



**HumDT™ 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-***-DT	HumDT™ Series Master Development System
HUM-***-DT	HumDT™ Series Transceiver
EVM-***-DT	HumDT™ Series Carrier Board
MDEV-PGDCK	Development System Programming Dock
MDEV-PROTO	Development System Prototype Board
CON-SOC-EVM	EVM Module Socket Kit

\*\*\* = Frequency; 868MHz, 900MHz

Figure 2: Ordering Information

## HumDT™ Series Transceiver Carrier Board

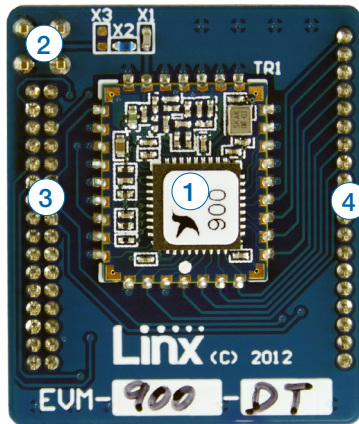


Figure 3: HumDT™ Series Transceiver Carrier Board

## HumDT™ Series Transceiver Carrier Board Objects

1. HumDT™ Series Transceiver
2. MMCX RF Connector
3. Dual Row Header
4. Single Row Header

# Prototype Board

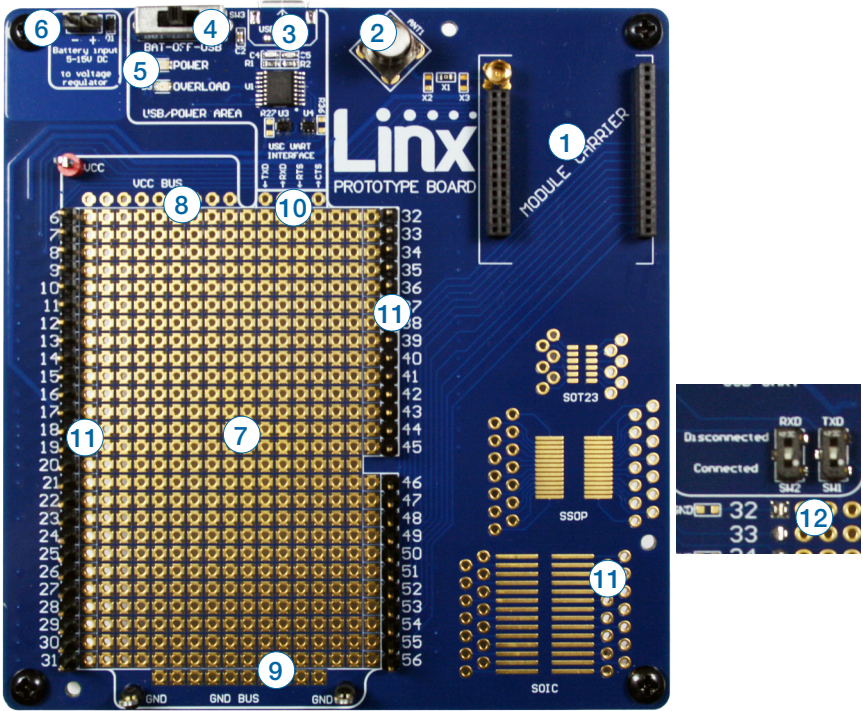


Figure 6: Prototype Board

## Prototype Board Objects

1. Carrier Board Socket
2. RP-SMA Antenna Connector
3. Micro USB Connector
4. Power Switch
5. Power LED
6. External Battery Connection
7. Prototyping Area
8. 3.3V Supply Bus
9. Ground Bus
10. USB Interface Lines
11. Module Interface Headers
12. Command Data Interface Routing Switches (on back)

## Using the Prototype Board

Snap a Carrier Board onto the socket on the Prototype Board as shown in Figure 7.

