Operating Instructions

Remote HMI
T-Ind Series

HW-Rev. T-Ind:	**01.02.00**
Operating Instructions Version:	**01.02.03**
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Disclaimer

Publisher and copyright holder:

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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.

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1   Product names

Display unit type:	**T-Ind-##*-CAT7***
	T-Ind-##*-MM*
	T-Ind-##*-SM*

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

Transmission unit type:	**T-Ind-KVM*-CAT7***
	T-Ind-KVM*-MM*
	T-Ind-KVM*-SM*

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

2   Technical data

2.1   Display unit

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

Housing type: Steel

Protection: IP65 at the front, IP20 at the back

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, optional glass surface

For transmission technology USB, DVI0, DVI2, IP and CAM:
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 heater[1]:   -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:
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 heater[1]:   +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).

Dimensions: 660 mm x 475 mm x 104 mm (25.98" x 18.70" x 4.1"),
see technical drawings in the manual

Weight: 10 kg typ. (22 lb), depending on version

Mounting type: fixed mounting

Power supply: 100-240 VAC, 50-60 Hz, 35 W typ. / maximum 150 W
(typ. 119BTU / max. 510BTU),
recommended protection 2.0 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 (1.640 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: (available for KVM USB)	up to 500 m (1.640 ft) via 50/125 µm FO cable up to 300 m (985 ft) via 62.5/125 µm FO cable
Data cable length FO single mode: (available for KVM USB)	up to 10.000 m (33.000 ft) via 9/125 µm FO cable
Interfaces/connections:	see section: "Interfaces and connections: display unit"

2.2 Keyboard units

T-Ind*-KB-TB*	(type Keyboard Trackball Unit)
T-Ind*-KB-M*	(type Keyboard Mouse Unit)
T-Ind*-KB-P*	(type Keyboard Touchpad Unit)
T-Ind*-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
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-Ind-KVM*-CAT7*	(type for CAT7 cable)
T-Ind-KVM*-MM*	(type for multi mode FO cable)
T-Ind-KVM*-SM*	(type for single mode FO cable)

Housing type: Desktop

Protection: min. IP20

For KVM USB, DVI2 und IP:
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 KVM DVI1:
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

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. 17BTU / max. 34BTU), 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 DVI1 CAT7: up to 140 m (460 ft) via CAT7 installation cable AWG22

Data cable length KVM DVI2 CAT7: up to 500 m (1.640 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 (1.640 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

HSG-Txx-V2A-PME-W	desk enclosure, wall mounting
HSG-Txx-V2A-PME-F	desk enclosure, floor mounting
HSG-Txx-V2A-FXE-W	strut enclosure, wall mounting
HSG-Txx-V2A-FXE-F	strut enclosure, floor mounting
HSG-Txx-V2A-FXE-C	strut enclosure, ceiling mounting
HSG-Txx-V2A-CFR-W	cleanroom enclosure, front door, wall mounting
HSG-Txx-V2A-CFR-F	cleanroom enclosure, front door, floor mounting
HSG-Txx-V2A-CFR-C	cleanroom enclosure, front door, ceiling mounting

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 kg typ., (43 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

Application	Material
Front plate	Aluminum
Touch screen	Polyester
Housing	Stainless steel
Front panel seal	Polyurethane

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)

Property	Chemical material class / group	Chemical substances	Test method
Chemical • Chemical resistance	Alcohols	1,3 Butanediol 1,4 Butanediol Cyclohexanol Diacetone alcohol Ethanol Glycol Glycerol Isopropyl alcohol Methanol Neopentyl glycol Octanol 1,2 Propylene glycol Triacetin Dowandol DRM/PM	DIN 42115 DIN 53 461 Oder ASTM-F-1598-95
	Aldehydes	Acetaldehyde Formaldehyde 37--42%	
	Amines	Ammonia < 2%	
	Esters	Amyl acetate Ethylacetate N-Butyl acetate	
	Ethers	1.1.1. Trichloroethane Ether Dioxane	

		Diethyl ether	
		2-Methyltetrahydrofuran (2-ME-THF)	
	Aromatic hydrocarbons	Benzene Toluene Xylene Paint thinner (white spirit)	
	Ketones	Acetone Methyl ethyl ketone Cyclohexanone Methyl isobutyl ketone (MIBK) Isophorone	
	Diluted acids	Formic acid Acetic acid Phosphoric acid Hydrochloric acid Nitric acid Trichloroacetic acid Sulfuric acid	<50% < 5% <30% <10% <10% <50% <30%
	Diluted alkaloids (bases)	Caustic soda	<40%
	Household chemicals	Ajax Ariel Domestos Downey Fantastic Formula 409 Gumption Jet Dry Lenor Persil Tenside Top Jop Vim Vortex Washing powder Fabric conditioner Whis Windex	
	Oils	Petrol Drilling muds Braking fluid Decon foam Diesel oil Varnish Keroflux Paraffin oil Castor oil Silicone oil Solvent naphta Mineral turpentine Kerosene	
	No specific material	Acetonitrile	

| | class | Alkali carbonate
Dichromates
Potassium dichromate
Caustic soda   <20%
Dibutyl phthalate
Dioctyl phthalate
Iron II chloride ($FeCl_2$)
Iron II chloride ($FeCl_3$)
Haloalkanes
Potassium soap
Potassium hydroxide <30%
Sodium bisulfate
Tetrachloroethylene
Salt water
Trichloroethylene
Water
Hydrogen peroxide   >25% | |

| Property	Resistance	Test method
Mechanic (keyboard) • Service life after imprint • Operating force • MIT folding resistance	5 million touches max. 50 N >20000 folding operations	Autotype method ASTM D2176
Mechanic (touch screen) • point activation	1 million activations at any single point	3M method
Thermal • Dimensional • Dimension stability	Max. 0.2% at 120° longitudinal Typically 0.1%	Autotype method

