N2KAnalyzer®

NMEA 2000® Network Analysis Software

User's Manual

Revision 2.2.1

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Maretron Manual Part #: M001501

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1 Introduction

N2KAnalyzer® software is a powerful PC-based tool for analyzing, troubleshooting, and upgrading NMEA 2000 networks. The N2KAnalyzer® software, when installed on a Windows PC and used in conjunction with an intelligent NMEA 2000 gateway, such as the Maretron USB100, can be used to analyze the performance of NMEA 2000 networks, troubleshoot NMEA 2000 networks which are not functioning correctly, and update firmware on Maretron NMEA 2000 devices. N2KAnalyzer® can be used on an operating NMEA 2000 network, whose state can be captured into a file and used for later analysis, or can be used offline to analyze the saved network state, allowing a user to save state of a network and send it to a technical expert for analysis.

Features:

- List all NMEA 2000 devices on the network
- Display a wealth of following information for each device:
  - Node Address
  - Manufacturer
  - Manufacturer Model ID
  - Manufacturer Model
  - Manufacturer Serial Number
  - Source
  - Unique Instance
  - Label
  - Current Software
  - Available Software
  - Boot Software Version
  - Installation Description
  - Manufacturer Information
  - NMEA 2000 Device Function
  - NMEA 2000 Device Class
  - Manufacturer Model (Hardware) Version
  - NMEA 2000 Industry Group
  - NMEA 2000 Unique Number
  - NMEA 2000 Device Instance
  - NMEA 2000 System Instance
  - NMEA 2000 Product Code
  - NMEA 2000 Database Version
  - NMEA 2000 Certification Level
  - NMEA 2000 Load Equivalency
  - Transmitted PGN List
  - Received PGN List
- For devices supporting multiple channels, display the following information for each device, as appropriate:
  - Hardware Channel
  - Indicator
  - Source

  - Instance
  - Label
- Display NMEA 2000 messages transmitted by each device in an easy-to-understand, human-readable format
- Modify Installation Description information on devices which support user-programming of this information
- Modify source and instance information on devices which support user-programming of this information
- Analyze the devices on the network and their transmitted data to ensure that there are no instancing conflicts which can cause "bouncing needles" on displays
- Program label information on devices which support user-programming of this information to assign meaningful text strings to every device and channel
- Configure/Calibrate Maretron devices and select devices from other manufacturers
- Update firmware on supported Maretron NMEA 2000 devices
- Update N2KAnalyzer® and its available firmware images over the internet

2 System Requirements

- Personal Computer running Microsoft Windows XP SP3, Vista, Windows 7, Windows 8, or Windows 10
- N2KAnalyzer® requires the use of a Maretron IPG100 or USB100 gateway. NMEA 2000® gateways from other manufacturers are not compatible with N2KAnalyzer®.
- 256 MB RAM
- 30 MB Hard Disk Space
- Internet connection

3 Installation

The N2KAnalyzer® may be obtained by downloading from the Maretron website at

http://www.maretron.com/downloads

The installer for N2KAnalyzer® is packaged as an executable file. To install N2KAnalyzer®, download the N2KAnalyzer® installer from the internet at the link given above and save the executable file to your hard drive. Then, run the N2KAnalyzer® installer as you would any other program.

The N2KAnalyzer® Installer will display the following screen:

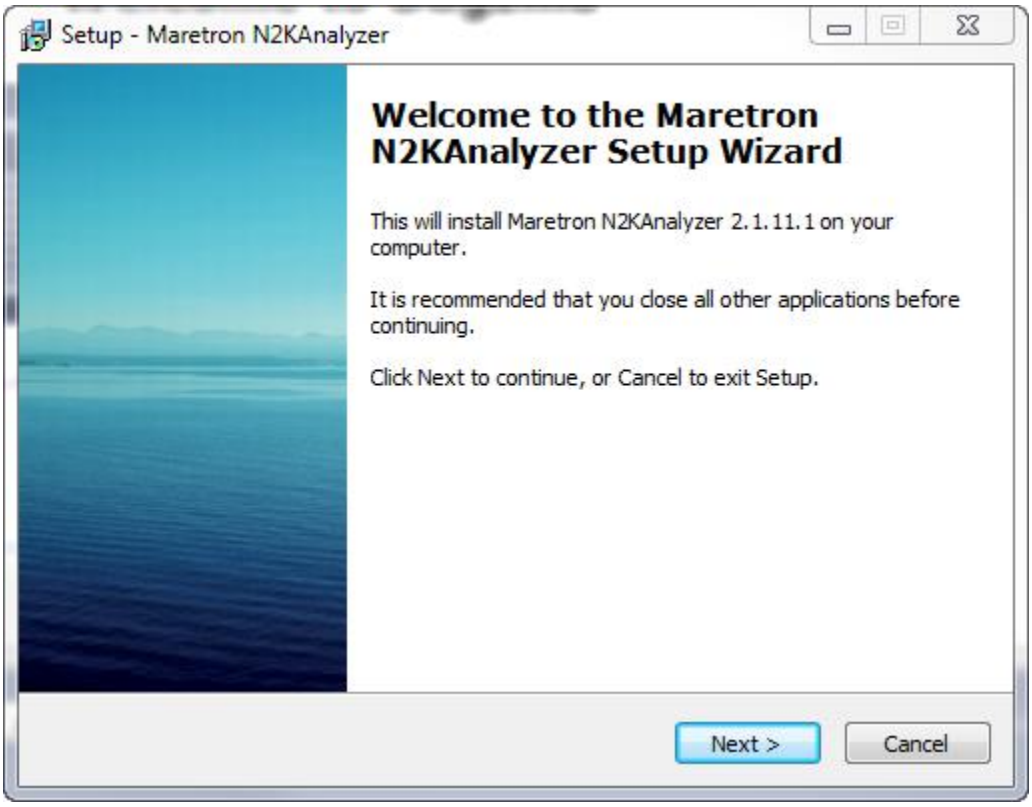


Figure 1 – N2KAnalyzer® Installation Introduction Screen

Click the *Next* button to continue. The N2KAnalyzer® Installation program will then display the *Select Destination Location* screen.

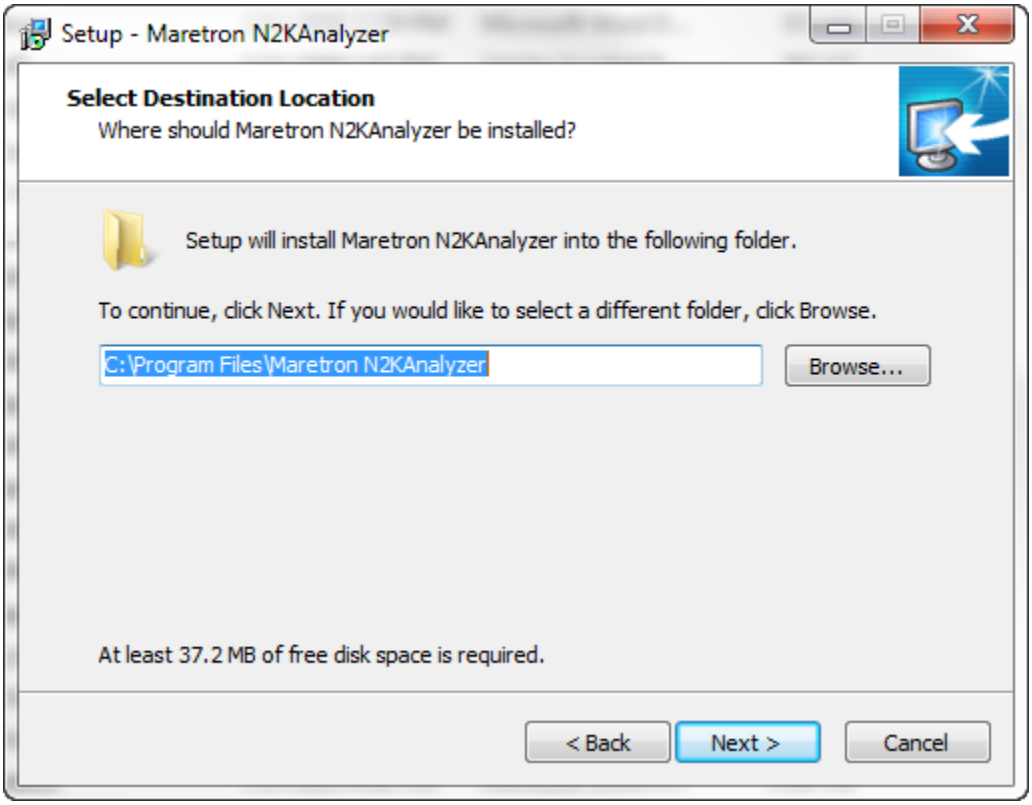


Figure 2 – Select Destination Location Screen

By browsing or by typing in the name directly, enter then name of directory in which you wish the software to be installed, then click the *Next* button to continue to the next screen.

The N2KAnalyzer® Installer software will then display the *Select Start Menu Folder* screen.

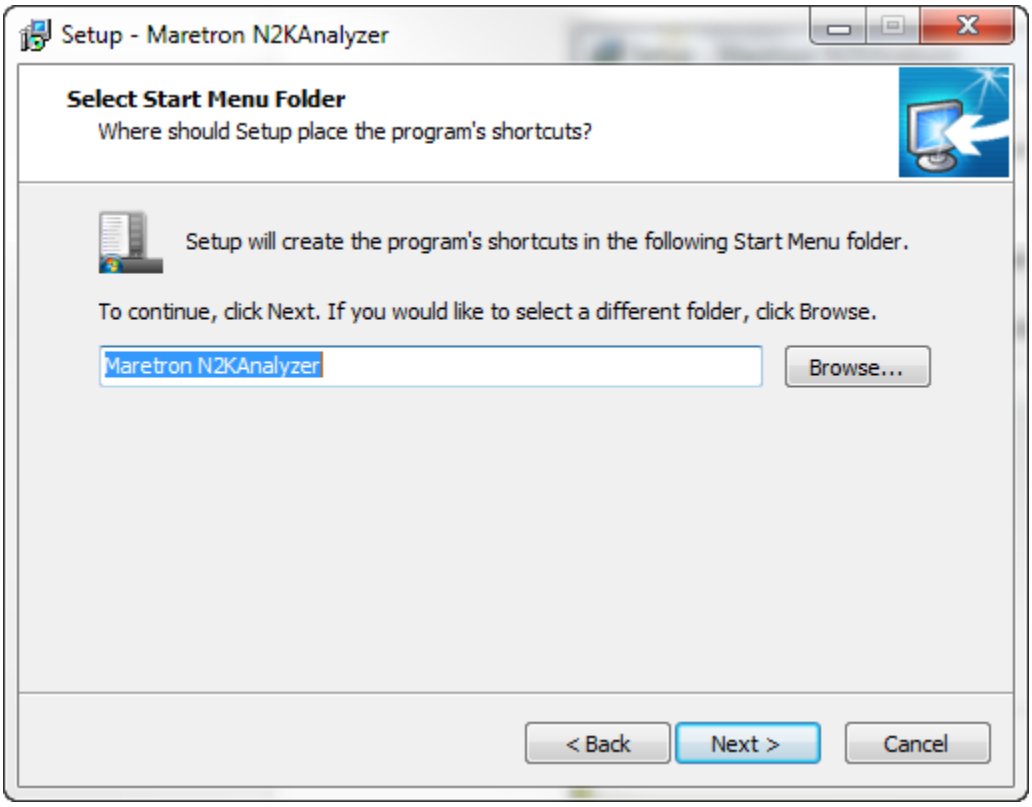


Figure 3 – Select Start Menu Folder Screen

This screen gives you the opportunity to change the default start menu folder into which the N2KAnalyzer's shortcuts will be placed. Once you are satisfied with the name of the start menu folder, click the *Next* button to continue. The N2KAnalyzer® installation program will then display the *Select Additional Tasks* screen.

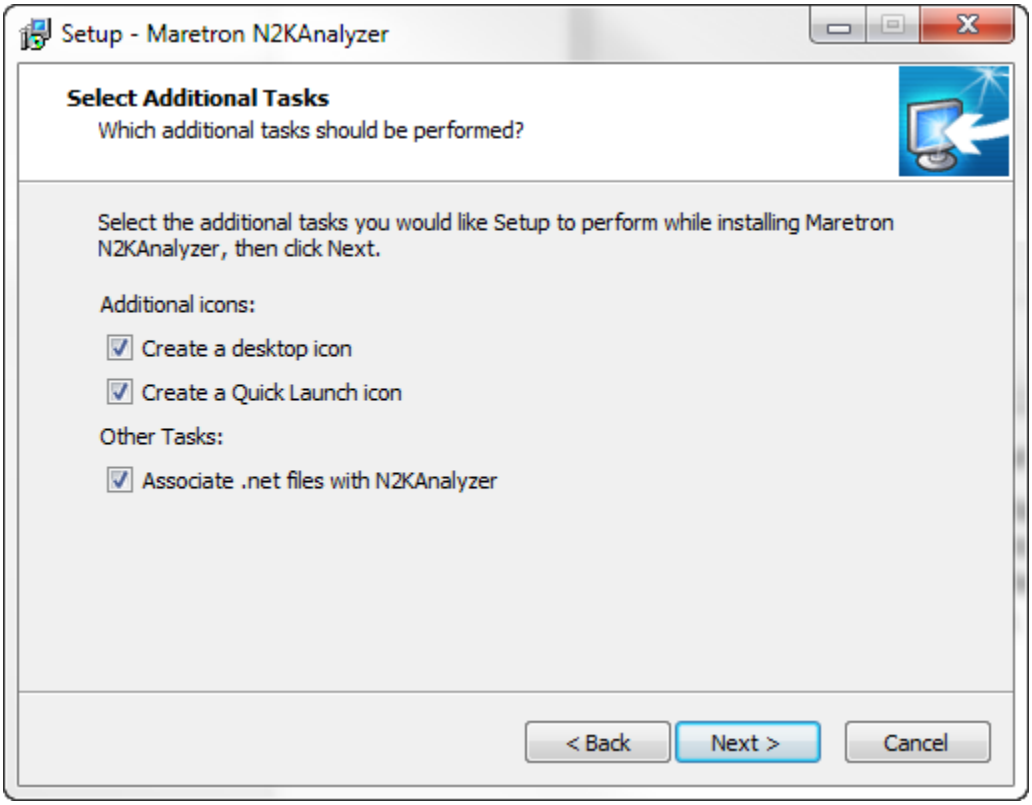


Figure 4 – Select Additional Tasks Screen

This screen will allow you to choose optional tasks for the N2KAnalyzer® Installation program to perform while it is installing the software. You may optionally select the creation of a desktop icon or a quick launch icon to start the N2KAnalyzer® software in addition to the standard start menu launch item. Also, you may choose to associate files with the ".net" extension with N2KAnalyzer® so that you may open the files in N2KAnalyzer® by clicking on them in Windows. Once you have made your selections by clicking on the appropriate checkboxes, click the *Next* button to continue to the next screen.

The N2KAnalyzer® Installation software will then display the *Ready to Install* screen.

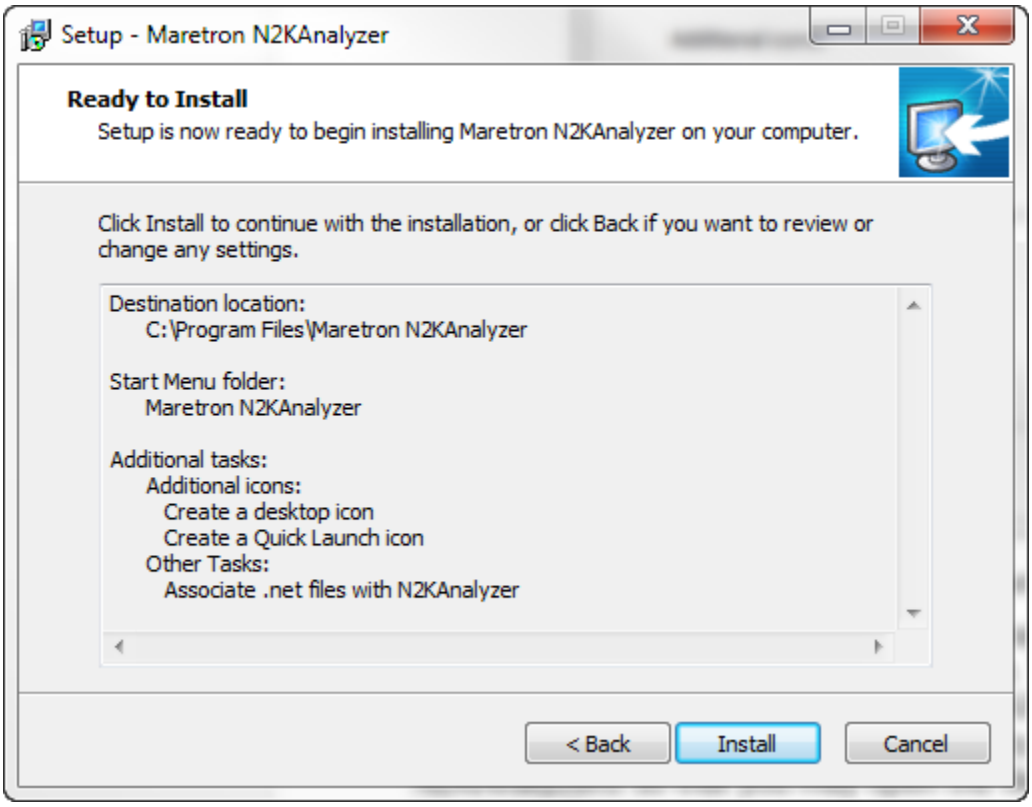


Figure 5 – Ready to Install Screen

This screen displays a summary of the options you have chosen up to this point in the installation process. If you wish to change any options at this time, click the *Back* button which will take you back to previous screens in the installation process, where you may make the desired changes. Once you are satisfied with the installation options you have chosen, click the *Install* button to begin copying the program files to the final locations.

The N2KAnalyzer® Installation software will display the *Installing* screen to show the status of the installation.

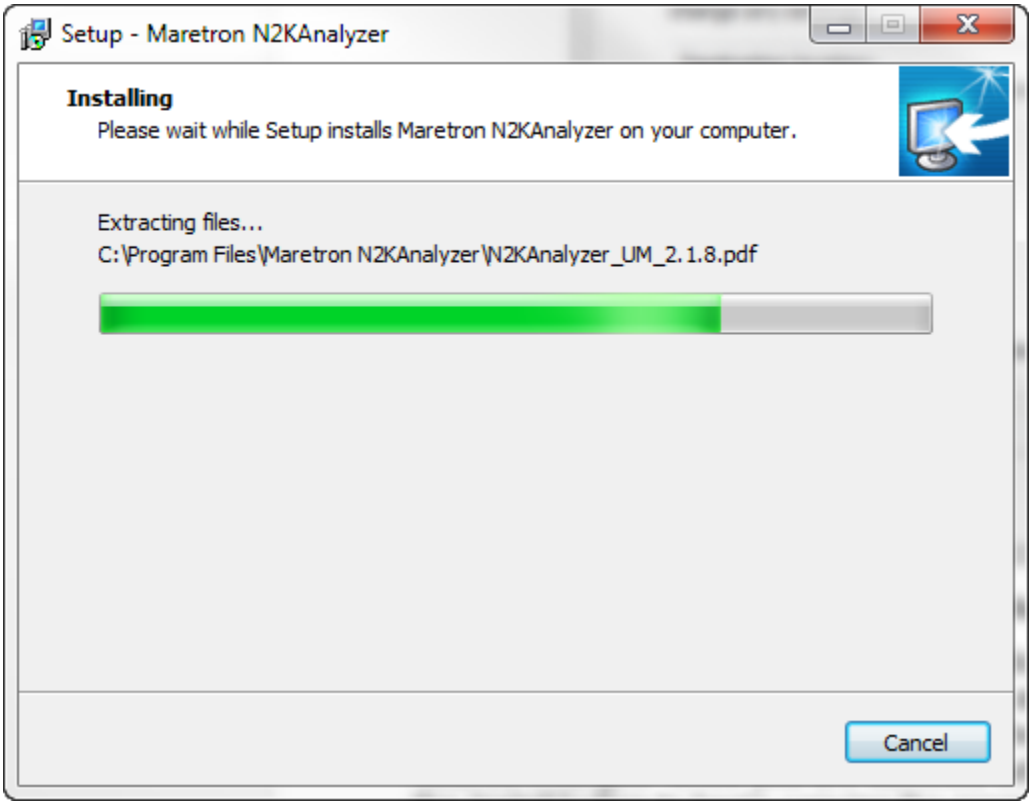


Figure 6 – Installing Screen

Once the installation of the software is finished, the N2KAnalyzer® Installation program will display the *Completing the N2KAnalyzer Setup Wizard* screen.

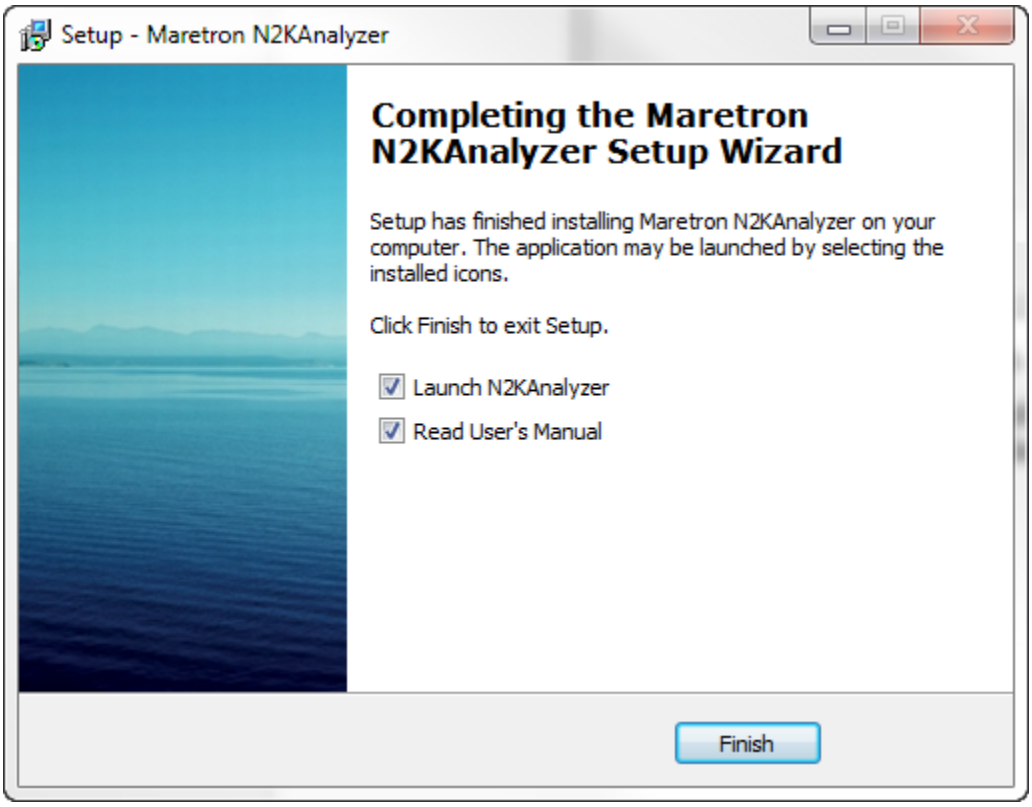


Figure 7 – Completing the Maretron N2KAnalyzer® Setup Wizard Screen

This screen gives you the option to launch the N2KAnalyzer® software. Click the *Launch N2KAnalyzer®* checkbox if you wish to start the N2KAnalyzer® software after the installation process is complete.

This screen also gives you the option to read the *N2KAnalyzer® User's Manual*. Click the *Read User's Manual* checkbox if you wish to open the *N2KAnalyzer® User's Manual* after the software installation process is complete.

Finally, click the *Finish* button to complete the software installation process. The N2KAnalyzer® software is now ready to use.

4 Tutorial

4.1 Starting the software

You may start the N2KAnalyzer® software in one of four ways:

- Selecting the *All Programs→Maretron N2KAnalyzer* menu item from the Start Menu
- Clicking the quick launch icon, if you requested one to be created during installation,
- Clicking the desktop icon, if you requested one to be created during installation, or
- Double-clicking on a saved boat (.NET) file.

4.2 Connecting to a NMEA 2000 Network

WARNING

N2KAnalyzer® requires the use of a Maretron IPG100 or USB100 gateway. NMEA 2000® gateways from other manufacturers are not compatible with N2KAnalyzer®.

When you start the N2KAnalyzer® software, the software will look for a NMEA 2000 gateway. If it finds a single gateway, or if the gateway you used previously is available, the N2KAnalyzer® software will ask you if you wish to connect to the NMEA 2000 network using that gateway.

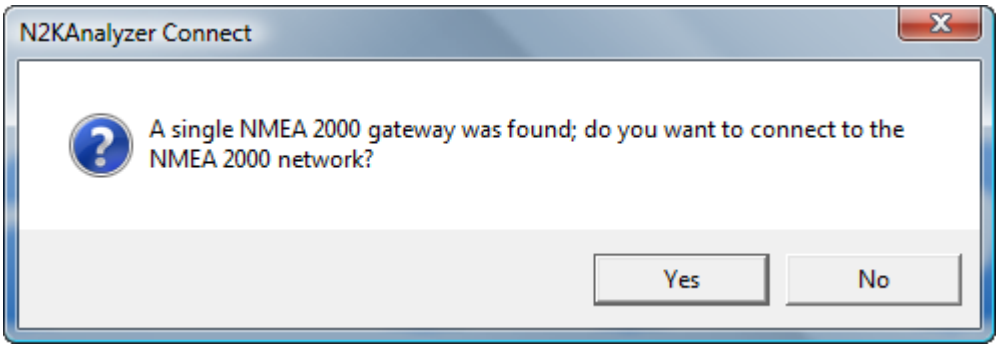


Figure 8 – N2KAnalyzer® Connect Screen

If no connected gateways are detected on the computer, you are given the option to connect a gateway and retry the gateway detection process by clicking the *OK* button, or you may continue the program without going online (for example, to examine a previously saved boat file) by clicking the *Cancel* button.

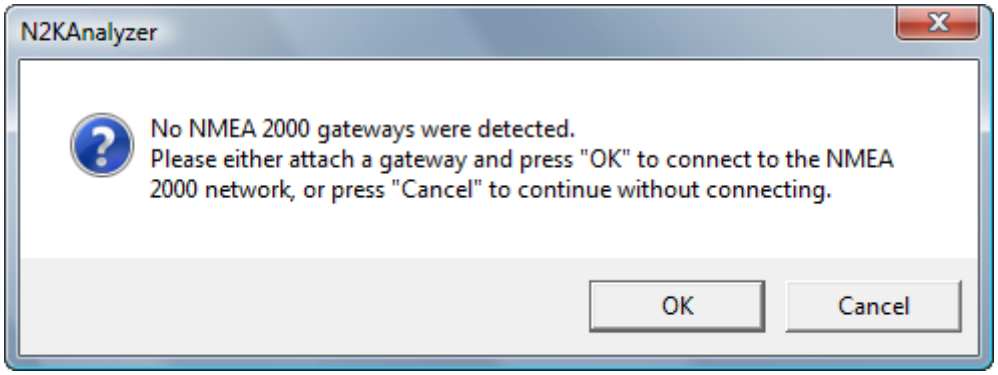


Figure 9 – Screen Displayed When No Gateways are Detected

If you choose to connect a gateway, then after you connect the gateway and press the *OK* button, you are presented with the *Configure Gateway* dialog box in order to confirm your gateway selection.

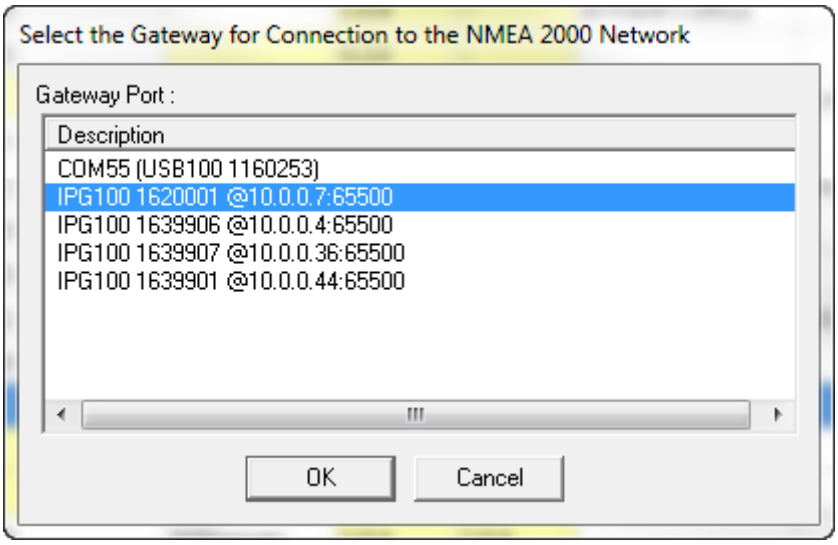


Figure 10 – Gateway Configuration Screen

Click on the desired gateway to select it, and then click on the *OK* button to confirm your selection and enter online mode.

4.3 Viewing Device Information

Once the N2KAnalyzer® software has connected to the N2K network, or if the N2KAnalyzer® software is operating disconnected from the N2K network with a loaded boat file, then the device list window is filled with information about the NMEA 2000 devices on the bus.

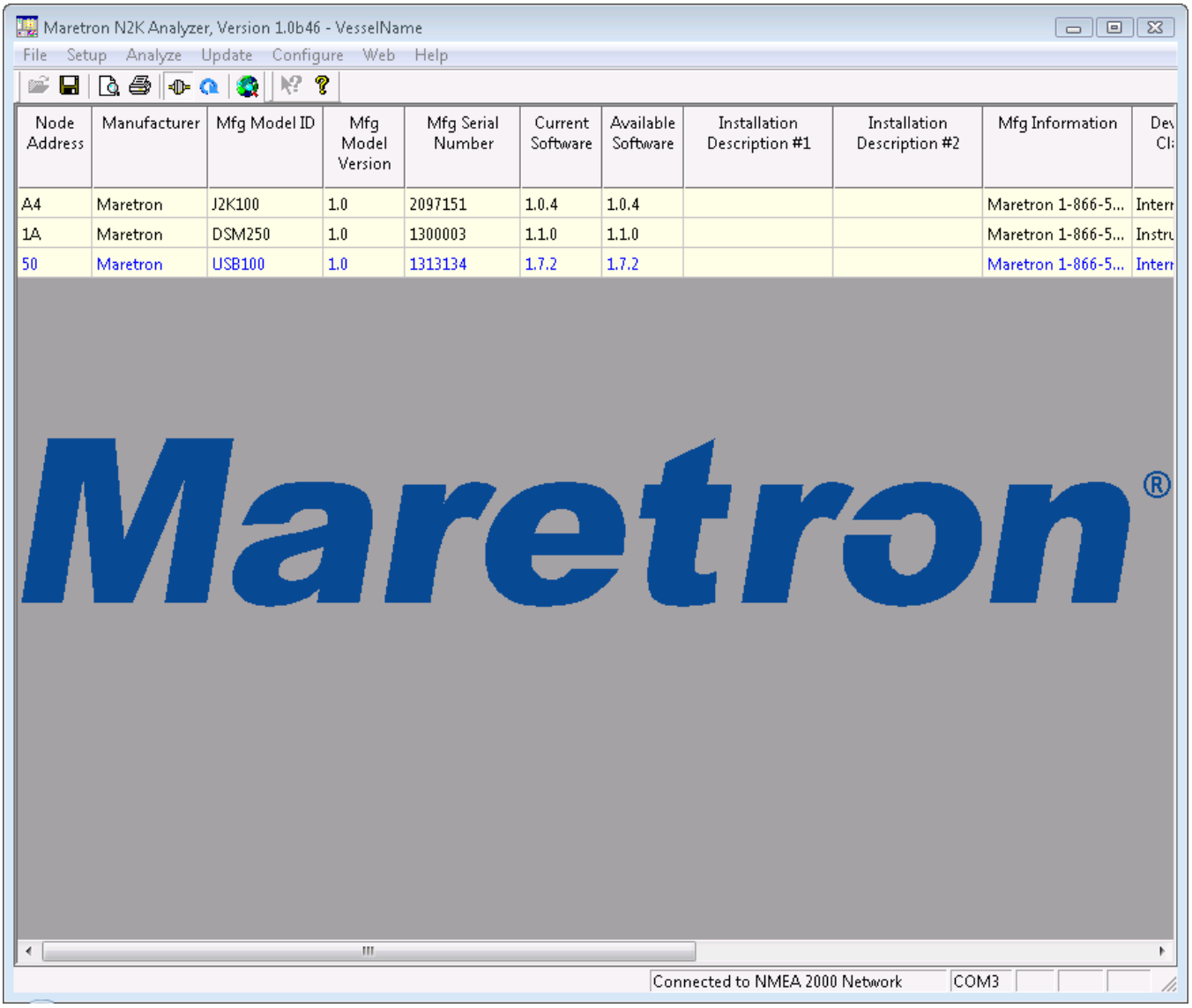


Figure 11 – Main Program Window

4.4 Boat Files

N2KAnalyzer® has the capability to store the state of a network and all of its devices to an external file, and also to load the state of a network and all of its devices from an external file. These files are called "boat files", and are usually named with the name of the vessel followed by a ".net" extension. If you are on a vessel with some NMEA 2000-related issue, you can start N2KAnalyzer® and save a boat file, which you can then e-mail or otherwise transfer to someone at a remote location for analysis.

4.4.1 Loading a Boat File

While working disconnected from the NMEA 2000 bus, you may load a boat file that was saved previously and examine its contents using the N2KAnalyzer® software. Selecting the

File→Open… menu option or clicking on the *Open File* toolbar button will cause the following dialog screen to be displayed.

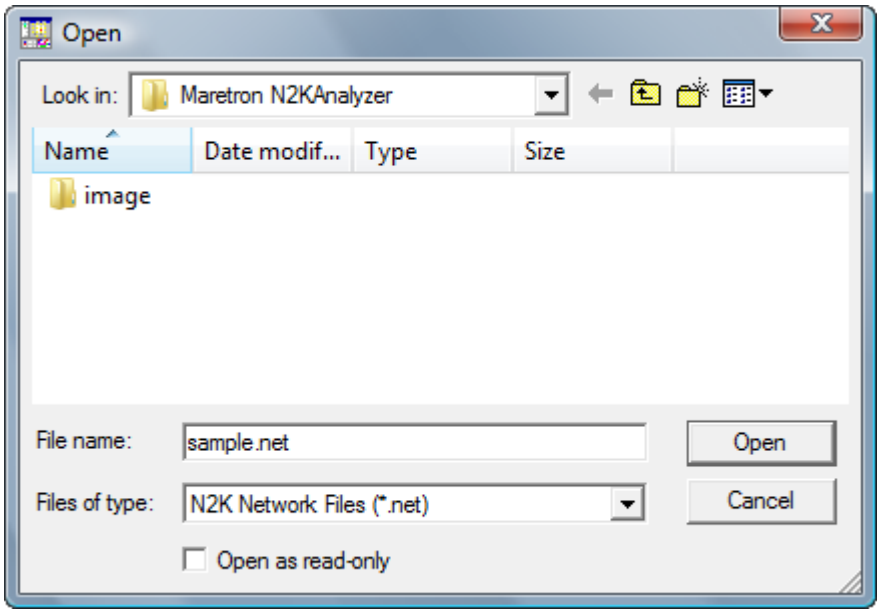


Figure 12 – Boat File Open Dialog Box

Browse to the boat file you wish to load or type in the name of a boat file you wish to load and then click the *Open* button to cause the boat file to be loaded.

4.4.2 Saving a Boat File

While connected to a NMEA 2000 bus, you may wish to save information about the network so that you or someone else can analyze it later using the N2KAnalyzer® software. Selecting the *File→Save As…* menu item will cause the *File Save* dialog box to be displayed and will cause all currently available network information to be saved to a boat file.

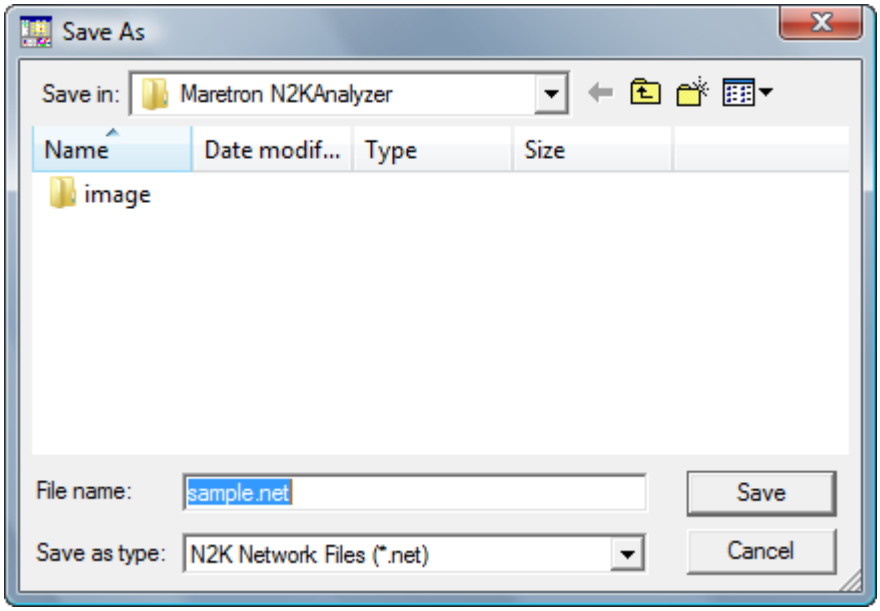


Figure 13 – Boat File Save Dialog Box

Browse to the directory in which you wish to save the boat file, and then type the desired filename under which to save the boat file. Finally, click the *Save* button to save the file to the hard drive.

If you are saving device configuration information in the boat file, it make take several minutes to write the boat file, as N2KAnalyzer will read device configuration information from every configurable device on the network.

4.5 Updating Software on a Device

If the N2KAnalyzer® software has a version of software for a device that is newer than the version currently on the device, then the version number in the *Current Software* column of the device list window will be highlighted in red. You can update the software on the device to the latest available version in one of two ways:

Select the device in the device list window by clicking on it, and then select the *Update→Selected Device's Software…* menu item, or

Select the device in the device list window by clicking on it, and then right-click on the device and select the *Update Selected Device's Software* menu item from the pop-up context menu that appears.

Once the update process starts, the N2KAnalyzer® software will display a window describing the status of the device software update process.

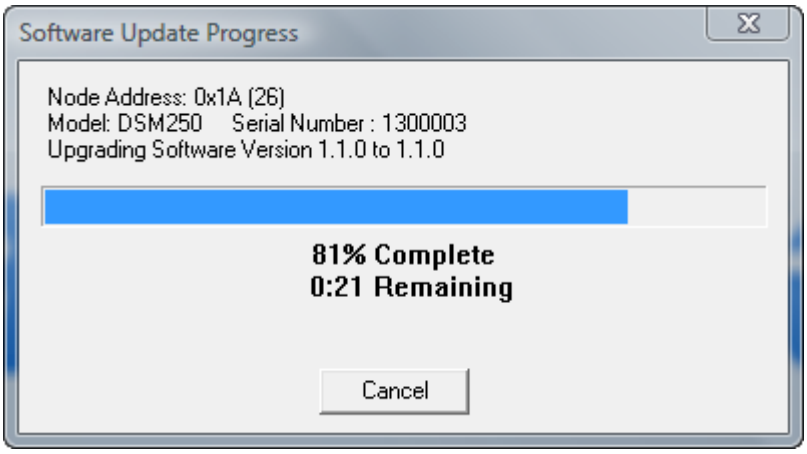


Figure 14 – Firmware Update Progress Window

Once the firmware update process has completed, the N2KAnalyzer® software will then display another window summarizing the results of the firmware update process.

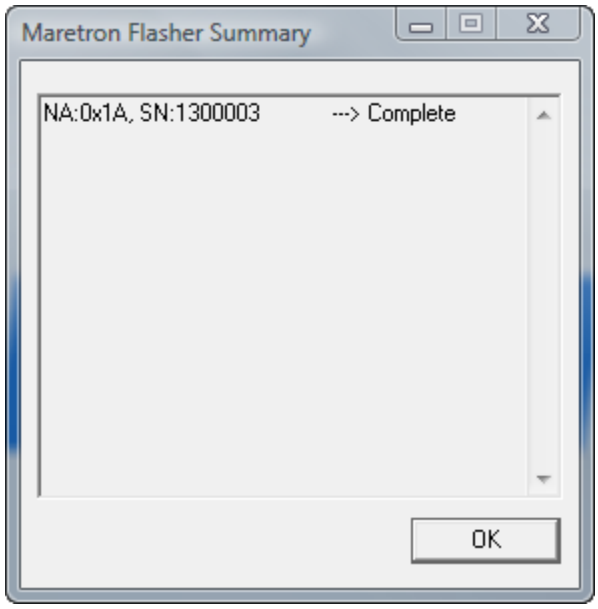


Figure 15 – Firmware Update Summary Window

4.6 Viewing Device Properties

In order to view more information about a device than is displayed in the device list window, select the device in the device list window and then either select the *Analyze→Device Properties* menu item or right-click on the highlighted device and select *Device Properties* from the pop-up context menu that appears as a result.

The Device Properties window has three tabs: General, Transmit PGN List, and Received PGN List. The General tab is shown in the figure below.

Figure 16 – Device Properties Window: General Tab

The General tab displays the following information:

- **Node Address** – Each device on an NMEA 2000 network claims a node address between the value of 0 (0x0 hexadecimal) and 251 (0xFB hexadecimal). These node addresses may change as new devices are added to the network. This column shows the node addresses claimed by the device.
- **Mfg Model ID** – This shows the Device Model (sometimes known as Model ID, Model Number, or Model Name) reported by the device.
- **Mfg Serial Number** – This shows the serial number reported by the device.
- **Mfg Model Version** – This shows the hardware version number reported by the device.
- **Current Software** – This shows the firmware version number reported by the device.
- **Current Boot** – This shows the boot loader version number reported by the device (for Maretron devices only)
- **Manufacturer** – This column shows the manufacturer reported by each device. The manufacturer's names are read from a table in the N2KAnalyzer® software which translates the manufacturer's code reported by the device. If a new NMEA 2000

manufacturer has been added since the N2KAnalyzer® software was release, this will show up as a numeric value. If this happens, please either
    - Update your N2KAnalyzer® software, or
    - Check the NMEA website for the current list of manufacturer codes.
- **Industry Group** – This shows the industry group reported by the device. Maretron products are in the Marine industry group. Device Class and Device Function definitions depend on the value on this field.
- **Device Class** – This shows the NMEA 2000 device class as reported by the device.
- **Device Function** – This shows the NMEA 2000 device function (this is a more-specific indication of the device function within the context of the device class) reported by the device.
- **Unique Number** – This shows a number for the specific device. The combination of this number, the Device Class, and the Device Function are guaranteed to be unique.
- **Device Instance** – This shows the electronic control instance number. This is used by some receiving devices to distinguish one set of data from another.
- **System Instance** – This shows the system instance number. This is used by some receiving devices to distinguish one group of devices of data from another.
- **Mfg Product** Code – This shows the NMEA 2000 product code for the device. This number uniquely identifies the manufacturer and model of the device.
- **N2K Database Version** – This shows the version of the NMEA 2000 database that is supported by this device.
- **N2K Certification Level** – This shows the certification level of this device. Current certification levels are “A” and “B”.
- **LEN** (**Load Equivalency Number**) – This shows the number of loads that this device presents to the network. This can be used for power supply and cable sizing. Each load represents 50 mA of current consumption.

The Transmit PGN List shows a list of the messages that this device can transmit. This function is required for devices with Certification Level “A”. Devices with Certification Level “B” may not provide this information.

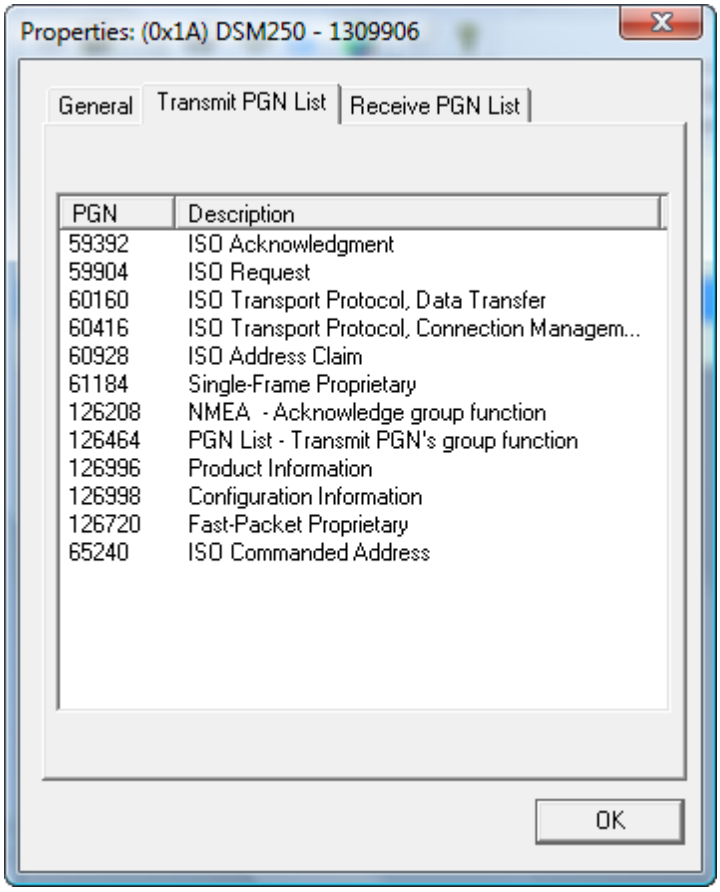


Figure 17 – Device Properties Window: Transmit PGN List Tab

The Receive PGN List shows a list of the messages that this device is capable of recognizing. This does not indicate the message that the device is receiving at the current time. This function is required for devices with Certification Level "A". Devices with Certification Level "B" may not provide this information.

