Flintec Device Configuration (FDC) Tool

EM100

V1.0 March 2019

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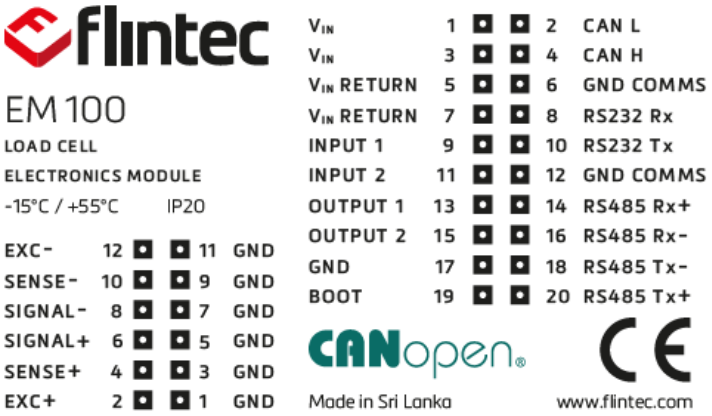
1. FDC Setup

1.1. System Requirements

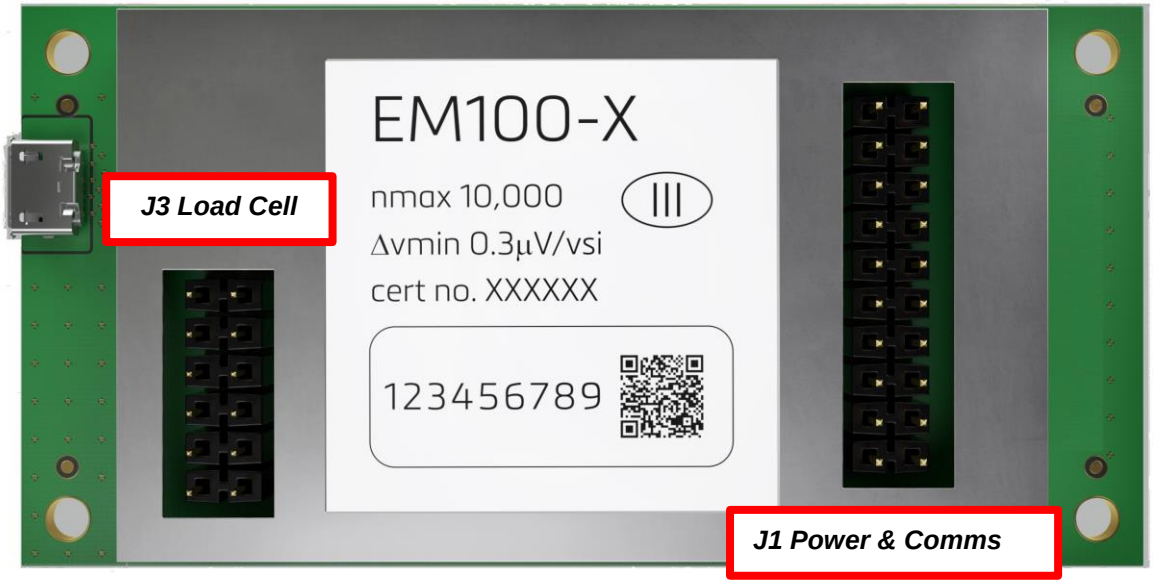
PC System Requirements.

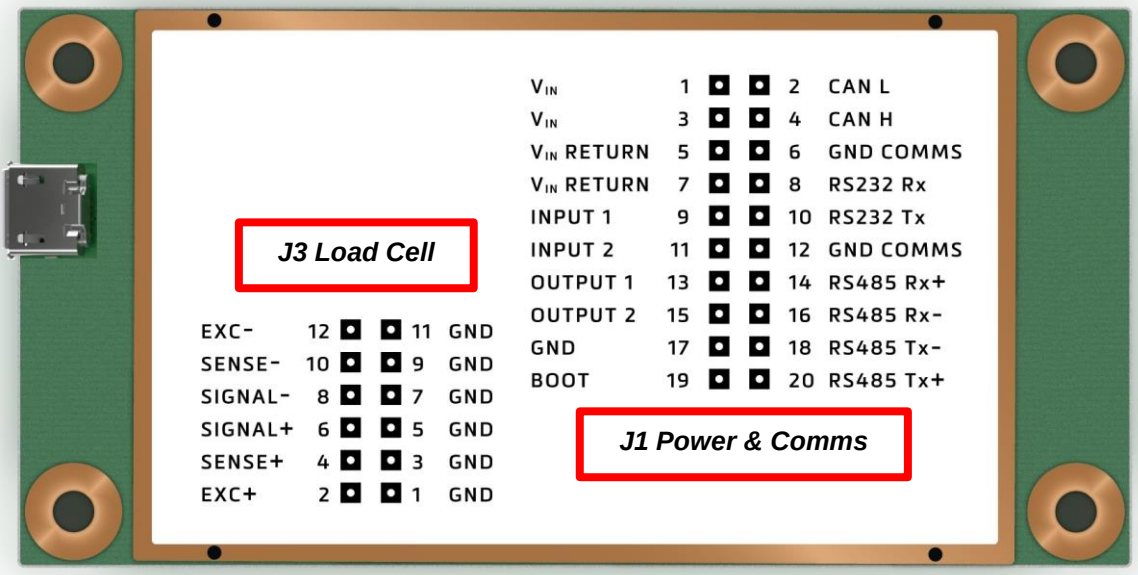
- Display screen size - minimum resolution of 1024x768.
- Windows 7 or Window 10 operating system.
- Microsoft Dot Net Framework v4.5 (automatically downloaded if required).
- Peak System Adaptor (IPEH-002022-210289).

1.2. Pinout of EM100



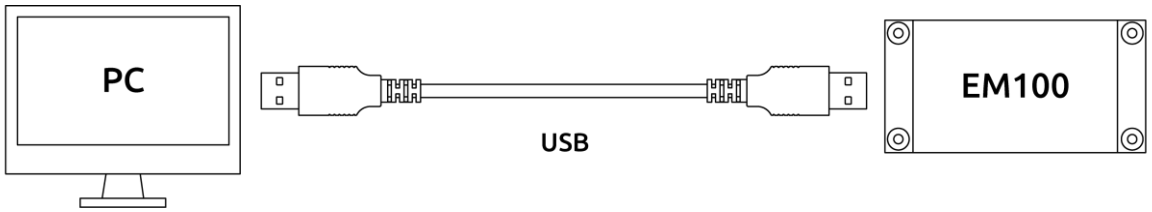
1.1. EM100 Pinout



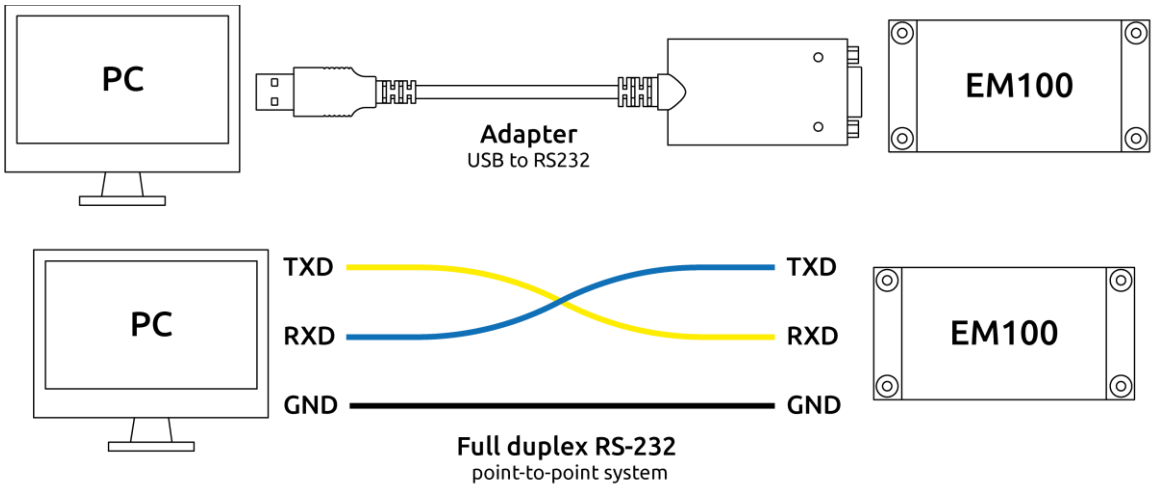


1.2. Connection Methods

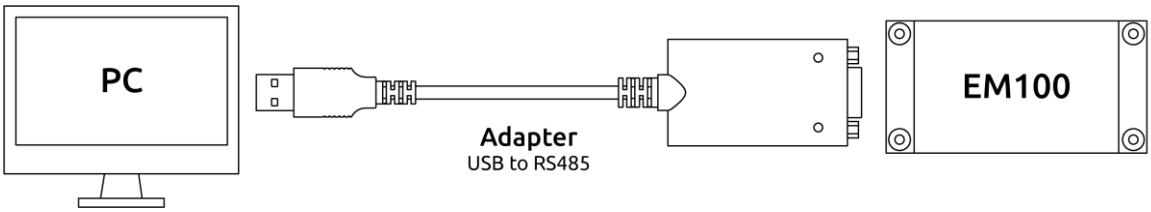
1.2.1. USB Connection

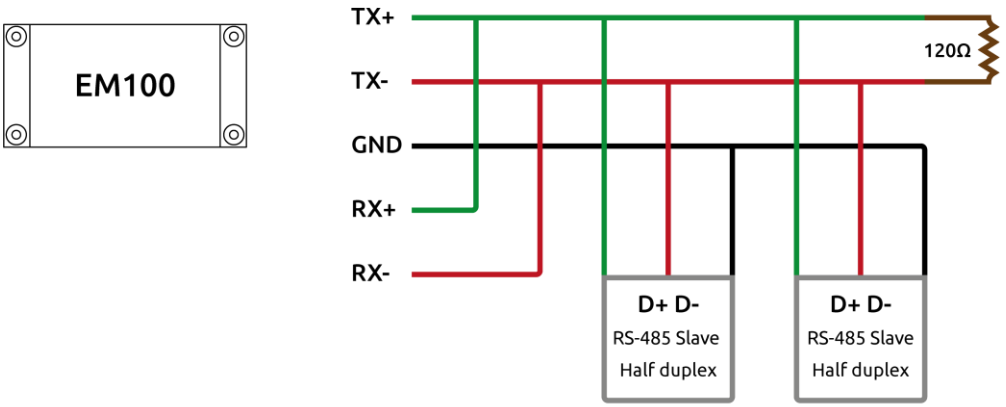


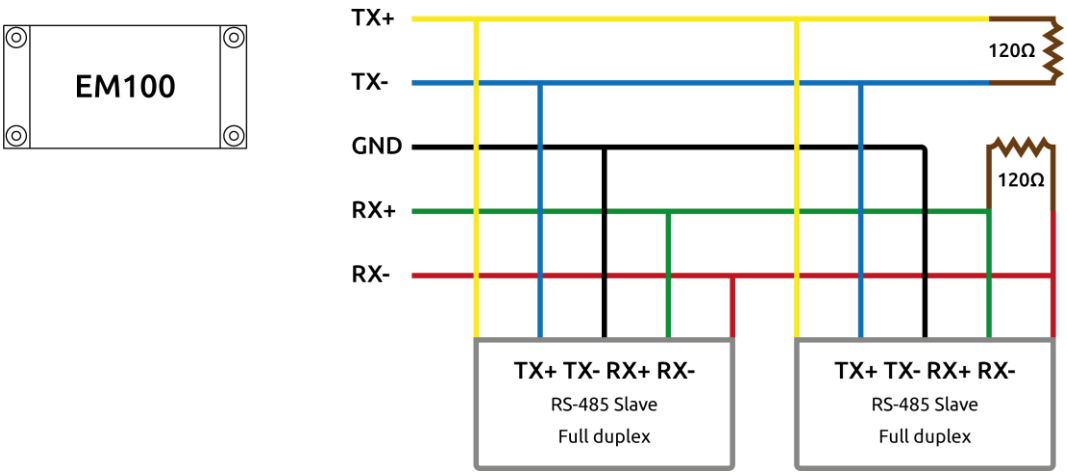
1.2.2. RS-232 Connection



1.2.3. RS-485 Connection

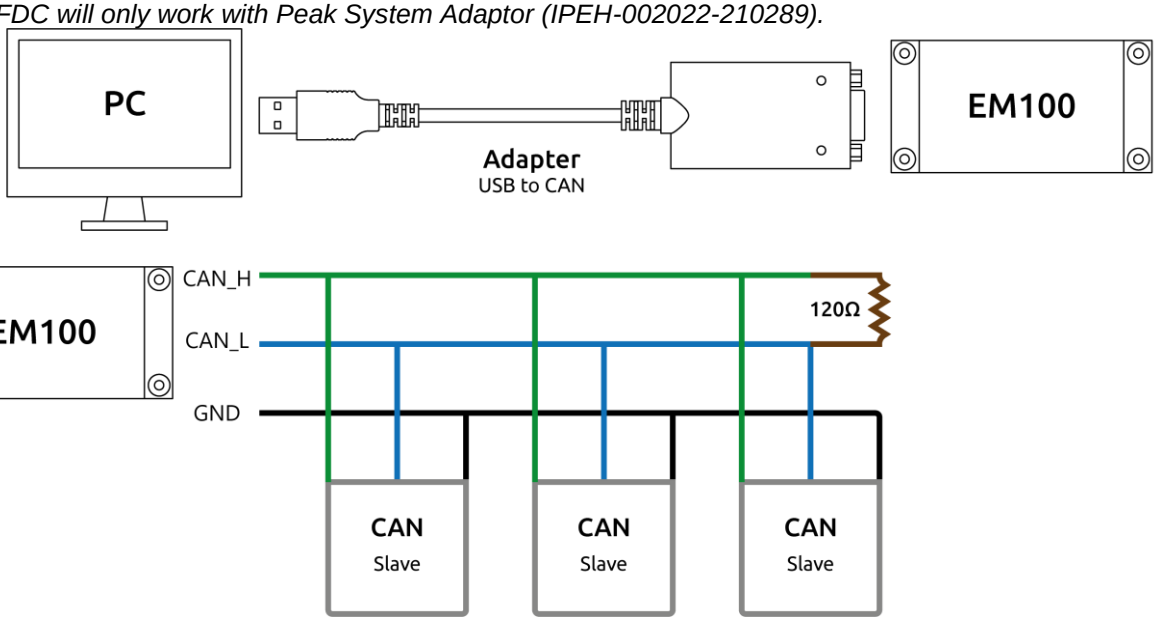




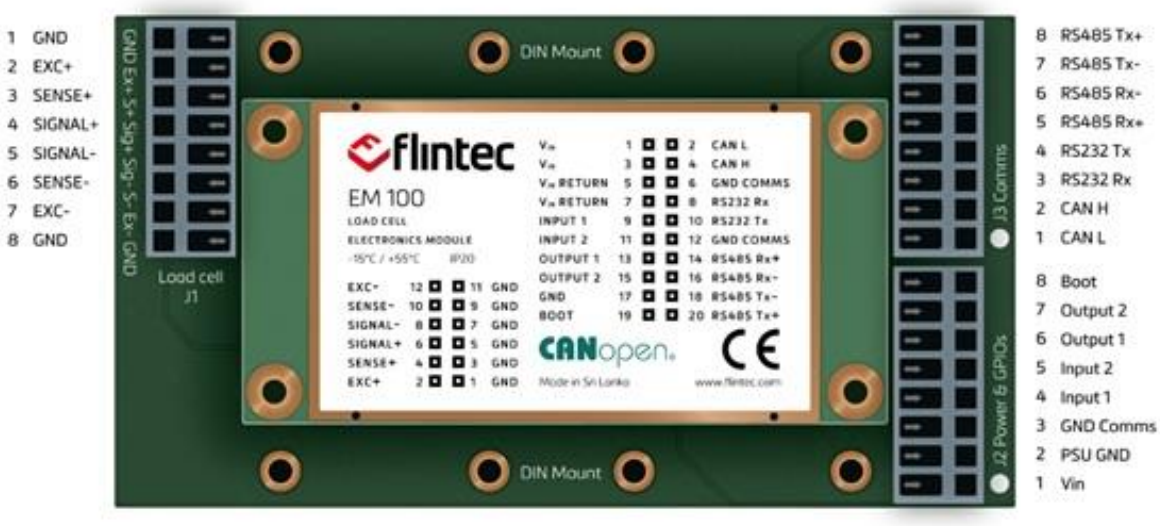


1.2.4. CANopen Connection

Note: *FDC will only work with Peak System Adaptor (IPEH-002022-210289).*



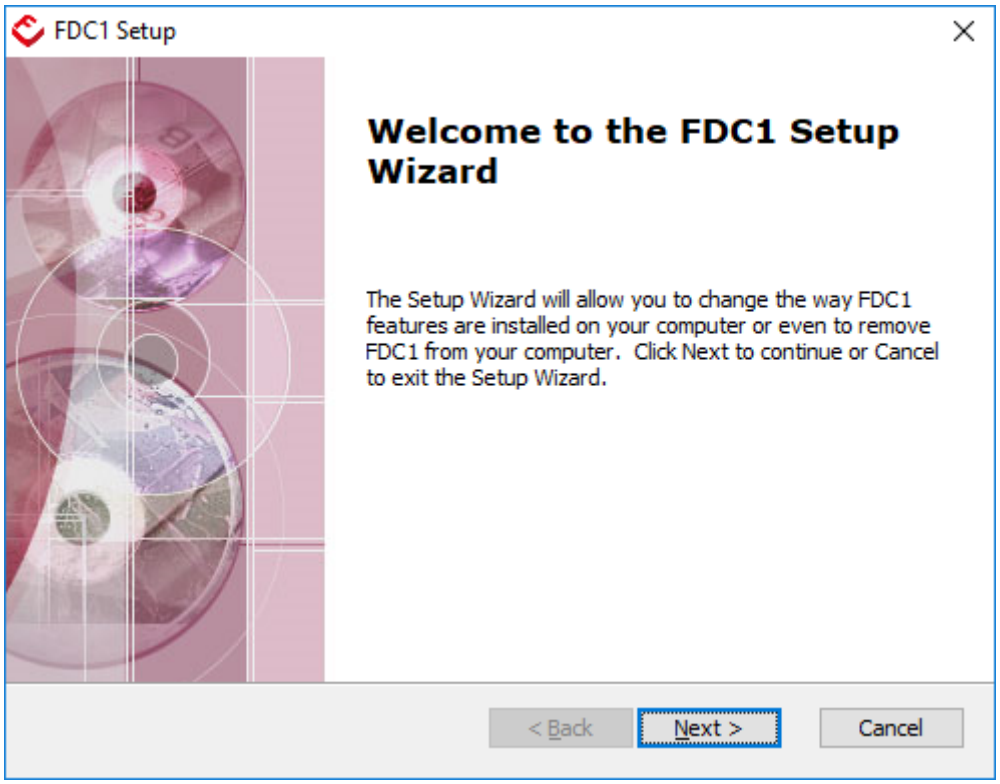
1.2.5. Adaptor Board



1.3. FDC Installation

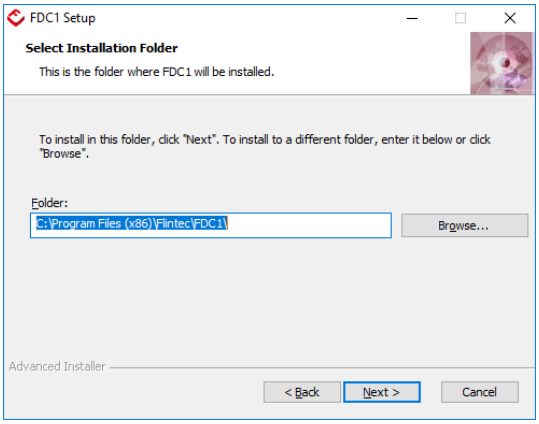
Download the latest copy of FDC from the Flintec website (www.flintec.com).

- Extract the executable file '***.exe***' from the zip folder.
- Run the setup/installation file (administration privileges maybe required).
- Press the '***Next***' button to proceed with the installation.

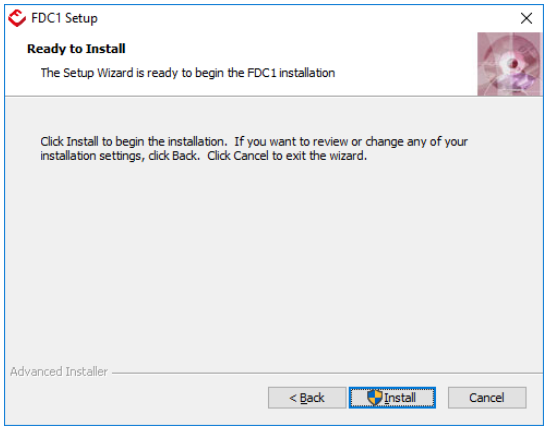


Note: If a previous version of FDC has been installed, this must be uninstalled prior to installation. Use the installation/setup program to uninstall (*see section **1.4 Uninstall Previous Versions of FDC** for details*).

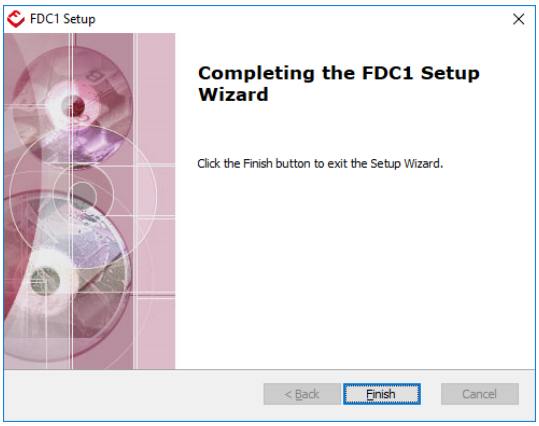
- Press the '***Next***' button (adjust the default directory as required).



- Press the '***Install***' button to start the installation.



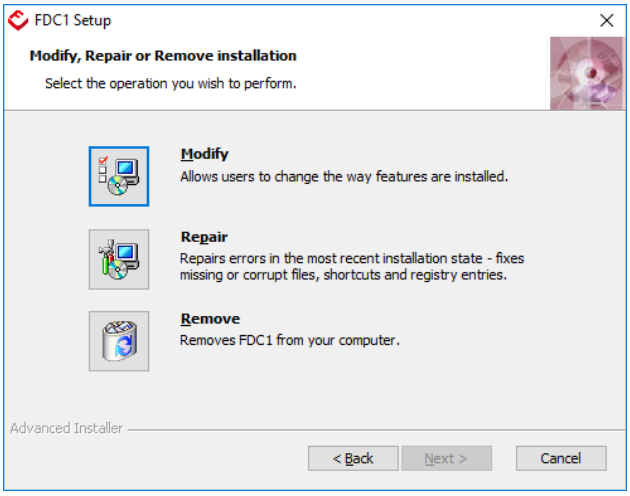
- Press the '***Finish***' button to complete the installation.



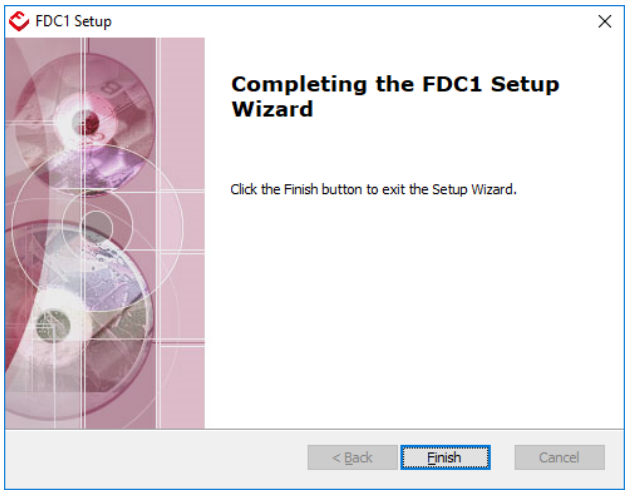
1.4. Uninstall Previous Versions of FDC

1.4.1. Uninstall with FDC Application

- Run the executable application to uninstall.
- Click the '***Remove***' button.
- Press the '***Next***' button to continue the installation removal.