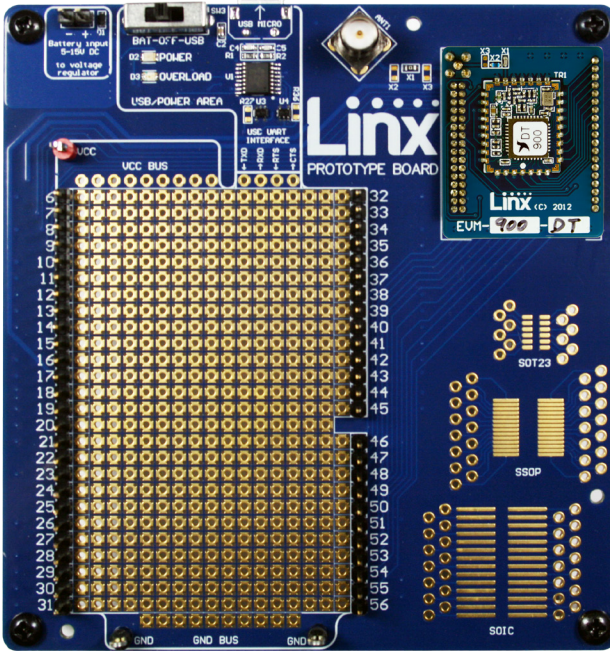


Figure 7: Prototype Board with a Carrier Board

Set the power switch (SW3) and connect a micro USB cable into the connector at the top of the board. Plug the other end into a PC or any USB charger. The board is powered by the USB bus. This board features a prototyping area to facilitate the addition of application-specific circuitry. 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.

At the top of the prototyping area is a row connected to the 3.3V power supply and at the bottom is a row connected to ground. External circuitry can be interfaced to the transceiver through the breakout headers. The numbers next to the headers correspond to the pin numbers on the Carrier Board. Figure 5 shows the pin assignments for the Carrier Board.

The OVERLOAD LED indicates that that too much current is being pulled from the USB bus. This is used to prevent damage to the parts or the bus.

## Using the Programming Dock

Snap a Carrier Board onto the socket on the Programming Dock as shown in Figure 9.

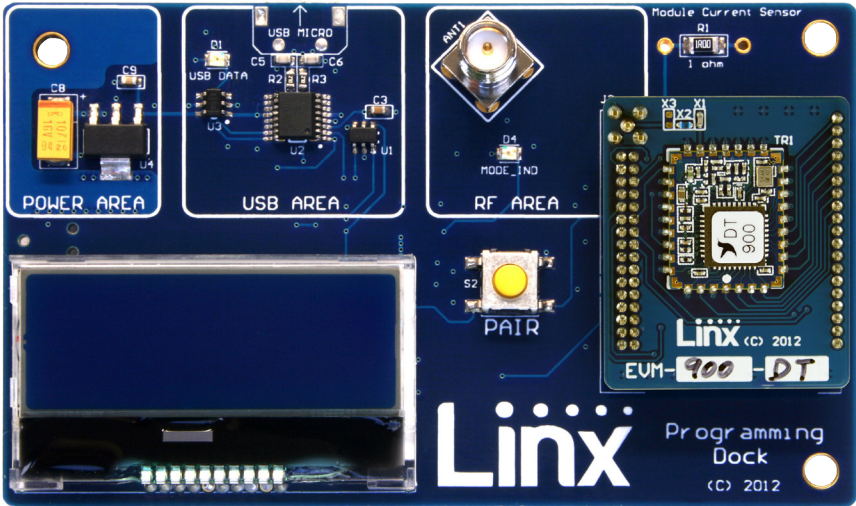


Figure 9: Programming Dock with a Carrier Board

Connect a micro USB cable into the connector at the top of the board. Plug the other end into a PC. The board is powered by the USB bus. The demonstration software included with the kit or custom application software can be used to configure the module through its Command Data Interface. The LCD is used to display information about the module. This includes the module's local address and a custom nickname. The nickname is entered using the development kit software and can be any name that helps distinguish the modules from one another. This is convenient when multiple programming docks are connected to the same computer. Please see the development kit software section for more information on the nicknames.

The HumDT™ Series transceiver has a serial Command Data Interface that is used to configure and control the transceiver. This interface consists of a standard UART with a serial command set.

# The Development Kit Demonstration Software

The development kit includes software that is used to configure and control the module through the Programming Dock. The software defaults to the Advanced Configuration tab when opened (Figure 10). This window configures the module's settings.

