

TReX - PLC TRANSCEIVER

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

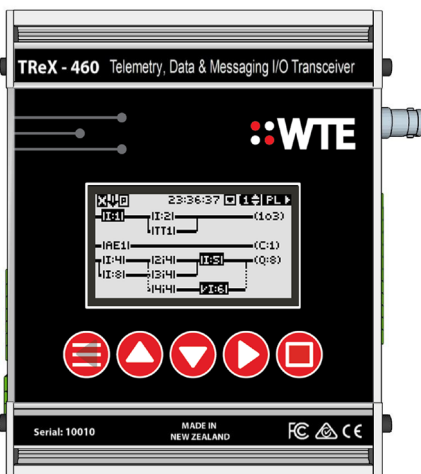
The TReX uses familiar ladder logic as its programming language. The Ladder Logic can be easily be configured via the TReX front screen, through the use of any text editor or via serial terminal. Program operation can be monitored on the TReX screen in real time.

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 to 200 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
- Two analog outputs
- 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 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	250mW, 500mW, 1W, 2W and 4W
DIGITAL INPUTS	8
ANALOG INPUTS	2 (0-16V)
DIGITAL OUTPUTS8 (Open Drain or relay depending on model)
ANALOG OUTPUTS	2 (0-10V AND 4-20mA)
REAL TIME CLOCK CALENDAR	Super Capacitor backup min 3 days Accuracy 20PPM over full temperature range
ANTENNA CONNECTOR	BNC
INTERFACES	RS232, RS422, RS485 AND ETHERNET (Web/TCP)
RECEIVER SENSITIVITY	460MHZ (512 BAUD) -123 dBm 460MHZ (4800 BAUD) -118 dBm

PLC SUPPORT:

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	30mS during Radio TX
LOGGING	Min 100,000 Non-Volatile Timestamped Events
DISTRIBUTED IO	9 Remote TReX units with up 20 I/O each

SPECTRUM ANALYZER:

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

MECHANICAL:

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

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ENVIRONMENTAL:

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

MESSAGING SUPPORT:

DMR ENCODE	Partial 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:

Supports:

- MODBUS, TCP Server/Client, MQTT and WT Protocol and Others

SECURITY:

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 Max AES key size 128 bits. (256 bit on request)

MODULATIONS:

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:

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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