



NT Series
Master Development System
User's Guide

Wireless made simple[®]



Warning: Some customers may want Linx radio frequency (“RF”) products to control machinery or devices remotely, including machinery or devices that can cause death, bodily injuries, and/or property damage if improperly or inadvertently triggered, particularly in industrial settings or other applications implicating life-safety concerns (“Life and Property Safety Situations”).

NO OEM LINX REMOTE CONTROL OR FUNCTION MODULE SHOULD EVER BE USED IN LIFE AND PROPERTY SAFETY SITUATIONS.

No OEM Linx Remote Control or Function Module should be modified for Life and Property Safety Situations. Such modification cannot provide sufficient safety and will void the product’s regulatory certification and warranty.

Customers may use our (non-Function) Modules, Antenna and Connectors as part of other systems in Life Safety Situations, but only with necessary and industry appropriate redundancies and in compliance with applicable safety standards, including without limitation, ANSI and NFPA standards. It is solely the responsibility of any Linx customer who uses one or more of these products to incorporate appropriate redundancies and safety standards for the Life and Property Safety Situation application.

Do not use this or any Linx product to trigger an action directly from the data line or RSSI lines without a protocol or encoder/decoder to validate the data. Without validation, any signal from another unrelated transmitter in the environment received by the module could inadvertently trigger the action.

All RF products are susceptible to RF interference that can prevent communication. RF products without frequency agility or hopping implemented are more subject to interference. This module does not have a frequency hopping protocol built in.

Do not use any Linx product over the limits in this data guide. Excessive voltage or extended operation at the maximum voltage could cause product failure. Exceeding the reflow temperature profile could cause product failure which is not immediately evident.

Do not make any physical or electrical modifications to any Linx product. This will void the warranty and regulatory and UL certifications and may cause product failure which is not immediately evident.

Ordering Information

Ordering Information	
Part Number	Description
MDEV-868-NT	868MHz NT Series Master Development System
MDEV-900-NT	900MHz NT Series Master Development System

Figure 2: Ordering Information

NT Series Transceiver Development Board

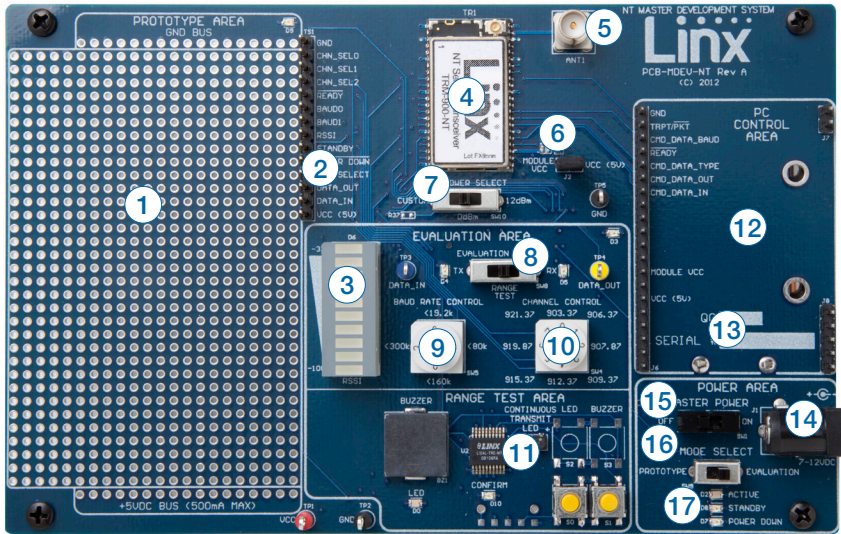


Figure 3: NT Series Transceiver Development Board

Board Objects

1. Prototype Area
2. Break-Out Header
3. RSSI Level
4. NT Series Transceiver
5. RP-SMA Antenna Connector
6. Module Power Header
7. Output Power Level Selection Switch
8. Evaluation Selection Switch
9. Baud Rate Selection Dial
10. Channel (Frequency) Selection Dial
11. Transcoder Range Test Area
12. PC Control Area
13. 9V Battery (on the back of the board)
14. DC Power Jack
15. Master Power Switch
16. Mode Selection Switch
17. Module Mode Indicator LEDs

- Make sure that the Baud Rate and Channel switches are set the same on both boards
- Check that the antennas are connected
- Make sure that a jumper is installed on the Module Power Header
- Make sure that the batteries are not dead

If all of these appear to be in order, please call +1 800 736 6677 or e-mail techsupport@linxtechnologies.com for technical support.

