Searching For A Transmitter

To search for a power transmitter on the same network as the computer running DTU, select the **File -> Search** menu option. The **Status** box will change to **SEARCHING** while DTU searches the network. The number of power transmitters found will be displayed in the **Status** box. Additionally, any hostnames or IP addresses of power transmitters will be selectable from the **Hostname** dropdown menu. Select a hostname and click **Connect** to connect to the transmitter.

Demo Commands

Receiver

Function	Description
Register	Register a newly discovered receiver to the current transmitter.
Unregister	Removes a registered receiver from the current transmitter.
Start Charge	Starts charging the selected receiver.
Stop Charge	Starts charging the selected receiver.
Identify	Causes the green LED on the selected receiver to flash for 10 seconds.
Sleep	Causes the receiver to enter deep sleep mode for storage or transportation.

Transmitter

Function	Description
Identify Transmitter	Causes the light ring on the transmitter to flash green for 10 seconds.
Calibrate	Starts the calibration process on the transmitter.
Send Discovery	Sends a discovery message. User will be prompted for 802.15.4 channel.
Shutdown	Shuts down the single board computer inside the transmitter.

Debug Commands (Requires password)

Receiver

Function	Description	Arguments	Return Value
Blink Receiver LED	Blinks the green LED on the receiver for 10 seconds.		
Control USB Power	Enables or disables the USB type A port on the receiver.	1 (Enable) 0 (Disable)	

CW Beacon	Forces the receiver to send out a continuous wave RF beacon for the entered duration in minutes.	<Minutes>	
Discharge Batt to %	Enables the USB type-A port until the battery level reaches the entered value.	<Percent>	
Firmware Version	Returns the receiver firmware commit hash.		Commit hash in the form 0xXXXXXXXX
Force Watchdog	Forces the watchdog counter to increment.		
Get Beacon Frequency	Reads the current beacon frequency.		Beacon frequency in MHz
Get COMM channel	Reads the current 802.15.4 communication channel used by the receiver.		11-26
Harvest Power	Forces the receiver to enter power harvest mode for the entered duration.	<Hours> <Minutes>	
Ping Receiver	Takes the entered value and adds 1 to it and returns the new value.	<Any value>	Any value + 1
Read Watchdog	Reads the number of watchdog resets since last hardware reset.		
Reset Receiver	Resets the receiver.		
Set Beacon Frequency	Sets the beacon frequency transmitted by the receiver.	0-100 or 255 (Reset to default)	
Set COM Channel	Sets the 802.15.4 communication channel on the receiver.	<11-26>	

Sleep Receiver	Puts the receiver in deep sleep mode. Must be hardware reset to resume operation.		

TRANSMITTER

Function	Description	Arguments	Return Value
Charge Virtual	Transmitter will send focused power to any beacons it detects at any time.		
Fans Full	Forces the fans all ON or OFF	1 (On) 2 (Off)	
Pause	Pauses the power transmitter software to allow for debugging.		
Reboot All	Reboots the single-board computer (SBC) inside the power transmitter.		
Reset Array	Resets and re-initializes the antenna array.		
Reset NVM	Resets all transmitter configuration parameters to default values.		
Reset Proxy	Resets the 802.15.4 Proxy chip inside the power transmitter.		
Restart Host MCU	Resets the host MCU. Required after changing any system parameters.		
RSSI Filter Enable	Enables or disables RSSI filtering. This must be enabled prior to static charging.	1 (Enable) 0 (Disable)	

Run	Resumes normal operation after the power transmitter has been paused.		
Sample Beacon	Switches the antennas to receive (RX) mode and captures beacon phase information. Transmitter must be in Pause mode.		
Send Discovery	Sends a discovery message to locate power receivers. A channel may be specified in the user input box.	<11-26>	
Set TX Frequency	Sets the frequency to be used for power transmission. Default value is '0' which means the frequency is chosen based on the COMM channel.	<2400-2500> Or 0	
Shutdown	Shuts down the SBC inside the power transmitter.		
Static Charge	Freezes TPS on a specified beacon beat. Also sends a command to the selected receiver to enter power harvesting mode for the same time duration.	<Beacon beat> <Hours> <Minutes>	
Static Power	Enables power transmission back to the beacon that was sampled with the Sample Beacon command. Transmitter must be in Pause mode.		

RECEIVER LOGGING

Before accessing any of the logging functions, an SSH session must be established between the transmitter and the DTU software. To start this session, click the **Connect SSH** button in the **Debug** tab. If the connection is successful, the message **SSH CONNECTED** will appear in the **Response** box.

Starting a Log

Receiver data can be logged to a .CSV file on the transmitter which can be downloaded at a later time. To start logging:

1. Select at least one receiver in the **Receiver List** (Control-Click to select multiple receivers)
2. Enter the number of hours to run the log
3. Enter the delay between data samples
4. Click the **Start Logging** button

Stopping a Log

To stop a logging session in progress, click the **Stop Logging** button. This will stop any and all currently running log processes on the transmitter.

Listing Log Files

To retrieve a list of log files currently on the transmitter, click the **List Files** button. The list of .CSV files on the transmitter will be displayed in the **Log Files** list box.

Downloading Log Files

To download a log file, select the desired filename in the **Log Files** list box and click the **Download** button. A *Save as…* dialog will prompt for a save location. The **Status** indicator will change to "**DOWNLOADING**". Once the download is complete, the **Status** indicator will display the number of bytes that were transferred.

Deleting Log Files

To delete a log file, select the desired filename in the **Log Files** list box and click the **Delete** button. A confirmation dialog will open asking to confirm the name of the file that will be deleted. Click **Yes** to confirm deletion.

Plotting Data From Log File

There are two ways to open the data plotting dialog. If not connected to a transmitter, select **Open Log** from the **File** window. Alternatively, there is a **Plot Log Data** button on the **Debug** tab. Once open, click the **Select File** button and select a previously downloaded log file. If the selected file contains valid data, the list of receiver IDs and data columns will be populated in the lists at the top of the dialog. To plot data, select one or more receivers and one or more data columns and then click the **Plot** button. **NOTE: To select multiple receivers or multiple data columns, hold the Ctrl key and select multiple entries from the lists.**

Viewing the MCU Log File

The last 50 log entries to the MCU log file on the transmitter can be viewed by clicking the **View MCU Log** button on the **Debug** tab.