Operating Instructions

Remote HMI
T-Ex Series

R. STAHL HMI Systems GmbH
Im Gewerbegebiet Pesch 14
D-50767 Köln

HW-Rev. T-Ex: 01.02.00
Doc.No.: 60000076

Operating Instructions Version: 01.02.04
Issue date: 31.10.2012
Disclaimer

Publisher and copyright holder:

R. STAHL HMI Systems GmbH
Im Gewerbegebiet Pesch 14
D-50767 Köln

Company located at: Cologne
Court of registration: District court Cologne, HRB 30512
VAT number: DE 812 454 820

Telephone: (switchboard) +49/(0)221/ 5 98 08 - 200
(switchboard) +49/(0)221/ 5 98 08 - 200
(hotline) - 59
Fax: - 260
E-mail: (switchboard) office@stahl-hmi.de
(switchboard) office@stahl-hmi.de
(hotline) support@stahl-hmi.de

- All rights reserved.
- This document may not be reproduced in whole or in part except with the written consent of
  the publisher.
- This document may be subject to change without notice.

This documentation has been produced and checked with due care.
R. STAHL HMI Systems GmbH shall, however, not accept liability for any mistakes in this and all
other documents.

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

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

Trademarks
The terms and names used in this document are registered trademarks and/or products of the
companies in question.
WINDOWS ® 95/98/2000/NT/ME/XP/Vista/7/Server are registered trademarks of MICROSOFT
Corporation, USA.

Copyright © 2012 R. STAHL HMI Systems GmbH. Subject to alterations.
# Table of contents

<table>
<thead>
<tr>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disclaimer</td>
<td>2</td>
</tr>
<tr>
<td>Table of contents</td>
<td>3</td>
</tr>
<tr>
<td>1 Product names and Ex-certificates</td>
<td>4</td>
</tr>
<tr>
<td>2 Technical data</td>
<td>5</td>
</tr>
<tr>
<td>2.1 Display unit</td>
<td>5</td>
</tr>
<tr>
<td>2.2 Keyboard units</td>
<td>6</td>
</tr>
<tr>
<td>2.3 Transmission units</td>
<td>7</td>
</tr>
<tr>
<td>2.4 Enclosure</td>
<td>8</td>
</tr>
<tr>
<td>2.5 Front panel resistance</td>
<td>9</td>
</tr>
<tr>
<td>2.5.1 Materials</td>
<td>9</td>
</tr>
<tr>
<td>2.5.2 Material properties</td>
<td>9</td>
</tr>
<tr>
<td>2.5.3 Membrane top (Polyester)</td>
<td>9</td>
</tr>
<tr>
<td>3 Interfaces and connection details</td>
<td>12</td>
</tr>
<tr>
<td>3.1 Display</td>
<td>12</td>
</tr>
<tr>
<td>3.2 Keyboard trackball unit</td>
<td>17</td>
</tr>
<tr>
<td>3.3 Keyboard mouse unit</td>
<td>17</td>
</tr>
<tr>
<td>3.4 Keyboard pad unit</td>
<td>18</td>
</tr>
<tr>
<td>3.5 Keyboard joystick unit</td>
<td>18</td>
</tr>
<tr>
<td>3.6 Transmission unit</td>
<td>19</td>
</tr>
<tr>
<td>4 Safety instructions</td>
<td>20</td>
</tr>
<tr>
<td>4.1 General safety instructions</td>
<td>20</td>
</tr>
<tr>
<td>4.2 Cautionary note</td>
<td>20</td>
</tr>
<tr>
<td>4.3 Installation – safety instructions</td>
<td>20</td>
</tr>
<tr>
<td>4.4 Operating instructions</td>
<td>22</td>
</tr>
<tr>
<td>5 General instruction</td>
<td>22</td>
</tr>
<tr>
<td>5.1 Technology advances</td>
<td>22</td>
</tr>
<tr>
<td>6 Maintenance</td>
<td>22</td>
</tr>
<tr>
<td>7 Troubleshooting</td>
<td>23</td>
</tr>
<tr>
<td>7.1 Repair/hazardous materials</td>
<td>23</td>
</tr>
<tr>
<td>8 Disposal</td>
<td>23</td>
</tr>
<tr>
<td>8.1.1 ROHS directive 2002/95/EC</td>
<td>23</td>
</tr>
<tr>
<td>9 Use of trademarks</td>
<td>23</td>
</tr>
<tr>
<td>10 Declaration of EC conformity</td>
<td>24</td>
</tr>
<tr>
<td>11 Release notes</td>
<td>26</td>
</tr>
</tbody>
</table>
1 Product names and Ex-certificates

Display unit type:
- T-Ex-##*-CAT7* or T-Ex-##*-CAT7*-R2
- T-Ex-##*-MM* or T-Ex-##*-MM*-R2
- T-Ex-##*-SM* or T-Ex-##*-SM*-R2

ATEX gas: II 2(1) G Ex e q [ia op is Ga] IIC T4 Gb
ATEX dust: II 2(1) D Ex lb IIC [ia op is Da] IP64 T110°C Db for T-Ex-##*
ATEX dust: II 2(1) D Ex lb IIC [ia op is Da] IP65 T110°C Db for T-Ex-##*-R2

IECEEx gas: Ex e q [ia op is Ga] IIC T4 Gb
IECEEx dust: Ex lb IIC [ia op is Da] IP64 T110°C Db for T-Ex-##*
IECEEx dust: Ex lb IIC [ia op is Da] IP65 T110°C Db for T-Ex-##*-R2

Ta = -30°C ... +60°C (certification temperature range)

Keyboard Trackball unit type: T-Ex*-KB-TB*
Keyboard Mouse unit type: T-Ex*-KB-M*
Keyboard Touchpad unit type: T-Ex*-KB-P*
Keyboard Joystick unit type: T-Ex*-KB-J*

ATEX gas: II 1 G Ex ia IIC T4 Ga
ATEX dust: II 1 D Ex ia IIIB T110°C Da

IECEEx gas: Ex ia IIC T4 Ga
IECEEx dust: Ex ia IIIB T110°C Da

Ta = -30°C ... +60°C (certification temperature range)

Transmission unit type: T-Ex-KVM*-MM*
T-Ex-KVM*-SM*

ATEX gas: II (1) G [Ex op is Ga] IIC (FO version only)
ATEX dust: II (1) D [Ex op is Da] IIIB (FO version only)

IECEEx gas: [Ex op is Ga] IIC (FO version only)
IECEEx dust: [Ex op is Da] IIIB (FO version only)

Ta = -30°C ... +60°C (certification temperature range)

* = any alphanumeric or symbolic character, without relevance for explosion protection
# = one numeric character, without relevance for explosion protection