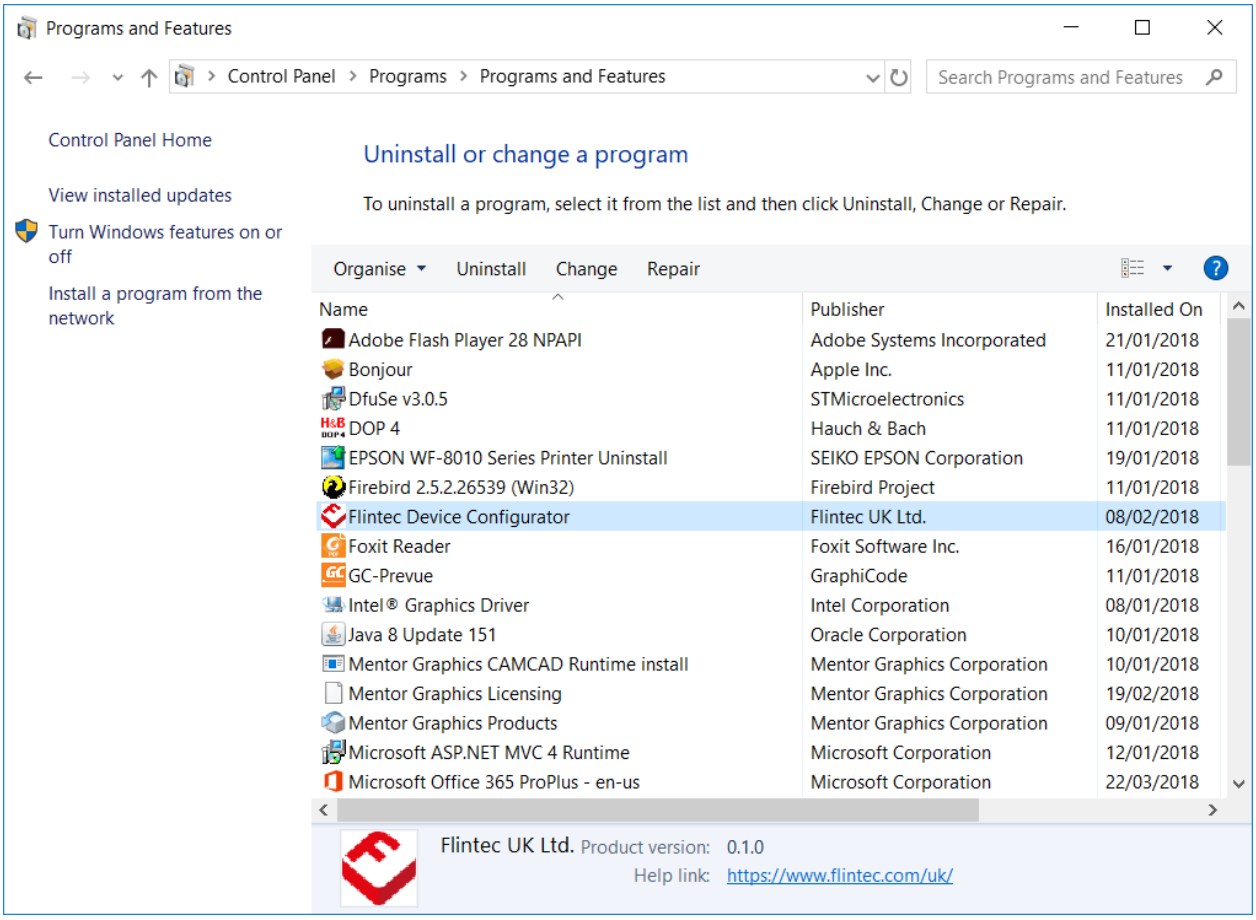
- Press the '***Finish***' button to complete the removal/repair.



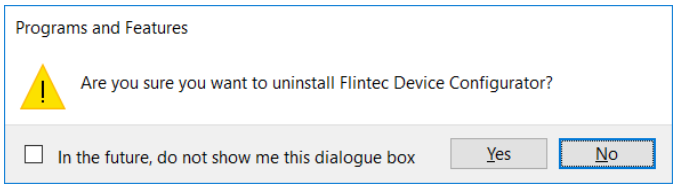
1.4.2. Uninstall with Windows

1.4.2.1. Windows 7

- Move the cursor over the start button/Windows logo in the bottom left of the screen.
- Click in the search window and type '***Add Remove***'.
- Select the '***Add Remove Programs***' option in the search window.
- Scroll down to the '***Flintec Device Configurator***' entry.

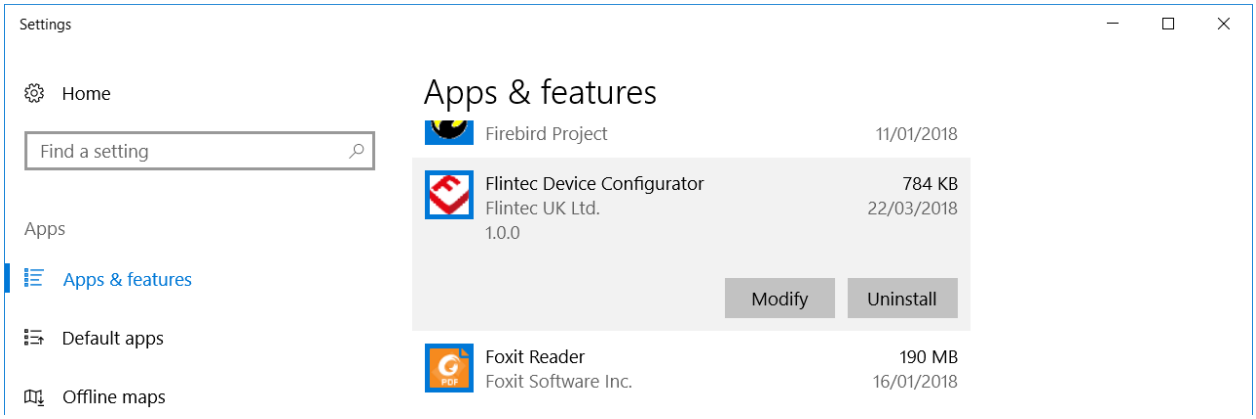


- Click on the entry with the right mouse button to reveal the context menu. Select the '***Uninstall***' option.
- Press the '***Yes***' button to initiate the removal process.



1.4.2.2. Windows 10

- Move the cursor over the start button/Windows logo in the bottom left of the screen.
- Click the right mouse button and select the '***Apps & Features***' in the context menu.
- Scroll down to the '***Flintec Device Configurator***' entry.
- Press the Uninstall button.



1.5. About/Revision FDC

2. Connecting to FDC

2.1. Driver Check

During the first session, it may be necessary for the PC to install appropriate drivers. If using a CAN adaptor or USB-to-serial converter, consult the manufacturer for instructions and latest drivers.

If using the USB CDC connection, the following driver from STMicroelectronics will need to be installed. View the ST.com website for the latest revision:

http://www.st.com/en/development-tools/stsw-stm32102.html

A driver installation manual is available from the Flintec website (www.flintec.com).

2.1.1. Device Manager in Windows

Plug in the adaptor and check in the '***Device Manager***' if the driver has been installed correctly.

2.1.1.1. Accessing Device Manager in Windows 7

- Move the cursor over the start button/Windows logo in the bottom left of the screen.
- Click in the search window and type '***Device Manager***'.
- Select the '***Device Manager***' option in the search window.

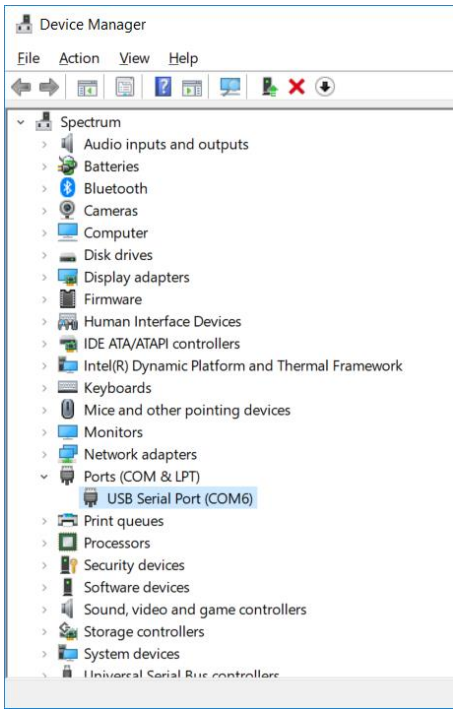
2.1.1.2. Accessing Device Manager in Windows 10

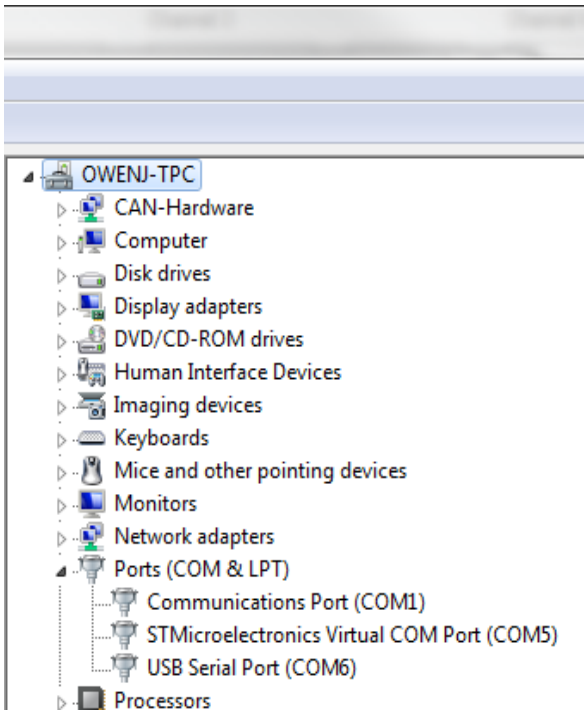
Method 1:

- Move the cursor over the start button/Windows logo in the bottom left of the screen.
- Click the right mouse button and select the '***Device Manager***' in the context menu.
- Expand the '***Ports (COM & LPT)***' group.

Method 2:

- Move the cursor over to the search window at the bottom left of the screen.
- Click in the search window and type '***Device Manager***'.
- Click on the '***Device Manager***' option that will appear after searching.
- Expand the '***Ports (COM & LPT)***' group.

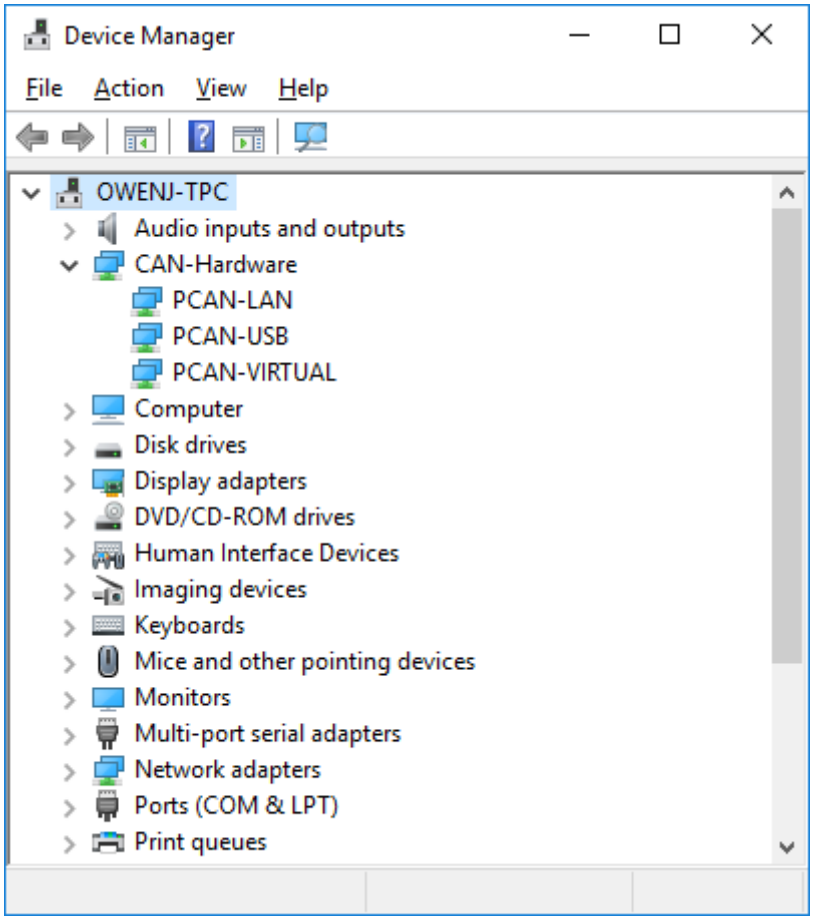




- Ensure the correct port has been assigned and appears similar to the screenshots above.

2.1.2. CAN Port Driver

- Open the '***Device Manager***' window (*see **2.1.1 Device Manager in Windows** section*).
- Expand the appropriate listing where the CAN adaptor resides. In this example a Peak System CAN adaptor is used listing under the '***CAN-Hardware***' group.

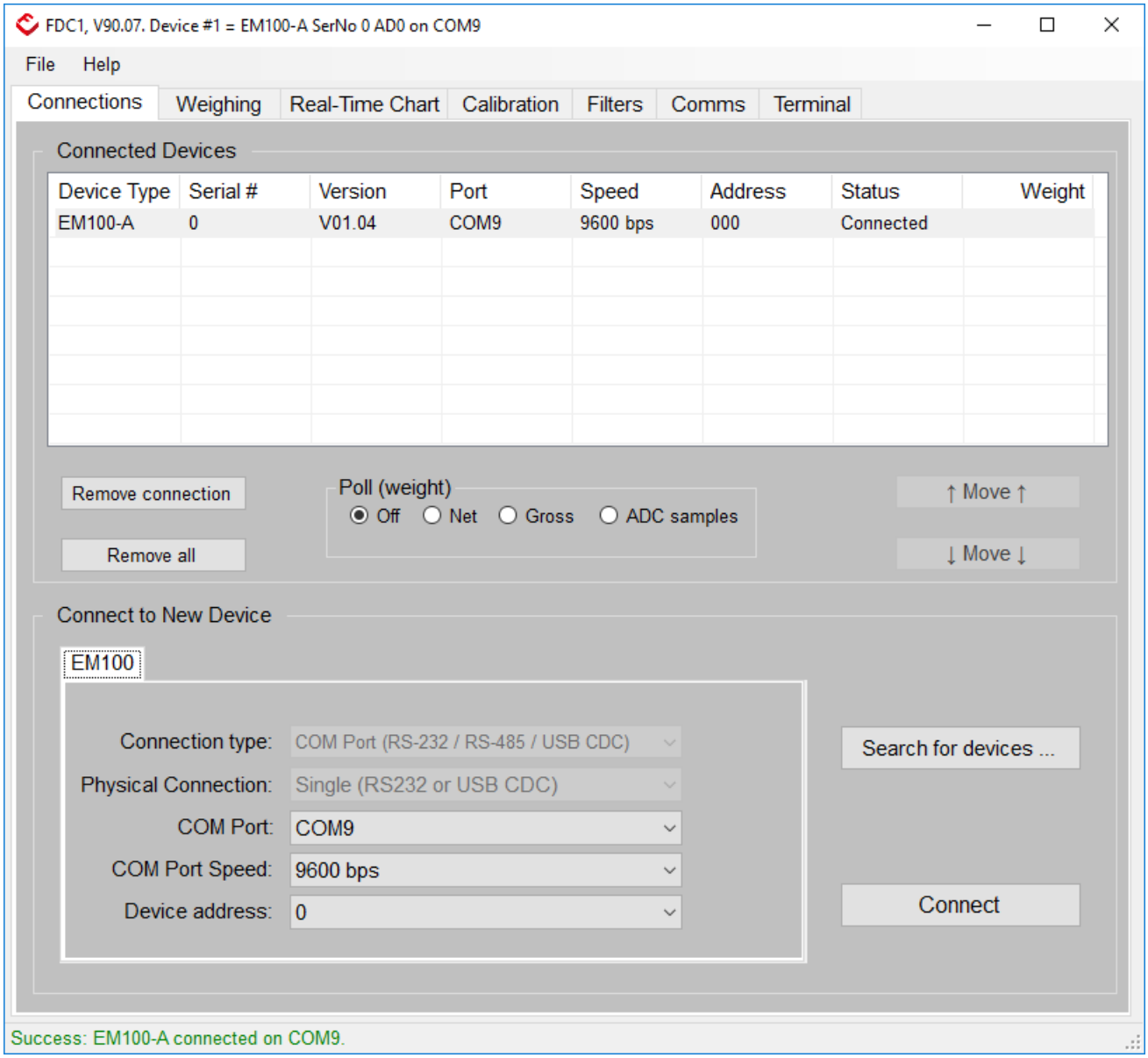


- Ensure the correct port has been assigned and appears similar to the screenshot.

2.2. Serial or USB Communications

2.2.1. Known Communications Setup

- Open FDC application.
- To connect to a device where the communication parameters are known, select the correct setup using the drop-down boxes in the '***Connect to New Device***' section.
- Establish a connection by pressing the '***Connect***' button.

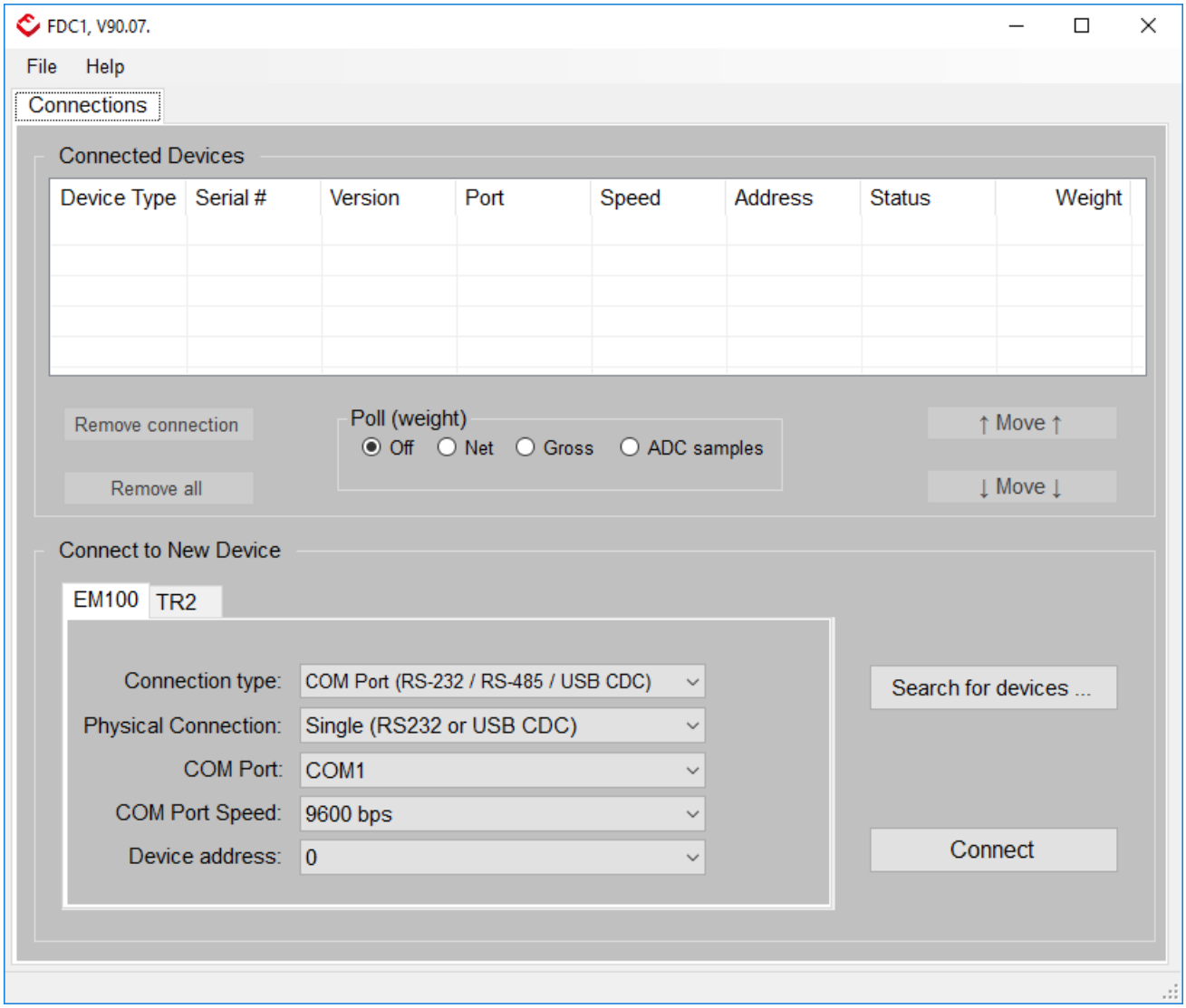


Note: At the bottom of the main screen, the status window will indicate a green message stating (depending on setup) '***Success: EM100-A connected on COM9***'.

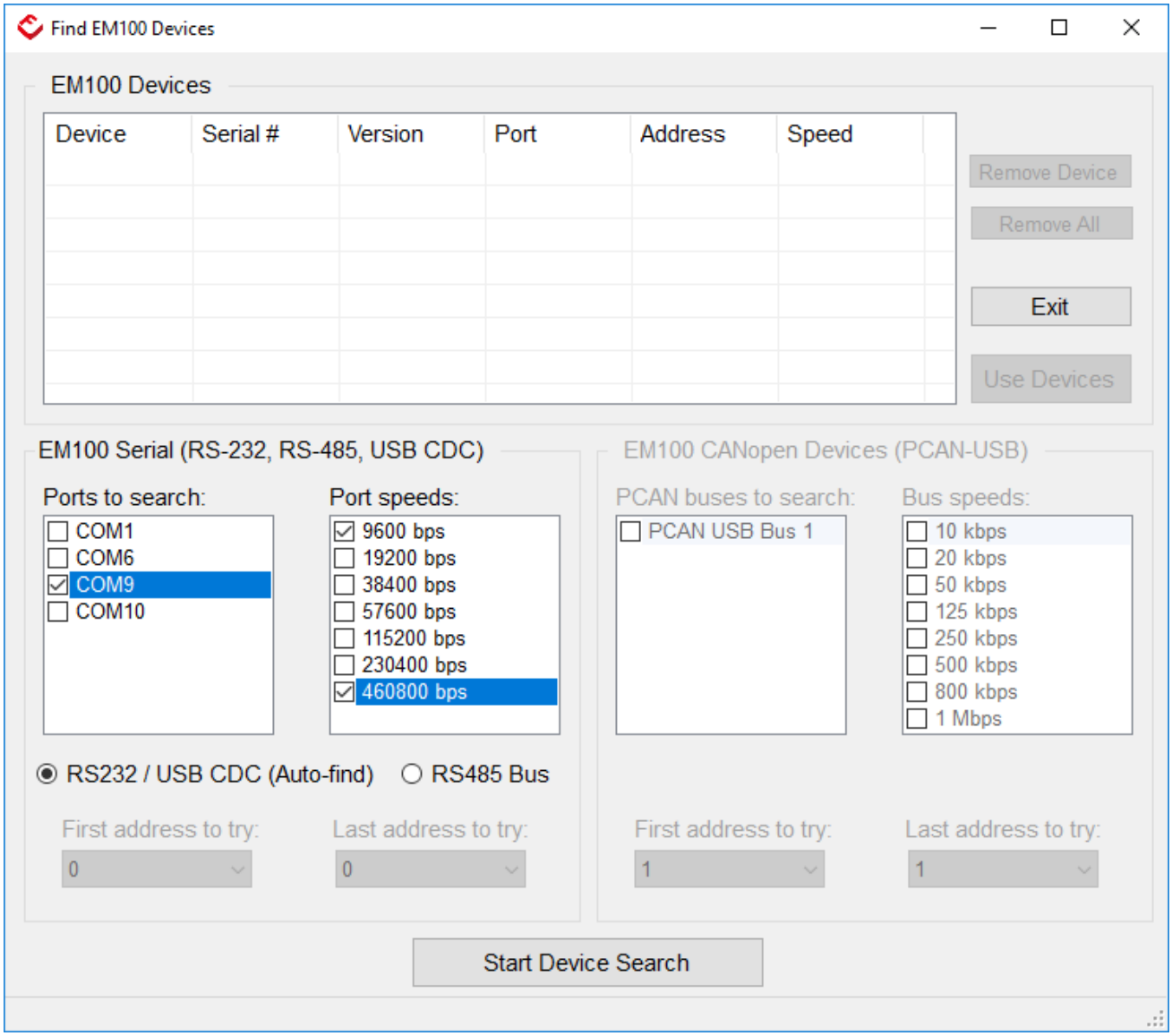
- Highlight the selected device (by clicking on the entry) before moving onto another tab.