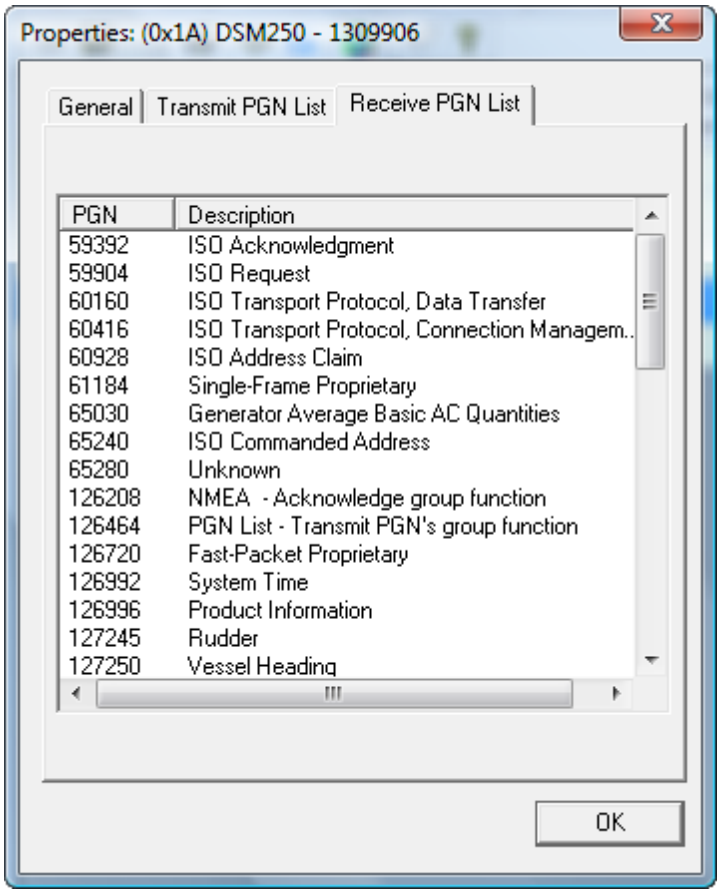


Figure 18 – Device Properties Window: Received PGN List Tab

4.7 Configuring Devices

N2KAnalyzer® allows you to configure information common to all devices directly in the device list, much as you would edit a spreadsheet. Items in the device list which you can change have a white background.

For more detailed configuration of most devices, you may configure devices using the configuration dialogs that are built into N2KAnalyzer. To do this, select the device in the device list so that it becomes highlighted, then select the *Configure→Configure Device* menu entry. Alternatively, you may select the device in the device list, then right click on the device, and select *Configure Device* from the popup menu that appears.

4.7.1 Common Controls

4.7.2 Device Configuration Files

You can save the configuration of a particular individual device to a file on your hard drive. You can later load this configuration into another device of the same type. This is convenient for loading configuration of tank monitors (TLA100, TLM100, TLM150, or TLM200, or FPM100 in tank mode) when you have multiple tanks that have the same profile. You can also use this if

you are building a series of similar boats which have common configurations. You can save the configurations of the devices on the first boat being built, and then load these configurations directly into the corresponding devices on new boats, cutting the time it takes to configure these devices and reducing the chance of making configuration errors.

4.7.2.1 Device Configuration Dialog Conventions

When you first open a device configuration dialog, it contains the current configuration of the device (if online) or the configuration of the device as it was saved in a device configuration file or boat file (if offline). Any fields in the device configuration dialog that differ from the configuration currently stored in the device itself are in RED text.

4.7.3 Common Configuration Screen Buttons

The following buttons appear at the bottom of every device configuration screen,

4.7.3.1 Load Config From File…

You can load the configuration dialogs with a stored device configuration by clicking this button. After you click this button, a file selection window opens, allowing you to choose a device configuration file. When you click *OK*, the configuration stored in the device configuration file will be loaded into the device configuration window. You must click *Put Config to Device* in order to store the configuration to the device itself.

4.7.3.2 Save Config To File…

When you click this button, N2KAnalyzer will store the configuration information currently in the device configuration window to a file. After this button is clicked, a file selection dialog will open, allowing you to choose a file name in which to save the configuration window contents. NOTE: if you want to be sure to store the device configuration to a file, make sure you haven't changed any configuration items between opening the configuration window (or clicking on *Get Config From Device*) and clicking *Save Config To File…*".

4.7.3.3 Get Config From Device

When you click this button, N2KAnalyzer gets the device configuration information from the device and refreshes the configuration window to match the device configuration.

4.7.3.4 Put Config To Device

When you click this button, the device configuration information currently appearing in the device configuration window is stored into the device, where it will be retained over power-up cycles.

4.7.3.5 Restore Factory Defaults

When you click this button, the device will be restored to the same state it was in when it was shipped from the factory. All configuration information and user calibration information are restored to the factory default state.

4.7.3.6 Close

When you click this button, the device configuration window will be closed. If you have made any changes to the data in the device configuration window and

4.7.4 ACM100

4.7.4.1 General Tab

This tab contains commonly-used configuration items.

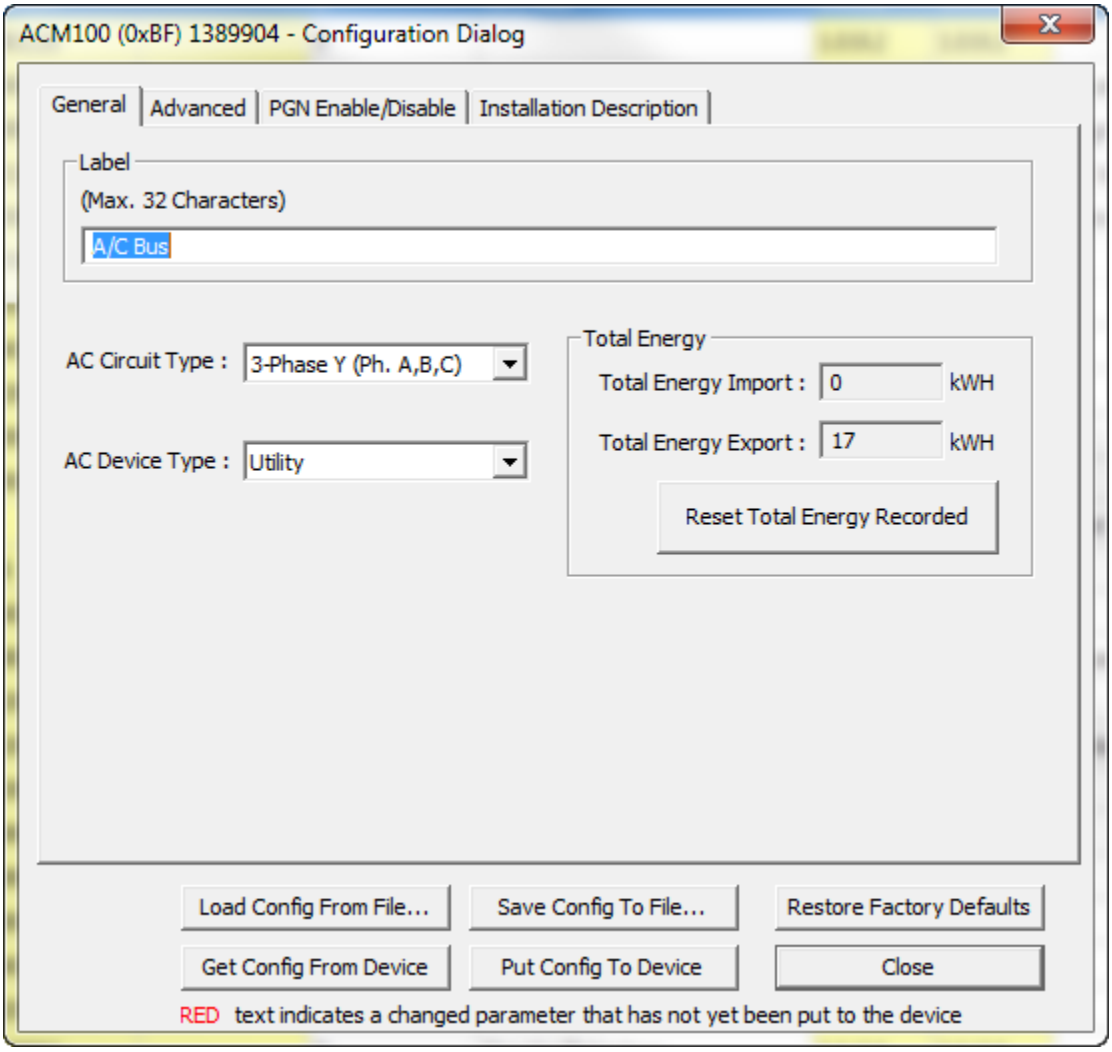


Figure 19 – ACM100 General Tab

4.7.4.1.1 Label

This text box allows you to assign a text label to the device. This label is visible in Maretron analysis and display products and allows you to easily identify the particular device.

4.7.4.1.2 AC Circuit Type

You must configure the ACM100 as to what type of AC circuit connection it is monitoring. The allowable values for this parameter are as follows:

- Single-Phase (Ph. A) – use this value when power is connected via a single hot wire and a single neutral wire (a typical 110VAC connection in the US).
- Single-Phase (Ph. A, B) – use this value when power is connected via the two hot wires and single neutral wire from a single phase of a transformer (a typical 220VAC connection in the US).
- Three-Phase (Ph. A, B, C) – use this value when power is connected via the three hot wires and single neutral wire from a three-phase "Wye" connected circuit.

4.7.4.1.3 AC Device Type

You must configure the ACM100 as to what type of AC source it is monitoring. The allowable values for this parameter are as follows:

- "Generator" (default) – use this value when you are monitoring the output of a genset.
- "Utility" – use this value when you are monitoring shore power
- "Bus" – use this value if you are monitoring power flowing across a cable that is not located directly at the output of a genset or a shore power connection (e.g., an AC selection switch might have as an input the shore power and another input from the genset, connecting the ACM100 at the output of the AC selection switch would require the ACM100 to be configured as "Bus".

4.7.4.1.4 Reset Total Energy Recorded

The ACM100 accumulates the total energy imported from a Utility and exported from a generator. Select this option to zero the total energy accumulated readings in the ACM100.

4.7.4.1.5 Total Energy Import

This field shows the total energy imported to the utility since the totals were last reset.

4.7.4.1.6 Total Energy Export

This field shows the total energy exported from the generator since the totals were last reset.

4.7.4.2 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

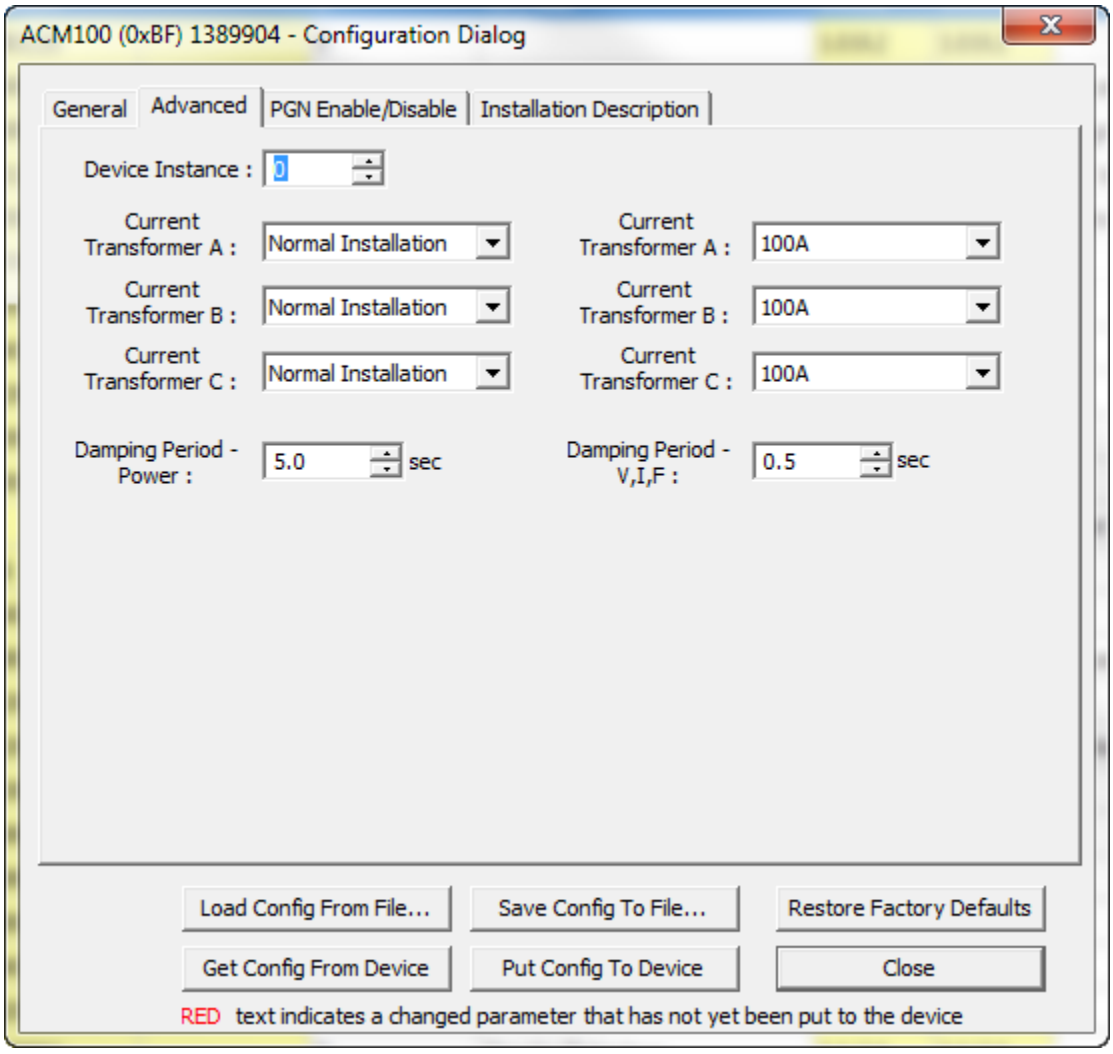


Figure 20 – ACM100 Advanced Tab

4.7.4.2.1 Device Instance

The device comes from the factory with the device instance value set to 0. If you have multiple of these devices on a network, you may find it necessary to set the device instances of other devices of this type so that they are different.

4.7.4.2.2 Current Transformer A

Installation: If you install the current transformer backwards from the recommended orientation, you can adjust for it by changing the value of this field from “Normal Install” to “Reverse Install”

Range: The ACM100 is usually used with 100A current sensors. If you are using an optional 400A current sensor, change the value of this field from the default value of “100A” to “400A”.

4.7.4.2.3 Current Transformer B

Installation: If you install the current transformer backwards from the recommended orientation, you can adjust for it by changing the value of this field from "Normal Install" to "Reverse Install"

Range: The ACM100 is usually used with 100A current sensors. If you are using an optional 400A current sensor, change the value of this field from the default value of "100A" to "200A".

4.7.4.2.4 Current Transformer C

Installation: If you install the current transformer backwards from the recommended orientation, you can adjust for it by changing the value of this field from "Normal Install" to "Reverse Install"

Range: The ACM100 is usually used with 100A current sensors. If you are using an optional 400A current sensor, change the value of this field from the default value of "100A" to "400A".

4.7.4.2.5 Damping Period – Power

If you feel that the monitored Power parameters are changing too quickly or too slowly on the display, you can adjust the damping that is applied to the output readings by adjusting this parameter. The default damping period is 5 seconds. You may change it to a value in the range of 0.2 seconds to 10 seconds.

4.7.4.2.6 Damping Period – V,I,F

If you feel that the monitored Voltage, Current, and Frequency parameters are changing too quickly or too slowly on the display, you can adjust the damping that is applied to the output readings by adjusting this parameter. The default damping period is 0.5 seconds. You may change it to a value in the range of 0.2 seconds to 10 seconds.

4.7.4.3 PGN Enable/Disable Tab

This tab allows you to enable or disable the transmission of the periodic messages output by the device. You may enable or disable the transmission of the messages, or may program the time interval between transmissions of a specific message, for devices which support the programming of time intervals.

When you first open the PGN Enable/Disable tab, a list of periodic PGN's transmitted by the device will appear. The mode column will read "On", if the device is currently transmitting the message, or "Off", if the message has not yet been detected from the device.

You may configure each periodic message with one of the following choices:

1) "Disable" – this will turn off the periodic transmission of this message
2) "Default" – this will turn on the periodic transmission of this message at the default rate
3) A numeric value that will turn on the periodic transmission of this message at the specified rate

Please note that for the ACM100, the contents of the PGN Enable/Disable tab will depend on the “AC Device Type” selected in the General tab.

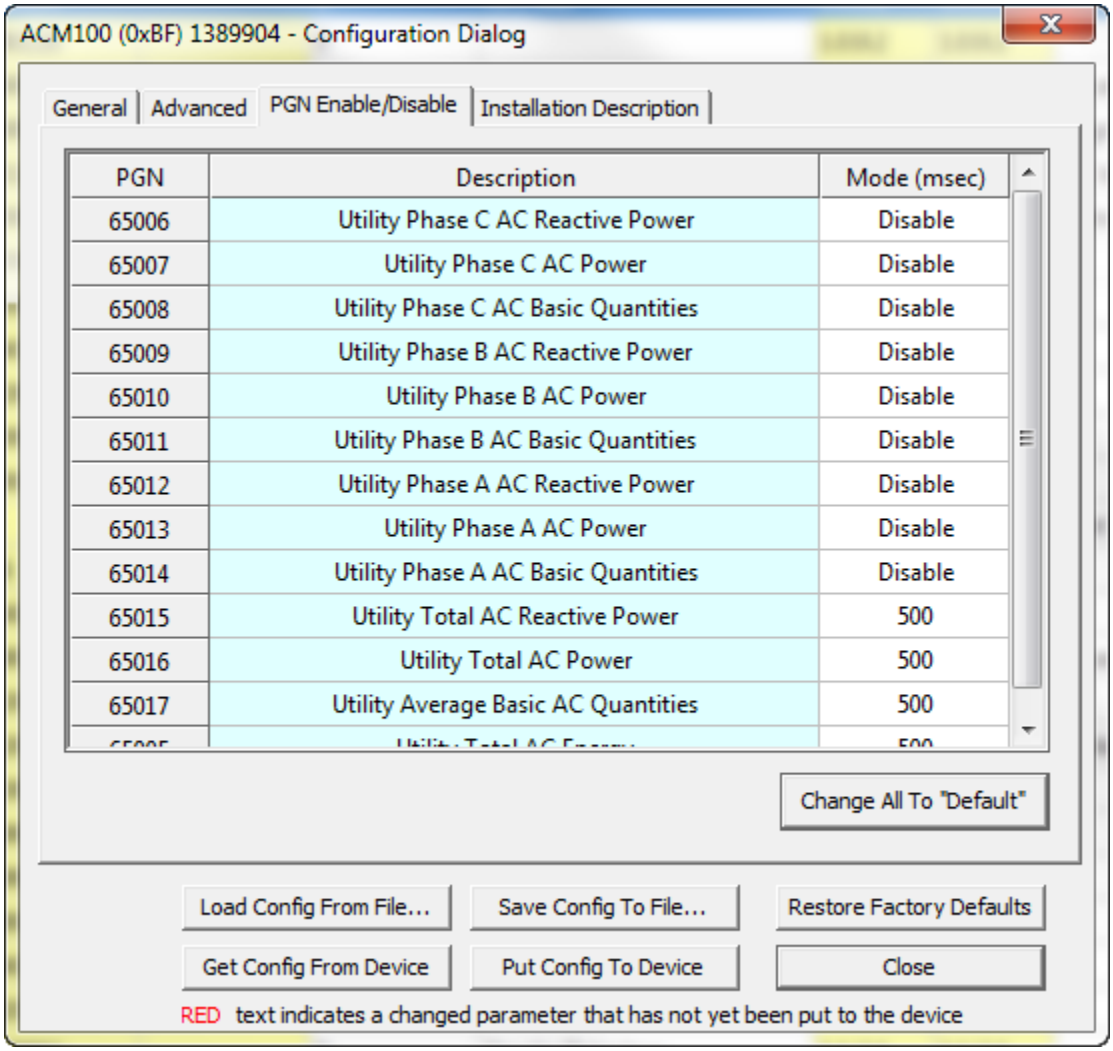


Figure 21 – ACM100 PGN Enable/Disable Tab

4.7.4.4 Installation Description Tab

This tab allows you to set values for the installation description properties of the device.

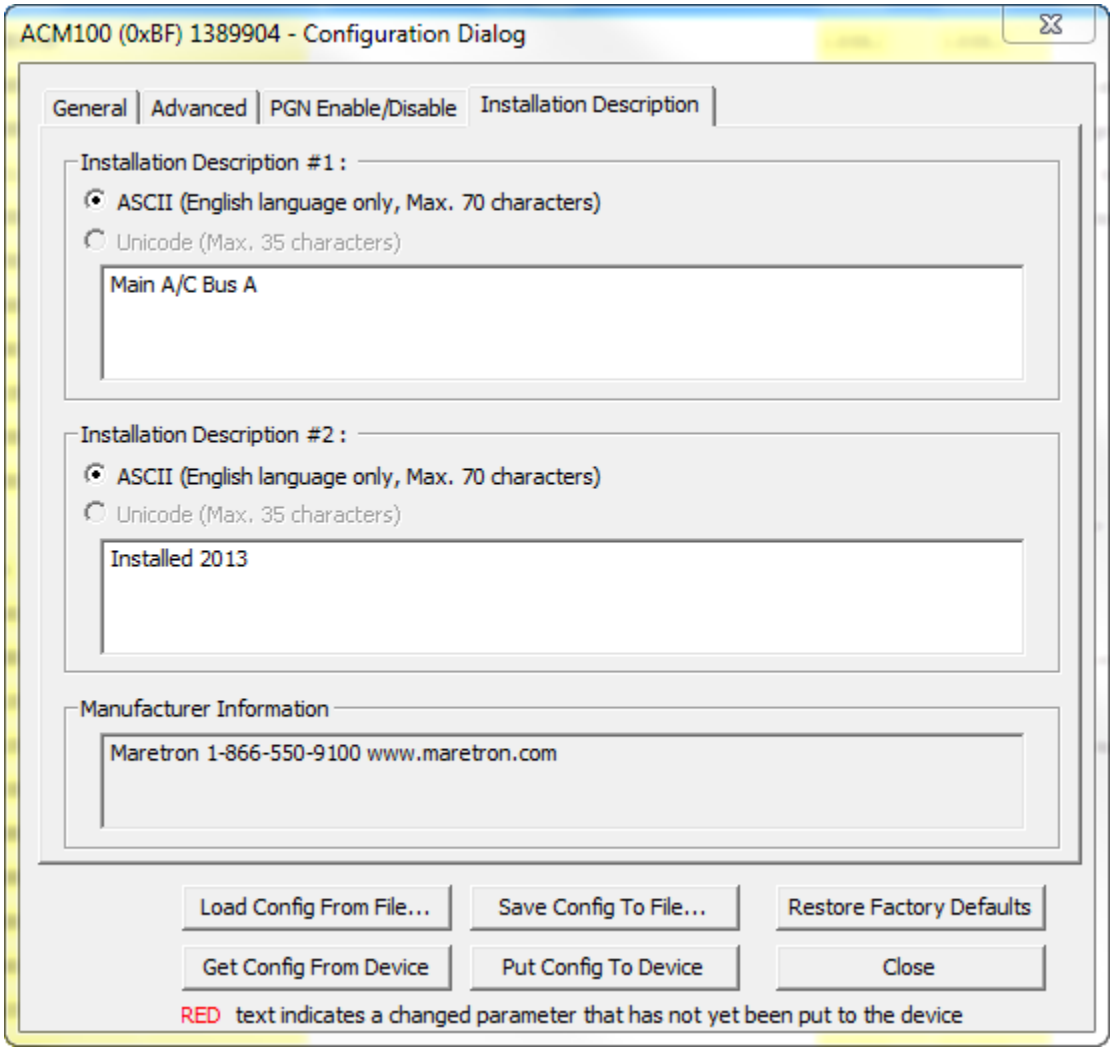


Figure 22 – ACM100 Installation Description Tab

4.7.4.4.1 Installation Description #1, #2

This device, along with all other Level A certified NMEA devices, has two user-programmable installation description fields. You may program these fields with information specific to the device, such as date installed, the initials/name of the installer, the physical location of the device, etc. This configuration option will allow you to program the values of these fields.

4.7.5 ALM100

4.7.5.1 General Tab

This tab contains commonly-used configuration items.

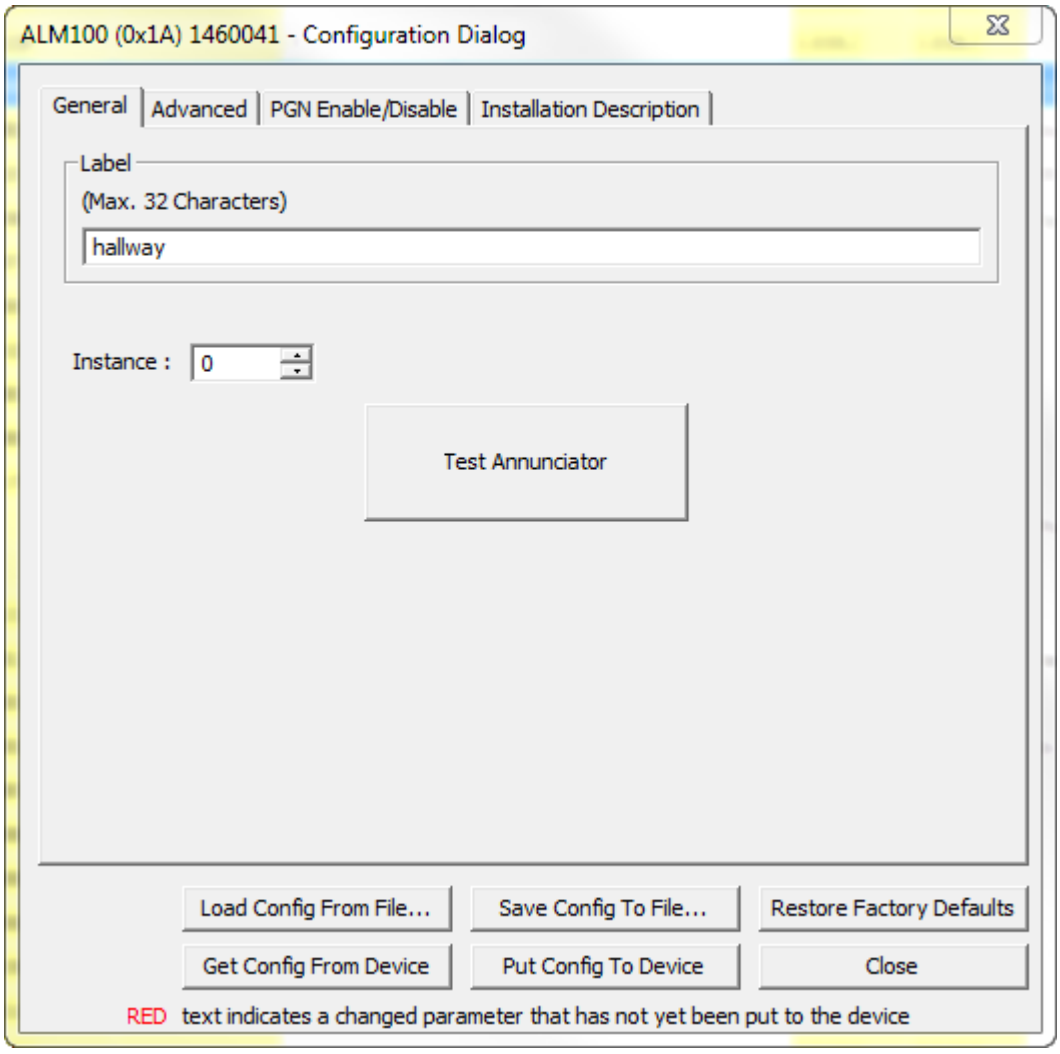


Figure 23 – ALM100 General Tab

4.7.5.1.1 Label

This text box allows you to assign a text label to the device. This label is visible in Maretron analysis and display products and allows you to easily identify the particular device.

4.7.5.1.2 Instance

NMEA 2000® provides for a unique annunciator instance for each alarm device on a vessel. This field allows a display device such as Maretron N2KView or a DSM250 to select different annunciators for sounding alarms for different alert types. For instance, an alert specific to engine operation may only sound in the engine room, pilot house, and crew quarters, while a general alarm would sound throughout the ship. This value should be programmed in each ALM100 so that each ALM100 is associated with a unique instance number. The default instance number is 0, which is used to indicate the first ALM100 that is hooked to the network. Subsequent ALM100s connected to the network would be numbered 1, 2, and so on.

4.7.5.1.3 Test Annunciator

Devices capable of configuring the ALM100 also have the ability to cause the ALM100 to generate an alarm indication, flashing the red alarm LED and sounding the annunciator. You may use this function to determine whether the ALM100 is properly connected and configured. When you select this option, the red alarm LED and annunciator will be activated for a short period of time.

4.7.5.2 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

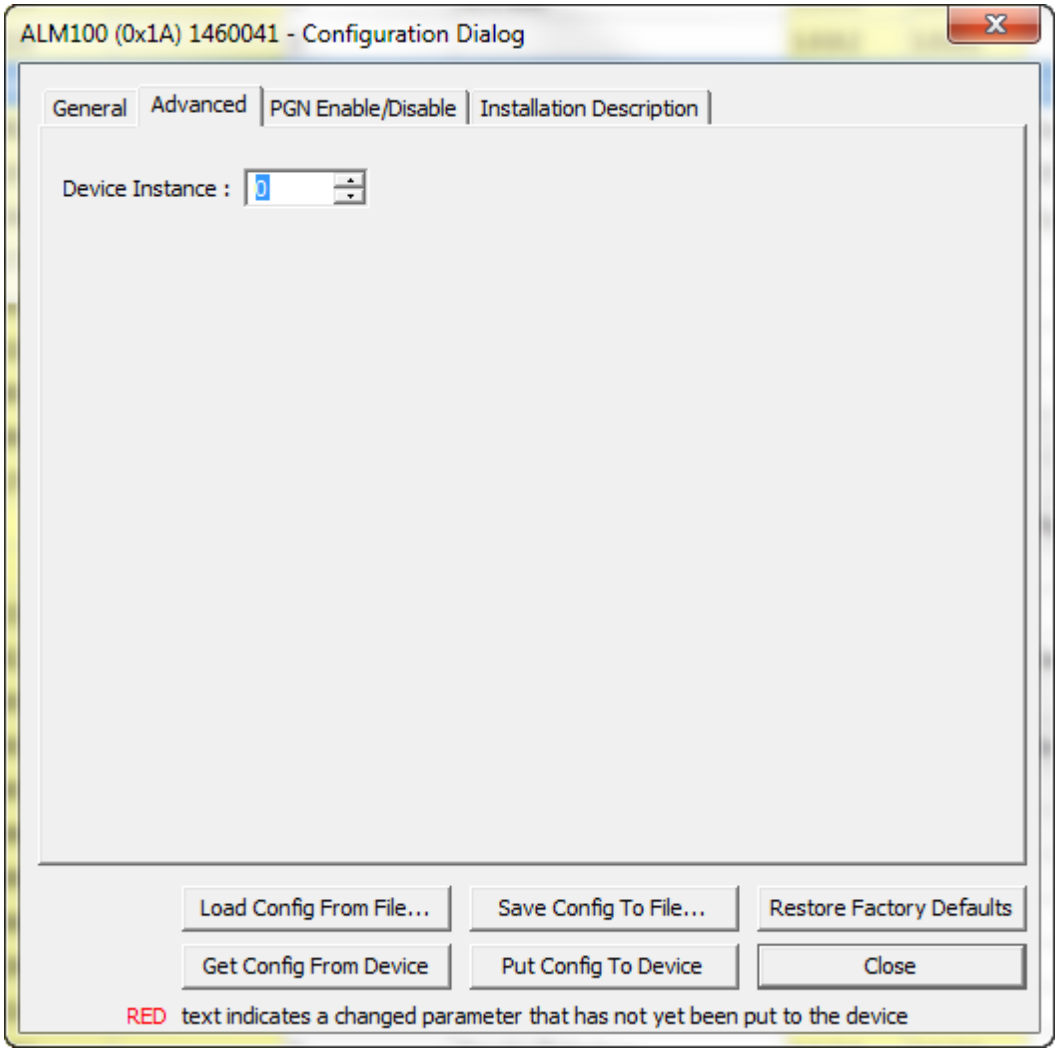


Figure 24 – ALM100 Advanced Tab

4.7.5.2.1 Device Instance

The device comes from the factory with the device instance value set to 0. If you have multiple of these devices on a network, you may find it necessary to set the device instances of other devices of this type so that they are different.

4.7.5.3 PGN Enable/Disable Tab

This tab allows you to enable or disable the transmission of the periodic messages output by the device. You may enable or disable the transmission of the messages, or may program the time interval between transmissions of a specific message, for devices which support the programming of time intervals.

When you first open the PGN Enable/Disable tab, a list of periodic PGN's transmitted by the device will appear. The mode column will read "On", if the device is currently transmitting the message, or "Off", if the message has not yet been detected from the device.

You may configure each periodic message with one of the following choices:

1) Disable – this will turn off the periodic transmission of this message
2) Default – this will turn on the periodic transmission of this message at the default rate
3) A numeric value that will turn on the periodic transmission of this message at the specified rate

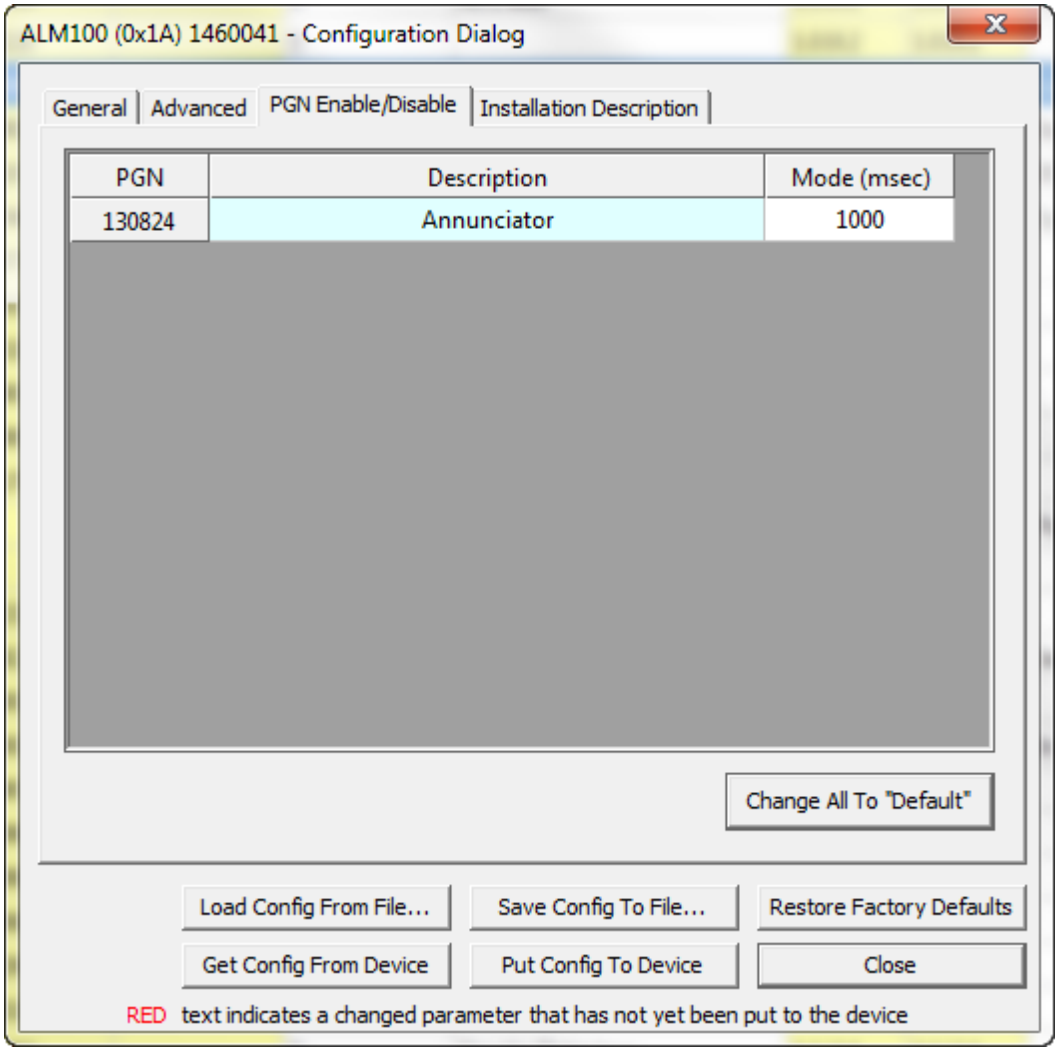


Figure 25 – ALM100 Advanced Tab

4.7.5.4 Installation Description Tab

This tab allows you to set values for the installation description properties of the device.

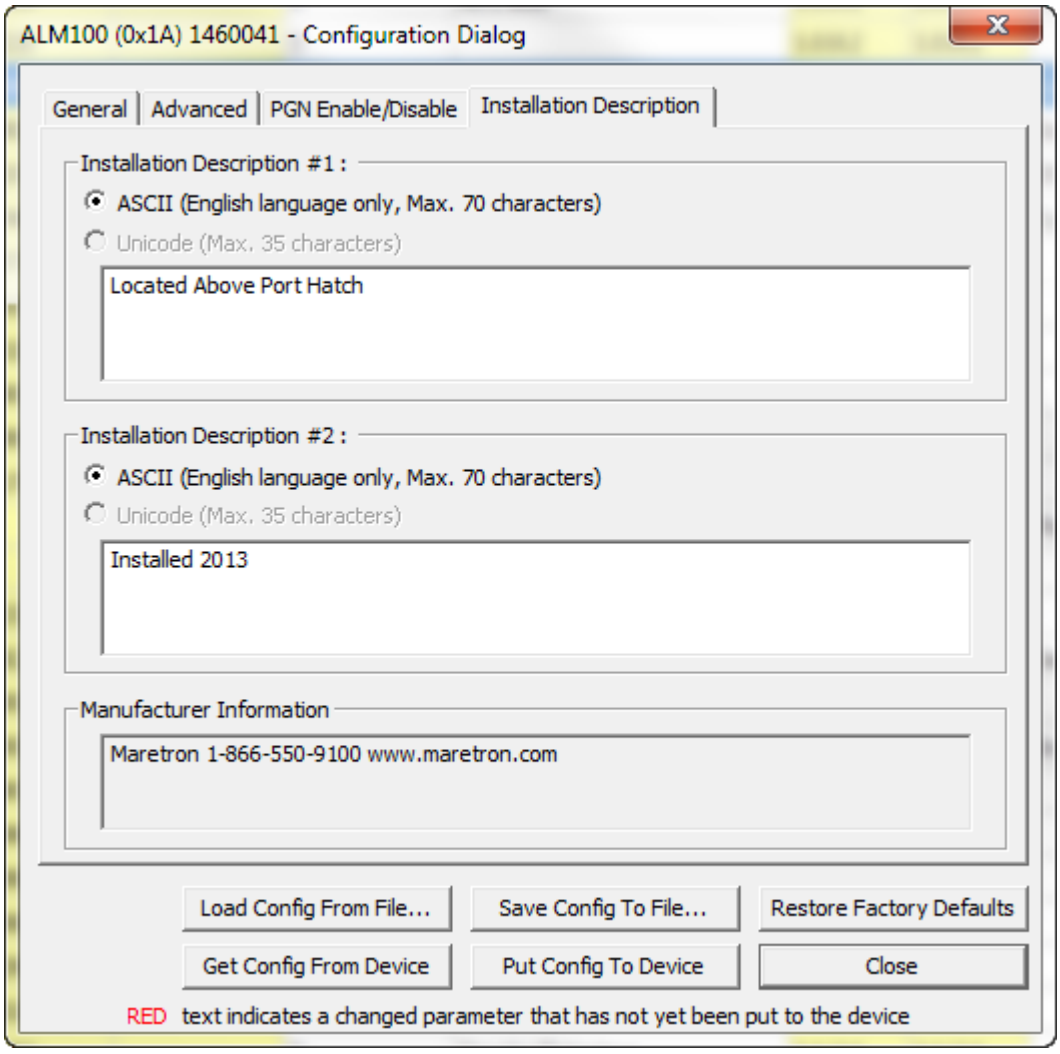


Figure 26 – ALM100 Installation Description Tab

4.7.5.4.1 Installation Description #1, #2

This device, along with all other Level A certified NMEA 2000® devices, has two user-programmable installation description fields. You may program these fields with information specific to the device, such as date installed, the initials/name of the installer, the physical location of the device, etc. This configuration option will allow you to program the values of these fields.

4.7.6 CLM100

4.7.6.1 General Tab

This tab contains commonly-used configuration items.

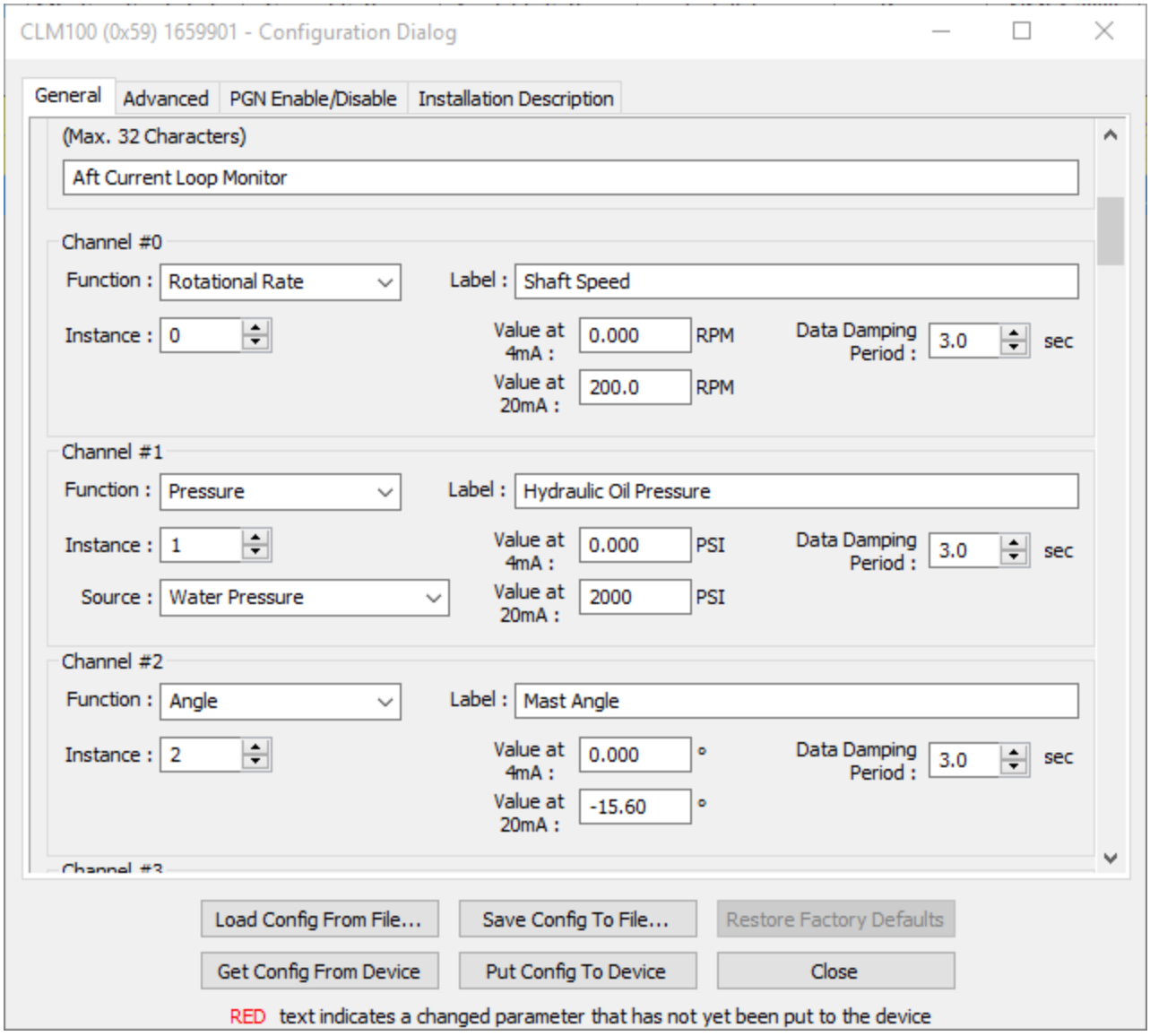


Figure 27 – CLM100 General Tab

4.7.6.1.1 Label

A label may be assigned to each channel of the CLM100 as an aid to identifying the parameter that is being displayed. Typically this label will describe the function or location of the sensor.

4.7.6.1.2 Function

The CLM100 can support 4-20mA current loop transducers of many different types. This field allows you to select the type of parameter that is being monitored by this channel. You may select from the following parameter types (please refer to the *CLM100 User's Manual* for information on the available units, ranges, and resolutions for each function.

- dB (decibels)

- DC Voltage
- DC Current
- Resistance
- Distance
- Velocity
- Acceleration
- Angle
- Angular Velocity
- Angular Acceleration
- Rotational Rate
- Temperature
- Pressure
- Humidity
- Force
- Flow Rate
- Strain
- Disable – the channel is disabled and transmits no data over the NMEA 2000 network

4.7.6.1.3 Instance

From here the instance number used in the message send for this channel may be set.

4.7.6.1.4 Source

This parameter is present only when the channel has been configured for the function of Temperature, Pressure, Humidity, or Flow Rate. This parameter selects the type of temperature, pressure, humidity, or flow rate measurement being performed so that displays can more easily select the data from the network.

4.7.6.1.5 Value at 4mA

Program this parameter to match the reading of the current loop transducer when it is sourcing a current of 4mA. You can determine this value by examining the specification of the transducer being used.

4.7.6.1.6 Value at 20mA

Program this parameter to match the reading of the current loop transducer when it is sourcing a current of 20mA. You can determine this value by examining the specification of the transducer being used.

4.7.6.1.7 Data Damping Period

You can configure a damping parameter to smooth the parametric readings or make them more responsive. The data damping is configurable between 0.1-25.0 seconds. The default data damping period is 3.0 seconds.