For further details, see certificates and technical data!
2 Technical data

2.1 Display unit

T-Ex-##*-CAT7* or T-Ex-##*-CAT7*-R2 (type for CAT7 cable)
T-Ex-##*-MM* or T-Ex-##*-MM*-R2 (type for multi mode FO cable)
T-Ex-##*-SM* or T-Ex-##*-SM*-R2 (type for single mode FO cable)

Housing type: Steel
Protection: IP64 for T-Ex-##* or IP65 for T-Ex-##*-R2
Resolution: 1280 x 1024 pixel, 4:3 ratio, 19" display size
1680 x 1050 pixel, 16:10 ratio, 22" display size
1920 x 1080 pixel, 16:9 ratio, 24" display size
1920 x 1200 pixel, 16:10 ratio, 24"WU display size
(Resolution 1920 x yyyy not for DVI2)
Visualization of resolution: 1:1 (standard for KVM USB)
scaling (standard for KVM DVI, optional for KVM USB)
Brightness: typ. 250 cd/m² @ Ta 20°C (68°F) via LED or CFL backlight
(depend of display size)
Touch option: 5-wire resistive touch, foil surface

For transmission technology USB, DVI2, IP and CAM:
Certification temperature: -30°C to +60°C (-22°F to 140°F)
Cold start temperature: -10°C to +50°C (-14°F to 122°F)
During operation: -20°C to +50°C (-4°F to 122°F)
Operation with heater¹): -30°C to +50°C (-22°F to 122°F)
Short term temperature: -30°C to +60°C (-22°F to 140°F)
Temp. when fixed in enclosure: -20°C to +50°C (-4°F to 122°F)
Storage temperature: -20°C to +70°C (-4°F to 158°F)
10 to 90% relative humidity @ 40°C (104°F), non-condensing

For transmission technology DVI1:
Certification temperature: -30°C to +60°C (-22°F to 140°F)
Cold start temperature: +5°C to +40°C (41°F to 104°F)
During operation: +5°C to +40°C (41°F to 104°F)
Operation with heater¹): +5°C to +40°C (41°F to 104°F)
Short term temperature: +5°C to +40°C (41°F to 104°F)
Temp. when fixed in enclosure: +5°C to +40°C (41°F to 104°F)
Storage temperature: -20°C to +70°C (-4°F to 158°F)
20 to 80% relative humidity @ 40°C (104°F), non-condensing

¹) The used heater must be constructed in the way, that inside of the enclosure the temperature will not fall below -20°C (-4°F).

Ex-certificates: Zone 1[0], Zone 21[20], EPL Gb[Ga], EPL Db[Da]
see certificates

Dimensions: 660 mm x 475 mm x 114 mm (25.98" x 18.70" x 4.49"), see technical drawings in the manual
Remote HMI T-Ex Series

Technical data

Weight: 30 kg typ. (66.2 lb), depending on version
Mounting type: fixed mounting
Power supply: 24 VDC or 100-240 VAC, 50-60 Hz, depending on type
35 W typ. / maximum 150 W (typ. 119BTU / max. 510BTU), recommended protection 5.0 AT
MTBF: min. / typ. 50,000 h @ Ta 20°C (68°F) and intended use

Data cable length KVM USB CAT7: up to 150 m (490 ft) via CAT7 installation cable AWG22
Data cable length KVM DVI1 CAT7: up to 140 m (460 ft) via CAT7 installation cable AWG22
Data cable length KVM DVI2 CAT7: up to 500 m (1640 ft) via CAT7 installation cable AWG22
Data cable length KVM IP CAT7: up to 100 m (330 ft) via CAT7 installation cable AWG22
Data cable length FO multi mode: up to 500 m (1640 ft) via 50/125 µm FO cable
(available for KVM USB) up to 300 m (985 ft) via 62,5/125 µm FO cable
Data cable length FO single mode: up to 10,000 m (33,000 ft) via 9/125 µm FO cable
(available for KVM USB)
Interfaces/Connections: see section: "interfaces and connections: display unit"

2.2 Keyboard units

T-Ex*-KB-TB* (type Keyboard Trackball Unit)
T-Ex*-KB-M* (type Keyboard Mouse Unit)
T-Ex*-KB-P* (type Keyboard Touchpad Unit)
T-Ex*-KB-J* (type Keyboard Joystick Unit)

Housing type: Steel/Aluminium
Surface foil: polyester
Protection: IP65/IP54 static/dynamic at the front, minimum IP20 at the back
Operating temperature range: -30°C to +60°C (-22°F to 140°F)
relative humidity: 10 to 90%, non-condensing
Storage temperature range: -30°C to +70°C (-22°F to 158°F)
relative humidity: 10 to 90%, non-condensing
Ex-Certificates: Zone 0, Zone 20, EPL Ga, EPL Da
see certificates
Dimensions: 581 mm x 186 mm x 50 mm (22.87" x 7.32" x 1.97"),
see technical drawings in the manual
Weight: 3 kg typ. (6.6 lb), depending on version
Mounting type: fixed mounting
Power supply via USB interfaces
MTBF: min. / typ. 50,000 h @ Ta 20°C (68°F) and intended use
Interfaces/connections: see section: "interfaces and connections: keyboard unit"
2.3 Transmission units

**T-Ex-KVM*-CAT7***
(type for CAT7 cable)

**T-Ex-KVM*-MM***
(type for multi mode FO cable)

**T-Ex-KVM*-SM***
(type for single mode FO cable)

Housing type: Desktop

Protection: min. IP20

For transmission technology USB, DVI2 and IP:

Certification temperature: -30°C to +60°C (-22°F to 140°F)
Cold start temperature: -10°C to +50°C (-14°F to 122°F)
During operation: -20°C to +50°C (-4°F to 122°F)
Short term temperature: -30°C to +60°C (-22°F to 140°F)
Storage temperature: -20°C to +70°C (-4°F to 158°F)
10 to 90% relative humidity @ 40°C (104°F), non-condensing

For transmission technology DVI1:

Certification temperature: -30°C to +60°C (-22°F to 140°F)
Cold start temperature: +5°C to +40°C (41°F to 104°F)
During operation: +5°C to +40°C (41°F to 104°F)
Short term temperature: +5°C to +40°C (41°F to 104°F)
Storage temperature: -20°C to +70°C (-4°F to 158°F)
20 to 80% relative humidity @ 40°C (104°F), non-condensing

Ex-certificates: Zone [0], Zone [20], EPL [Ga], EPL [Da], LWL versions only, see certificates

Dimensions KVM USB: 145 mm x 44.45 mm x 165 mm (5.71" x 1.75" x 6.5")
see technical drawings in the manual

Dimensions KVM DVI1: 210 mm x 44 mm x 210 mm (8.27" x 1.73" x 8.27")
see technical drawings in the manual

Dimensions KVM DVI2: 210 mm x 44.45 mm x 165 mm (8.27" x 1.75" x 6.5")
see technical drawings in the manual