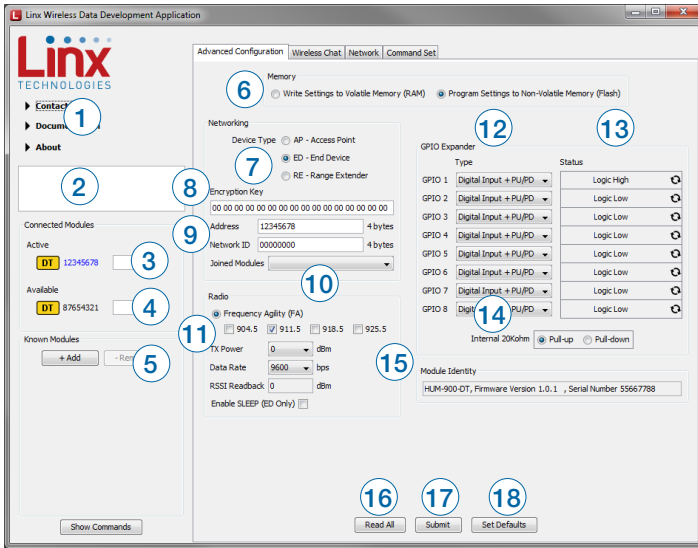


Figure 10: The Master Development System Software Advanced Configuration Tab

1. Clicking the Contact Linx, Documentation and About labels on the left side expands them to show additional information and links to the latest documentation. This is shown in Figure 11.
2. The Help window shows tips and comments about the software.
3. The active module is connected to the PC and being configured by the software.
4. Available modules are connected to the PC but are not currently being configured or controlled by the software.
5. Known Modules are not currently connected to the PC, but have either been connected to the software in the past or have been manually entered.
6. The memory setting configures the software to read and write from either volatile memory or non-volatile memory.
7. The Device Type section configures the module as either an Access Point, End Device or Range Extender.
8. The Encryption Key box shows the module's 16 byte AES encryption



The 868MHz version of the module operates on one of 68 channels as opposed to being agile among 4 channels. The software automatically detects the frequency band for the active module and adjusts the selection. The 868MHz module changes the channel selection from the check boxes to a drop-down menu in the Radio section (1).

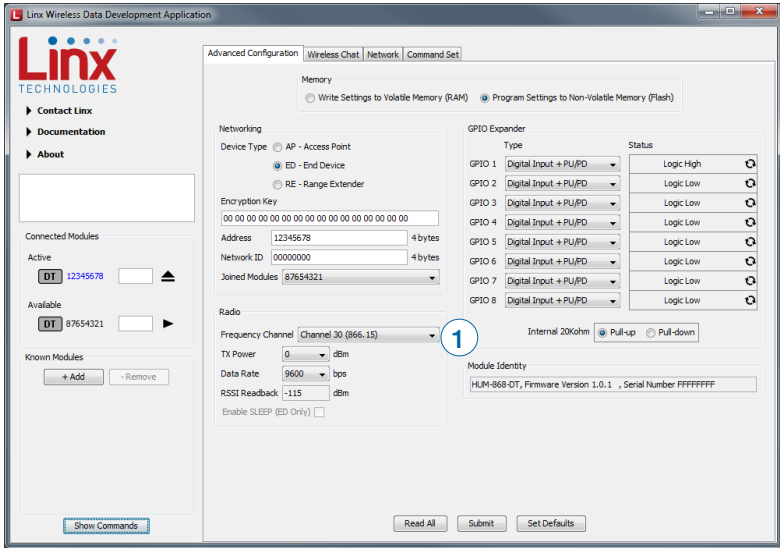


Figure 12: The Master Development System Software Advanced Configuration Tab

All other selections and operation are identical for both versions. The examples that follow show the 900MHz version, but the same procedures apply for the 868MHz version.

The Wireless Chat tab (Figure 15) offers a demonstration of sending data between two modules. There is a window for each connected module.