4.7.6.2 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

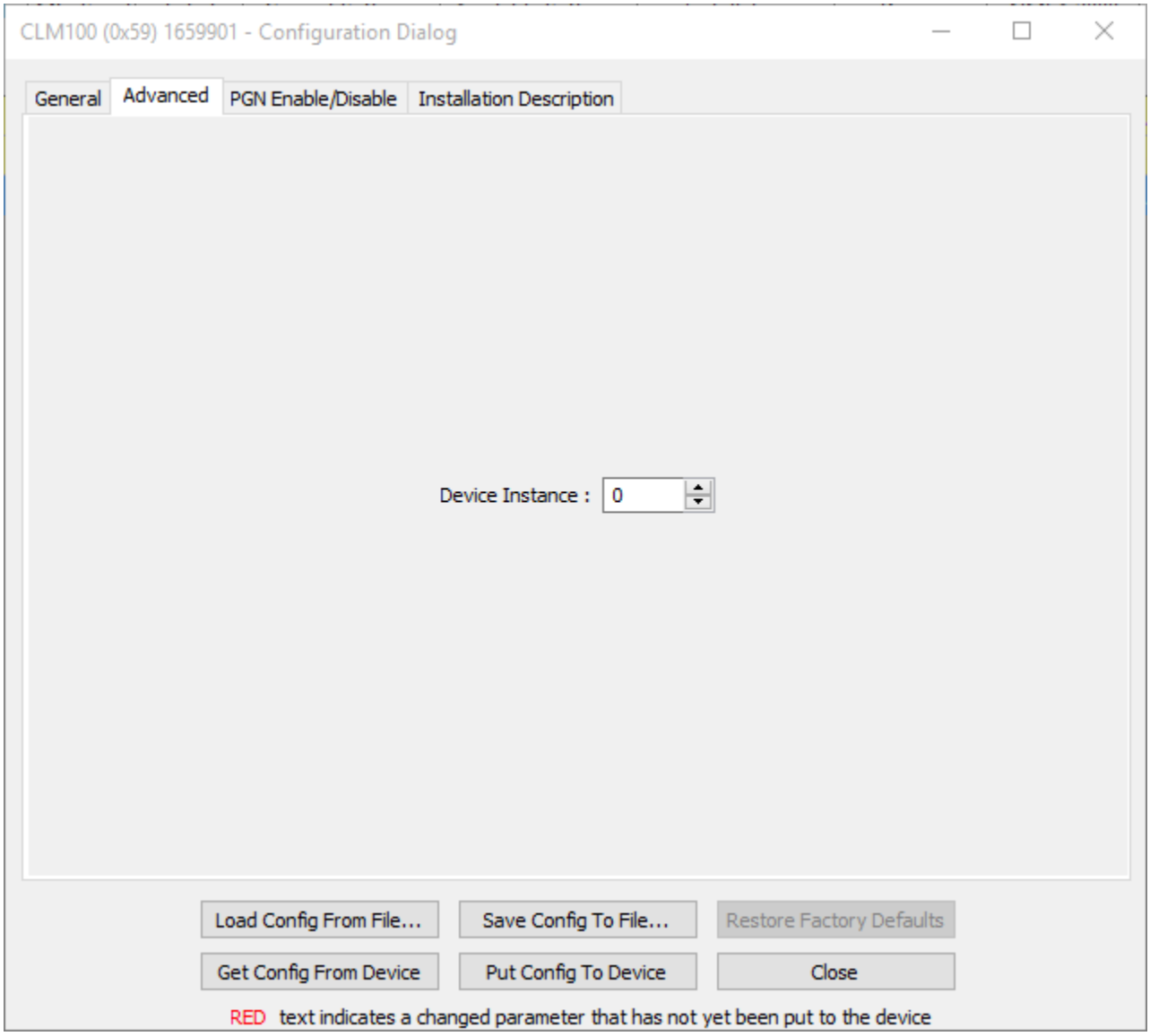


Figure 28 – CLM100 Advanced Tab

4.7.6.2.1 Device Instance

The device comes from the factory with the device instance value set to 0. If you have multiple of these devices on a network, you may find it necessary to set the device instances of other devices of this type so that they are different.

4.7.6.3 PGN Enable/Disable Tab

This tab allows you to enable or disable the transmission of the periodic messages output by the device. You may enable or disable the transmission of the messages, or may program the time interval between transmissions of a specific message, for devices which support the programming of time intervals.

When you first open the PGN Enable/Disable tab, a list of periodic PGN's transmitted by the device will appear. The mode column will read "On", if the device is currently transmitting the message, or "Off", if the message has not yet been detected from the device.

You may configure each periodic message with one of the following choices:

1) Disable – this will turn off the periodic transmission of this message
2) Default – this will turn on the periodic transmission of this message at the default rate
3) A numeric value that will turn on the periodic transmission of this message at the specified rate

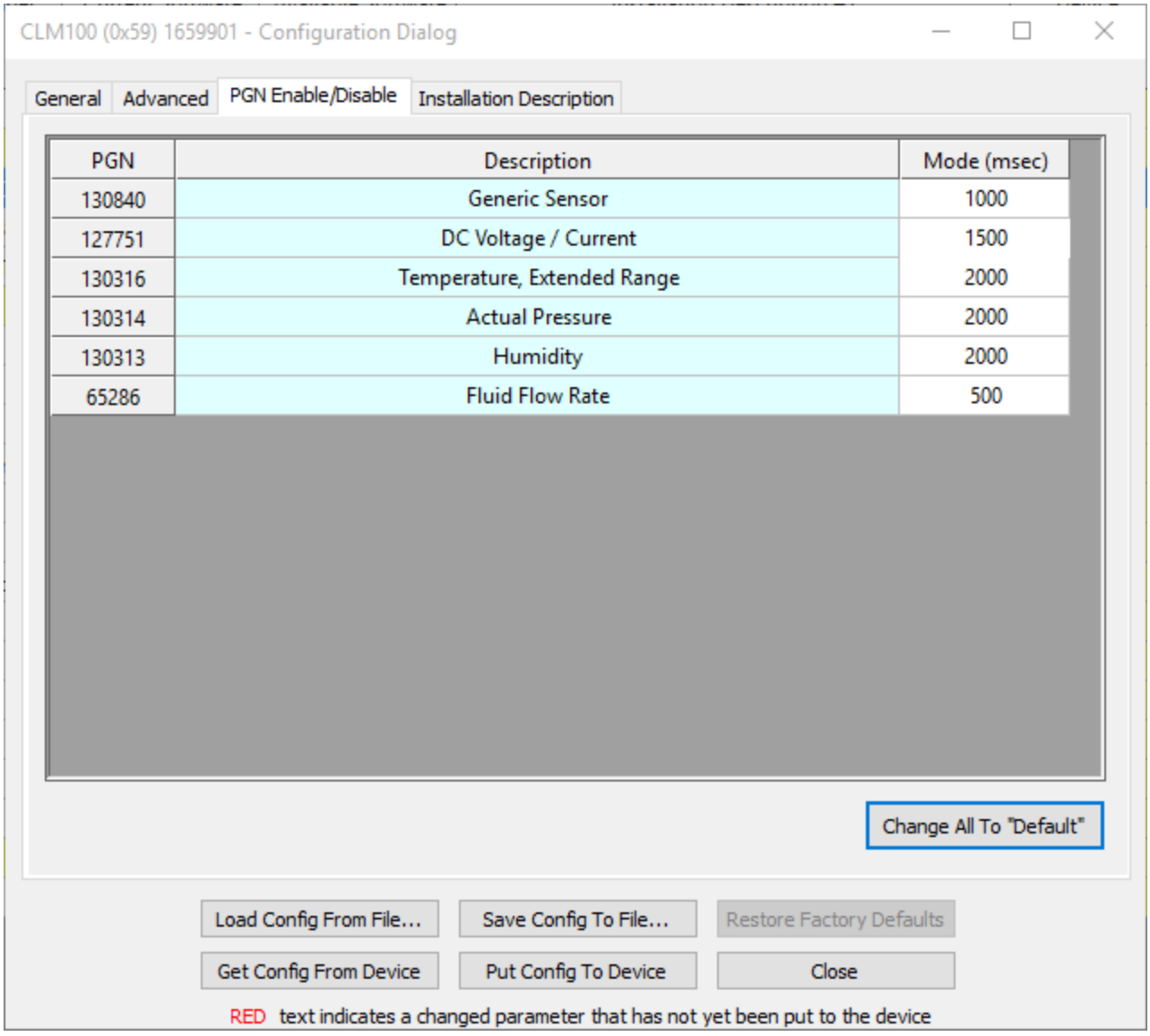


Figure 29 – CLM100 PGN Enable/Disable Tab

4.7.6.1 Installation Description Tab

This tab allows you to set values for the installation description properties of the device.

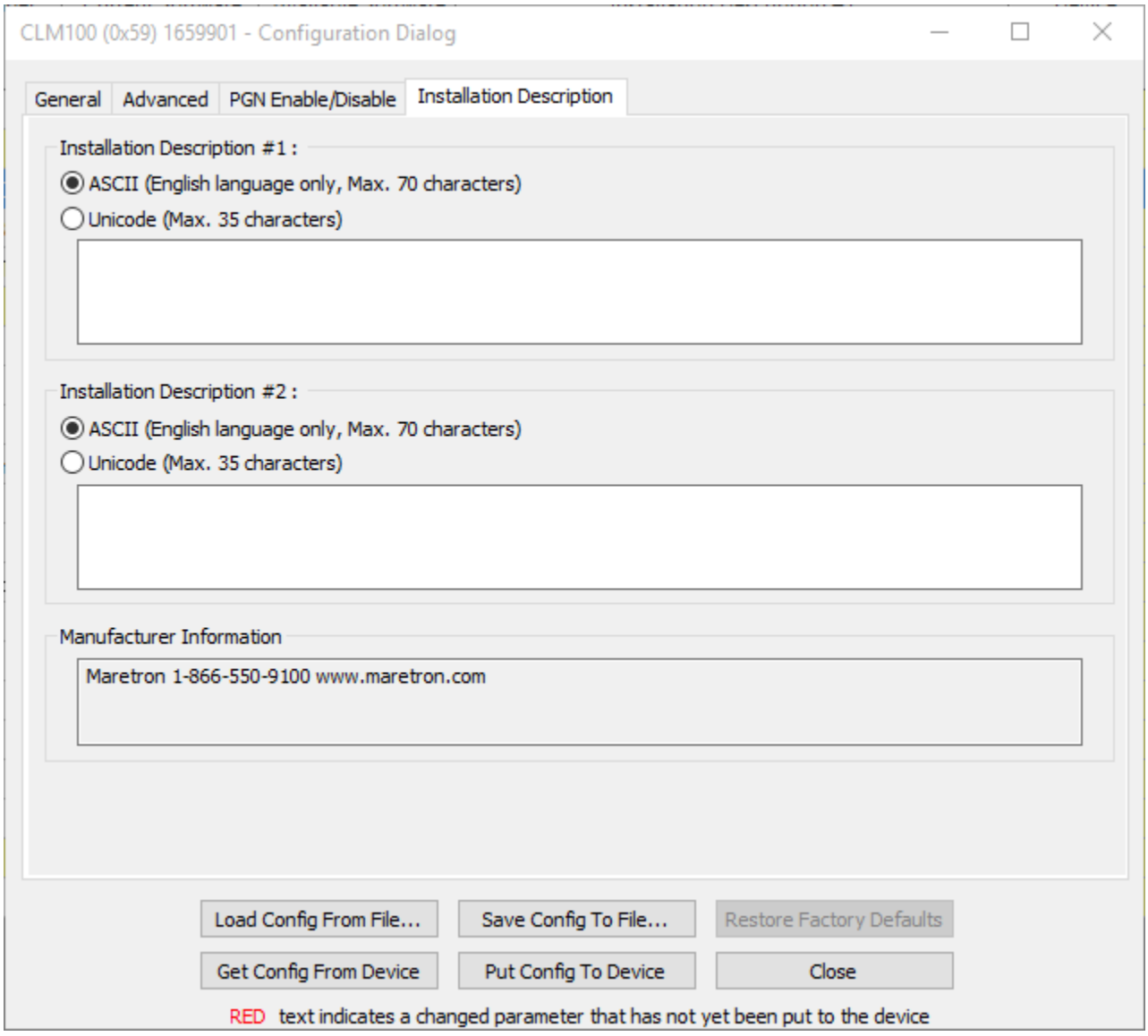


Figure 30 – CLM100 Installation Description Tab

4.7.6.1.1 Installation Description #1, #2

This device, along with all other Level A certified NMEA 2000® devices, has two user-programmable installation description fields. You may program these fields with information specific to the device, such as date installed, the initials/name of the installer, the physical location of the device, etc. This configuration option will allow you to program the values of these fields.

4.7.7 DCM100

4.7.7.1 General Tab

This tab contains commonly-used configuration items.

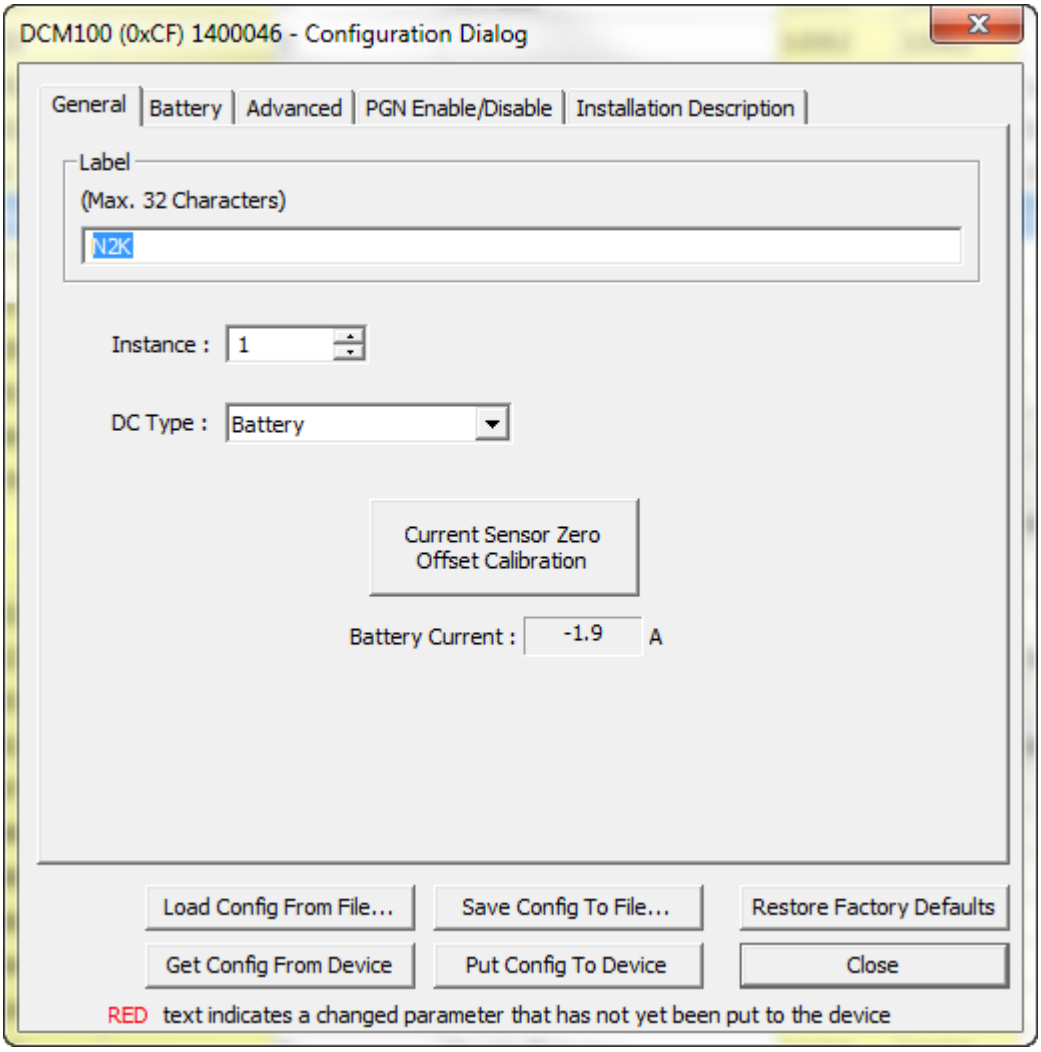


Figure 31 – DCM100 General Tab

4.7.7.1.1 Label

This text box allows you to assign a text label to the device. This label is visible in Maretron analysis and display products and allows you to easily identify the particular device.

4.7.7.1.2 Instance

NMEA 2000® provides a unique instance number for each DC power source on a vessel. You configure the DCM100 using a Maretron DSM250 display or other NMEA 2000® display unit that is capable of configuring the DCM100. Please refer to the Maretron *DSM250 User's Manual* for details.

4.7.7.1.3 DC Type

You can configure the DCM100 as to what type of DC power source it is monitoring. With the exception of the "Battery" type, the value of this parameter is used only for reporting the power source type over the NMEA 2000 network. However, if you select the "Battery" type, many

battery-related options become available. You configure the DCM100 using a Maretron DSM250 display or other NMEA 2000® display unit that is capable of configuring the DCM100. Please refer to the Maretron *DSM250 User's Manual* for details.

The following DC Types are selectable:

- Battery
- Alternator
- Convertor
- Solar Cell
- Wind Generator

4.7.7.1.4 Current Sensor Zero Offset Calibration

The DCM100 is shipped with a Hall-effect current sensor. In order to match the DCM100 unit and the sensor to one another and ensure maximum accuracy, you should perform this calibration step while there is no current flowing through the current sensor.

4.7.7.1.5 Battery Current

This display-only field shows the current provided by the battery. If there is no current flowing through the current sensor, this field should read near zero after current sensor zero offset calibration is performed.

4.7.7.2 Battery Tab

This tab provides a means to program the DCM100 with characteristics of the battery being monitored.

Please note that this tab is only functional when "DC Type" is set to "Battery" in the General tab.

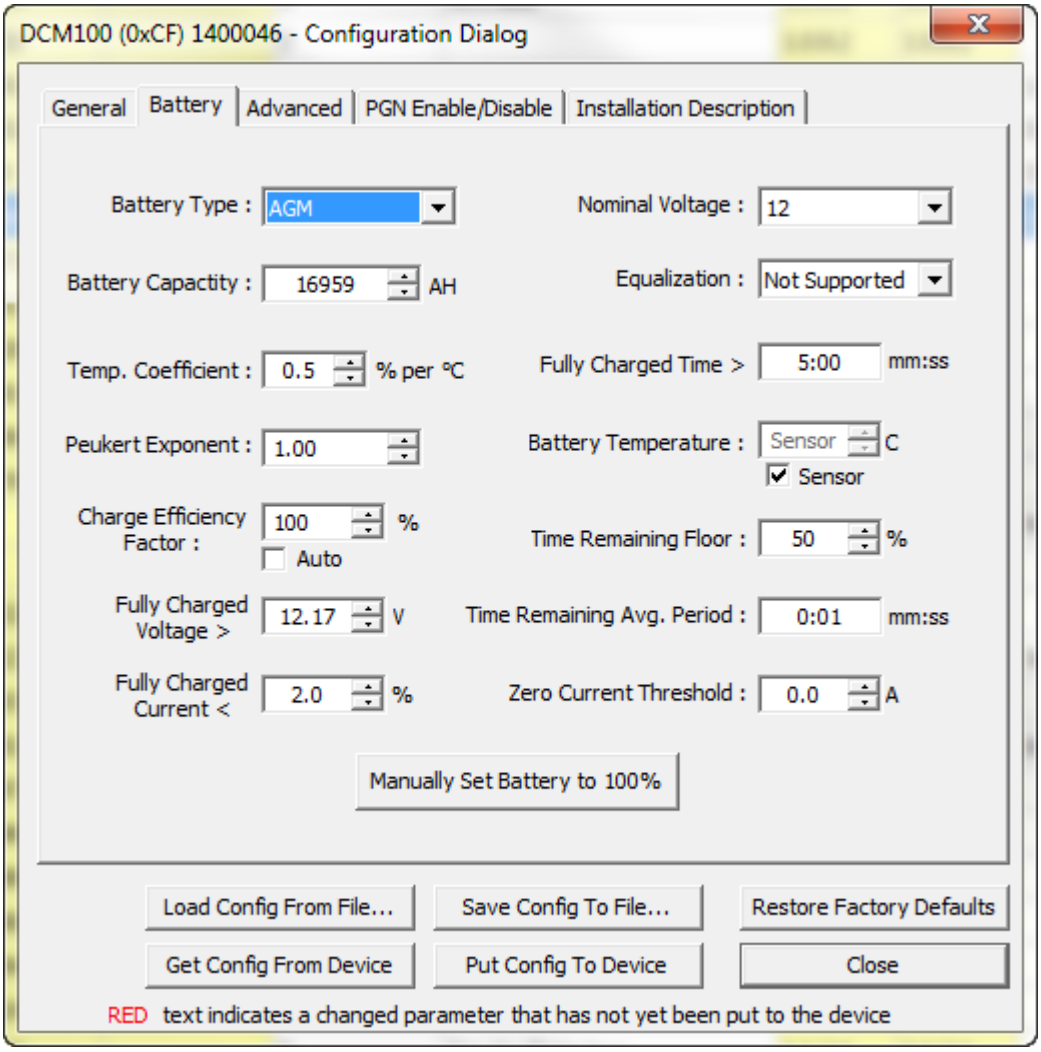


Figure 32 – DCM100 Battery Tab

4.7.7.2.1 Battery Type

The available battery types are "Flooded/Wet", "Gel", "AGM", and "Other". Selecting one of these types causes the remaining parameters to be set to appropriate default values.

4.7.7.2.2 Battery Capacity

Set this field to the value of the capacity of the battery in Amp-hours at 25C.

4.7.7.2.3 Temperature Coefficient

The capacity of a battery generally increases with increasing temperature. So that the DCM100 can properly calculate the battery's state of charge, program this parameter with the increase in battery capacity, in percent, per increase in temperature, in degrees Celsius. The temperature coefficient can be set to a value between 0%/°C – 5%/°C.

4.7.7.2.4 Temperature Coefficient

The capacity of a battery generally increases with increasing temperature. So that the DCM100 can properly calculate the battery's state of charge, program this parameter with the increase in battery capacity, in percent, per increase in temperature, in degrees Celsius. The temperature coefficient can be set to a value between 0%/°C – 5%/°C.

4.7.7.2.5 Peukert Exponent

The Peukert Exponent for the battery can be set to a value between 1.0 and 1.5. Please refer to the *DCM100 User's Manual* for details.

4.7.7.2.6 Charge Efficiency Factor

The Charge Efficiency Factor for the battery can be set to a value between 5% and 100%. Please refer to the *DCM100 User's Manual* for details.

4.7.7.2.7 Fully Charged Voltage

In order for the DCM100 to determine when a battery is fully charged, it uses three parameters. The "Fully Charged Voltage" indicates the value voltage at which the battery is considered fully charged if the battery voltage remains above this value and the battery current remains below the "Fully Charged Current" for the amount of time defined by the "Fully Charged Time" parameter.

4.7.7.2.8 Fully Charged Current

In order for the DCM100 to determine when a battery is fully charged, it uses three parameters. The "Fully Charged Voltage" indicates the value voltage at which the battery is considered fully charged if the battery voltage remains above this value and the battery current remains below the "Fully Charged Current" for the amount of time defined by the "Fully Charged Time" parameter.

4.7.7.2.9 Nominal Voltage

You may program here the nominal voltage of the battery, which is used only for reporting over the NMEA 2000 network. Available choices are 6, 12, 24, 32, 36, 42, and 48 Volts.

4.7.7.2.10 Equalization

You may indicate here whether or not the battery supports equalization. This is used only for reporting over the NMEA 2000 network. Available choices are "Supported" and "Not Supported".

4.7.7.2.11 Fully Charged Time

In order for the DCM100 to determine when a battery is fully charged, it uses three parameters. The "Fully Charged Voltage" indicates the value voltage at which the battery is considered fully charged if the battery voltage remains above this value and the battery current remains below the "Fully Charged Current" for the amount of time defined by the "Fully Charged Time" parameter.

4.7.7.2.12 Battery Temperature

In order for the DCM100 to properly determine battery capacity and state of charge, it must know the temperature of the battery. If you are using a TR3K temperature sensor attached to the battery, you should set this parameter to "Sensor". Otherwise, if no temperature sensor is available, you can set this parameter to the estimated battery temperature, between -25°C and 125°C.

4.7.7.2.13 Time Remaining Floor

The DCM100 calculates the time, given the current being discharged from the battery, before the battery becomes discharged. By default, the DCM100 considers a battery to be discharged when its state of charge reaches the "Time Remaining Floor" value, which is by default set to 50%. If you desire to use some other state of charge value for the "Time Remaining Floor", you may change this parameter to the desired value.

4.7.7.2.14 Time Remaining Averaging Period

If loads on the battery are switching on and off frequently, the battery time remaining value calculated by the DCM100 can vary significantly. You may change the time over which current readings are averaged by changing this parameter anywhere in the range of 1 second to 32 minutes.

4.7.7.2.15 Zero Current Threshold

The current sensor reading can drift slightly at zero current, depending on temperature. Over a long period of time, this can cause the DCM100 to calculate that a battery is discharging slowly, even though it is not. The Zero Current Threshold parameter indicates a reading from the current sensor below which no current is considered to be flowing into or out of the battery.

4.7.7.2.16 Manually Set Battery to 100%

If you know that the battery is fully charged, press this button to immediately set the battery state of charge to 100%.

4.7.7.3 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

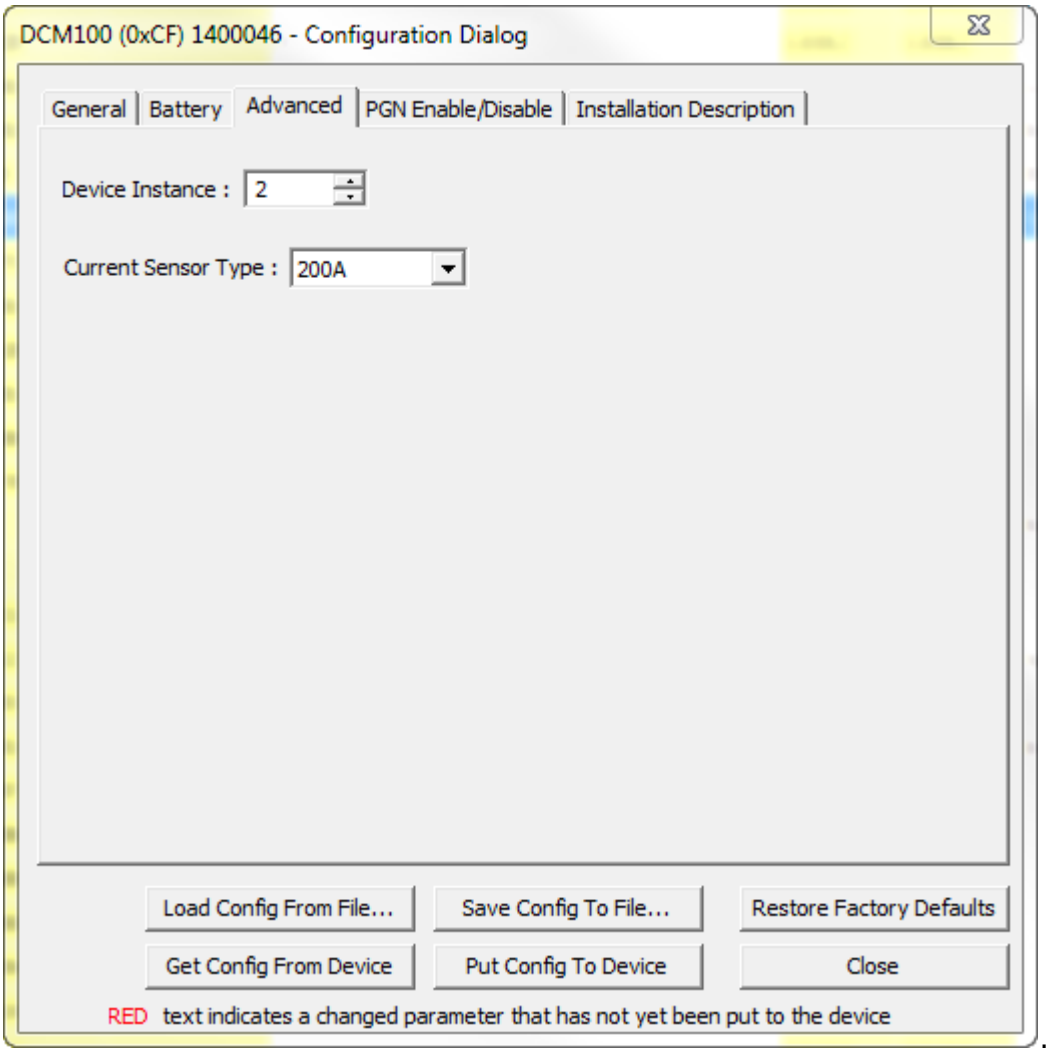


Figure 33 – DCM100 Advanced Tab

4.7.7.3.1 Device Instance

The device comes from the factory with the device instance value set to 0. If you have multiple of these devices on a network, you may find it necessary to set the device instances of other devices of this type so that they are different.

4.7.7.3.2 Current Sensor Type

From the factory, the DCM100 is configured to use a 200A Hall Effect current sensor. If you are using a 400A or 600A current sensor, you should configure the DCM100 for the proper sensor type by selecting it in this field.

4.7.7.4 PGN Enable/Disable Tab

This tab allows you to enable or disable the transmission of the periodic messages output by the device. You may enable or disable the transmission of the messages, or may program the

time interval between transmissions of a specific message, for devices which support the programming of time intervals.

When you first open the PGN Enable/Disable tab, a list of periodic PGN's transmitted by the device will appear. The mode column will read "On", if the device is currently transmitting the message, or "Off", if the message has not yet been detected from the device.

You may configure each periodic message with one of the following choices:

4) Disable – this will turn off the periodic transmission of this message
5) Default – this will turn on the periodic transmission of this message at the default rate
6) A numeric value that will turn on the periodic transmission of this message at the specified rate

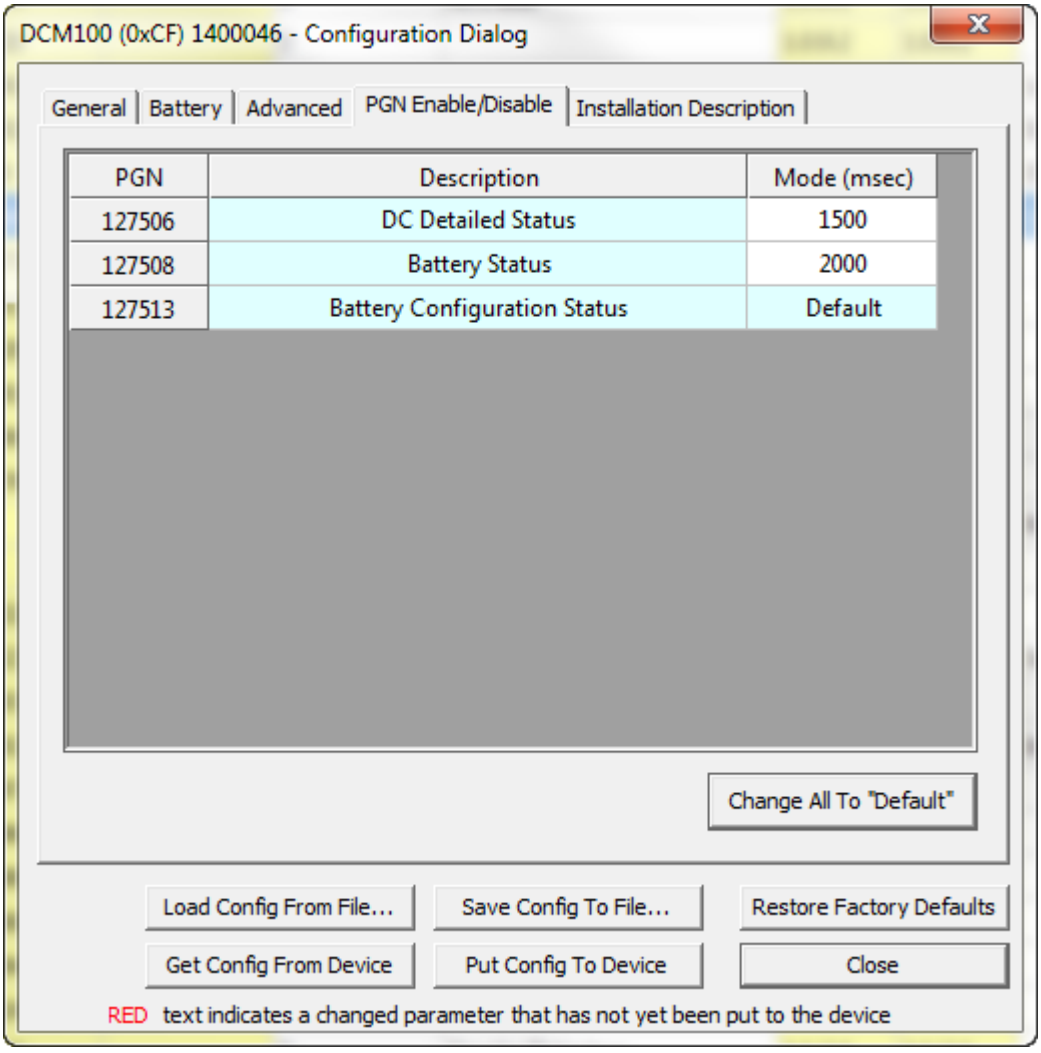


Figure 34 – DCM100 PGN Enable/Disable Tab

4.7.7.5 Installation Description Tab

This tab allows you to set values for the installation description properties of the device.

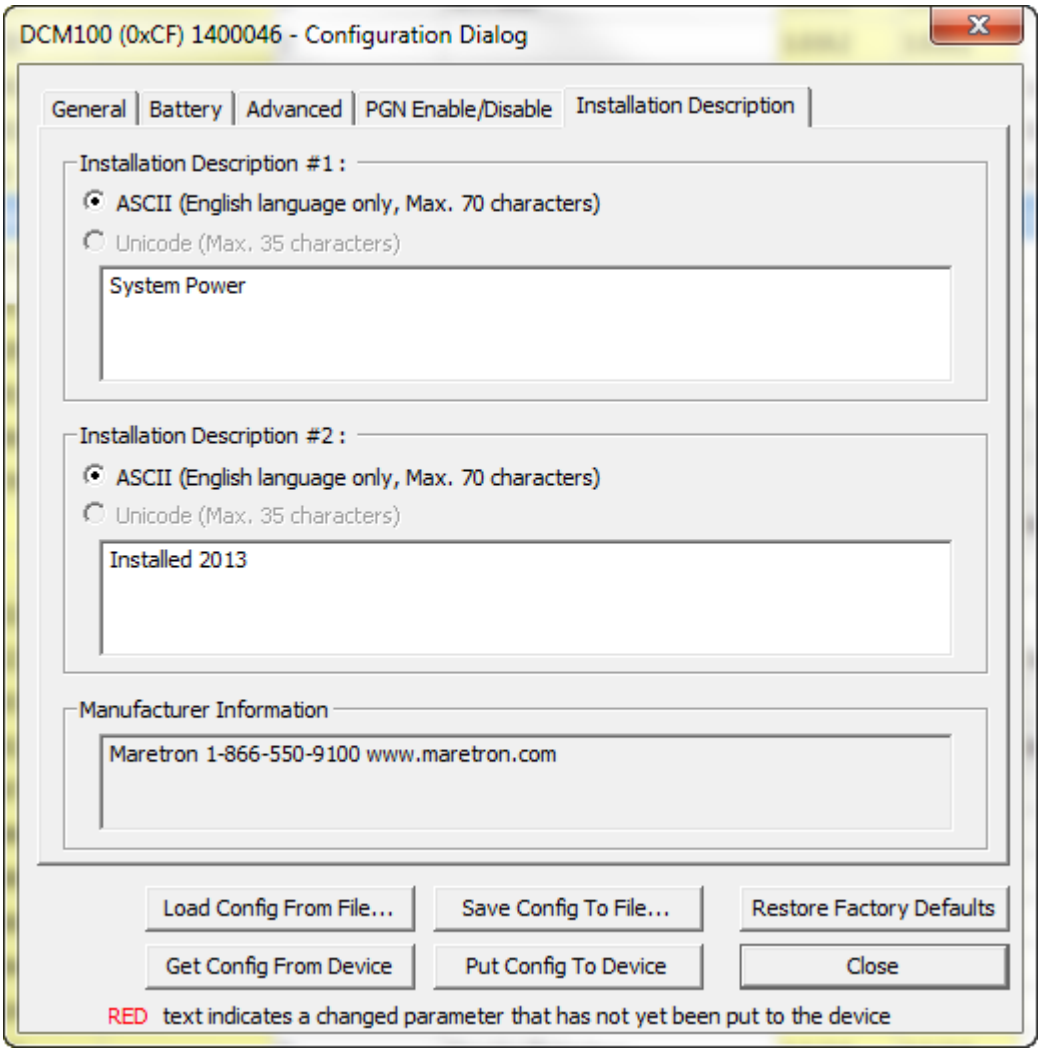


Figure 35 – DCM100 Installation Description Tab

4.7.7.5.1 Installation Description #1, #2

This device, along with all other Level A certified NMEA 2000® devices, has two user-programmable installation description fields. You may program these fields with information specific to the device, such as date installed, the initials/name of the installer, the physical location of the device, etc. This configuration option will allow you to program the values of these fields.

4.7.8 DCR100

4.7.8.1 General Tab

This tab contains commonly-used configuration items.

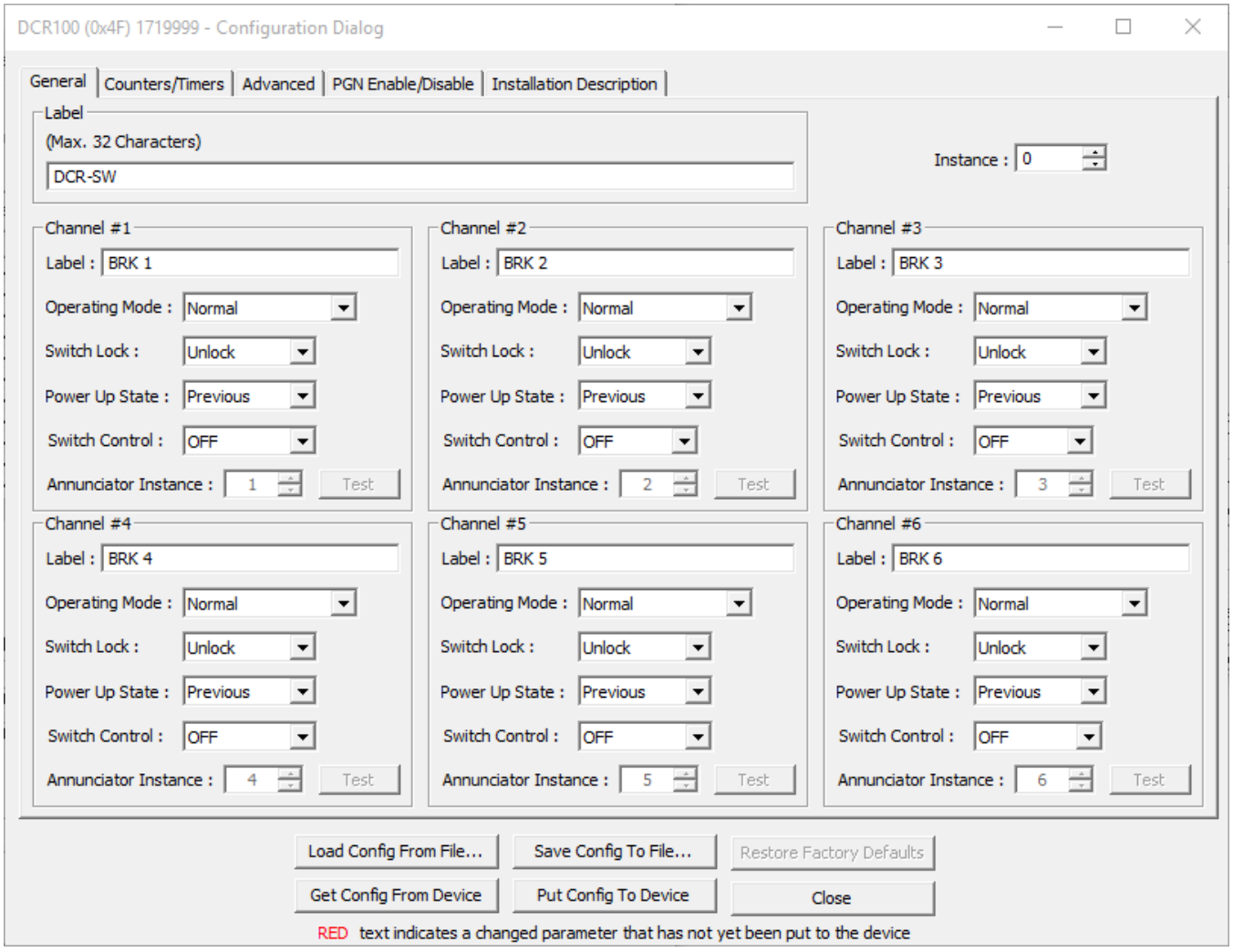


Figure 36 – DCR100 General Tab

4.7.8.1.1 Label

This text box allows you to assign a text label to the device. This label is visible in Maretron analysis and display products and allows you to easily identify the particular device.

4.7.8.1.2 Channel #x Label

Each channel has a text label you can set to identify the load controlled by that channel (for example, "EXHAUST FAN" or "NAV LIGHTS"). For each channel, set this to a value which describes the load being controlled so that you can easily identify it in display devices.

4.7.8.1.3 Channel #x Operating Mode

DCR100 channels have two operating modes: "Normal", in which the DCR100 channel responds to standard NMEA 2000 switching commands, and "Annunciator", in which the channel may be connected to a power source for a sounder or a light to be activated in the case of an alert generated by a DSM150 or DSM250 display, or by N2KView software.

4.7.8.1.4 Channel #x Switch Lock

This menu allows you to view the lock status of each switch. When a switch is locked, it will not respond to the on and off commands transmitted over the NMEA 2000 network until it has been unlocked. This menu is disabled if the channel is set to “Annunciator Mode”.

4.7.8.1.5 Channel #x Power Up State

This menu allows you to configure the state of the switch when the DCR100 is first powered up. You may set the state to ON, OFF, or Previous State (the state of the switch when power was last applied to the DCR100). This menu is disabled if the channel is set to “Annunciator Mode”.

4.7.8.1.6 Channel #x Switch Control

This entry will show the current state of the relay channel, either “Off” (open) or “On” closed. You may use this menu entry to turn the relay channel on or off.

4.7.8.1.7 Channel #x Annunciator Instance

This entry allows you to program the instance number for the channel in Annunciator Modem. You may use a value between 0 and 15. This instance number is used by the DSM150/DSM250 or N2KView when selecting annunciators to sound when programming an alert.

4.7.8.1.8 Channel #x Test

Press this button to verify functionality of the channel in Annunciator mode. This will cause the annunciator to sound or light briefly.

4.7.8.2 Counters/Timers Tab

This tab contains controls to view the state of and to reset the hardware counters and timers in the DCR100.

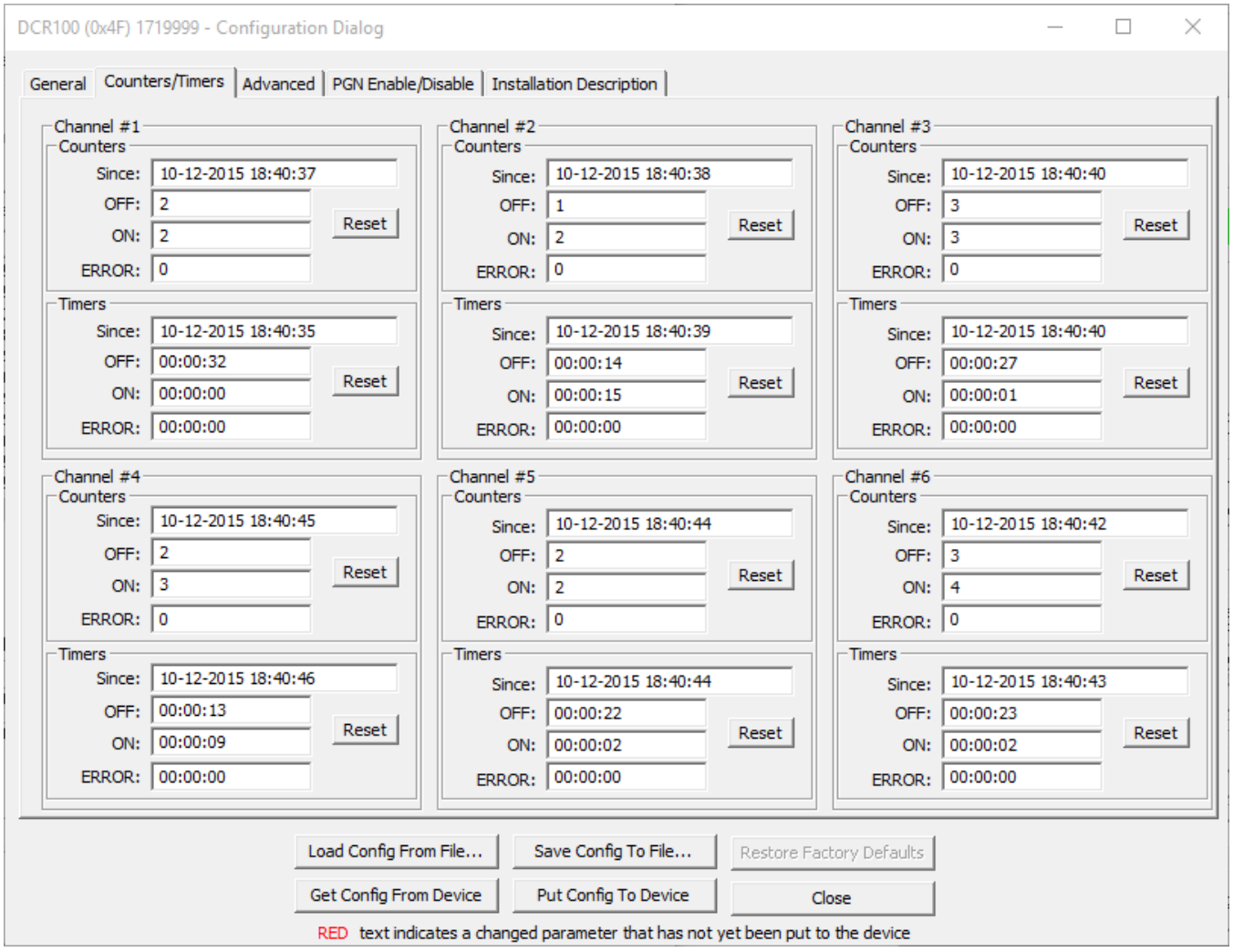


Figure 37 – DCR100 Counters/Timers Tab

Each channel of the DCR100 maintains counters that track how many times the channel has transitioned into each of the states OFF, ON, and ERROR. The "Counters" section of this dialog for each channel has the following fields:

- **Since:** the time and date that the channel's counter was last reset (this requires that a source of time and date, usually a GPS receiver, be present on the NMEA 2000 network.
- **OFF:** the number of times that this channel has transitioned into the OFF state since the channel's counters were last reset.
- **ON:** the number of times that this channel has transitioned into the ON state since the channel's counters were last reset.
- **ERROR:** the number of times that this channel has transitioned into the ERROR state since the channel's counters were last reset.

- **Reset:** Pressing this button will reset the OFF, ON, and ERROR counters to zero values, and will update the “Since:” field for this channel’s counters to the current time and date.

Each channel of the DCR100 maintains timers of the elapsed time that the channel has spent in each of the states OFF, ON, and ERROR. The “Timers” section of this dialog for each channel has the following fields:

- **Since:** the time and date that the channel’s timer was last reset (this requires that a source of time and date, usually a GPS receiver, be present on the NMEA 2000 network.
- **OFF:** the elapsed time that this channel has been in the OFF state since the channel’s timer were last reset.
- **ON:** the elapsed time that this channel has been in the ON state since the channel’s timers were last reset.
- **ERROR:** the elapsed time that this channel has been in the ERROR state since the channel’s timers were last reset.
- **Reset:** Pressing this button will reset the OFF, ON, and ERROR timers to zero values, and will update the “Since:” field for this channel’s timers to the current time and date.