2.2.2. Unknown Communications Setup

- Open FDC application.
- Press the '***Search for Devices …***' button.

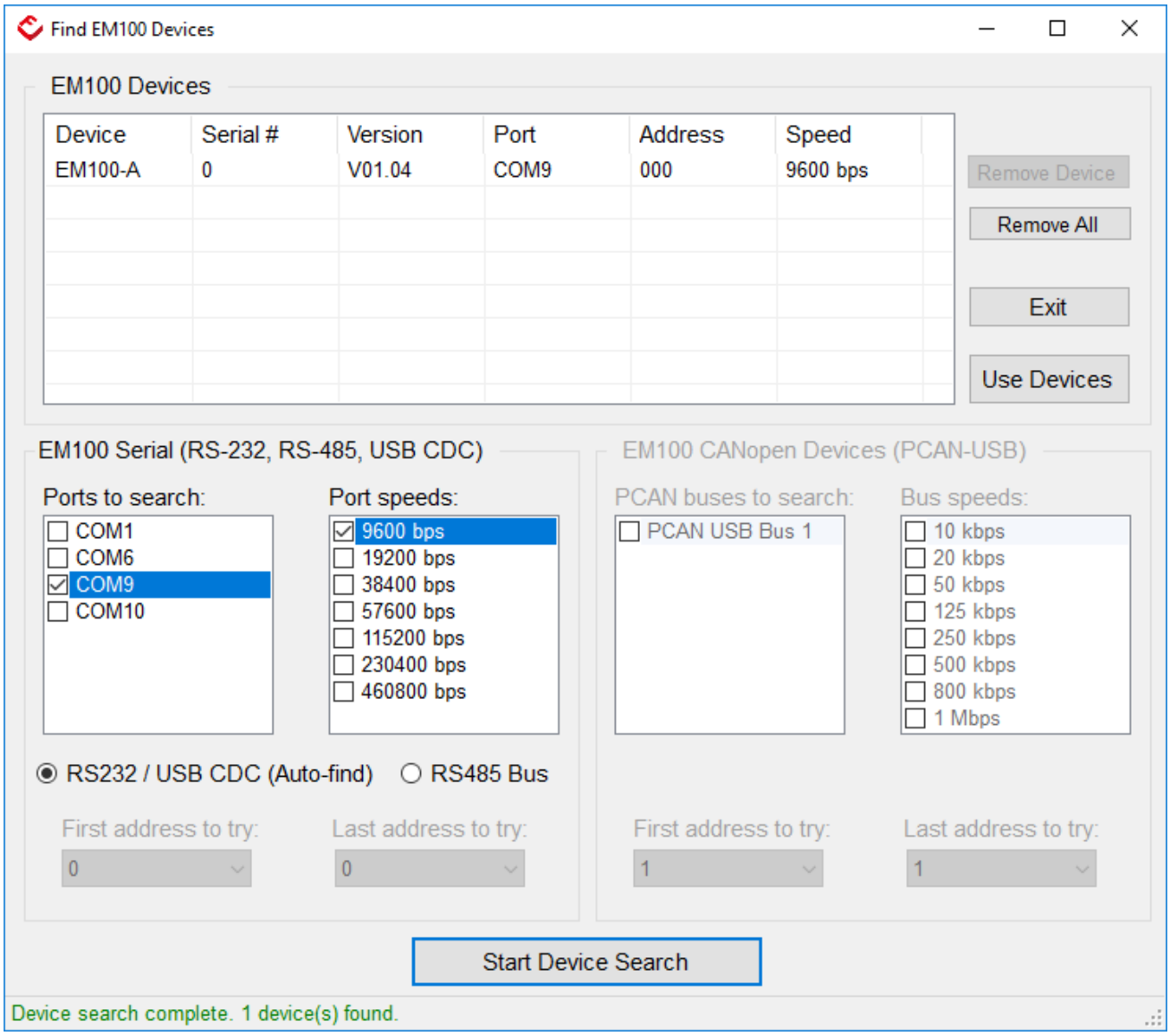


- Click the check-boxes for both port and speed to be searched. At least one selection from each list is required otherwise the search button will remain greyed out.
- After the selections have been made press the '***Start Device Search***' button to implement the search.

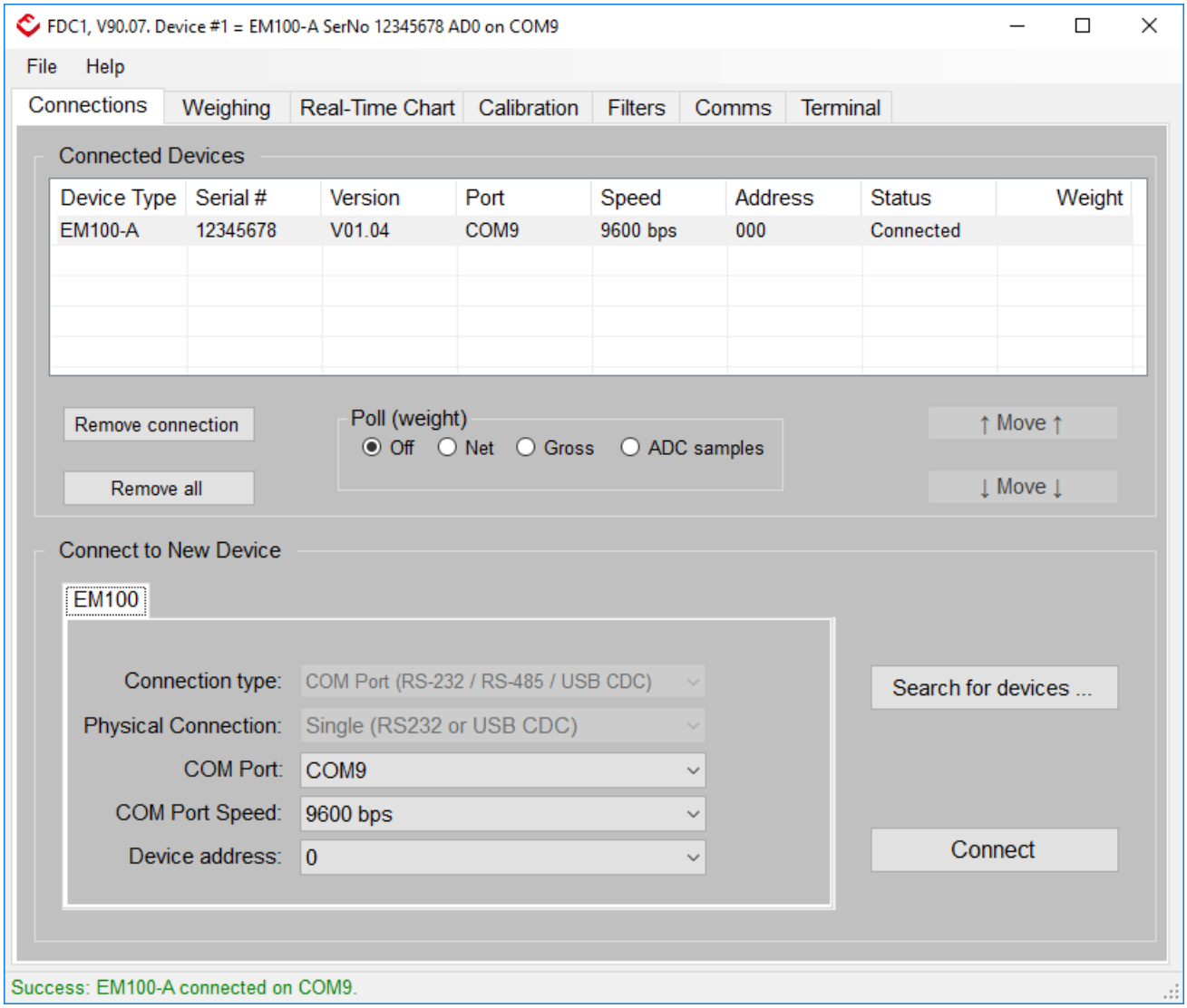


Note: If the transmit delay time '***TD***' is set to a high value and all the check-boxes are selected, this may take a very long time to search all ports combinations.

- The window will be populated when it has found a successful comms channel
- The status window at the bottom of the screen will state '***Device search complete. 1 device(s) found***'.



- Select the device by clicking on the newly found module in the '***Devices***' window.
- Press '***Use Devices***' button to select and return back to the main window.

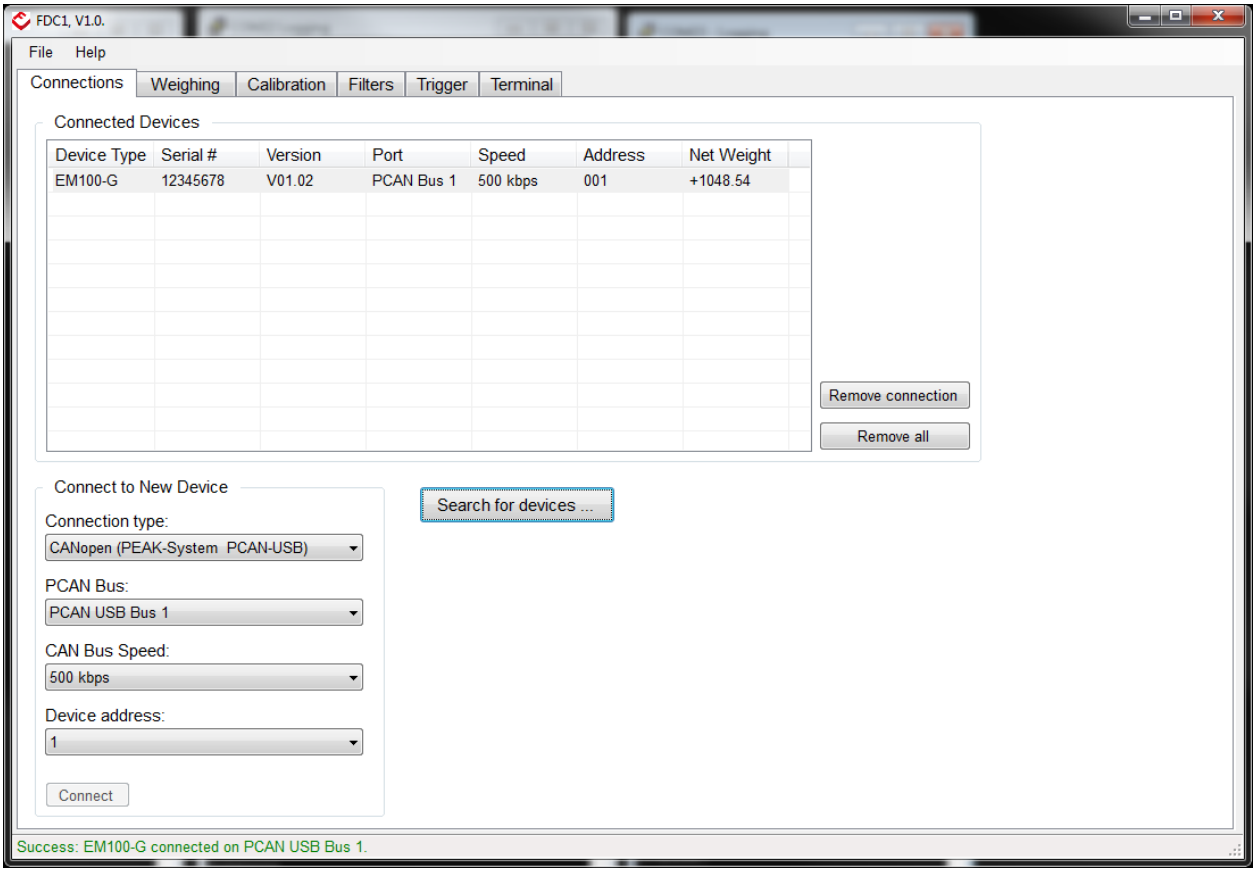


Note: At the bottom of the main screen, the status window will indicate a green message stating (depending on setup) '***Success: EM100-A connected on COM9***'.
Click on the device to select before clicking on any of the other tabs.

2.3. CAN Communications

2.3.1. Known Communications Setup

- Open FDC application.
- To connect to a device where the communication parameters are known, select the correct setup using the drop-down boxes in the '***Connect to New Device***' section.
- Establish a connection by pressing the '***Connect***' button.

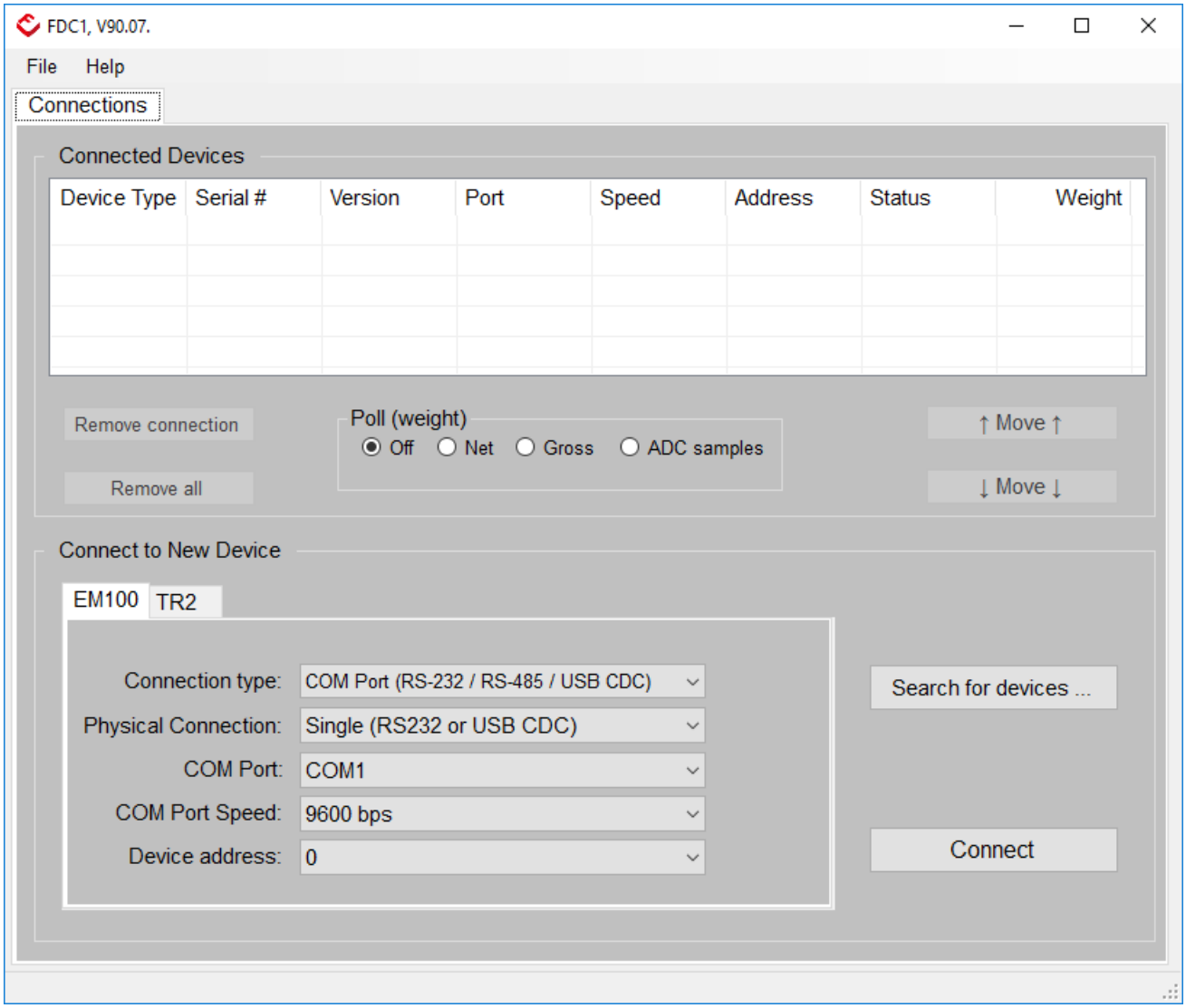


Note: At the bottom of the main screen, the status window will indicate a green message stating (depending upon the CAN adaptor and setup) '***Success: EM100-G connected on PCAN USB Bus 1'***.

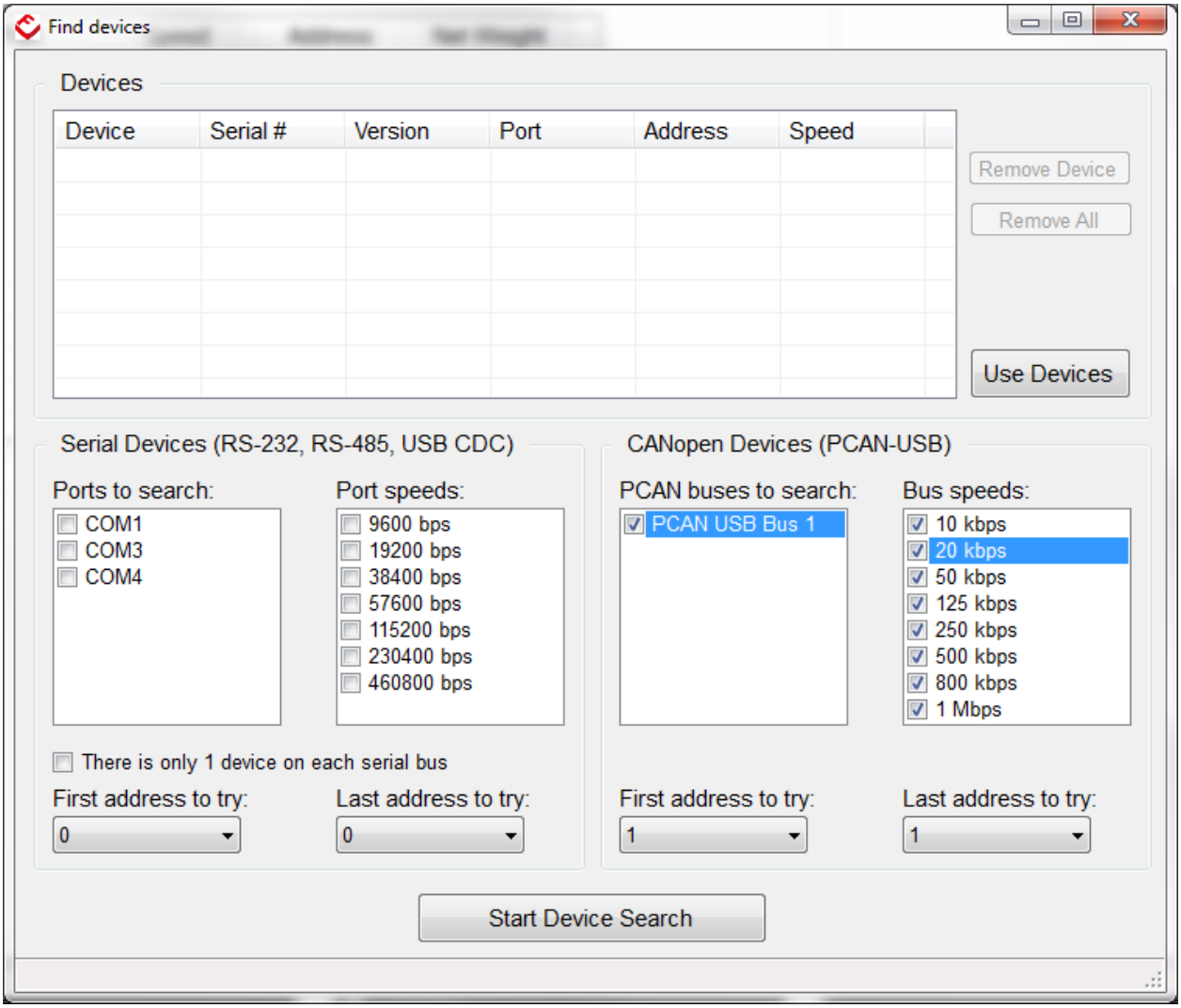
- Click on the device to select before clicking on any of the other tabs.

2.3.2. Unknown Communications Setup

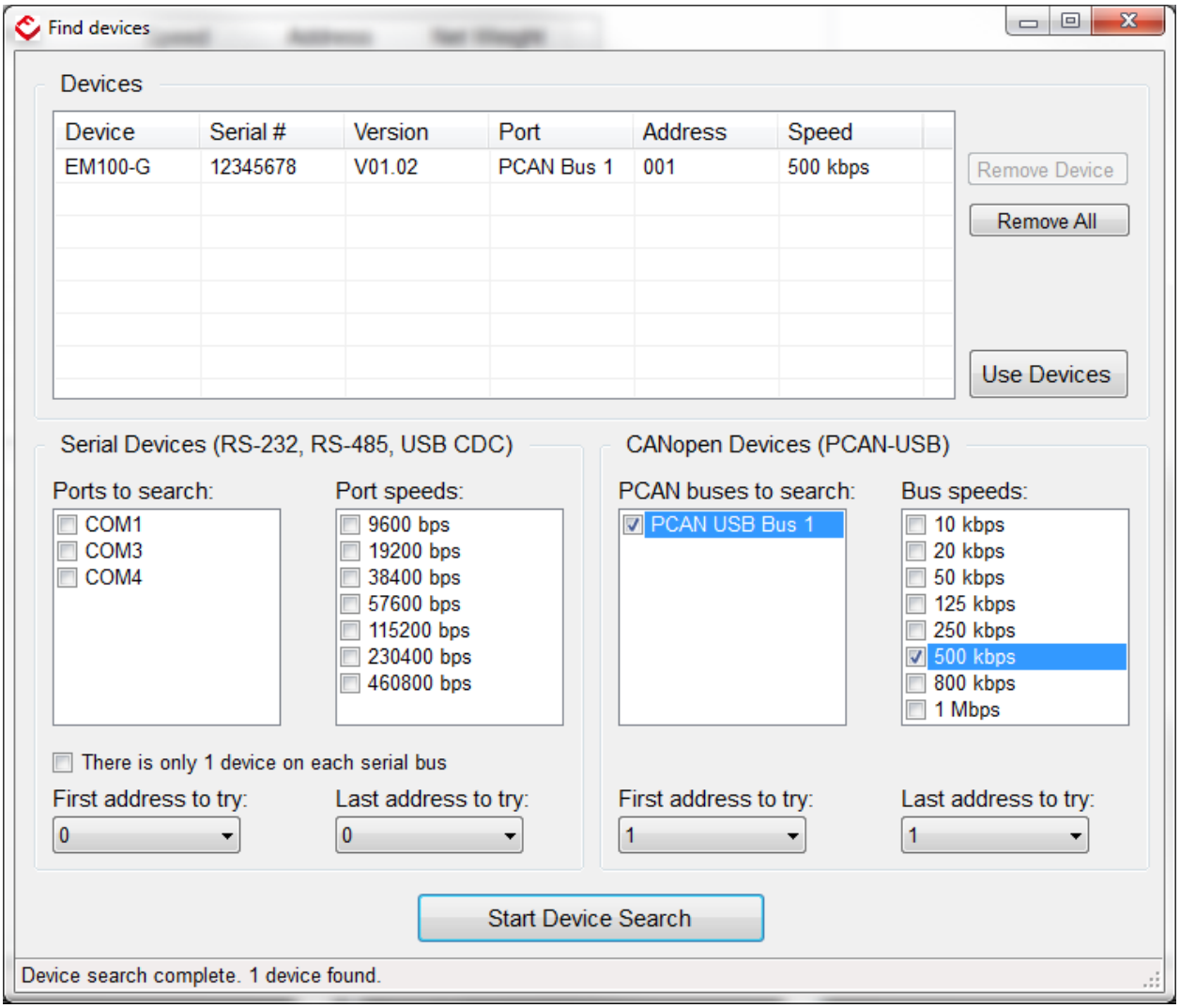
- Open FDC application.
- Press the '***Search for Devices …***' button.



