TRAX

Intelligent Pipeline Technology

EMTx Config Windows Operating Manual

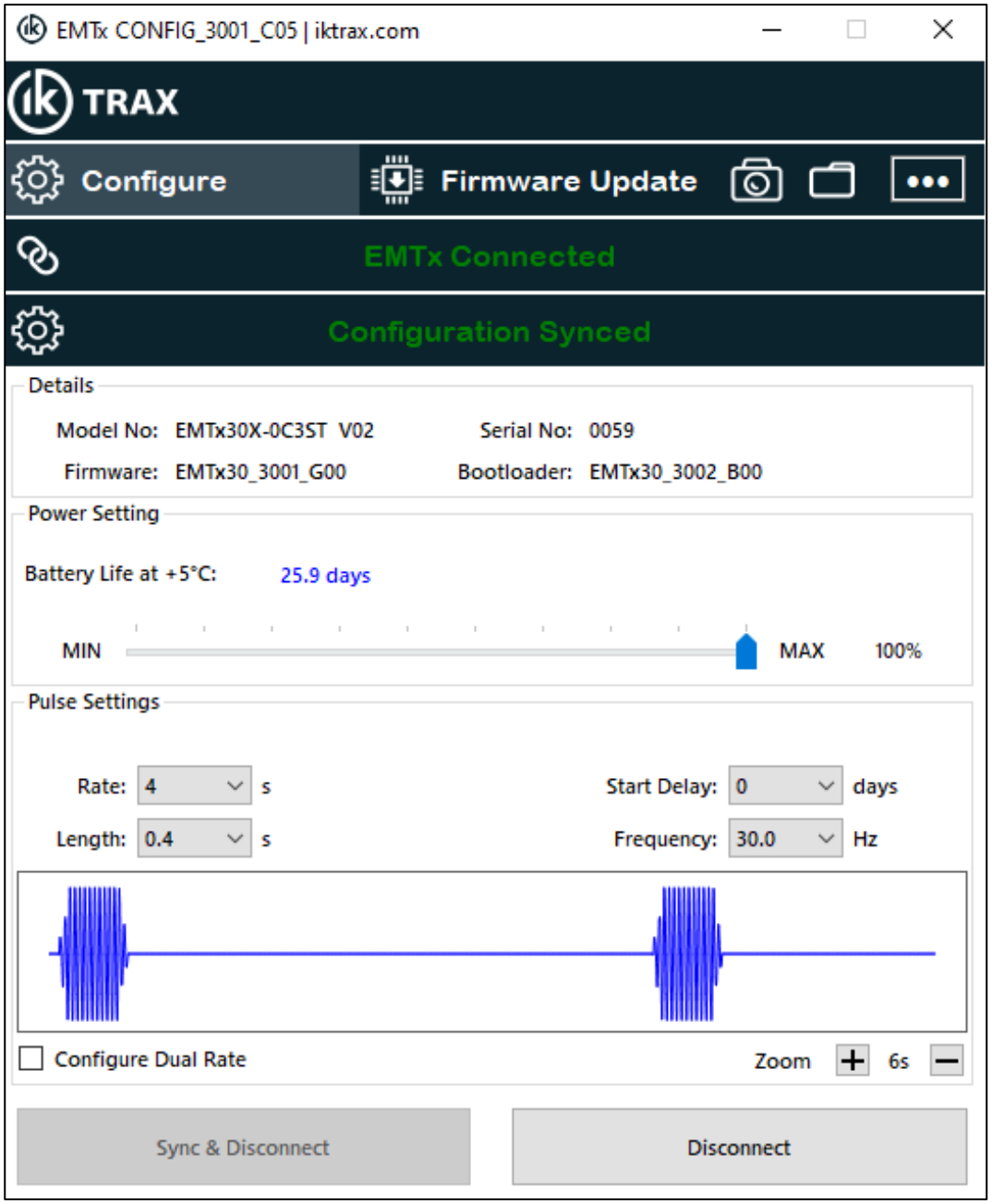
www.iktrax.com

EMTx CONFIG_5001			
Rev	**Date**	**By**	**Summary of change**
A00	15/09/20	GH	CR00498 Initial Release.
B00	09/02/21	GH	CR00498 All sections updated to reflect major updates to the application.
C00	11/07/24	SS	CR01155 All sections updated to reflect major updates to the application.
COMMENTS:			

CONTENTS **Page**

1. GENERAL DESCRIPTION

The IK Trax EMTx Config Windows application is used to configure the EMTx series of Electromagnetic (EM) transmitters. The user can configure the transmitter frequency, signal strength, pulse rates, pulse lengths and start delay. With these selected parameters the app can then predict the battery life for your application. The screen capture feature can be used to record the applied transmitter configuration.



