Approvals and Certifications
TREX2-0045-0001 Rev 1
October 2025

AMS Trex™ Device Communicator

Approvals and Certifications

EMERSON.

Available languages

The AMS Trex Device Communicator Approvals and Certifications is available in multiple languages. See the AMS Trex website to view this guide in the following languages:

Approvals and Certifications	**(ENG)** English
Одобрения и сертификати	**(BUL)** Български (Bulgarian)
Schválení a certifikace	**(CES)** Čeština (Czech)
Godkendelser og certificeringer	**(DAN)** Dansk (Danish)
Zulassungen und Zertifizierungen	**(DEU)** Deutsch (German)
Εγκρίσεις και πιστοποιήσεις	**(ELL)** Ελληνικά (Greek)
Hyväksynnät ja sertifioinnit	**(FIN)** Suomi (Finnish)
Homologations et certifications	**(FRA)** Français (French)
Jóváhagyások és tanúsítványok	**(HUN)** Magyar (Hungarian)
Approvazioni e certificazioni	**(ITA)** Italiano (Italian)
承認および認証	**(JPN)** 日本語 (Japanese)
승인 및 인증	**(KOR)** 한국어 (Korean)
Goedkeuringen en certificeringen	**(NLD)** Nederlands (Dutch)
Godkjenninger og sertifiseringer	**(NOR)** Norsk (Norwegian)
Atesty i certyfikaty	**(POL)** Polski (Polish)
Aprovações e certificações	**(POR)** Português (Portuguese)
Aprobări și certificări	**(RON)** Română (Romanian)
Разрешения и сертификаты	**(RUS)** Русский (Russian)
Schválenia a certifikáty	**(SLK)** Slovenský (Slovak)
Aprobaciones y certificaciones	**(SPA)** Español (Spanish)
Godkännanden och certifieringar	**(SWE)** Svenska (Swedish)
批准和认证	**(ZHO)** 中文 (Chinese)

Copyright and trademark information

FOUNDATION™, HART® and *Wireless*HART® are marks of the FieldComm Group of Austin, Texas, USA.

The Bluetooth® wordmark is a registered trademark owned by the Bluetooth SIG, Inc.

The Emerson logo is a trademark and service mark of Emerson Electric Co.

All other marks are the property of their respective owners.

Notice

Important
Read this manual before working with the Trex unit. For personnel and system safety, and for optimum product performance, thoroughly understand the contents before using or servicing this product.

For equipment service needs, contact technical support.

Important
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

⚠ WARNING

If the Trex unit is used in a manner not specified by Emerson, the protection provided by the equipment may be impaired.

⚠ WARNING

Do not directly connect the ports or terminals on the Trex unit to any main line voltage.

⚠ WARNING

WARNING - POTENTIAL ELECTROSTATIC CHARGING HAZARD - SEE INSTRUCTIONS.

AVERTISSEMENT - DANGER POTENTIEL DE CHARGES ÉLECTROSTATIQUES - VOIR INSTRUCTIONS

1 Overview

This guide provides safety precautions, certification information, and hazardous area approvals for the AMS Trex Device Communicator. For more information please reference the *AMS Trex Device Communicator User Guide* on the Emerson website.

⚠ CAUTION

When the Trex unit communicates with devices, follow all standards and procedures applicable to the location. Failure to comply may result in equipment damage and/or personal injury. Understand and comply with the sections in this manual.

1.1 Precautions for AMS Trex Device Communicator

Before operating the Trex unit, ensure:

- The Trex unit is not damaged.
- The power module is securely attached.
- All screws are sufficiently tightened.
- The communication terminal recess is free of dirt and debris.
- The communication module is securely attached.

Precautions for the power module and AC adapter

Understand and follow the precautions below before using the power module or AC adapter.

- Ensure sufficient grounding. Ensure the personnel, working surfaces, and packaging are sufficiently grounded when handling electrostatically sensitive parts.
- Avoid touching the pins on the connectors or components. Discharged energy can affect the power modules.
- Protect the power module and AC adapter from moisture, and respect operating and storage temperature limits listed in the *AMS Trex Device Communicator User Guide*. The AC adapter is for indoor use only.
- Charge the power module with only the provided AC adapter. The AC adapter should not be used with other products. Failure to comply may permanently damage the Trex unit and void the IS approval and warranty.
- Do not open or modify the power module or AC adapter. There are no user-serviceable components or safety elements inside. Opening or modifying them will void the warranty and could cause personal harm.

⚠ WARNING

Do not use the AC adapter in a hazardous area environment.

⚠ WARNING

Do not install, remove, or charge the Lithium Ion (Li-ion) power module in a hazardous area environment.

Precautions for the communication module

Understand and follow the precautions below before using the Device Communication Module or the Device Communication Plus Module.

- Before you insert or remove a communication module, ensure the Trex unit is powered off.
- Ensure the personnel, working surfaces, and packaging are sufficiently grounded when handling electrostatically sensitive parts.
- Avoid touching the pins on the connectors or components. Discharged energy can affect the modules.
- When you insert/attach the communication module to the Trex unit, do not over tighten the screws. Use 0.5Nm maximum torque load.

1.2 Product support

Emerson provides a variety of ways to reach your Product Support team to get the answers you need when you need them:

Phone	Toll free 800.833.8314 (U.S. and Canada) +1.512.832.3774 (Latin America) +63.2 702.1111 (Asia Pacific, Europe, and Middle East)
Email	Guardian.GSC@Emerson.com
Web	http://www.emerson.com/en-us/contact-us

To view toll free numbers for specific countries, visit http://www.emerson.com/technicalsupport.

1.3 Product certifications

See the AMS Trex Device Communicator website for the latest certificates, declaration of conformity, and approval information.

Approved manufacturing location

R. STAHL HMI Systems GmbH - Cologne, Germany

Labels

Each Trex unit has a main unit label. An Intrinsically Safe (KL option) Trex unit has another label on the side. If the Trex unit does not have this label, it is considered non-IS approved.