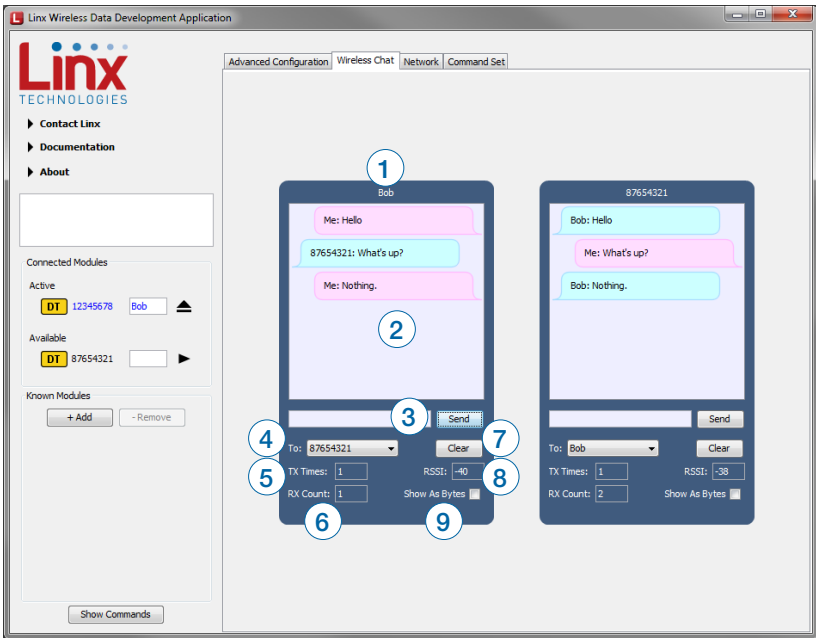


Figure 15: The Master Development System Software Wireless Chat Tab

1. The top of the window shows the address of the associated module.
2. The chat screen shows the chat messages that have been sent and received.
3. The Send box is where the message text is entered. The message is transmitted when the Send button is pressed.
4. The To menu selects the address of the connected module that is to receive the message (the destination address).
5. The TX Times box shows how many times the module has transmitted.
6. The RX Count box counts the number of messages that the module has received.
7. The Clear button clears all of the messages from the chat window.
8. The RSSI box indicates the signal strength of the last received message.
9. When the Show As Bytes box is selected the messages are shown as bytes in the chat window.



## Development Kit Demonstration Software Example

This example shows how to configure two modules to work with each other. The software defaults to the Advanced Configuration tab when opened (Figure 21).

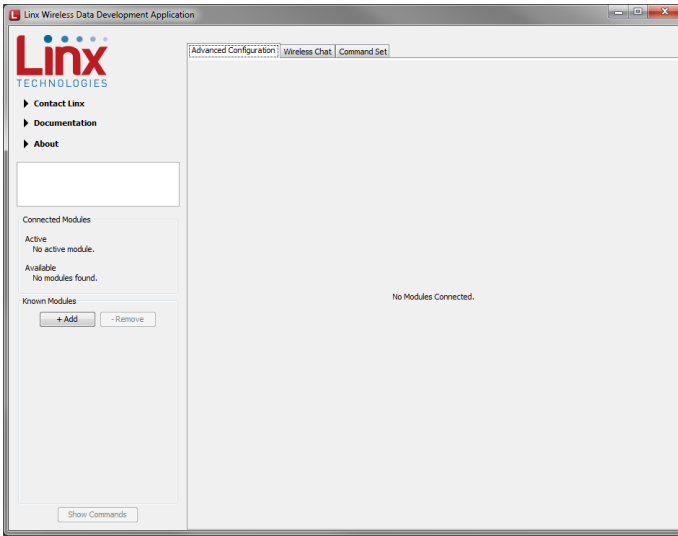


Figure 21: The Master Development System Software Advanced Configuration Tab at Start-up

Install Carrier Boards onto the Programming Docks and plug a USB cable between the Programming Docks and the PC. The software automatically detects attached devices. The first module that is identified appears under the Active label. This is the module that is actively controlled by the software. Subsequent modules are listed under the Available label as shown in Figure 22.

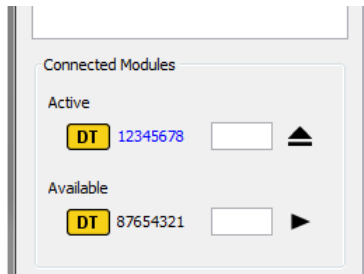


Figure 22: The Master Development System Software Connected Modules

Once the modules are detected by the software, the appropriate options are displayed on the Advanced Configurations tab and a Network tab appears. The module's documents appear under the Documentation link.

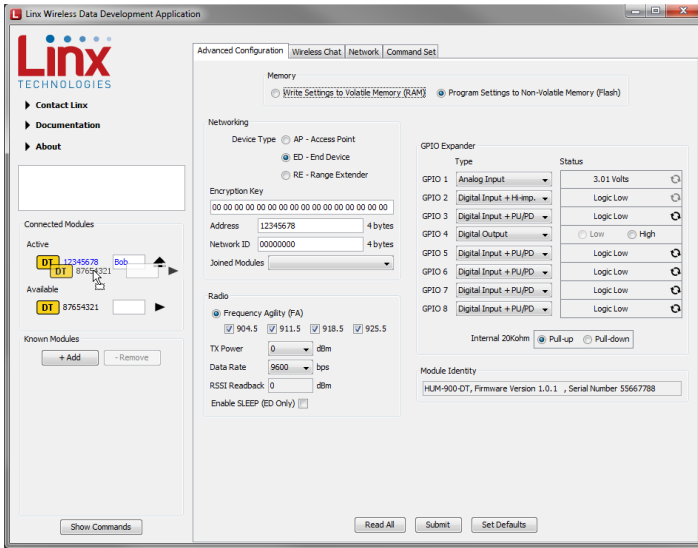


Figure 25: The Master Development System Software Dragging to Change the Active Module