2. INSTALLATION

Ensure that the application has been installed and tested in advance of when it will be required.

The application requires the Microsoft .NET Framework to be installed on the target device. Depending on which version of Windows is installed on the target device it may be necessary to upgrade to the latest version of the .NET framework to enable the correct installation of this application.

2.1. .NET FRAMEWORK RUNTIME INSTALLATION

An internet connection will be required for the .NET installation.

1. Log into the target device as an administrator with full administrator rights.
2. Go to https://dotnet.microsoft.com/download.
3. Follow all instructions provided to download and install the latest version of .NET Framework Runtime.

2.2. EMTx CONFIG APPLICATION INSTALLATION

1. Log into the target device as an administrator with full administrator rights.
2. If a previous version of the EMTx Config application is already installed, uninstall it first by navigating to *Start -> Control Panel -> Programs -> Uninstall a Program*.
3. Unzip **EMTx CONFIG_3001_Xnn EMTx CONFIG WINDOWS APP INSTALL** folder to any location on the target device.
4. Execute the appropriate **setup.exe** file found in the install folder.
5. Follow all instructions provided on screen to complete the installation.
6. The application will now be available in the Start menu and a desktop shortcut will be automatically created.

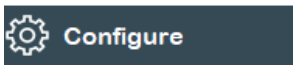
3. USING THE APPLICATION

3.1. LAUNCH EMTx CONFIG

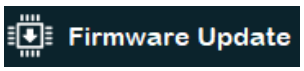
To run the application, double click on the EMTx Config desktop icon.

3.2. APPLICATION CONTROLS & STATUS INDICATORS

The application controls have the following functions:



Enables Configure Mode as per *3.3.1 Configure Mode*.



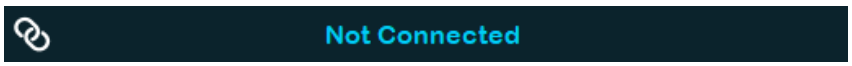
Enables Firmware Update Mode as per *3.3.2 Firmware Update Mode*.

Captures a screenshot as per *3.8 Screen Capture*.

Selects the save location for screenshots.

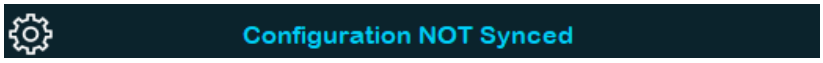
Password box, reserved for IK Trax use.

The application has the following status indications:



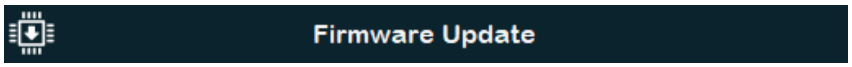
Indicates that the application is not currently connected to a transmitter.

Indicates that the application is currently connected to a transmitter.



Indicates that the current transmitter configuration is out of sync with the values displayed in the application i.e. at least one setting has been changed and requires to be saved.

Indicates that the current transmitter configuration is in sync with the values displayed in the application i.e. the application is showing how the transmitter is currently configured.