The Prototyping Area

In addition to its evaluation functions, the board may also be used for product development. It features a prototyping area to facilitate the addition of application-specific circuitry (Figure 4). The prototyping area contains a large area of plated through-holes so that external circuitry can be placed on the board. The holes are set at 0.100" on center with a 0.040" diameter, accommodating most industry-standard SIP and DIP packages.

External circuitry can be easily interfaced to the NT transceiver through the breakout header (TS1) to the right of the prototyping area. The Mode Select switch should be set to the left position to enable the module's lines to be controlled from the prototyping area. At the bottom of the prototyping area is a row connected to the 5V power supply and at the top is a row connected to ground.

Note: The onboard 5-volt regulator has approximately 600mA available for additional circuitry. If more current is required, the user must add an additional regulator or power the board from an external supply.

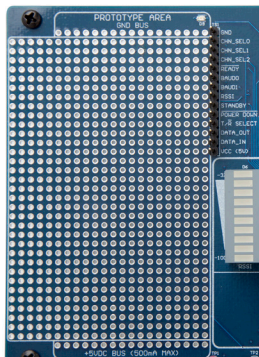


Figure 4: The Development Board Prototyping Area

The Power Area

The Power Area has two switches that control power to the board and the type of operation (Figure 7). The Master Power switch supplies power from the 9V battery or the power jack to the board. The power jack accepts a 2.5mm plug with the tip ground and the shell 7 to 12VDC.

The Mode Select switch configures the board for either Prototype operation (left position) or Evaluation operation (right position). In Prototype operation, the module's signal lines are routed to the header next to the Prototype Area. This allows custom circuits to easily interface with the module.

In Evaluation operation, the module's signal lines are routed to the Evaluation Area. The controls in this area allow the module to be operated without any other circuits, microcontrollers or a PC.

Three LEDs show the state of the module. Active shows the module is on and ready for operation. Standby and Power Down indicate that the low power modes have been entered and the module is not ready for operation.

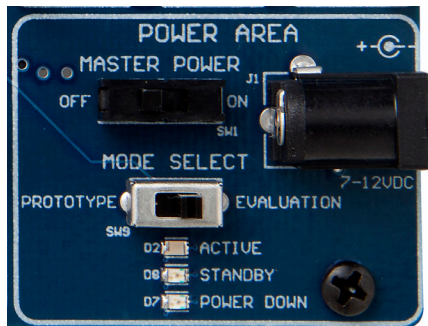


Figure 7: The Development Board Power Area

The Evaluation Area

The Evaluation Area is activated by setting the Mode Select switch to the right position. Figure 8 shows the Evaluation Area.

The Evaluation Select switch configures the area for different types of evaluation. The left position puts the module into transmit mode. The orange TX LED lights up and any data present on the blue DATA_IN test point is transmitted by the module.

The Range Test Area

The board features an MT Series remote control transcoder with two push buttons, a buzzer and an LED. The two boards in the kit are populated differently so that the button/LED inputs on one board are outputs on the other board. Figure 9 shows the differences.

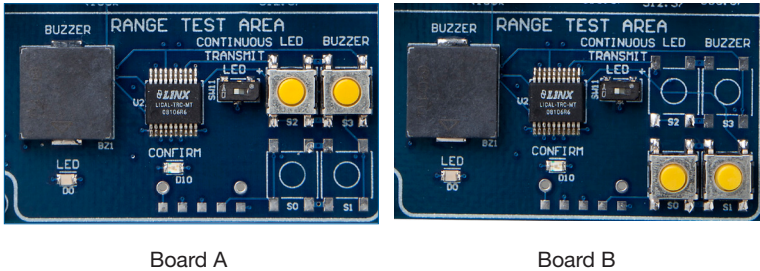


Figure 9: The Development Board Range Test Section

When a button is pressed on one board, the status of both buttons is captured, encoded into a data stream, and transmitted. The data recovered by the receiving board is decoded and the transcoder's data lines are set to replicate the states of the buttons, driving either the buzzer or the LED. A confirmation packet is then sent to the transmitting board activating the Confirm LED.