There are several settings that must match in order for the modules to be able to communicate. This example uses the following settings.

- The Encryption Key must match on both modules. This can only be read out of an AP.
- Network ID must match on both devices.
- The UART Baud Rate is 9600.

Other settings can be used as long as they match on both modules. Once the settings are changed and submitted to both modules, the Network tab can be used to graphically view the network topology and the Wireless Chat tab can be used to transfer data.

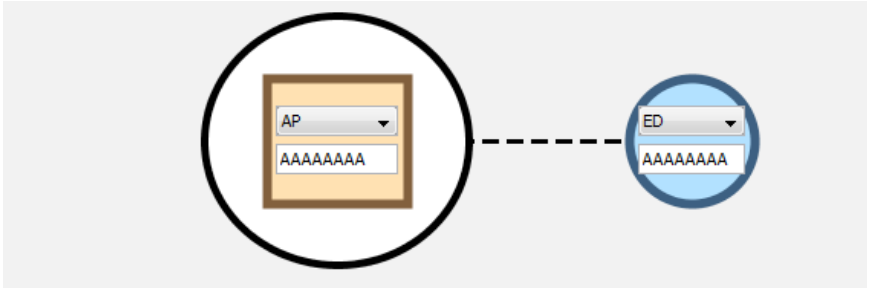


Figure 28: The Master Development System Software Network Tab

A dotted line appears between the modules indicating that they are joining the network.

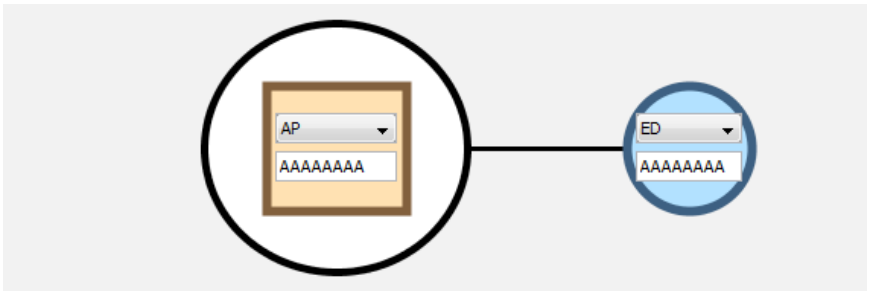


Figure 29: The Master Development System Software Network Tab

A solid line appears between the modules when they are joined and ready to communicate. The Wireless Chat tab can now be used to send data between the modules.