4.7.8.3 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

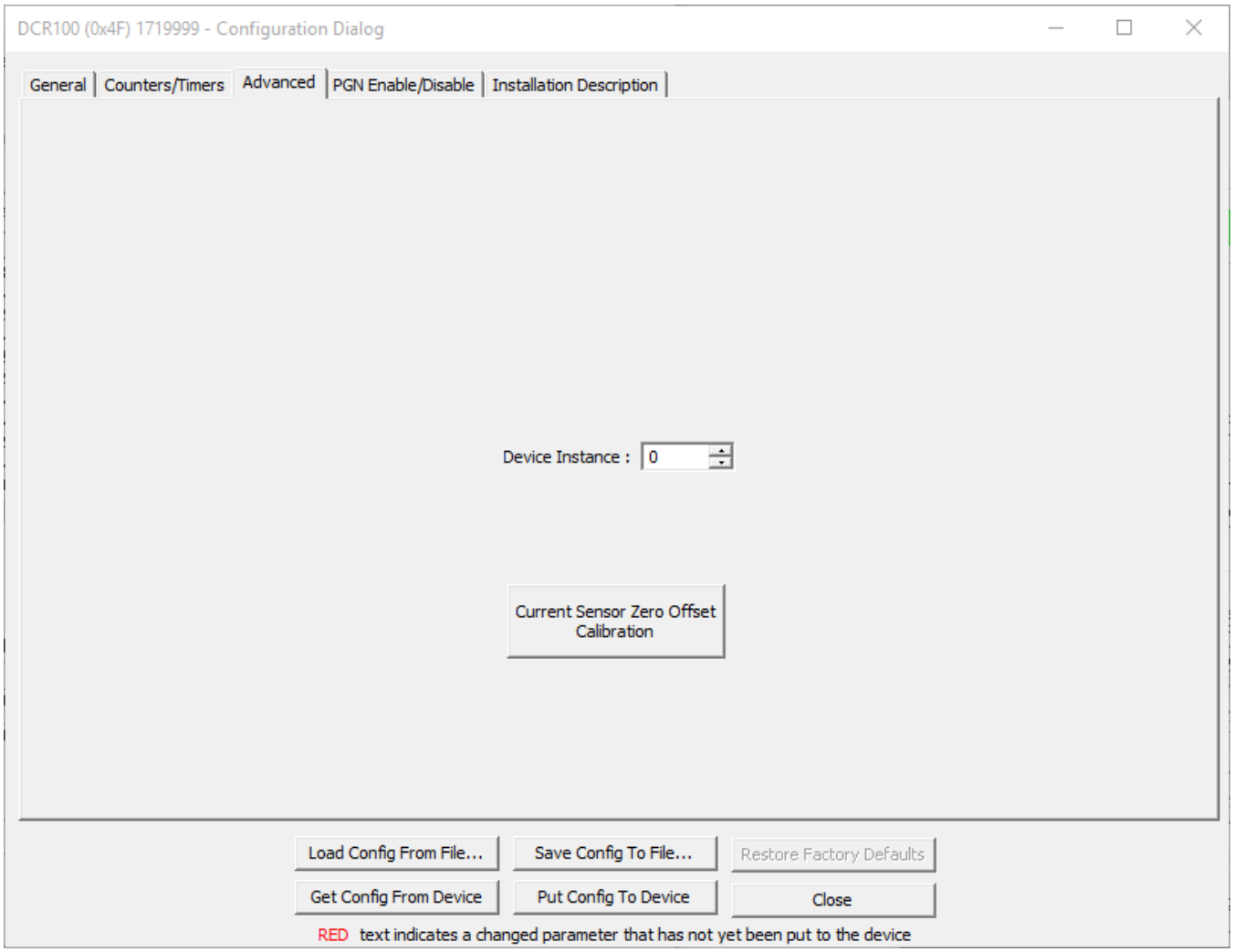


Figure 38 – DCR100 Advanced Tab

4.7.8.3.1 Device Instance

The device comes from the factory with the device instance value set to 0. If you have multiple of these devices on a network, you may find it necessary to set the device instances of other devices of this type so that they are different.

4.7.8.3.2 Current Sensor Zero Offset Calibration

The DCR100 contains Hall-effect current sensors. Press this button to calibrate the zero current reading of the sensors. In order to ensure maximum accuracy, you should perform this calibration step while there is no current flowing through the current sensors.

4.7.8.4 PGN Enable/Disable Tab

This tab allows you to enable or disable the transmission of the periodic messages output by the device. You may enable or disable the transmission of the messages, or may program the time interval between transmissions of a specific message, for devices which support the programming of time intervals.

When you first open the PGN Enable/Disable tab, a list of periodic PGN's transmitted by the device will appear. The mode column will read "On", if the device is currently transmitting the message, or "Off", if the message has not yet been detected from the device.

You may configure each periodic message with one of the following choices:

1) Disable – this will turn off the periodic transmission of this message
2) Default – this will turn on the periodic transmission of this message at the default rate
3) A numeric value that will turn on the periodic transmission of this message at the specified rate

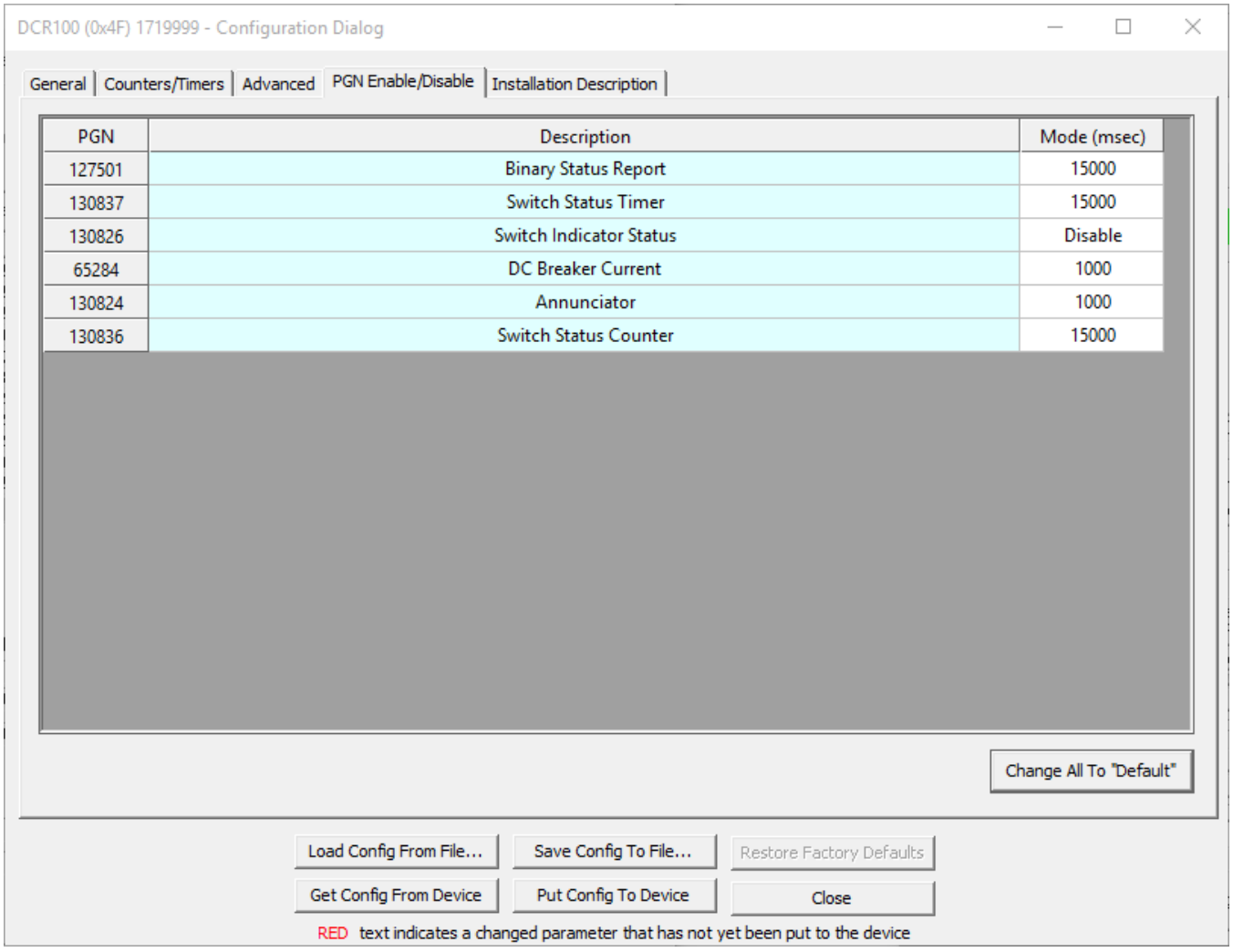


Figure 39 – DCR100 PGN Enable/Disable tab

4.7.8.5 Installation Description Tab

This tab allows you to set values for the installation description properties of the device.

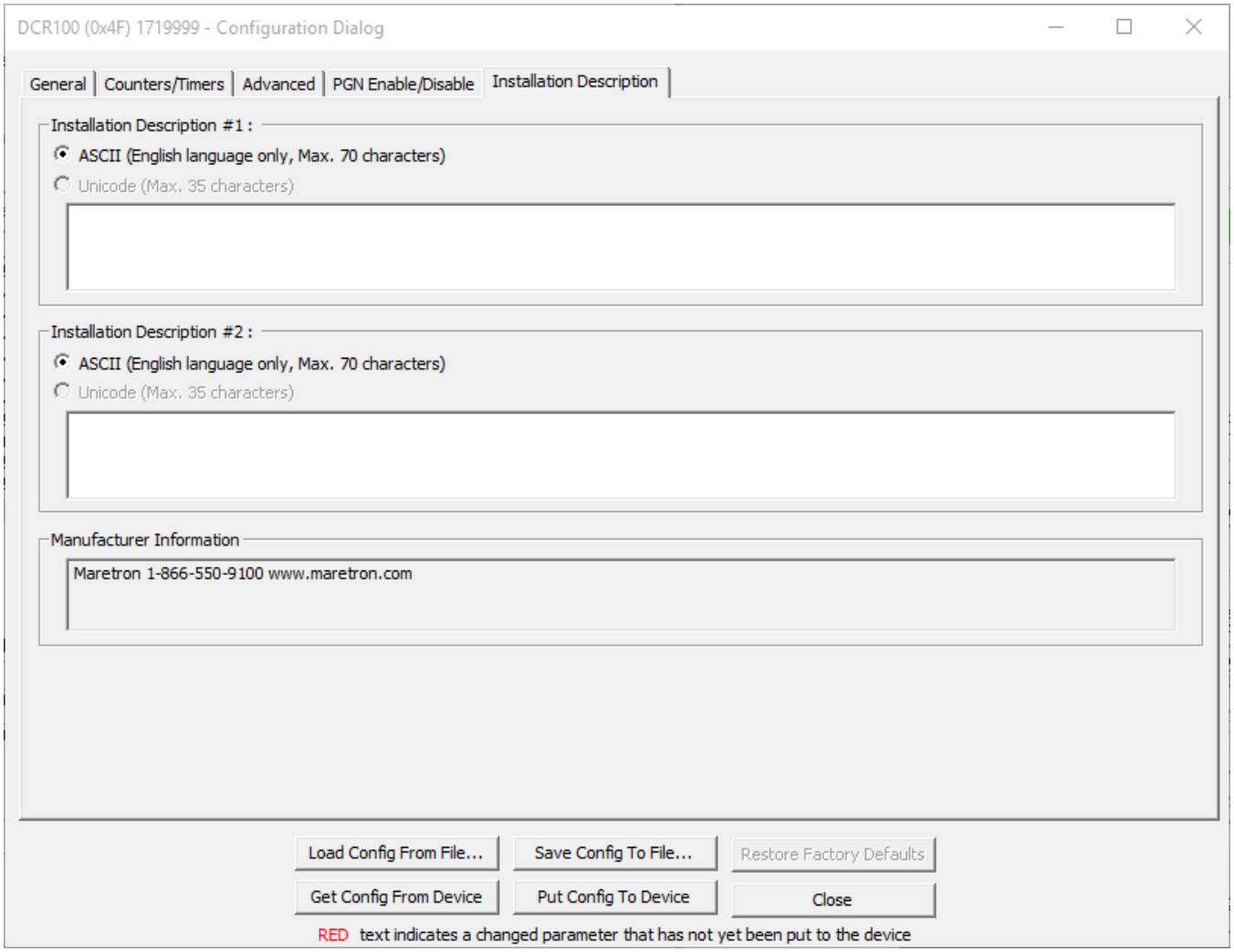


Figure 40 – DCR100 Installation Description Tab

4.7.8.5.1 Installation Description #1, #2

This device, along with all other Level A certified NMEA 2000® devices, has two user-programmable installation description fields. You may program these fields with information specific to the device, such as date installed, the initials/name of the installer, the physical location of the device, etc. This configuration option will allow you to program the values of these fields.

4.7.9 DSM200

DSM200 Configuration is only available through the DSM250 Emulator. Please refer to Section 4.7.29.6 in this document and the *DSM250 User's Manual* for details.

4.7.10 DSM250

DSM250 Configuration is only available through the DSM250 Emulator. Please refer to Section 4.7.29.6 in this document and the *DSM250 User's Manual* for details.

4.7.11 DST110

4.7.11.1 General Tab

This tab contains commonly-used configuration items.

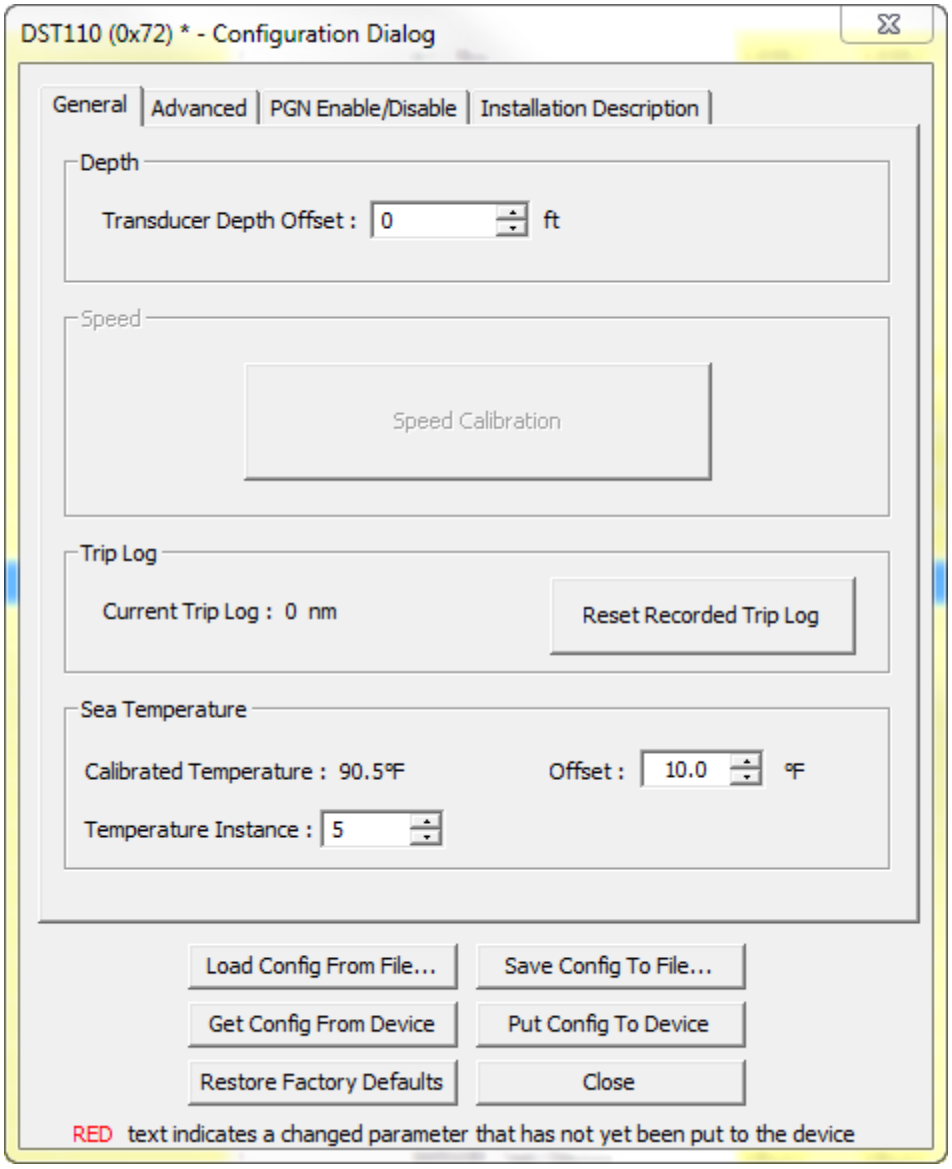


Figure 41 – DST110 General Tab

4.7.11.1.1 Transducer Depth Offset

The DST110 measures the depth of the water from the transducer, which may or may not be the waterline depth or the depth of water underneath the keel depending on the mounting location. Fortunately, the DST110 can be calibrated for reporting the offset from the transducer to the waterline or the DST110 can be calibrated to report the offset between the transducer and the lowest point on the vessel. Depth display readings then report either the waterline

depth or the depth under keel depending on your preference. A negative value will represent depth from the keel, while a positive value will represent depth from the waterline.

4.7.11.1.2 Speed Calibration

While the Maretron DST110 as shipped from the factory accurately represents the speed of water traveling past the paddlewheel sensor, the speed of water past the sensor might not be the same as the speed of the vessel, due to hull shape or how or where the DST110 is mounted. The DST110 can be programmed with a multiplier by which the internally calculated speed through water is multiplied before the speed through water value is transmitted over the NMEA 2000® network. In this way, the DST110 can be programmed such that its transmitted speed through water can more closely match the speed of the vessel.

4.7.11.1.3 Current Trip Log

The Maretron DST110 automatically logs two different cumulative distances; 1) total cumulative distance since installation, and 2) cumulative voyage distance (trip log) since reset. You cannot zero out the total cumulative distance since installation but you are able to zero out the trip log.

4.7.11.1.4 Reset Recorded Trip Log

Press this button to set the trip log in the Maretron DST110 to zero.

4.7.11.1.5 Calibrated Sea Temperature

This field shows the sea temperature, including the sea temperature offset, being transmitted by the DST110.

4.7.11.1.6 Sea Temperature Offset

The Maretron DST110 may be programmed with an offset value which is added to the water temperature measured by the DST110 before the value is transmitted over the NMEA 2000® network.

4.7.11.1.7 Sea Temperature Instance

This field should be programmed with the data instance number to be used by the DST110 when it transmits sea temperature.

4.7.11.2 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

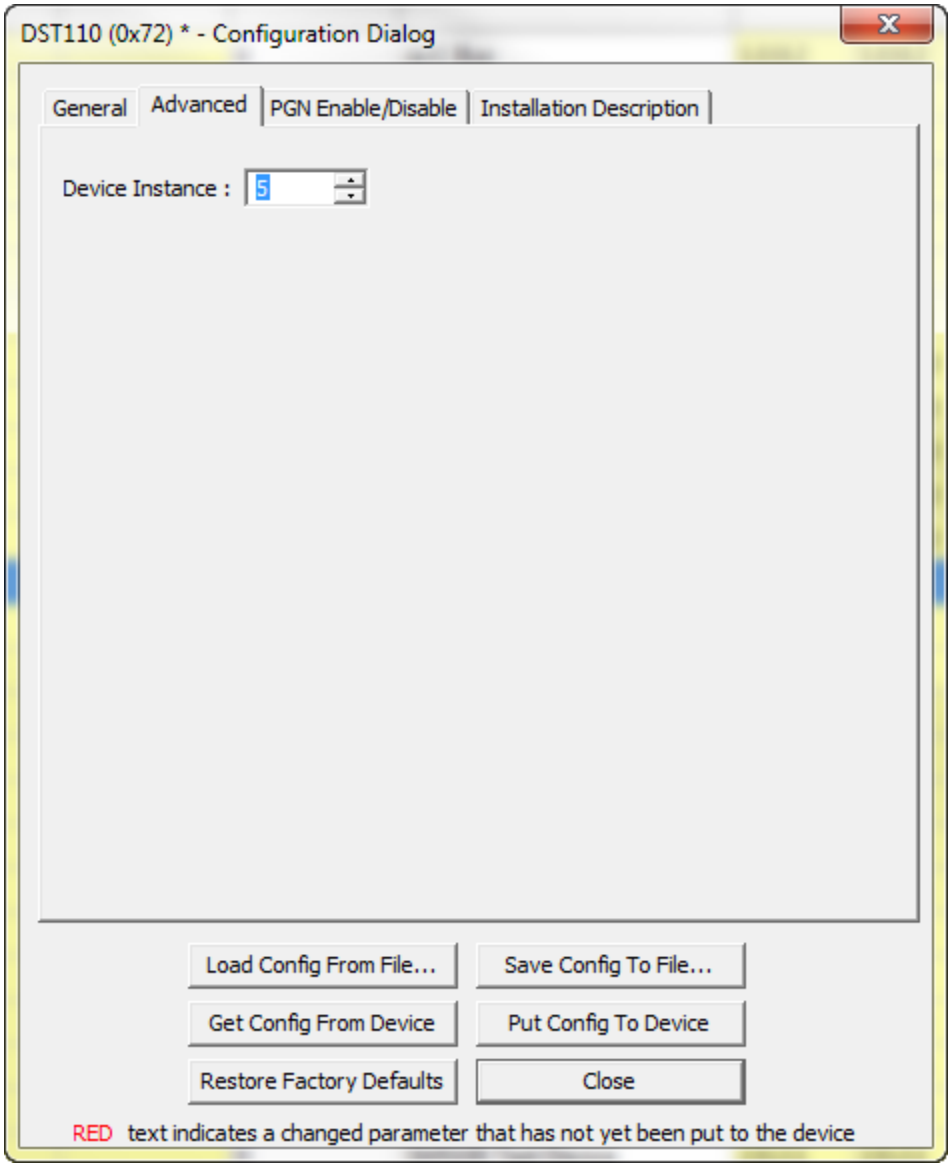


Figure 42 – DST110 Advanced Tab

4.7.11.2.1 Device Instance

The device comes from the factory with the device instance value set to 0. If you have multiple of these devices on a network, you may find it necessary to set the device instances of other devices of this type so that they are different.

4.7.11.3 PGN Enable/Disable Tab

This tab allows you to enable or disable the transmission of the periodic messages output by the device. You may enable or disable the transmission of the messages, or may program the time interval between transmissions of a specific message, for devices which support the programming of time intervals.

When you first open the PGN Enable/Disable tab, a list of periodic PGN's transmitted by the device will appear. The mode column will read "On", if the device is currently transmitting the message, or "Off", if the message has not yet been detected from the device.

You may configure each periodic message with one of the following choices:

1) "Disable" – this will turn off the periodic transmission of this message
2) "Default" – this will turn on the periodic transmission of this message at the default rate
3) A numeric value that will turn on the periodic transmission of this message at the specified rate

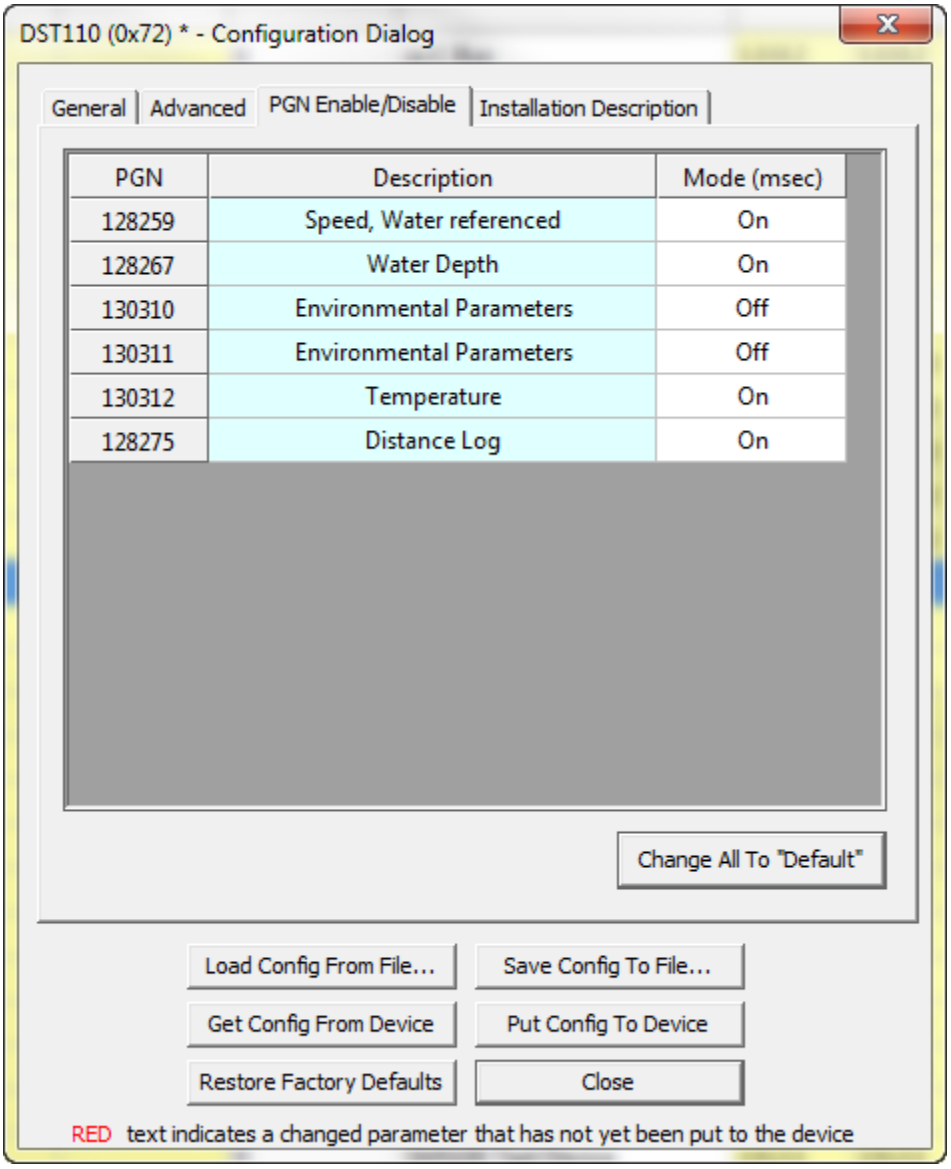


Figure 43 – DST110 PGN Enable/Disable Tab

4.7.11.4 Installation Description Tab

This tab allows you to set values for the installation description properties of the device.

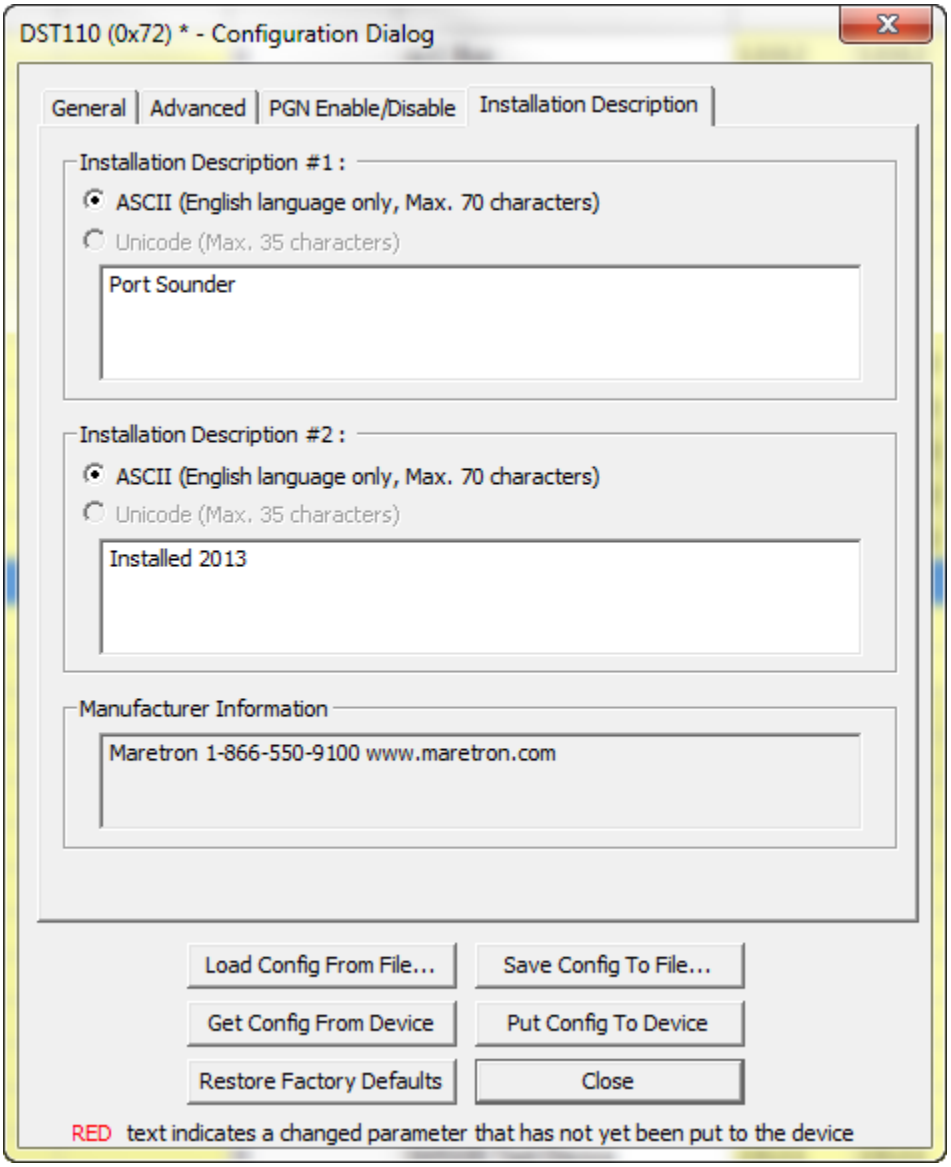


Figure 44 – DST110 Installation Description Tab

4.7.11.4.1 Installation Description #1, #2

This device, along with all other Level A certified NMEA 2000® devices, has two user-programmable installation description fields. You may program these fields with information specific to the device, such as date installed, the initials/name of the installer, the physical location of the device, etc. This configuration option will allow you to program the values of these fields.

4.7.12 EMS100

4.7.12.1 General Tab

This tab contains commonly-used configuration items.

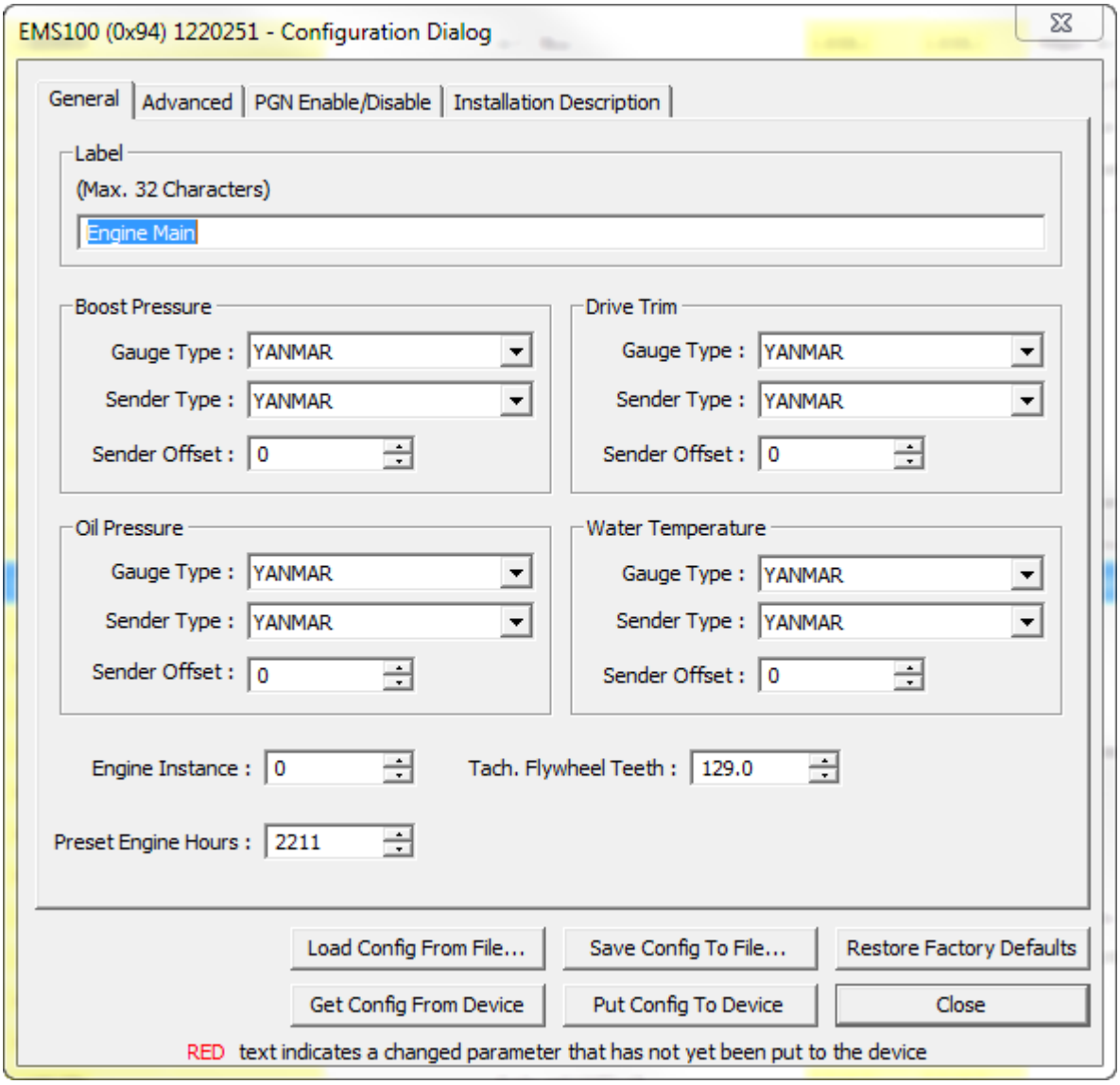


Figure 45 – EMS100 General Tab

4.7.12.1.1 Label

This text box allows you to assign a text label to the device. This label is visible in Maretron analysis and display products and allows you to easily identify the particular device.

4.7.12.1.2 Boost Pressure Gauge Type

The EMS100 comes from the factory preprogrammed with the characteristics of boost pressure gauge types for supported engines. If the EMS100 is used with an analog boost pressure gauge, you must select the correct type of gauge for this setting in order for the data to be displayed correctly. If you have no boost pressure gauge present, select the "No Gauge" option for this setting.

4.7.12.1.3 Boost Pressure Sender Type

The EMS100 comes from the factory preprogrammed with the characteristics of boost pressure senders for supported engines. If the engine to which you are connecting the EMS100 has a boost pressure sender, you must select the correct type of boost pressure sender for this setting in order for the data to be displayed correctly. If you have no boost pressure sender present, select the "Disabled" option for this setting.

4.7.12.1.4 Boost Pressure Sender Offset

Often, the characteristics of individual boost pressure senders vary from their specified values. This setting allows you to apply an offset to the resistance value of the boost pressure sender in order to allow you to bring the digital value reported by the EMS100 into agreement with that displayed by the analog gauge.

4.7.12.1.5 Oil Pressure Gauge Type

The EMS100 comes from the factory preprogrammed with the characteristics of oil pressure gauge types for supported engines. If the EMS100 is used with an analog oil pressure gauge, you must select the correct type of gauge for this setting in order for the data to be displayed correctly. If you have no oil pressure gauge present, select the "No Gauge" option for this setting.

4.7.12.1.6 Oil Pressure Sender Type

The EMS100 comes from the factory preprogrammed with the characteristics of oil pressure senders for supported engines. If the engine to which you are connecting the EMS100 has an oil pressure sender, you must select the correct type of oil pressure sender for this setting in order for the data to be displayed correctly. If you have no oil pressure sender present, select the "Disabled" option for this setting.

4.7.12.1.7 Oil Pressure Sender Offset

Often, the characteristics of individual oil pressure senders vary from their specified values. This setting allows you to apply an offset to the resistance value of the oil pressure sender in order to allow you to bring the digital value reported by the EMS100 into agreement with that displayed by the analog gauge.

4.7.12.1.8 Drive Trim Gauge Type

The EMS100 comes from the factory preprogrammed with the characteristics of drive trim gauge types for supported engines. If the EMS100 is used with an analog drive trim gauge, you must select the correct type of gauge for this setting in order for the data to be displayed

correctly. If you have no drive trim gauge present, select the “No Gauge” option for this setting.

4.7.12.1.9 Drive Trim Sender Type

The EMS100 comes from the factory preprogrammed with the characteristics of drive trim senders for supported engines. If the engine to which you are connecting the EMS100 has a drive trim sender, you must select the correct type of drive trim sender for this setting in order for the data to be displayed correctly. If you have no drive trim sender present, select the “Disabled” option for this setting.

4.7.12.1.10 Drive Trim Sender Offset

Often, the characteristics of individual drive trim senders vary from their specified values. This setting allows you to apply an offset to the resistance value of the drive trim sender in order to allow you to bring the digital value reported by the EMS100 into agreement with that displayed by the analog gauge.

4.7.12.1.11 Water Temperature Gauge Type

The EMS100 comes from the factory preprogrammed with the characteristics of water temperature gauge types for supported engines. If the EMS100 is used with an analog water temperature gauge, you must select the correct type of gauge for this setting in order for the data to be displayed correctly. If you have no water temperature gauge present, select the “No Gauge” option for this setting.

4.7.12.1.12 Water Temperature Sender Type

The EMS100 comes from the factory preprogrammed with the characteristics of water temperature senders for supported engines. If the engine to which you are connecting the EMS100 has a water temperature sender, you must select the correct type of water temperature sender for this setting in order for the data to be displayed correctly. If you have no water temperature sender present, select the “Disabled” option for this setting.

4.7.12.1.13 Water Temperature Sender Offset

Often, the characteristics of individual water temperature senders vary from their specified values. This setting allows you to apply an offset to the resistance value of the water temperature sender in order to allow you to bring the digital value reported by the EMS100 into agreement with that displayed by the analog gauge.

4.7.12.1.14 Engine Instance

In order to allow display equipment to distinguish between data coming from different engines, the NMEA 2000® network requires that each engine be assigned a unique instance number in the range of 0-252. The EMS100 comes from the factory programmed with an instance number of 0. Conventions for instance numbers for common engine configurations are as follows:

Single Engine = 0

Dual Engines: Port Engine = 0, Starboard Engine = 1

Triple Engines: Port Engine = 0, Starboard Engine = 1, Center Engine =2

4.7.12.1.15 Tach. Flywheel Teeth

The EMS100 needs to know the number of flywheel teeth on the engine (or the number of alternator pulses per revolution) in order to correctly calculate engine RPM. Use this setting to program the EMS100 with the number of flywheel teeth or alternator pulses per revolution for the engine the EMS100 is connected to.

4.7.12.1.16 Preset Engine Hours

The EMS100 reports engine hours based on how long the EMS100 has been powered from the engine. The EMS100 comes from the factory preprogrammed with an engine hours reading of 0 hours. If you are installing the EMS100 on an engine that has been in service, or if you have overhauled an engine, you can use this setting to preset the engine hours reading to the desired value.

4.7.12.2 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

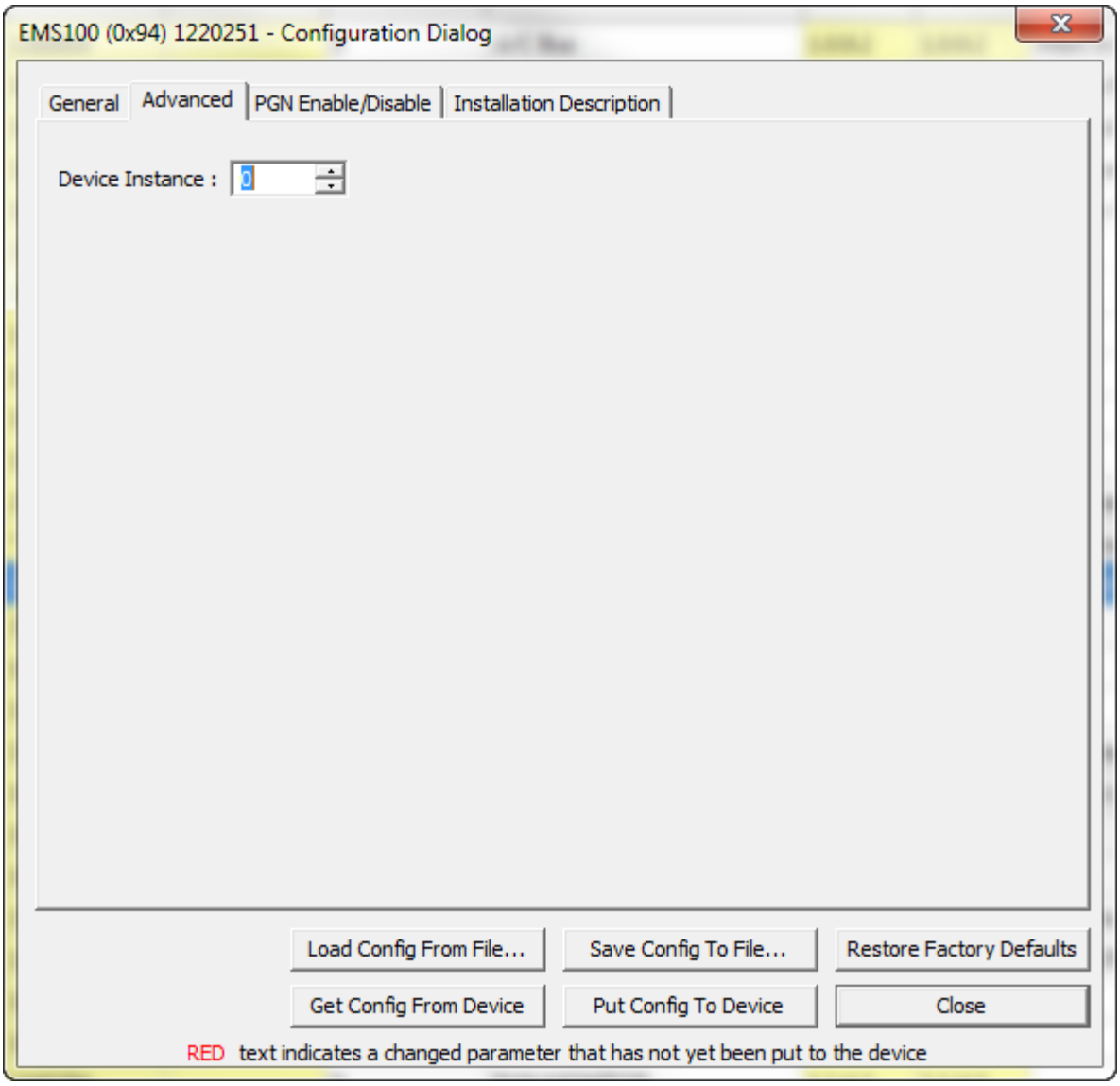


Figure 46 – EMS100 Advanced Tab

4.7.12.2.1 Device Instance

The device comes from the factory with the device instance value set to 0. If you have multiple of these devices on a network, you may find it necessary to set the device instances of other devices of this type so that they are different.

4.7.12.3 PGN Enable/Disable Tab

This tab allows you to enable or disable the transmission of the periodic messages output by the device. You may enable or disable the transmission of the messages, or may program the time interval between transmissions of a specific message, for devices which support the programming of time intervals.

When you first open the PGN Enable/Disable tab, a list of periodic PGN's transmitted by the device will appear. The mode column will read "On", if the device is currently transmitting the message, or "Off", if the message has not yet been detected from the device.

You may configure each periodic message with one of the following choices:

1) Disable – this will turn off the periodic transmission of this message
2) Default – this will turn on the periodic transmission of this message at the default rate
3) A numeric value that will turn on the periodic transmission of this message at the specified rate

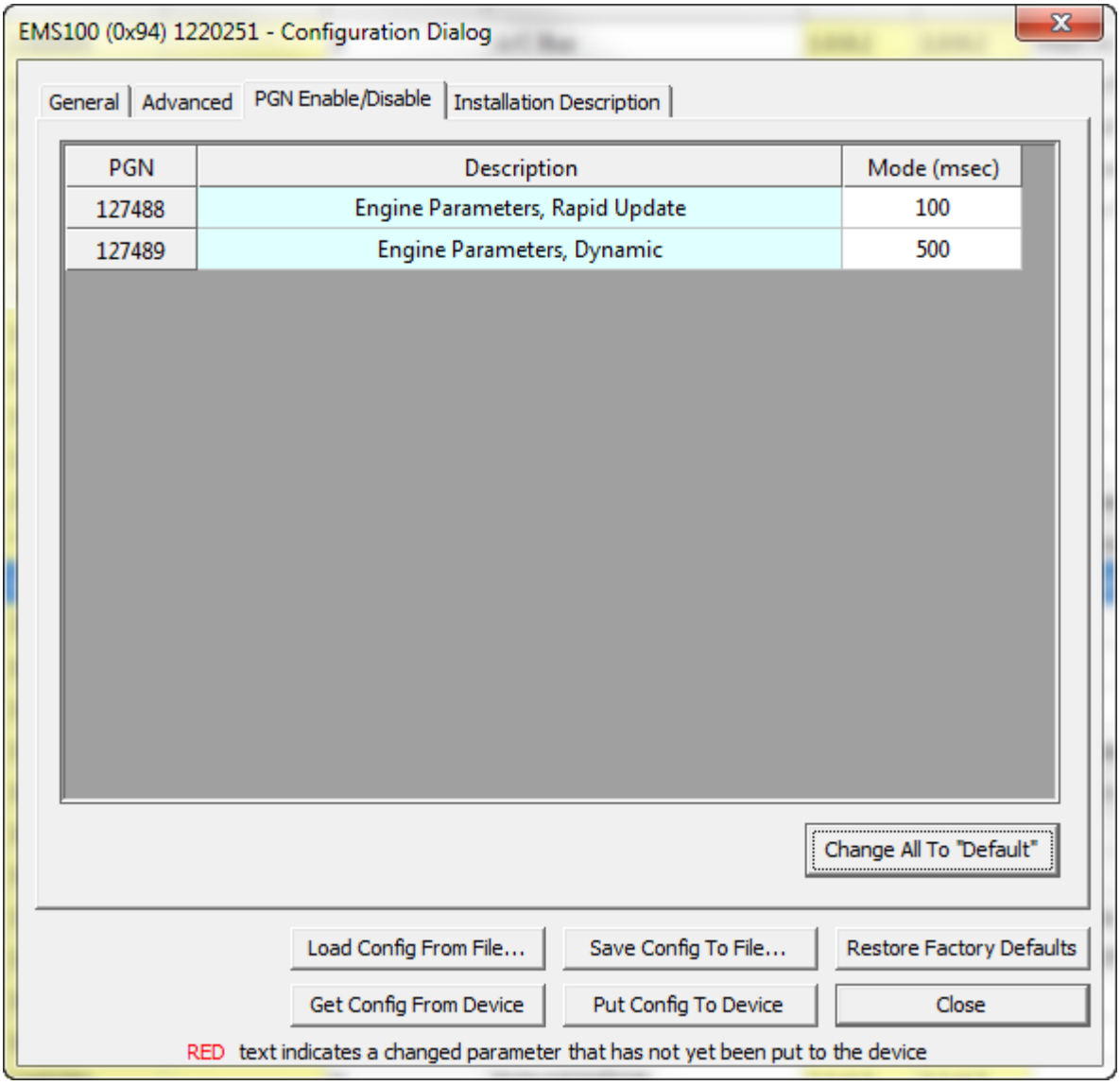


Figure 47 – EMS100 PGN Enable/Disable tab

4.7.12.4 Installation Description Tab

This tab allows you to set values for the installation description properties of the device.