Dimensions KVM IP: 198 mm x 44 mm x 120 mm (7.76" x 1.73" x 4.72")
see technical drawings in the manual

Weight: 1 kg typ., (2.2 lb), depending on version

Mounting type: typ. corresponding equipment

Power supply: 100-240 VAC, 50-60 Hz, 5 W typ. / maximum 10 W (typ. 17 BTU / max. 34 BTU), recommended protection 1.0 AT

MTBF: min. / typ. 50,000 h @ Ta 20°C (68°F) and intended use
Data cable length KVM USB CAT7: up to 150 m (490 ft) via CAT7 installation cable AWG22
Data cable length KVM DVI CAT7: up to 140 m (460 ft) via CAT7 installation cable AWG22
Data cable length FO multi mode: up to 500 m (1640 ft) via 50/125 µm FO cable
(available for KVM USB) up to 300 m (985 ft) via 62,5/125 µm FO cable
Data cable length FO single mode: up to 10,000 m (33,000 ft) via 9/125 µm FO cable
(available for KVM USB)
Interfaces/connections: see section: "interfaces and connections: transmission unit"

2.4 Enclosure

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSG-Txx-V2A-PME-W</td>
<td>desk enclosure, wall mounting</td>
</tr>
<tr>
<td>HSG-Txx-V2A-PME-F</td>
<td>desk enclosure, floor mounting</td>
</tr>
<tr>
<td>HSG-Txx-V2A-FXE-W</td>
<td>strut enclosure, wall mounting</td>
</tr>
<tr>
<td>HSG-Txx-V2A-FXE-F</td>
<td>strut enclosure, floor mounting</td>
</tr>
<tr>
<td>HSG-Txx-V2A-FXE-C</td>
<td>strut enclosure, ceiling mounting</td>
</tr>
<tr>
<td>HSG-Txx-V2A-CFR-W</td>
<td>cleanroom enclosure, front door, wall mounting</td>
</tr>
<tr>
<td>HSG-Txx-V2A-CFR-F</td>
<td>cleanroom enclosure, front door, floor mounting</td>
</tr>
<tr>
<td>HSG-Txx-V2A-CFR-C</td>
<td>cleanroom enclosure, front door, ceiling mounting</td>
</tr>
</tbody>
</table>

Protection: Typ. IP65 when all assembly and mounting holes appropriate closed
Lock: Typ. two way key bit
Material: Typ. 1.4301 (DIN/EN), 304 (ASTM), 304 S 31 (BS)
Surface: Typ. 240 grinding
Mounting pipe MPF, MPC, MPW: Typ. 1.4301 (DIN/EN), 304 (ASTM), 304 S 31 (BS), 60.3 mm x 2 mm, min. 470 N/mm² (EN10217-7)
Operating temperature range: -30°C to +60°C (-22°F to 140°F)
relative humidity: 10 to 90%, non-condensing
Storage temperature range: -30 °C to +70°C (-22°F to 158°F)
relative humidity: 10 to 90%, non-condensing
Dimensions: 750 mm x 665 mm x 243 mm (29.54” x 26.18” x 9.56”), see technical drawings in the manual
Weight: 19.5 up to 25 kg, (43 up to 55 lb), depending on version
2.5 Front panel resistance

This section contains information on the resistance of the operator interfaces to various environmental factors. These have an impact on the mechanical, thermal and chemical stability of the operator interfaces.

The resistance to chemicals was tested according to DIN 42115 Part 2, i.e. the stability over 24 hours without visible changes to the operator interfaces.

2.5.1 Materials

<table>
<thead>
<tr>
<th>Application</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front plate</td>
<td>Aluminum</td>
</tr>
<tr>
<td>Touch screen</td>
<td>Polyester</td>
</tr>
<tr>
<td>Housing</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Front panel seal</td>
<td>Polyurethane</td>
</tr>
</tbody>
</table>

2.5.2 Material properties

- The selection of chemicals listed here is not exhaustive.
- More comprehensive lists can be obtained for further information from R. STAHL HMI Systems GmbH.
- Because of the numerous chemical substances available on the market, these lists can only represent a selection.

2.5.3 Membrane top (Polyester)

<table>
<thead>
<tr>
<th>Property</th>
<th>Chemical material class / group</th>
<th>Chemical substances</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical</td>
<td>Alcohols</td>
<td>1,3 Butanediol</td>
<td>DIN 42115</td>
</tr>
<tr>
<td>Chemical resistance</td>
<td></td>
<td>1,4 Butanediol</td>
<td>DIN 53 461</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cyclohexanol</td>
<td>Oder</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diacetone alcohol</td>
<td>ASTM-F-1598-95</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ethanol</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Glycol</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Glycerol</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Isopropyl alcohol</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Methanol</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Neopentyl glycol</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Octanol</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1,2 Propylene glycol</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Triacetin</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dowandol DRM/PM</td>
<td></td>
</tr>
<tr>
<td>Aldehydes</td>
<td>Acetaldehyde</td>
<td>&lt; 2%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Formaldehyde 37--42%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amines</td>
<td>Ammonia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Esters</td>
<td>Amyl acetate</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ethylacetate</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N-Butyl acetate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethers</td>
<td>Trichloroethylene</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ether</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dioxane</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diethyl ether</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-Methyltetrahydrofuran</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

