

# AMS Trex™ Device Communicator

## Approvals and Certifications



### Copyright and trademark information

©2022 Emerson. All rights reserved.

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

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 personal and system safety, and for optimum product performance, thoroughly understand the contents before using or servicing this product.

For equipment service needs, contact the nearest product representative.

---

#### 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

---

---

### Contents

AMS Trex Device Communicator overview..... 3

# 1 AMS Trex Device Communicator overview

The Trex unit supports HART® and FOUNDATION™ fieldbus devices, so you can configure or troubleshoot in the field or on the work bench. Electronic Device Description Language (EDDL) technology enables the Trex unit to communicate with a variety of devices independent of device manufacturer.

Depending on the attached communication module, the Trex unit lets you:

- Configure HART and FOUNDATION fieldbus devices.
- Power one HART or FOUNDATION fieldbus device.
- Measure current and voltage.
- Perform diagnostics on a 4-20 mA current loop or FOUNDATION fieldbus segment.

The Trex unit includes a color LCD touchscreen, a Lithium-Ion power module (battery pack), a processor, memory components, and optional communication modules.

## **⚠ 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 the Trex unit

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.

## **⚠ CAUTION**

Do not use a screen protector on an IS-approved Trex unit. Static discharge is possible.

## 1.2 Front view of the Trex unit

---

**Figure 1-1: Front view**



- A. Micro USB port (top)
  - B. Power button (side)
  - C. Strap connectors (side)
  - D. Touchscreen
  - E. Keypad
  - F. Charger port for the AC adapter (side)
- 

## 1.3 Precautions for the power module and AC adapter

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

- When transporting a Lithium-Ion power module, follow all applicable regulations.
- 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.
- Do not cover the power module or AC adapter while charging. Do not subject them to prolonged periods of direct sunlight, or place them on or next to heat-sensitive materials.
- 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.
- Clean the AC adapter by clearing the terminal of dirt and debris, if required.
- If the AC adapter is used in a manner not specified by Emerson, the protection provided by the equipment may be impaired.
- The AC adapter comes complete with interchangeable plug heads for UK, USA, EU and AU.
- The maximum operating altitude for the AC adapter is 2000 meters.

### **⚠ WARNING**

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

---

## 1.4 Charge the power module

Fully charge the power module before using it in the field. The Trex unit is fully operable when the power module is charging. An overcharge condition will not occur if the AC adapter is connected after charging completes. You can charge the power module when it is attached to or detached from the Trex unit.

To maintain performance, charge the power module frequently, preferably after each use. Limit full discharges, if possible.

If you experience communication issues when working with a device, remove the AC adapter from the Trex unit.

### **⚠ WARNING**

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

---

**Procedure**

1. Plug the AC adapter into a power outlet.
2. Attach the AC adapter cable to the charger port on the lower left side of the Trex unit.  
A full charge takes approximately three to four hours.

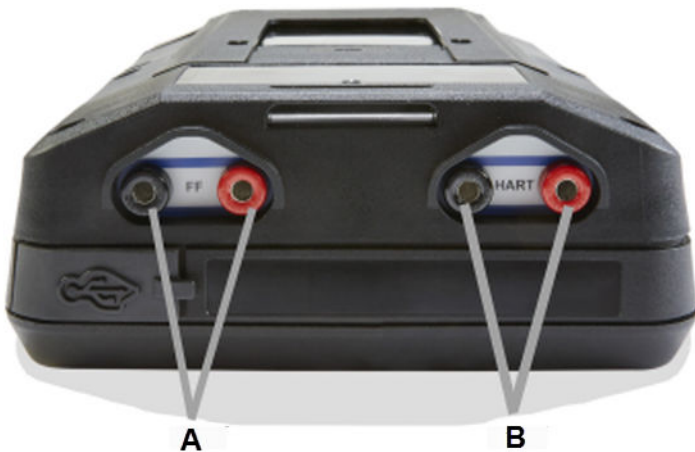
## 1.5 Communication modules

The Trex unit has two communication modules.