Certifications and approvals

European directive information - CE compliance	
ATEX (2014/34/EU)	This equipment complies with the ATEX Directive. Applicable standards are EN IEC 60079-0:2018, IEC 60079-11:2023 Ed 7 and EN 60079-11:2012.
	Certification No. CSANe 25ATEX1027
	Ex II 2 G (1GD) Ex ia [ia Ga] [ia Da IIIC] IIC T4 Gb (Ta = -20°C < Ta < +50°C)
	CE 0158
Electro Magnetic Compatibility (EMC) 2014/30/EU	Tested to the CISPR 32 V2.0 :2015/AMD1:2019, ETSI 301489-17 V 3.2.4:2020, IEC 61000-6-1 V3.0:2016, IEC 61000-3-2 V5.0:2018/AMD1:2020/AMD2:2024, IEC 61000-3-3 V3.0:2013/ AMD1:2017/AMD2:2021 specification.
Low Voltage 2014/35/EU	Tested to the IEC 61010-1:2010, IEC 61010-1:2010/AMD1:2016, and IEC 61010-2-030:2017 specification.
RED 2014/53/EU	This equipment is in conformity with the Radio Equipment Directive (RED) Directive, ETSI EN 300328 V2.2.2:2019, and EN 18031-1:2024 standards.
Battery Regulation 2023/1542/EU	Product is compliant with EU regulation 2023/1542:2023-07 and EU 2025/1561:2025-07.
RoHS 2011/65/EU	Product is compliant with the RoHS Directive, EN IEC 63000:2018 /Exemption 7(a), 7(c)-I.

International certifications	
IECEx	Certification No. CSAE 25.0013
	Ex ia [ia Ga] [ia Da IIIC] IIC T4 Gb (Ta = -20°C < Ta < +50°C)

North American certifications	
Canadian Standards Association - cCSAus	Certification No. 25CA80222871
	Class I, Division 1, Groups A, B, C, D, T4. Class 1, Zone 1 AEx ia [ia Ga] [ia Da IIIC] IIC T4 Gb

North American certifications	
CSA	Certification No. 25CA80222871
	Ex ia [ia Ga] [ia Da IIIC] IIC T4 Gb

1.4 Hazardous areas

A Trex unit that meets the Intrinsic Safety requirements (IS-approved) can be used in Zone 1, or Zone 2, for Group IIC, and Class I, Division 1 and Division 2, Groups A, B, C, and D locations.

An IS-approved Trex unit may be connected to loops or segments that are attached to equipment located in Zone 0, Zone 1, Zone 2, for Group IIC; Zone 20, Zone 21, Zone 22, and Class I, Division 1 and Division 2, Groups A, B, C, and D locations.

An IS-approved Trex unit can be ordered by selecting the KL option. The Trex unit has a label that lists the approvals.

⚠ WARNING

Explosions can result in serious injury or death.

Use in an explosive environment must be in accordance with the appropriate local, national, and international standards, codes, and practices. Please review the Technical specifications and Product certifications sections of the *AMS Trex Device Communicator User Guide* for any restrictions associated with safe use.

Electrical shock can result in serious injury or death.

1.5 Intrinsically Safe electrical parameters

Table 1: Device Communication Module

	FOUNDATION™ fieldbus (non-FISCO)	FOUNDATION™ fieldbus (FISCO)	HART®
	FF + and -	FF + and -	HART + and -
Ui	30 Vdc	30 Vdc	30 Vdc
Ii	380 mA	215 mA (IIC) 380 mA (IIB)	200 mA
Pi	1.3 W	1.9 W (IIC) 5.3 W (IIB)	1.0 W
Ci	0	0	0
Li	0	0	0

	FOUNDATION™ fieldbus (non-FISCO)	FOUNDATION™ fieldbus (FISCO)	HART®
	FF + and -	FF + and -	HART + and -
Uo	1.89 Vdc	1.89 Vdc	1.89 Vdc
Io	1.91 µA	1.91 µA	19.1 µA
Po	3.61 µW	3.61 µW	36.1 µW
Co	14.3 µF	14.3 µF	14.3 µF
Lo	100 mH	100 mH	100 mH

Table 2: Device Communication Plus Module

	mA interface	FOUNDATION™ fieldbus (non-FISCO)		HART®		FOUNDATION™ fieldbus (FISCO)	
	mA	FF pwr and F-	FF + and -	HART + pwr	HART + and -	FF pwr and F -	FF + and -
Ui	30 Vdc	17.5 Vdc	30 Vdc	30 Vdc	30 Vdc	17.5 Vdc	30 Vdc
Ii	200 mA	380 mA	380 mA	200 mA	200 mA	380 mA	215 mA (IIC) 380 mA (IIB)
Pi	1.0 W	1.3 W	1.3 W	1.0 W	1.0 W	1.3 W	1.9 W (IIC) 5.3 W (IIB)
Ci	0	20.5 nF	0	0	0	20.5 nF	0
Li	0	0	0	0	0	0	0
Uo	0.09 Vdc	17.44 V	1.89 V	28.35 Vdc	1.89 Vdc	17.44 V	1.89 V
Io	14.63 mA	153 mA	1.91 µA	68.1 mA	19.1 µA	153 mA	1.91 µA
Po	1.28 mW	1.73 W	3.61 µW	0.78 W	36.1 µW	1.73 W	3.61 µW
Co	-	See table 3	14.3 µF	See table 4	14.3 µF	See table 3	14.3 µF
Lo	-	See table 3	100 mH	See table 4	100 mH	See table 3	100 mH

Table 3: Co and Lo values for FF pwr and F-			
Co [nf]	249.5	318.5	318.5
Lo [µH]	100	50	30

Table 4: Co and Lo values for HART + pwr				
Co [nf]	56	62	71	79
Lo [µH]	1000	750	500	100

1.6 AC adapter approvals

The following AC adapter has been approved for use with AMS Trex: TREX-0003-0003.

Approvals

cUL North America, TUV GS Europe, Japan PSE, IRAM Argentina, Kazakhstan EAC, South Africa SANS IEC 60 950, China CCC, Korea KC, Taiwan BSMI, UKCA

WEEE 2012/19/EU, RoHS (2011/65/EU)

1.7 AMS Trex Device Communicator Control Drawings

See the AMS Trex Device Communicator website at http://www.emerson.com/Trex to view the latest full-size control drawings.

TREX2 DEVICE COMMUNICATOR

Control Drawing / Safety instructions

The TREX2 Device Communicator is a handheld, battery-powered, intrinsically safe, portable maintenance tool, typically for use in a process plant.