To activate this area of the board, the module's DATA and T/ \bar{R} _SEL lines must be routed to the transcoder. This is accomplished by setting the Mode Select switch to the right position and the Evaluation Select switch to the middle position.

After the boards have been configured, place Board A on a flat surface and turn it on. Turn on Board B and press button S1. The buzzer on Board A will sound and the Confirm LED on Board B will light up. The usable range of the link in your environment can be ascertained by carrying Board B away from Board A. Switch SW11 has been provided to continuously transmit the LED activation without having to hold down a button.

As you near the maximum range of the link in your area, it is common for the signal to cut in and out as you move. This is normal and can result from other interfering sources or fluctuating signal levels due to multipath effects. The areas in which this occurs are commonly called "nulls" and simply walking a little farther will often restore the signal.

The three position slide switch (2) controls the CMD_DATA_TYPE line. This line tells the module that the data coming in on the CDI is either command data for configuring the module (middle position) or packet data to be transmitted over the air (top position). The bottom position connects this line to the DTR line on the USB or RS-232 interface. This allows the PC software to control the line, giving it the ability to configure the module and send data.

Test points for CMD_DATA_IN (3) and CMD_DATA_OUT (4) are provided so that the communications can be monitored.

The PC Software

The kit includes PC software that can be used to configure the module through the PC interface daughter board. Figure 11 shows the software.

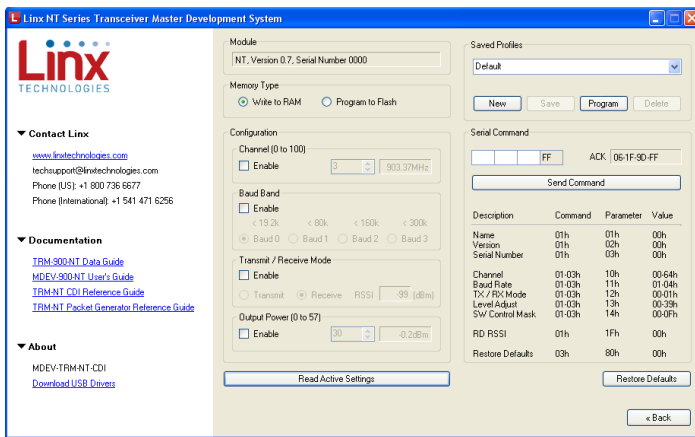


Figure 11: Development Kit PC Software

The left side of the window contains labels that expand to show links to useful information (Figure 12). This includes the Linx Technologies contact information and links to the website for the latest product documentation and software updates. Clicking on these links opens the page in the computer's default web browser.

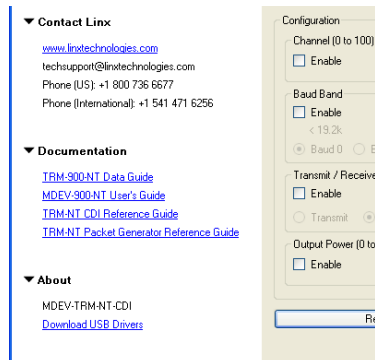


Figure 12: Development Kit PC Software

The “Read Active Settings” button at the bottom (Figure 16) reads the existing configuration settings from the module and adjusts the values in the configuration sections based on the module’s current configuration.

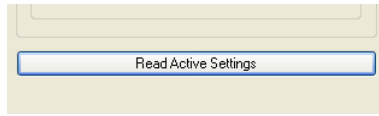


Figure 16: Development Kit PC Software

The right column in the window starts with the Profile section (Figure 17). Specific configuration settings can be saved as a profile and loaded into a connected module. This allows the software to be used in small-scale production lines for products that provide connection to the CDI.

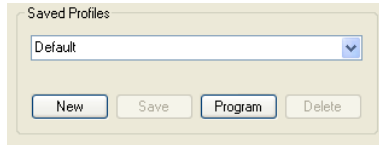


Figure 17: Development Kit PC Software

Select the “New” button to create a new profile and give it a name. Set the configuration controls as desired and click the “Save” button to save the profile. Click the “Program” button to send the profile to the module. All of the profiles saved on the PC can be viewed in the drop down menu and sent to the module with the “Program” button. The “Delete” button removes the selected profile from the computer.