© R. STAHL HMI Systems GmbH / OL_RemoteHMI_T-Ex_en_V_1_02_04.docx / 30.10.2012 Page 9 of 28
<table>
<thead>
<tr>
<th>(2-ME-THF)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aromatic hydrocarbons</strong></td>
<td>Benzene</td>
</tr>
<tr>
<td></td>
<td>Toluene</td>
</tr>
<tr>
<td></td>
<td>Xylene</td>
</tr>
<tr>
<td></td>
<td>Paint thinner (white spirit)</td>
</tr>
<tr>
<td><strong>Ketones</strong></td>
<td>Acetone</td>
</tr>
<tr>
<td></td>
<td>Methyl ethyl ketone</td>
</tr>
<tr>
<td></td>
<td>Cyclohexanone</td>
</tr>
<tr>
<td></td>
<td>Methyl isobutyl ketone</td>
</tr>
<tr>
<td></td>
<td>(MIBK)</td>
</tr>
<tr>
<td></td>
<td>Isophorone</td>
</tr>
<tr>
<td><strong>Diluted acids</strong></td>
<td>Formic acid</td>
</tr>
<tr>
<td></td>
<td>Acetic acid</td>
</tr>
<tr>
<td></td>
<td>Phosphoric acid</td>
</tr>
<tr>
<td></td>
<td>Hydrochloric acid</td>
</tr>
<tr>
<td></td>
<td>Nitric acid</td>
</tr>
<tr>
<td></td>
<td>Trichloroacetic acid</td>
</tr>
<tr>
<td></td>
<td>Sulfuric acid</td>
</tr>
<tr>
<td><strong>Diluted alkaloids (bases)</strong></td>
<td>Caustic soda</td>
</tr>
<tr>
<td></td>
<td>&lt;40%</td>
</tr>
<tr>
<td><strong>Household chemicals</strong></td>
<td>Ajax</td>
</tr>
<tr>
<td></td>
<td>Ariel</td>
</tr>
<tr>
<td></td>
<td>Domestos</td>
</tr>
<tr>
<td></td>
<td>Downey</td>
</tr>
<tr>
<td></td>
<td>Fantastic</td>
</tr>
<tr>
<td></td>
<td>Formula 409</td>
</tr>
<tr>
<td></td>
<td>Gumption</td>
</tr>
<tr>
<td></td>
<td>Jet Dry</td>
</tr>
<tr>
<td></td>
<td>Lenor</td>
</tr>
<tr>
<td></td>
<td>Persil</td>
</tr>
<tr>
<td></td>
<td>Tenside</td>
</tr>
<tr>
<td></td>
<td>Top Jop</td>
</tr>
<tr>
<td></td>
<td>Vim</td>
</tr>
<tr>
<td></td>
<td>Vortex</td>
</tr>
<tr>
<td></td>
<td>Washing powder</td>
</tr>
<tr>
<td></td>
<td>Fabric conditioner</td>
</tr>
<tr>
<td></td>
<td>Whis</td>
</tr>
<tr>
<td></td>
<td>Windex</td>
</tr>
<tr>
<td><strong>Oils</strong></td>
<td>Petrol</td>
</tr>
<tr>
<td></td>
<td>Drilling muds</td>
</tr>
<tr>
<td></td>
<td>Braking fluid</td>
</tr>
<tr>
<td></td>
<td>Decon foam</td>
</tr>
<tr>
<td></td>
<td>Diesel oil</td>
</tr>
<tr>
<td></td>
<td>Varnish</td>
</tr>
<tr>
<td></td>
<td>Keroflux</td>
</tr>
<tr>
<td></td>
<td>Paraffin oil</td>
</tr>
<tr>
<td></td>
<td>Castor oil</td>
</tr>
<tr>
<td></td>
<td>Silicone oil</td>
</tr>
<tr>
<td></td>
<td>Solvent naphta</td>
</tr>
<tr>
<td></td>
<td>Mineral turpentine</td>
</tr>
<tr>
<td></td>
<td>Kerosene</td>
</tr>
<tr>
<td><strong>No specific material class</strong></td>
<td>Acetonitrile</td>
</tr>
<tr>
<td></td>
<td>Alkali carbonate</td>
</tr>
<tr>
<td></td>
<td>Dichromates</td>
</tr>
<tr>
<td></td>
<td>Potassium dichromate</td>
</tr>
<tr>
<td></td>
<td>Caustic soda</td>
</tr>
<tr>
<td></td>
<td>&lt;20%</td>
</tr>
</tbody>
</table>
### Property

<table>
<thead>
<tr>
<th>Mechanic (keyboard)</th>
<th>Resistance</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service life after imprint</td>
<td>5 million touches</td>
<td>Autotype method</td>
</tr>
<tr>
<td>Operating force</td>
<td>max. 50 N</td>
<td>ASTM D2176</td>
</tr>
<tr>
<td>MIT folding resistance</td>
<td>&gt;20000 folding operations</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanic (touch screen)</th>
<th>Resistance</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point activation</td>
<td>1 million activations at any single point</td>
<td>3M method</td>
</tr>
</tbody>
</table>

| Thermal |
|--------------------------|------------|
| Dimensional | Max. 0.2% at 120° longitudinal |
| Dimension stability | Typically 0.1% |
3 Interfaces and connection details

3.1 Display

PWR (Power):

- X10, terminal 1-3, Ex e, increased safety:
  - terminal X10-1: L
  - terminal X10-2: N
  - terminal X10-3: Earth

  0.2 – 2.5 mm² / 24 AWG - 16 AWG for flexible cable
  0.2 – 4 mm² / 24 AWG - 14 AWG for rigid cable

  Strip length 7 mm (0.28")

  Max. 1 cable per contact

  \[ U_{\text{typ}} \leq 20 \text{ V} \ldots 240 \text{ VAC/DC}, \text{ depending on type} \]

  \[ I_{\text{max}} \leq 5 \text{ A} \]

  \[ P_{\text{max}} \leq 150 \text{ W} \]

  \[ U_{m} \leq 250 \text{ V} \]

  \[ I_{k} \leq 1500 \text{ A} \]

USB:

- X13, terminal 1-4, Ex e, increased safety:
  - terminal X13-1: +UB (typ. colour: red)
  - terminal X13-2: D- (typ. colour: white)
  - terminal X13-3: D+ (typ. colour: green)
  - terminal X13-4: GND (typ. colour: black)

  0.2 – 2.5 mm² / 24 AWG - 16 AWG for flexible cable

  0.2 – 4 mm² / 24 AWG - 14 AWG for rigid cable

  Strip length 7 mm (0.28")

  Max. 1 cable per contact

  Recommended cable length max. 3 m (10 ft)

  \[ U_{\text{typ}} \leq 5 \text{ V (±10%)} \]

  \[ U_{m} \leq 250 \text{ V} \]

12 V:

- X14, terminal 1-2, Ex e, increased safety:
  - terminal X14-1: +12 V (typ. colour: red)
  - terminal X14-2: GND (typ. colour: black)

  0.2 – 2.5 mm² / 24 AWG - 16 AWG for flexible cable

  0.2 – 4 mm² / 24 AWG – 14 AWG for rigid cable

  Strip length 7 mm (0.28")

  Max. 1 cable per contact

  Recommended cable length max. 3 m (10 ft)

  \[ U_{\text{typ}} \leq 12 \text{ V (±10%)} \]

  \[ I_{\text{max}} \leq 400 \text{ mA} \]

  \[ U_{m} \leq 250 \text{ V} \]
### Remote HMI T-Ex Series

#### Interfaces and connection details

<table>
<thead>
<tr>
<th>SER:</th>
<th>X97, terminal 1-5, Ex e, increased safety:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>terminal X97-1: TXD / TXD-B (typ. colour: white/blue)</td>
</tr>
<tr>
<td></td>
<td>terminal X97-2: RXD / TXD-A (typ. colour: blue)</td>
</tr>
<tr>
<td></td>
<td>terminal X97-3: RTS / RXD-B (typ. colour: white/orange)</td>
</tr>
<tr>
<td></td>
<td>terminal X97-4: CTS / RXD-A (typ. colour: orange)</td>
</tr>
<tr>
<td></td>
<td>terminal X97-5: GND (typ. colour: black)</td>
</tr>
</tbody>
</table>