Trex Device Communicator communication module:

- HART
- FOUNDATION Fieldbus (FISCO and non-F ISCO)

Trex Device Communicator Plus communication module:

- HART
- FOUNDATION Fieldbus (FISCO and non-F ISCO)
- mAMeter

MAIN MARKING

MARQUAGE PRINCIPALE

Install in accordance with Control Drawing 14530004
Installer selon le dessin de control nr.: 14530004
R. STAHL HMI Systems GmbH, Cologne / Germany
-20°C ≤ Ta ≤ +50°C

ATEX: CSANe 25ATEX1027
CE0158 Ex II 2G (1GD) Ex ia [ia Ga] [ia Da IIIC] IIC T4 Gb

IECEx: IECEx CSAE 25.0013
Ex ia [ia Ga] [ia Da IIIC] IIC T4 Gb

25CA80222871

CSAus ZONE MARKINGS
CLASS I, Zone 1, AEx ia [ia Ga] [ia Da IIIC] IIC T4 Gb

cCSA- ZONE MARKINGS
Ex ia [ia Ga] [ia Da IIIC] IIC T4 Gb

cCSAus DIVISION EQUIVALENCY MARKINGS
CLASS I, DIVISION 1, GROUPS A,B,C,D T4

WARNINGS:

- DO NOT USE THE USB CONNECTOR IN HAZARDOUS LOCATIONS
- INSTALL, CHARGE, OR REMOVE THE POWER MODULE ONLY IN NONHAZARDOUS LOCATIONS
- ADDITION OR SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY
- BEFORE CONNECTING FFpwr; DISCONNECT ALL FURTHER POWER SUPPLIES AND TERMINATORS
- CONNECT THE TREX DEVICE COMMUNICATOR ACCORDING TO THE SCHEMES IN THE CONTROL DRAWING
- POTENTIAL ELECTROSTATIC CHARGING HAZARD! DEVICE MUST BE PROTECTED AGAINST HIGH ELECTROSTATIC CHARGE! CLEAN ONLY WITH DAMP CLOTH!

VERTISSEMENTS:

- NE JAMAIS UTILISIER LE CONNECTEUR USB DANS DES ZONES À RISQUE D'EXPLOSION
- N'INSTALLEZ, NE CHARGEZ OU NE RETIREZ LE MODULE D'ALIMENTATION UNIQUEMENT EN DEHORS DES ZONES À RISQUE D'EXPLOSION
- L'AJOUT OU LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SÉCURITÉ INTRINSÈQUE
- AVANT DE CONNECTER Ffpwr, DÉCONNECTER D'ABORD TOUTES LES ALIMENTATIONS ET LES DISPOSITIFS DE TERMINAISON
- RACCORDER CET APPAREIL TREX DEVICE CONNUNICATOR SELON LE PLAN FOURNI
- DANGER POTENTEIL DE CHARGES ÉLECTROSTATIQUES! L'APPAREIL DOIT ÊTRE PROTÉGÉ PAR CONTRE LES CHARGES ÉLECTROSTATIQUES ÉLEVÉES ! NETTOYER UNIQUEMENT AVEC UN TISSU HUMIDE!

SECURITY ADVICES (NOTES)

CONSEILS DE SÉCURITÉ (NOTES)

1. No revision to drawing prior to certification body.
Aucune révision du dessin avant l'envoi à l'organisme de certification.

2. The Associated Apparatus must be NRTL approved in accordance to IEC 60079-11.
L'appareil associé doit être certifié NRTL conformément à la norme CEI 60079-11.

3. Manufacturer's installation drawing must be followed when installing associated apparatus.
Le plan d'installation du fabricant doit être respecté lors de l'installation de l'appareil associé.

4. Selected intrinsically safe equipment must be third party listed as intrinsically safe for the application, and have intrinsically safe entity parameters conforming with Table A1 below. When used in a Division area, the intrinsically safe equipment may be replaced with non-incendive field wiring apparatus having the same electrical rating.

L'équipement de sécurité intrinsèque sélectionné doit être répertorié par un tiers comme étant de sécurité intrinsèque pour l'application, et avoir des paramètres d'entité de sécurité intrinsèque conformes au tableau A1 ci-dessous. Lorsqu'ils sont utilisés dans des divisions dangereuses, les équipements à sécurité intrinsèque peuvent être remplacés par des appareils NI ayant les mêmes paramètres électriques.

Table A1
Tableau A1

Intrinsically safe equipment or Nonincondive equipment *Appareil à sécurité intrinsèque ou bien Equipement non-incendive*		*Associated Aparatus Appareil associé*
Ui (or Vmax)	≥	Uo (or Voc)
Ii (or Imax)	≥	Io (or Isc)
Pi	≥	Po
Ci + Ccable	≤	Co (or Ca)
Li + Lcable	≤	Lo (or La)

5. FOR USA: Installation should be in accordance with ANSI/ISA RP12.06.01 "Installation of Intrinsically safe systems for Hazardous (classified) Locations" and the National Electrical Code (ANSI/NFPA 70)
Pour les USA: l'installation doit être conforme aux réglementations électriques du ANSI/ISA RP12.06.01 « Installation de systèmes à sécurité intrinsèque pour les emplacements dangereux (classés)» et au National Electrical Code (ANSI/NFPA 70).
For CANADA: Installation should be in accordance with Canadian Electrical Code CSA 22.1, Part 1.
Pour le CANADA : L'installation doit être conforme au code canadien de l'électricité CSA 22.1, partie 1.

Calculation of cable length:

A. Determination of maximum possible capacitance of cable:
Cmax = Co - Ci (associated apparatus)
B. Determination of maximum possible inductance of cable:
Lmax = Lo - Li (associated apparatus)
C. Determination of maximum possible cable length by capacitance and inductance of cable:
length C = Cmax / Ccable (*1)
length L = Lmax / Lcable (*1)
D. Determination of maximum length of cable:
length C or lenght L, whatever is less.

(*1) when cable parameters are unknown, the following values may be used:
Ccable = 60 pF/ft. (200 pF/m)
Lcable = 1 µH/m for ATEX / IECEx.
Lcable = 0.2 µH/ft. (0.66 µH/m) for NEC® /CE Code

Type code:

TREX2 followed by numbers and / or letters

TREX2-abcde

a = Communication Module
C=TREX2 Device communication
L= TREX2 Device communication Plus
D=Reserved for the complete TREX2 device assembly
For further details, see the marking on the communication module label
0=None

b = Power Module type
P=Rechargeable Li-Ion Power Module Rev. 04 (new cell)
0=None

c = Product Certification:
KL=ATEX, **c**CSA and CSA**us**, IECEx Intrinsically Safe (includes FISCO as applicable)
NA=None (Used for individual modules that are not Ex-certified as a stand-alone device, as well as for use of the complete TREX2 device in non-hazardous areas)

d = Radio options
W=Wifi and/or Bluetooth for TREX2
9=None for TREX2
M=Reserved for the complete TREX2 device assembly
For further details, see the marking on the Display and CPU module label

e = Options
*=any alphanumeric or symbolic characters, not relevant for hazardous area certification

LIST OF STANDARDS

See certificate.