### Device Communicator communication module

The Device Communicator communication module can connect to and communicate with HART and FOUNDATION fieldbus devices on an externally-powered HART loop or fieldbus segment. The Device Communicator communication module has unique terminals for both HART and FOUNDATION fieldbus devices.

**Figure 1-2: Device Communicator communication module**

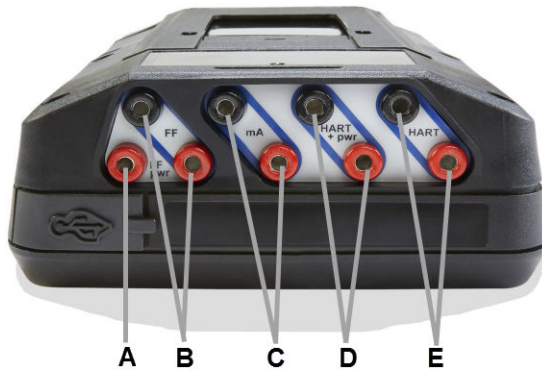


- A. Connect to externally-powered FOUNDATION fieldbus devices.
- B. Connect to externally-powered HART devices.

### Device Communicator Plus communication module

The Device Communicator Plus communication module can connect to HART and FOUNDATION fieldbus devices, measure current and voltage, and power a device.

**Figure 1-3: Device Communicator Plus communication module**



- A. Power a FOUNDATION fieldbus device. You need to connect the FOUNDATION fieldbus Power Plug to the FF pwr and the positive FF terminals.
- B. Connect to a FOUNDATION fieldbus device that is externally-powered or powered by the Trex unit.
- C. Measure current on a 4-20 mA current loop.
- D. Power and connect to a HART device. The HART+pwr terminals can measure the current output of a connected transmitter or control the current input to a connected positioner. The terminals also have a loop resistor for device communication.
- E. Connect to an externally-powered HART device. The HART terminals also have an optional loop resistor for enabling HART communications on 4-20 current loop and optional current control for moving a positioner.

### **⚠ CAUTION**

- Before you insert or remove a communication module, ensure the Trex 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 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.
- Remove the USB cable from the Trex unit before connecting to a device.

## **⚠ WARNING**

- The Trex unit cannot power a 4-wire device. Do not connect Trex unit to the power terminals of a 4-wire device. This can blow a fuse inside the Trex unit. The repair/replacement will need to be completed at an authorized service center.
- Do not connect lead sets to the HART and HART + pwr terminals at the same time. If the lead sets are connected to devices, this increases the chance of wiring mistakes and could create a short in the HART loop.
- Do not add any external power to the device when the Trex unit is powering the device. This can blow a fuse inside the Trex unit. The repair/replacement will need to be completed at an authorized service center. Ensure the device is disconnected from the loop/segment and no other wires are connected to the device before providing power from the Trex unit.
- Do not use the Trex unit to power a *WirelessHART* device. Providing power to a *WirelessHART* device may damage the device.
- Do not connect the mA terminals (ammeter) in parallel with a powered 4-20 mA current loop. Ammeters have low resistance. This can disrupt the loop and cause devices to report incorrect values or positioners to move unexpectedly.
- Do not connect the mA terminals on the Trex unit to a power supply that is not current limited to 250 mA. This can blow a fuse inside the Trex unit. The repair/replacement will need to be completed at an authorized service center.

## 1.6 Power on or off

### Procedure

1. To power on, press and hold the power button on the upper left side of the Trex unit for one second.
2. To power off, do one of the following:
  - Quickly press the power button, and then tap **Turn Off**.
  - Tap **Settings** or the status bar at the top of the screen, and tap **More** → **Power Management** → **Turn off**.

## 1.7 Device connections

Use the provided lead set and the Field Communicator application to communicate with a device. The appropriate device description is also required. If the Trex unit does not have the HART device description revision,

then the device is displayed in generic mode. This mode does not display all device functionality. If the Trex unit does not have the fieldbus device description, the device cannot be configured. See the wiring diagrams in the *AMS Trex Device Communicator User Guide* for more information.