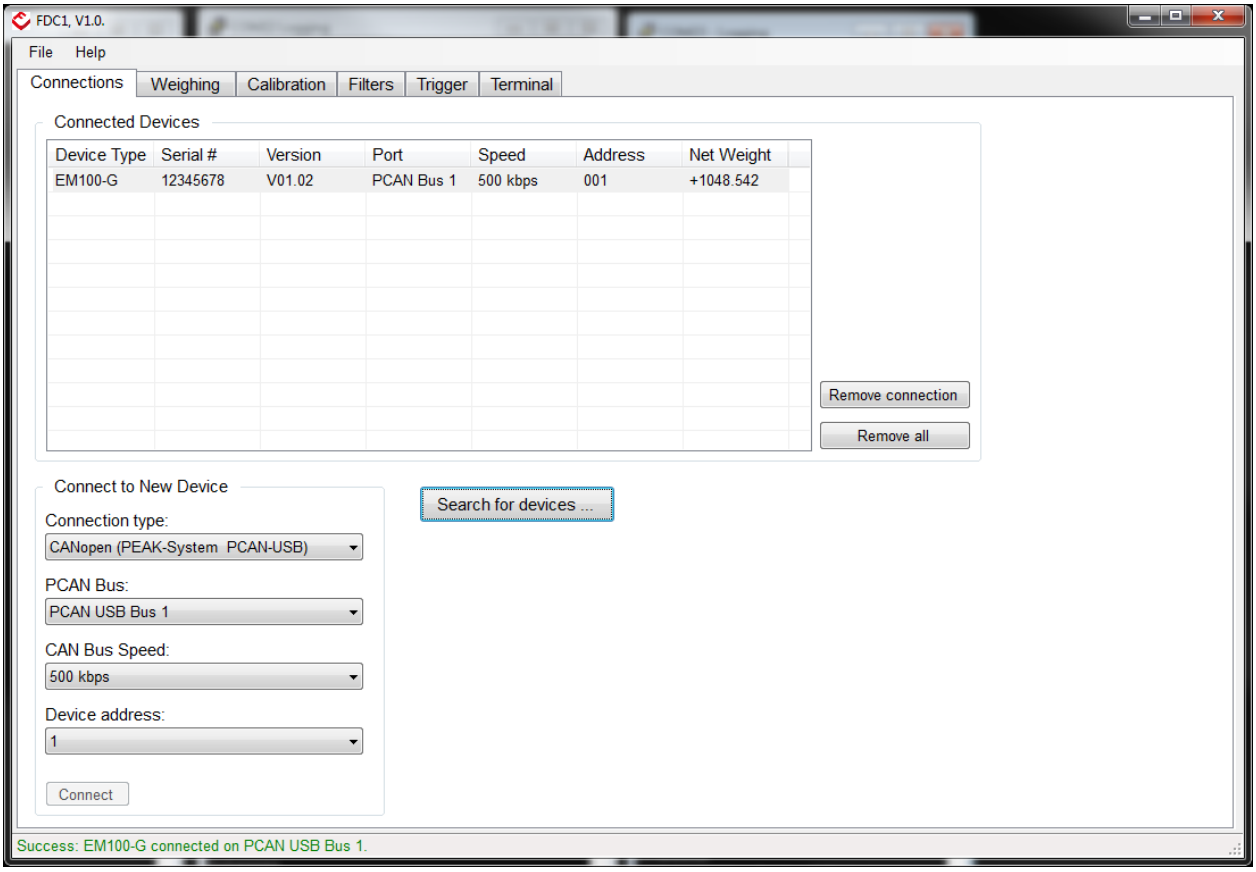
- In the '***CANopen Devices***' section, click the check-boxes for both port and speed to be searched. At least one selection from each list is required otherwise the search button will remain greyed out.
- After the selections have been made press the '***Start Device Search***' button to implement the search.



- The window will be populated when it has found a successful comms channel
- The status window at the bottom of the screen will state '***Device search complete. 1 device found***'.



- Select the device by clicking on the newly found module in the '***Devices***' window.
- Press '***Use Devices***' button to select and return back to the main window.

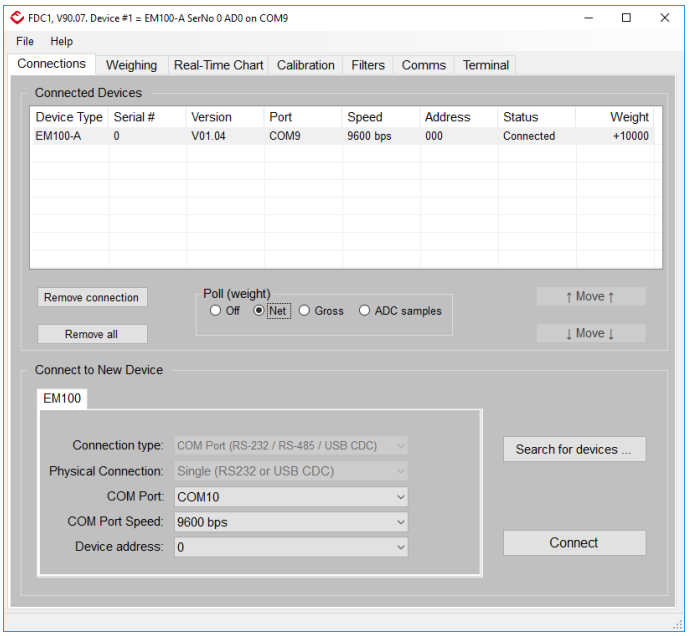


Note: At the bottom of the main screen, the status window will indicate a green message stating (depending on CAN adaptor and setup) '***Success: EM100-G connected on PCAN USB Bus 1***'.

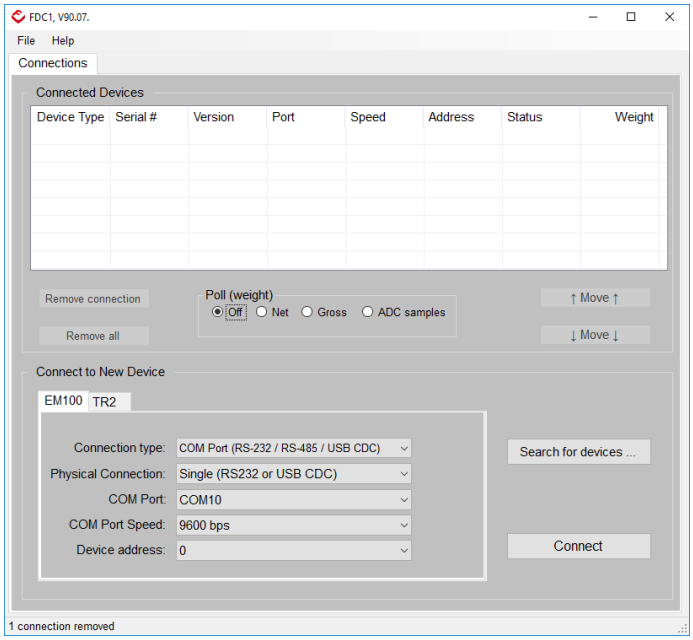
- Click on the device to select before clicking on any of the other tabs.

2.4. Device Removal

- If for any reason, the detected device needs to be removed, press the '***Remove Connection***' button.

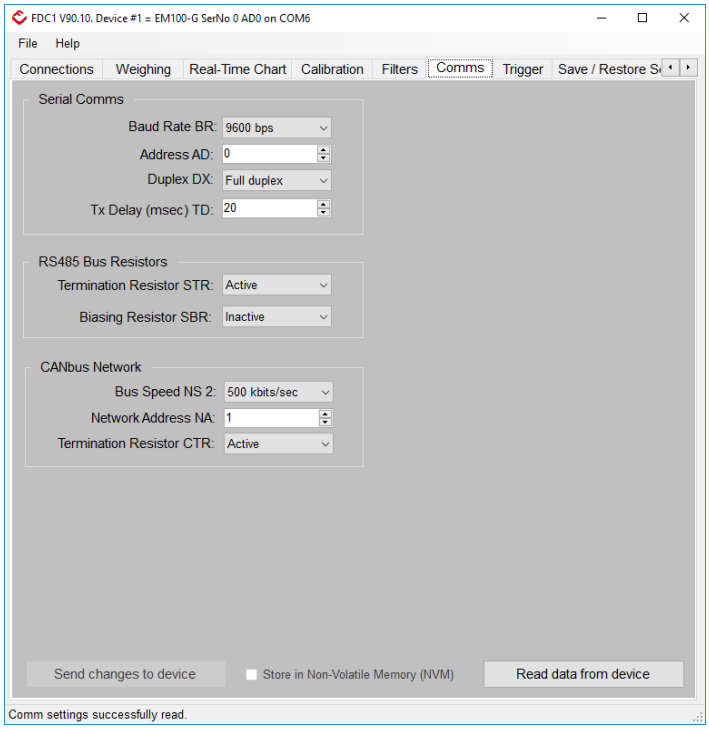


- The Status window at the bottom of the screen will display '***1 Connection Removed***'.



2.5. Additional Communication Settings

- Click on the '***Comms***' tab.
- Additional settings e.g. setting of address, comms mode or 120Ω termination resistance can be set in this tab.
- To save the current session, press the '***Send Changes to Device***' button.
- To save the changes for future sessions, tick the '***Store in Non-Volatile Memory***' check-box before pressing the '***Send Changes to Device***' button.



Note: If changing fundamental communication parameters e.g. Baud-rate, Address etc. this will require the re-negotiation of the comms channel. Also, these changes require a software reset (or hardware reset) to take effect. The configuration will continue to be operational until the reset is applied.

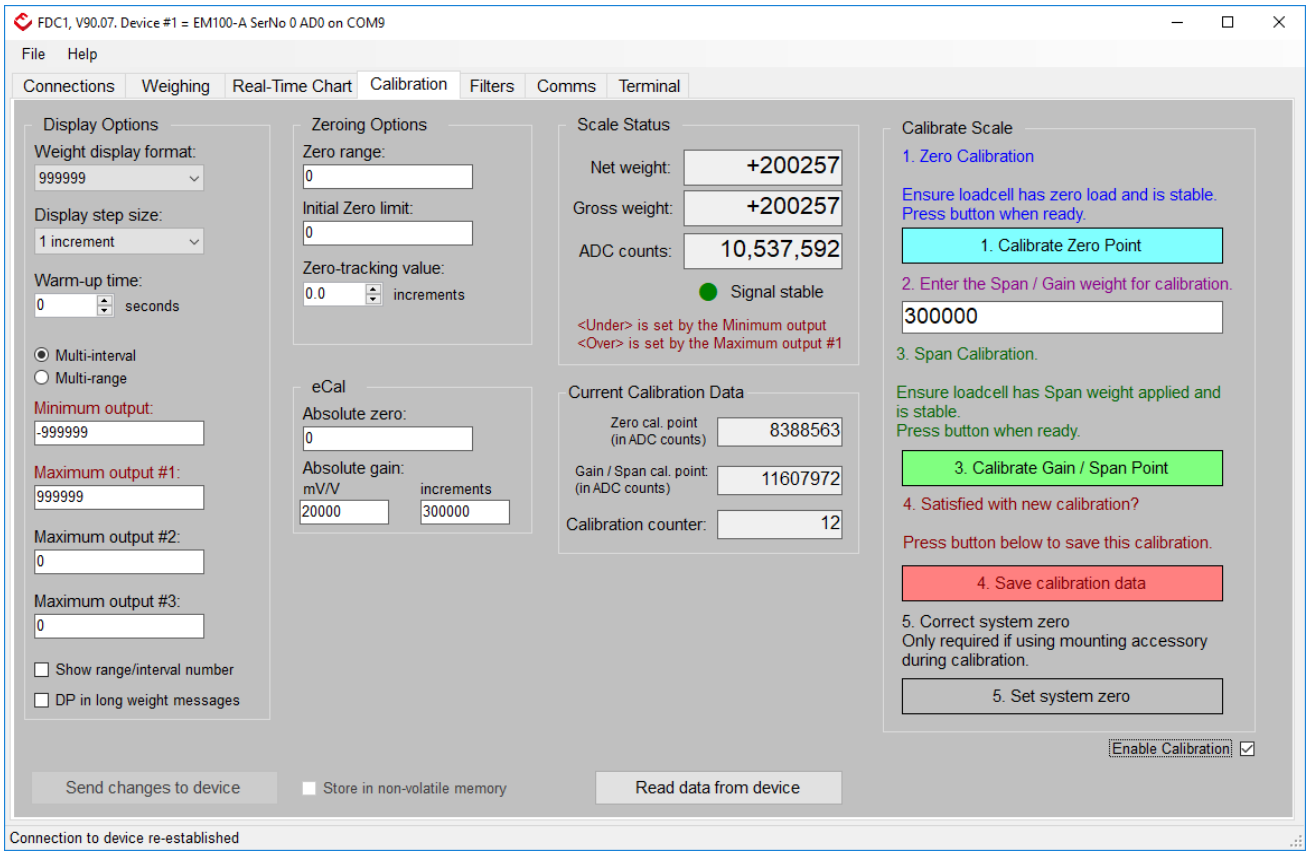
The parameters can be changed and applied only during the current session. If, however, these settings are applied after a power cycle, save the new settings to non-volatile memory.

3. Calibration

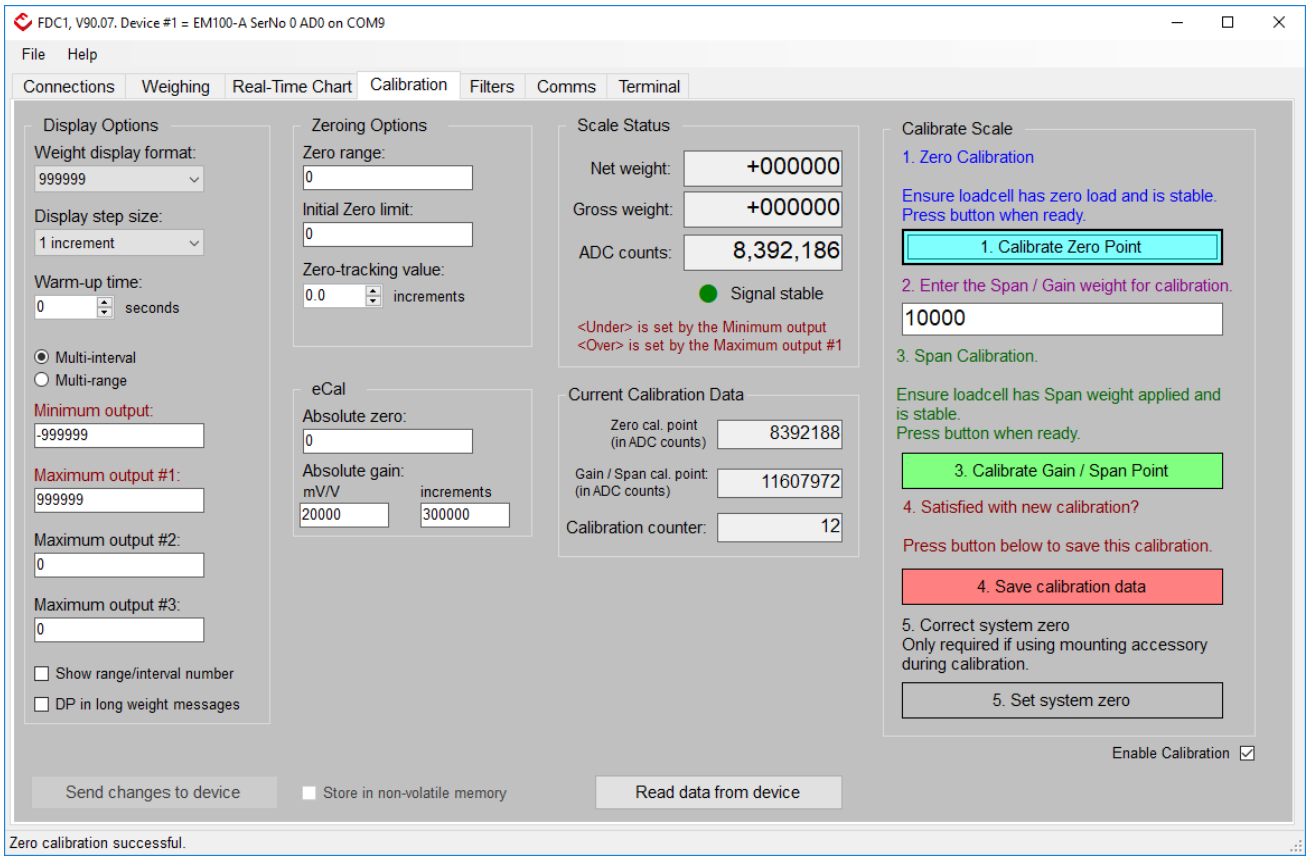
3.1. Zero Calibration

3.1.1. Zero Calibration Setup

- Click on the '***Calibration***' tab.
- Tick the '***Enable Calibration***' check-box in the bottom right corner.



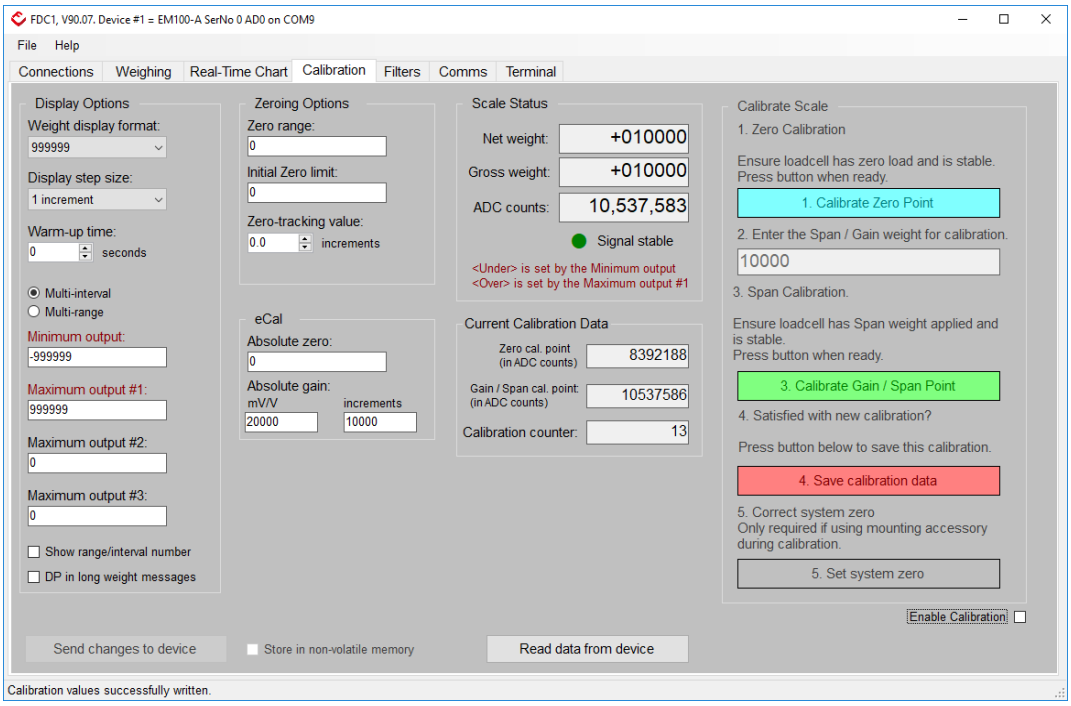
- Apply the zero (or 0mv/V) point input stimulus by either using unloaded scale or calibration simulator.
- The '***Stable Signal***' indicator should turn green after a couple of seconds (*see section **3.3 Motion Detection Settings** for details on detection window*).
- Press the '***Calibration Zero Point***' button.
- Press the '***Save Calibration Data***' button if only making a zero-point adjustment. This will increment the TAC counter by 1.



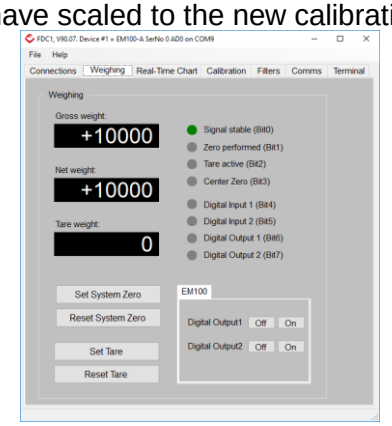
3.2. Span/Gain Calibration

3.2.1. Span/Gain Calibration Setup

- Open FDC application.
- Click on the '***Calibration***' Tab.
- Tick the '***Enable Calibration***' check-box in the bottom right corner.
- Enter the number of divisions required in the '***Gain/Span increments***' field (e.g. 10,000).
- Change the input loading to the required calibration point (e.g. 2mV/V).
- Allow the readings (ADC/Net/Gross) to settle.
- The '***Stable Signal***' indicator should turn green after a couple of seconds (*see section **3.3 Motion Detection Settings** for details on detection window*).
- Press the '***Calibration Gain/Span***' button.
- Press the '***Save Calibration Data***' button. This will increment the TAC counter by 1.



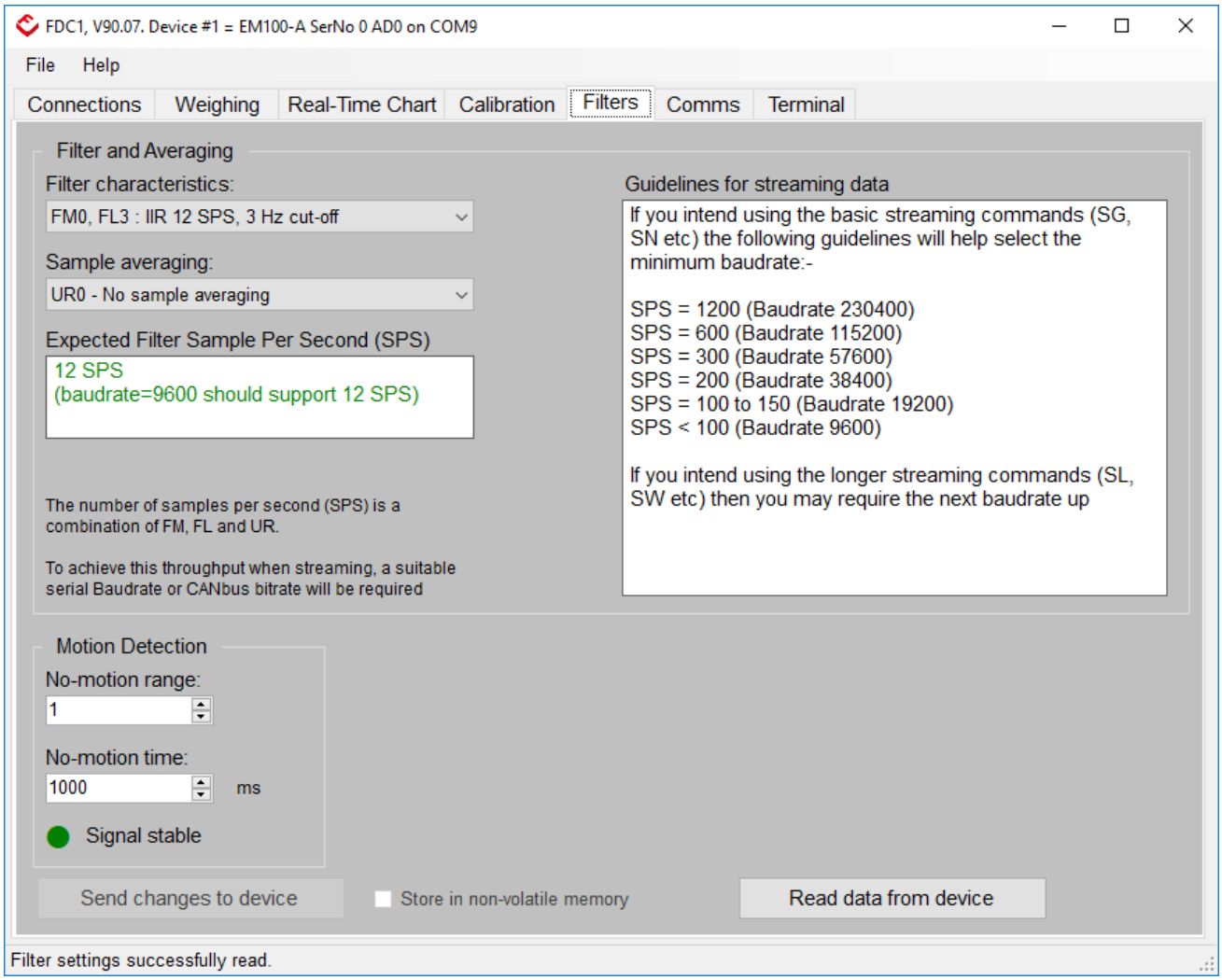
Note: The Net/Gross figures will have scaled to the new calibration points.



3.3. Motion-Detection Settings

If the '***Stable Signal***' indicator remains red or toggles between states, adjust the '***Motion Detection***' window settings.