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS [inches]

Rev.	Modification	Date	Drawn	Checked
01	Adjust table names and Io, Po values, warning	24.06.2025	BEN	JN

R. STAHL HMI Systems GmbH
Cologne - Germany
www.r-stahl.com

SCALE: 1:1 | MAT.-NO.:- | Date 2025.02.12 | Drawn Nabil Benighil | Checked A. Jung

DRAWING NO. TITLE
14530004 Rev01 TREX2 Device communicator IS Control drawing_Safety instructions

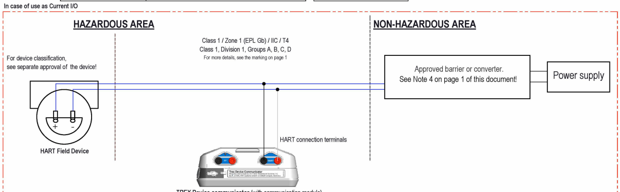
WEIGHT: SURFACE: A3 SHEET 1 OF 15

TABLE 1- CSA ENTITY PARAMETERS for **HART interface** with the TREX2 Device communicator - communication module

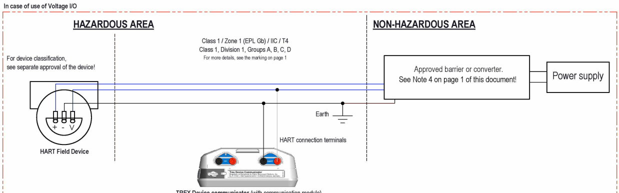
Input parameters		Output parameters
Ui (or Vmax) = 30 Vdc	Vt or Voc of loop must be ≤ 30 Vdc	Uo (or Voc) = 1,89 Vdc
Ii (or Imax) = 200 mA	It or Isc of loop must be ≤ 200 mA	Io (or Isc) = 19,1 µA
Pi (or Pmax) = 1 W		Po = 36,1 µW
Ci = 0 µF	Device does not add capacitance to loop	Co (or Ca) = 14,3 µF
Li = 0 mH	Device does not add inductance to loop	Lo (or La) = 100 mH

See security advices on page 1 of this document
Voir les conseils en matière de sécurité à la page 1 du présent document.

In case of use as Current I/O



In case of use of Voltage I/O



UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS [inches]

Rev.	Modification	Date	Drawn	Checked
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SCALE: 1:1 | MAT.-NO.:- | Date 2025.02.12 | Drawn Nabil Benighil | Checked A. Jung

DRAWING NO. TITLE
14530004 Rev01 TREX2 Device communicator IS Control drawing_Safety instructions

WEIGHT: SURFACE: A3 SHEET 2 OF 15

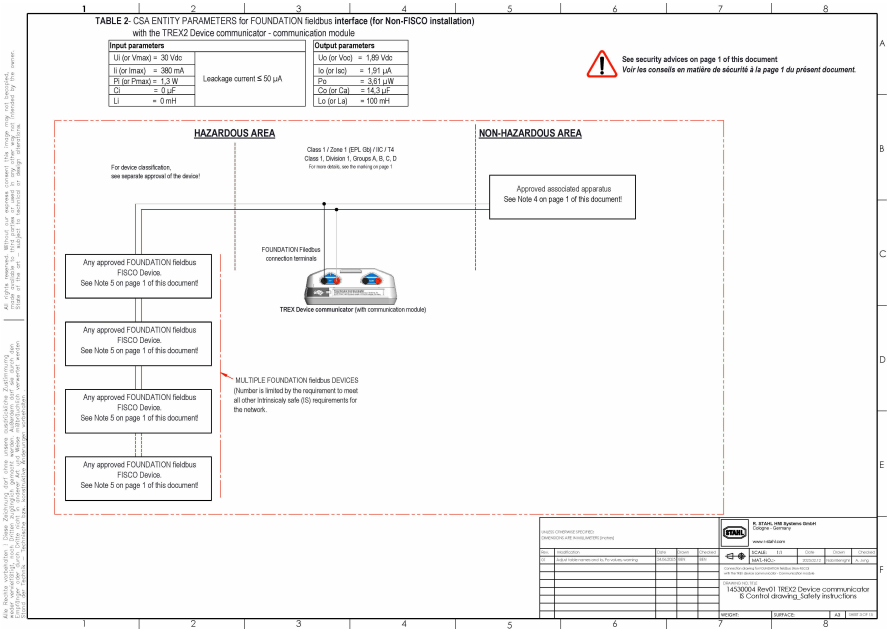
TABLE 2- CSA ENTITY PARAMETERS for FOUNDATION fieldbus interface (for Non-FISCO installation)
with the TREX2 Device communicator - communication module
Input parameters
Ui (or Vmax) = 30 Vdc
Ii (or Imax) = 380 mA
Pi (or Pmax) = 1,3 W
Ci = 0 µF
Li = 0 mH
Leakage current ≤ 50 µA
Output parameters
Uo (or Voc) = 1,89 Vdc
Io (or Isc) = 1,91 µA
Po = 3,61 µW
Co (or Ca) = 14,3 µF
Lo (or La) = 100 mH
See security advices on page 1 of this document
Voir les conseils en matière de sécurité à la page 1 du présent document.
HAZARDOUS AREA
NON-HAZARDOUS AREA
Class 1 / Zone 1 (EPL Gb) / IIC / T4
Class 1, Division 1, Groups A, B, C, D
For more details, see the marking on page 1
For device classification,
see separate approval of the device!
Approved associated apparatus
See Note 4 on page 1 of this document!
FOUNDATION Fieldbus
connection terminals
TREX Device communicator (with communication module)
Any approved FOUNDATION fieldbus
FISCO Device.
See Note 5 on page 1 of this document
MULTIPLE FOUNDATION fieldbus DEVICES
(Number is limited by the requirement to meet
all other Intrinsically safe (IS) requirements for
the network.
R. STAHL HMI Systems GmbH
Cologne - Germany
www.r-stahl.com
14530004 Rev01 TREX2 Device communicator
& Control drawing_Safety instructions