### **⚠ CAUTION**

The Trex unit draws approximately 12 mA from the fieldbus segment when it is online. (The Trex unit draws 0 mA when it is offline.) Ensure the power supply or barrier on the fieldbus segment has the capacity to provide this additional current when the Trex unit is online. If a heavily loaded fieldbus segment is drawing near the capacity of the segment's power supply, connecting the Trex unit may result in loss of communication.

## 1.8 Maintenance and repair

Any maintenance, repair, or replacement of components not listed below must be performed by specially trained personnel at an authorized service center. You can perform common maintenance procedures listed below:

- Clean the exterior. Use only a dry, lint-free towel or dampen the towel with an alcohol or mild soap and water solution.
- Clean the touchscreen.
- Install, remove, or charge the power module.
- Remove and replace the stand.
- Ensure that all exterior screws are sufficiently tightened.
- Ensure the communication terminal recess is free of dirt and debris.
- Install and remove the communication module.

## 1.9 Technical support

Contact your local representative or go to the AMS Trex Device Communicator website for technical support contact information.

## 1.10 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	
<b>ATEX</b> <b>(2014/34/EU)</b>	This equipment complies with the ATEX Directive. Applicable standards are EN 60079-0:2012 / A11:2013 and EN 60079-11:2012
	Certification No.: SIRA 16ATEX2171
	 II 2 G (1GD) Ex ia [ia Ga] [ia Da IIIC] IIC T4 Gb (Ta = -20°C < Ta < +50°C)
	<b>CE</b> 0158
<b>Electro Magnetic Compatibility (EMC)</b> <b>2014/30/EU</b>	Tested to the EN 61326-1:2013-07 and ETSI EN 301489-17:2012-09 specification.
<b>Low Voltage</b> <b>2014/35/EU</b>	Tested to the IEC 61010-1:2010 specification.
<b>RED</b> <b>(2014/53/EU)</b>	This equipment is in conformity with the Radio Equipment Directive (RED) Directive, ETSI EN 300328: 2015-02, and IEC 62209-2: 2010-01 standards.
<b>RoHS</b> <b>(2011/65/EU)</b>	Product is compliant with the RoHS Directive.

International certifications	
<b>IECEX</b>	Certification No.: SIR 16.0057
	Ex ia [ia Ga] [ia Da IIIC] IIC T4 Gb (Ta = -20°C < Ta < +50°C)

North American certifications	
<b>Canadian Standards Association - cCSAus</b>	Class I, Division 1, groups A, B, C, D, T4. Class 1, Zone 1 AEx ia [ia Ga] [ia Da IIIC] IIC T4 Gb.
<b>CSA</b>	Ex ia [ia Ga] [ia Da IIIC] IIC T4 Gb

South American certifications	
<b>UL of Brazil</b>	Ex ia [ia Ga] [ia Da IIIC] IIC T4 Gb -20°C ≤ Ta ≤ +50°C
<b>Anatel</b>	Resolution 680 Warning: This equipment is not entitled to protection against harmful interference and may not cause interference in properly authorized systems. For more information, see the ANATEL website: <a href="http://www.gov.br/anatel/pt-br">www.gov.br/anatel/pt-br</a> [gov.br]

EAC compliance	
EAC Ex TP TC 012/2011	This equipment complies with the EAC Directive. Applicable standards are ГOCT 31610.11-2014 (IEC 60079-11:2011) and ГOCT 31610.0-2014 (IEC 60079-0:2011).
	 1Ex ia [ia Ga] [ia IIIC Da] IIC T4 Gb X
Electro Magnetic Compatibility TP TC 020/2011	Tested to the EN 61326-1:2013-07 and ETSI EN 301489-17:2012-09 specification.
Low Voltage TP TC 004/2011	Tested to the IEC 61010-1:2010 specification.

