

TReX - PLC TRANSCEIVER RTU

The WTE TReX is an Ethernet and serial smart transceiver with inbuilt Programmable Logic Controller for general automation, telemetry and radio messaging.

Easily automate your own distributed telemetry solution. Setup and monitor with a user-friendly configuration interface.

The TReX PLC allows messaging and output control using timers, counters, inputs and outputs via ladder logic programming.

LADDER LOGIC

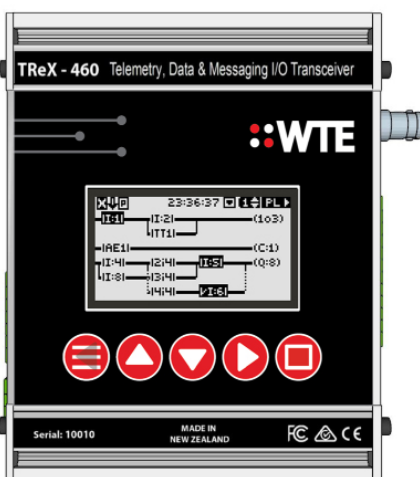
The TReX uses familiar ladder logic as its programming language. The Ladder Logic can be configured via the TReX front screen or by using free to use simulation and debugging software. Program operation can be monitored on the TReX screen in real time.

TELEMETRY MACROS

Unique to the TReX, the TReX PLC supports the concept of macro outputs. These macros allow access to all TReX features under program control.

Use output macros to:

- Output any serial commands to easily integrate with third party equipment
- Change any system or radio parameters
- Construct and transmit a DMR or POCSAG message



PLC FEATURES:

- Simplified Ladder Logic
- Timers
- Counters
- Analog Comparators
- Programmable serial input and output streams, allowing integration with third party devices.
- Alarms Weekly/daily/hourly
- Program flow Control Bits
- Hold Bits (retained on power off)
- Radio completely re-configurable via PLC program control
- Program controlled macros
- Program control of up to 9 remote TReX slave units
- Access many remotely distributed IO connections
- Timestamped logging to internal non volatile memory

TREX RADIO FEATURES:

- Up to 4W power output
- Operates from 421 to 480MHz
- Data transmit rates from 512 baud to 32K baud
- Supported channel spacing of 25kHz, 12.5kHz and 6.25kHz
- Integrated spectrum analyzer
- Antenna mismatch detection
- High sensitivity receiver
- Periodic message support to ensure radio link integrity

TREX HARDWARE FEATURES:

- 8 digital inputs
- 8 digital outputs
- Two analog inputs (voltage/current)
- Two analog outputs (voltage/current)
- RS232, RS422 and RS485 support
- USB connection allows downloading of TX, RX and PLC logs or direct access to configuration files
- RJ45 Ethernet Interface
- Graphical display shows all transmit and receive activity, I/O state and PLC program status
- Internal real time clock with supercap power-fail backup
- Easily mountable from any side or to standard DIN rail

EXTENDED FEATURES:

- AES-256 Radio link encryption
- Web configurable
- Inbuilt TCP Server/Client with DNS lookup and TLS/mTLS support
- Multi language capable GUI
- Any output can be assigned to indicate:
 - Channel busy
 - Alert on filtered match of message payload
 - Communications link fail
 - Antenna fault
 - Low output power
 - Low input voltage
 - High temperature
- Monitor and control installations using standard SCADA software
- Transmit and receive serial and telemetry data at high data rates
- Transmit messages to a variety of DMR and POCSAG radios
- Inspection of potential site interference using the integrated spectrum analyzer
- Reporting of system and installation errors, such as loss of communications, faults to antennas and system voltage states

CONFIGURABLE

The TReX can be configured and diagnosed completely from the front panel without the need for a remote or direct computer connection.

In addition, the TReX can be configured and/or cloned through serial commands, TCP, USB or via a web browser.

CUSTOMISATION

The TReX has been developed and is maintained "in-house". WTE can work with your team to customize the TReX to meet your system needs. Designed and manufactured in New Zealand.