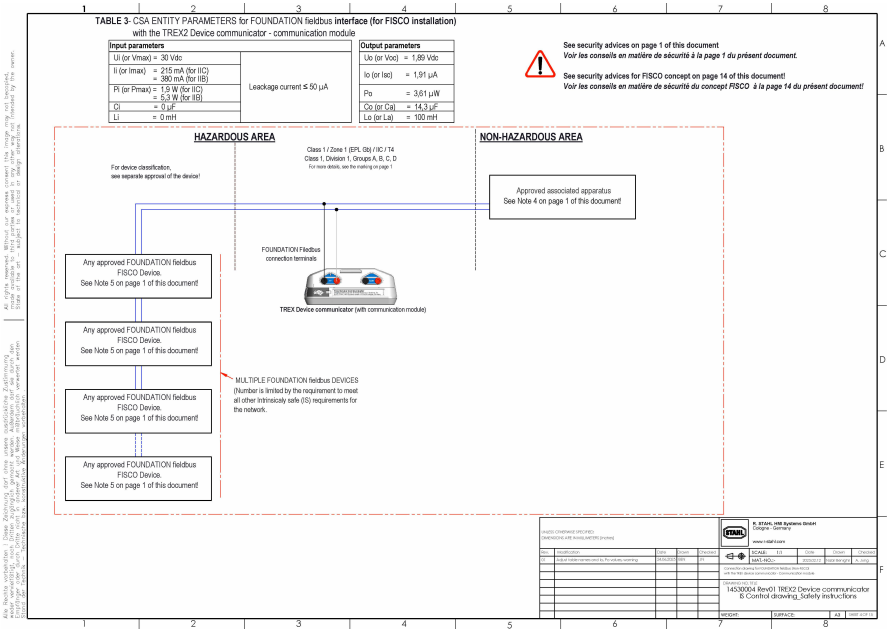
TABLE 3- CSA ENTITY PARAMETERS for FOUNDATION fieldbus interface (for FISCO installation)
with the TREX2 Device communicator - communication module
Input parameters
Ui (or Vmax) = 30 Vdc
Ii (or Imax) = 215 mA (for IIC)
= 380 mA (for IIB)
Pi (or Pmax) = 1,9 W (for IIC)
= 5,3 W (for IIB)
Ci = 0 µF
Li = 0 mH
Leakage current ≤ 50 µA
Output parameters
Uo (or Voc) = 1,89 Vdc
Io (or Isc) = 1,91 µA
Po = 3,61 µW
Co (or Ca) = 14,3 µF
Lo (or La) = 100 mH
See security advices on page 1 of this document
Voir les conseils en matière de sécurité à la page 1 du présent document.
See security advices for FISCO concept on page 14 of this document!
Voir les conseils en matière de sécurité du concept FISCO à la page 14 du présent document!
HAZARDOUS AREA
NON-HAZARDOUS AREA
Class 1 / Zone 1 (EPL Gb) / IIC / T4
Class 1, Division 1, Groups A, B, C, D
For more details, see the marking on page 1
For device classification,
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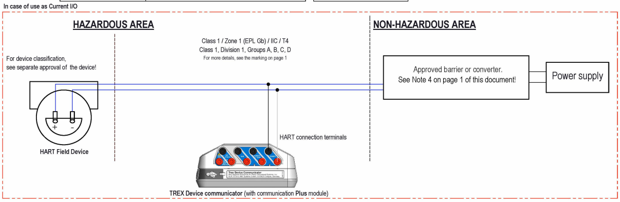
FOUNDATION Fieldbus
connection terminals
TREX Device communicator (with communication module)
Any approved FOUNDATION fieldbus
FISCO Device.
See Note 5 on page 1 of this document
MULTIPLE FOUNDATION fieldbus DEVICES
(Number is limited by the requirement to meet
all other Intrinsically safe (IS) requirements for
the network.
R. STAHL HMI Systems GmbH
Cologne - Germany
www.r-stahl.com
14530004 Rev01 TREX2 Device communicator
& Control drawing_Safety instructions

TABLE 4- CSA ENTITY PARAMETERS for **HART interface**
with the TREX2 Device communicator - communication **Plus** module

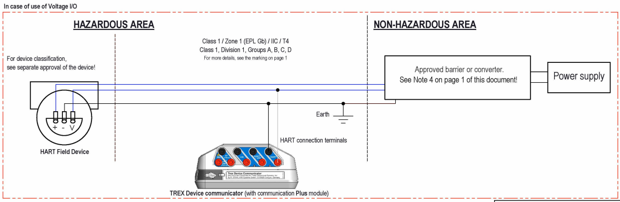
Input parameters			Output parameters
Ui (or Vmax) = 30 Vdc	Vt or Voc of loop must be ≤ 30 Vdc		Uo (or Voc) = 1,89 Vdc
Ii (or Imax) = 200 mA	It or Isc of loop must be ≤ 200 mA		Io (or Isc) = 19,1 µA
Pi (or Pmax) = 1 W			Po = 36,1 µW
Ci = 0 µF	Device does not add capacitance to loop		Co (or Ca) = 14,3 µF
Li = 0 mH	Device does not add inductance to loop		Lo (or La) = 100 mH

See security advices on page 1 of this document
Voir les conseils en matière de sécurité à la page 1 du présent document.

In case of use as Current I/O



In case of use of Voltage I/O



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Connection drawing for HART
with the TREX device communicator - Communication Plus module

DRAWING NO. TITLE
14530004 Rev01 TREX2 Device communicator
IS Control drawing_Safety instructions

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TABLE 5- CSA ENTITY PARAMETERS for **HART+pwr interface**
with the TREX2 Device communicator - communication **Plus** module

Input parameters		Output parameters			
Ui (or Vmax) = 30 Vdc	Vt or Voc of loop must be ≤ 30 Vdc	Uo (or Voc) = 28,35 Vdc			
Ii (or Imax) = 200 mA	It or Isc of loop must be ≤ 200 mA	Io (or Isc) = 68,1 mA			
Pi (or Pmax) = 1 W		Po = 0,78 W			
Ci = 0 µF	Device does not add capacitance to loop	Co (or Ca) = 56 nF	62 nF	71 nF	79 nF
Li = 0 mH	Device does not add inductance to loop	Lo (or La) = 1000 µH	750 µH	500 µH	100 µH

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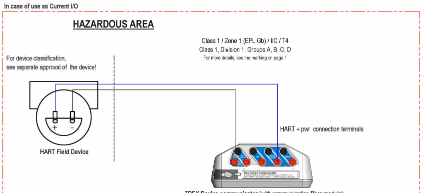
In case of use as Current I/O