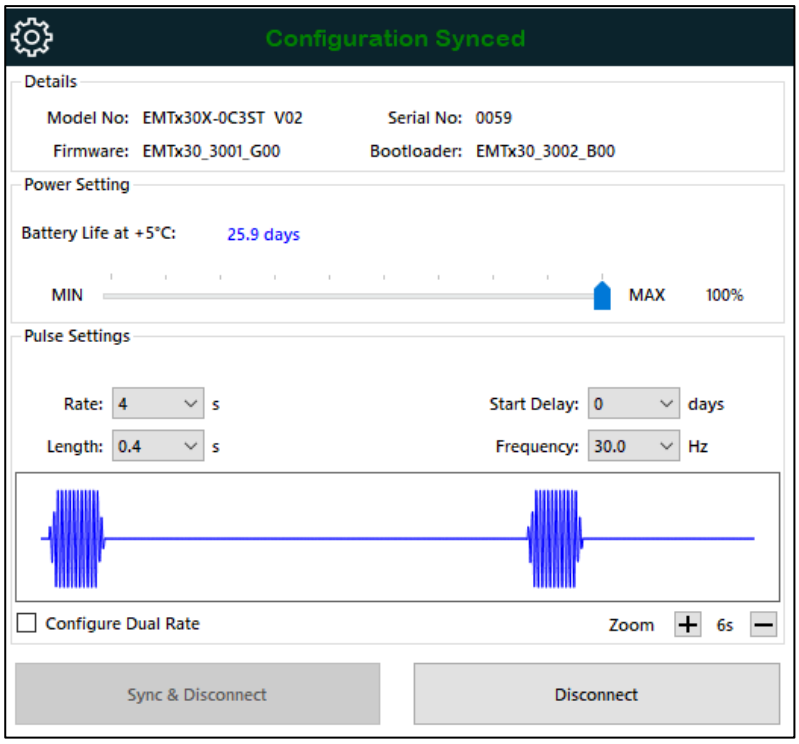
Indicates that the application is connected to the transmitter bootloader in Firmware Update mode.

3.3. APPLICATION MODES

The application has two modes of operation, Configure mode and Firmware Update mode. For a detailed description of each mode refer to the following sections.

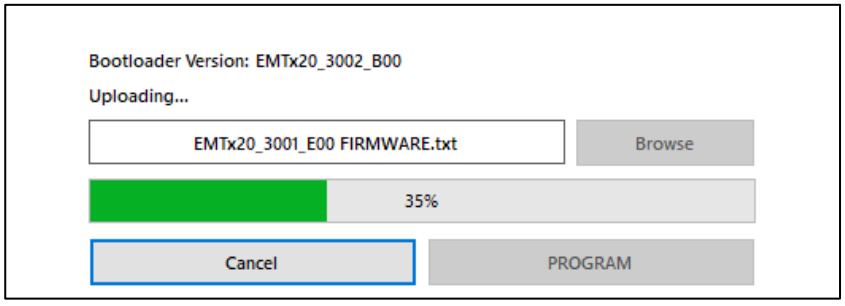
3.3.1. CONFIGURE MODE

Configure mode is the typical mode of operation for the application. This mode makes it possible to tailor the EMTx configuration to suit specific requirements It is possible to configure the EMTx Output Power, Frequency, Pulse Rates, Pulse Lengths and Start Delay. Refer to *3.6 Configure EMTx* for full details on each of the configurable settings.



3.3.2. FIRMWARE UPDATE MODE

Firmware Update mode enables the EMTx firmware to be updated. EMTx20 transmitters require a USB Endcap connected in order to update the firmware. EMTx30 firmware can be updated using the Bluetooth Low Energy (BLE) interface. Refer to *3.7 Update EMTx Firmware* for full instructions on updating EMTx firmware.



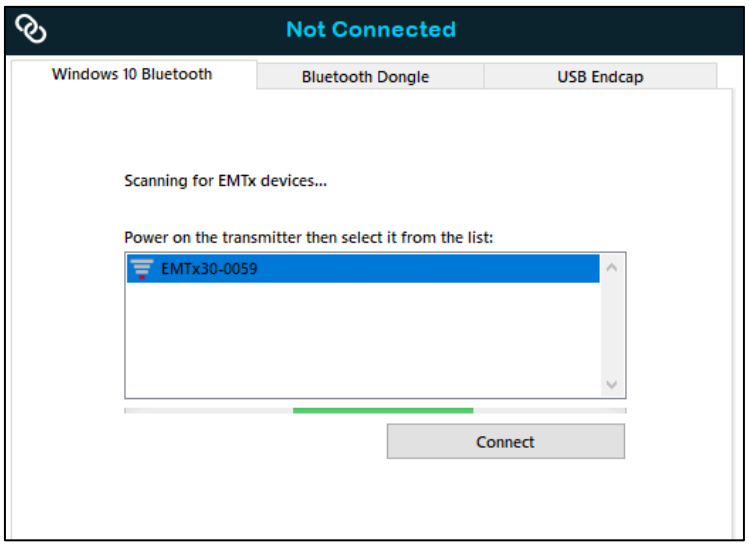
3.4. CONNECTION INTERFACES

The application has three connection interfaces available, Windows 10 Bluetooth, Bluetooth Dongle and USB Endcap. The type of EMTx being configured will determine which interfaces can be used. Currently the EMTx20 requires a wired connection via a USB Endcap (supplied separately) whereas the EMTx30 supports wireless connection via Bluetooth LE as standard. For a detailed description of each connection interface refer to the following sections.

