumulate static electricity must be cleaned only with a damp cloth.

11.4 Safety information for operation

- Operate the HMI device only if it is clean and undamaged. If the HMI device is in any way damaged, do not touch it to avoid injury. In the case of any damage that may compromise ingress protection (e.g. cracks, holes or broken components) the HMI device must be taken out of commission immediately. Before the device is recommissioned the damaged components must be replaced.
- If you want to use the device in zone 20, 21 or 22 as EPL Da/Db/Dc, dust deposits of a thickness exceeding 5 mm must be removed and you have to ensure that no high-energy loading mechanisms at the operating surface of the unit (e.g. pneumatic particle transport) occur during operation. The HMI device may not be used in environments where propagating brush discharges may occur.
- In general, and particularly when opening and closing enclosures, users must take care not to get injured by getting caught / trapped.
- In case of non-compliance or contravention of the above explosion-protection is no longer guaranteed and all warranty claims shall be null and void.

11.5 Special conditions

- Along the intrinsically safe circuits between the display unit and pointing device potential equalization must exist.
- The pointing device shall not be used in areas where charging mechanism creating propagating brush discharges have to be regarded.

12 Assembly and disassembly

12.1 General information

! NOTICE	Assembly and disassembly are subject to general technical rules. Additional, specific safety regulations apply to electronic and pneumatic installations.
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12.2 Cut-out ET-xx7

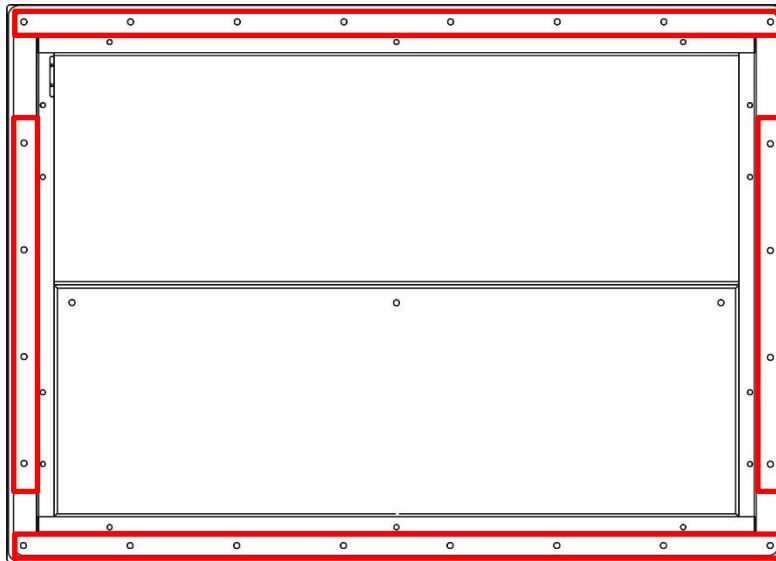
Make a cut-out with the following dimensions:

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

12.3 Tightening torque

! NOTICE

The tightening torque of the nuts for the fixing bolts of the ET-4x7/5x7/6x7/ panel mount devices is **1.2 N (+ 0.2 N)!**



13 Operation

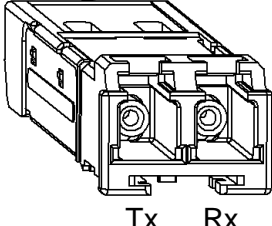
13.1 General information

! NOTICE

When operating the devices, particular care shall be taken that:

- the HMI device has been properly installed according to instructions,
- the HMI device is undamaged,
- the terminal compartment is clean,
- all screws are tightened fast,
- before switching the HMI device on, its external equipotential bonding terminal is properly connected to the equipotential bonding system at its place of use,
- the cover of the terminal compartment is completely closed.