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Connection drawing for HART
with the TREX device communicator - Communication Plus module and internal power supply

DRAWING NO. TITLE
14530004 Rev01 TREX2 Device communicator
IS Control drawing_Safety instructions

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TABLE 6- CSA ENTITY PARAMETERS for **mA Meter interface**
with the TREX2 Device communicator - communication **Plus** module

Input parameters		Output parameters
Ui (or Vmax) = 30 Vdc	Vt or Voc of loop must be ≤ 30 Vdc	Uo (or Voc) = 0,09 Vdc
Ii (or Imax) = 200 mA	It or Isc of loop must be ≤ 200 mA	Io (or Isc) = 14,63 mA
Pi (or Pmax) = 1 W		Po = 1,28 mW
Ci = 0 µF	Device does not add capacitance to loop	Co (or Ca) = -
Li = 0 mH	Device does not add inductance to loop	Lo (or La) = -

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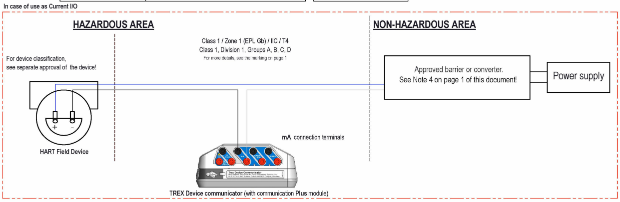
In case of use as Current I/O



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					Connection drawing for mA terminals with the TREX device communicator - Communication Plus module
					DRAWING NO. TITLE: 14530004 Rev01 TREX2 Device communicator IS Control drawing_Safety instructions
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TABLE 7- CSA ENTITY PARAMETERS for **mA Meter interface**
with the TREX2 Device communicator - communication **Plus** module

Input parameters		Output parameters
Ui (or Vmax) = 30 Vdc	Vt or Voc of loop must be ≤ 30 Vdc	Uo (or Voc) = 0,09 Vdc
Ii (or Imax) = 200 mA	It or Isc of loop must be ≤ 200 mA	Io (or Isc) = 14,63 mA
Pi (or Pmax) = 1 W		Po = 1,28 mW
Ci = 0 µF	Device does not add capacitance to loop	Co (or Ca) = -
Li = 0 mH	Device does not add inductance to loop	Lo (or La) = -

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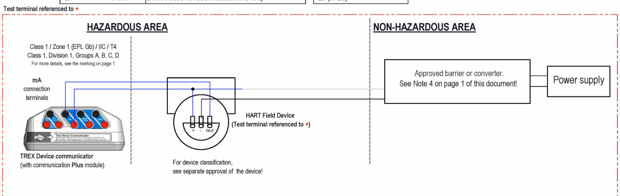
Test terminal referenced to +



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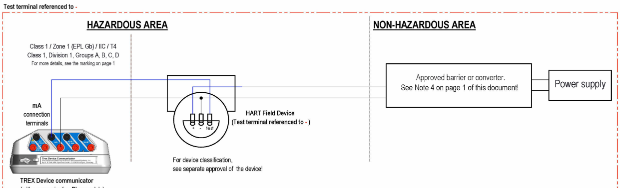

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					Connection drawing for mA terminals with the TREX device communicator - Communication Plus module
					DRAWING NO. TITLE: 14530004 Rev01 TREX2 Device communicator IS Control drawing_Safety instructions
					WEIGHT: · SURFACE: · A3 · SHEET 8 OF 15

TABLE 8- CSA ENTITY PARAMETERS for **mA Meter interface with HART** with the TREX2 Device communicator - communication **Plus** module

Input parameters		Output parameters
Ui (or Vmax) = 30 Vdc	Vt or Voc of loop must be ≤ 30 Vdc	Uo (or Voc) = 1,89 Vdc
Ii (or Imax) = 200 mA	It or Isc of loop must be ≤ 200 mA	Io (or Isc) = 14,64 mA
Pi (or Pmax) = 1 W		Po = 1,31 mW
Ci = 0 µF	Device does not add capacitance to loop	Co (or Ca) = 14,3 µF
Li = 0 mH	Device does not add inductance to loop	Lo (or La) = 100 mH

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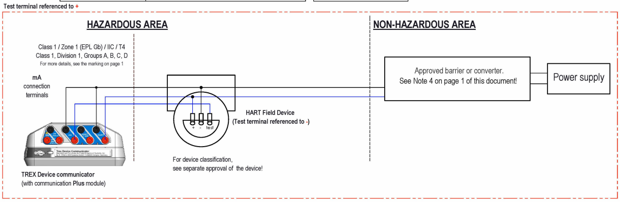
Voir les conseils en matière de sécurité à la page 1 du présent document.

Test terminal referenced to +



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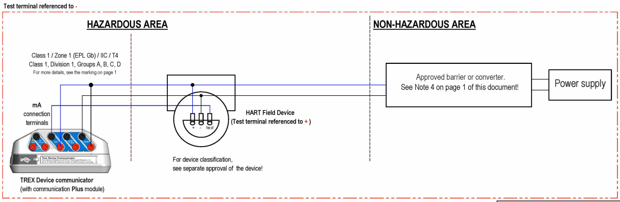

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Connection drawing for mA terminals with the TREX device communicator - Communication Plus module

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TABLE 9- CSA ENTITY PARAMETERS for **mA Meter interface with HART** with the TREX2 Device communicator - communication **Plus** module

Input parameters		Output parameters
Ui (or Vmax) = 30 Vdc	Vt or Voc of loop must be ≤ 30 Vdc	Uo (or Voc) = 1,89 Vdc
Ii (or Imax) = 200 mA	It or Isc of loop must be ≤ 200 mA	Io (or Isc) = 14,64 mA
Pi (or Pmax) = 1 W		Po = 1,31 mW
Ci = 0 µF	Device does not add capacitance to loop	Co (or Ca) = 14,3 µF
Li = 0 mH	Device does not add inductance to loop	Lo (or La) = 100 mH

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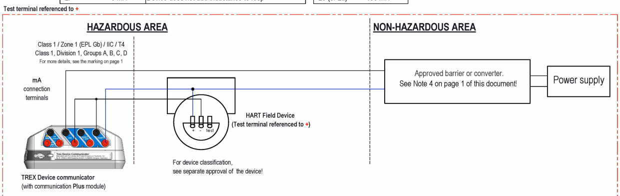
Test terminal referenced to +