3.4.1. WINDOWS 10 BLUETOOTH

The Windows Bluetooth interface is intended to be the primary connection interface for configuring EMTx30, 40 & 50 transmitters. In order to use this interface, the target device must have a built in Bluetooth adapter. If these requirements cannot be met then please use the alternative BLE Dongle interface as per *3.4.2 Bluetooth Dongle*. This connection interface facilitates wireless communications between the transmitter and target device via Bluetooth LE.

When the Windows 10 Bluetooth connection interface is selected, the application will immediately begin scanning for EMTx devices. Discovered devices will be shown in the list box together with an indication of the device signal strength. The progress bar at the bottom will be traversing the screen to indicate that the application is currently scanning for devices. Scanning will continue indefinitely until a device connection is established or a different connection interface is selected.



3.4.2. BLUETOOTH DONGLE

The Bluetooth Dongle interface is intended to provide an alternative Bluetooth connection interface for target devices that do not have a built in Bluetooth adapter in order to allow configuration of EMTx30 transmitters. This connection interface facilitates wireless communications between the transmitter and target device via Bluetooth LE.

The interface will accept any Bluetooth dongle, provided all drivers are installed, yet the reccomended dongle is SILICON LABS BLED112 USB Bluetooth dongle. IK Trax can supply BLED112 dongles if required, alternatively the dongle can be purchased locally from the following suppliers:

Farnell - 2930668 RS - 807-7742

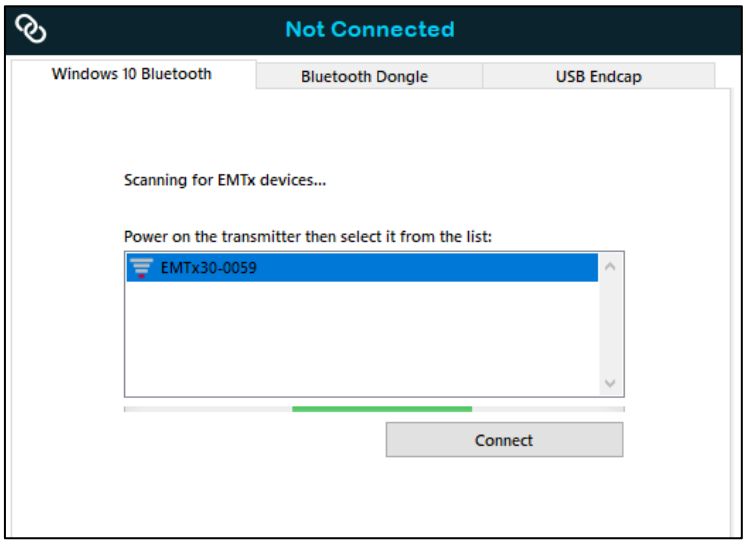
Digi-Key - 1446-1030-ND Mouser - 603-BLED112

When the USB Bluetooth dongle is first connected to the target device the required driver should be downloaded and installed automatically by Windows.However, it may be necessary in some circumstances to obtain the driver from the SCILABS website (link below) and install it manually.

https://www.silabs.com/wireless/bluetooth/bluegiga-low-energy-legacy-modules/device.bled112

Ensure the USB Bluetooth dongle is connected to the target device and the driver installed before attempting to use the Bluetooth Dongle connection interface.

When the Bluetooth Dongle connection interface is selected, the application will immediately begin scanning for EMTx devices. Discovered devices will be shown in the list box together with an indication of the device signal strength. The progress bar at the bottom will be traversing the screen to indicate that the application is currently scanning for devices. Scanning will continue indefinitely until a device connection is established or a different connection interface is selected.



3.4.3. USB ENDCAP

The USB Endcap interface is used exclusively to configure EMTx20 transmitters. This connection interface facilitates wired communications between the transmitter and target device via a USB cable and EMTx20 USB endcap supplied by IK Trax.