SPECIFICATIONS:

| | |
|---------------------------------|---|
| FREQUENCY RANGE | TReX-460: 421MHZ to 480MHZ |
| SUPPLY VOLTAGE | Nominal 12V Min 10.8V Max 15.6V |
| TX POWER | up to 4W |
| DIGITAL INPUTS | 8 |
| ANALOG INPUTS | 2 (0-16V) |
| DIGITAL OUTPUTS | 8 (Open Drain or relay depending on model) |
| ANALOG OUTPUTS | 2 (0-10V AND 4-20mA) |
| REAL TIME CLOCK CALENDAR | with power backup |
| ANTENNA CONNECTOR | BNC |
| INTERFACES | RS232, RS422, RS485 AND ETHERNET |
| RECEIVER SENSITIVITY | 460MHZ (512 BAUD) -123 dBm 460MHZ (4800 BAUD) -118 dBm |
| PROCESSOR | up to 250MHZ 32BITS DSP |
| MEMORY | 512KB RAM, 2MB Flash, 4GB uSD card |
| EVENT LOGGING | Min 100,000 Non-Volatile Timestamped Events |

PLC SUPPORT:

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|----------------------------------|---|
| PROGRAM RUNGS | 250 |
| TIMERS | 32 (TON, TOF and RTON Types) |
| COUNTERS | 16 CTU Type |
| ALARMS | 16 Weekly/Daily/Hourly |
| WORK BITS | 64 |
| HOLD BITS | 16 non-volatile min 3 days |
| SERIAL MATCH INPUTS | 4 strings (up to 20 characters long) |
| ANALOG COMPARATORS | 16 |
| PROGRAM CONTROLLED MACROS | 64 |
| SCAN | Typically 10mS, Independent of program length |
| MAX SCAN LATENCY | Typically 10mS |
| DISTRIBUTED IO | 9 Remote TReX units with up to 20 I/O each |

SPECTRUM ANALYZER:

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|-----------------------------------|---------------------------------|
| RESOLUTION BANDWIDTH (RBW) | 1KHZ OR 25KHZ |
| SPAN | up to 3MHz |
| SWEEP MODE | Continual or peak display |
| MINIMUM SIGNAL | -120 dBm |
| MAXIMUM SIGNAL | -10 dBm |

ENVIRONMENTAL:

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|------------------------------|----------------------------------|
| OPERATING TEMPERATURE | -40 to +70 °C |
| HUMIDITY | Maximum 95% non-condensing |

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MECHANICAL:

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|-------------------|---|
| LENGTH: | 104mm (125mm including BNC connector) |
| WIDTH: | 131mm |
| HEIGHT: | 41mm |
| WEIGHT: | 550 Grams |
| MOUNTING: | RACK, WALL & DIN RAIL |
| IP RATING: | IP51 |

MESSAGING SUPPORT:

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|--|--|
| DMR ENCODE | ETSI TS 102 361-1 (Tier 1 direct mode) Short Message Type, unconfirmed Max Message Length 70 characters |
| POCSAG ENCODE AND DECODE BAUD RATES | 512, 1200, 2400, 4800, 9600 |
| POCSAG SUPPORTED MODES | Alphanumeric and numeric |

COMMUNICATION PROTOCOLS:

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| Supports: | Serial and IP Modbus TCP Server/Client, MQTT, HTTP SNTP, DNP3 IEC61850, WT Protocol and Others |
|------------------|--|

SECURITY:

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|----------------------------------|--|
| RF Link Security: | AES 128 or AES 256 with cipher block chaining Uniquely identified transmissions with replay attack protection |
| TRANSPORT LAYER SECURITY: | TLS version 1.2, mTLS |

MODULATIONS:

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|------------------------------|--|
| 25KHZ CHANNEL WIDTH | 512 BAUD (FSK), 1200 (FSK), 1600 (FSK), 2400 (GFSK), 3200 (4GFSK), 4800 (2GFSK), 9600 (GFSK), 9600 (4GFSK), 16K (4GFSK), 32K (4GFSK) |
| 12.5KHZ CHANNEL WIDTH | 512 BAUD (FSK), 1200 (FSK), 2400 (GFSK), 4800 (GFSK), 9600 (GFSK), 9600 (4GFSK), 16K (4GFSK) |
| 6.25KHZ CHANNEL WIDTH | 512 BAUD (FSK), 1200 (GFSK), 2400 (GFSK), 4800 (4GFSK) |

REGULATORY COMPLIANCE:

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|---|--|
| FCC | FCC Part 90 |
| EN | EN 300 113 |
| EN | EN 50385 |
| ETSI | ETSI TS 102 361-1 (DMR modulation and TDMA bursts) |
| AS/NZ | AS/NZ 4769.1:2000 |
| EMC | EN 301 489 |
| SAFETY | EN 60950 + IEC 62368 |
| RoHS (Restriction of Hazardous Substances) | Compliant |
| WEEE (Waste Electrical and Electronic Equipment) | Compliant ¹ |

Notes: ¹ Please contact your WTE dealer or WTE directly for further information regarding safely disposing of electronic equipment.

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