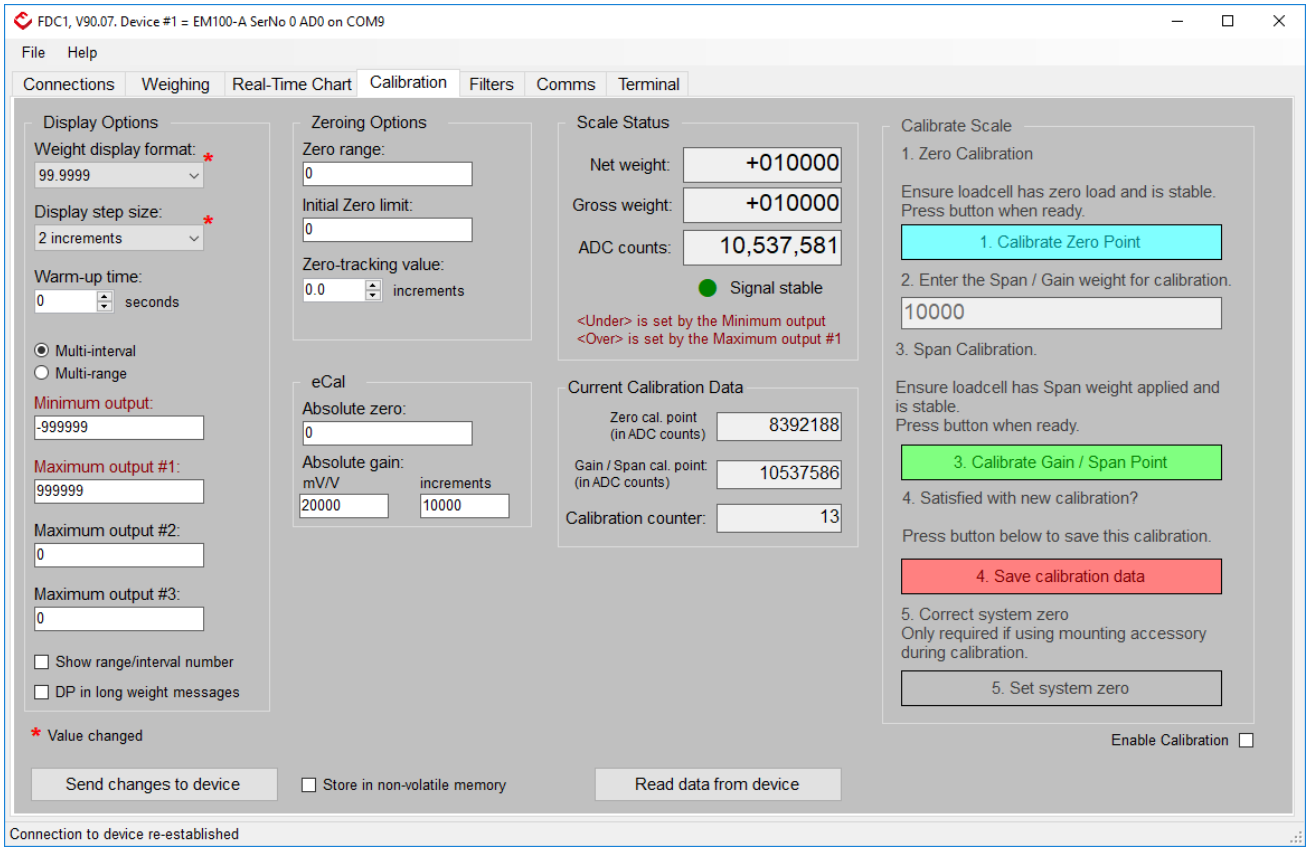
- Click on the '***Filters***' tab.
- Scale the '***No-Motion Range***' and '***No-Motion Time***' parameters to sensible values.
- The Factory defaults are set to 1 step and 1000ms respectively.
- Save the changes by pressing the '***Send Changes to Device***' button (tick '***Store in Non-Volatile Memory***' check-box if setting is to be preserved after a reset or power cycle.



4. Display Options

4.1. Change Weight Format

- Click on the '***Calibration***' Tab.
- Change the property of the '***Weight Display Format***' drop-down box to the appropriate selection.
- Change the property of the '***Display Step Size***' drop-down box to the desired setting.
- The properties adjusted will be highlighted with a red asterisk to the right. To save the selection, press the '***Send Changes to Device***' button.

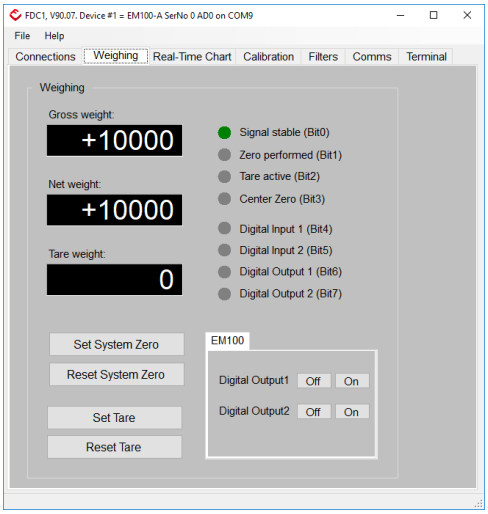


Note: To make the changes permanent, tick the '***Store in Non-Volatile Memory***' check-box before pressing the '***Send Changes to Device***' button.

5. Weighing Functions

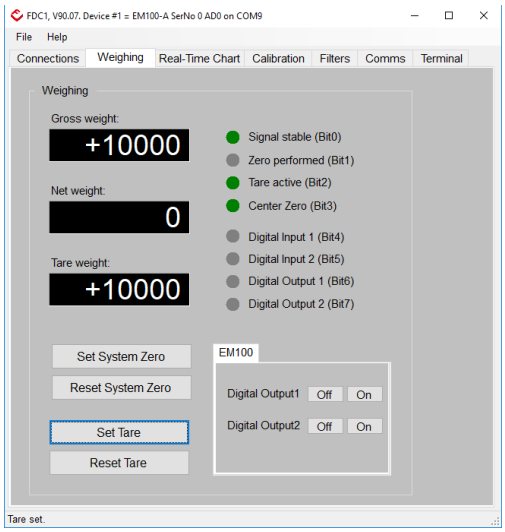
5.1. Weight

- Click on the '***Weighing***' Tab.
- This tab displays the Gross, Net and Tare weights.



5.2. Tare Weight

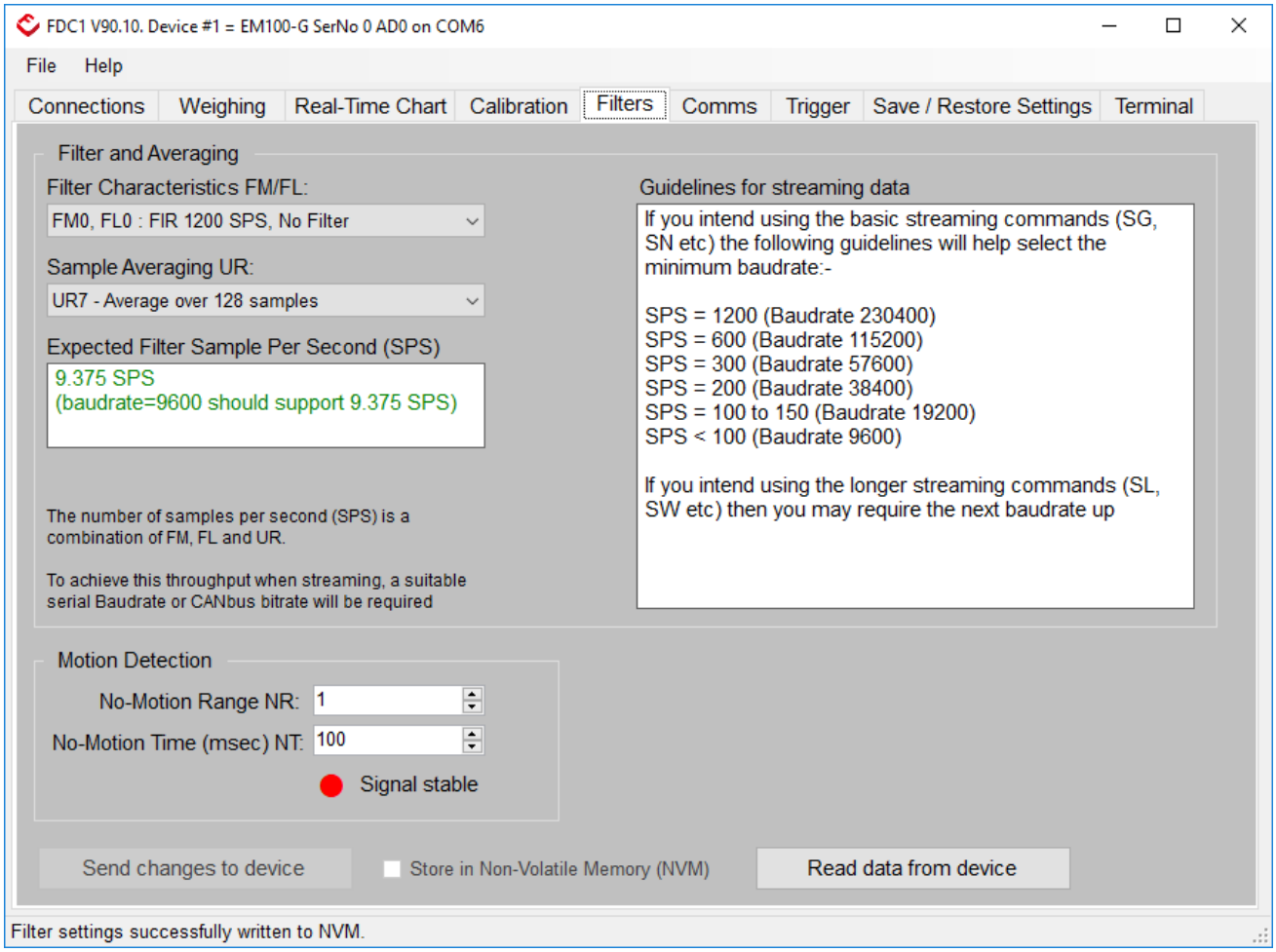
- Click on the '***Weighing***' Tab.
- Press the '***Set Tare***' button to enable a tare weight.



6. Filters

6.1. Filter Settings

- Click on the '***Filters***' Tab.
- Select the required '***Filter Characteristics***' from the drop-down list (FIR & IIR filters with a selection of cut-off frequencies are available).
- Any changes to the filters during the current session can be made by pressing the '***Send Changes to Device***' button. Ticking the '***Store in Non-Volatile Memory***' check-box prior to executing the save command will preserve the settings in subsequent sessions.

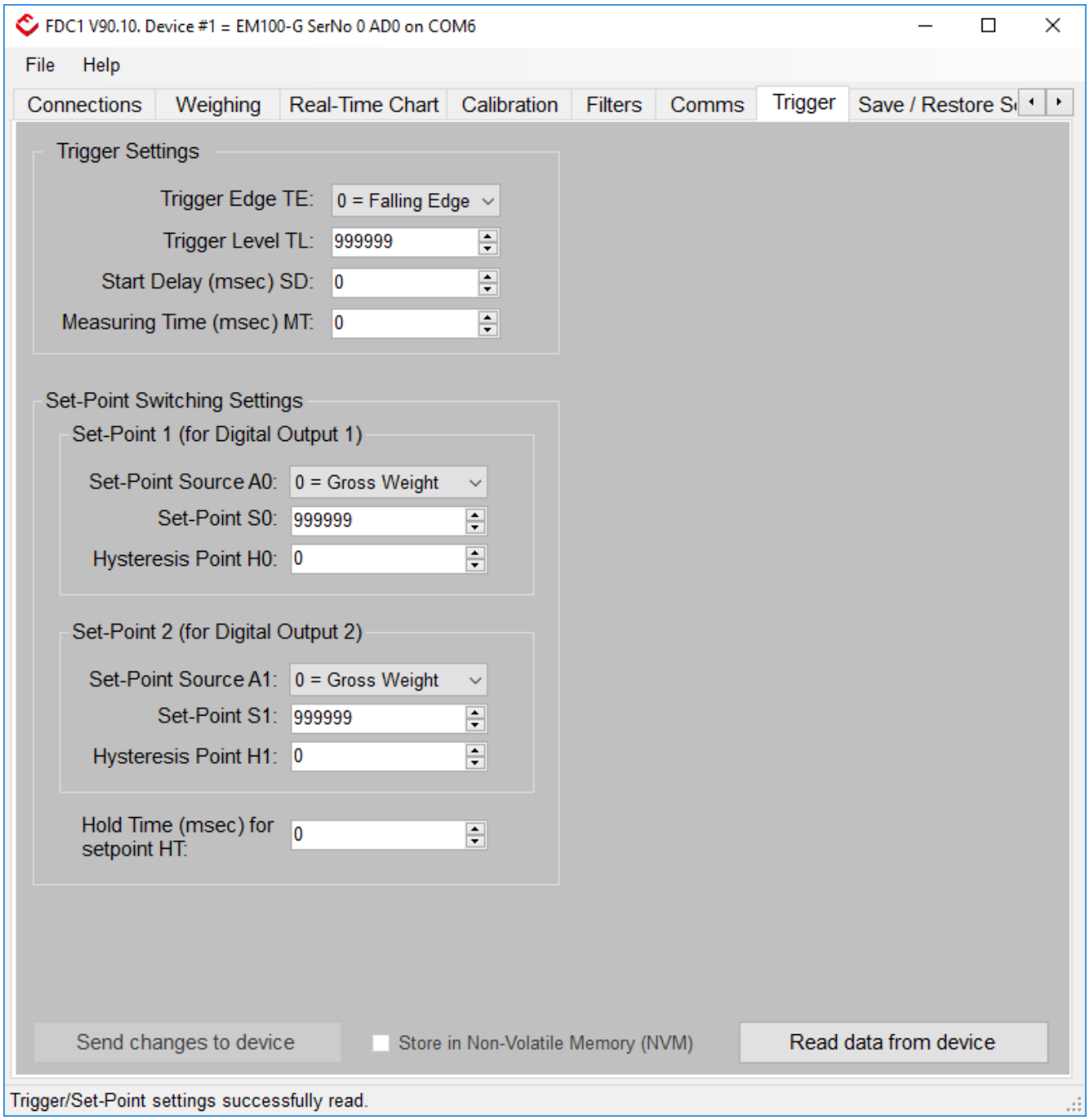


Note: The Update Rate '***UR***' applies averaging to the ADC samples. Care should be taken when selecting the output rate of the comms port in relation to the ADC sampling rate. It should be fast enough to output the handle the entire message format. A short message (e.g. Get ADC Sample '***GS***' will display ***S+02097090***) contains up to 10 ASCII characters. Enough time (Baud-rate periods) should be allocated for the entire message plus the inclusion of start and stop bits. A long message (e.g. Get Data String '***GW***' will display ***W+000000+0000000000***) contains up to 19 ASCII characters.

7. Trigger

7.1. Trigger Settings

- Click on the '***Trigger***' Tab.

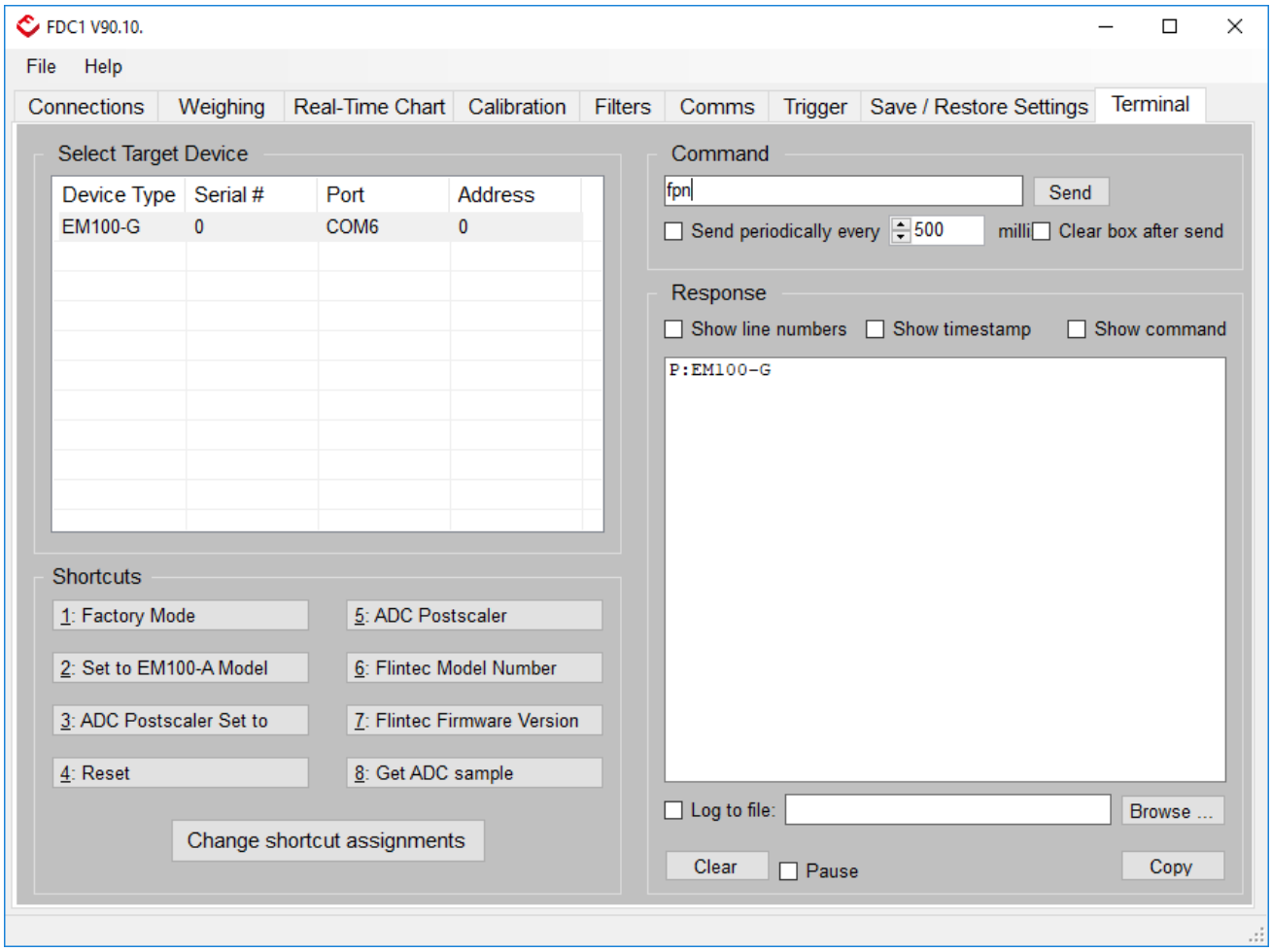


8. Terminal Command Line

8.1. USB/Serial Command Line

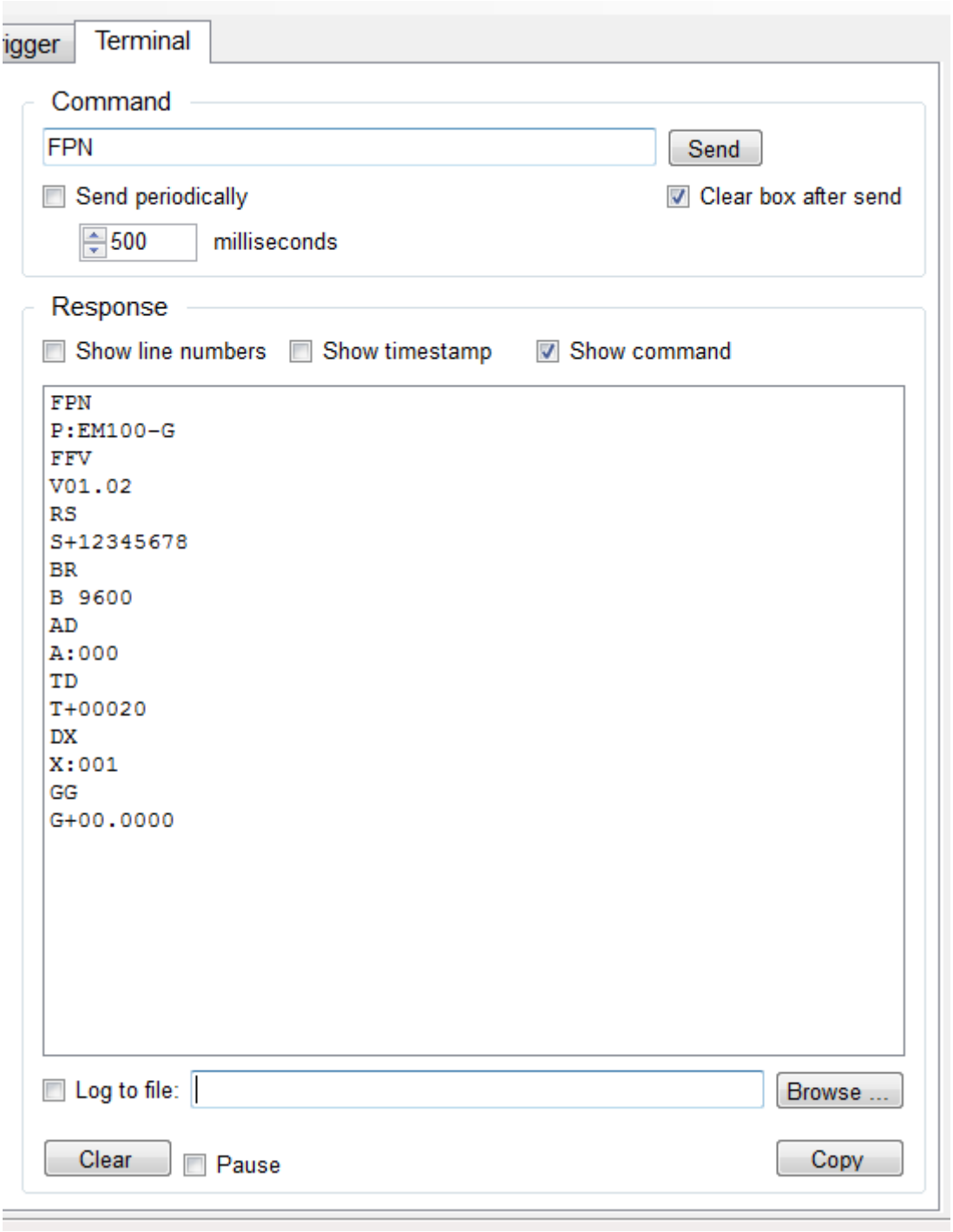
8.1.1. Send Single Command

- Click in the '***Command***' field of the '***Terminal***' tab.
- Type the desired command (not case sensitive).
- Press the '***Send***' button to execute the command.
- Watch the '***Response***' window for any return string.



8.1.2. Clear Response Window

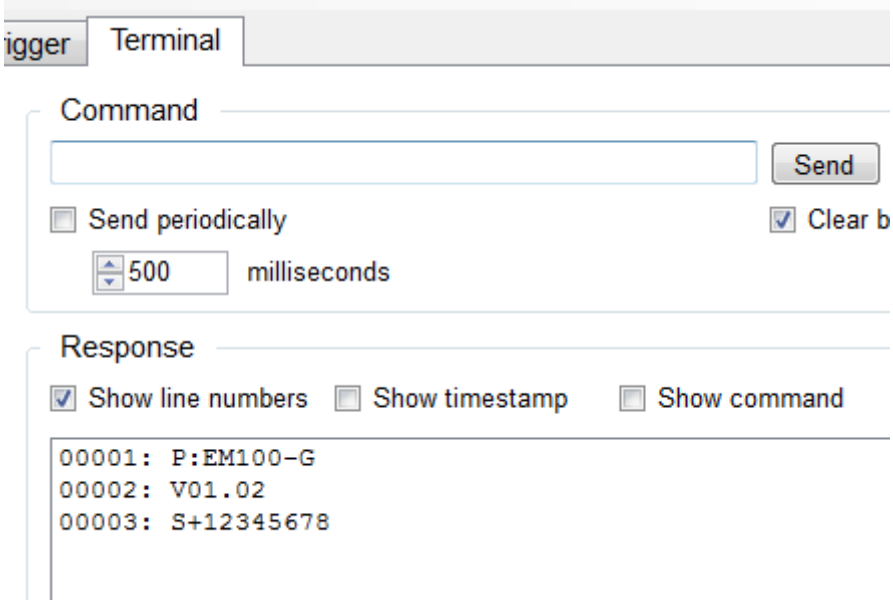
- Press the '***Clear***' button to empty the '***Response***' window.