0.2 – 2.5 mm² / 24 AWG - 16 AWG for flexible cable
0.2 – 4 mm² / 24 AWG - 14 AWG for rigid cable
Strip length 7 mm (0.28")
Max. 1 cable per contact

\[ U_{\text{typ}} \leq 15 \text{ V (±10%)} \]
\[ U_{\text{m}} \leq 250 \text{ V} \]

<table>
<thead>
<tr>
<th>CAM:</th>
<th>X101, terminal 1-2, Ex e, increased safety:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>terminal X101-1: FBAS (typ. colour: white)</td>
</tr>
<tr>
<td></td>
<td>terminal X101-2: GND (typ. colour: black)</td>
</tr>
</tbody>
</table>

0.2 – 2.5 mm² / 24 AWG - 16 AWG for flexible cable
0.2 – 4 mm² / 24 AWG - 14 AWG for rigid cable
Strip length 7 mm (0.28")
Max. 1 cable per contact

\[ U_{\text{typ}} \leq 5 \text{ V (±10%)} \]
\[ U_{\text{m}} \leq 250 \text{ V} \]

<table>
<thead>
<tr>
<th>AUD:</th>
<th>X105, terminal 1-5, Ex e, increased safety:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>terminal X97-1: CH1 (typ. colour: red)</td>
</tr>
<tr>
<td></td>
<td>terminal X97-2: CH2 (typ. colour: black)</td>
</tr>
<tr>
<td></td>
<td>terminal X97-3: CH3 (typ. colour: red)</td>
</tr>
<tr>
<td></td>
<td>terminal X97-4: CH4 (typ. colour: black)</td>
</tr>
<tr>
<td></td>
<td>terminal X97-5: GND (typ. colour: black)</td>
</tr>
</tbody>
</table>

0.2 – 2.5 mm² / 24 AWG - 16 AWG for flexible cable
0.2 – 4 mm² / 24 AWG - 14 AWG for rigid cable
Strip length 7 mm (0.28")
Max. 1 cable per contact

\[ U_{\text{typ}} \leq 100 \text{ V (±10%)} \]
\[ U_{\text{m}} \leq 250 \text{ V} \]
CAT7 1 (Data):  \[X_{16}\], terminal 1-9, Ex e, increased safety:

- terminal \[X_{16}-1\]: TRD0+ (typ. colour: white/orange)
- terminal \[X_{16}-2\]: TRD0- (typ. colour: orange)
- terminal \[X_{16}-3\]: TRD1+ (typ. colour: white/green)
- terminal \[X_{16}-4\]: TRD1- (typ. colour: green)
- terminal \[X_{16}-5\]: TRD2+ (typ. colour: white/blue)
- terminal \[X_{16}-6\]: TRD2- (typ. colour: blue)
- terminal \[X_{16}-7\]: TRD3+ (typ. colour: white/brown)
- terminal \[X_{16}-8\]: TRD3- (typ. colour: brown)
- terminal \[X_{16}-9\]: SHLD (typ. colour: shield)

0.2 – 2.5 mm² / 24 AWG – 16 AWG for flexible cable
0.2 – 4 mm² / 24 AWG – 14 AWG for rigid cable
Strip length 7 mm (0.28”)
Max.1 cable per contact

\[U_{\text{typ}} \leq 5 \text{ V (±10%)}\]
\[U_{\text{m}} \leq 250 \text{ V}\]

FO 1 (Data):  \[X_{18}\], terminal TX-RX, Ex op is, inherent safe optical radiation:

![LC Duplex connector](image)

LC Duplex connector

Multimode: preferred for 50/125 µm, max. 35 mW, 850 nm
Single-mode: preferred for 9/125 µm, max. 35 mW, 1310 nm
Remote HMI T-Ex Series  

Interfaces and connection details

**KBi (Keyboard):**  
**X11**, terminal 1-4, Ex ia, intrinsically safe:

- terminal X11-1: +UB (typ. colour: red)
- terminal X11-2: D- (typ. colour: white)
- terminal X11-3: D+ (typ. colour: green)
- terminal X11-4: GND (typ. colour: black)

- 0.2 – 2.5 mm² / 24 AWG -16 AWG for flexible cable
- 0.2 – 4 mm² / 24 AWG – 14 AWG for rigid cable

Strip length 7 mm (0.28’’)

Max. 1 cable per contact

Recommended cable length max. 3 m (10 ft)

\[\begin{align*}
U_i &= 5.5 \text{ V} & U_o &= 5.5 \text{ V} \\
I_i &= 3 \text{ A} & I_o &= 309 \text{ mA} \\
P_i &= 2 \text{ W} & P_o &= 629 \text{ mW} \\
C_i &= \text{negligible} & C_o &= 50 \mu\text{F} \\
L_i &= \text{negligible} & L_o &= 40 \mu\text{H}
\end{align*}\]

**Mi (Mouse):**  
**X12**, terminal 1-4, Ex ia, intrinsically safe:

- terminal X12-1: +UB (typ. colour: red)
- terminal X12-2: D- (typ. colour: white)
- terminal X12-3: D+ (typ. colour: green)
- terminal X12-4: GND (typ. colour: black)

- 0.2 – 2.5 mm² / 24 AWG – 16 AWG for flexible cable
- 0.2 – 4 mm² / 24 AWG – 14 AWG for rigid cable

Strip length 7 mm (0.28’’)

Max. 1 cable per contact

Recommended cable length max. 3 m (10 ft)

\[\begin{align*}
U_i &= 5.5 \text{ V} & U_o &= 5.5 \text{ V} \\
I_i &= 3 \text{ A} & I_o &= 309 \text{ mA} \\
P_i &= 2 \text{ W} & P_o &= 629 \text{ mW} \\
C_i &= \text{negligible} & C_o &= 50 \mu\text{F} \\
L_i &= \text{negligible} & L_o &= 40 \mu\text{H}
\end{align*}\]

**USB1i:**  
**X24**, terminal 1-4, Ex ia, intrinsically safe:

- terminal X24-1: +UB (typ. colour: red)
- terminal X24-2: D- (typ. colour: white)
- terminal X24-3: D+ (typ. colour: green)
- terminal X24-4: GND (typ. colour: black)

- 0.2 – 2.5 mm² / 24 AWG – 16 AWG for flexible cable
- 0.2 – 4 mm² / 24 AWG – 14 AWG for rigid cable

Strip length 7 mm (0.28’’)

Max. 1 cable per contact

Recommended cable length max. 3 m (10 ft)

\[\begin{align*}
U_i &= 5.5 \text{ V} & U_o &= 5.5 \text{ V} \\
I_i &= 3 \text{ A} & I_o &= 309 \text{ mA} \\
P_i &= 2 \text{ W} & P_o &= 629 \text{ mW} \\
C_i &= \text{negligible} & C_o &= 50 \mu\text{F} \\
L_i &= \text{negligible} & L_o &= 40 \mu\text{H}
\end{align*}\]
USB2i: X25, terminal 1-4, Ex ia, intrinsically safe:

- terminal X25-1: +UB  (typ. colour: red)
- terminal X25-2:  D-  (typ. colour: white)
- terminal X25-3:  D+  (typ. colour: green)
- terminal X25-4:  GND (typ. colour: black)

0.2 – 2.5 mm² / 24 AWG – 16 AWG for flexible cable
0.2 – 4 mm² / 24 AWG – 14 AWG for rigid cable
Strip length 7 mm (0.28")
Max. 1 cable per contact
Recommended cable length max. 3 m (10 ft)

The cable glands of the connection box must be Ex e types or must be in accordance to the country specific regulations and have to be changed if necessary. The pre manufactured cable gland threads are M16x1.5 and M20x1.5. The wall thickness to mount the cable glands are min. 4 mm.

For pre-mounted ATEX-certified cable glands:
- Cable gland M16 for round cable, outer diameter of cable: 5...9 mm (0.2"...0.35").
- Cable gland M20 for round cable, outer diameter of cable: 9...13 mm (0.35"...0.51").

Only permanently laid cables may be entered. The end user must guarantee suitable clamping. In case of pre mounted ATEX certified cable glands possible changing of the ambient parameters e.g. like ambient temperature range must be observed.

The EC-Type examination certificate of respective cable glands (DMT 99 ATEX E 016 or KEMA 99 ATEX 6971X resp. IECEx KEM 07.00144X) will be send on request.

For information on general installation refer to document: HM_RemoteHMI_T-Ex_en_V_1_01_01.pdf
3.2 Keyboard trackball unit

**KBi (Keyboard):**  X72, pre-mounted cable, Ex ia, intrinsically safe:

- wire X72-1 (typ. colour: red): +UB
- wire X72-2 (typ. colour: white): D-
- wire X72-3 (typ. colour: green): D+
- wire X72-4 (typ. colour: black): GND

\[
\begin{align*}
U_i &= 5.5 \text{ V} \quad & U_o &= 5.5 \text{ V} \\
I_i &= 0.8 \text{ A} \quad & I_o &= I_i \\
P_i &= 650 \text{ mW} \quad & P_o &= P_i \\
C_i &= 20 \mu\text{F} \quad & C_o &= 30 \mu\text{F} \\
L_i &= \text{negligible} \quad & L_o &= 5 \mu\text{H}
\end{align*}
\]

**Mi (Mouse):**  X73, pre-mounted cable 1-4, Ex ia, intrinsically safe:

- wire X73-1 (typ. colour: red): +UB
- wire X73-2 (typ. colour: white): D-
- wire X73-3 (typ. colour: green): D+
- wire X73-4 (typ. colour: black): GND

\[
\begin{align*}
U_i &= 5.5 \text{ V} \quad & U_o &= 5.5 \text{ V} \\
I_i &= 0.8 \text{ A} \quad & I_o &= I_i \\
P_i &= 650 \text{ mW} \quad & P_o &= P_i \\
C_i &= 20 \mu\text{F} \quad & C_o &= 30 \mu\text{F} \\
L_i &= \text{negligible} \quad & L_o &= 5 \mu\text{H}
\end{align*}
\]

3.3 Keyboard mouse unit

**KBi (Keyboard):**  X72, pre-mounted cable, Ex ia, intrinsically safe:

- wire X72-1 (typ. colour: red): +UB
- wire X72-2 (typ. colour: white): D-
- wire X72-3 (typ. colour: green): D+
- wire X72-4 (typ. colour: black): GND

\[
\begin{align*}
U_i &= 5.5 \text{ V} \quad & U_o &= 5.5 \text{ V} \\
I_i &= 0.8 \text{ A} \quad & I_o &= I_i \\
P_i &= 650 \text{ mW} \quad & P_o &= P_i \\
C_i &= 20 \mu\text{F} \quad & C_o &= 30 \mu\text{F} \\
L_i &= \text{negligible} \quad & L_o &= 5 \mu\text{H}
\end{align*}
\]

**Mi (Mouse):**  X94, pre-mounted cable 1-4, Ex ia, intrinsically safe:

- wire X94-1 (typ. colour: red): +UB
- wire X94-2 (typ. colour: white): D-
- wire X94-3 (typ. colour: green): D+
- wire X94-4 (typ. colour: black): GND

\[
\begin{align*}
U_i &= 5.5 \text{ V} \quad & U_o &= 5.5 \text{ V} \\
I_i &= 0.8 \text{ A} \quad & I_o &= I_i \\
P_i &= 650 \text{ mW} \quad & P_o &= P_i \\
C_i &= 20 \mu\text{F} \quad & C_o &= 30 \mu\text{F} \\
L_i &= \text{negligible} \quad & L_o &= 5 \mu\text{H}
\end{align*}
\]
3.4 Keyboard pad unit

KBi (Keyboard): \( X72 \), pre-mounted cable, Ex ia, intrinsically safe:

- wire \( X72-1 \) (typ. colour: red): \( +UB \)
- wire \( X72-2 \) (typ. colour: white): \( D- \)
- wire \( X72-3 \) (typ. colour: green): \( D+ \)
- wire \( X72-4 \) (typ. colour: black): \( GND \)

- \( U_i = 5.5 \text{ V} \)
- \( I_i = 0.8 \text{ A} \)
- \( P_i = 650 \text{ mW} \)
- \( C_i = 20 \mu\text{F} \)
- \( L_i = \text{negligible} \)

- \( U_o = 5.5 \text{ V} \)
- \( I_o = I_i \)
- \( P_o = P_i \)
- \( C_o = 30 \mu\text{F} \)
- \( L_o = 5 \mu\text{H} \)

Pi (Pad): \( X95 \), pre-mounted cable 1-4, Ex ia, intrinsically safe:

- wire \( X95-1 \) (typ. colour: red): \( +UB \)
- wire \( X95-2 \) (typ. colour: white): \( D- \)
- wire \( X95-3 \) (typ. colour: green): \( D+ \)
- wire \( X95-4 \) (typ. colour: black): \( GND \)

- \( U_i = 5.5 \text{ V} \)
- \( I_i = 0.8 \text{ A} \)
- \( P_i = 650 \text{ mW} \)
- \( C_i = 20 \mu\text{F} \)
- \( L_i = \text{negligible} \)

- \( U_o = 5.5 \text{ V} \)
- \( I_o = I_i \)
- \( P_o = P_i \)
- \( C_o = 30 \mu\text{F} \)
- \( L_o = 5 \mu\text{H} \)