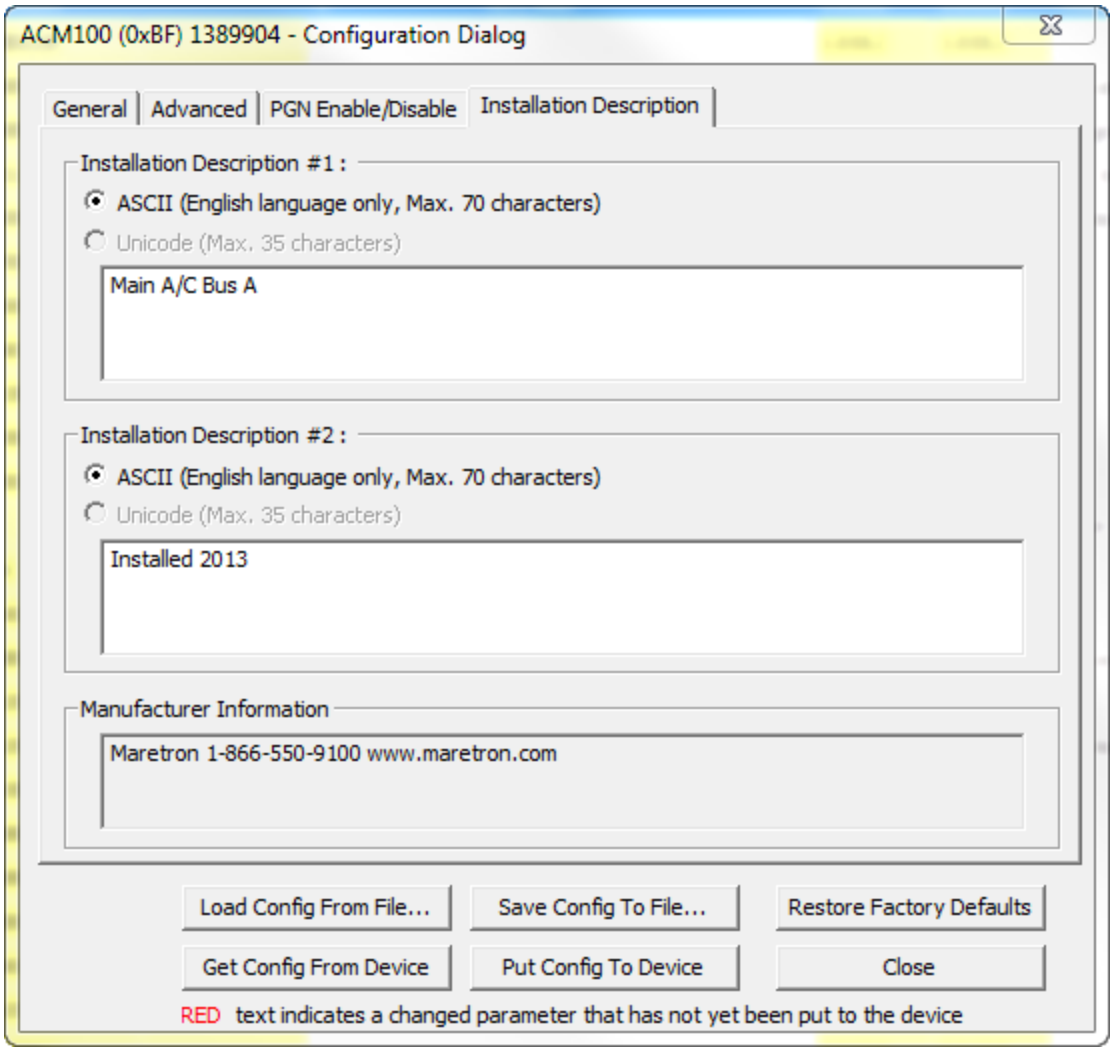


Figure 48 – EMS100 Installation Description Tab

4.7.12.4.1 Installation Description #1, #2

This device, along with all other Level A certified NMEA devices, has two user-programmable installation description fields. You may program these fields with information specific to the device, such as date installed, the initials/name of the installer, the physical location of the device, etc. This configuration option will allow you to program the values of these fields.

4.7.13 FFM100

4.7.13.1 General Tab

This tab contains commonly-used configuration items.

The FFM100 General Tab appears differently depending on the selected operating mode. Please refer to the details in the remainder of this section.

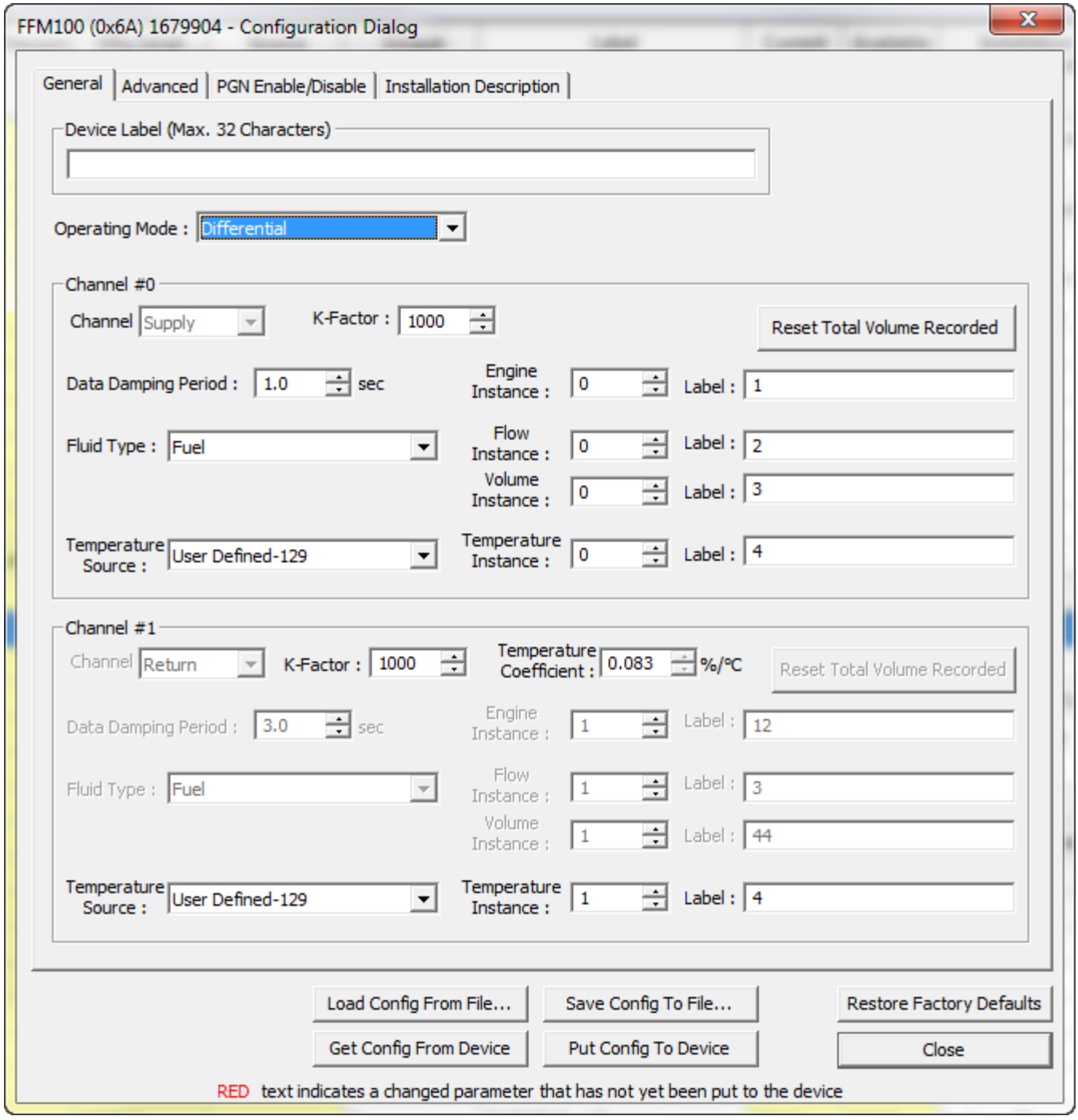


Figure 49 – FFM100 General Tab (Differential Flow Rate)

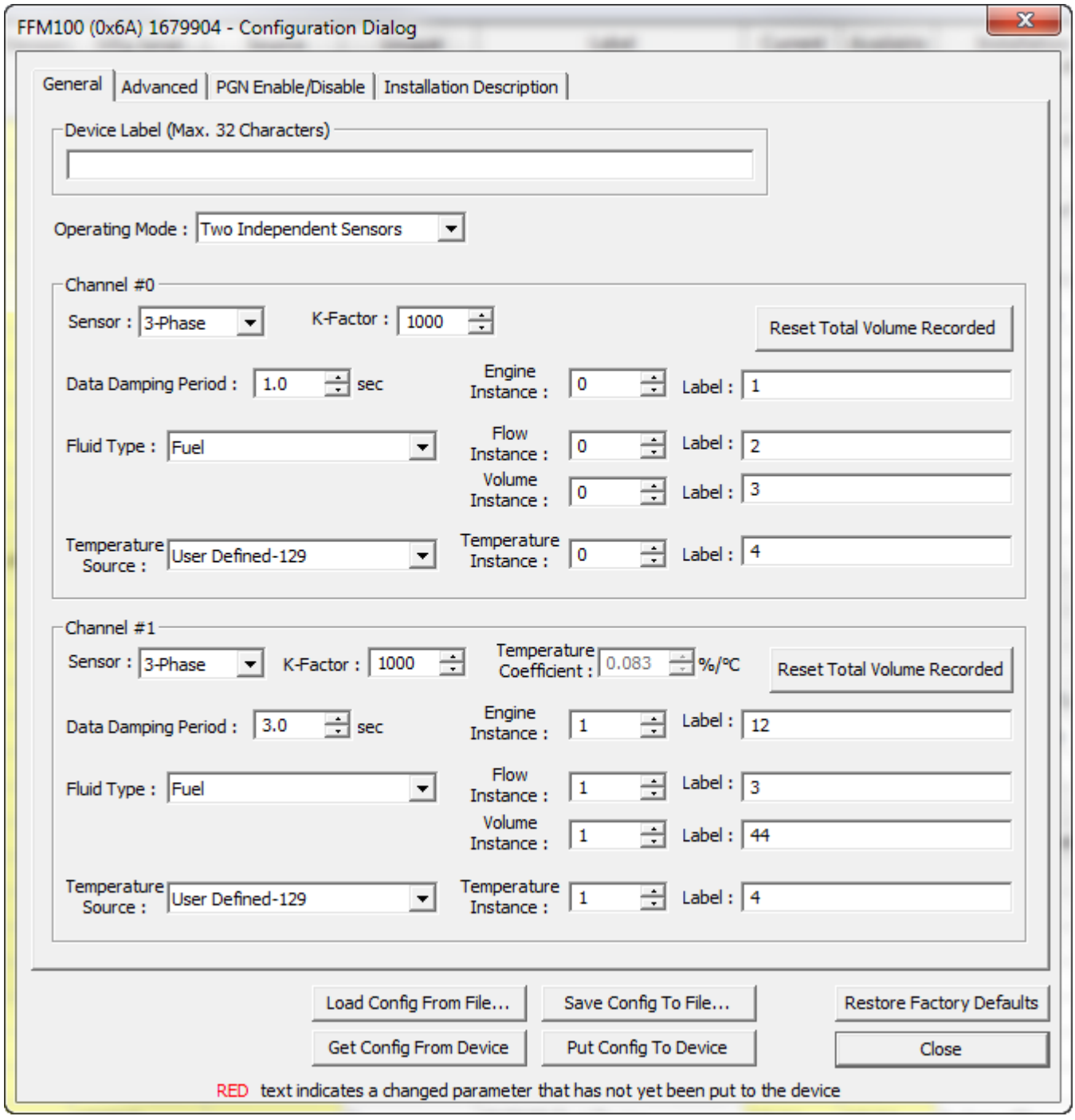


Figure 50 – FFM100 General Tab (Two Independent Flow Rates)

4.7.13.1.1 Device Label

This text box allows you to assign a text label to the device. This label is visible in Maretron analysis and display products and allows you to easily identify the particular device.

4.7.13.1.2 Operating Mode

The FFM100 can operate in one of two user-selectable operating modes:

Differential – this mode is used for diesel engines that recirculate unused fuel back into the fuel take. These engines will have separate supply and return fuel lines.

Two Independent Sensors – the FFM100 can measure flow rates from two independent sources; for example, a water flow rate on one channel and a gasoline fuel flow rate on another channel.

4.7.13.1.3 Channel #x Sensor

You may select the sensor type for each channel, or you may disable the channel. There are two sensor types you may select: 3-Phase, which include the Maretron fuel flow sensors that are designed for use with the FFM100, and 1-Phase, which is used for flow sensors that have a single fluid flow output signal.

NOTE: If the operating mode is set to "Differential Flow Rate", then this parameter is unavailable for Channel #1.

4.7.13.1.4 Channel #x Engine Instance

Program this parameter to match the desired engine instance number of the flow rate and total fuel used for this channel. You can program this parameter to any value between 0 and 252.

NOTE: If the operating mode is set to "Differential Flow Rate", then this parameter is unavailable for Channel #1.

4.7.13.1.5 Channel #x K-Factor

Program this parameter to match the K-factor that appears on the flow sensor connected to this channel.

4.7.13.1.6 Channel #x Temperature Instance

Program this parameter to match the desired instance number of the temperature reading for each channel. You can program this parameter to any value between 0 and 252. The default value for this parameter is 0.

4.7.13.1.7 Channel #x Engine Label

Each channel has a text label you can set to identify the load controlled by that channel (for example, "PORT ENGINE" or "COOLING WATER FLOW"). For each channel, set this to a value which describes the flow being monitored so that you can easily identify it in display devices. This label is transmitted for the NMEA 2000 Engine messages.

NOTE: If the operating mode is set to "Differential Flow Rate", then this parameter is unavailable for Channel #1.

4.7.13.1.8 Channel #x Flow Label

Each channel has a text label you can set to identify the load controlled by that channel (for example, “COOLING WATER FLOW”). For each channel, set this to a value which describes the flow being monitored so that you can easily identify it in display devices. This label is transmitted for the 65286 Maretron Proprietary Fluid Flow Rate and 65287 Maretron Proprietary Fluid Flow messages.

NOTE: If the operating mode is set to “Differential Flow Rate”, then this parameter is unavailable for Channel #1.

4.7.13.1.9 Channel #x Temperature Label

Program this parameter with a text string which identifies the particular temperature parameter being monitored by this channel. Maretron display products will display this label text when you are selecting data to display. This label is transmitted for the 130312 Temperature and 130316 Temperature, Extended Range messages.

4.7.13.1.10 Channel #x Data Damping Period

You can configure a damping parameter to smooth the flow rate readings or make them more responsive. The data damping is configurable between 0.2-25.0 seconds. The default data damping period is 3.0 seconds.

NOTE: If the operating mode is set to “Differential Flow Rate”, then this parameter is unavailable for Channel #1.

4.7.13.1.11 Channel #x Temperature Source

Program this parameter to match the desired instance number of the temperature reading for this channel. You can program this parameter to any value between 0 and 252. The default value for this parameter is 129 (User Defined).

4.7.13.1.12 Channel #x Reset Total Volume Recorded

The FFM100 maintains the total volume recorded in EEPROM, so that it is maintained across power cycles. Select this menu entry to reset the total volume recorded to zero.

NOTE: If the operating mode is set to “Differential Flow Rate”, then this parameter is unavailable for Channel #1.

4.7.13.1.13 Temperature Coefficient

NOTE: This parameter is available for Channel #1 only when the Operating Mode of the FFM100 is set to “Differential Mode”.

In a diesel engine, the diesel fuel is used to help cool the fuel injection system. Therefore, the fuel returned from the engine to the tank has a higher temperature than the fuel sent to the engine from the tank. The FFM100 accounts for this expansion by sensing the temperature at the supply flow sensor and the receive flow sensor, and calculating the effect of the temperature difference on the fuel expansion. In order to do this compensation, this parameter is programmed with the appropriate value for thermal expansion coefficient of the fluid being

measured. The default value of this field is (0.083%/°C), which is appropriate for diesel fuel. The configuration tools have predefined values for common fluids: diesel, engine oil, gasoline, and water. You may select one of these values or choose your own.

4.7.13.2 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

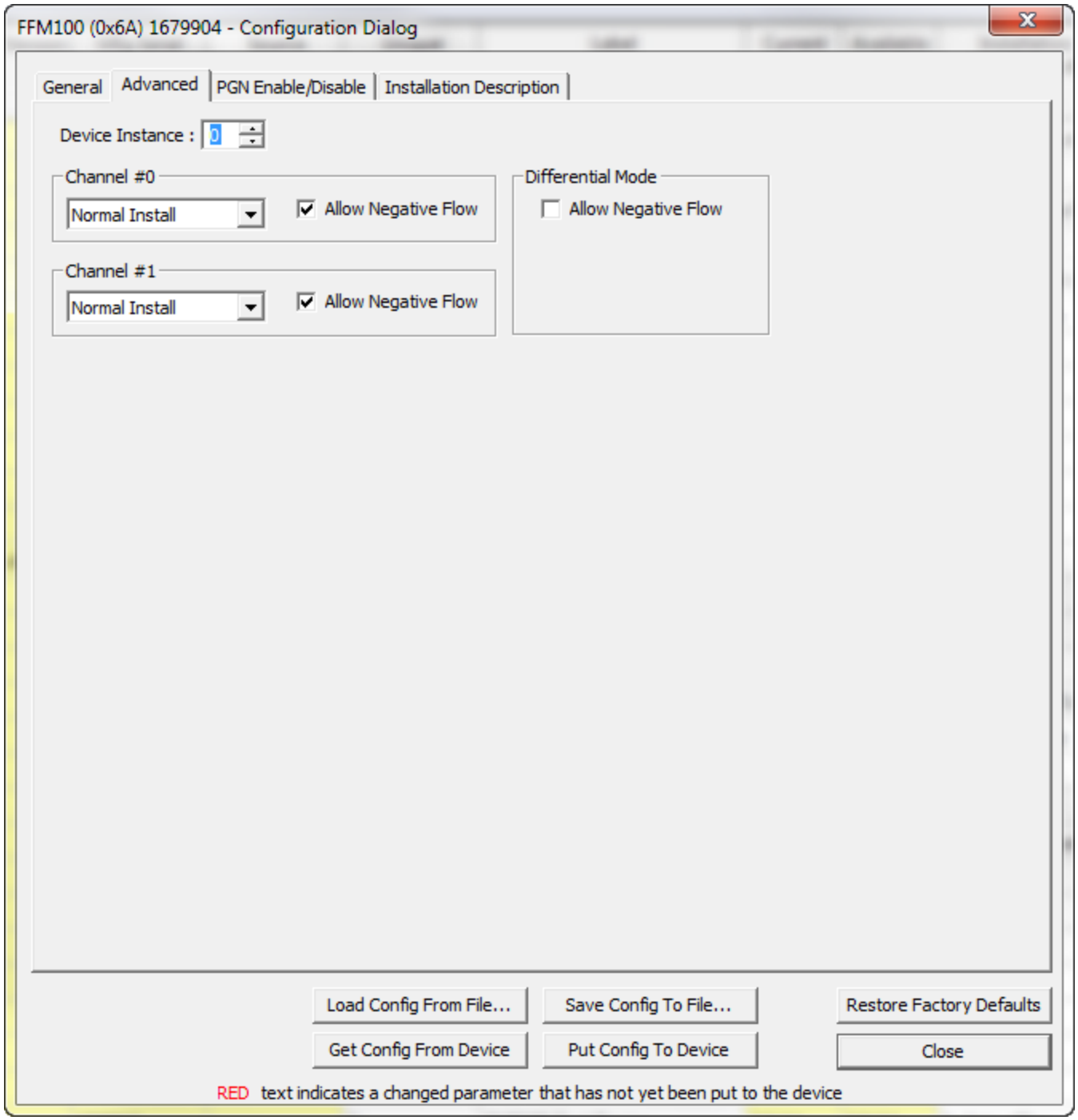


Figure 51 – FFM100 Advanced Tab

4.7.13.2.1 Device Instance

The device comes from the factory with the device instance value set to 0. If you have multiple of these devices on a network, you may find it necessary to set the device instances of other devices of this type so that they are different.

4.7.13.2.2 Channel #x Installation

If you a fluid flow sensor with the "FLOW" arrow on the sensors pointing in the same direction as the fuel flow, you will not need to change this parameter from the factory default setting. If you inadvertently install the sensor in the reverse direction, rather than reinstalling the sensor, you may change this parameter from "Normal Install" to "Reverse Install", and the FFM100 will compensate for the reversed installation of the flow sensor.

4.7.13.2.3 Channel #x Allow Negative Flow

In Two Independent Sensors mode, if you are using Maretron fuel flow sensors which can detect negative flow (flow in the opposite direction from the flow arrow), click this checkbox to allow negative values of fluid flow to be transmitted. If this checkbox is cleared, then a zero value will be transmitted for fluid flow whenever any negative flow is detected. This checkbox is ignored in Differential mode.

4.7.13.2.4 Differential Mode Allow Negative Flow

In Differential mode, if you want to see a negative flow value if the Return flow is greater than the Supply flow, check this checkbox. If this checkbox is cleared, then the FFM100 will transmit a zero flow value whenever the return flow is greater than the supply flow.

This checkbox is ignored in Two Independent Sensors mode.

4.7.13.3 PGN Enable/Disable Tab

This tab allows you to enable or disable the transmission of the periodic messages output by the device. You may enable or disable the transmission of the messages, or may program the time interval between transmissions of a specific message, for devices which support the programming of time intervals.

When you first open the PGN Enable/Disable tab, a list of periodic PGN's transmitted by the device will appear. The mode column will read "On", if the device is currently transmitting the message, or "Off", if the message has not yet been detected from the device.

You may configure each periodic message with one of the following choices:

1) Disable – this will turn off the periodic transmission of this message
2) Default – this will turn on the periodic transmission of this message at the default rate
3) A numeric value that will turn on the periodic transmission of this message at the specified rate

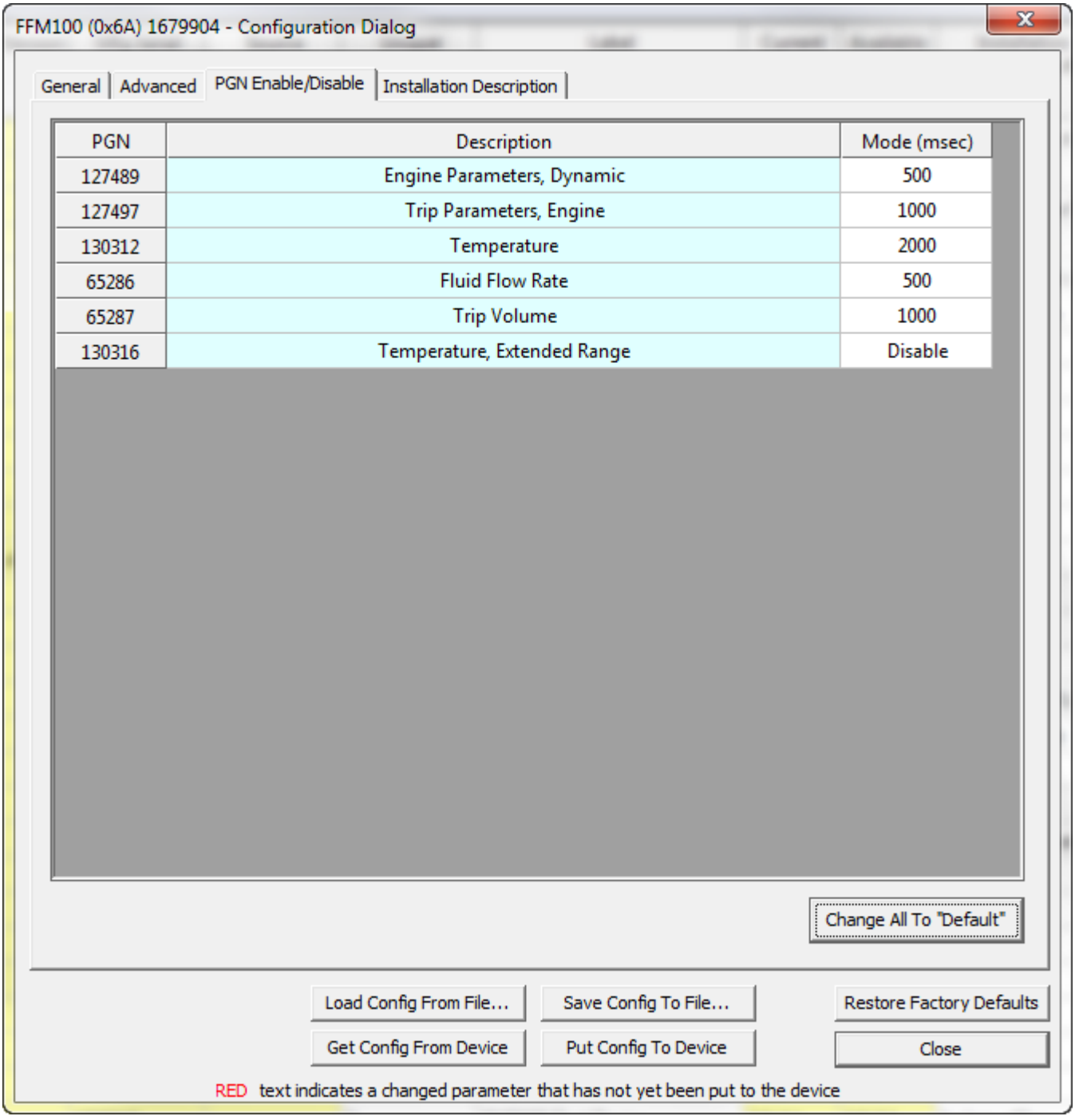


Figure 52 – FFM100 PGN Enable/Disable tab

4.7.14 FPM100

4.7.14.1 General Tab

This tab contains commonly-used configuration items.

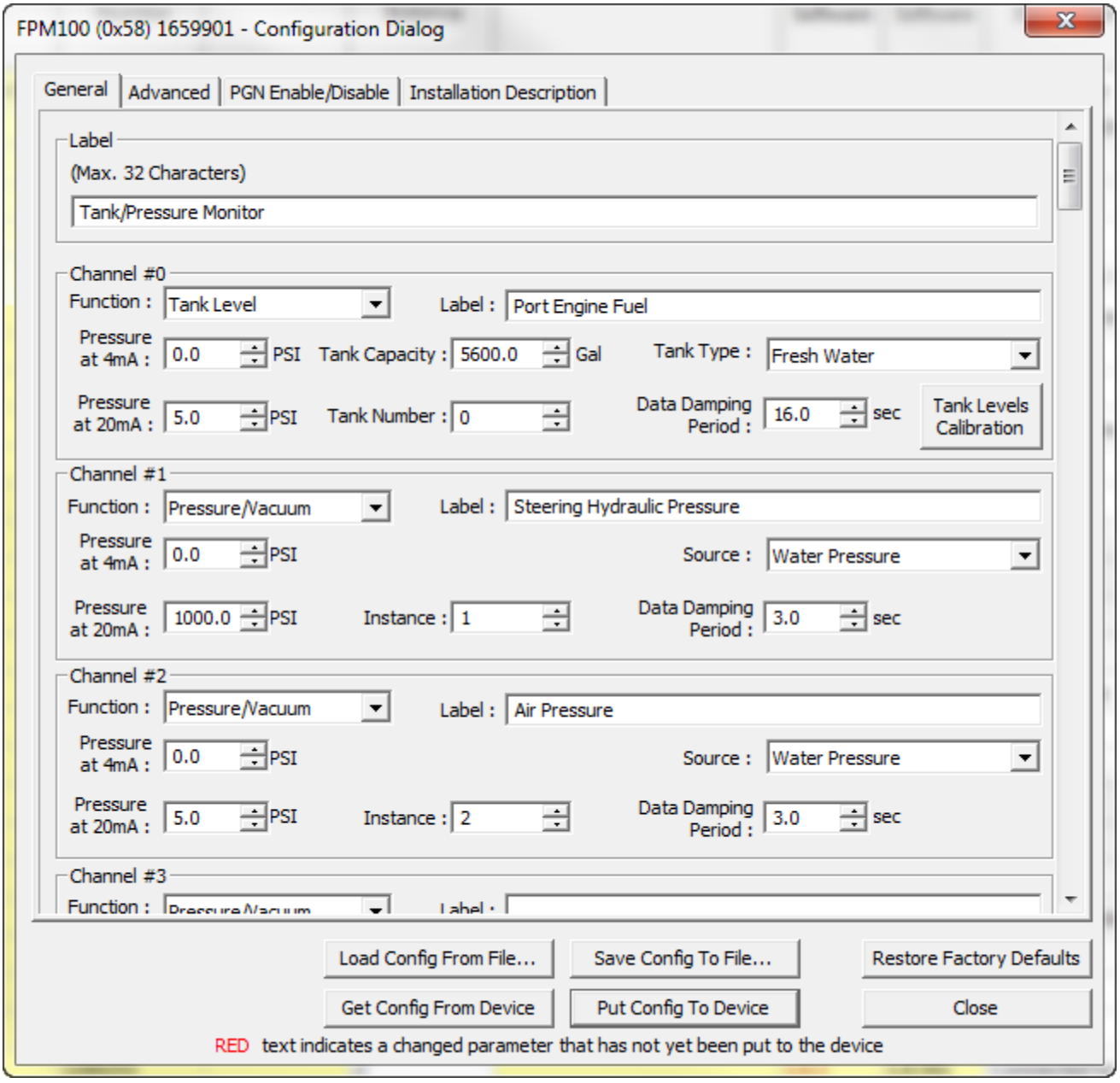


Figure 53 – FPM100 General Tab

4.7.14.1.1 Label

This text box allows you to assign a text label to the device. This label is visible in Maretron analysis and display products and allows you to easily identify the particular device.

4.7.14.1.2 Function

The FPM100 has 6 individually configurable channels. Each channel can be programmed to operate in one of three modes:

- Pressure/Vacuum Mode – In this mode, the FPM100 measures and transmits pressure and/or vacuum directly over the NMEA 2000 network
- Tank Mode – In this mode, the FPM100 measures pressure and uses information about the tank dimensions and the type of fluid in the tank to calculate a tank level, which is transmitted over the NMEA 2000 network
- Disable – The channel is disabled and transmits no data over the NMEA 2000 network

The Disable mode requires no configuration. The following sections describe in detail the configuration of an FPM100 channel for Pressure/Vacuum Mode and in Tank Mode.

4.7.14.1.3 Label

Program this parameter with a text string which identifies the particular parameter being monitored by this channel. Maretron display products will display this label text when you are selecting data to display.

4.7.14.1.4 Pressure at 4mA

Program this parameter to match the pressure reading of the pressure transducer when it is sourcing a current of 4mA. You can determine this value by examining the specification of the pressure transducer being used.

4.7.14.1.5 Pressure at 20mA

Program this parameter to match the pressure reading of the pressure transducer when it is sourcing a current of 20mA. You can determine this value by examining the specification of the pressure transducer being used.

4.7.14.1.6 Tank Capacity

NOTE: This parameter is available only when the channel is configured into Tank mode.

In addition to indicating the fluid level within a tank, the FPM100 also has the ability to be configured or programmed with the attached tank's capacity. This way, you will be able to view the tank's capacity as well as the amount of liquid remaining anywhere on the vessel where there is an NMEA 2000® compatible display.

4.7.14.1.7 Instance

NOTE: This parameter is available only when the channel is configured into Pressure/Vacuum mode.

Program this parameter to match the desired instance number of the pressure reading for this channel. You can program this parameter to any value between 0 and 252.

4.7.14.1.8 Tank Number

NOTE: This parameter is available only when the channel is configured into Tank mode.

As shipped from the factory, the FPM100 transmits the Tank Number as "0". The FPM100 supports up to sixteen tanks (0 through 15) for a given type of tank, which means you can

monitor up to 16 separate fuel tanks or 16 separate fresh water tanks. The FPM100 is configured or programmed by choosing a FPM100 tank number using a display product such as the Maretron DSM250. Refer to the user's manual of the particular product that will be used for configuring the FPM100 as these manuals provide detailed instruction on configuration procedures.

4.7.14.1.9 Source

NOTE: This parameter is available only when the channel is configured into Pressure/Vacuum mode.

You can configure a "Source" descriptor to be transmitted with the pressure reading which is used to provide an indication of the source of the pressure data for this channel. Choices are as follows:

- Water Pressure
- Atmospheric Pressure
- Compressed Air Pressure
- Hydraulic Pressure
- Steam Pressure
- 16 User Defined pressure sources (User Defined 129 – User Defined 144)

4.7.14.1.10 Tank Type

NOTE: This parameter is available only when the channel is configured into Tank mode.

As shipped from the factory, the FPM100 transmits the tank type as "Fuel". You can reconfigure the FPM100 for any of these tank types:

- Fuel
- Fresh Water
- Waste Water
- Live Well
- Oil
- Black Water
- Reserved-1 through Reserved-7 (if none of the above types apply)

4.7.14.1.11 Data Damping Period

You can configure a damping parameter to smooth the tank level or pressure/vacuum readings or make them more responsive. The data damping is configurable between 0.2-25.0 seconds. The default data damping for a channel in Tank mode is 15.0 seconds. The default data damping for a channel in Pressure/Vacuum mode is 3.0 seconds.

4.7.14.1.12 Tank Levels Calibration

NOTE: This parameter is available only when the channel is configured into Tank mode.

Pressing this button opens the Tank Calibration dialog, which is shown below.

There are two methods of calibration: Manual Table and Step Fill Table

4.7.14.1.13 Manual Table

Using the manual table method, you enter each entry of the measured parameter (depth) and the level of fluid in the tank. The table may have as few as 2 entries (for a tank with rectangular cross-section) or as many as 16 entries (for a tank with a complex cross-section).

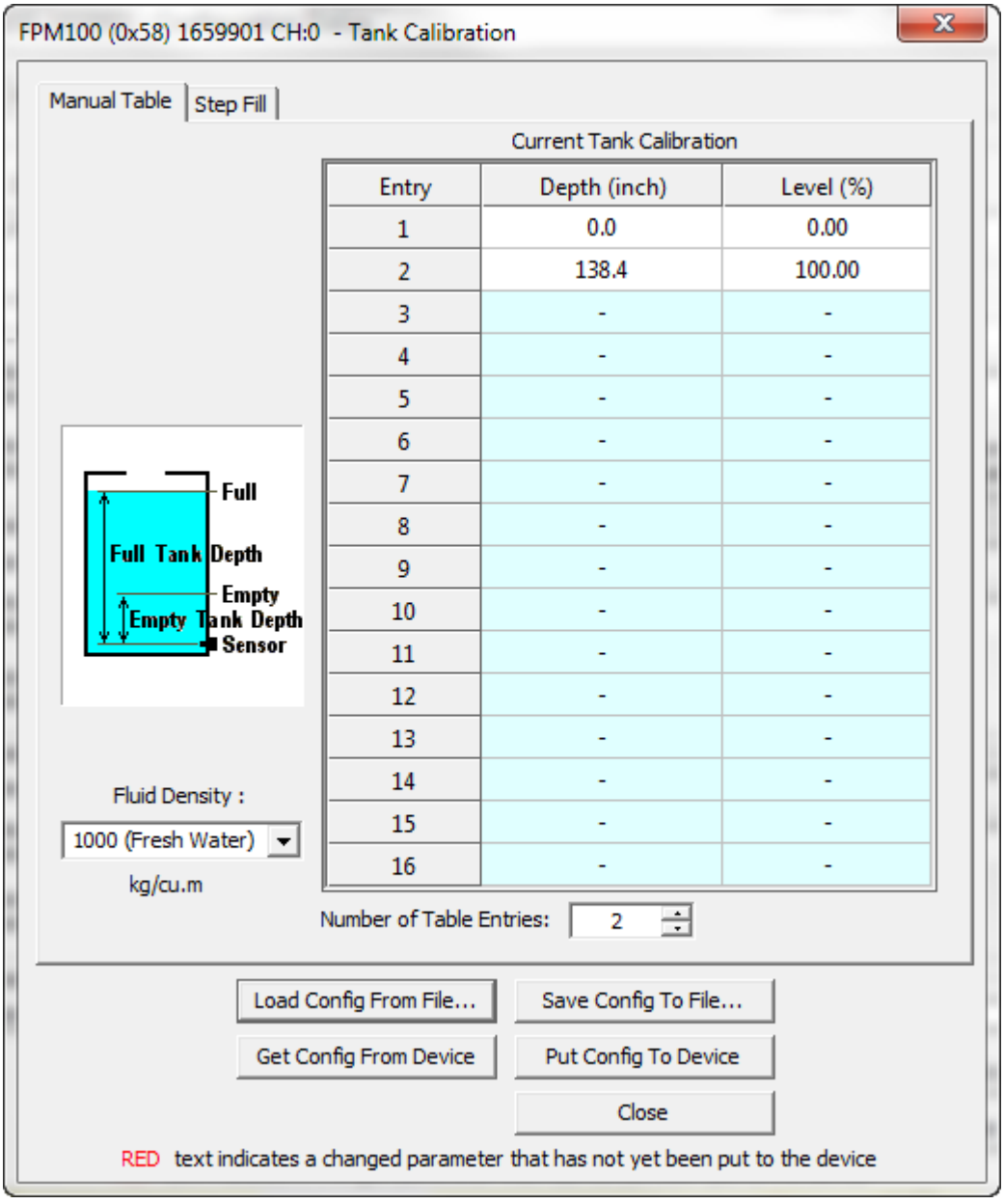


Figure 54 – FPM100 Tank Calibration Manual Table Window

4.7.14.1.13.1 Fluid Density

In order to convert the pressure measured into the height of a column of fluid, the FPM100 must know the density of the fluid being measured. This control allows you to program the FPM100 with the proper fluid density. You may choose from Diesel Fuel 20, Diesel Fuel 60, Fresh Water, or you may enter a different numeric density value appropriate to the fluid whose depth is being measured.

4.7.14.1.13.2 Number of Table Entries

You may choose the number of entries to be in the calibration table. Two is sufficient for a tank with a rectangular cross-section. The FPM100 supports up to 16 table entries for supporting tanks with more complex cross-sections.

4.7.14.1.13.3 Current Tank Calibration

This grid shows the values of the tank calibration table. Each line of the grid has two entries:

1) Tank Depth – this is the height of the fluid above the pressure sensor port
2) Level (%) – this is the percent full the tank is at the specific tank depth

4.7.14.1.14 Step Fill Table

In the Step Fill Table method, you start with an empty tank, and then fill the tank with fluid, stopping at intermediate points to enter the amount of fluid put into the tank thus far, ending once the tank is full. You may enter between two and sixteen calibration points.

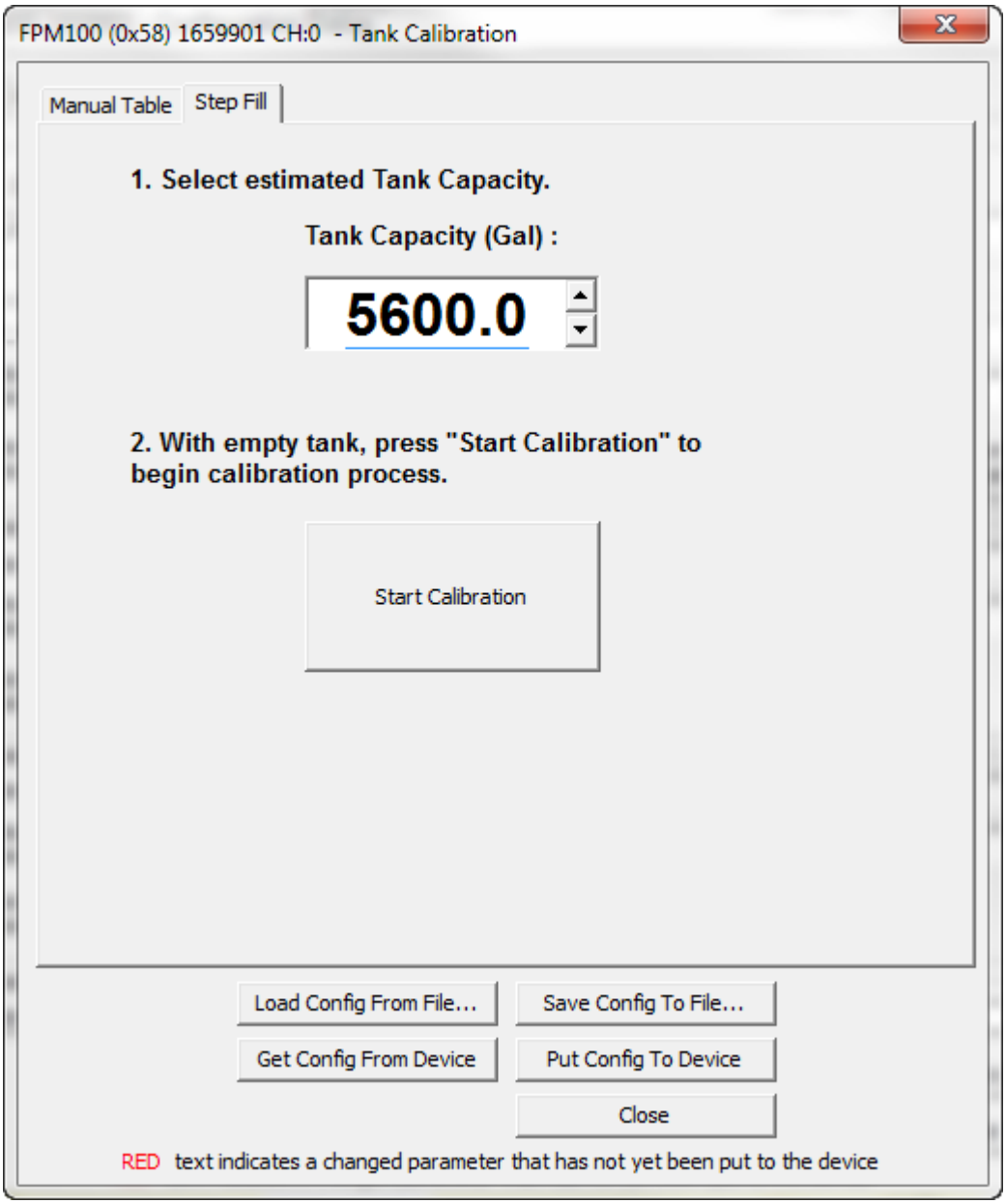


Figure 55 – FPM100 Step Fill Calibration Initial Window

To use this method, use the following steps:

1) Enter the estimated total capacity of the tank into the “Total Capacity” text box.
2) Press the “Start Calibration” button. You will now see the Step Fill Calibration window displayed, as shown below.

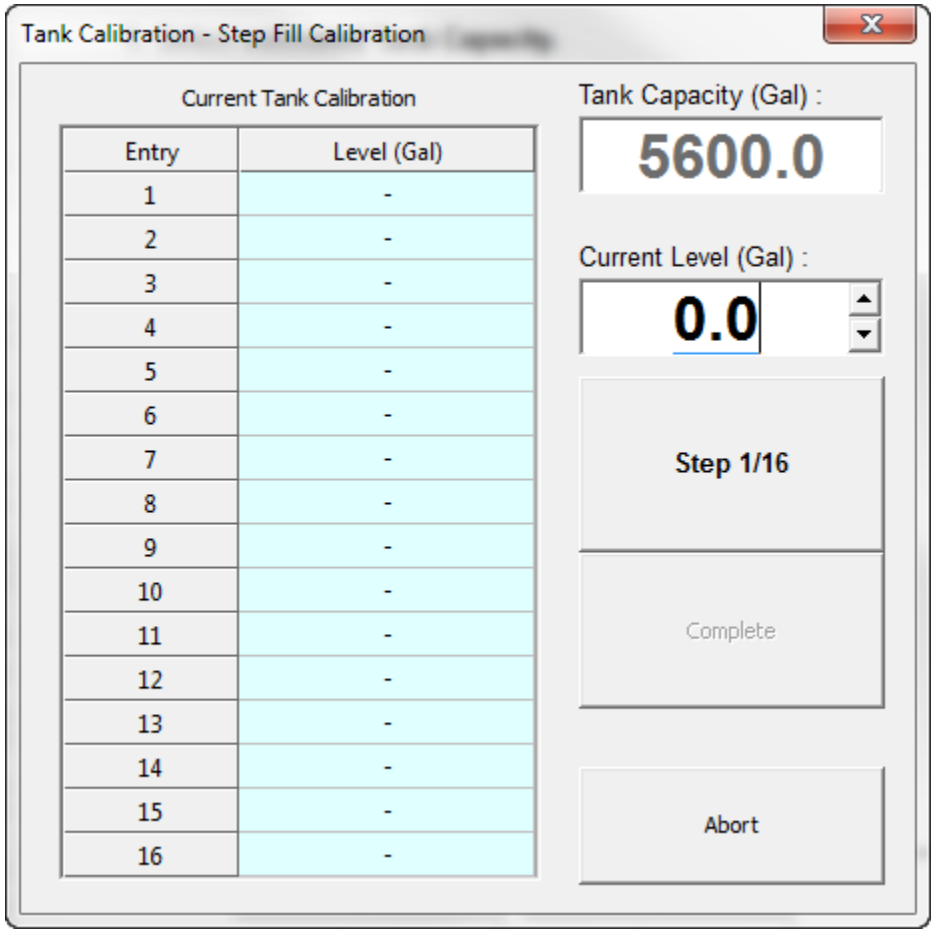


Figure 56 – FPM100 Step Fill Calibration Initial Window

3) Enter "0" into the Current Level text box, and press "Step". You have now entered the first point of the table.
4) Partially fill the tank. Enter the amount of fluid pumped into the tank into the "Current Level" text box, and press "Step" (if you make a mistake entering a level, you can press "Back" and re-enter the level, If you want to cancel the process, press the "Abort" button).
5) Repeat the previous step until the tank is completely filled.