3   Interfaces and connection details

3.1   Display

PWR (Power):   IEC power plug

USB: USB A plug

FO 1 (Data):   terminal TX-RX
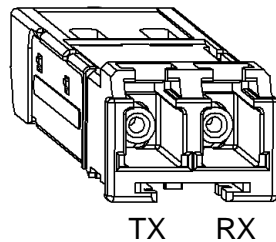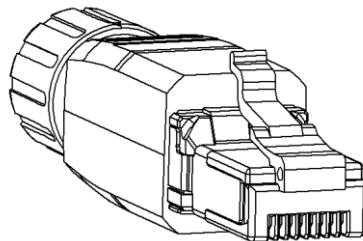

TX   RX

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):   RJ45 Data interface

1   8

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: white/blue)
terminal X0-5:   TRD2-   (typ. colour: 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

KB (Keyboard):   USB A plug, recommended cable length max. 3 m (10 ft)

M (Mouse):   USB A plug, recommended cable length max. 3 m (10 ft)

3.2   Keyboard trackball unit

KB (Keyboard):   USB A plug, recommended cable length max. 3 m (10 ft)

TBM (Trackball):   USB A plug, recommended cable length max. 3 m (10 ft)

3.3   Keyboard mouse unit

KB (Keyboard):   USB A plug, recommended cable length max. 3 m (10 ft)

M (Mouse):   USB A plug, recommended cable length max. 3 m (10 ft)

3.4   Keyboard pad unit

KB (Keyboard):   USB A plug, recommended cable length max. 3 m (10 ft)

P (Pad):   USB A plug, recommended cable length max. 3 m (10 ft)
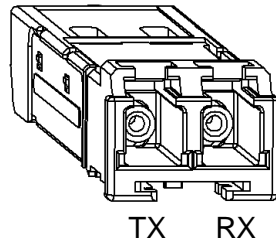
3.5   Keyboard joystick unit

KB (Keyboard):   USB A plug, recommended cable length max. 3 m (10 ft)

J (Joystick):   USB A plug, recommended cable length max. 3 m (10 ft)

3.6   Transmission unit

FO 1 (Data):   terminal TX-RX
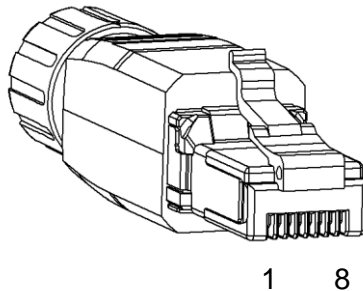

TX   RX

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):   RJ45 Data interface

1   8

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   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.

- 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 influent the performance.

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

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

4.3   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.

- 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 and non-compliance the guarantee will become void !

5   General instructions

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 GmbH.

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.

5.2   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).

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

7   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.

7.1   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.

8 Use of trademarks

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

8.1 SCREEN-TEC GmbH

SCREEN-TEC GmbH and R. STAHL HMI Systems GmbH shall be merging to form one company trading under the name of R. STAHL HMI Systems GmbH.
From June 2011 onwards, R. STAHL HMI GmbH shall assume legal succession of SCREEN-TEC GmbH.
SCREEN-TEC GmbH shall cease to exist after May 31st, 2011.

9   Declaration of EC conformity

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

STAHL

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   T-Ind
that the product   *T-Ind*
que le produit   *T-Ind*

Typ, *type, type:*

Display Unit T-Ind-##*-CAT7*
Display Unit T-Ind-##*-MM*
Display Unit T-Ind-##*-SM*
Keyboard Trackball Unit T-Ind*-KB-TB*
Keyboard Mouse Unit T-Ind*-KB-M*
Keyboard Pad Unit T-Ind*-KB-P*
Keyboard Joystick Unit T-Ind*-KB-J*
Transmission Unit T-Ind-KVM*-CAT7*
Transmission Unit T-Ind-KVM*-MM*
Transmission Unit T-Ind-KVM*-SM*

*=any alphanumeric or symbolic character
#=one numeric character

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 cette déclaration se rapporte, est conforme aux normes ou aux documents normatifs suivants

Bestimmungen der Richtlinie *Terms of the directive* *Prescription de la directive*	Nummer sowie Ausgabedatum der Norm *Number and date of issue of the standard* *Numéro ainsi que date d'émission de la norme*
2004/108/EG: EMV-Richtlinie *2004/108/EC:* *EMC Directive* *2004/108/CE:* *Directive CEM*	EN 61000-6-2: 2006 EN 61000-6-4: 2007
2006/95/EG: Niederspannungsrichtlinie *2006/95/EC:* *Low Voltage Directive* *2006/95/CE:* *Directive Basse Tension*	EN 60950-1: 2006

Köln, 01.07.2011

Ort und Datum
Place and date
Lieu et date

J. Düren
Technical Director

W. Bertges
Quality Manager

Datei: CE_T-Ind_20110701.docx

Vorlage: F058_EG-Konferklärung-HMI_20110325.docx

10 Release notes

Version 1.00.00

- First version
- Inclusion disclamer
- 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
- Inclusion data cable length DVI2 and IP
- Inclusion transmission unit T-Ind-KVM*-CAT7*
- Inclusion dimensions DVI2 and IP
- Layout and text corrections

Version 1.02.01

- Addition of data for front panel resistance

Version 1.02.02

- Notes on 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 encliosure
- Inclusion of section maintenance