3.5 Keyboard joystick unit

KBi (Keyboard): \( X72 \), pre-mounted cable, Ex ia, intrinsically safe:

- wire \( X72-1 \) (typ. colour: red): \( +UB \)
- wire \( X72-2 \) (typ. colour: white): \( D- \)
- wire \( X72-3 \) (typ. colour: green): \( D+ \)
- wire \( X72-4 \) (typ. colour: black): \( GND \)

- \( U_i = 5.5 \text{ V} \)
- \( I_i = 0.8 \text{ A} \)
- \( P_i = 650 \text{ mW} \)
- \( C_i = 20 \mu\text{F} \)
- \( L_i = \text{negligible} \)

- \( U_o = 5.5 \text{ V} \)
- \( I_o = I_i \)
- \( P_o = P_i \)
- \( C_o = 30 \mu\text{F} \)
- \( L_o = 5 \mu\text{H} \)

Ji (Joystick): \( X96 \), pre-mounted cable 1-4, Ex ia, intrinsically safe:

- wire \( X96-1 \) (typ. colour: red): \( +UB \)
- wire \( X96-2 \) (typ. colour: white): \( D- \)
- wire \( X96-3 \) (typ. colour: green): \( D+ \)
- wire \( X96-4 \) (typ. colour: black): \( GND \)

- \( U_i = 5.5 \text{ V} \)
- \( I_i = 0.8 \text{ A} \)
- \( P_i = 650 \text{ mW} \)
- \( C_i = 40 \mu\text{F} \)
- \( L_i = \text{negligible} \)

- \( U_o = 5.5 \text{ V} \)
- \( I_o = I_i \)
- \( P_o = P_i \)
- \( C_o = 10 \mu\text{F} \)
- \( L_o = 5 \mu\text{H} \)


3.6 Transmission unit

**FO 1 (Data):** X70, terminal TX-RX, Ex op is, inherently safe optical radiation:

![Diagram of FO 1 (Data)](image)

LC Duplex connector

Multimode: preferred for 50/125 µm, max. 35 mW, 850 nm
Single-mode: preferred for 9/125 µm, max. 35 mW, 1310 nm

**CAT7 (Data):** X0, terminal 1-8, RJ45 Data interface:

![Diagram of CAT7 (Data)](image)

- terminal X0-1: TRD0+ (typ. colour: white/orange)
- terminal X0-2: TRD0- (typ. colour: orange)
- terminal X0-3: TRD1+ (typ. colour: white/green)
- terminal X0-4: TRD2+ (typ. colour: blue)
- terminal X0-5: TRD2- (typ. colour: white/blue)
- terminal X0-6: TRD1- (typ. colour: green)
- terminal X0-7: TRD3+ (typ. colour: white/brown)
- terminal X0-8: TRD3- (typ. colour: brown)
- terminal X0-SHLD: SHLD (typ. colour: shield)

Recommended connector: Phoenix Contact VS-08-RJ45-5-Q/IP20
- 0.14 – 0.36 mm² / 26 AWG – 22 AWG for flexible cable
- 0.13 – 0.32 mm² / 26 AWG – 22 AWG for rigid cable

Connection method: IDC/insulation displacement contacts in acc. with IEC 60352-4

Connection in acc. with TIA-568 B
4 Safety instructions

4.1 General safety instructions

- All the relevant accident prevention regulations and the regulations for electrical installations must be observed during installation, maintenance work and operation. All persons involved in the installation, commissioning, operation, maintenance and servicing of this devices and its accessories must be qualified and familiar with this manual and associated documents.
- In case of non-observance and non-compliance, the warranty of the specified explosion protection and the warranty claim expire.
- The national safety regulations and accident prevention regulations are to be observed.
- The device may only be used for its intended purpose.
- Modifications and changes of the equipment are not permitted. The housing of the devices is only to be opened by R. STAHL HMI Systems GmbH.
- The first four digits of the serial number on the nameplate provide the year of manufacture.

4.2 Cautionary note

Caution:

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.

4.3 Installation – safety instructions

- The national assembly and installation instructions and technical standards are to be observed. Equipment and accessories must be connected and operated according to the standards, regulations and installations instructions. Installation is to be carried out by qualified or trained staff members only.
- Use only appropriate tools for installation.
- The screws of the cover from the Ex e connection box must be fixed with a torque of 1 N.
- The cable glands of the connection box must comply with the country-specific standards and if necessary, must be adjusted. Any changes in environment parameters, e.g. ambient temperature, must be observed. The outer diameter of the cables must comply with the specifications of the cable glands. Tighten the cable glands according to the instructions. Unused cable glands must be sealed with a suitable dummy plug. In case of pre mounted ATEX cable glands only permanently laid cables may be entered.
- Ex e and Ex i circuits must be complete de-energized when connecting the device. Isolate supply and all Ex e and Ex i circuits and wait 7 minutes before opening the Ex e connection box. Do not open the connection box when the device is powered and live. Ensure the power supply is isolated. The cable diameter has to comply to the specification of the terminals. The Ex e connection box must be seal locked.
- Equipment must be earthed with a core cross section of at least 4 mm² or regarding the according standards. Always ensure equipotential bonding between the electrical equipment.
- Shielded cables are recommended for this device. Interconnections of the data cable can influence the 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.
The terminal X16 exist at each display type of T-Ex-##-MM*, T-Ex-##-MM*-R2 or T-Ex-##-SM*, T-Ex-##-SM*-R2, but will not be used.

The cable shields of the cables in Ex e connection box area must be clamped to the according metallic cable bracket in front of each terminal to ensure proper earth connection and to prevent unattended cable loosening.

At the place of installation, a maximum voltage of 250 V and a short circuit current of 1.500 A must not be exceeded.

The type of power supply (AC/DC) is marked near at the terminal X10. If the power supply type 24 VDC is used, the following cable diameter should be used, dependend of the length of the power supply cable:

<table>
<thead>
<tr>
<th>Cable length in meter (ft)</th>
<th>Cable diameter in mm² (AWG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>max. 55 m (180 ft)</td>
<td>1.5 mm² (AWG 16)</td>
</tr>
<tr>
<td>max. 90 m (295 ft)</td>
<td>2.5 mm² (AWG 14)</td>
</tr>
<tr>
<td>max. 150 m (492 ft)</td>
<td>4 mm² (AWG 12)</td>
</tr>
<tr>
<td>max. 225 m (738 ft)</td>
<td>6 mm² (AWG 10)</td>
</tr>
<tr>
<td>max. 375 m (1230 ft)</td>
<td>10 mm² (AWG 8)</td>
</tr>
<tr>
<td>max. 600 m (1968 ft)</td>
<td>16 mm² (AWG 6)</td>
</tr>
</tbody>
</table>

If the cable diameter exceeds the diameter size of the terminals, this cable diameter had to be resized according the valid rules (maybe by using of an Ex e terminal junction box), before insertion into the connection box of the display.