Once you have entered the last point, where the tank is 100% full, press "Complete". This will cause the table to be stored in the device.

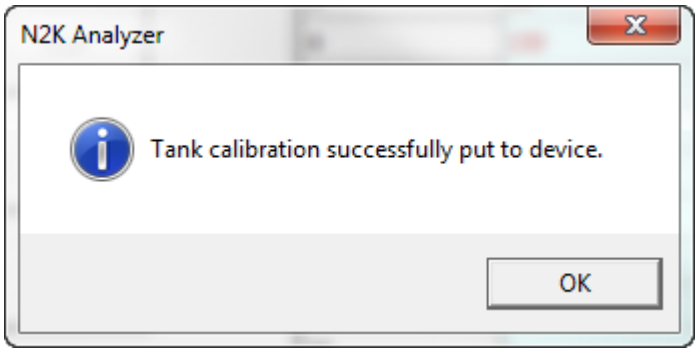


Figure 57 – FPM100 Tank Fill Confirmation Dialog Box

4.7.14.2 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

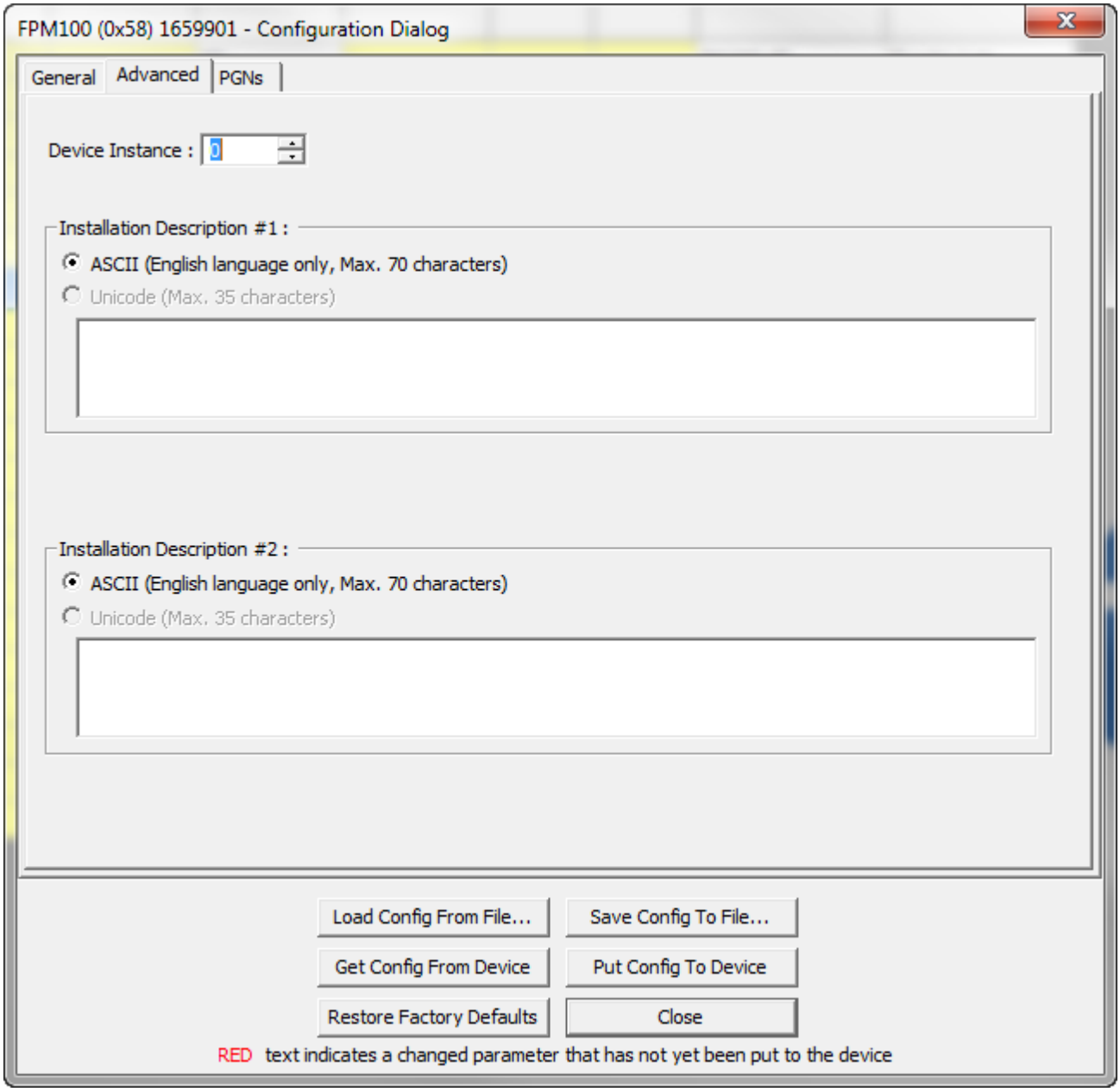


Figure 58 – FPM100 Advanced Tab

4.7.14.2.1 Device Instance

The device comes from the factory with the device instance value set to 0. If you have multiple of these devices on a network, you may find it necessary to set the device instances of other devices of this type so that they are different.

4.7.14.2.2 Installation Description #1, #2

This device, along with all other Level A certified NMEA devices, has two user-programmable installation description fields. You may program these fields with information specific to the

device, such as date installed, the initials/name of the installer, the physical location of the device, etc. This configuration option will allow you to program the values of these fields.

4.7.14.3 PGNs tab

This tab allows you to enable or disable the transmission of the periodic messages output by the device. You may enable or disable the transmission of the messages, or may program the time interval between transmissions of a specific message, for devices which support the programming of time intervals.

When you first open the PGNs tab, a list of periodic PGN's transmitted by the device will appear. The mode column will read "On", if the device is currently transmitting the message, or "Off", if the message has not yet been detected from the device.

You may configure each periodic message with one of the following choices:

1) Disable – this will turn off the periodic transmission of this message
2) Default – this will turn on the periodic transmission of this message at the default rate
3) A numeric value that will turn on the periodic transmission of this message at the specified rate

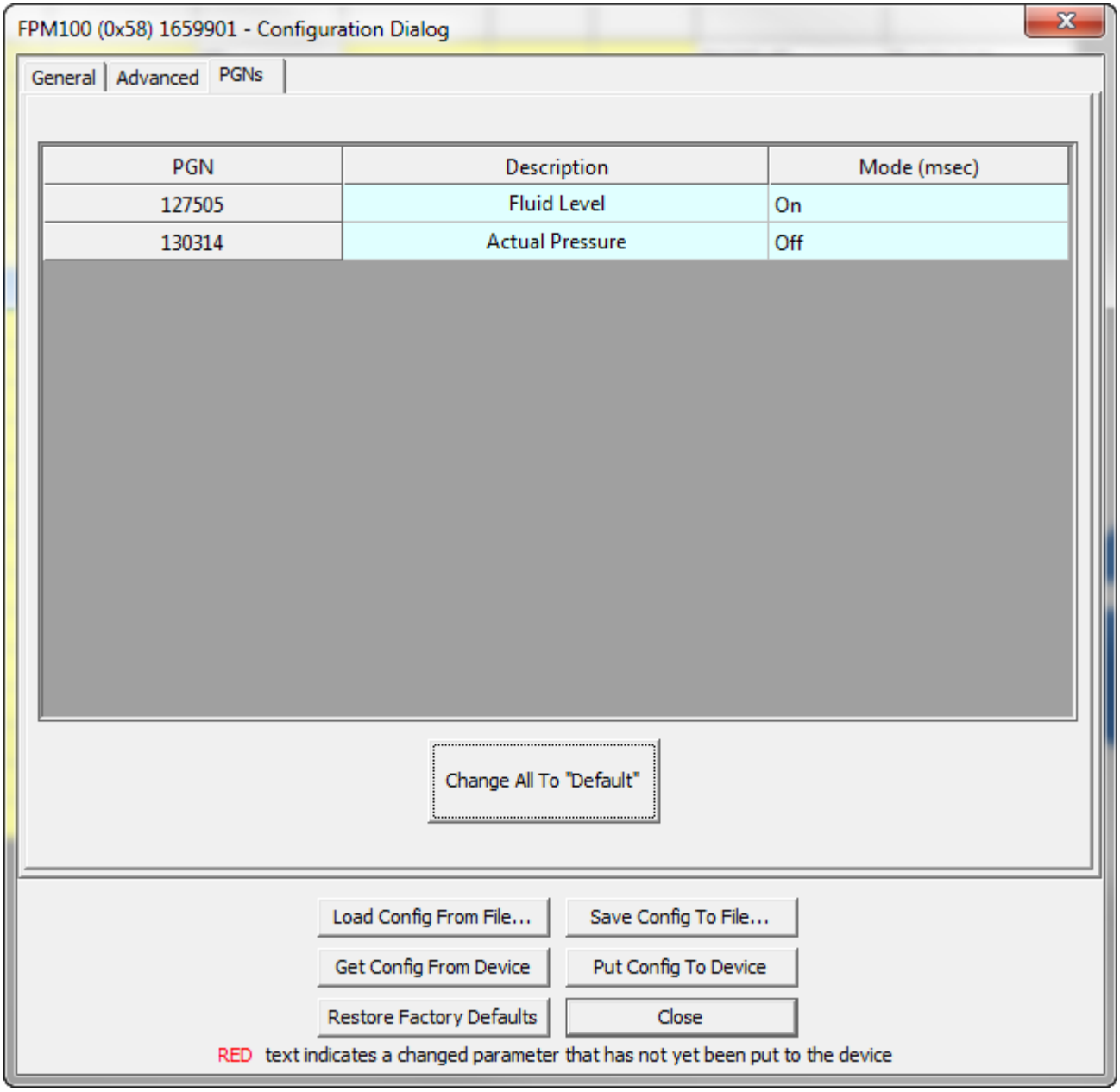


Figure 59 – FPM100 PGN Enable/Disable tab

4.7.15 GPS100

4.7.15.1 General Tab

This tab contains commonly-used configuration items.

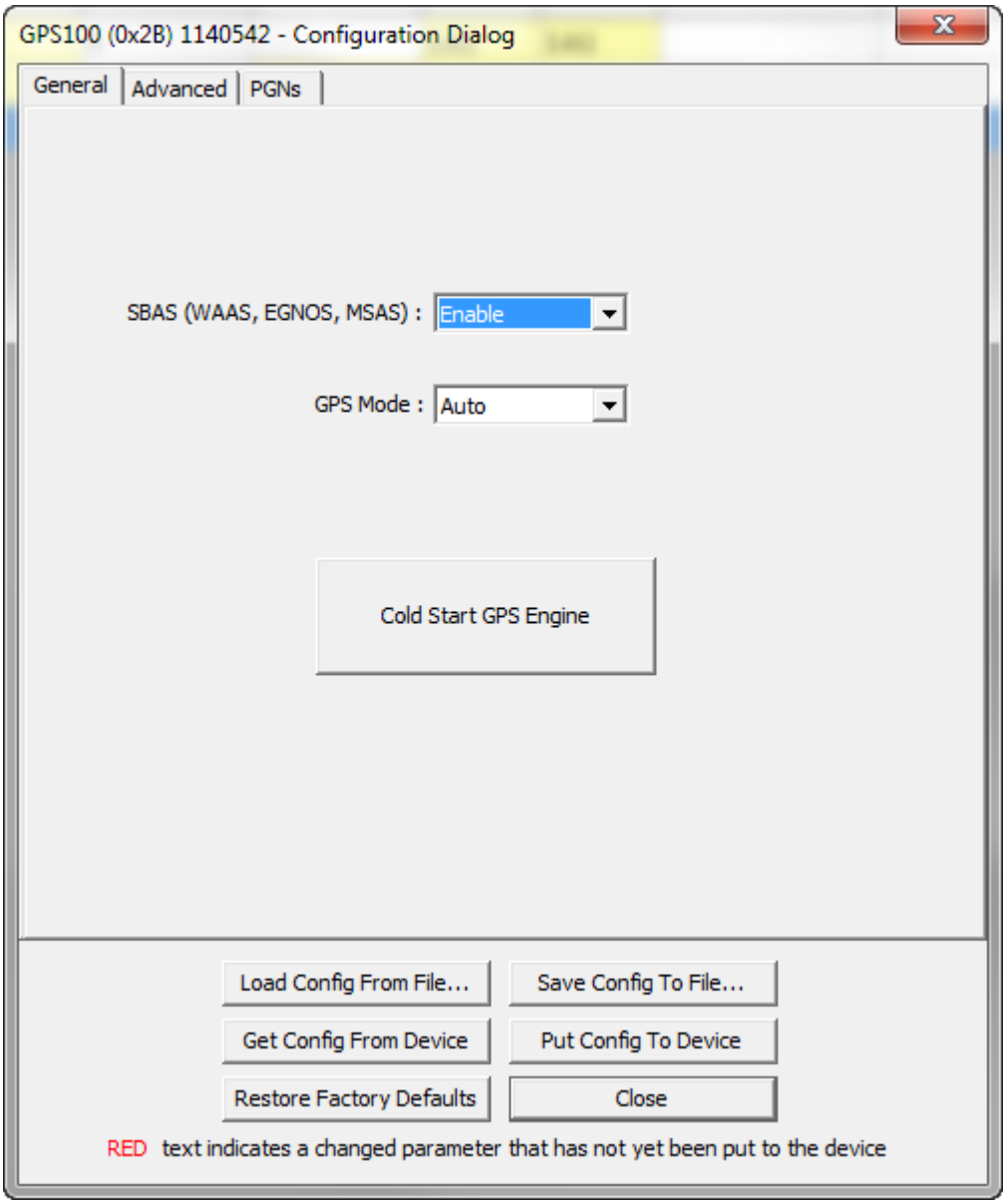


Figure 60 – GPS100 General Tab

4.7.15.1.1 SBAS (WAAS, EGNOS, MSAS)

The GPS200 may be programmed to use SBAS (WAAS) using the best available SBAS satellite (factory default). Alternatively, SBAS may be disabled.

4.7.15.1.2 GPS Mode

You may choose the desired operating mode for the GPS engine: 1D (time only), 2D, 3D, or best available (factory default).

4.7.15.1.3 Cold Start GPS Engine

Clicking this button will cause the GPS engine to restart, discarding all time, position, almanac, and ephemeris data.

4.7.15.2 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

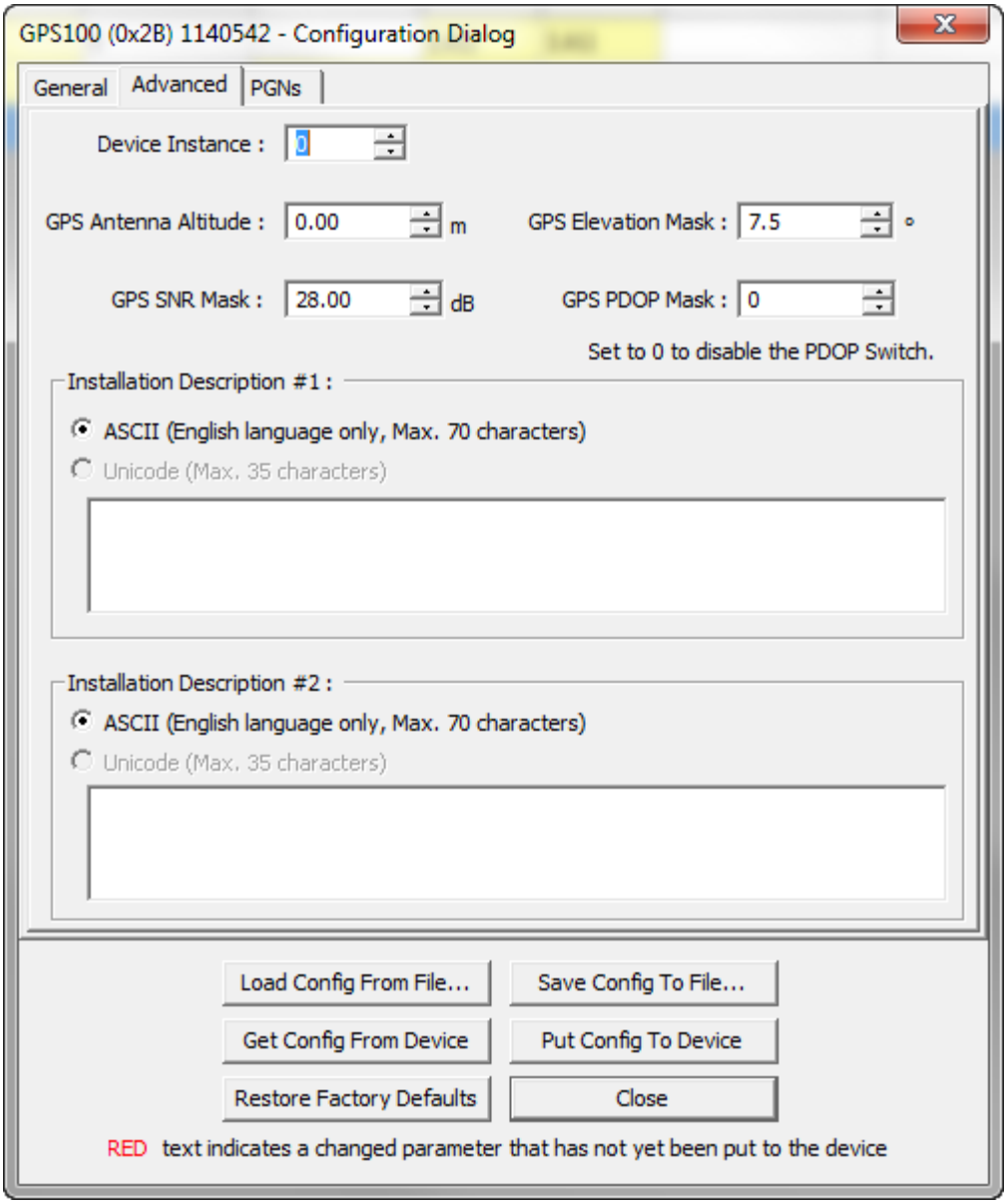


Figure 61 – GPS100 Advanced Tab

4.7.15.2.1 Device Instance

The device comes from the factory with the device instance value set to 0. If you have multiple of these devices on a network, you may find it necessary to set the device instances of other devices of this type so that they are different.

4.7.15.2.2 GPS Antenna Altitude

A user may specify an antenna altitude for use when the GPS100 is operating in 2D mode. As shipped from the factory, the GPS100 will use the altitude calculated when it was last operating in 3D mode.

4.7.15.2.3 GPS Elevation Mask

As shipped from the factory, the GPS100 uses all visible satellites in its position solution, regardless of the elevation (angle above the horizon). A user may specify a SV Elevation Mask, such that only satellites with an elevation greater than this value will be used in the position solution.

4.7.15.2.4 GPS SNR Mask

As shipped from the factory, the GPS100 will use all detectable satellites in its position solution, regardless of the signal-to-noise ratio (SNR). A user may specify a SNR mask, such that such that only satellites with an SNR greater than this value will be used in the position solution.

4.7.15.2.5 GPS PDOP Mask

as shipped from the factory, the GPS100 will report a GPS fix whenever possible, regardless of the value of position dilution of precision (PDOP). A user may specify a PDOP Mask, such that whenever the PDOP is above the specified value, the GPS100 will report that no GPS fix is available.

4.7.15.2.6 Installation Description #1, #2

This device, along with all other Level A certified NMEA devices, has two user-programmable installation description fields. You may program these fields with information specific to the device, such as date installed, the initials/name of the installer, the physical location of the device, etc. This configuration option will allow you to program the values of these fields.

4.7.15.3 PGNs Tab

This tab allows you to enable or disable the transmission of the periodic messages output by the device. You may enable or disable the transmission of the messages, or may program the time interval between transmissions of a specific message, for devices which support the programming of time intervals.

When you first open the PGNs tab, a list of periodic PGN's transmitted by the device will appear. The mode column will read "On", if the device is currently transmitting the message, or "Off", if the message has not yet been detected from the device.

You may configure each periodic message with one of the following choices:

1) Disable – this will turn off the periodic transmission of this message
2) Default – this will turn on the periodic transmission of this message at the default rate
3) A numeric value that will turn on the periodic transmission of this message at the specified rate

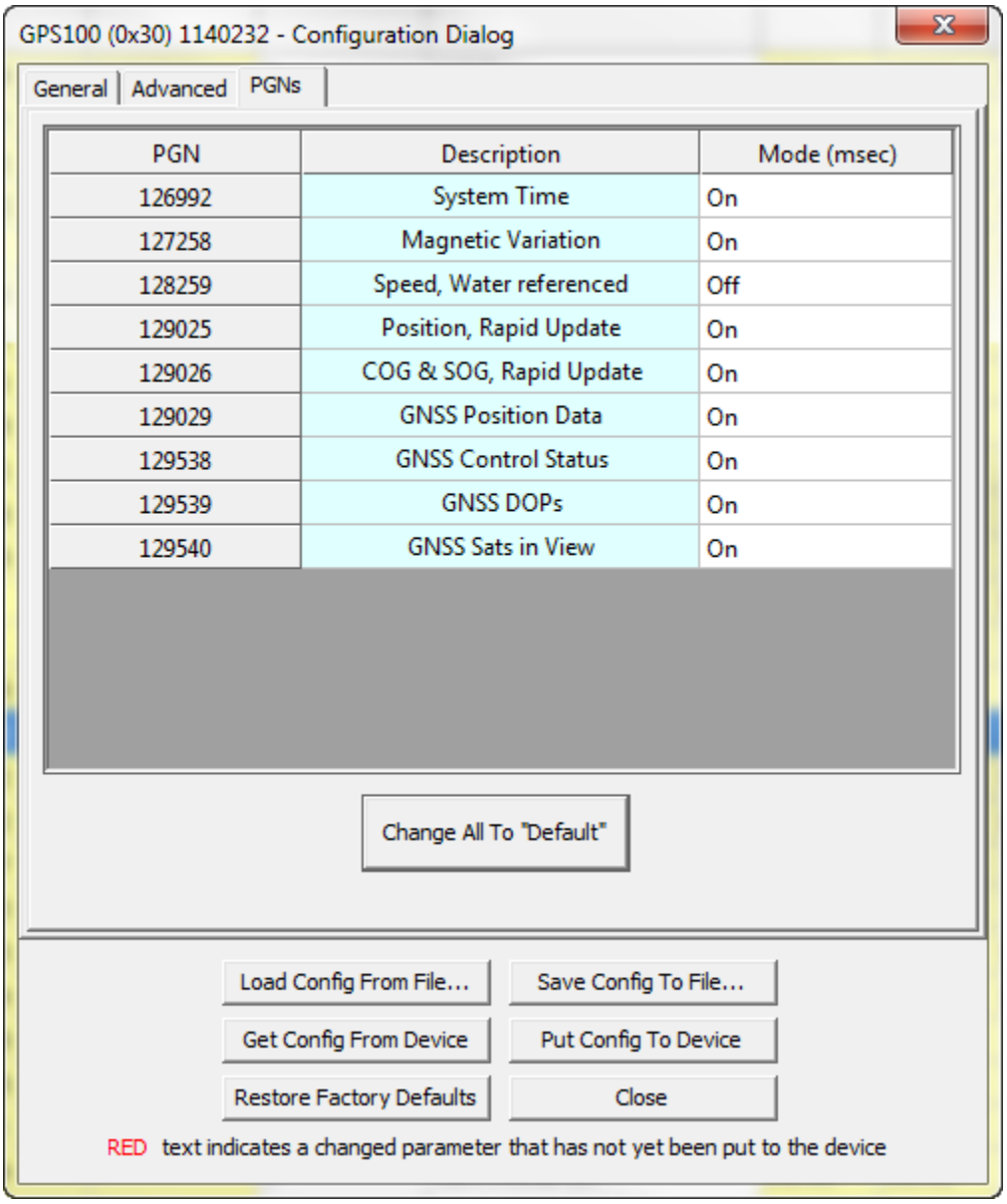


Figure 62 – GPS100 PGNs Tab

4.7.16 GPS200

4.7.16.1 General Tab

This tab contains commonly-used configuration items.

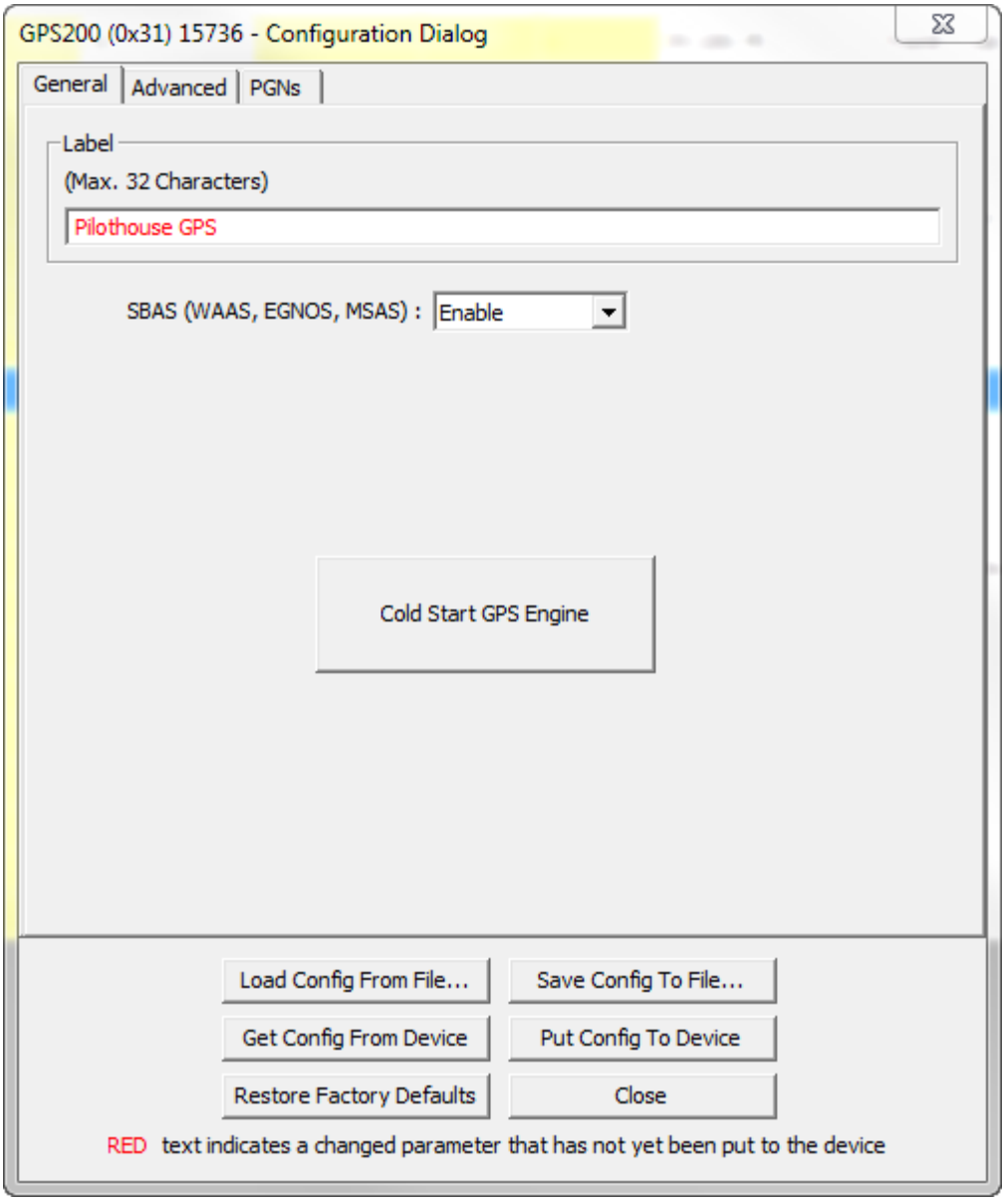


Figure 63 – GPS200 General Tab

4.7.16.1.1 Label

This text box allows you to assign a text label to the device. This label is visible in Maretron analysis and display products and allows you to easily identify the particular device.

4.7.16.1.2 SBAS (WAAS, EGNOS, MSAS)

The GPS200 may be programmed to use SBAS (WAAS) using the best available SBAS satellite (factory default). Alternatively, SBAS may be disabled.

4.7.16.1.3 Cold Start GPS Engine

Clicking this button will cause the GPS engine to restart, discarding all time, position, almanac, and ephemeris data.

4.7.16.2 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

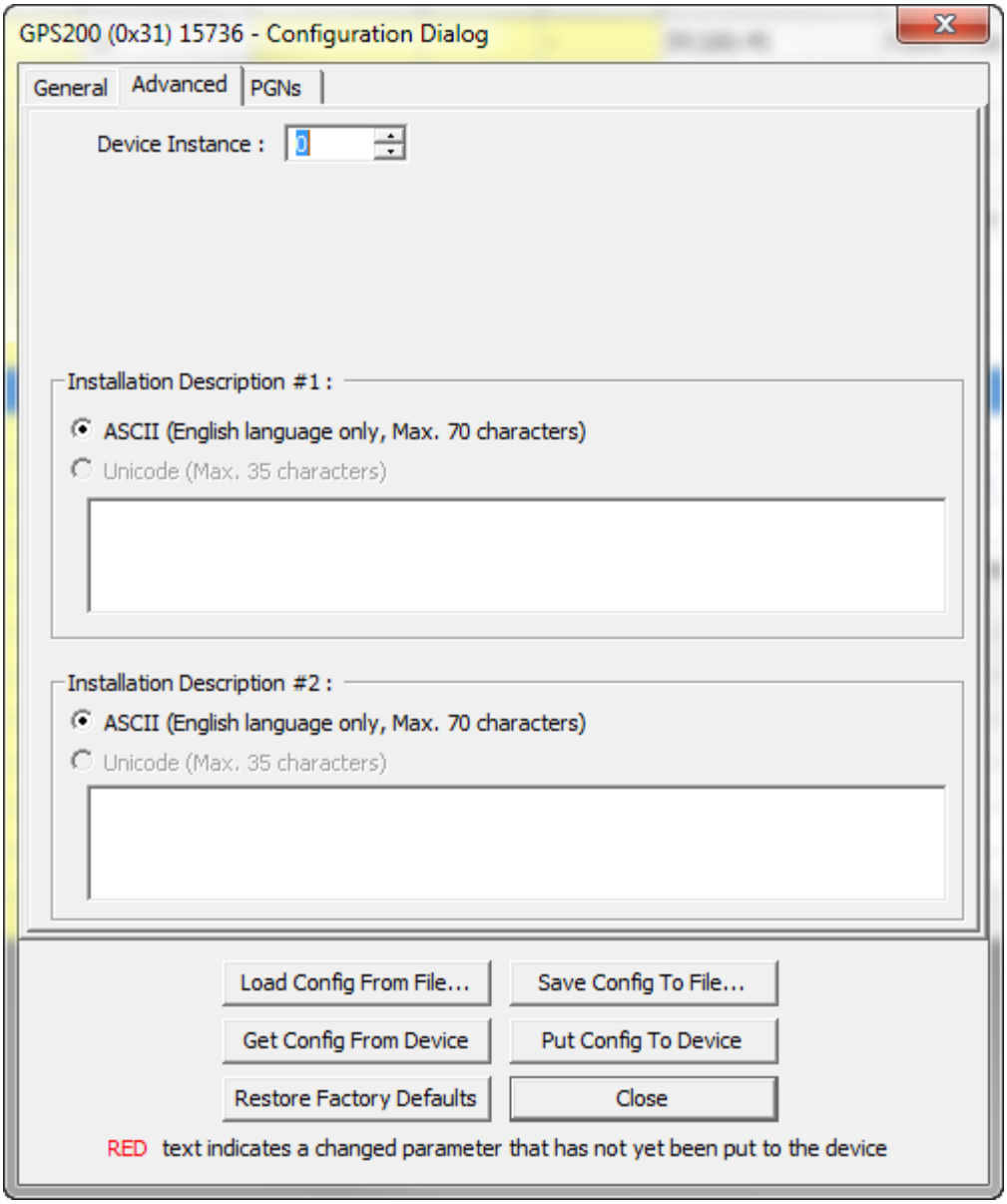


Figure 64 – GPS200 Advanced Tab

4.7.16.2.1 Device Instance

The device comes from the factory with the device instance value set to 0. If you have multiple of these devices on a network, you may find it necessary to set the device instances of other devices of this type so that they are different.

4.7.16.2.2 Installation Description #1, #2

This device, along with all other Level A certified NMEA devices, has two user-programmable installation description fields. You may program these fields with information specific to the device, such as date installed, the initials/name of the installer, the physical location of the device, etc. This configuration option will allow you to program the values of these fields.

4.7.16.3 PGNs Tab

This tab allows you to enable or disable the transmission of the periodic messages output by the device. You may enable or disable the transmission of the messages, or may program the time interval between transmissions of a specific message, for devices which support the programming of time intervals.

When you first open the PGNs tab, a list of periodic PGN's transmitted by the device will appear. The mode column will read "On", if the device is currently transmitting the message, or "Off", if the message has not yet been detected from the device.

You may configure each periodic message with one of the following choices:

1) Disable – this will turn off the periodic transmission of this message
2) Default – this will turn on the periodic transmission of this message at the default rate
3) A numeric value that will turn on the periodic transmission of this message at the specified rate

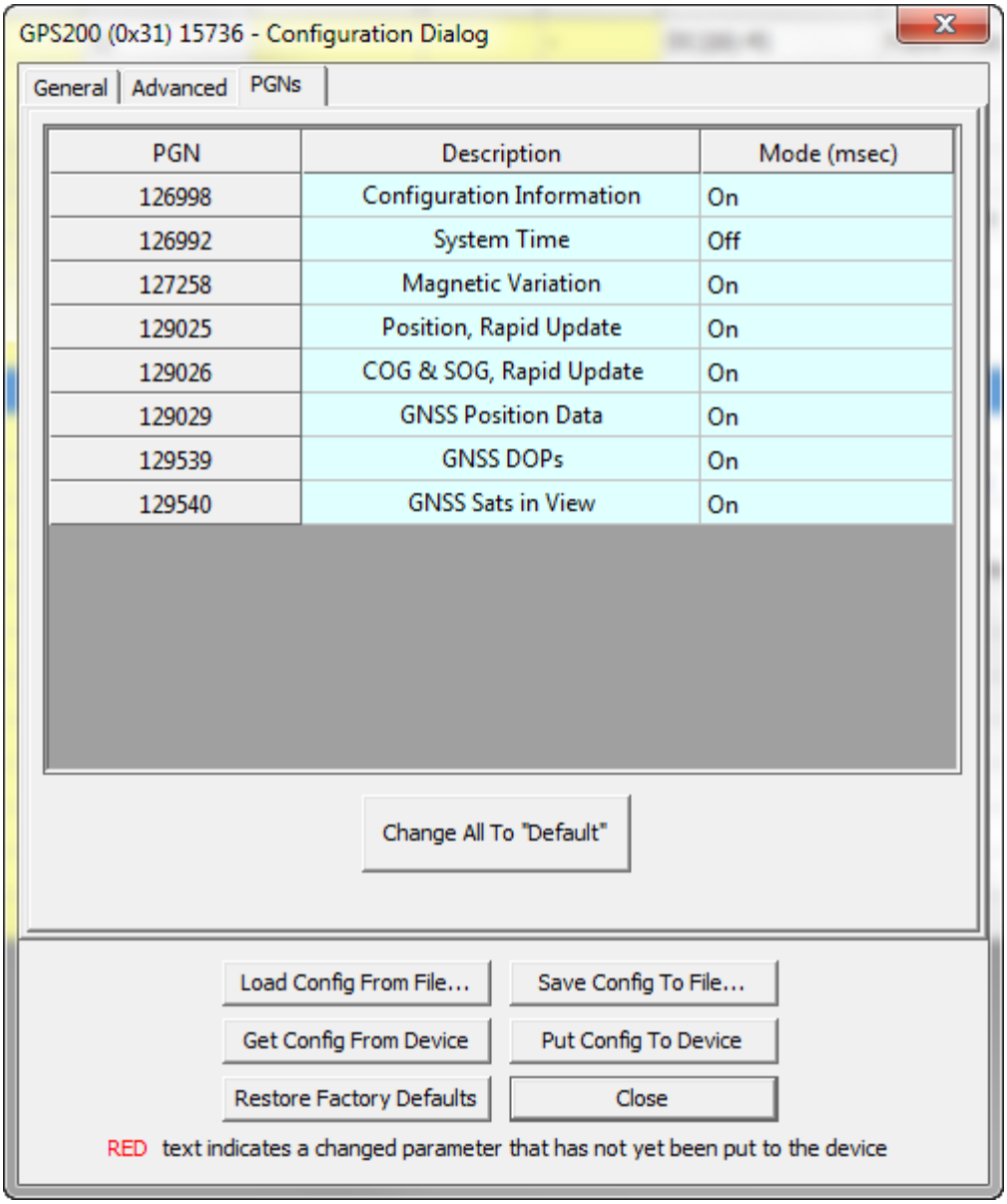


Figure 65 – GPS200 PGNs Tab

4.7.17 IPG100

4.7.17.1 General Tab

This tab contains commonly-used configuration items.

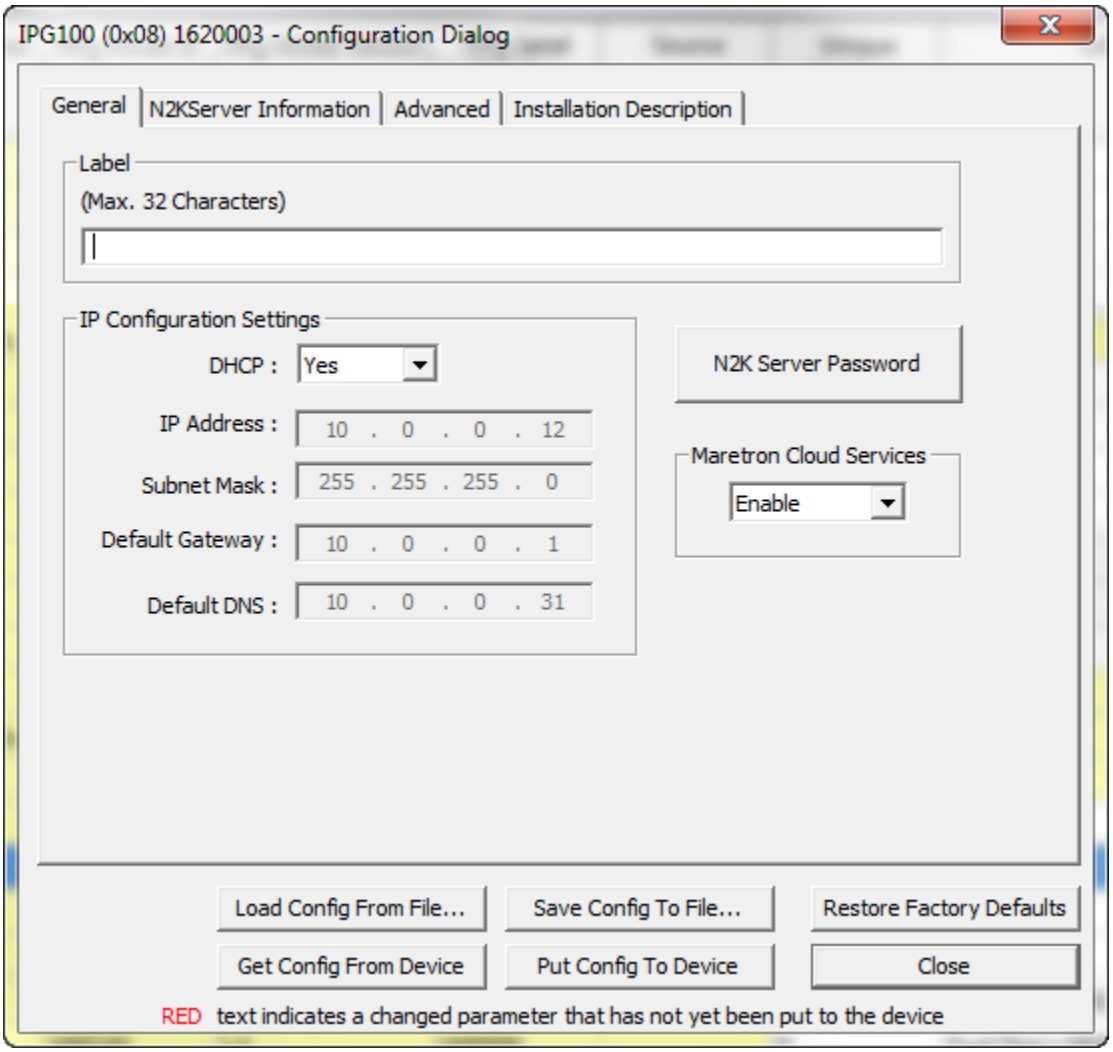


Figure 66 – IPG100 General Tab

4.7.17.1.1 Label

This text box allows you to assign a text label to the device. This label is visible in Maretron analysis and display products and allows you to easily identify the particular device.

4.7.17.1.2 DHCP

This parameter determines whether or not the IPG100 obtains its LAN connection settings from a DHCP server on the local area network. When set to “Yes” (the default value), the IPG100 will obtain all necessary connection settings (IP Address, Subnet Mask, Default Gateway, and Default DNS) from a DHCP server on the local area network. Most routers have the capability to act as a DHCP server. Consult the user documentation for your network’s router for details.

If there is no DHCP server on the local area network (or if the IPG100 is connected directly to a DSM800 or directly to an MBB100), set the "DHCP" parameter to "No" and manually configure the IP Address, Subnet Mask, Default Gateway, Default DNS.

4.7.17.1.3 IP Address

This parameter is the IP (Internet Protocol) address used by the IPG100. You will need to specify this address to N2KView® clients in order to allow them to connect to the IPG100. If the "DHCP" parameter is set to "Yes", you do not need to configure this parameter. If the "DHCP" parameter is set to "No", you will need to configure this parameter.

4.7.17.1.4 Subnet Mask

This is a mask used to divide an IP Address into subnets. Basically, it tells the computer how much of the IP Address defines the network, and how much may be used by computers on the network. For most networks, the first three parts of the IP address define the network (i.e., every computer on the network must have the same values), and the last part defines the computer (i.e., every computer on the network must have a different value). Where the value 255 appears in the subnet mask, the values define the network and must be the same.

The most common value is 255.255.255.0.

If the "DHCP" parameter is set to "Yes", you do not need to configure this parameter. If the "DHCP" parameter is set to "No", you will need to configure this parameter.

4.7.17.1.5 Default Gateway

This is the IP address of the router. If the "DHCP" parameter is set to "Yes", you do not need to configure this parameter. If the "DHCP" parameter is set to "No", you will need to configure this parameter.

4.7.17.1.6 Default DNS

This is the IP address of a computer on the Internet that can identify and locate computer systems and resources on the internet. In most cases, this should not be required by the IPG100 and may be left blank. If the "DHCP" parameter is set to "No", you will need to configure this parameter.

4.7.17.1.7 N2KServer Password

This button allows you to configure the password for the N2KServer in the IPG100 that clients use to authenticate themselves to the N2KServer, as shown in the figure below.

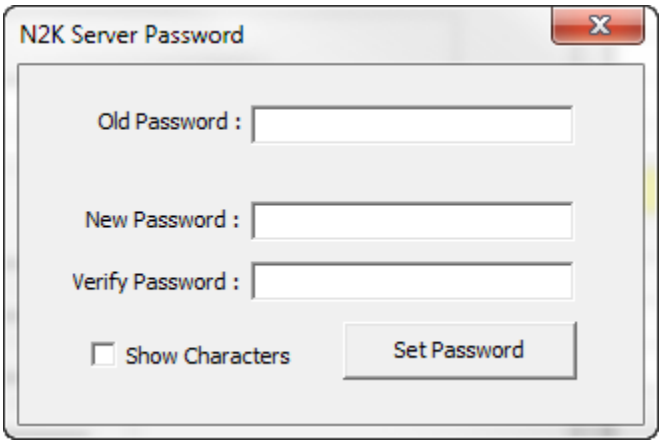


Figure 67 – IPG100 N2KServer Password Tab

Old Password

Enter the current N2KServer password in this text box.

4.7.17.1.8 New Password

Type the new N2KServer password in this text box.

4.7.17.1.9 Verify Password

Retype the new N2KServer password in this text box.

4.7.17.1.10 Show Characters

If you check this box, the passwords will be visible.

4.7.17.1.11 Set Password

Once you have typed in the old password and the new password, click this button to store the new password to the IPG100.

4.7.17.1.12 Maretron Cloud Services

This field allows you to enable Maretron Cloud Services for the IPG100 by setting it to "Enable". If you do not subscribe to Maretron Cloud Services for this IPG100, then set this to "Disable".

4.7.17.2 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

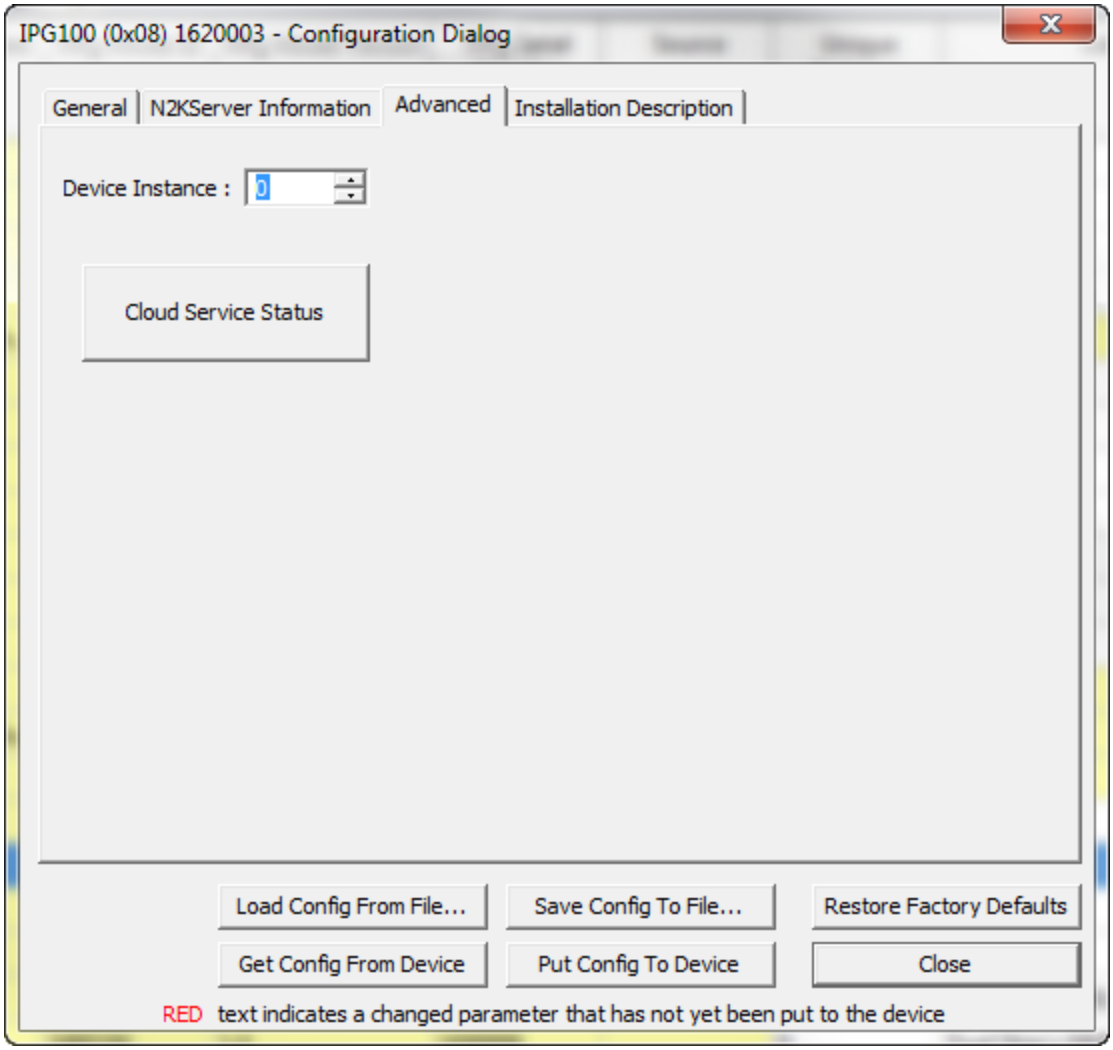


Figure 68 – IPG100 Advanced Tab

4.7.17.3 Installation Description Tab

This tab allows you to set values for the installation description properties of the device.

