

AMS Trex™ Device Communicator

Quick Start Guide (ENG)



Copyright and trademark information

©2016 Emerson Process Management. 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 Process Management, 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

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.

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.

Front view of the Trex unit

Figure 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).*
-

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 *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 Process Management, the protection provided by the equipment may be impaired.
 - The AC adapter comes complete with interchangeable plug heads for countries UK, USA, EU and AU.
 - The maximum operating altitude for the AC adapter is 2000 meters.

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!

You cannot 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.

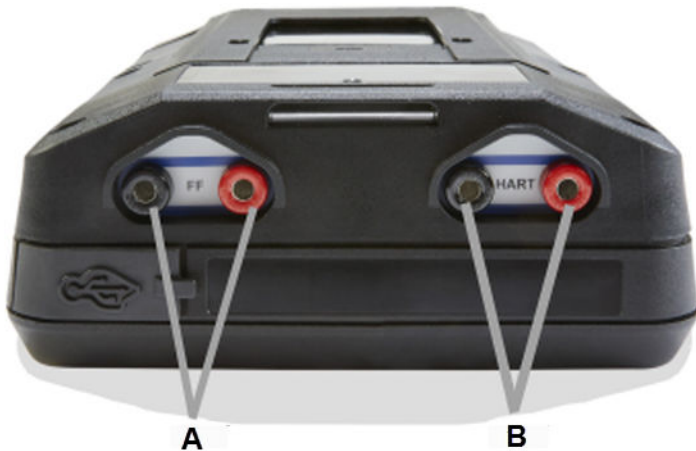
Communication modules

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 2: Device Communicator communication module

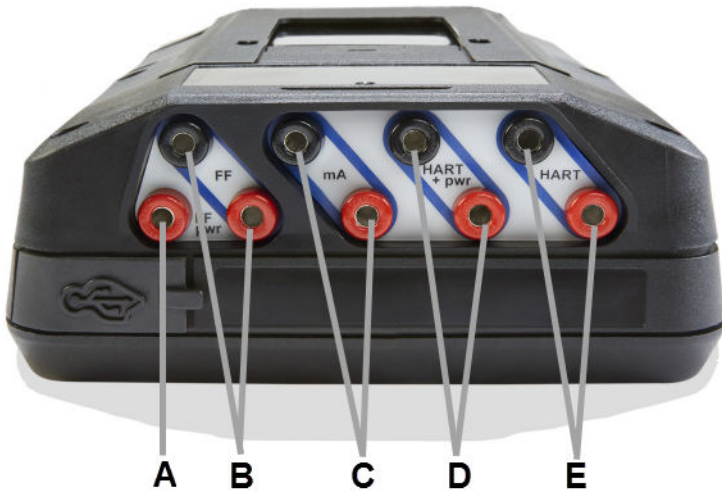


- A. Connect to externally-powered FOUNDATION fieldbus devices.
- B. Connect to externally-powered HART devices.

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 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.
-

Power on or off

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.

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, 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 *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.

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.

Technical support

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

Product certifications

See the 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 60079-0:2012 / A11:2013 and EN 60079-11:2012 |
| | Certification No.: SIRA 16ATEX2171 |
| |  II 2 G (1GD) Ex ia [ia Ga] [ia Da IIC] IIC T4 Gb (Ta = -20°C < Ta < +50°C) |
| | CE 0158 |
| Electro Magnetic Compatibility (EMC) 2014/30/EU | Tested to the EN 61326-1:2013-07 and ETSI EN 301489-17:2012-09 specification. |
| Low Voltage 2014/35/EU | Tested to the IEC 61010-1:2010 specification. |