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Connection drawing for mA terminals with the TREX device communicator - Communication Plus module

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TABLE 10- CSA ENTITY PARAMETERS for FOUNDATION fieldbus **interface (for Non-FISCO installation)**
with the TREX2 Device communicator - communication **Plus** module

Input parameters		Output parameters
Ui (or Vmax) = 30 Vdc	Leackage current ≤ 50 µA	Uo (or Voc) = 1,89 Vdc
Ii (or Imax) = 380 mA		Io (or Isc) = 1,91 µA
Pi (or Pmax) = 1,3 W		Po = 3,61 µW
Ci = 0 µF		Co (or Ca) = 14,3 µF
Li = 0 mH		Lo (or La) = 100 mH

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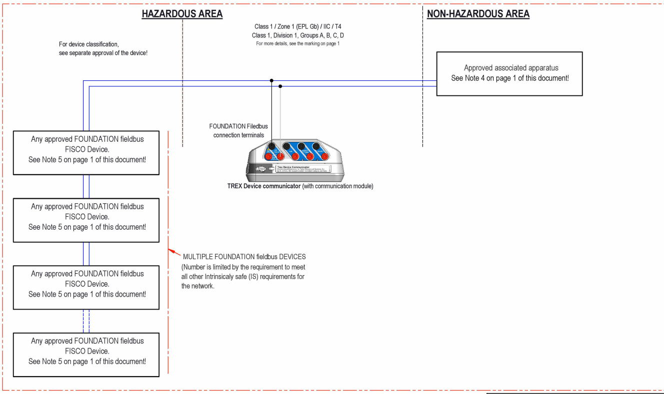

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Connection drawing for FOUNDATION fieldbus (Non-FISCO)
with the TREX device communicator - Communication Plus module

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14530004 Rev01 TREX2 Device communicator
IS Control drawing_Safety instructions

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TABLE 11- CSA ENTITY PARAMETERS for FOUNDATION fieldbus **interface (for FISCO installation)**
with the TREX2 Device communicator - communication **Plus** module

Input parameters		Output parameters
Ui (or Vmax) = 30 Vdc	Leackage current ≤ 50 µA	Uo (or Voc) = 1,89 Vdc
Ii (or Imax) = 215 mA (for IIC) = 380 mA (for IIB)		Io (or Isc) = 1,91 µA
Pi (or Pmax) = 1,9 W (for IIC) = 5,3 W (for IIB)		Po = 3,61 µW
Ci = 0 µF		Co (or Ca) = 14,3 µF
Li = 0 mH		Lo (or La) = 100 mH

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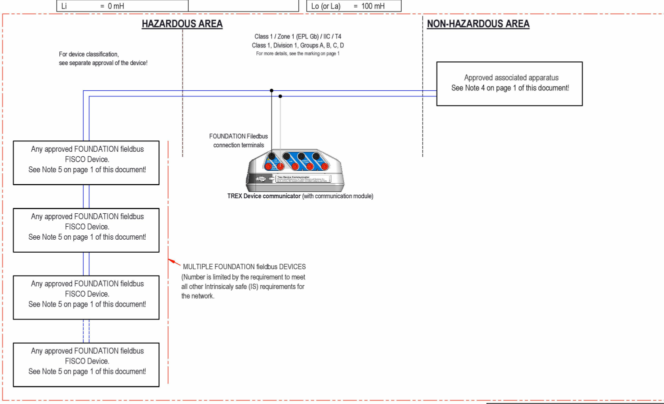
Voir les conseils en matière de sécurité à la page 1 du présent document.

See security advices for FISCO concept on page 14 of this document!
Voir les conseils en matière de sécurité du concept FISCO à la page 14 du présent document!



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Connection drawing for FOUNDATION fieldbus (FISCO)
with the TREX device communicator - Communication Plus module

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14530004 Rev01 TREX2 Device communicator
IS Control drawing_Safety instructions

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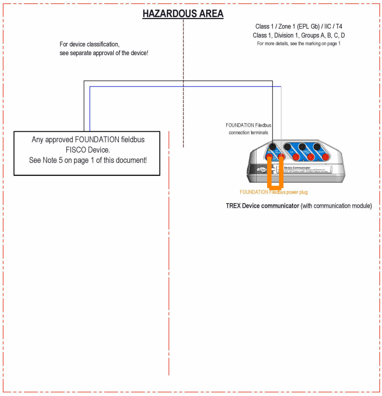
TABLE 12- CSA ENTITY PARAMETERS for FOUNDATION fieldbus **interface (for FISCO and Non-FISCO installation)** with internal power supply and TREX2 Device communicator - communication **Plus** module

Input parameters	
Ui (or Vmax) = 17,5 Vdc	Leackage current ≤ 50 µA
Ii (or Imax) = 380 mA	
Pi (or Pmax) = 1,3 W	
Ci = 20,5 nF	
Li = 0 mH	

Output parameters		
Uo (or Voc) = 17,44 Vdc		
Io (or Isc) = 153 mA		
Po = 1,73 W		
Co (or Ca) = 249,5 nF	318,5 nF	318,5nF
Lo (or La) = 100 µH	50µH	30µH



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See secutity advices for FISCO concept on page 14 of this document!
Voir les conseils en matière de sécurité du concept FISCO à la page 14 du présent document!

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Connection drawing for FOUNDATION fieldbus (FISCO and Non FISCO installation) with the TREX device communicator - Communication Plus module and internal power supply

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FISCO CONCEPT

THE FISCO CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS TO ASSOCIATED APPARATUS NOT SPECIALLY EXAMINED IN SUCH COMBINATION. THE CRITERIA FOR INTERCONNECTION IS THAT THE VOLTAGE (Ui OR Vmax), THE CURRENT (Ii OR Imax) AND THE POWER (Pi OR Pmax) WHICH AN INTRINSICALLY SAFE APPARATUS CAN RECEIVE AND REMAIN INTRINSICALLY SAFE CONSIDERING FAULTS, MUST BE EQUAL OR GREATER THAN VOLTAGE (Uo, Voc OR Vt), THE CURRENT (Io, Isc OR It) AND THE POWER (Po OR Pmax) LEVELS WHICH CAN BE DELIVERED BY THE ASSOCIATED APPARATUS, CONSIDERING FAULTS AND APPLICABLE FACTORS. IN ADDITION, THE MAXIMUM UNPROTECTED CAPACITANCE (Ci) AND THE INDUCTANCE (Li) OF EACH APPARATUS (OTHER THAN THE TERMINATION) CONNECTED TO THE FIELDBUS MUST BE LESS THAN OR EQUAL TO 5 nF and 10 uH RESPECTIVELY.

