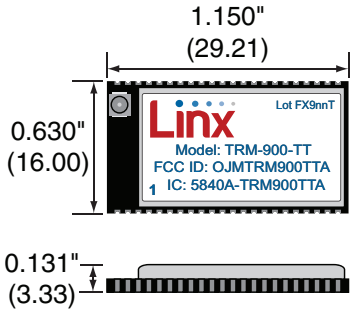
TT Series Remote Control and Sensor Transceiver Module

The TT Series transceiver is designed for reliable bi-directional, long-range remote control and sensor applications. It consists of a highly optimized Frequency Hopping Spread Spectrum (FHSS) RF transceiver and integrated remote control transcoder. The FHSS system allows higher power and therefore, longer range than narrowband radios. The TT Series transceiver has obtained modular approval for the United States and Canada.



High Performance: The TT Series transceiver has been designed as a high performance, long-range remote control solution. It has a robust FHSS protocol, good output power and best-in-class receiver sensitivity.

Long Range: The module has a typical sensitivity of –112dBm. The low power version has +12.5dBm transmitter output power and has a range of over 2 miles (3.2km) line of site in typical environments with 0dB gain antennas. A high power version outputs +23.5dBm achieving up to 8 miles (12.8km).

Easy Implementation: The transceiver has 8 status lines that can be individually configured as inputs to register button presses or as outputs to drive application circuitry. When an input line on one module goes high, it sends a transmission to take a corresponding output line on a paired module high. This makes implementation of basic remote control extremely simple.

Small Size: At 1.15" x 0.63" (29.21mm x 16.0mm) the module is smaller than most competitive products.

Pairing: A simple and efficient pairing operation configures two modules to operate together. A single button press on each side causes the modules to swap their 32-bit addresses and store them in non-volatile memory.

Acknowledgements: A receiving module can send an acknowledgement to the transmitting unit after receiving a command or when a line is raised with external circuitry to indicate successful control. The acknowledgements can be configured to include up to two bytes of custom data.

Low Power: Linx designed the TT Series with battery-powered applications in mind, so its power consumption has been highly optimized. Duty cycle and power down features give the designer complete control over the module.

Configuration: Primary settings are hardware-selectable, eliminating the need for an external microcontroller or other logic. Advanced configuration and operation are supported by a UART interface; however, no programming is required for basic operation.

Certification: The module has been certified by the United States FCC and Canada's Industry Canada. Use of specific antennas is required to utilize this certification as is labeling of the end product.

Antenna: An integrated antenna connector and hardware pin gives the designer antenna implementation flexibility.

Specifications	
Operating Voltage	2.5 to 5.5VDC
TRM-900-TT TX Supply Current @ 12.5dBm	36mA typical
TRM-900-TT-A TX Supply Current @ 23.5dBm	TBD
RX Supply Current	19mA typical
Standby Current	200µA typical
RX Sensitivity	–111dBm
Response Time	4 to 50ms
Operating Temperature Range	–40 to +85°C

Applications

- Long range remote control
- Long range sensor monitoring
- Irrigation control
- Home and industrial automation
- Remote access control with confirmation
- Remote status monitoring
- Robotics
- Keyless entry
- Lighting control

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The TT Series Transceiver can be completely configured in hardware, so no programming or serial interface is required for basic remote control applications. However, a UART interface provides more control and advanced features.

Hardware Controlled Operation

- Send a control message by taking a status line input high
- Pair modules so that they work together
- Set status lines as inputs and outputs in groups of 4 lines
- Enable acknowledgements
- Set the transmitter output power
- Power down the module
- Set all status line outputs to be latched or momentary

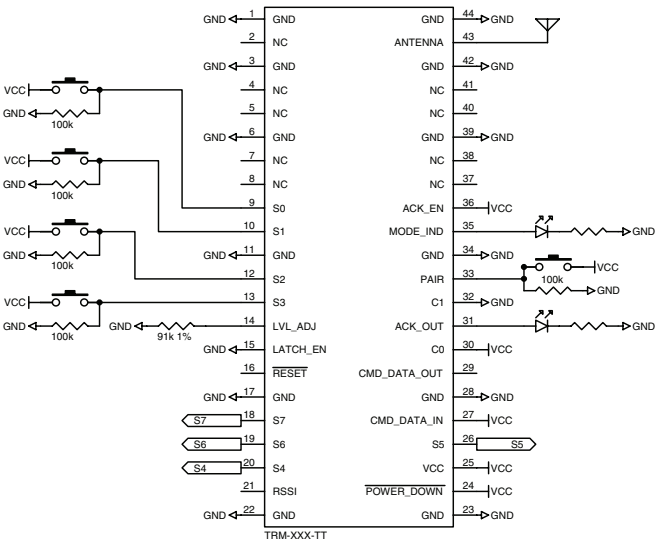
Software Configuration Options

- All hardware configuration options
- Enter two bytes of custom data to be sent with control messages or acknowledgements
- Individually configure the address and control permissions of up to 40 paired units
- Configure status line direction individually
- Configure status line output latching individually
- Configure receiver duty cycling for lower power
- Configure interrupts to trigger an external micro on events

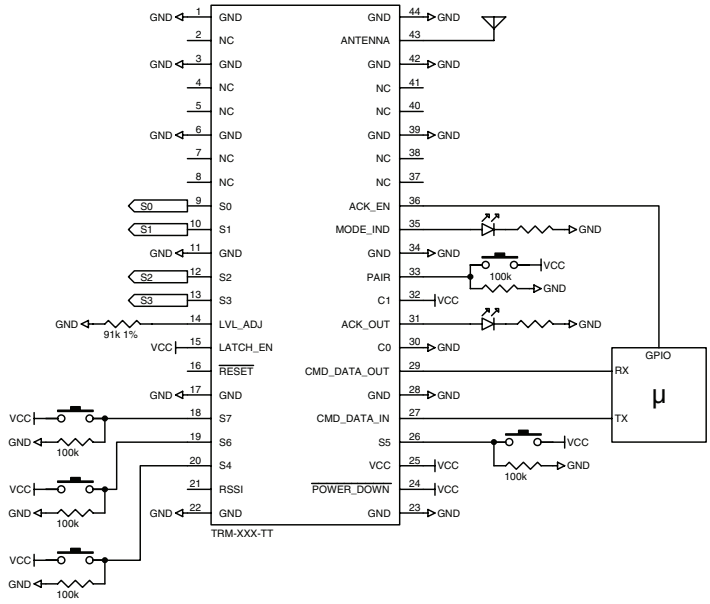
Software Operation

- All hardware-controlled operations
- Initiate a transmission of a specified number of packets
- Send acknowledgements
- Read RSSI
- Read remote status line values by serial interface, rather than 8 separate hardware lines
- Receive serial break on selected events
- Read two bytes of additional data from remote transmitter

Typical Application Circuits



Hardware configuration with 4 inputs and 4 outputs



Software configuration with 4 inputs, 4 outputs and an external microcontroller

Ordering Information

Part Number	Description
TRM-900-TT	900MHz TT Series Remote Control and Sensor Transceiver
TRM-900-TT-A	900MHz Amplified TT Series Remote Control and Sensor Transceiver
EVM-900-TT	900MHz TT Series Evaluation Module
EVM-900-TT-A	900MHz Amplified TT Series Evaluation Module
EVAL-900-TT	TT Series Basic Evaluation Kit
EVAL-900-TT-A	Amplified TT Series Basic Evaluation Kit
MDEV-900-TT	TT Series Master Development System
MDEV-900-TT-A	Amplified TT Series Master Development System

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