# Carrier Board Schematic

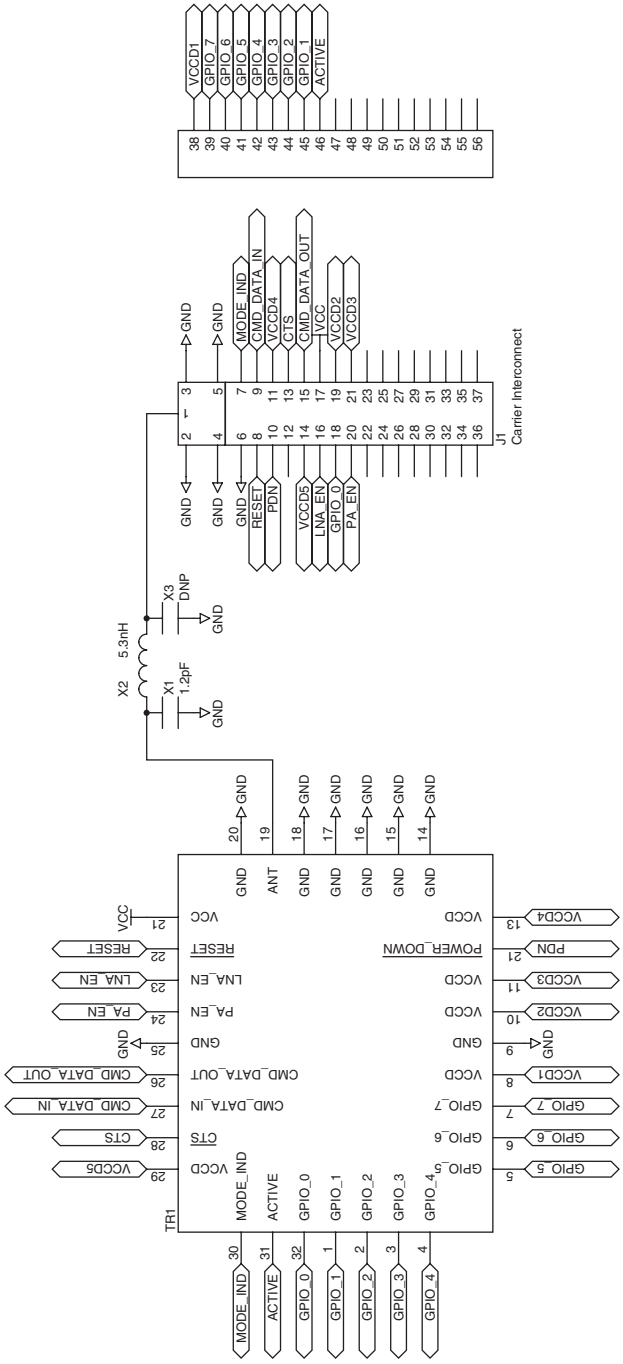


Figure 31: HumDT™ Series Transceiver Carrier Board Module Schematic

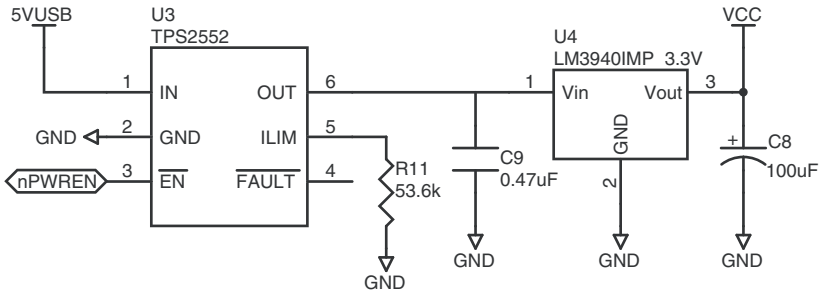


Figure 33: Programming Dock Board Power Supply Area Schematic

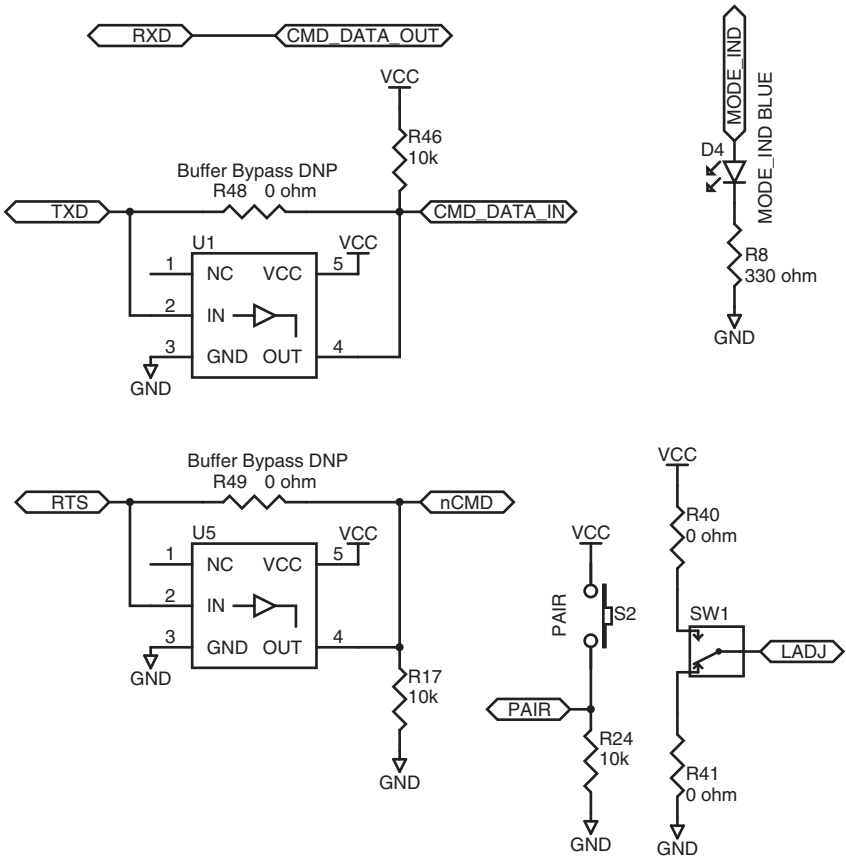


Figure 34: Programming Dock Board Signal Routing Schematic