8.1.3. Response Window Format

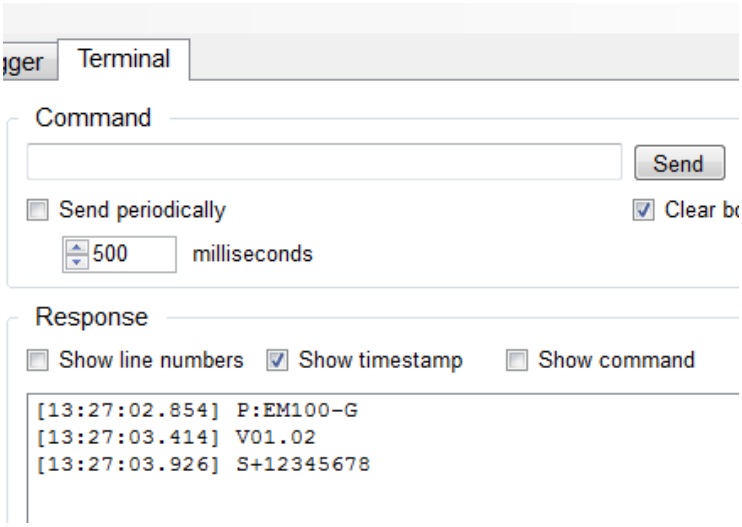
8.1.3.1. Line Numbers

- Line numbers can be appended to the '***Response***' window output. Tick the '***Show Line Numbers***' check-box before executing the command.
- Watch the '***Response***' window for any return string.



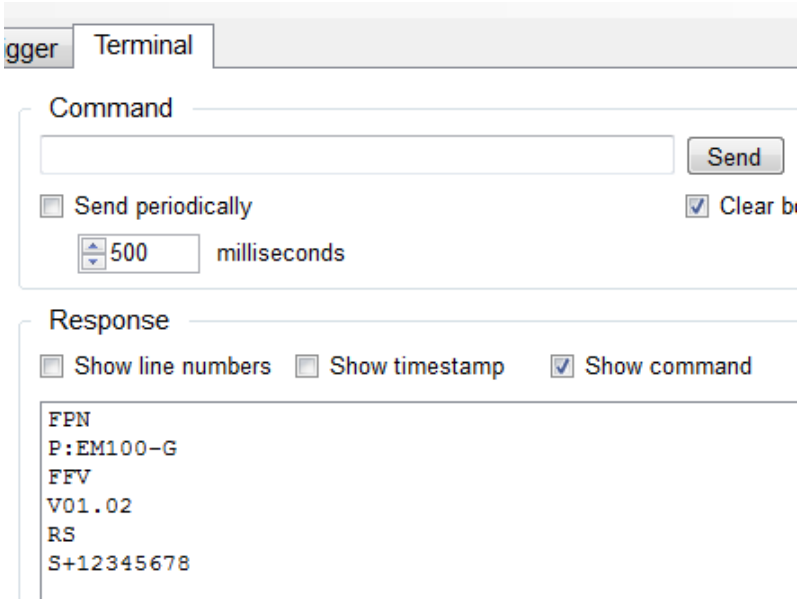
8.1.3.2. Time Stamp

- A time stamp can be appended to the '***Response***' window output. Tick the '***Show Time Stamp***' check-box before executing the command.
- Watch the '***Response***' window for any return string.



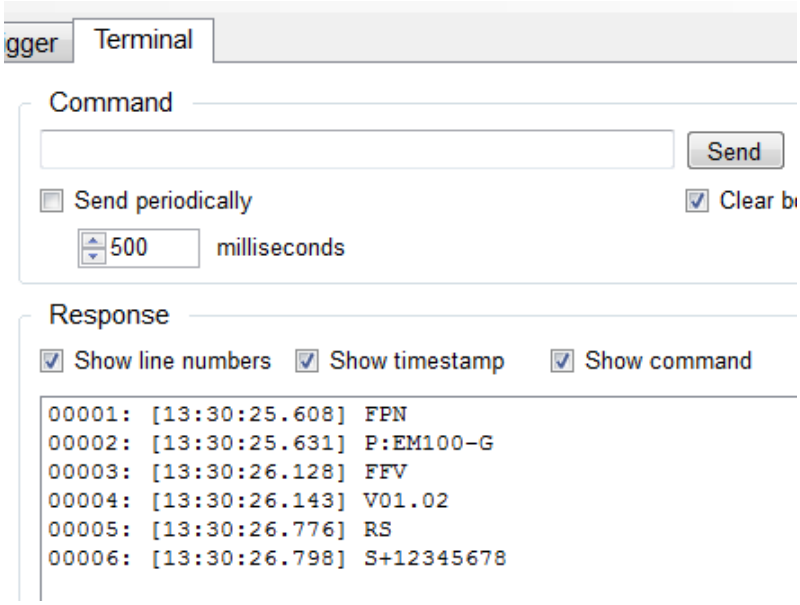
8.1.3.3. Show Command

- The entered command can be appended to the '***Response***' window output. Tick the '***Show Command***' check-box before executing the command.
- Watch the '***Response***' window for any return string.



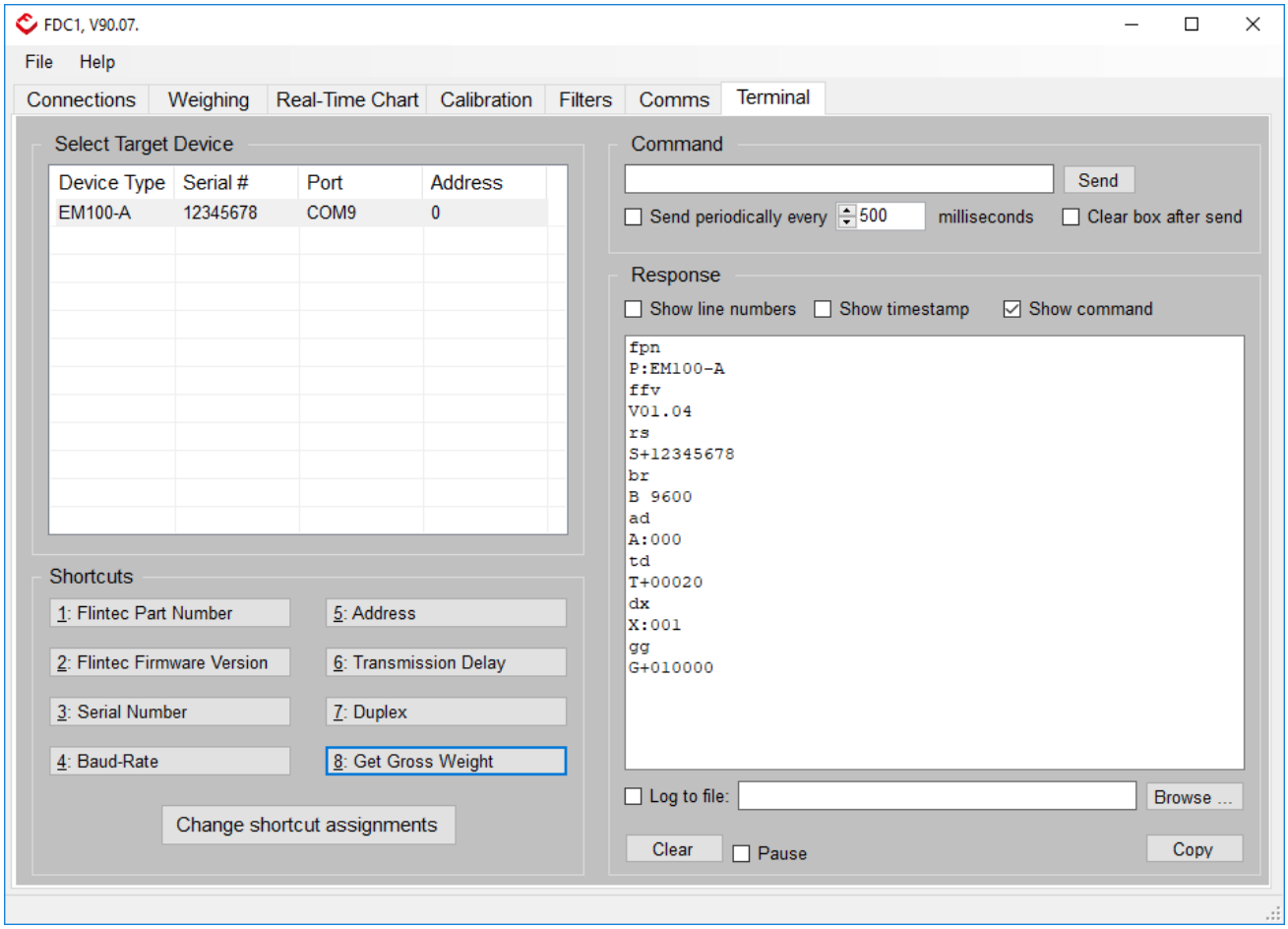
8.1.3.4. All Formats Enabled

- If all check-boxes are applied the following format will be displayed in the '***Response***' window.



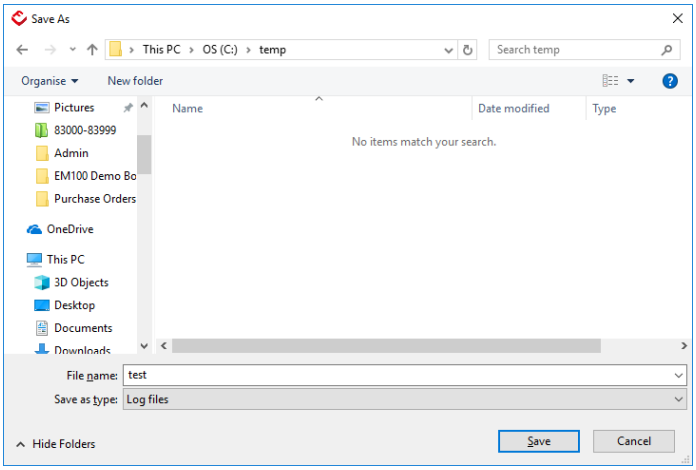
8.1.4. Periodic Command Streaming

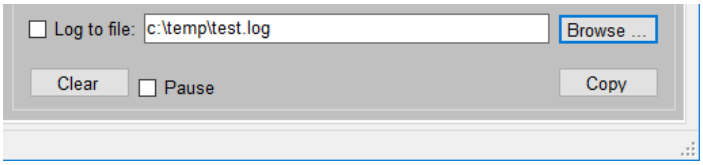
- The terminal window can be used to manually stream commands at a user determined rate by adjusting the '***Time Period***' text-box.
- Tick the '***Send Periodically***' check-box to enable the command entered in the '***Command***' text-box (determined by the time set).
- Watch the '***Response***' window for any return string.



8.1.5. Log File

- Press the '***Browse***' button to enter/select a name and location for the log file.
- Press '***Save***' button.
- Ticking the '***Log to File***' check-box will generate the log file (the output file extension is *.log containing all the '***Response***' window output data.
- The output saved to file can be paused by checking the '***Pause***' check-box.
- The '***Copy***' button save the contents of the '***Response***' window to the PCs clip-board for easy cut and paste operations.

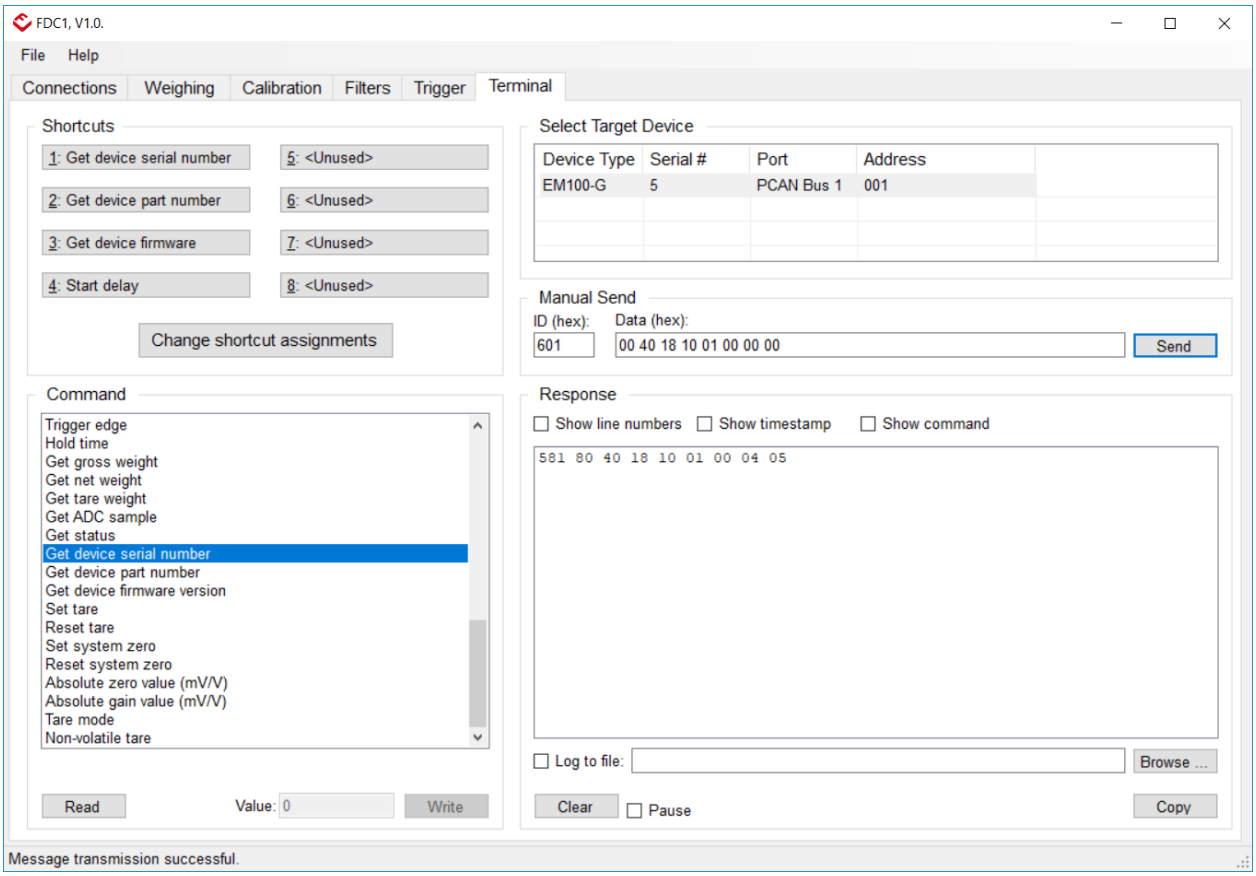




8.2. CAN Command Line

8.2.1. Send Single Command

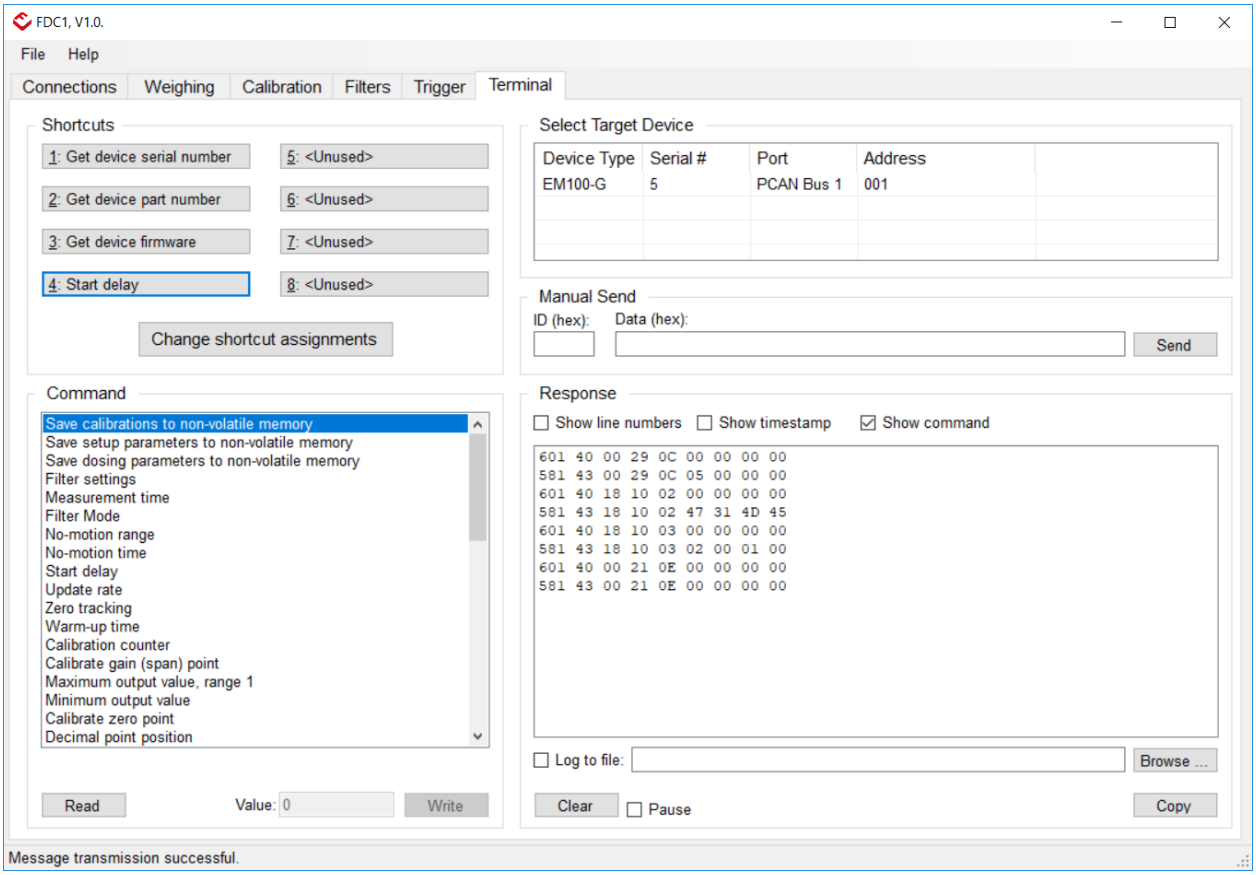
- Click on the '***Terminal***' Tab.
- Click in the '***ID(Hex)***' field.
- Type the CAN command ID in the '***ID(Hex)***' field.
- Click in the '***Data(Hex)***' field.
- Type the CAN command ID in the '***Data(Hex)***' field.
- Press the '***Send***' button to execute the command.
- Watch the '***Response***' window for any return string.



Note: Refer to the user manual for CAN command IDs and indexes. The code used in the example is request the device Vendor ID.

8.2.2. Clear Response Window

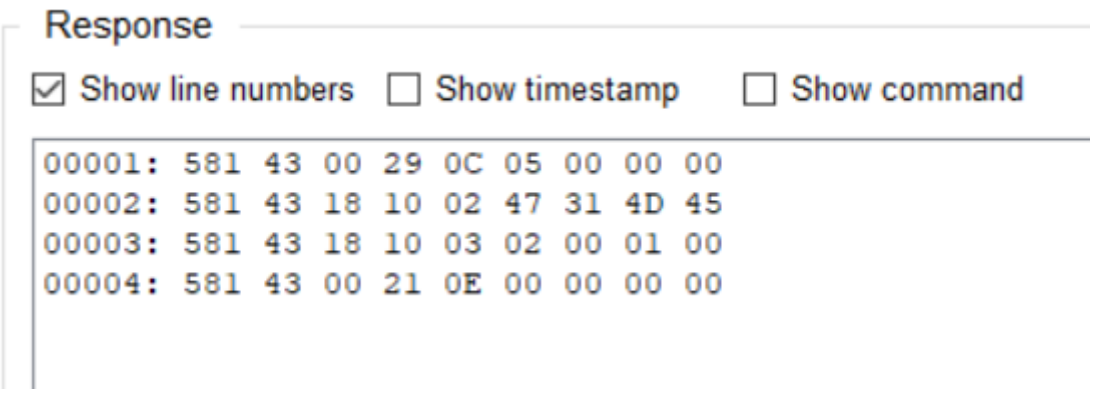
- Press the '***Clear***' button to clear the '***Response***' window.



8.2.3. Response Window Format

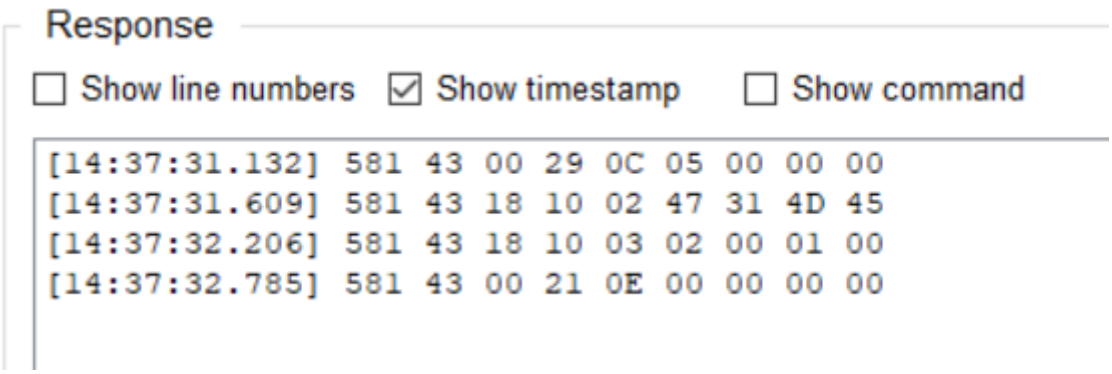
8.2.3.1. Line Numbers

- Line numbers can be appended to the '***Response***' window output. Tick the '***Show Line Numbers***' check-box before executing the command.
- Watch the '***Response***' window for any return string.



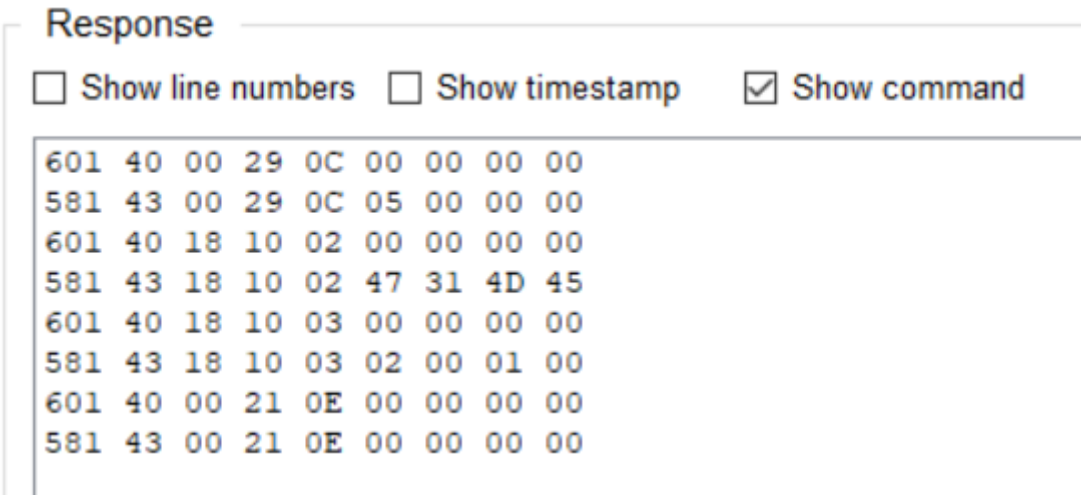
8.2.3.2. Time Stamp

- A time stamp can be appended to the '***Response***' window output. Tick the '***Show Time Stamp***' check-box before executing the command.
- Watch the '***Response***' window for any return string.



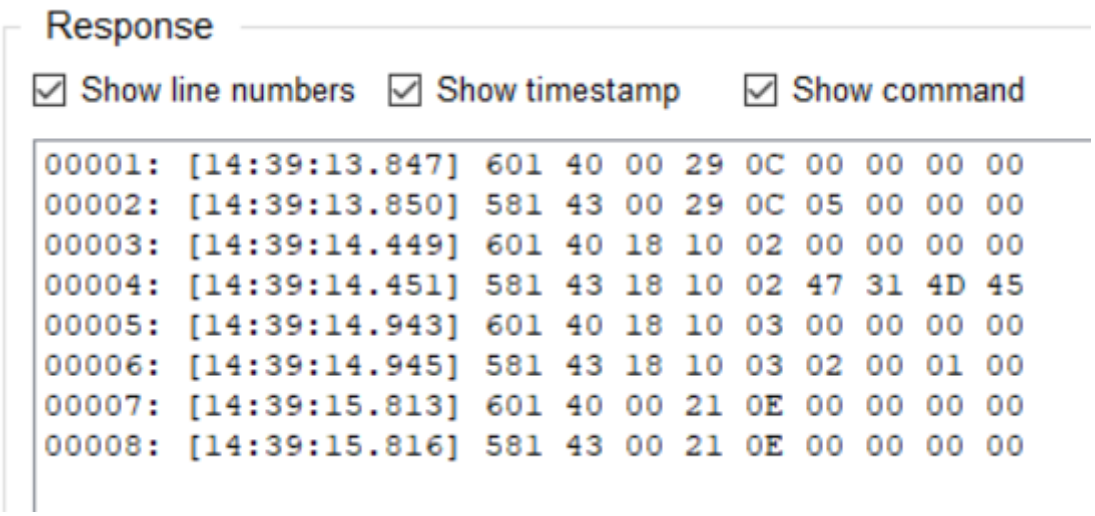
8.2.3.3. Show Command

- The entered command can be appended to the '***Response***' window output. Tick the '***Show Command***' check-box before executing the command.
- Watch the '***Response***' window for any return string.