13.2 Connections

Terminal	Pin	Definition / typical cable color				Connection
X10 PWR	1	Power supply HMI device +24 VDC or 100 - 240 VAC				Power supply of the HMI device. Ex e
	2	Power supply HMI device 0 VDC or 100 - 240 VAC				
	3	Earth connection				
X11 KBi	1	+UB		Red		USB interface Ex ia for External keyboard
	2	D-		White		
	3	D+		Green		
	4	GND		Black		
X12 Mi	1	+UB		Red		USB interface Ex ia for Mouse
	2	D-		White		
	3	D+		Green		
	4	GND		Black		
X13	1	+UB		Red		USB Ex e
	2	D-		White		
	3	D+		Green		
	4	GND		Black		
X14	1	+12 V		Red		12 VDC output Ex e, max. 500 mA
	2	GND		Black		
X16 CAT7 / CAT5 Data						Ethernet copper connection * Ex e either * TX or 2TX (2TX not 600 SERIES)
	1	TRD0+	TxD + 1	White / Orange	White / Orange 1	
	2	TRD0-	TxD - 1	Orange	Orange 1	
	3	TRD1+	RxD + 1	White / Green	White / Green 1	
	4	TRD1-	RxD - 1	Green	Green 1	
	5	TRD2+	TxD + 2	Blue / White	White / Orange 2	
	6	TRD2-	TxD - 2	Blue	Orange 2	
	7	TRD3+	RxD + 2	White / Brown	White / Green 2	
8	TRD3-	RxD - 2	Brown	Green 2		
9	SHLD	SHLD	Screen	Screen		
X18 FO 1 Data		 <p>Tx Rx</p>			Optical fibre connection type LC Duplex connector	Ethernet optical fibre interface * Ex op is
X24 USB1i	1	+UB		Red		USB interface Ex ia
	2	D-		White		
	3	D+		Green		
	4	GND		Black		
X25 USB2i	1	+UB		Red		USB interface ** Ex ia
	2	D-		White		
	3	D+		Green		
	4	GND		Black		
X97 SER	1	TxD		Blue / White		Serial Ex e interface RS-232
	2	RxD		Blue		
	3	RTS		White / Orange		
	4	CTS		Orange		
	5	GND		Black		

X101 CAM	1	Signal FBAS	White	Video Ex e interface (optional)
	2	Screen (GND)	Black	
X105 AUD	1	CH1 / line out left	Red	Audio Ex e interface (Line in only 600 SERIES)
	2	CH2 / line out right	Black	
	3	CH3 / line in left	Red	
	4	CH4 / line in right	Black	
	5	GND	Black	
or				
X105 AUD	1	LS1+	Red	Audio sound
	2	LS1-	Black	Ex e interface
	3	LS2+	Red	(optional)
	4	LS2-	Black	
	5	GND	Black	

NOTICE

The following applies to all terminals:
 0.2 - 2.5 mm² / AWG24 - AWG14 for flexible cable
 0.2 - 4 mm² / AWG24 - AWG12 for rigid cable
 Strip cable of 7 mm (0.28 in) insulation
 max. one cable per terminal
 Recommended cable length for terminals X11, X12, X13, X14, X24, X25:
 max. 3 m (10 ft)

* Please note that the Ethernet connection is **either** for an optical fibre connection (X16) **or** for a copper connection (X18), depending on the version ordered !
 The option 2TX is only possible at devices with Bay Trail processor (BT) and **NOT** at 600 SERIES !
 If display types ET-xx7-DVI1-MM or ET-xx7-DVI1-SM (optical fibre versions) are used, terminal X16 remains unused.
 In the case of an optical fibre connection the following cable is recommended:
 Multi-mode optical fibre cable:
 50 µm core cross section and 125 µm external cross section
 Single mode optical fibre cable:
 9 µm core cross section and 125 µm external cross section

** The USBi2 connection (X25) is **NOT** available for devices with touch screen and may **NOT** be connected.

14 Data loss

NOTICE

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

ATTENTION

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

15 Maintenance


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

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

System maintenance should focus on the following:

- a. Seal wear
- b. Display damage
- c. All screws are tightened fast
- d. All cables and lines are properly connected and undamaged

16 Troubleshooting

	<p>Devices operated in hazardous areas must not be modified. Repairs may only be carried out by qualified, authorized staff specially trained for this purpose.</p>
	<p>Repairs may only be carried out by specially trained staff who are familiar with all basic conditions of the applicable user regulations and – if requested – have been authorized by the manufacturer.</p>

16.1 Repairs / hazardous substances

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

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

17 Disposal

Disposal of packaging and used parts is subject to regulations valid in whichever country the device has been installed.