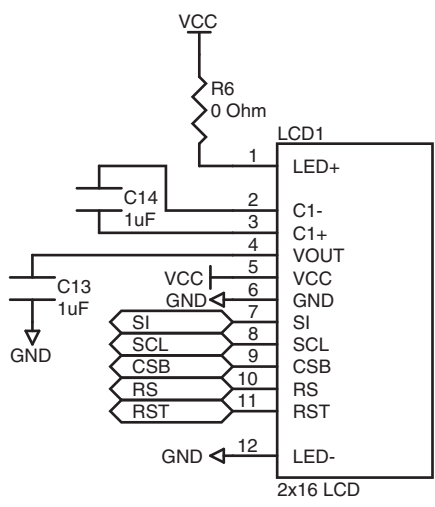
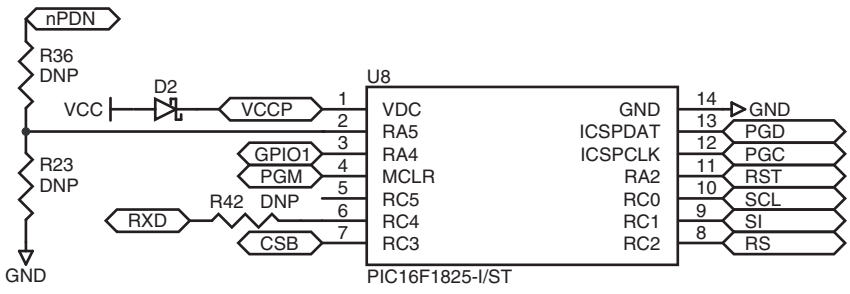


Figure 36: Programming Dock Board Microcontroller Area Schematic

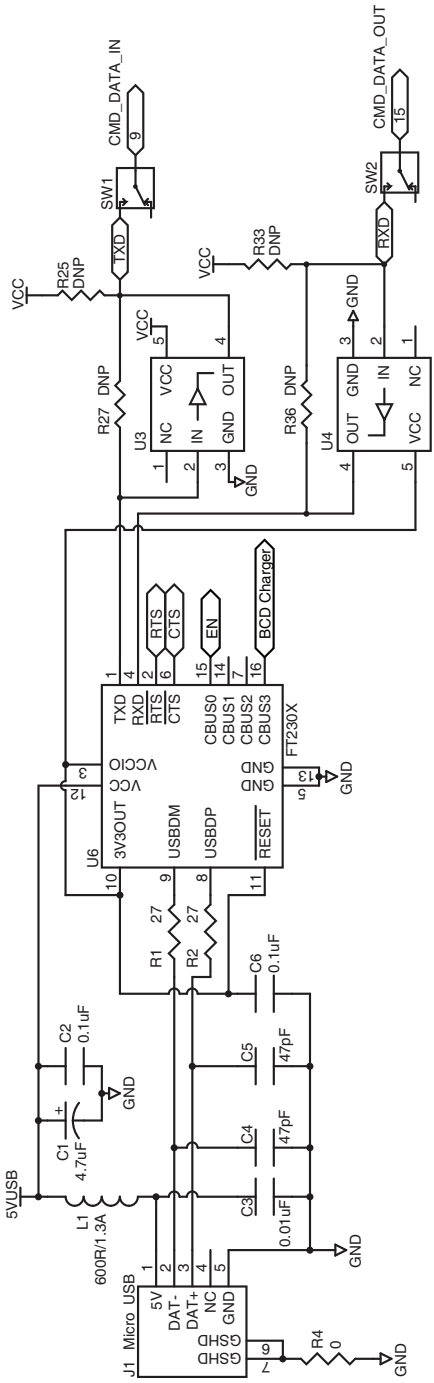


Figure 39: Prototype Board USB Area Schematic



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