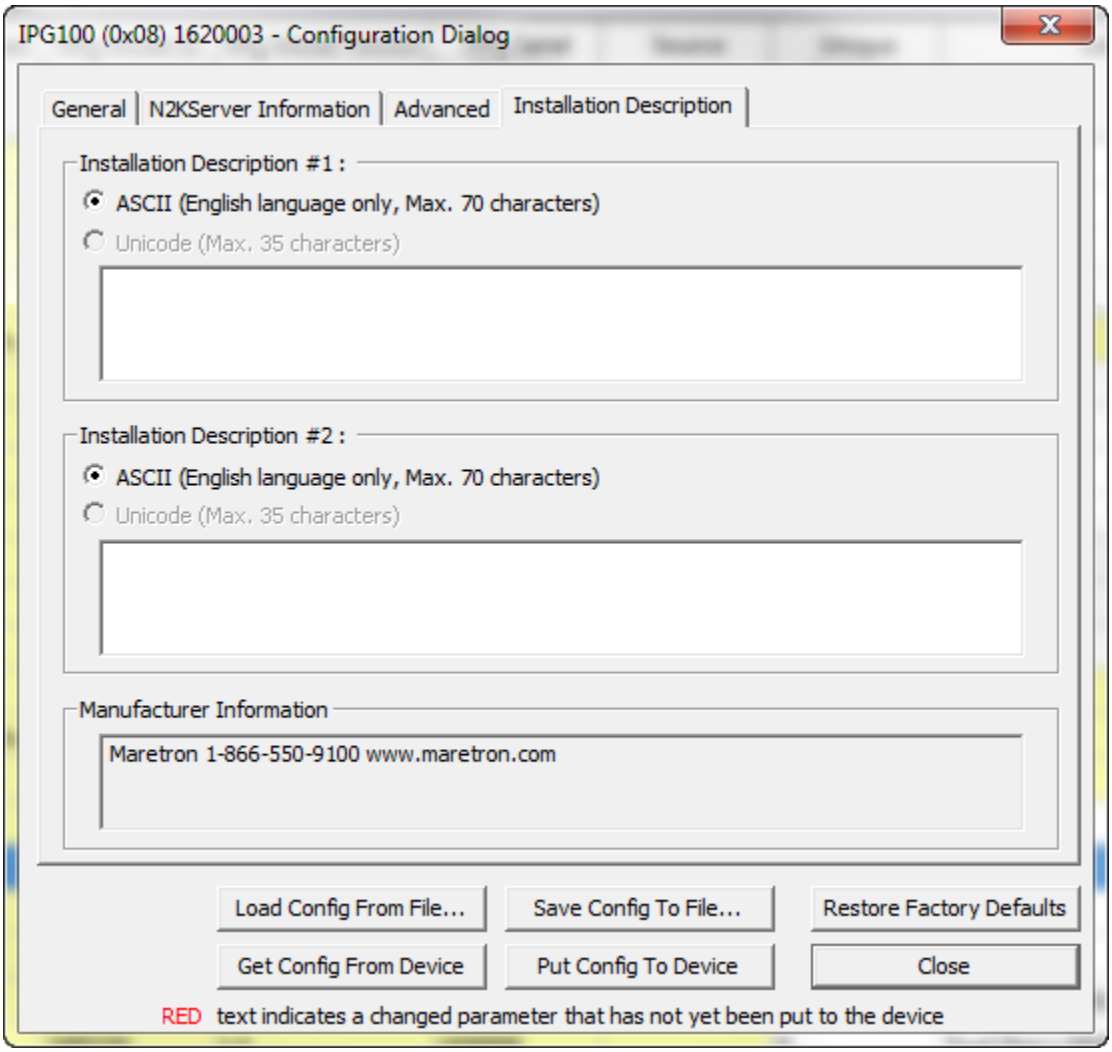


Figure 69 – IPG100 Installation Description Tab

4.7.17.3.1 Installation Description #1, #2

This device, along with all other Level A certified NMEA devices, has two user-programmable installation description fields. You may program these fields with information specific to the device, such as date installed, the initials/name of the installer, the physical location of the device, etc. This configuration option will allow you to program the values of these fields.

4.7.17.4 N2KServer Information Tab

This tab displays information about the N2KServer running on the IPG100

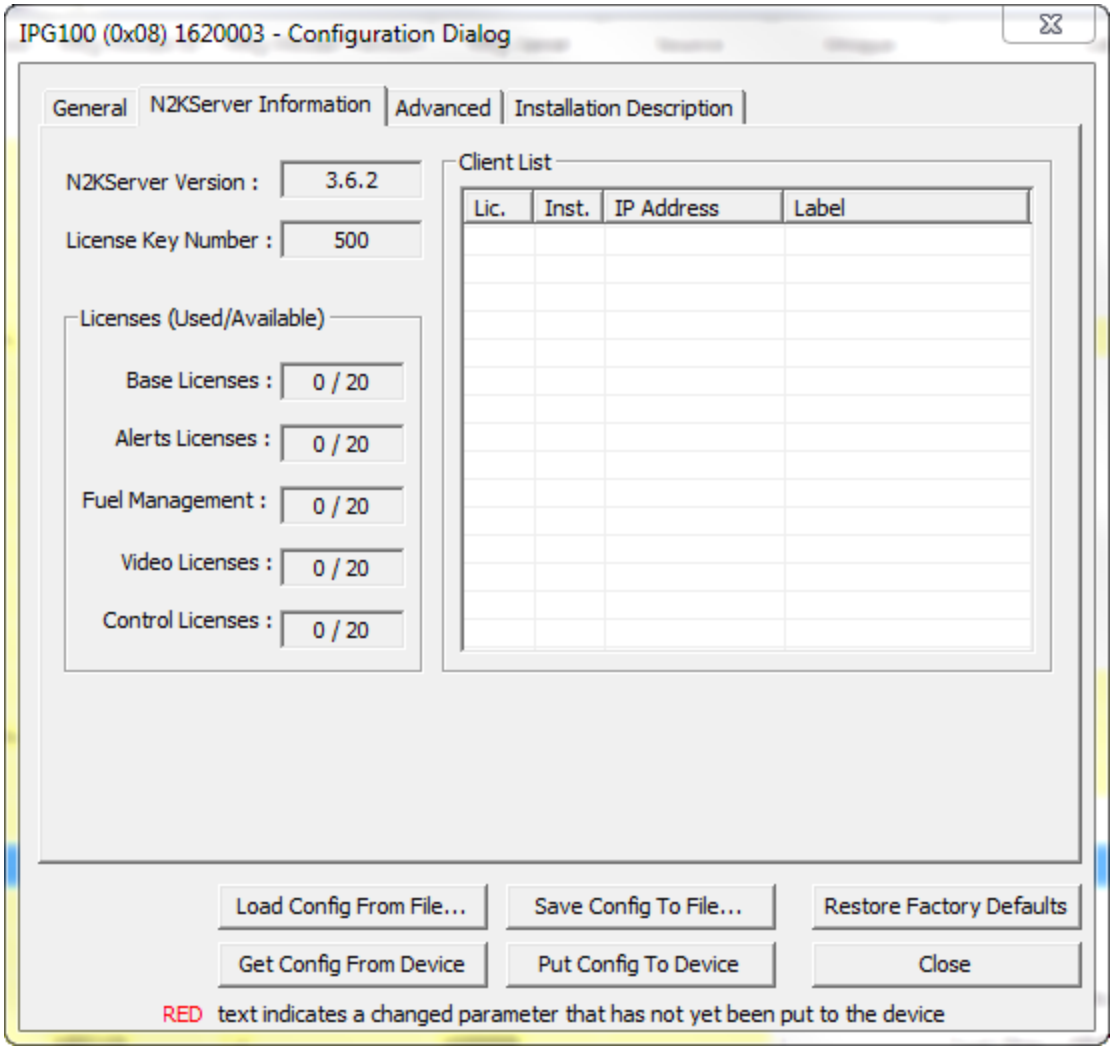


Figure 70 – IPG100 N2KServer Information Tab

4.7.17.4.1 N2KServer Version

This field displays the version number of the N2KServer running on the IPG100.

4.7.17.4.2 License Key Number

This field displays the serial number of the hardware license key plugged into the IPG100.

4.7.17.4.3 Base Licenses

This field displays the number of base licenses in use, followed by the total number of base licenses.

4.7.17.4.4 Alerts License

This field displays the number of alerts licenses in use, followed by the total number of alerts licenses.

4.7.17.4.5 Fuel Management License

This field displays the number of fuel management licenses in use, followed by the total number of fuel management licenses.

4.7.17.4.6 Video License

This field displays the number of video licenses in use, followed by the total number of video licenses.

4.7.17.4.7 Control License

This field displays the number of control licenses in use, followed by the total number of control licenses.

4.7.17.4.8 Client List

This window shows a summary of the clients currently connected to the IPG100.

The following fields are displayed:

- Lic. – This field displays the type of license used: “P” for Platinum, or “B” for Basic.
- Inst. – This field displays the instance number assigned to the client
- IP Address – This field displays the IP address of the connected client
- Label – This field shows the Label assigned to the connected client

4.7.18 J2K100

4.7.18.1 General Tab

This tab contains commonly-used configuration items.

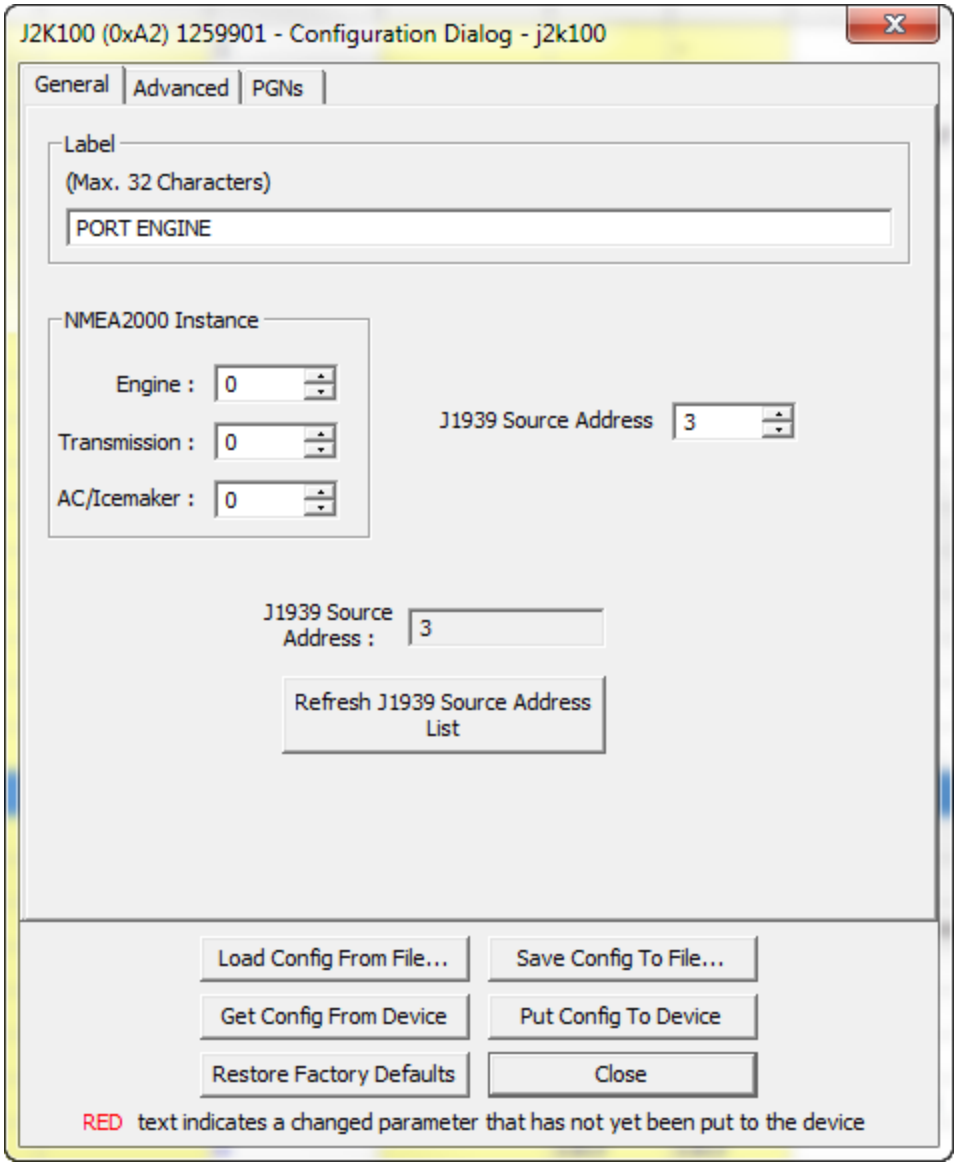


Figure 71 – J2K100 General Tab

4.7.18.2 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

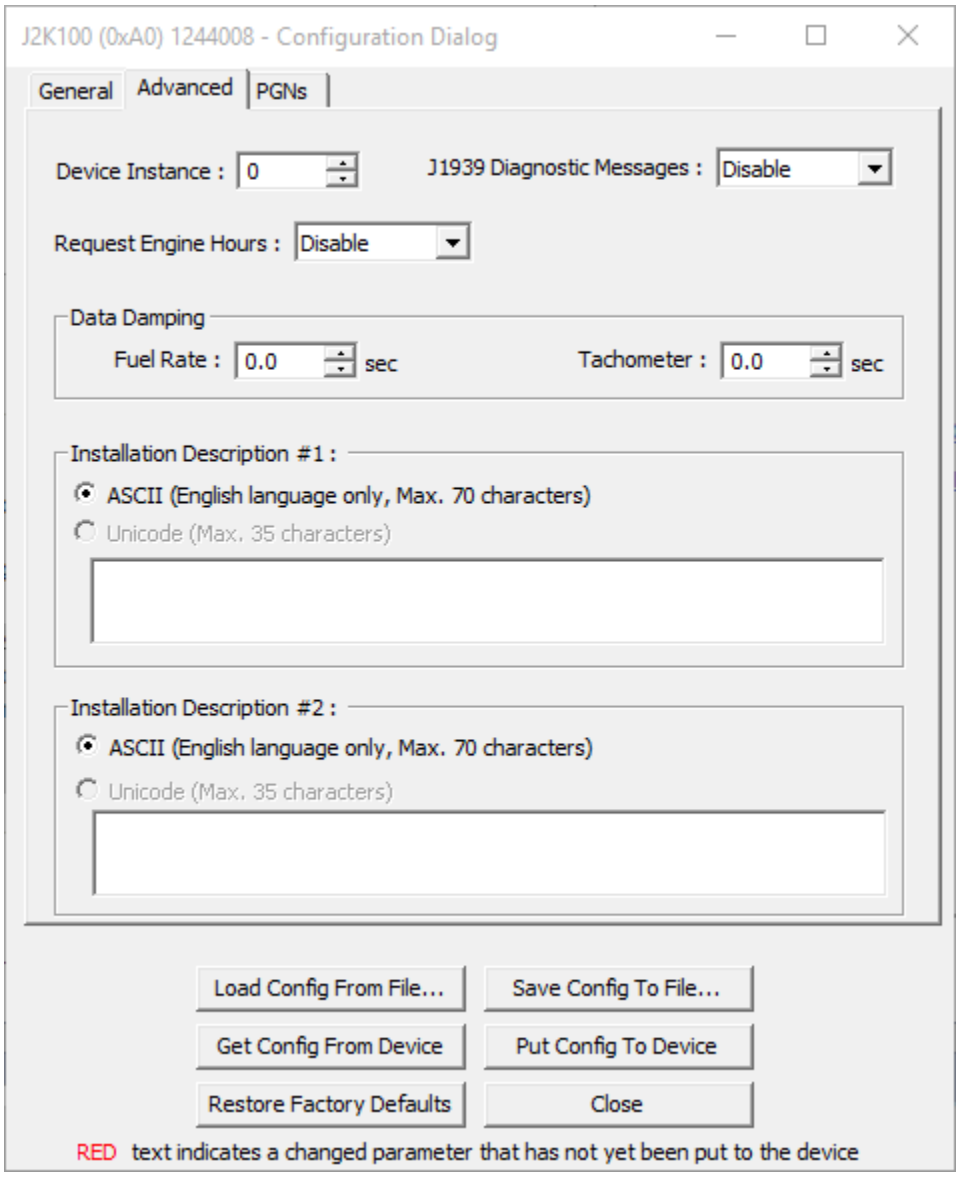


Figure 72 – J2K100 Advanced Tab

4.7.18.2.1 Device Instance

The device comes from the factory with the device instance value set to 0. If you have multiple of these devices on a network, you may find it necessary to set the device instances of other devices of this type so that they are different.

4.7.18.2.2 J1939 Diagnostic Messages

The J2K100 can optionally pass through J1939 diagnostic messages, used to indicate fault conditions on engines and transmissions, from the J1939 interface to the NMEA 2000® network so that NMEA 2000® connected displays can interpret these diagnostic codes.

4.7.18.2.3 Request Engine Hours

Some J1939 ECU's will not transmit engine hours unless they are requested to do so by another device on the J1939 network. If this setting is enabled, then the J2K100 will periodically transmit a request for the engine hours message to the J1939 ECU over the J1939 network. This is the only time the J2K100 will transmit messages over the J1939 network. If this setting is disabled, then the J2K100 will not transmit any messages over the J1939 network.

4.7.18.2.4 Installation Description #1, #2

This device, along with all other Level A certified NMEA devices, has two user-programmable installation description fields. You may program these fields with information specific to the device, such as date installed, the initials/name of the installer, the physical location of the device, etc. This configuration option will allow you to program the values of these fields.

4.7.18.3 PGNs Tab

This tab allows you to enable or disable the transmission of the periodic messages output by the device. You may enable or disable the transmission of the messages, or may program the time interval between transmissions of a specific message, for devices which support the programming of time intervals.

When you first open the PGNs tab, a list of periodic PGN's transmitted by the device will appear. The mode column will read "On", if the device is currently transmitting the message, or "Off", if the message has not yet been detected from the device.

You may configure each periodic message with one of the following choices:

1) Disable – this will turn off the periodic transmission of this message
2) Default – this will turn on the periodic transmission of this message at the default rate
3) A numeric value that will turn on the periodic transmission of this message at the specified rate

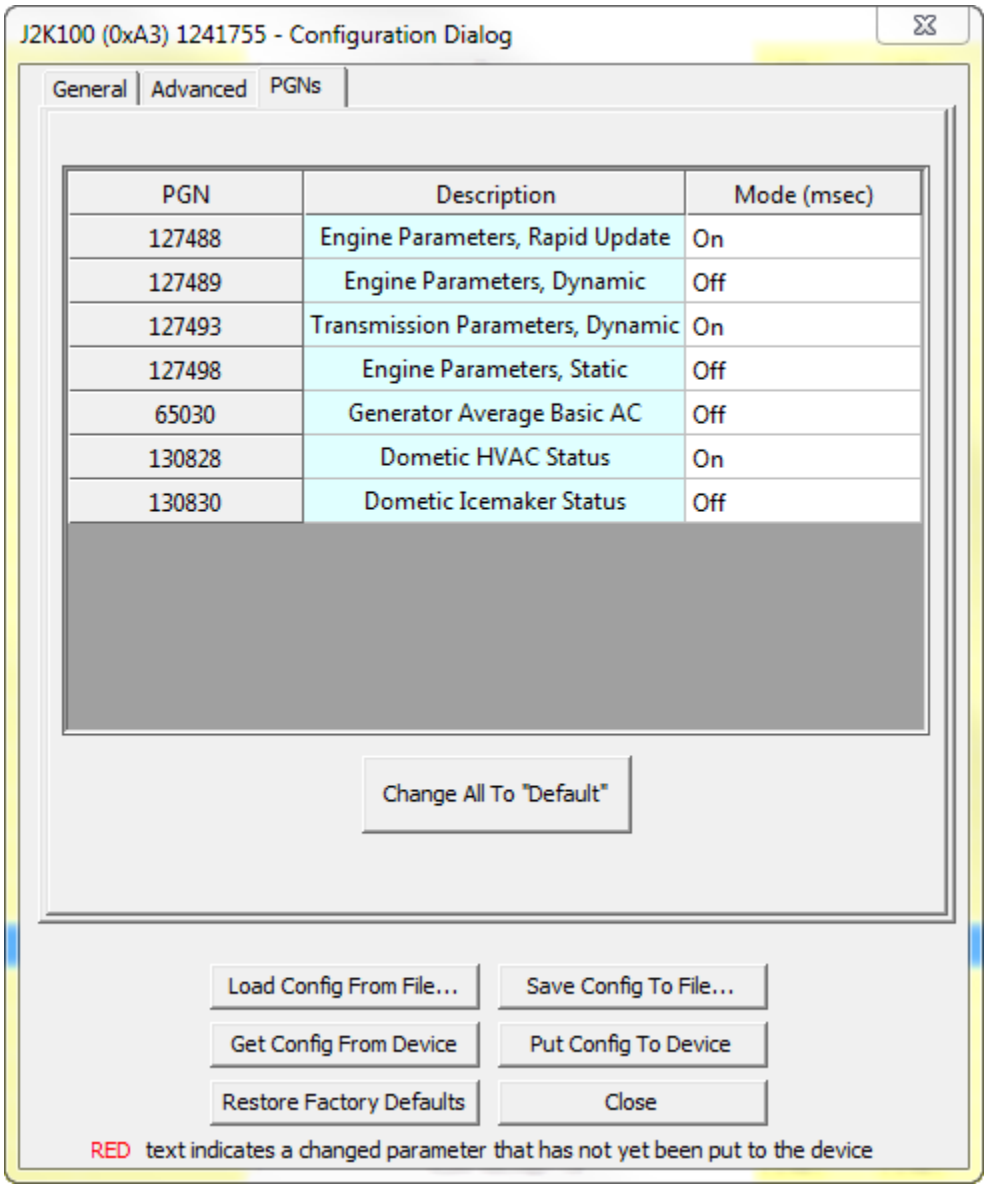


Figure 73 – J2K100 PGNs Tab

4.7.19 NBE100

4.7.19.1 General Tab

This tab contains commonly-used configuration items.

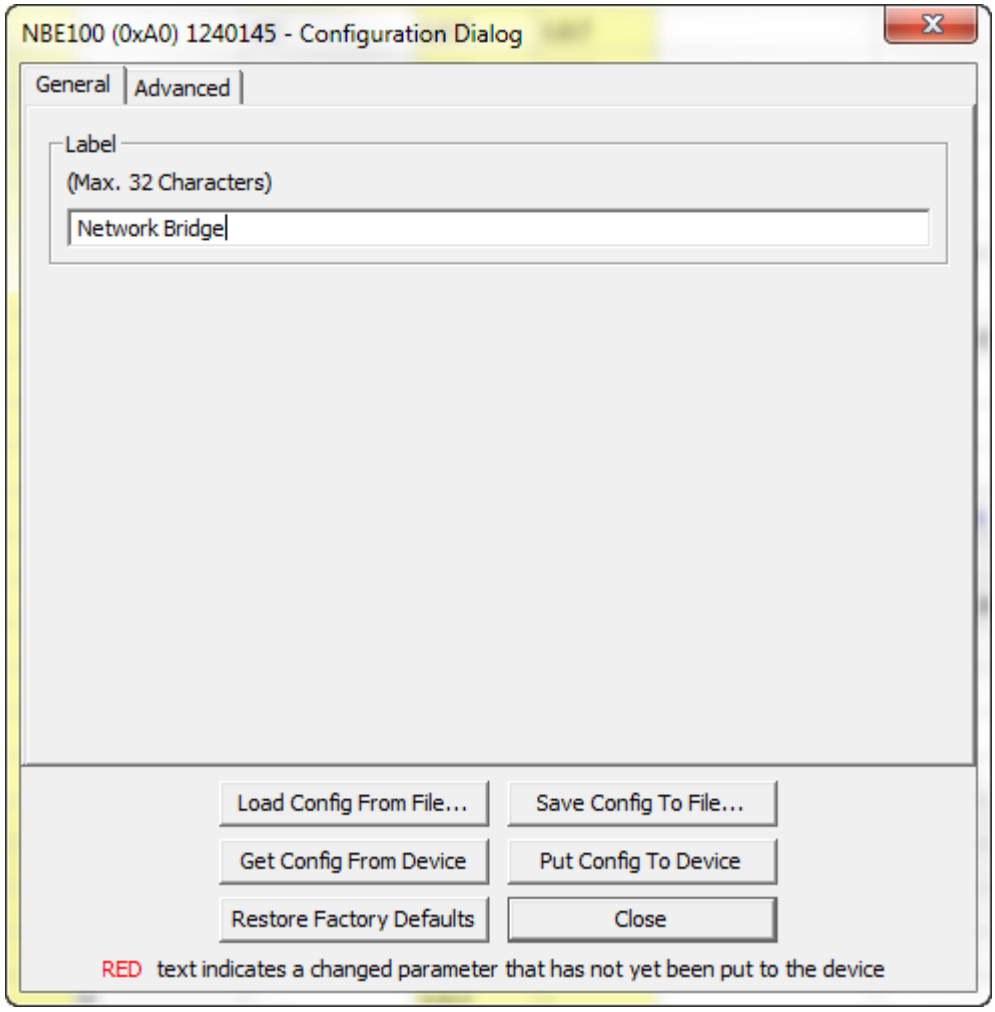


Figure 74 – NBE100 General Tab

4.7.19.2 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

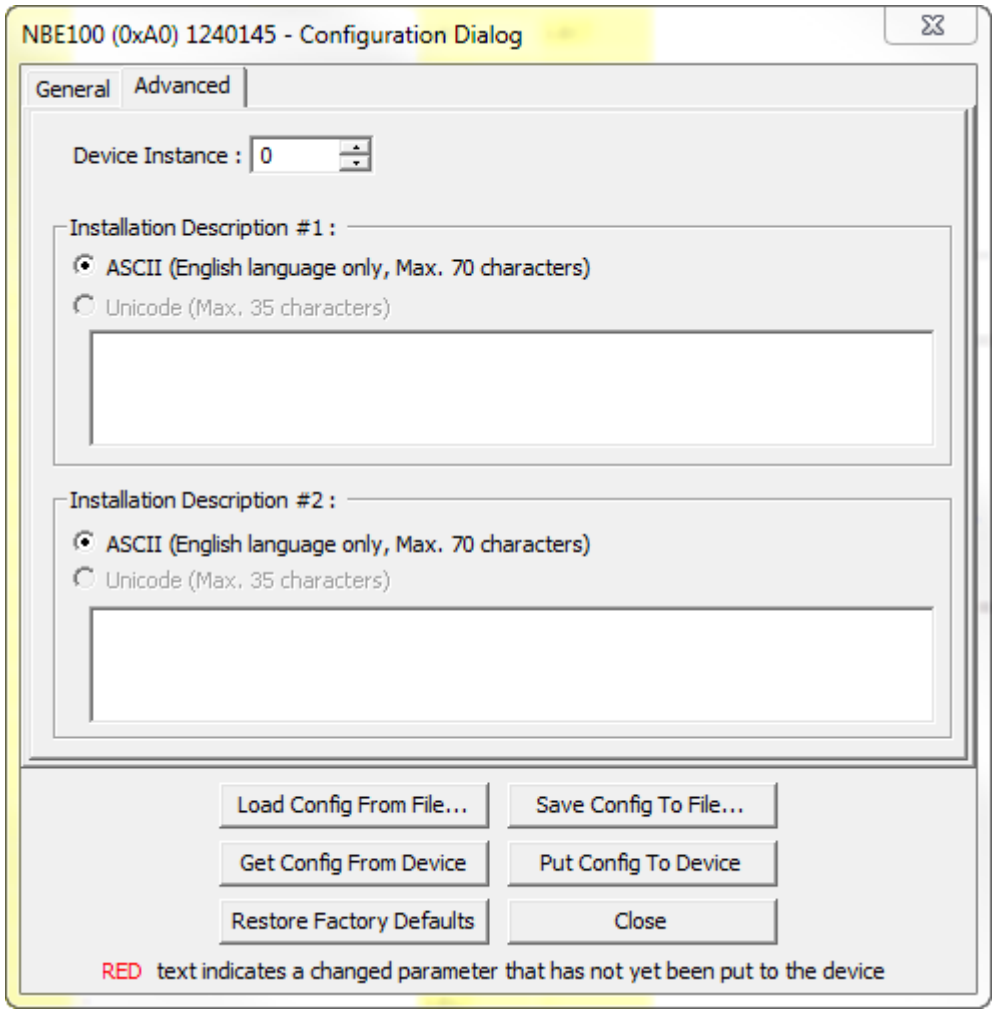


Figure 75 – NBE100 Advanced Tab

4.7.20 RAA100

4.7.20.1 General Tab

This tab contains commonly-used configuration items.

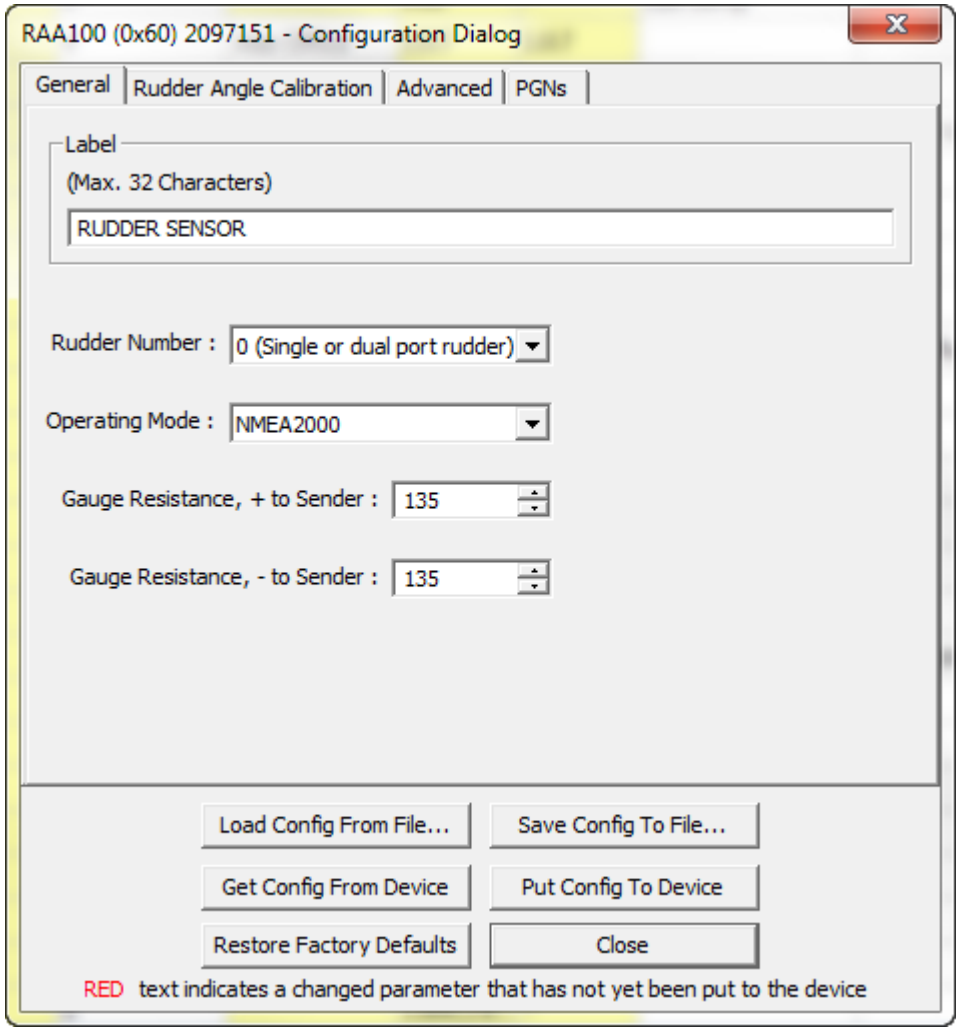


Figure 76 – RAA100 General Tab

4.7.20.2 Rudder Angle Calibration Tab

This tab allows you to calibrate the RAA100 for the particular rudder and rudder sensor installation. You will move the rudder to three positions: hard starboard, center, and hard port.

In order to start the calibration, move the rudder to hard starboard, measure the position of the rudder (deviation in degrees from the center position), enter this position into the box at the top of the screen, and click the "Calibrate Starboard" button.

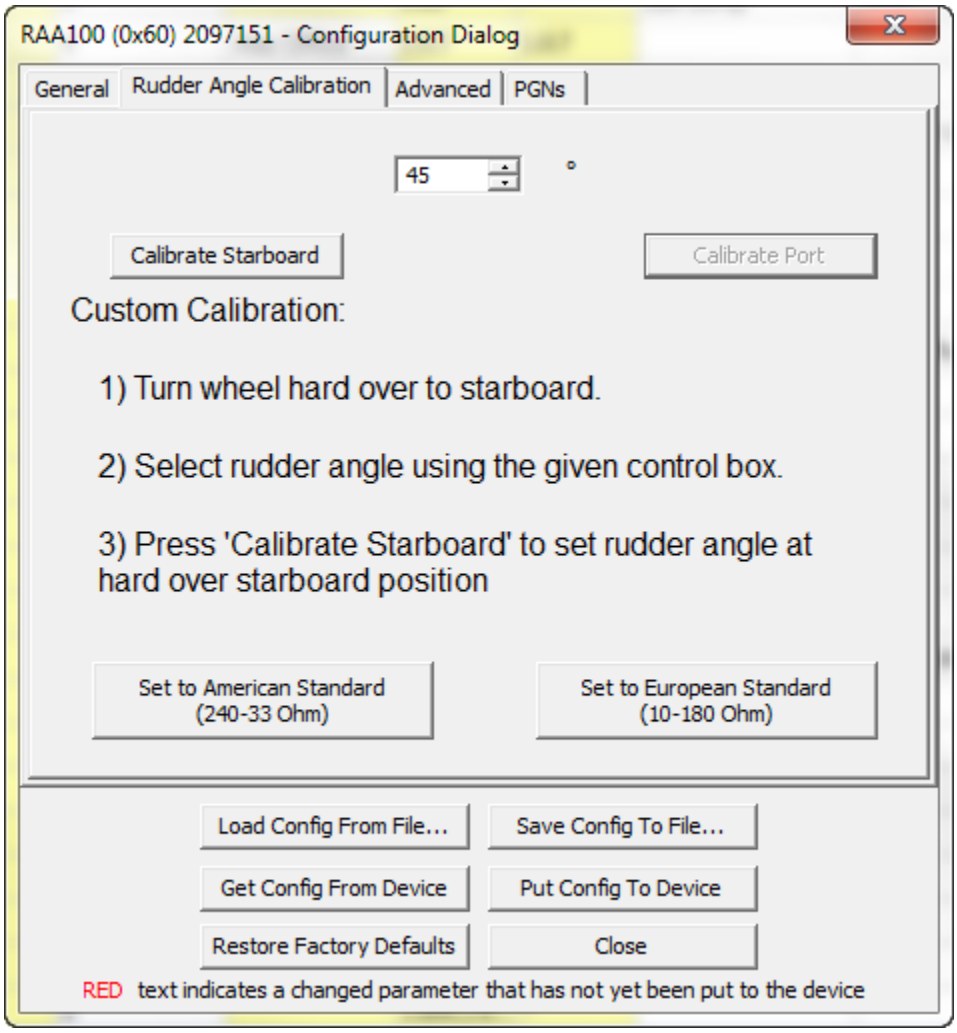


Figure 77 – RAA100 Rudder Angle Calibration Tab (First Step)

Once you have clicked the “Calibrate Starboard” button, the following dialog will appear. Move the rudder to the center position and click the “OK” button.

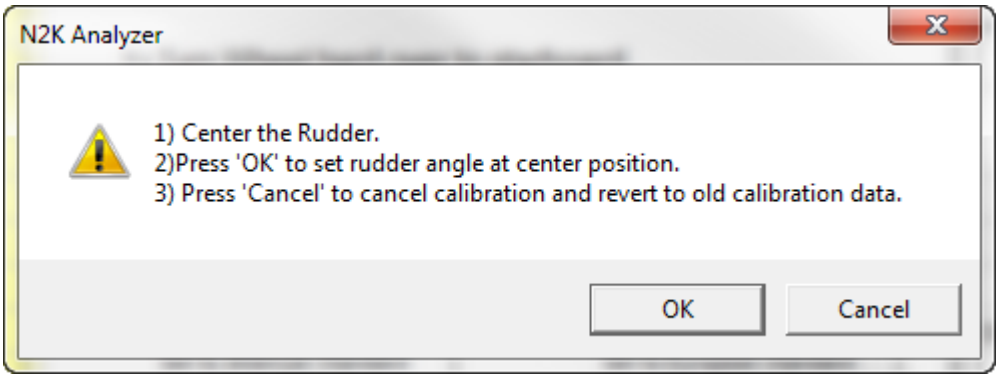


Figure 78 – RAA100 Rudder Angle Instructions Dialog Box (Second Step)

Now, move the rudder to hard port, measure the rudder angle (deviation from the center angle in degrees), type this into the box at the top of the screen, and click the "Calibrate Port" button.

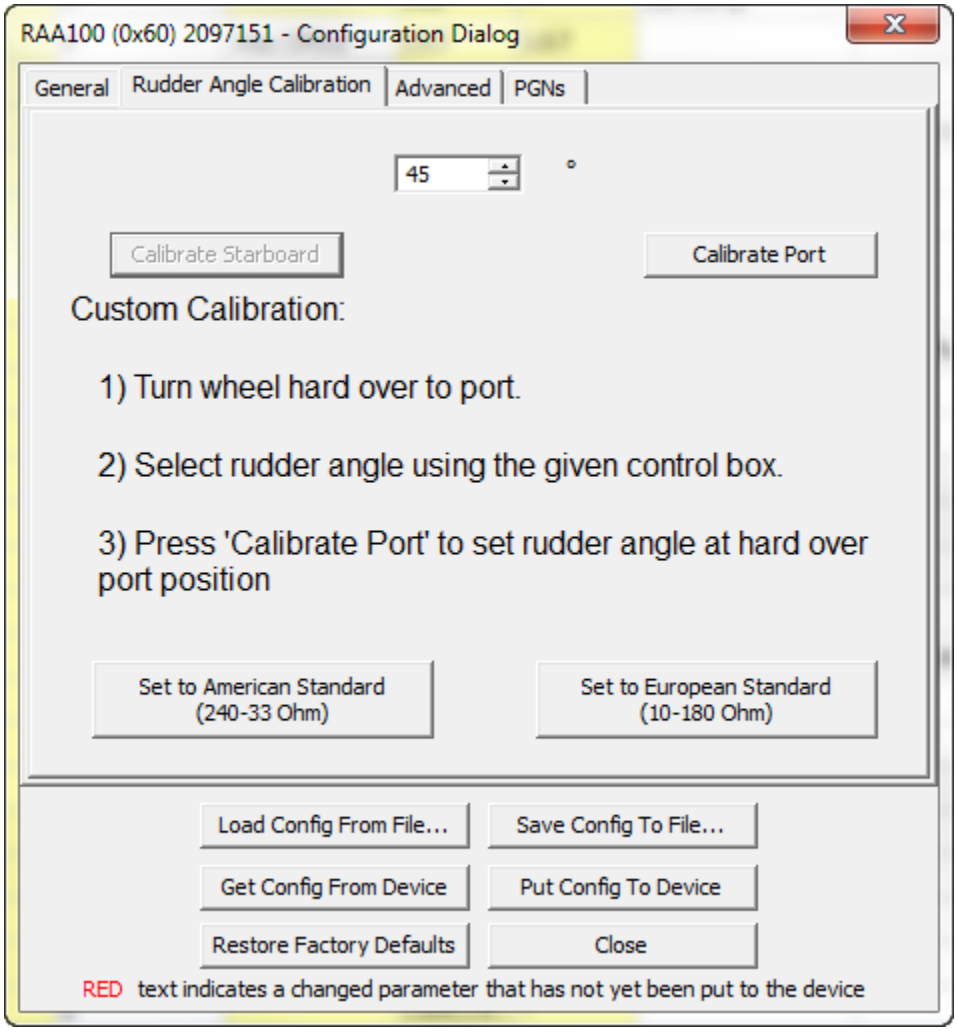


Figure 79 – RAA100 Rudder Angle Calibration Tab (Third Step)

The rudder angle calibration is now complete. You may alternatively select the "American Standard" or "European Standard" options if your rudder sensor matches one of those resistance curves and the hard port and hard starboard positions are 45° from the center position.

4.7.20.3 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

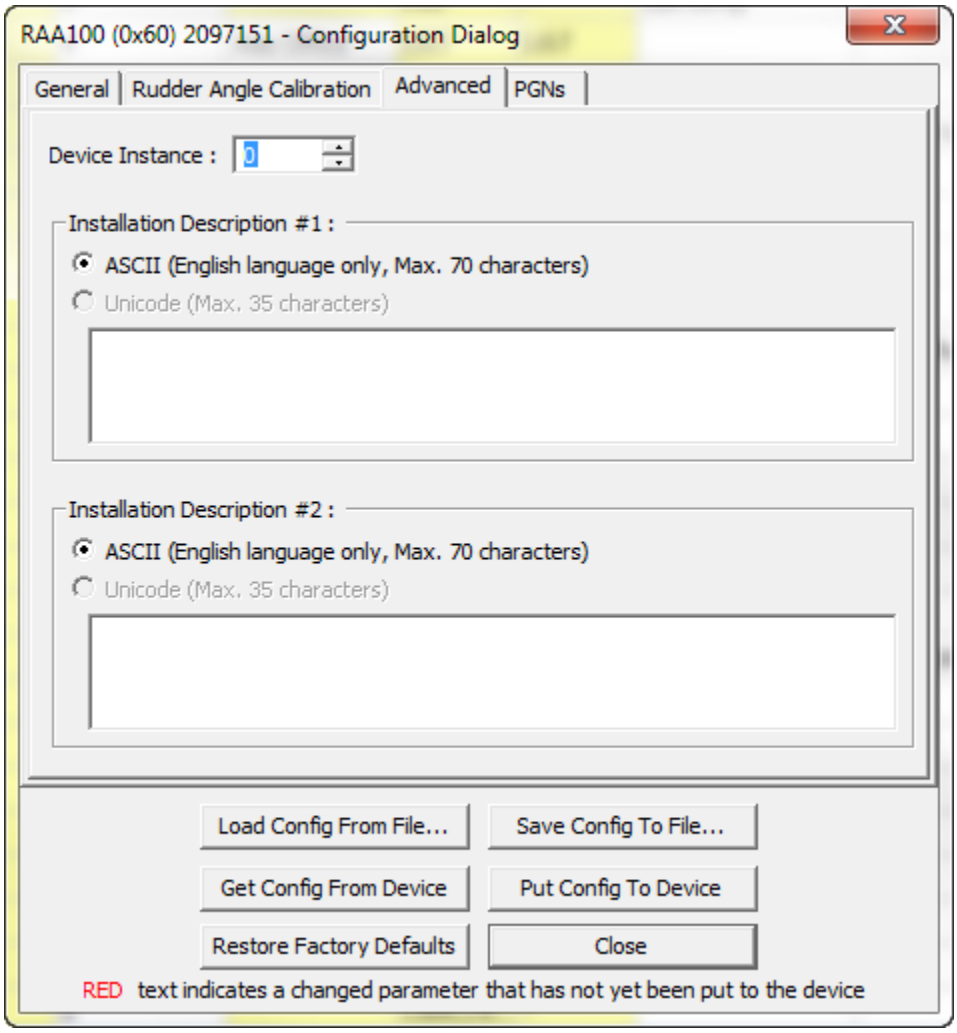


Figure 80 – RAA100 Advanced Tab

4.7.20.4 PGNs Tab

This tab allows you to enable or disable the transmission of the periodic messages output by the device. You may enable or disable the transmission of the messages, or may program the time interval between transmissions of a specific message, for devices which support the programming of time intervals.

When you first open the PGNs tab, a list of periodic PGN's transmitted by the device will appear. The mode column will read "On", if the device is currently transmitting the message, or "Off", if the message has not yet been detected from the device.