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. a Ex ia device on a Ex ib interface), it must not be operated afterwards in applications for a higher level of international protection (e.g. Ex ia).

If the device in a dust atmosphere is to be replaced, the device and/or the housing, in which the device is installed, is to be de-energized first and if necessary cooled according to the regulations. Before opening the device and/or housing and during period in which the device and/or the housing is open, the environment of the device and/or housing has to be kept dust-free to such an extent that no dust can enter the interior of the housing. When installing new components observe that all seals are in a flawless condition and function properly.

Before initial operation, make sure that equipment has been properly installed, and ensure that the wiring is not damaged.
4.4 Operating instructions

- Equipment must be operated in undamaged, clean condition only. Do not touch damaged equipment, this can cause a risk of injury. In case of any damage that might affect the IP protection (e.g. cracks, holes, or broken components), the equipment must be taken out of service immediately. Before putting the equipment into operation again, all damaged components must be replaced.

- For use respective category 1D/2D/3D or EPL Da/Db/Dc dust layers > 5 mm have to be removed and high energy load mechanism at the operating surface of the unit respectively equipment (for example pneumatic particle transport) have to be excluded. Do not use the device in areas where propagating brush discharges are to expect.

- General and especially during opening or closing of the enclosure pay attention that no injury of the operator e.g. clamping occur.

- In the event of non-observance & non-compliance the stipulated explosion protection cannot be guaranteed and/or the guarantee will become void!

5 General instruction

Please read this manual before installation! In case of doubt (in regards to the translation), the German version of the manual will prevail. We do not assume any liability for any misprints or errors in this manual.

Should you have any questions or suggestions, please contact R. STAHL HMI Systems.

5.1 Technology advances

Any changes and modifications shall require the written approval of R. STAHL HMI Systems GmbH. The producer reserves the right to adapt technical data to technological advances without prior notice.

6 Maintenance

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

Keep the devices clean so that the enclosure locks and the screws remain accessible. Some maintenance work on the enclosure seal may be required.

System maintenance should focus on the following:
- Seal wear
- Display damage
- All screws are tightened fast
- All cables and lines are properly connected and undamaged
7 Troubleshooting

Devices operated in hazardous areas must not be modified. Repairs may only be carried out by qualified, authorized staff specially trained for this purpose.

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.

7.1 Repair/hazardous materials

Equipment to be repaired by and shipped to R. STAHL HMI Systems GmbH must include a detailed error description.

Before shipping of the equipment, any adhering materials must be removed, in particular seal channels and gaps. Please do not return any equipment if hazardous substances cannot be removed completely. Should disposal of equipment become necessary, the proprietor of the equipment will be charged with any costs arising from insufficient cleaning or personal injuries (e.g. chemical cauterization).

8 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 2002/96/EC on waste electrical and electronic equipment (WEEE). Under this directive, operator interfaces are listed in category 9 (monitoring and control instruments).

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

8.1.1 ROHS directive 2002/95/EC

The prohibition of hazardous substances as detailed in directive 2002/95/EC (ROHS) does not apply to electronic equipment of categories 8 and 9, and is therefore not applicable to the equipment described in these operating instructions.

9 Use of trademarks

All trademarks (product names, logos) in this text are the property of the respective owners and are considered protected.
10 Declaration of EC conformity

EG-Konformitätserklärung
EC-Declaration of Conformity
Déclaration de Conformité CE

R. STAHL HMI Systems GmbH • Im Gewerbegebiet Pesch 14 • 50767 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

Typ. type, type:

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
T at numeric character, without relevance for explosion protection

Kernzeichen, marking, marquage:

For Display Unit:
II 2(1) G Ex q [a op is Ga] IIC T4 Gb
II 2(1) D Ex tb IIC [a op is Da] IP64 T110°C Db

For Keyboard Trackball Unit, for Keyboard Mouse Unit,
for Keyboard Pad Unit, for Keyboard Joystick Unit:
II 1 G Ex ia IIC T4 Gb
II 1 D Ex ia IIIB T110°C Da

For Transmission Unit:
II 1(1) G [EX op is Gb] IIC
II 1(1) D [EX op is Db] IIIb

mit der EG-Baumusterprüfungszertifizierung,
issued by notified body,

außerhalb der Zuständigkeit der Stelle,

DEKRA EXAM GmbH
Dienstlehrstraße 8, 44009 Bochum

auf das sich diese Erklärung bezieht, mit den folgenden Normen oder normativen Dokumenten übereinstimmt
which is the subject of this declaration, is in conformity with the following standards or normative documents
auquel elle déclaration se rapporte, est conforme aux normes ou aux documents normatifs suivants

Begründer der Richtlinie
Terms of the directive
Préparation de la directive

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>94/9/SEC:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>94/9/CCE:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Datei: CE_T-Ex_20110701.docx
Version: 7.03_Ek-Konformität HMI_20110125.docx
EG-Konformitätserklärung
EC-Declaration of Conformity
Déclaration de Conformité CE

2004/108/EG: EMV-Richtlinie

EN 01000-0-2: 2000
EN 01000-0-4: 2007

Köls, 01.07.2011

Ort und Datum
Place and date
Lieu et date

J. Dürre
Technical Director

W. Bartges
Quality Manager

11 Release notes

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

Version 1.00.00
- First version
- Inclusion disclaimer
- Inclusion of assuming legal succession of SCREEN-TEC GmbH

Version 1.01.00
- Splitting of documentation in operation instruction, manual and certificates
- Inclusion of hardware revision
- Reduction of the operating instruction to "old" chapter 5 to 9 and declaration of EC conformity
- Changing from the names of the devices to new definition
- Text corrections
- Correction of the dimensions from the display unit and keyboard
- Including of declaration of conformity

Version 1.02.00
- Changing of technical data display units
- Changing of interfaces and connection details display, power supply PWR
- Inclusion of interfaces and connection details display, serial SER, camera CAM and audio AUD
- Inclusion of installation - safety instructions locking torque of cover screws
- Inclusion of installation - safety instructions cable screen
- Inclusion display types R2
- Inclusion data cable length DVI2 and IP
- Inclusion transmission unit T-Ex-KVM*-CAT7*
- Inclusion dimensions KVM DVI2 and IP
- Inclusion of installation - safety instructions with "connection X16 at R2 types"
- Inclusion of installation - safety instructions with "cable length for 24 VDC type"
- Layout and text corrections

Version 1.02.01
- Addition of data for front panel resistance

Version 1.02.02
- Notes on troubleshooting, disposal and banned substances included

Version 1.02.03
- Addition of resolution 1920 x 1200 pixel
- Addition of limitation of DVI2 resolution
- Inclusion of CFR enclosure
- Inclusion of section maintenance

Version 1.02.04
- Note on EMC class added.