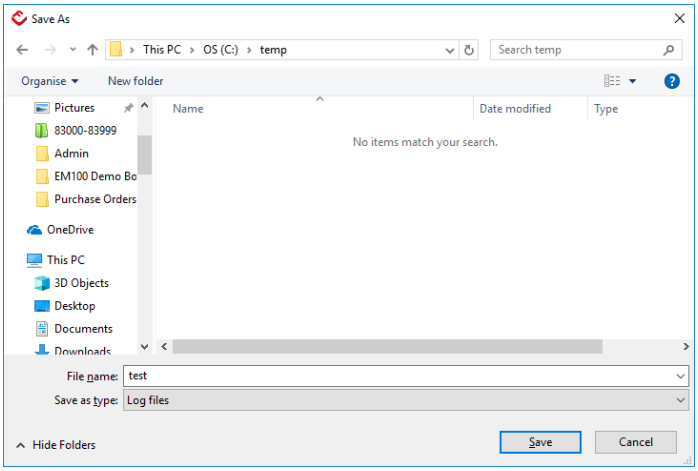
8.2.3.4. All Formats Enabled

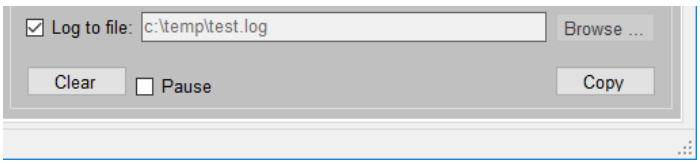
- If all check-boxes are applied the following format will be displayed in the '***Response***' window.



8.2.4. Log File

- Press the '***Browse***' button to enter/select a name and location for the log file.
- Press '***Save***' button.
- Ticking the '***Log to File***' check-box will generate the log file (the output file extension is *.log containing all the '***Response***' window output data.
- The output saved to file can be paused by checking the '***Pause***' check-box.
- The '***Copy***' button save the contents of the '***Response***' window to the PCs clip-board for easy cut and paste operations.

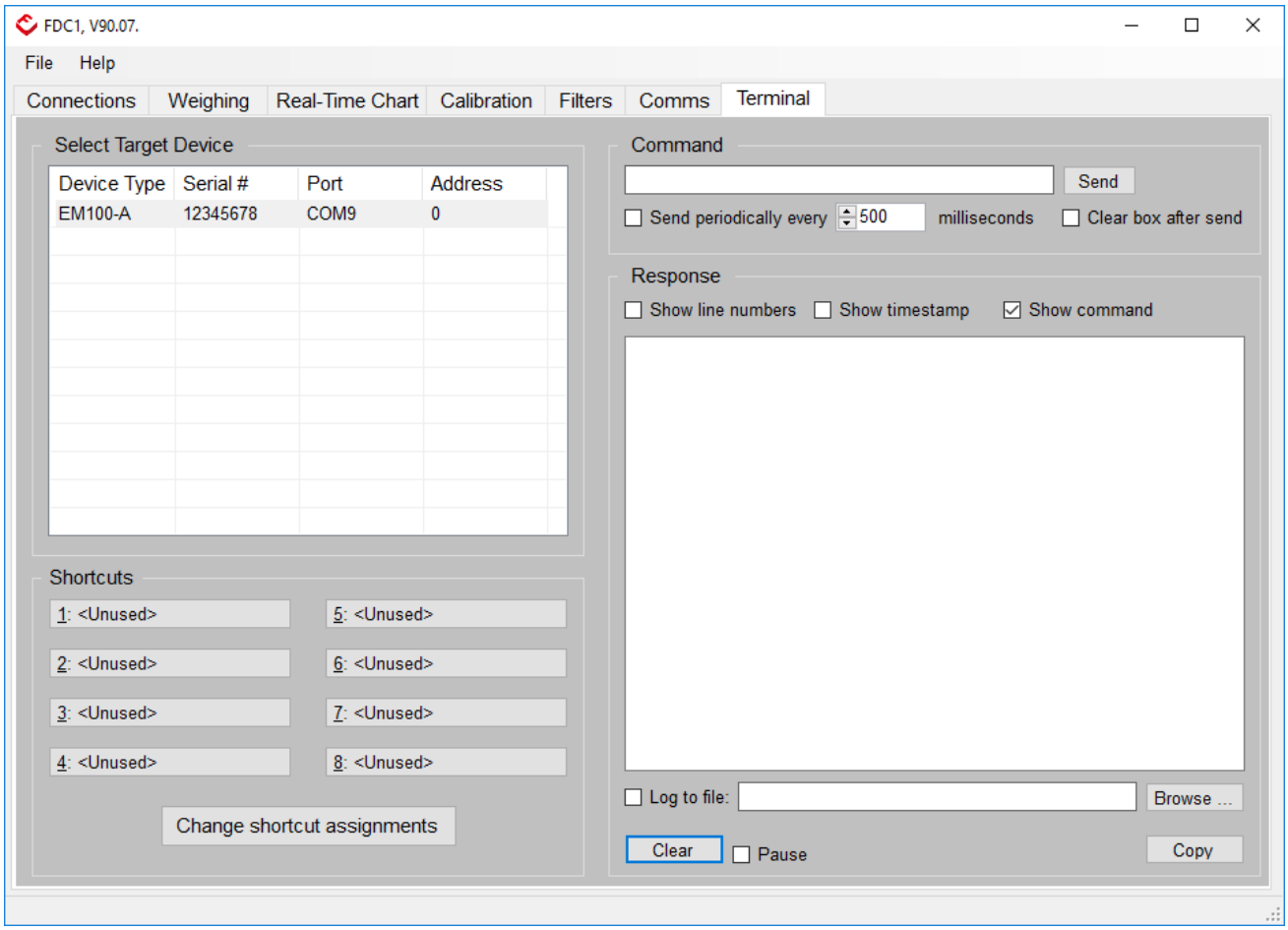




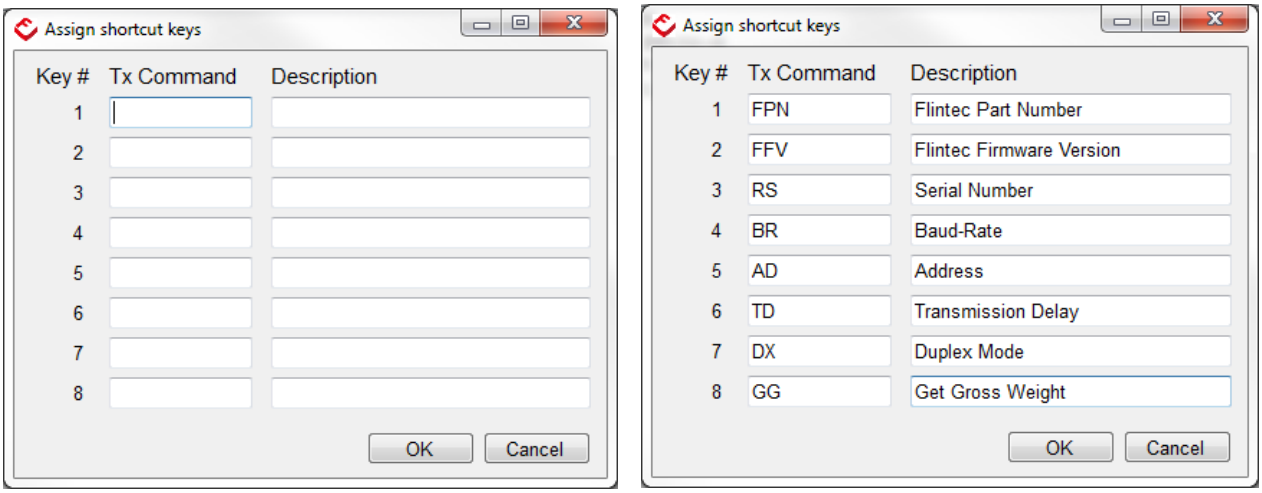
8.3. Terminal Shortcuts

8.3.1. USB/Serial Communications

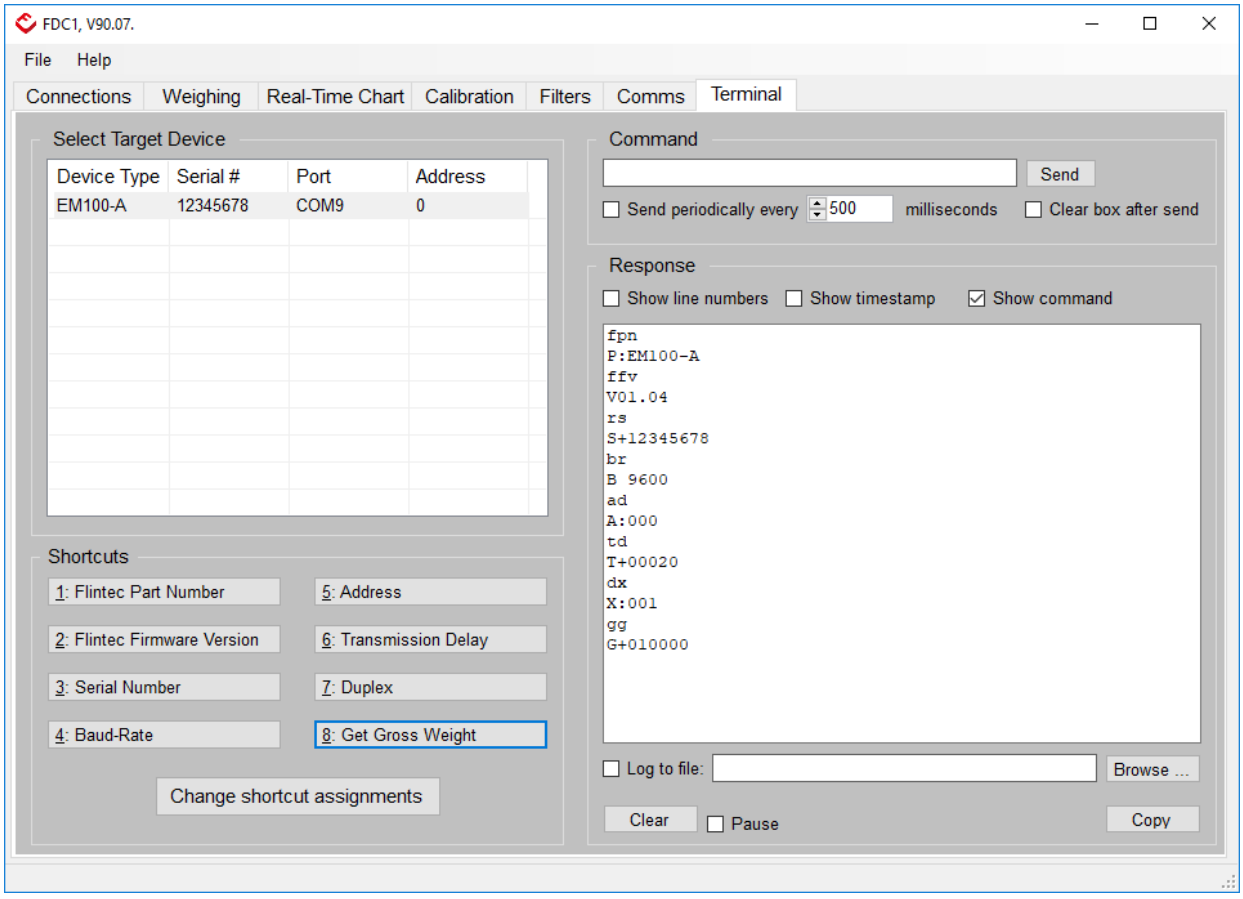
- Click on the '***Terminal***' Tab.
- Click on the '***Change Shortcut Assignments***' button.



- Frequently used commands can be assigned to shortcut buttons for ease of use. Type the desired command in the '***Tx Command***' field.
- Assign a note in the '***Description***' field as a reference (optional).
- When finished, press the '***OK***' button to assign the shortcuts.

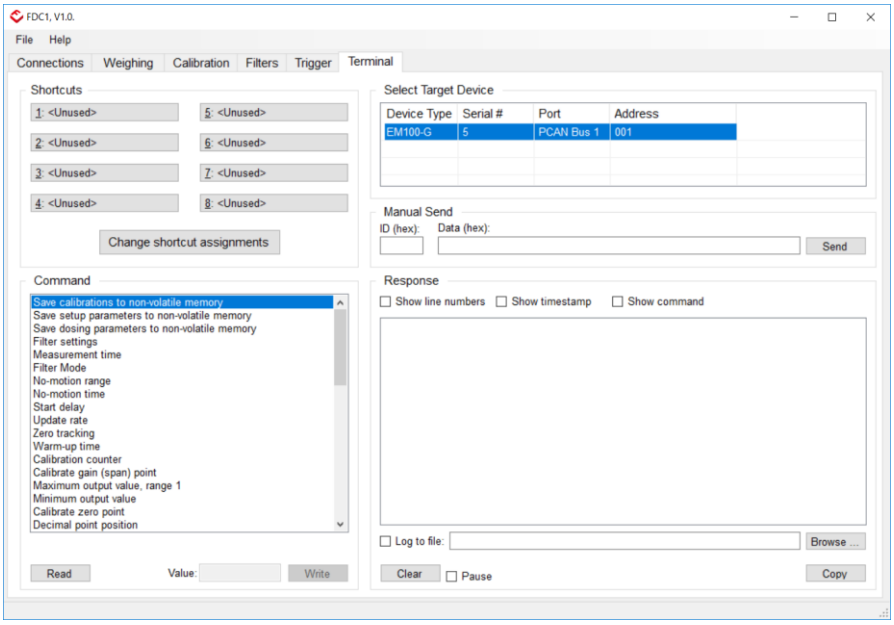


- The assigned commands will be updated in the '***Shortcuts***' section.
- Press the shortcut buttons and view the feedback from the device in the '***Response***' window.

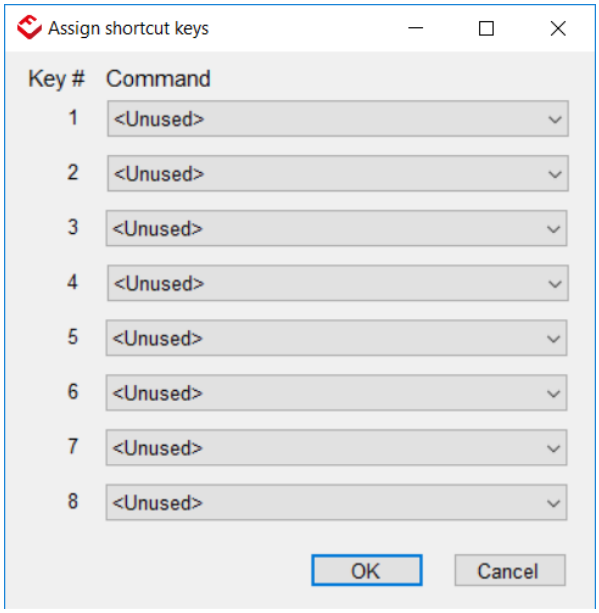


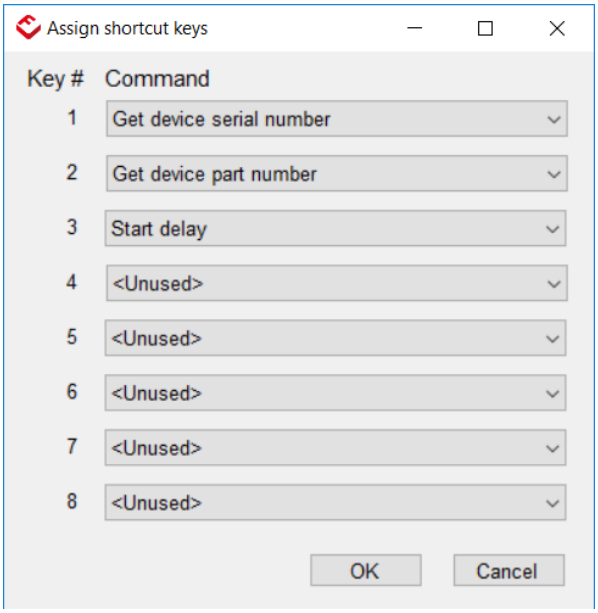
8.3.2. CAN Communication

- Click on the '***Terminal***' tab.

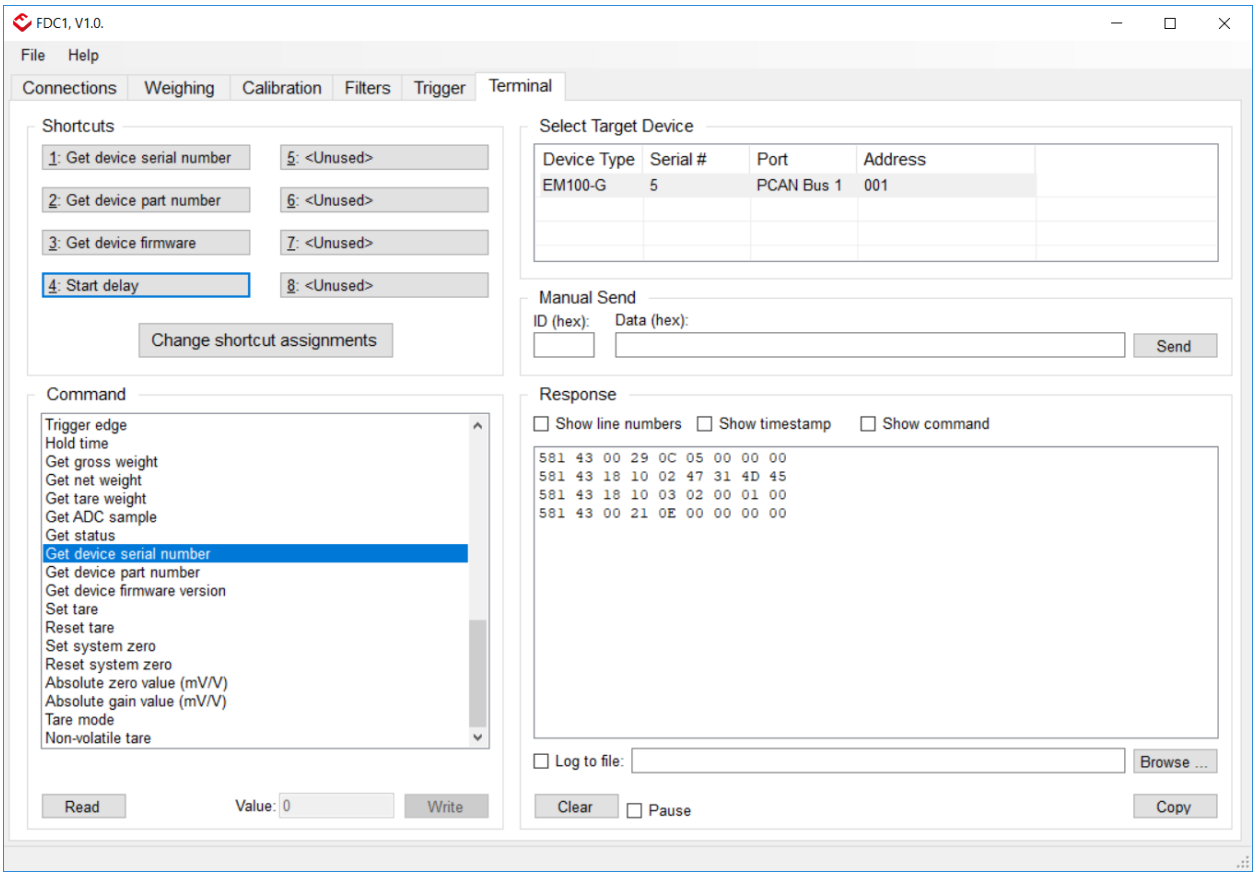


- Press the '***Change Shortcut Assignments***' buttons.
- Select the required command descriptions from the drop-down list.
- Confirm the selections by pressing '***OK***' button.





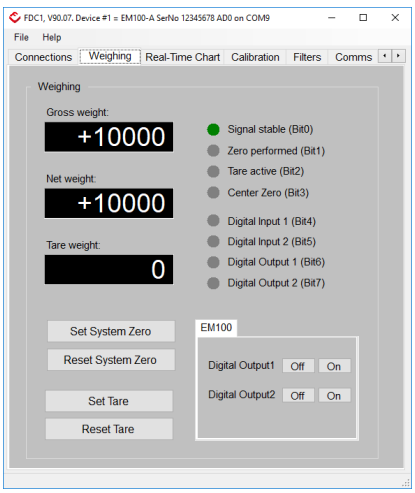
- The assigned commands will be updated in the '***Shortcuts***' section.
- Press the shortcut buttons and view the feedback from the device in the '***Response***' window.

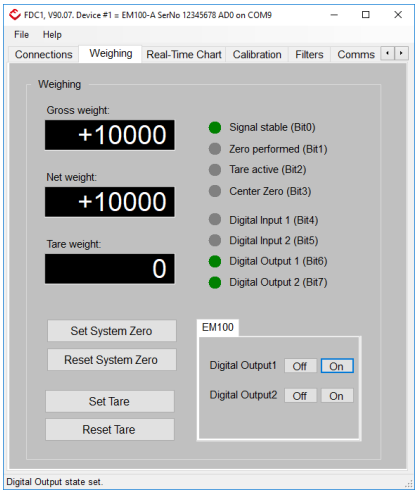


9. GPIOs

9.1. Change Digital Output Status

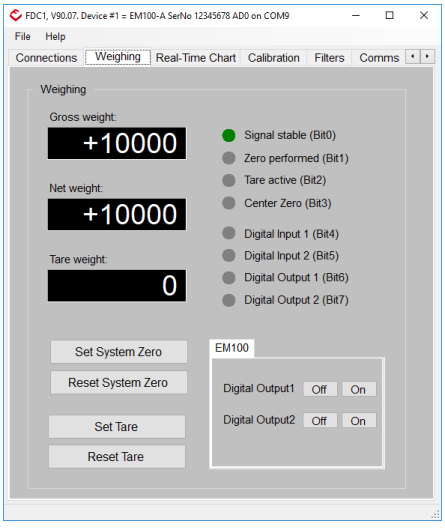
- Click on the '***Weighing***' Tab.
- To manually change the logic level of the digital outputs, use the '***On***' or '***Off***' buttons in the EM100 group (alternatively the '***IO***' & '***OM***' commands can be used). The changed condition will be displayed on the digital output indicators. Also, the status window will echo the result of the last command.

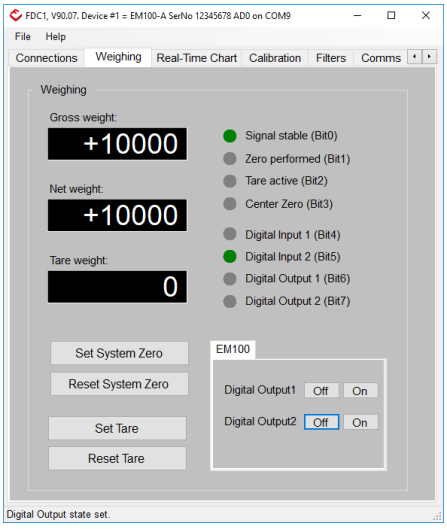




9.2. Change Digital Input Status

- Click on the '***Weighing***' Tab.
- Apply a logic '***high***' condition to either of the digital inputs. The indicator will detect the presence of the input and display the logic conditions. In this example, '***Digital Input 2***' has been used.