The disposal of devices sold after August 13th, 2005, and installed in countries under the jurisdiction of the EU is governed by directive (amendment) 2012/19/EU on waste electrical and electronic equipment (WEEE). Under this directive, the HMI devices are category 9 devices (monitoring and control devices).

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

17.1 RoHS directive 2011/65/EC

The revised version of the RoHS (restriction of hazardous substances) 2002/95/EC directive, directive 2011/65/EC, extends its area of application to all electric and electronic products.

In the case of HMI devices (category 9 – monitoring and controlling devices) a transitional period applies until 22.07.2017, after which the banned substances listed in RoHS 2011/65/EC directive apply to all devices newly put on the market.

Security Advises

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
 $V_{max} > U_0$
 $I_{max} > I_0$
 $P_i > P_0$
 $C_j + C_{cable} < C_0$
 $L_i + L_{cable} < L_0$

WARNING:

- Substitution of components may impair Safety.
- To prevent ignition of flammable or combustible atmospheres disconnect power and wait a minimum of 7 min. before servicing.

The ET-xx7 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 Canadian Electric Code for installation within Canada.

Alle Rechte vorbehalten. Diese Zeichnung darf ohne unsere ausdrückliche Zustimmung
 weder vervielfältigt noch Dritten zugänglich gemacht werden. Außerdem darf sie durch den
 Empfänger oder durch Dritte nicht in irgendeiner Art und Weise abgedruckt, vervielfältigt
 oder für Technik - Technische bzw. Konstruktive Änderungen verwendet werden.
 State of the art - subject to technical or design alterations.

Calculation of cable length

- 1.) Determination of maximum possible capacitance of cable:
 $C_{max} = C_0 - C_i$ (associated Apparatus)
 Determination of maximum possible inductance of cable:
 $L_{max} = L_0 - L_i$ (associated Apparatus)
- 2.) Determination of maximum possible cable length by capacitance and inductance of cable:
 length $C = C_{max}$
 Ccable (*1)
 length $L = L_{max}$
 Lcable (*1)
- 3.) Determination of maximum length of cable:
 length C or length L, whatever is less.
 (*1) when cable parameters are unknown, the following values may be used:
 Cable = 60 pF/ft. (200 pF/m)
 Lcable = 0.2 µH/ft. (0.66 µH/m)

HMI-STAHL 3011 000 00 1111 1-0017 Nummer der Zeichnung		HMI-STAHL SYSTEME GMBH Industriepark 48157 Datteln Telefon +49 23 07 25 00 00 Telefax +49 23 07 25 00 01 E-Mail hmi@hmi-stahl.de	
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19 Declaration of EC conformity

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):
Display Unit T-EX-##*-CAT7*
Display Unit T-EX-##*-MM*
Display Unit T-EX-##*-SM*
Keyboard Trackball Unit T-EX*-KB-TB*
Keyboard Mouse Unit T-EX*-KB-M*
Keyboard Pad Unit T-EX*-KB-P*
Keyboard Joystick Unit T-EX*-KB-J*
Transmission Unit T-EX-KVM*-CAT7*
Transmission Unit T-EX-KVM*-MM*
Transmission Unit T-EX-KVM*-SM*
 *=any alphanumeric or symbolic character, without relevance for explosion protection
 #=one numeric character, without relevance for explosion protection