When the USB endcap is first connected to the target device the required driver should be downloaded and installed automatically by Windows, however, it may be necessary in some circumstances to get the driver from the FTDI website (link below) and install it manually.

https://www.ftdichip.com/Drivers/VCP.htm

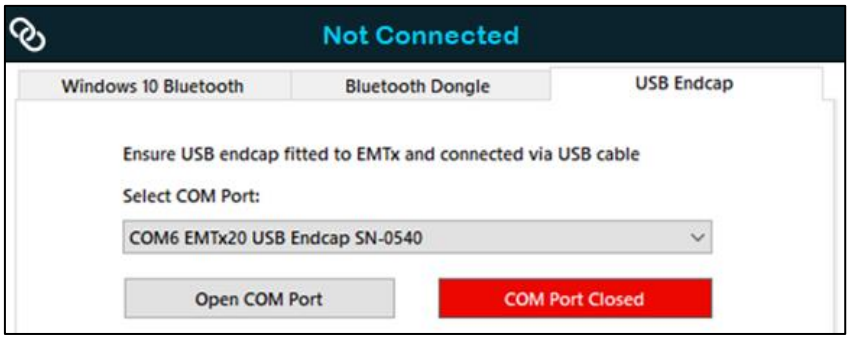
Ensure the USB endcap is connected to the target device and the driver is installed before attempting to use the USB Endcap connection interface.

When the USB Endcap connection interface is selected the user must select the COM port associated with the connected USB endcap from the drop-down list then click the 'Open COM Port' button to establish a connection with the endcap.

The coloured panel indicates the current status of the COM port connection.

Any open COM port connection will be closed automatically if a different connection interface is selected.

NOTE: Disconnecting the USB cable or endcap from the target device while there is an open COM port connection may cause the application to crash.



3.5. CONNECT TO EMTx

The following sections describe the steps required to connect to the different types of EMTx transmitters in Configure or Firmware Update mode.

3.5.1. EMTx20

1. Ensure that the USB endcap is fitted to the transmitter and connected to the target device with the supplied USB cable.

   NOTE: USB endcap replaces the PCB end cap; the battery end cap does not need to be removed.

2. Launch the EMTx Config application if not already running.
3. Select the desired application mode, Configure(default) or Firmware Update.

4. Select the USB Endcap connection interface.
5. Select the COM port associated with the connected USB endcap from the drop-down list of available ports then click on the 'Open COM Port' button.

6. If the COM port is opened successfully the status indicator will change to green as shown.
7. Press the 'RESET' button on the USB endcap and hold for 1 second then release.
8. The application will now connect to the transmitter and load into either Configure mode or Firmware Update mode as selected. Refer to *3.6 Configure EMTx* or *3.7 Update EMTx Firmware* for details of these modes.

3.5.2. EMTx30

1. Completely remove the **PCB endcap** from the EMTx30. This is to facilitate wireless reception.
2. Unscrew the **battery endcap** until both o-rings are clear of the housing but the threads are still engaged.
3. Launch the EMTx Config application if not already running.
4. Select the desired application mode, Configure(default) or Firmware Update.

5. Select either of the Bluetooth connection interfaces.

6. Turn on the transmitter by screwing in the battery endcap until the EMTx device name appears in the list of found devices on the Bluetooth connection interface. It is not required to fully close the endcap.
7. Click on the name of the target transmitter and then the "Connect" button.
8. The application will now connect to the transmitter and load into either Configure mode or Firmware Update mode as selected. Refer to *3.6 Configure EMTx* or *3.7 Update EMTx Firmware* for details of these modes. (It may take several seconds to establish the connection).

3.5.3. **EMTX 40**

1. Run the application. Select the desired Bluetooth connection method as described in *3.4 Connection* Interfaces section.
2. Remove the PCB endcap to ensure that the Bluetooth signal is strong enough to be detected.
3. Screw the bleed screw in to switch the device on. Ensuring that the travel insulator has been removed from the bleed screw.
4. The device will appear on the EMTX config app the device name will resemble this format: EMTx40-XXX.
5. Click on the name of the target transmitter and then the "Connect" button.
6. The application will now connect to the transmitter and load into either Configure mode or Firmware Update mode as selected. Refer to *3.6 Configure EMTx* or *3.7 Update EMTx Firmware* for details of these modes. (It may take several seconds to establish the connection).