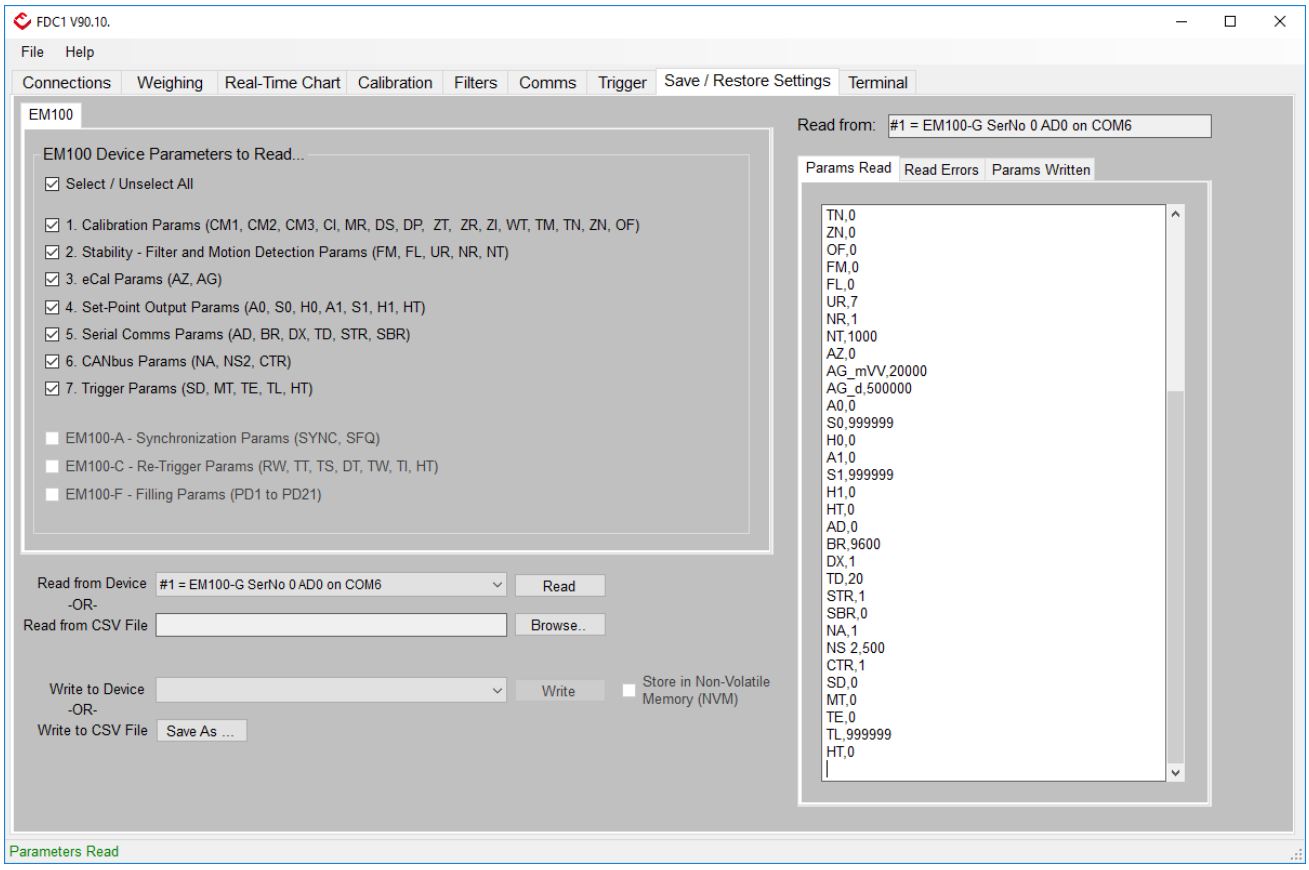




10. Save/Restore Settings

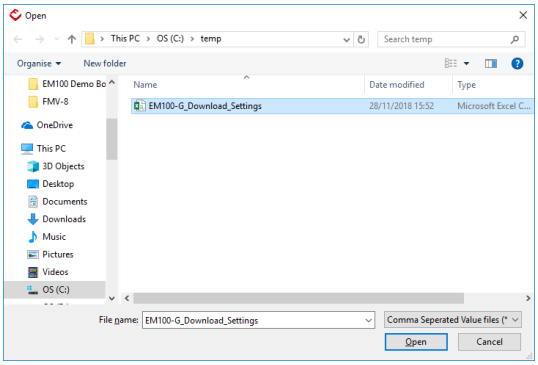
10.1. Recall Settings from EM100

- Click on the '***Save/Restore Settings***' Tab.
- Select to appropriate port number/selection from the '***Read from Device***' drop-down list.
- To select specific features, tick the appropriate check-box beside the function in the '***EM100 Device Parameters section***'.
- Press the '***Read***' button to populate the dialogue window on the left.

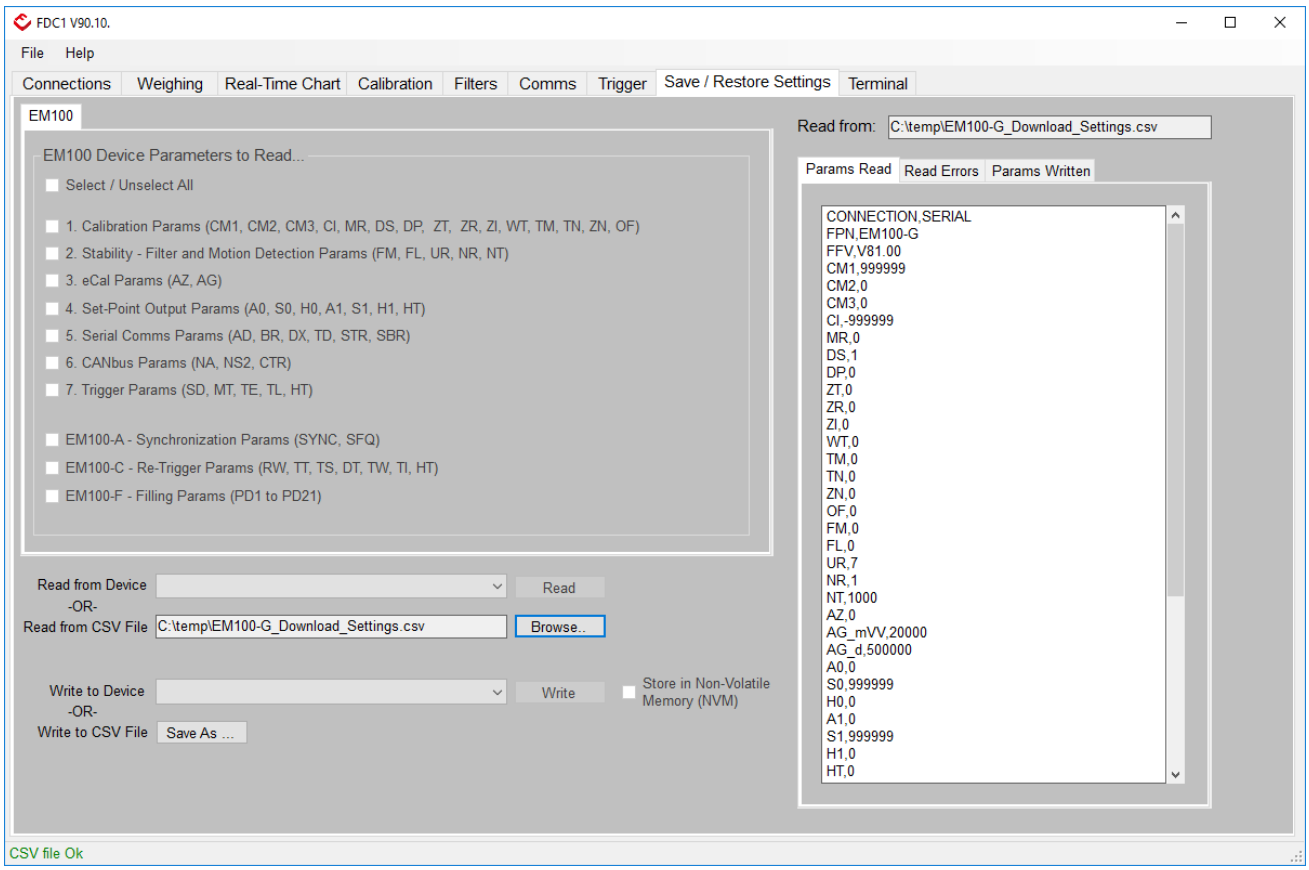


10.2. Recall Settings from File

- Click on the '***Save/Restore Settings***' Tab.
- Click on the '***Browse***' Button at the bottom of the window.
- Select/Navigate to the required filename and location and press the '***Open***' button.

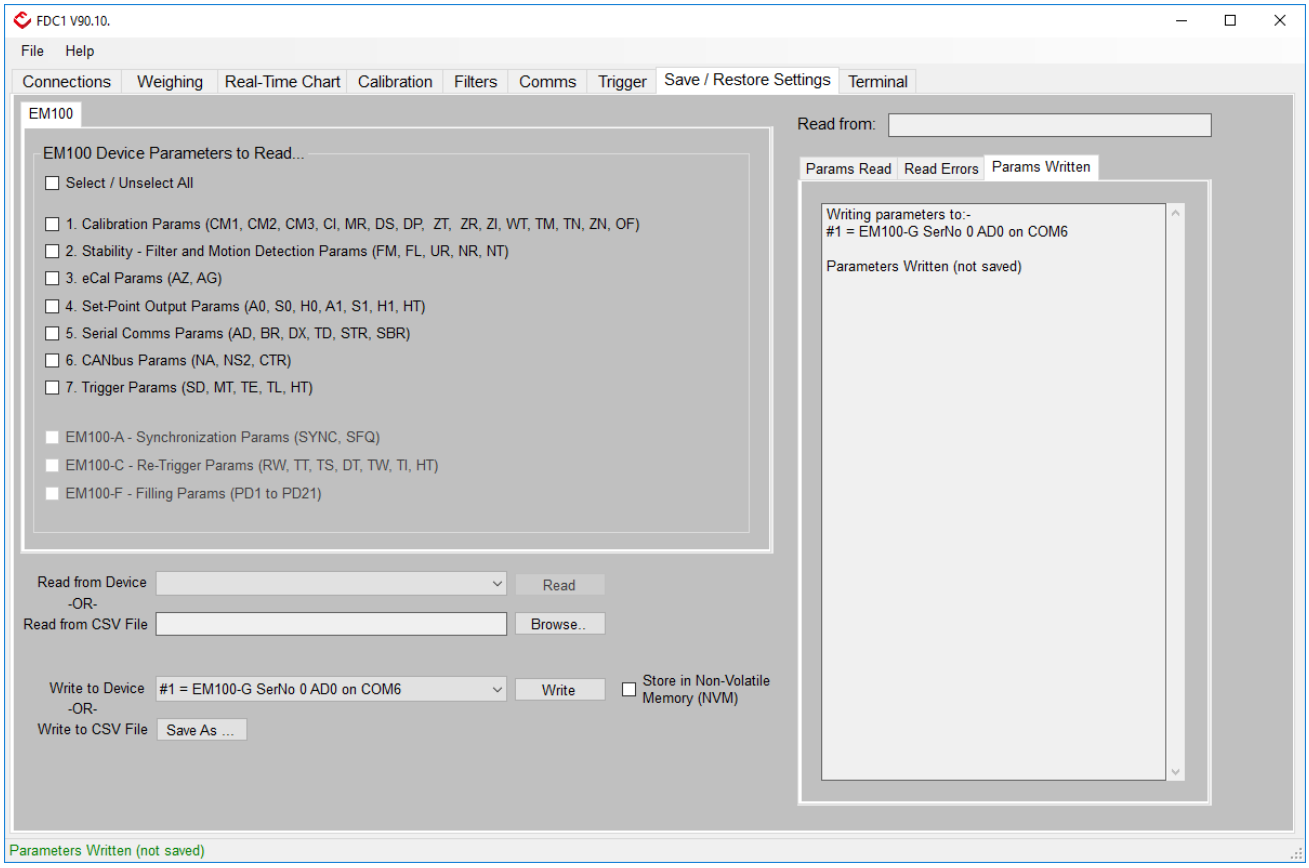


- Successful reading of the file will populate the information window on the left side also the file location & name will appear in the '***Read from CSV File***' text window.



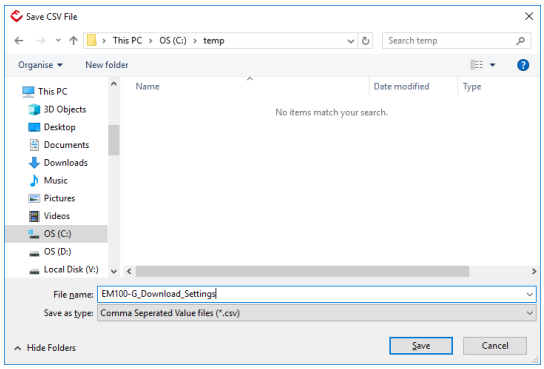
10.3. Save Settings to EM100

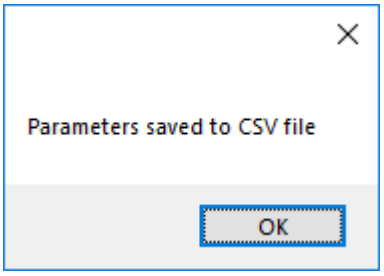
- Click on the '***Save/Restore Settings***' Tab.
- Select the appropriate port number/selection from the '***Write to Device***' drop-down list.
- Press the '***Write***' button will update the current device settings to the EM100. This will not been permanently write to non-volatile memory unless the '***Store to Non-Volatile Memory (NVM)***' check-box has ticked.



10.4. Save Settings to File

- Click on the '***Save/Restore Settings***' Tab.
- Press the '***Save As***' button in the '***Write to CSV File***' section.
- Enter the required filename and location and press the '***Save***' button.
- Successful creation of the saved file is indicated by a dialogue box. Click '***OK***'.



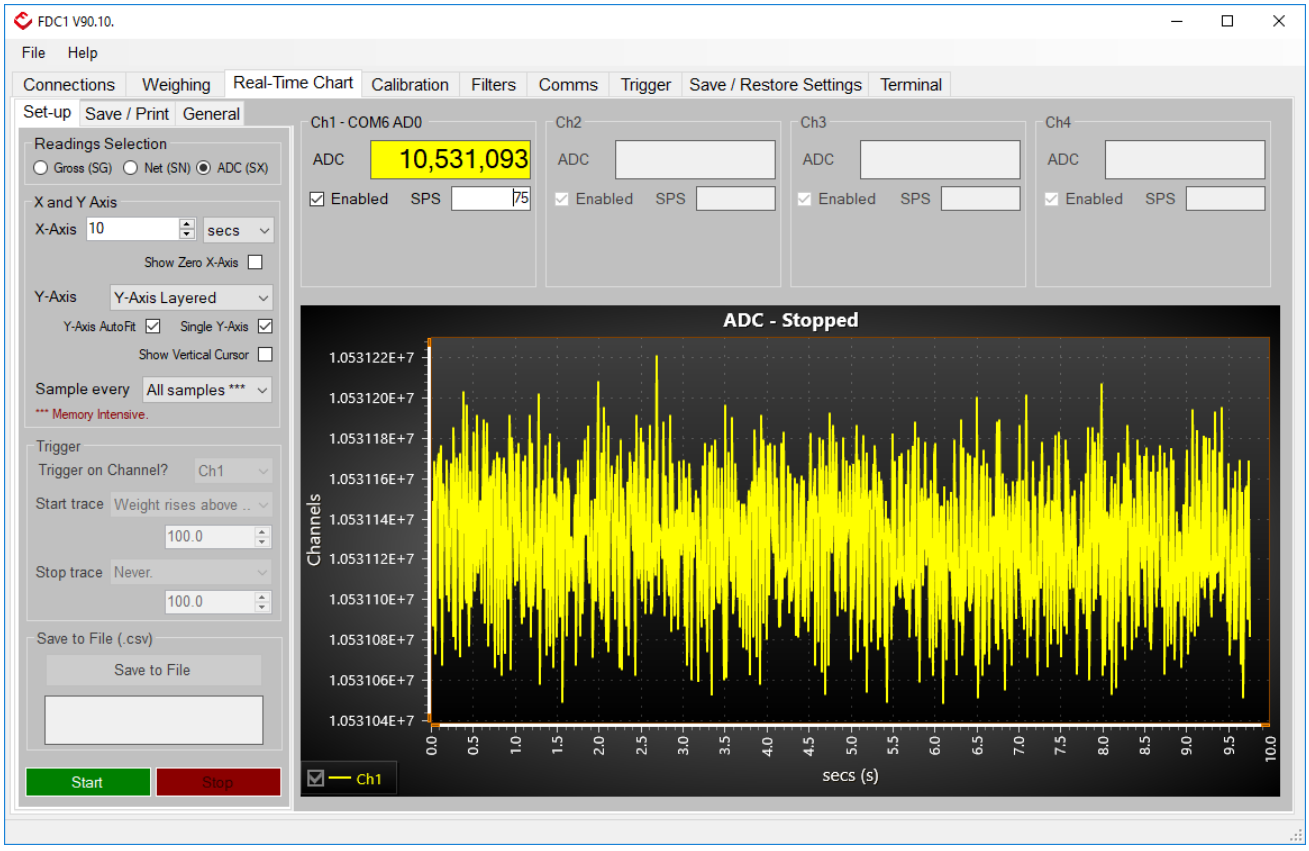


11. Real-Time Chart

This tab will not appear if using half-duplex communications as it uses streaming commands '***SG***', '***SN***' & '***SX***'.

11.1. Real-Time Chart Settings

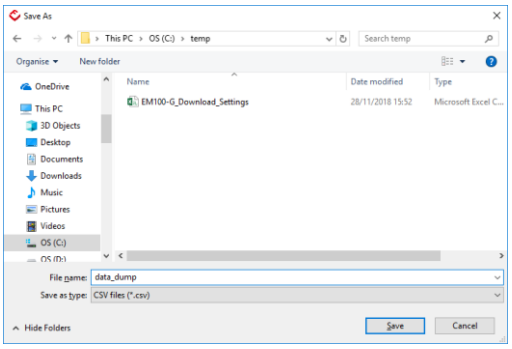
- Click on the '***Real-Time Chart***' Tab.
- Click on the '***Setup***' Tab within the '***Real-Time Chart***'.
- Select the appropriate radio button to enable the readings type from the '***Readings Selection***' section.
- Tick the '***Y-Axis Auto Fit***' check-box in the '***X and Y Axis section***' to auto-scale the graph in the display window.
- Select the '***1sec***' option in the '***Sample Every***' drop-down box in the '***X and Y Axis section***'.
- Enter a suitable value for the time-base (seconds) in the '***X-Axis***' section.
- To start the test running, press the green '***Start***' button at the bottom of the window.



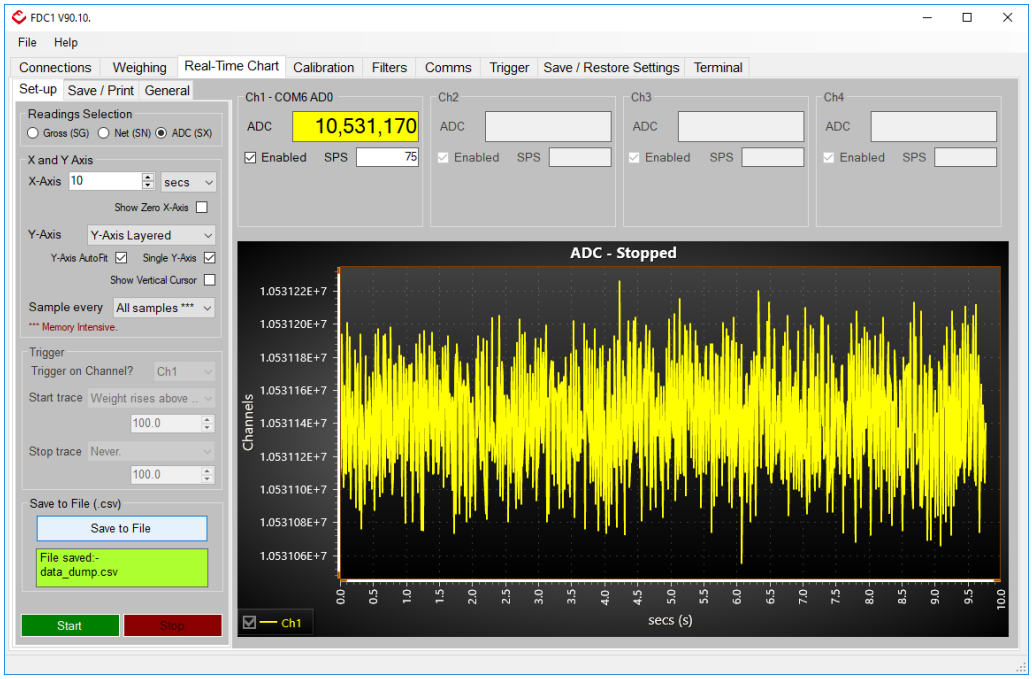
Note: The memory depth of the PC used should be considered before starting the graphing function. To limit the system memory required, several options have been included. Using high sample rates when displaying '***All Samples***' is only advisable when doing short duration testing.

11.2. Saving Graph Data

- Click on the '***Real-Time Chart***' Tab.
- Click on the '***Save/Print***' Tab within the '***Real-Time Chart***'.
- Tick the '***Save to .csv file***' check-box.
- Press the '***New***' button to create a new file name and location.
- Enter a file name in the appropriate directory and press '***Save***' button. The '***Filename (.csv)***' text-box will update with the chosen file name.

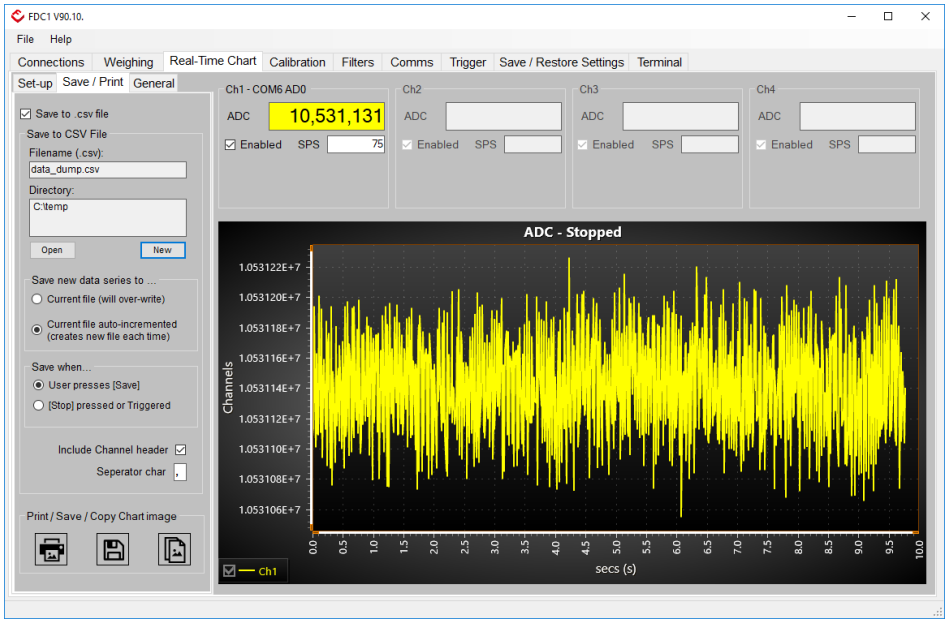


- To save the data points in a CSV file, click on the '***Setup***' Tab within the '***Real-Time Chart***'.
- Press the '***Save to File***' button. This will create the *.csv file, confirmed by the text-window updating with '***File Saved:- xxx.csv***'.

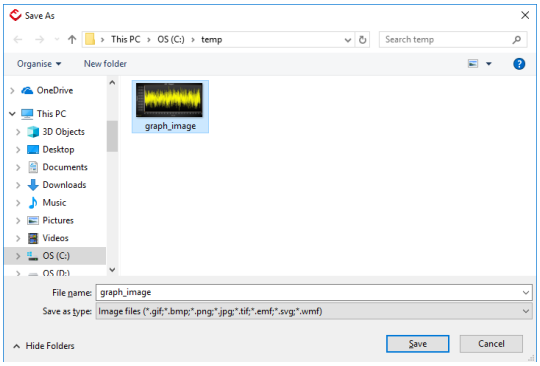
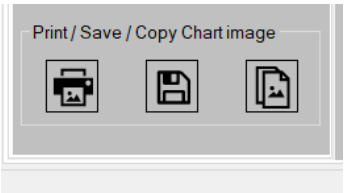


11.3. Saving Graph Image

- Click on the '***Real-Time Chart***' Tab.
- Click on the '***Save/Print***' Tab within the '***Real-Time Chart***'.



- Press the '***Disc***' button symbol at the bottom of the window will save the chart window to an image file (e.g. bmp/jpg etc).
- Enter the image file name and location.



- Alternatively, the '***Printer***' symbol will send the graph image to the default printer, while the '***Copy***' symbol will transfer the graph to the clip-board to cut-and-paste into another document.