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

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

| Wireless/Spectrum approvals | |
|-----------------------------|---|
| FCC and IC | <p>Radio frequency radiation exposure Information: For body worn operation, this device has been tested and meets FCC RF exposure guidelines.</p> <p>Information sur l'exposition aux rayonnements des ondes radio : Pour le port sur une partie du corps, les directives de la FCC en rapport avec l'exposition aux fréquences RF ont été testées et respectées.</p> <p>NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:</p> <ul style="list-style-type: none"> • Reorient or relocate the receiving antenna. • Increase the separation between the equipment and receiver. • Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. • Consult the dealer or an experienced radio/TV technician for help. <p>NOTICE: This device complies with Part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s). 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.</p> <p><i>Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:</i> <i>(1) l'appareil ne doit pas produire de brouillage, et</i> <i>(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.</i></p> <p>NOTICE: Changes or modifications made to this equipment not expressly approved by R. Stahl HMI Systems may void the FCC authorization to operate this equipment.</p> <p>NOTICE : This Class B digital apparatus complies with Canadian ICES-003. <i>Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.</i></p> |
| RED (2014/53/EU) | <p>This equipment is in conformity with the Radio Equipment Directive (RED) Directive, ETSI EN 300328: 2015-02, and IEC 62209-2: 2010-01 standards.</p> |

| WEEE Label | Description |
|---|---|
|  | <p>Products with this label comply with the Waste Electrical and Electronic Equipment (WEEE) directive, 2012/19/EU, which applies to European Union (EU) member states only.</p> <p>The label indicates this product should be recycled and not treated as household waste. Customers in EU member states should contact their local Emerson sales representative for information on discarding any part of the product.</p> <p>For customers in all other world areas, if it is necessary to discard any part of the product, follow the waste-disposal regulations applicable in your location.</p> |

| RoHS Label | Description |
|---|--|
|  | <p>Products with this label are lead-free and comply with the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) directive, 2011/65/EU, which applies to EU member states only. EN 50581: 2012 is the applicable standard.</p> <p>The purpose of the directive is to limit the use of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB), and polybrominated diphenyl ether (PBDE) flame retardants in electronic equipment.</p> |

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.

WARNING!

You cannot 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 *Trex Device Communicator User Guide* for any restrictions associated with safe use.

Electrical shock can result in serious injury or death.

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 |
| 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 |
| 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 | | HART® | | FOUNDATION™ fieldbus | |
|----|--------------|----------------------|------------|-------------|--------------|----------------------|------------------------------|
| | | (non-FISCO) | | | | (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 | 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 [μ F] | 100 | 50 | 30 |

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

AC adapter specifications

| Electrical Specification | |
|-----------------------------|---|
| AC input voltage range | 90-264 VAC |
| Frequency | 47 - 63Hz |
| Input current | 1.6A max. at low line input and full load output |
| Inrush current | 60 A max. at 230VAC input and 25°C ambient temperature |
| Leakage current | <0.25 mA |
| Input protection | 1.6A 250VAC Fuse |
| No load power consumption | <0.5W max. at nominal input and no load output |
| Output voltage | 15 V |
| Output current | 4.33 A |
| Ripple and noise | 1% Vout |
| Hold up time | 10ms at nominal input and full load output |
| No load operation | Yes, to protect power supply and system from damage |
| Short circuit protection | Auto recovery, cannot exceed 8A max. after 1 minute at nominal input line. |
| Over current protection | 150-200%, foldback type, auto recovery |
| Over voltage protection | 110-140%, voltage limiting, recycle input to recover |
| Operating temperature range | 0°C to + 50°C |
| Operating humidity | 8-90% RH non-condensing |
| Operating altitude | Maximum of 2000 meters |
| Storage temperature range | -20°C to +70°C |
| Storage humidity | 5-95% RH non-condensing |
| Cooling | Free air convection |
| Dimensions | 119 x 54x 36mm |
| Weight | 0.33 kg |
| Withstand voltage | I/P-O/P (FG): 3kVAC / 10 mA / 1 minute |
| EMI | EN55022: 2006 Class B, EN61000-3-2:2006, EN61000-3-3: 1995+A1: 2001+A2:2005 EN55024:1998+A1: 2001+A2: 2003, IEC61000-4-2, -3, -4, -5, -6+A1:2004, -8, -11 |

| Electrical Specification | |
|--------------------------|---|
| Safety | CB (IEC60950-1: 2001), TUV GS (EN60950-1: 2005 +A1 + A2), cUL, CE, VCCI |

Approvals

cUL North America, TUV GS Europe, Japan PSE, IRAM Argentina, Russian EAC, Kazakhstan EAC, South Africa SANS IEC 60 950, Korean EK, China CCC.

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