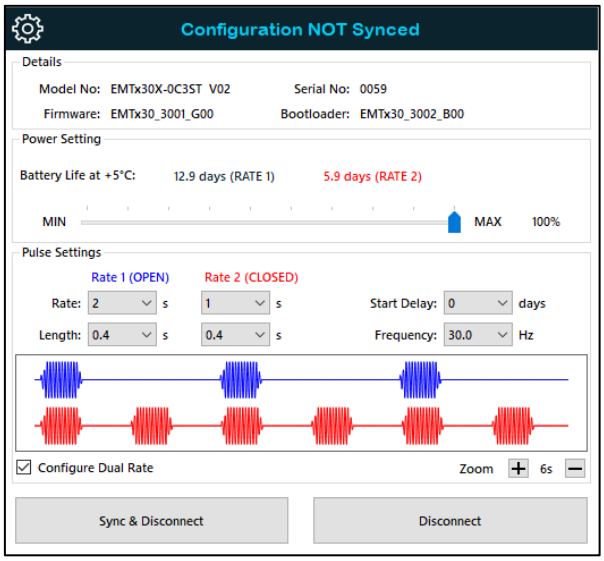
3.5.4. **EMTX 50**

The EMTX 50 at the moment is in plastic housing and does not require removal of any end caps to ensure Bluetooth discoverability.

1. Power on the device, as per manual instructions of the transmitter manual.
2. Select the target transmitter and then press the "Connect" button.
3. The application will now connect to the transmitter and load into either Configure mode or Firmware Update mode as selected. Refer to *3.6 Configure EMTx* or *3.7 Update EMTx Firmware* for details of these modes. (It may take several seconds to establish the connection).

3.6. CONFIGURE EMTx

The Configuration panel provides the interface for making adjustments to the transmitter settings as required.



For instructions on how to connect a transmitter in Configure mode refer to *3.5 Connect to EMTx*.

The drop-down boxes and slider are used to adjust the setting values. The use of these controls ensures that valid values are always entered.

The pulse charts merely provide a visual approximation of the output signal waveform.

Once the transmitter is configured as required, press the 'Sync & Disconnect' button to save the new setting values to the transmitter. Once the settings have been saved the transmitter will automatically disconnect and start transmitting.

The 'Sync & Disconnect' button will only be enabled when at least one of the transmitter's setting values has been modified. This is indicated by the Sync Status indicator at the top of the Configure panel.

The Details panel is used to show the Model No, Serial No and Firmware Version of the currently connected transmitter.

Refer to the following sections for further details on the configuration of each setting details

3.6.1. POWER SETTING

⚠ **CAUTION:** Modifying the transmitter power setting will affect the battery life and output signal strength of the transmitter. You are responsible for ensuring that the power output selected provides suitable battery life and output signal strength for your intended application. Please contact IK Traxfor further information and guidance if required.

The Power Setting panel contains a slider that allows the output power of the transmitter to be adjusted.

The output power setting can be configured to provide a stronger signal at the expense of battery lifetime or extend battery lifetime at the expense of signal strength.

3.6.2. FREQUENCY

⚠ **CAUTION:** Modifying the frequency may affect the ability of a receiver to detect the signal. You are responsible for ensuring that the frequency selected is suitable for your intended application. It is recommended that you suitably test any such change in advance. Please contact IK trax for further information and guidance if required.

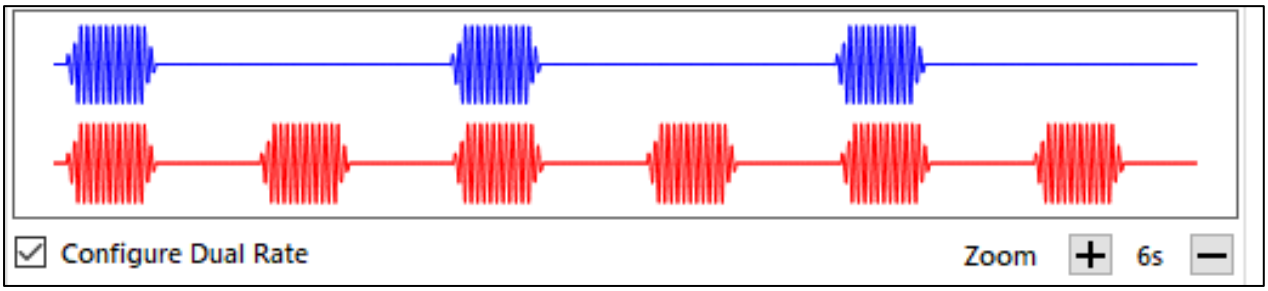
The transmitter frequency can be configured between 15Hz and 30Hz. The default configuration is the industry standard 22Hz.