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)
Bis/Until/Jusque'au 2016-04-19:		Ab/From/De 2016-04-20:	EN 60079-0: 2009 EN 60079-5: 2007 EN 60079-7: 2007 EN 60079-11: 2007 EN 60079-26: 2007 EN 60079-28: 2004 EN 60079-31: 2009 EN 61241-11: 2006
94/9/EG 94/9/EC 94/9/CE	ATEX-Richtlinie ATEX Directive Directive ATEX	2014/34/EU 2014/34/EU 2014/34/UE	Das Produkt entspricht Anforderungen aus: <i>Product corresponds to requirements from:</i> <i>Produit correspond aux exigences:</i> EN 60079-0: 2012, EN 60079-11: 2012, EN 60079-31: 2014

Kennzeichnung, marking, marquage:
Display Unit:
 II 2(1) G Ex e q [ia op is Ga] IIC T4 Gb
 II 2(1) D Ex tb IIIC [ia op is Da] IP64 T110°C Db
Keyboard Trackball Unit, for Keyboard Mouse Unit, for Keyboard Pad Unit, for Keyboard Joystick Unit:
 II 1 G Ex ia IIC T4 Ga
 II 1 D Ex ia IIIB T110°C Da
Transmission Unit:
 II (1) G [Ex op is Ga] IIC
 II (1) D [Ex op is Da] IIIB



CE 0158

EG/EU-Baumusterprüfbescheinigung:
EC/EU Type Examination Certificate:
Attestation d'examen CE/UE de type:
BVS 12 ATEX E 033 X
DEKRA EXAM GmbH (NB 0158)
 Dinnendahlstraße 9, 44809 Bochum, Germany

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



Bis/Until/Jusque'au 2016-04-19:	Ab/From/De 2016-04-20:	EN 61000-6-2: 2006 EN 61000-6-4: 2007
2004/108/EG 2004/108/EC 2004/108/CE	EMV-Richtlinie <i>EMC Directive</i> <i>Directive CEM</i>	2014/30/EU 2014/30/EU 2014/30/UE
Produktnormen nach Niederspannungsrichtlinie: <i>Product standards according to Low Voltage Directive:</i> <i>Normes des produit pour la Directive Basse Tension:</i>		EN 50178: 1997 EN 61010-1: 2001+ Corrigendum / Errata
Produktnormen nach RoHS-Richtlinie (2011/65/EU): <i>Product standards according to RoHS Directive:</i> <i>Normes des produit pour la Directive RoHS:</i>		EN 50581:2012

Köln, 2015-12-11

Ort und Datum
Place and date
Lieu et date

i.V.

J. Düren
 Technical Director

i.V.

W. Bertges
 Quality Manager

20 Release notes

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

Version 01.03.04

- Removal of previous release notes
- Inclusion of "Resolution at ET-6x7 (KVM Systems) with DVI3"
- Adaption of Conformity to standards
- Renew Declaration of EC conformity
- Text-, layout- and formal corrections

Version 01.03.05

- Inclusion of DNV / GL certification for 600 SERIES
- Correction of IECEx certification number
- Addition of section "Tightening torque"
- Addition of section "Data loss"
- Changing of data memory size at ET-4x7 BT into 64 GB
- Changing of processor, RAM and data memory size at ET-5x7 BT
- Changing of operating system at ET-5x7 BT
- Changing of information according to "Operating temperature range"
- Addition of "Operating force touch" in section "Technical data"
- Addition of "Cut-out dimension for rear mount module" in section "Technical data"
- Addition of "Environmental conditions" in section "Technical data"
- Changing of Type code BT versions
- Addition of version 2TX at BT
- Addition of 2TX in "Technical data"
- Addition of terminal assignment 2TX with notice
- Addition of "video interface" in table "Connections"
- Addition of "audio sound interface" in section "Technical data"
- Addition of "audio sound interface" in table "Connections"
- Addition of "voltage output interface" in section "Technical data"
- Changing of "Order" in "versions" in section "Type code"
- Text-, layout- and formal corrections

Version 01.03.06

- Limitation of DNV / GL certification for ET-6x7-DVI3-yM-FO-TFT-TG-AC-O30-AL devices

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