The Serial Command section (Figure 18) provides the ability to send a specific packet to the module. Byte values are typed into the boxes to create the packet and the “Send Command” button sends the packet to the module. The ACK text box displays the module’s response. The possible values for each byte are shown in the table below the “Send Command” button.

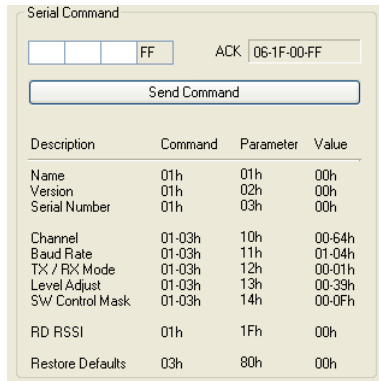


Figure 18: Development Kit PC Software

The “Restore Defaults” button (Figure 19) writes the factory default values to the transceiver. This is an easy way to restore the module to a known configuration.

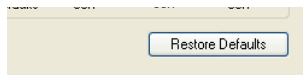


Figure 19: Development Kit PC Software

Board Control

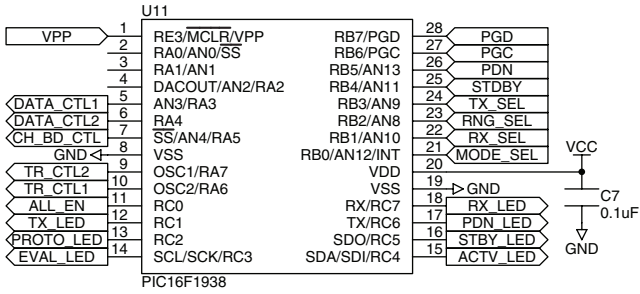


Figure 20: Board Control

Transmitter Output Power Selection

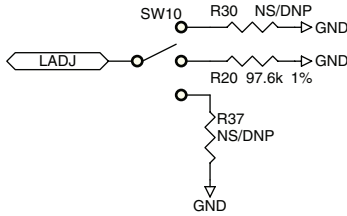


Figure 21: Transmitter Output Power Selection

Range Test Area

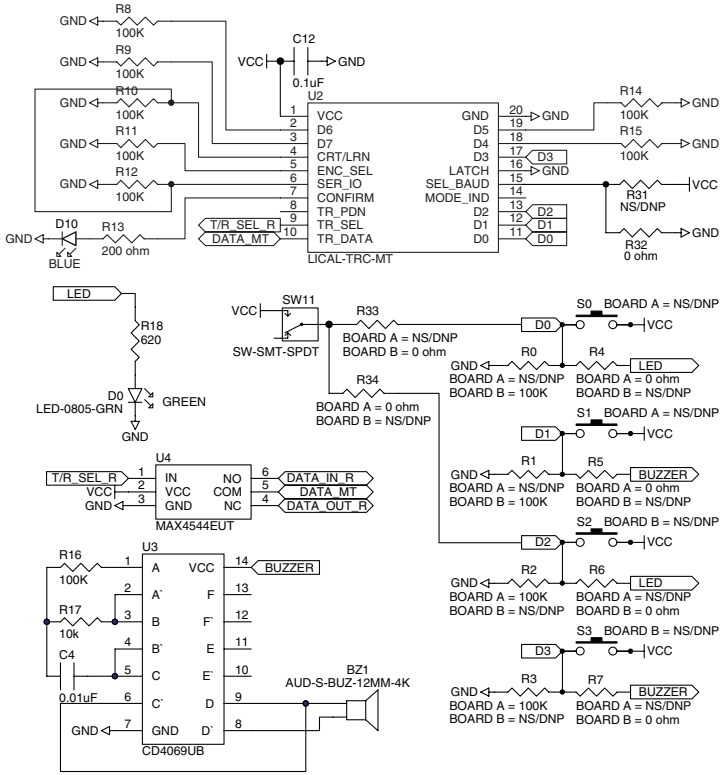


Figure 24: Range Test Area

Power Area

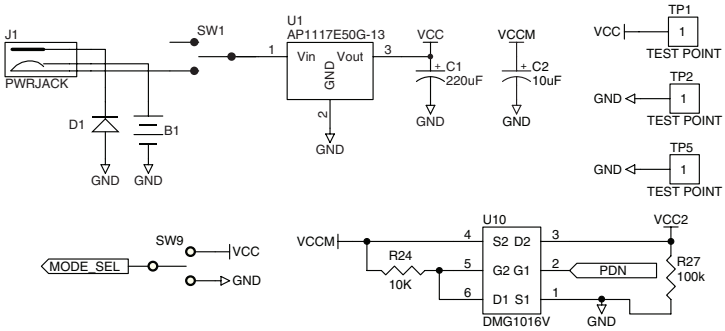


Figure 25: Power Area

Single Routing

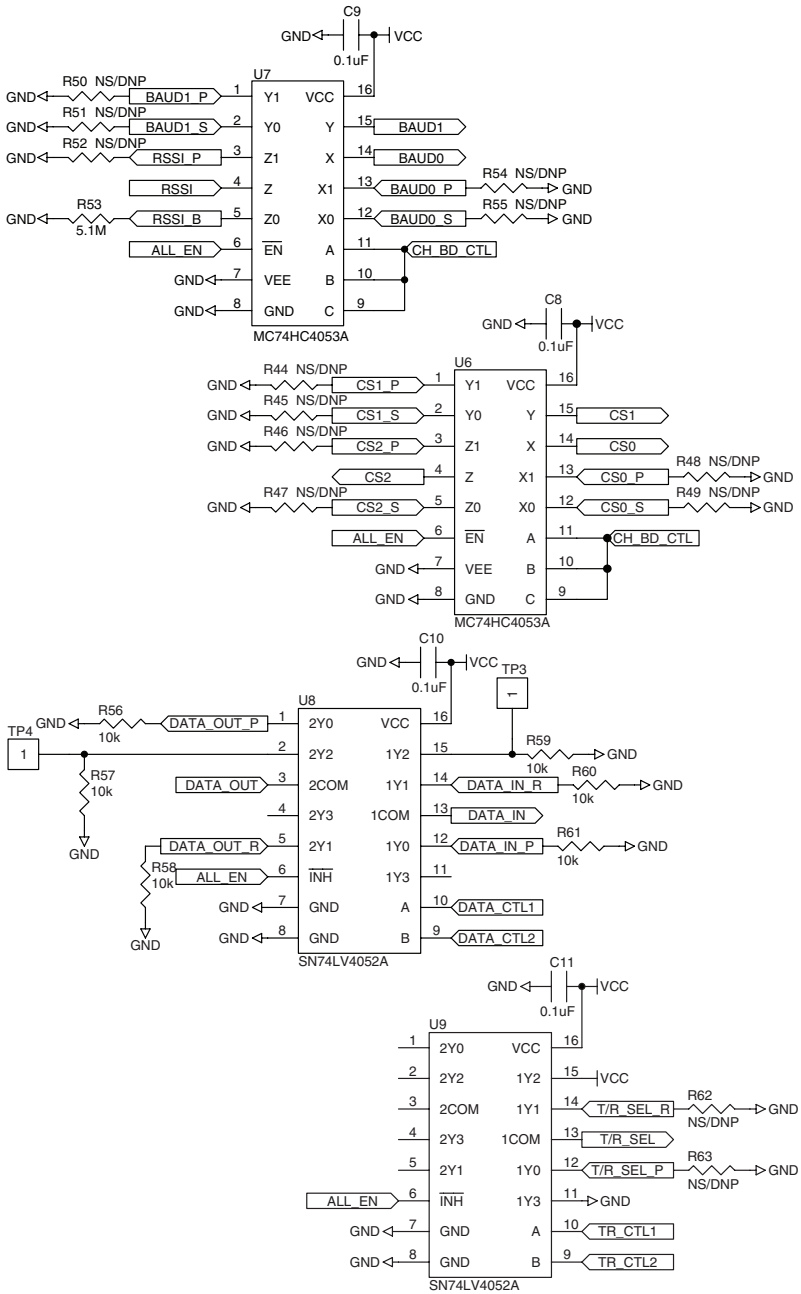


Figure 28: Single Routing



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