IN EACH SEGMENT ONLY ONE ACTIVE DEVICE, NORMALLY THE ASSOCIATED APPARATUS, IS ALLOWED TO PROVIDE THE NECESSARY ENERGY FOR THE FIELDBUS SYSTEM. THE VOLTAGE

Uo (OR Voc OR Vt) OF THE ASSOCIATED APPARATUS IS LIMITED TO A RANGE OF 14 V TO 24 Vdc ALL OTHER EQUIPMENT CONNECTED TO THE BUS CABLE HAS TO BE PASSIVE, MEANING THAT THEY ARE NOT ALLOWED TO PROVIDE ENERGY TO THE SYSTEM, EXCEPT A LEAKAGE CURRENT OF 50uA FOR EACH CONNECTED DEVICE. SEPARATELY POWERED EQUIPMENT NEEDS GALVANIC ISOLATION TO ASSURE THAT THE INTRINSICALLY SAFE FIELDBUS CIRCUIT REMAINS PASSIVE.

THE CABLE USED TO INTERCONNECT DEVICES NEEDS TO HAVE THE PARAMETERS IN THE FOLLOWING RANGE:

- Loop Resistance R': 15... 150 Ohm/km
- Inductance per unit length L': 0.4... 1 mH/km
- Capacitance per unit length C': 80... 200 nF/km
- C' = C' line/line + 0.5C' line/screen, if both lines are floating, or
- C' = C' line/line + C' line/screen, if the screen is connected to one line
- Length of trunk cable: less than or equal to 1000m
- Length of spur cable: less than or equal to 30m
- Length of spur splice: less than or equal to 1m

AT EACH END OF THE TRUNK CABLE AN APPROVED INFALLIBLE LINE TERMINATION WITH THE FOLLOWING PARAMETERS IS SUITABLE:

- R = 90... 100 Ohm
- C = 0... 2.2 uF

ONE OF THE ALLOWED TERMINATIONS MIGHT ALREADY BE INTEGRATED IN THE ASSOCIATED APPARATUS. THE NUMBER OF PASSIVE APPARATUS CONNECTED TO THE BUS SEGMENT IS NOT

LIMITED DUE TO I.S. REASONS. IF THE ABOVE RULES ARE RESPECTED, UP TO A TOTAL LENGTH OF 1000 m (SUM OF TRUNK AND ALL SPUR CABLES) OF CABLE IS PERMITED.

THE INDUCTANCE AND THE CAPACITANCE OF THE CABLE WILL NOT IMPAIR THE INTRINSIC SAFETY OF THE INSTALLATION.

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FISCO CONCEPT

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Details and instructions:

- The TREX2 Device Communicator is a handheld, battery-powered, intrinsically safe, portable maintenance tool, typically for use in a process plant. It supports multiple communication protocols including HART® and FOUNDATION(TM) Fieldbus™.
  The device consists of 3 main modules:
    <u>Display and CPU module</u>: A module that mainly contains the display, the motherboard with IS circuits and CPU and the PCBs for the front-panel keypads, plus an optional WLAN/Bluetooth module.
    <u>Communication module</u>: A communication and measurement module containing various PCBs in different options
    <u>Power module</u>: A power supply module containing the batteries and the PCBs controlling charging and discharging

- This device is maufactured by R. STAHL HMI Systems GmbH (www.r-stahl.com) for EMERSON (www.emerson.com)
- Any repairs must always be carried out by the manufacturer or an authorized service center (www.emerson.com) .
- System maintenance should focus on the following: Seal wear. Damage to front screen / glass. All screws are tightened properly. All cables and lines are properly connected and undamaged.
- Only appropriate tools must be used for the installation.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

- Before you insert or remove the different modules, ensure that the TREX2 unit is powered off.
- Ensure sufficient grounding. Ensure the personnel, working surfaces, and packaging are sufficiently grounded when handling electrostatically sensitive parts.
- Avoid touching the pins on the connectors or components. Discharged energy canaffect the modules.
- When you insert/attach the different modules to the Trex unit, do not over tighten the screws. Use 0.5Nm maximum torque load.
- Remove the USB cable from the TREX2 unit before connecting to a device.

- The TREX2 may only be operated in an undamaged, dry and clean condition! Any damage may compromise the explosion protection!
- Keep unit free of decontaminations. Use suitable cleaning agents for cleaning. Do not use aggressive or abrasive agents.

- The 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 device has to be installed in such a way that mechanical effects (pulling forces) on the cables are excluded. The cable has to be fixed and effectively protected against damage.

- Ambient rating -20°C≤Ta≤+50°C at place of installation. Rel. humidity 90% at 40 °C without condensation. Altitude up to 2000m above sea level..
- The equipment is inteded for installation in an area providing at least pollution degree 2, as defined in IEC 60664-1.
- Specification of the Overvoltage Category: II
- Using whith external power source with limited energy:
  The equipment shall be supplied by a Limited Power Source or Class 2 output in accordance with CEC Part 1, Rule 16-200 and NFPA 70, Article 725.121.
- Environmental conditions for instatllation regarding NEC® / CE Code: Indoor use dry location. The device TREX2 is not intended for permanent outdoor use.
- This associated apparatus may also be connected to simple apparatus as defined in the National Electrical Code (ANSI/NFPA 70), or other local codes, as applicable.
- Intrinsically safe circuits must be wired and separated in accordance with Article 504.20 of the National Electrical Code (ANSI/NFPA 70) or other local codes, as applicable.
- When installed with cable, this device shall be installed in areas where the cables has been deemed suitable for the locals as defined in the NEC® /CE Code.
- FOR USA: All circuits must be wired using the National Electric Code NFPA 70 or other local codes for installation within the United States.
- FOR Canada: All circuits must be wired as specified in the Canadian Electric Code or other local codes for installation within Canada.

Condition of use:
The Trex Device Communicator shall only be charged in a non-hazardous location with suitable environmental control, using a charger specifically supplied for use with the unit.
The following type only has been approved for use to charge the Trex Device Communicator (in nonhazardous areas):
    Type PSDx-y0-XX manufactured by Powersolve Electronics Ltd, Type PA65PD-1504000 by Powersolve Electronics Ltd.

The charging locations shall provide pollution degree 2 or 1 environment, and the ambient temperature during charging shall be in the range 0ºC to 35ºC.

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