China certifications	
CCC	Ex ia [ia Ga] [ia Da IIIC] IIC T4 Gb (Ta = -20°C < Ta < +50°C)
Applicable Standards	GB/T 3836.1-2021, GB/T 3836.4-2021

## 1.11 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.

**⚠ CAUTION**

Do not use a screen protector on an IS-approved Trex unit. Static discharge is possible.

**⚠ WARNING**

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

**⚠ 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.**

## 1.12 Intrinsically Safe electrical parameters

**Table 1: Device Communicator communication module**

	FOUNDATION™ fieldbus	FOUNDATION™ fieldbus	HART®
	(non-FISCO)	(FISCO)	
	FF + and -	FF + and -	HART + and -
Ui	30 Vdc	30 Vdc	30 Vdc
li	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
Uo	1.89 V	1.89 V	1.89 V
Io	32 μA	32 μA	32 μA
Po	61 μW	61 μW	61 μW
Co	14.3 μF	14.3 μF	14.3 μF
Lo	100 mH	100 mH	100 mH

**Table 2: Device Communicator Plus communication module**

	mA interface	FOUNDATION™ fieldbus (non-FISCO)		HART®		FOUNDATION™ fieldbus (FISCO)	
		FF pwr and F-	FF + and -	HART + pwr	HART + and -	FF pwr and F -	FF + and -
	mA						
Ui	30 Vdc	17.5 Vdc	30 Vdc	30 Vdc	30 Vdc	17.5 Vdc	30 Vdc
li	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	231 nF	0	0	0	231 nF	0
Li	0	0	0	0	0	0	0
Uo	0	17.31 V	1.89 V	25.69 V	1.89 V	17.31 V	1.89 V
Io	0	199 mA	32 μA	105 mA	1.9 mA	199 mA	32 μA
Po	0	0.94 W	61 μW	668 mW	3.6 mW	0.94 W	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]	19	69	115
Lo [μH]	100	50	30

Table 4: Co and Lo values for HART + pwr				
Co [nf]	57	64	75	102
Lo [μH]	1000	750	500	100

## 1.13 AC adapter specifications

Electrical Specification	PART NUMBER
	TREX-0003-0003 (PA65PD-1504000)
AC input voltage range	100-240 VAC
Frequency	50-60Hz
Input current	1.5A max at full load condition
Inrush current	80 A Max at 264VAC input
Leakage current	<350uA.
Input protection	1.3A 250VAC
No load power consumption	<0.21W (at 115VAC / 23VAC)
Output voltage	15 V
Output current	4.0 A
Ripple and noise	150mVp-p max
Hold up time	10mS/20mS worst at full load 115/230VAC input
No load operation	Yes.
Short circuit protection	Self recovery when short circuit removed.
Over current protection	hiccup mode when over current, auto recovery
Over voltage protection	output voltage clamped by internal protection IC
Operating temperature range	0°C to 40°C
Operating humidity	10% to 90% relative humidity
Operating altitude	Maximum of 2000 meters
Storage temperature range	-20°C to +80°C
Storage humidity	5-95% RH non-condensing
Cooling	Free air convection
Dimensions	109 x 54 x 33 mm
Weight	0.33 kg
Withstand voltage	I/P-O/P (FG): 3kVAC / 10 mA / 1 minute
EMI	FCC Part 15B, CE EN55032 B, C-Tick AS/NZ CISPR22, EN61000-3-2:2014, EN61000-3-3:2013, EN55035:2017

Electrical Specification	PART NUMBER
	<b>TREX-0003-0003 (PA65PD-1504000)</b>
Safety	UL, cUL62368-1, CE/GS EN62368-1, RCM/SAA/62368-1 Class II plug top model
Approvals	cUL North America, TUV GS Europe, Japan PSE, IRAM Argentina, EAC for Russia and EAEU, South Africa SANS IEC 60 950, China CCC, Korea KC, Taiwan BSMI, UKCA WEEE 2012/19/EU, RoHS (2011/65/EU)

### 1.14 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.