3.6.3. PULSE RATES

⚠ **CAUTION:** Modifying the pulse rates will affect the battery life of the transmitter. You are responsible for ensuring that the pulse rates selected are suitable for your intended application. Please contact IK Trax for further information and guidance if required.

The pulse rate can be set to either Continuous mode or one of the predefined pulsing rates from 1 to 10 seconds using the 'Rate' drop-down box.

3.6.4. DUAL RATE MODE



If configuring the transmitter for use with a Dual Rate Endcap check the box labelled 'Configure Dual Rate'. Selecting this option will allow access to configure the second pulse rate and length. If interfacing with a BWGP or ARGF, RATE 1 is the Fail Pulse Rate and RATE 2 is the Pass Pulse Rate.

3.6.5. PULSE LENGTHS

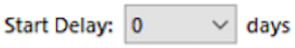
⚠ **CAUTION:** Modifying the pulse lengths will affect the battery life of the transmitter and may affect the ability of a receiver to detect the signal. You are responsible for ensuring that the pulse lengths selected are suitable for your intended application. It is recommended that you suitably test any such change in advance. Please contact IK Trax for further information and guidance if required.

It is possible to independently configure the pulse length for each rate using the 'Length' drop-down box to select one of the predefined pulse lengths.

Reducing the pulse length will increase the battery life of the transmitter but will make it more difficult to detect the pulsing signal using a receiver. Increasing the pulse length will reduce the battery life of the transmitter but will make the pulsing signal easier to detect using a receiver.

The standard pulse length of 0.4 seconds should be optimal for most applications.

3.6.6. START DELAY



The Start Delay setting can be used to delay the start of the transmitter by the configured number of days.

If configured, then when the transmitter is next powered on it will immediately go into sleep mode. Once the configured number of days has elapsed the transmitter will begin transmitting as normal.

This feature can be useful if the transmitter is to be installed significantly in advance of the pigging operation commencing.

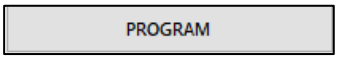
3.7. UPDATE EMTx FIRMWARE

⚠ **CAUTION:** Do not attempt to update firmware without the express permission of IK Trax

To update the firmware, follow the steps below.

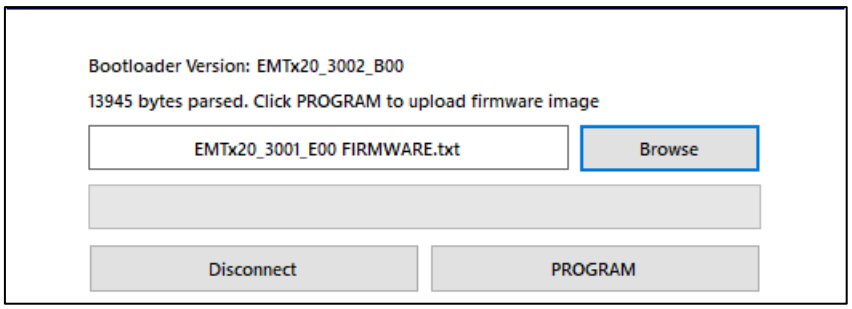
1. Connect to the transmitter in Firmware Update mode as per 3.5 Connect to EMTx.
2. Click 'Browse' to locate and select the firmware image .txt file supplied by IK Trax.

3. Click 'Program' to start the firmware update. The upload may take several minutes to complete.



When the upload is complete the transmitter will automatically disconnect from the application and start transmitting.

The firmware upload can be cancelled at any time, however, immediately on beginning a firmware upload the currently installed firmware image is invalidated. The transmitter will, therefore, no longer function until a complete valid image has been successfully uploaded.



3.8. SCREEN CAPTURE

A time-stamped screenshot can be taken at any time by clicking on the 'Screenshot' button.

It is possible to change the screenshot save location at any time by clicking on the folder button and selecting a new location. The default setting is the Desktop.

The screen capture will be saved to the selected folder as a PNG image with the name <YYMMDD hhmmss EMTx Config Screenshot.png> where "YYMMDD hhmmss" represents the current date (reversed) and time.