You may configure each periodic message with one of the following choices:

1) Disable – this will turn off the periodic transmission of this message
2) Default – this will turn on the periodic transmission of this message at the default rate

3) A numeric value that will turn on the periodic transmission of this message at the specified rate

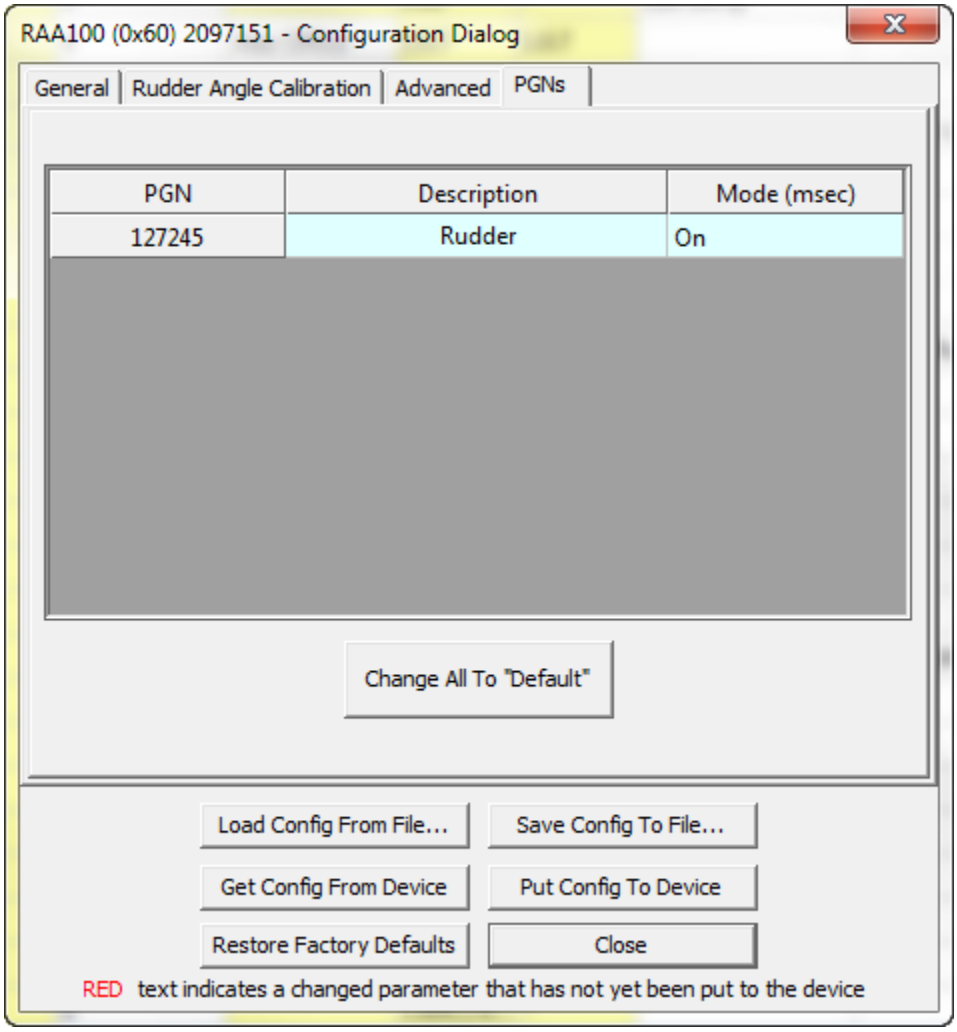


Figure 81 – RAA100 PGNs Tab

4.7.21 RIM100

4.7.21.1 General Tab

This tab contains commonly-used configuration items.

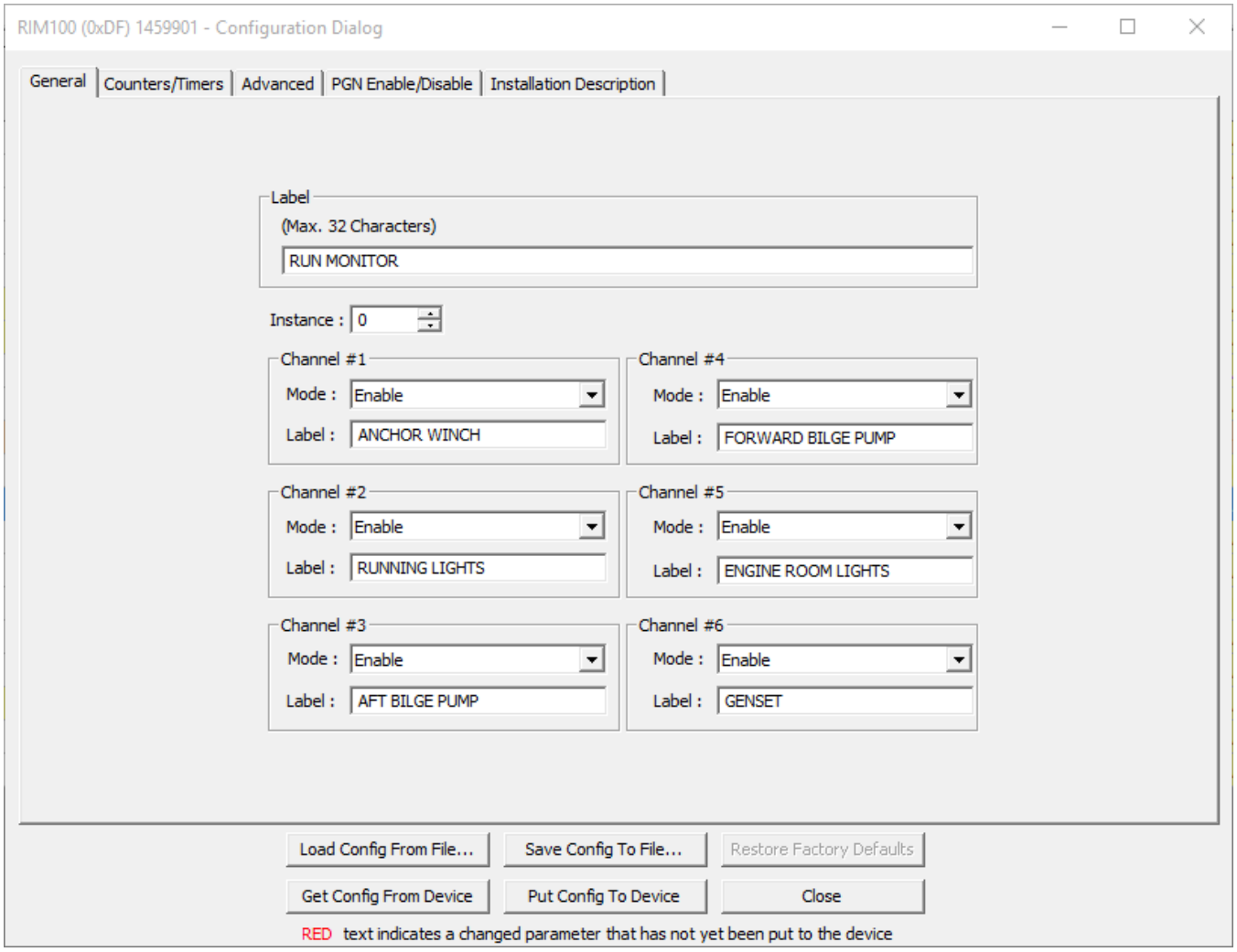


Figure 82 – RIM100 General Tab

4.7.21.1.1 Label

This text box allows you to assign a text label to the device. This label is visible in Maretron analysis and display products and allows you to easily identify the particular device.

4.7.21.1.2 Instance

This field identifies the particular switch bank to which this PGN applies.

4.7.21.1.3 Channel #x Mode

You may enable or disable each channel.

4.7.21.1.4 Channel #x Label

Each channel has a text label you can set to identify the circuit monitored by that channel (for example, “BILGE PUMP” or “RUNNING LIGHTS”). For each channel, set this to a value which describes the circuit being monitored so that you can easily identify it in display devices.

4.7.21.2 Counters/Timers Tab

This tab contains controls to view the state of and to reset the hardware counters and timers in the RIM100.

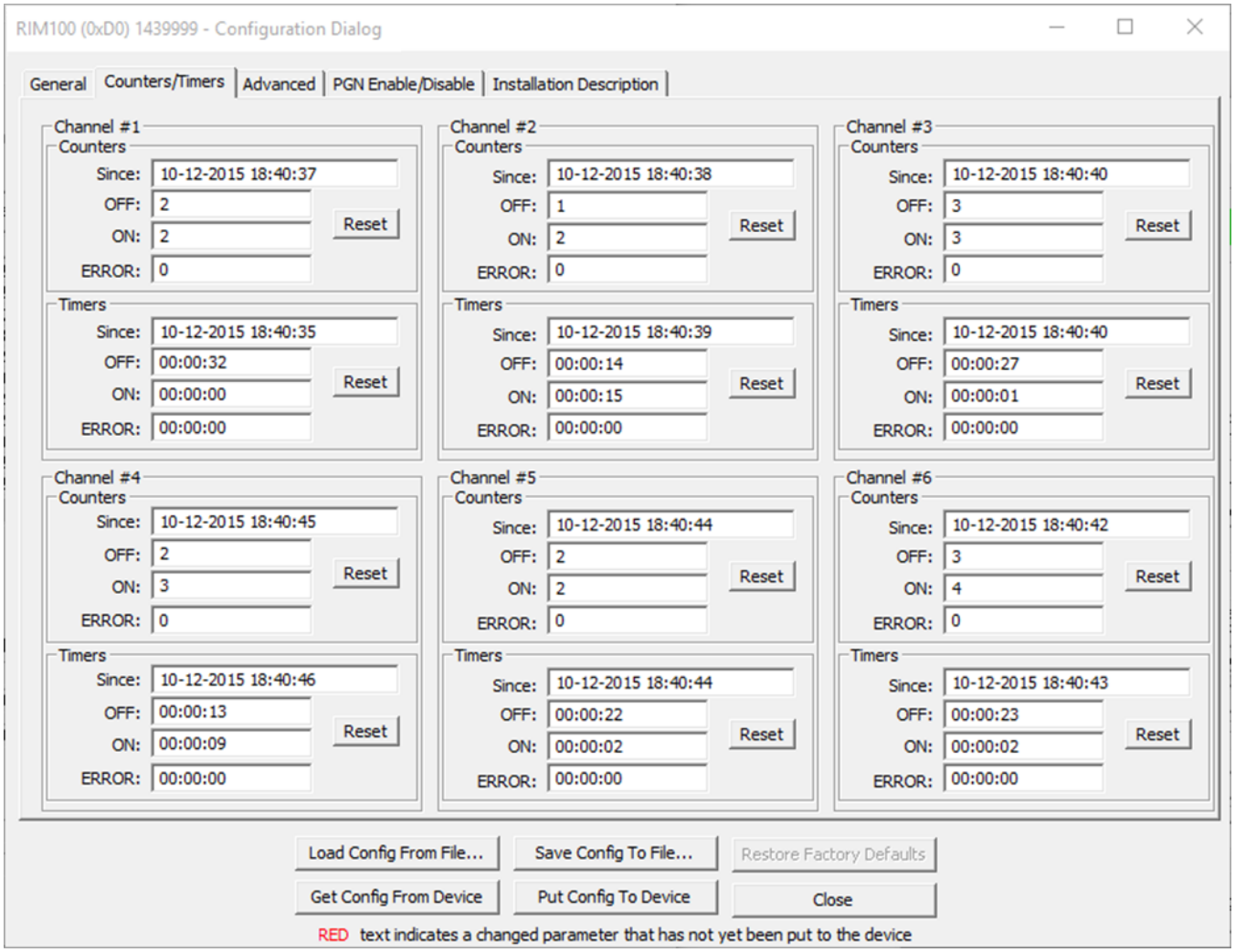


Figure 83 – RIM100 Counters/Timers Tab

Each channel of the RIM100 maintains counters that track how many times the channel has transitioned into each of the states OFF, ON, and ERROR. The "Counters" section of this dialog for each channel has the following fields:

- **Since:** the time and date that the channel's counter was last reset (this requires that a source of time and date, usually a GPS receiver, be present on the NMEA 2000 network.
- **OFF:** the number of times that this channel has transitioned into the OFF state since the channel's counters were last reset.
- **ON:** the number of times that this channel has transitioned into the ON state since the channel's counters were last reset.

- **ERROR:** the number of times that this channel has transitioned into the ERROR state since the channel's counters were last reset.
- **Reset:** Pressing this button will reset the OFF, ON, and ERROR counters to zero values, and will update the "Since:" field for this channel's counters to the current time and date.

Each channel of the RIM100 maintains timers of the elapsed time that the channel has spent in each of the states OFF, ON, and ERROR. The "Timers" section of this dialog for each channel has the following fields:

- **Since:** the time and date that the channel's timer was last reset (this requires that a source of time and date, usually a GPS receiver, be present on the NMEA 2000 network.
- **OFF:** the elapsed time that this channel has been in the OFF state since the channel's timer were last reset.
- **ON:** the elapsed time that this channel has been in the ON state since the channel's timers were last reset.
- **ERROR:** the elapsed time that this channel has been in the ERROR state since the channel's timers were last reset.
- **Reset:** Pressing this button will reset the OFF, ON, and ERROR timers to zero values, and will update the "Since:" field for this channel's timers to the current time and date.

4.7.21.3 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

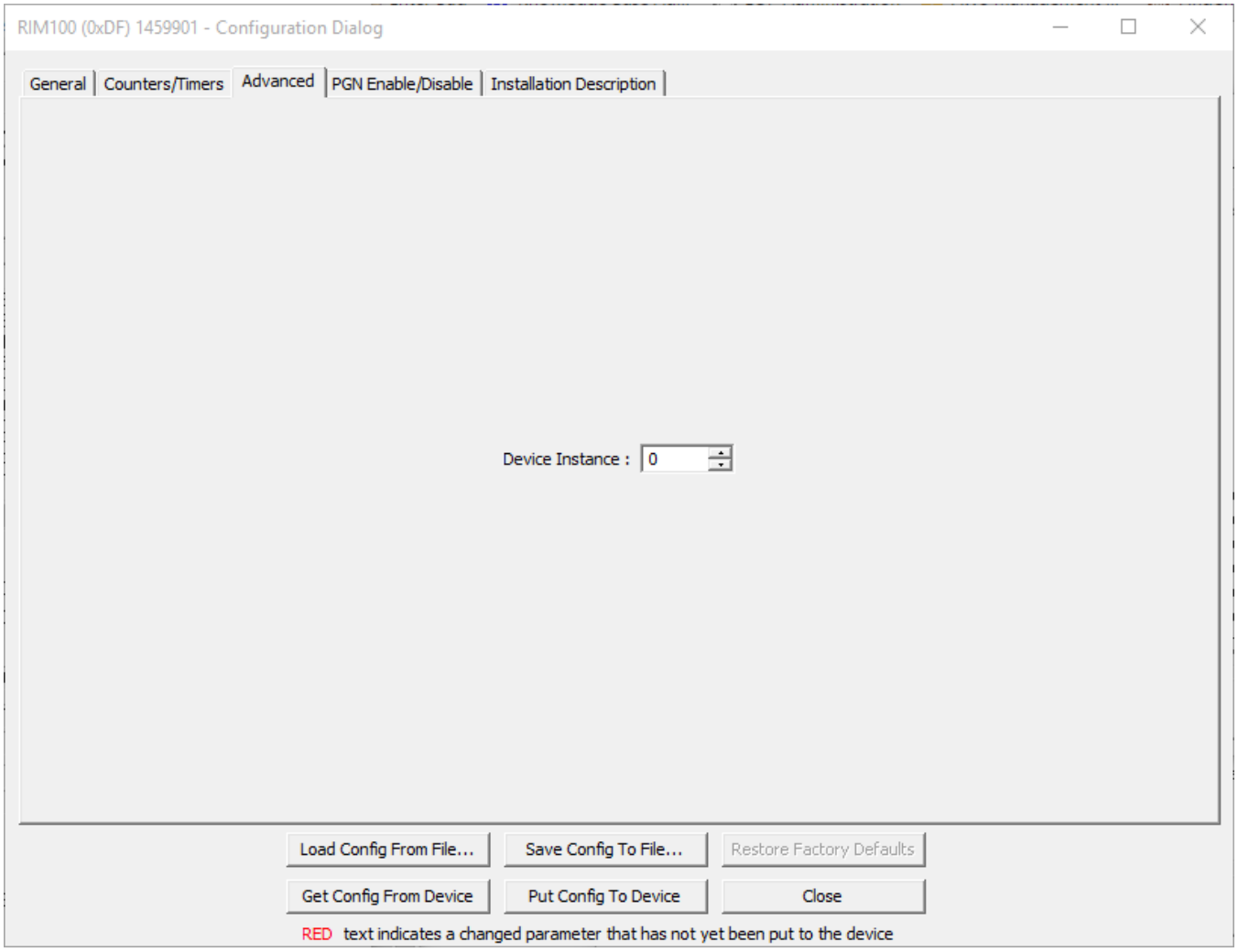


Figure 84 – RIM100 Advanced Tab

4.7.21.3.1 Device Instance

The device comes from the factory with the device instance value set to 0. If you have multiple of these devices on a network, you may find it necessary to set the device instances of other devices of this type so that they are different.

4.7.21.4 PGN Enable/Disable Tab

This tab allows you to enable or disable the transmission of the periodic messages output by the device. You may enable or disable the transmission of the messages, or may program the time interval between transmissions of a specific message, for devices which support the programming of time intervals.

When you first open the PGN Enable/Disable tab, a list of periodic PGN's transmitted by the device will appear. The mode column will read "On", if the device is currently transmitting the message, or "Off", if the message has not yet been detected from the device.

You may configure each periodic message with one of the following choices:

1) Disable – this will turn off the periodic transmission of this message
2) Default – this will turn on the periodic transmission of this message at the default rate
3) A numeric value that will turn on the periodic transmission of this message at the specified rate

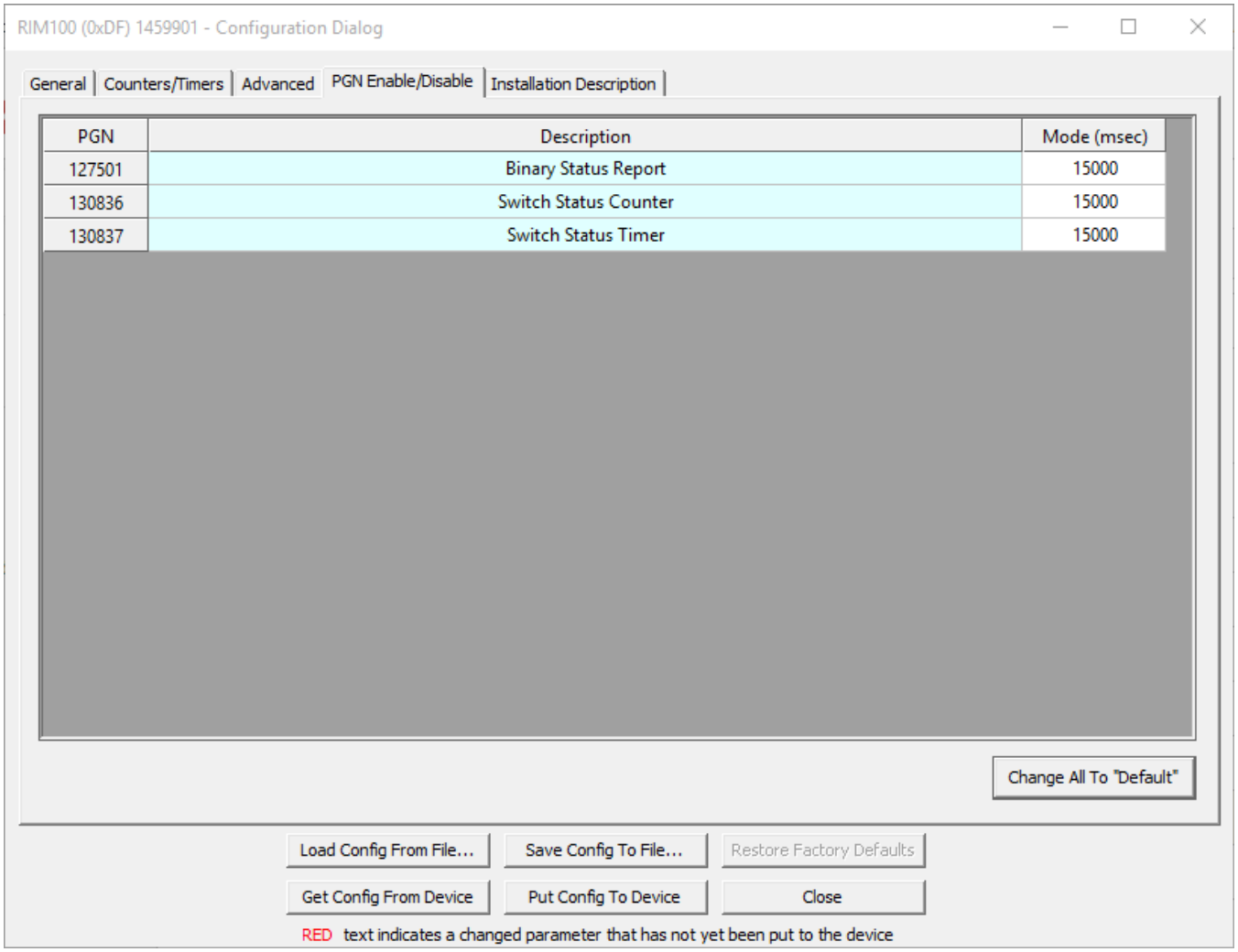


Figure 85 – RIM100 PGN Enable/Disable Tab

4.7.21.5 Installation Description Tab

This tab allows you to set values for the installation description properties of the device.

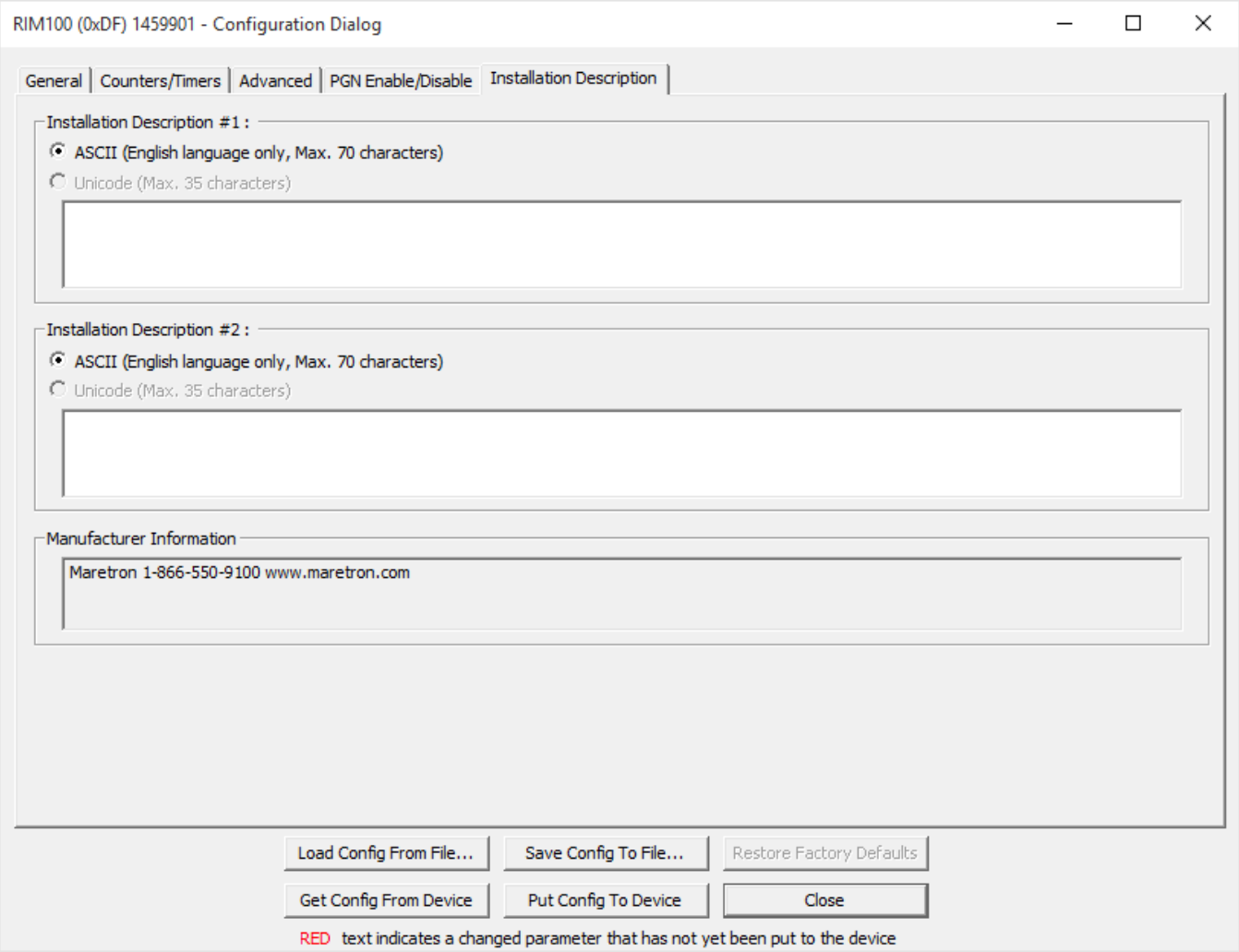


Figure 86 – RIM100 Installation Description Tab

4.7.21.5.1 Installation Description #1, #2

This device, along with all other Level A certified NMEA devices, has two user-programmable installation description fields. You may program these fields with information specific to the device, such as date installed, the initials/name of the installer, the physical location of the device, etc. This configuration option will allow you to program the values of these fields.

4.7.22 SIM100

4.7.22.1 General Tab

This tab contains commonly-used configuration items.

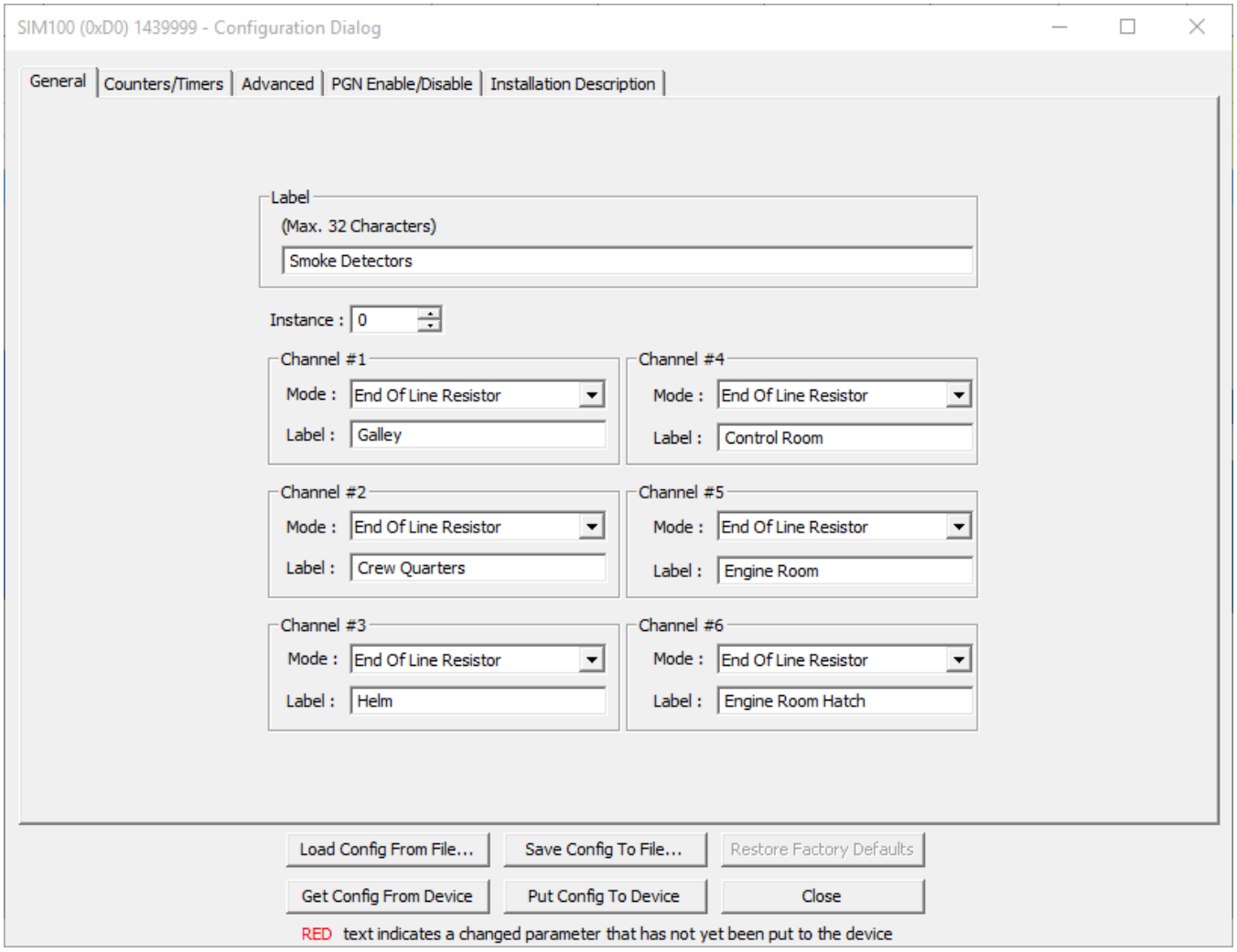


Figure 87 – SIM100 General Tab

4.7.22.1.1 Label

This text box allows you to assign a text label to the device. This label is visible in Maretron analysis and display products and allows you to easily identify the particular device.

4.7.22.1.2 Instance

This field identifies the particular switch bank to which this PGN applies.

4.7.22.1.3 Channel #x Mode

You may program each channel as “No End of Line Resistor”, if there is no 8KΩ end of line resistor present on the monitored switch, “End of Line Resistor”, if there is an 8KΩ end of line resistor present on the monitored switch, or “Disable” to disable the channel.

4.7.22.1.4 Channel #x Label

Each channel has a text label you can set to identify the switch monitored by that channel (for example, "SMOKE ALARM" or "HATCH AJAR"). For each channel, set this to a value which describes the switch being monitored so that you can easily identify it in display devices.

4.7.22.2 Counters/Timers Tab

This tab contains controls to view the state of and to reset the hardware counters and timers in the SIM100.

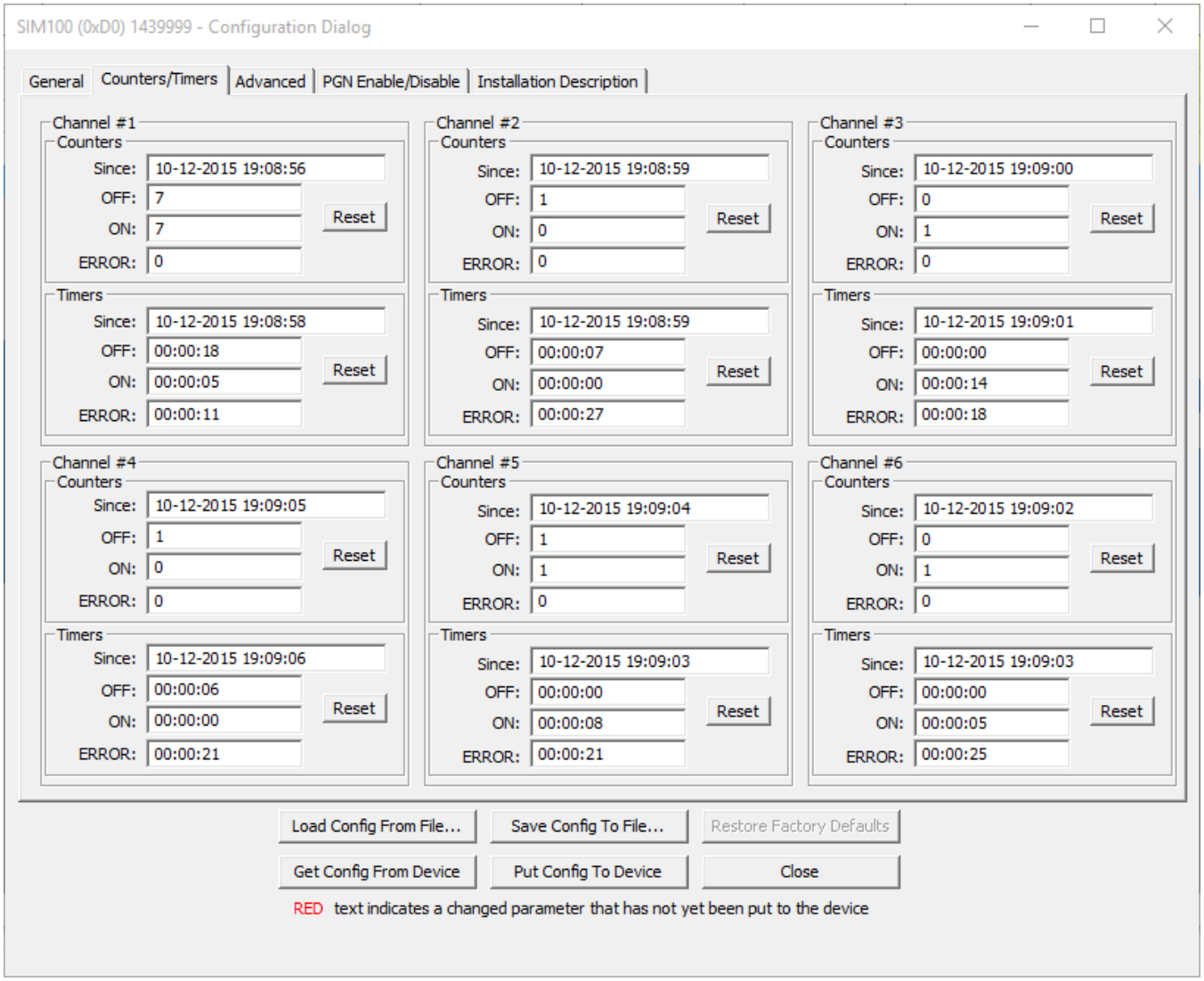


Figure 88 – SIM100 Counters/Timers Tab

Each channel of the SIM100 maintains counters that track how many times the channel has transitioned into each of the states OFF, ON, and ERROR. The "Counters" section of this dialog for each channel has the following fields:

- **Since:** the time and date that the channel's counter was last reset (this requires that a source of time and date, usually a GPS receiver, be present on the NMEA 2000 network.
- **OFF:** the number of times that this channel has transitioned into the OFF state since the channel's counters were last reset.
- **ON:** the number of times that this channel has transitioned into the ON state since the channel's counters were last reset.
- **ERROR:** the number of times that this channel has transitioned into the ERROR state since the channel's counters were last reset.
- **Reset:** Pressing this button will reset the OFF, ON, and ERROR counters to zero values, and will update the "Since:" field for this channel's counters to the current time and date.

Each channel of the SIM100 maintains timers of the elapsed time that the channel has spent in each of the states OFF, ON, and ERROR. The "Timers" section of this dialog for each channel has the following fields:

- **Since:** the time and date that the channel's timer was last reset (this requires that a source of time and date, usually a GPS receiver, be present on the NMEA 2000 network.
- **OFF:** the elapsed time that this channel has been in the OFF state since the channel's timer were last reset.
- **ON:** the elapsed time that this channel has been in the ON state since the channel's timers were last reset.
- **ERROR:** the elapsed time that this channel has been in the ERROR state since the channel's timers were last reset.
- **Reset:** Pressing this button will reset the OFF, ON, and ERROR timers to zero values, and will update the "Since:" field for this channel's timers to the current time and date.

4.7.22.3 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

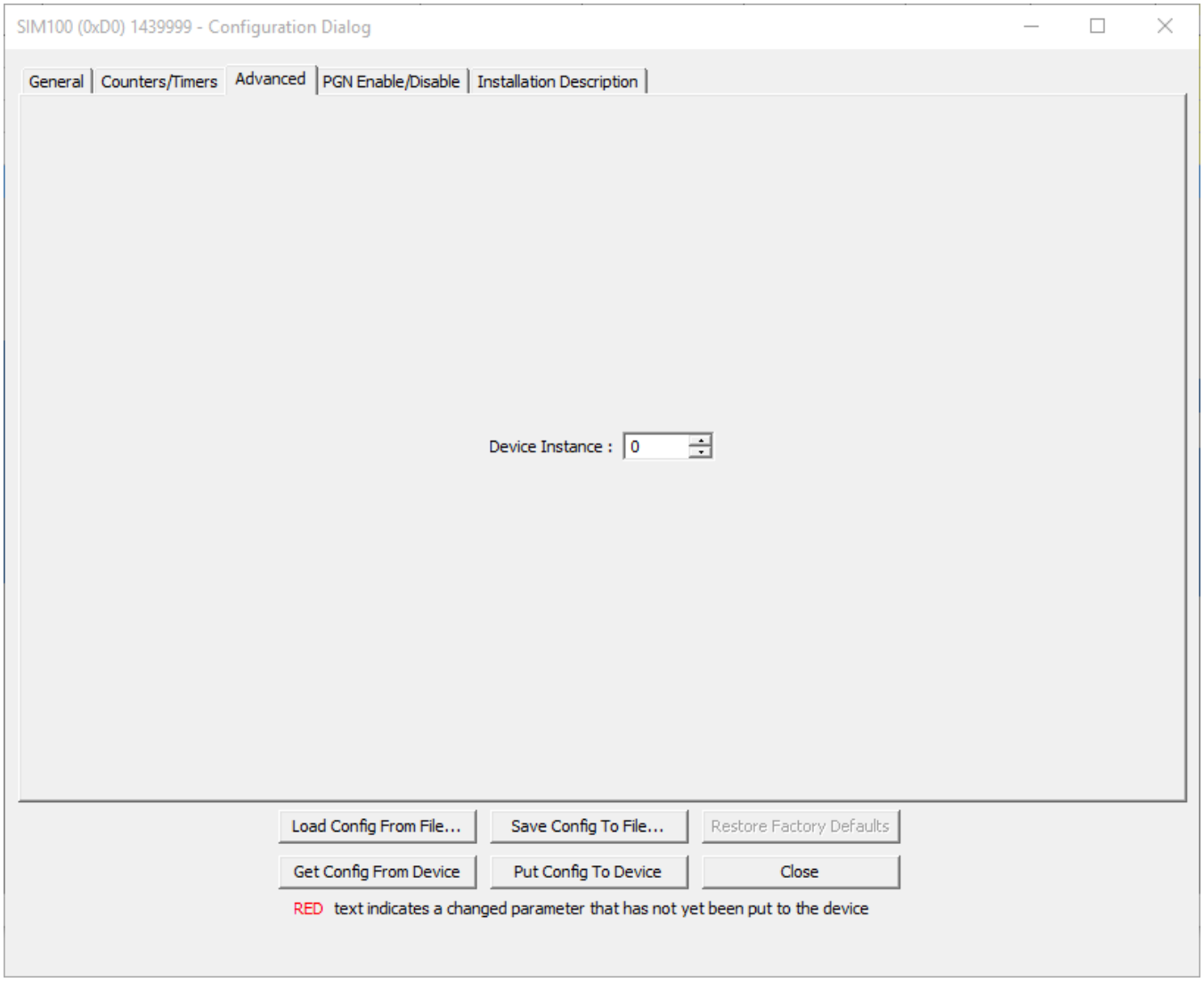


Figure 89 – SIM100 Advanced Tab

4.7.22.3.1 Device Instance

The device comes from the factory with the device instance value set to 0. If you have multiple of these devices on a network, you may find it necessary to set the device instances of other devices of this type so that they are different.

4.7.22.4 PGN Enable/Disable Tab

This tab allows you to enable or disable the transmission of the periodic messages output by the device. You may enable or disable the transmission of the messages, or may program the time interval between transmissions of a specific message, for devices which support the programming of time intervals.

When you first open the PGN Enable/Disable tab, a list of periodic PGN's transmitted by the device will appear. The mode column will read "On", if the device is currently transmitting the message, or "Off", if the message has not yet been detected from the device.

You may configure each periodic message with one of the following choices:

- Disable – this will turn off the periodic transmission of this message
- Default – this will turn on the periodic transmission of this message at the default rate
- A numeric value that will turn on the periodic transmission of this message at the specified rate

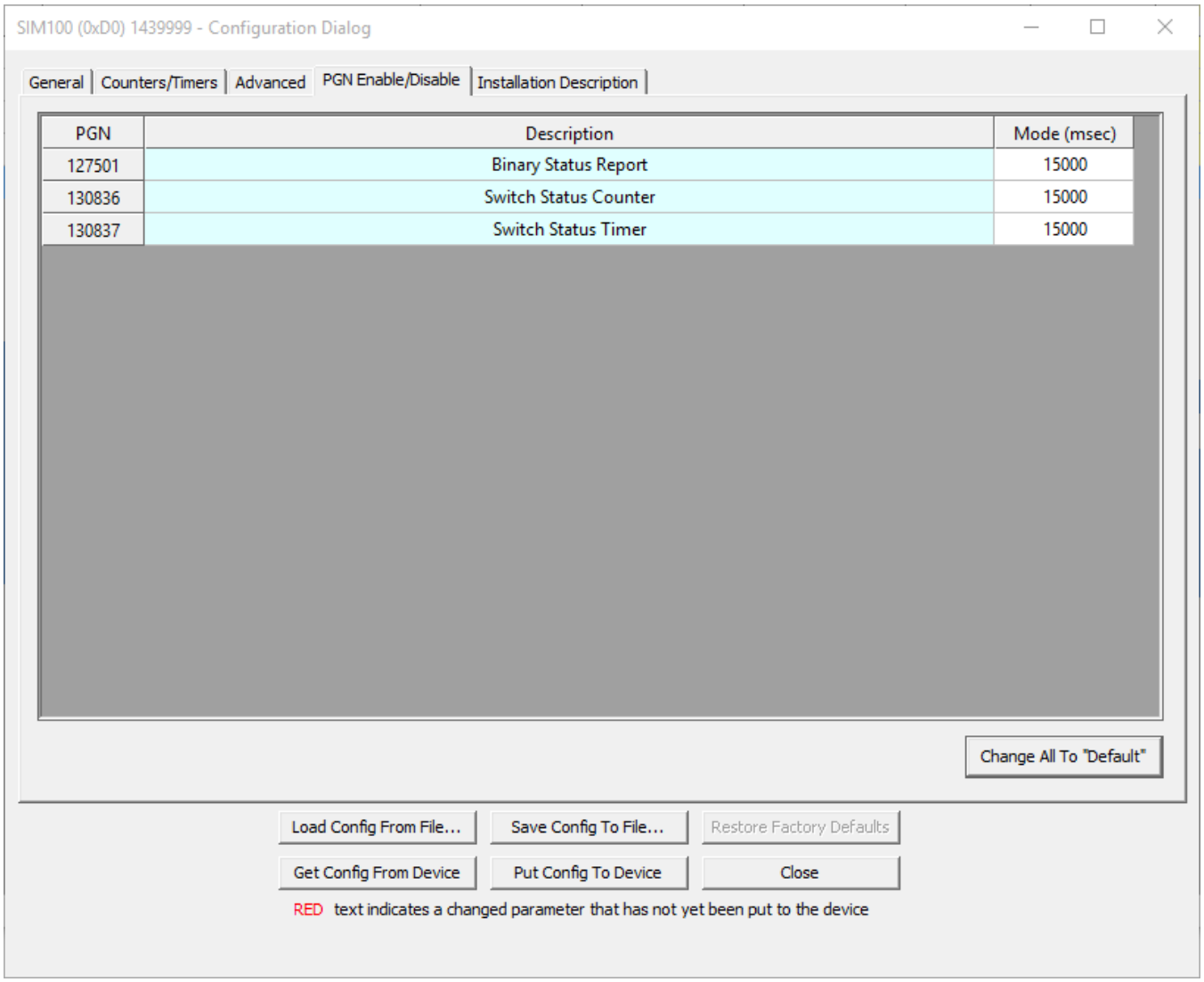


Figure 90 – SIM100 PGN Enable/Disable tab

4.7.22.5 Installation Description Tab

This tab allows you to set values for the installation description properties of the device.

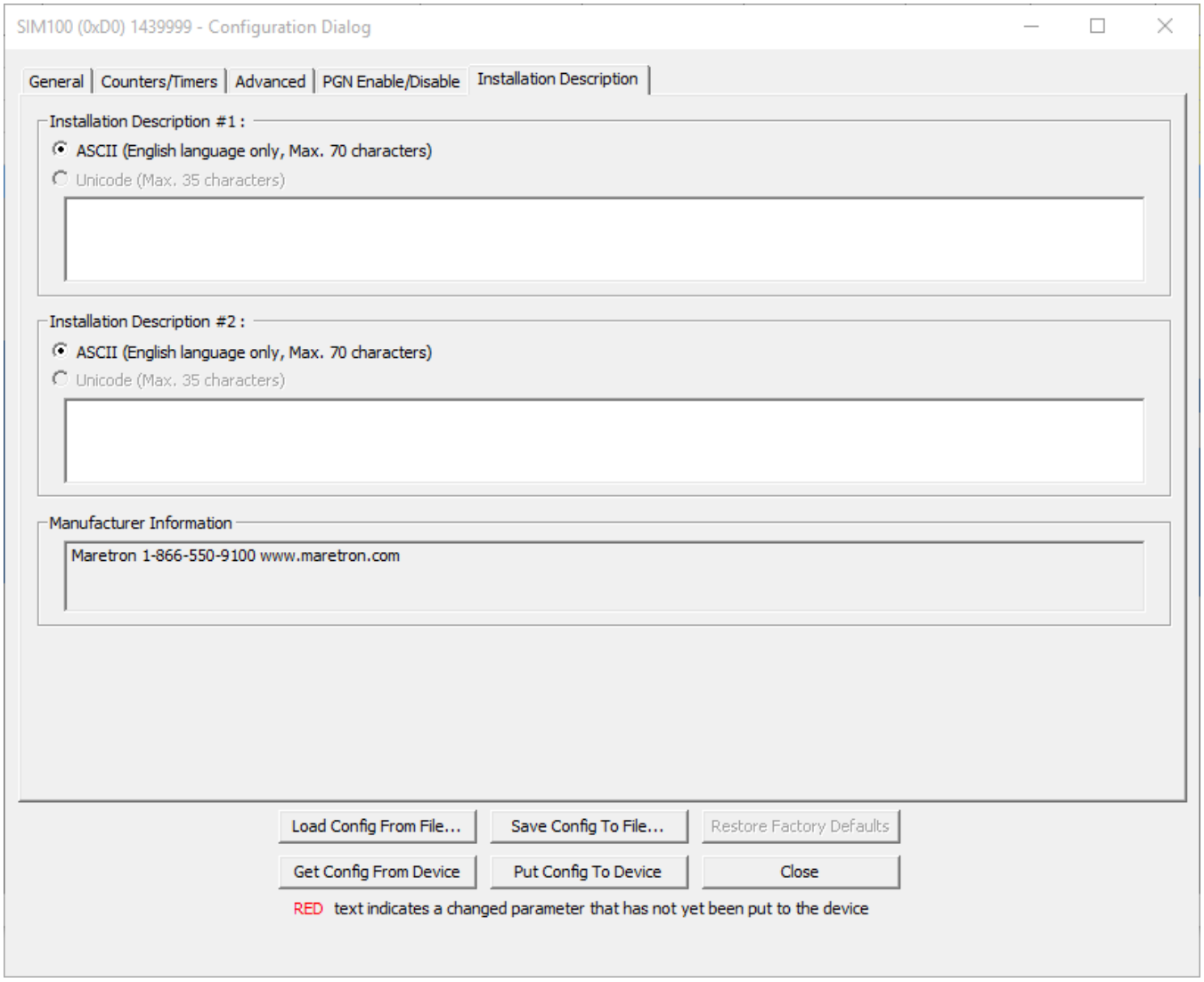


Figure 91 – SIM100 Installation Description Tab

4.7.22.5.1 Installation Description #1, #2

This device, along with all other Level A certified NMEA devices, has two user-programmable installation description fields. You may program these fields with information specific to the device, such as date installed, the initials/name of the installer, the physical location of the device, etc. This configuration option will allow you to program the values of these fields.

4.7.23 SMS100

4.7.23.1 General Tab

This tab contains commonly-used configuration items.

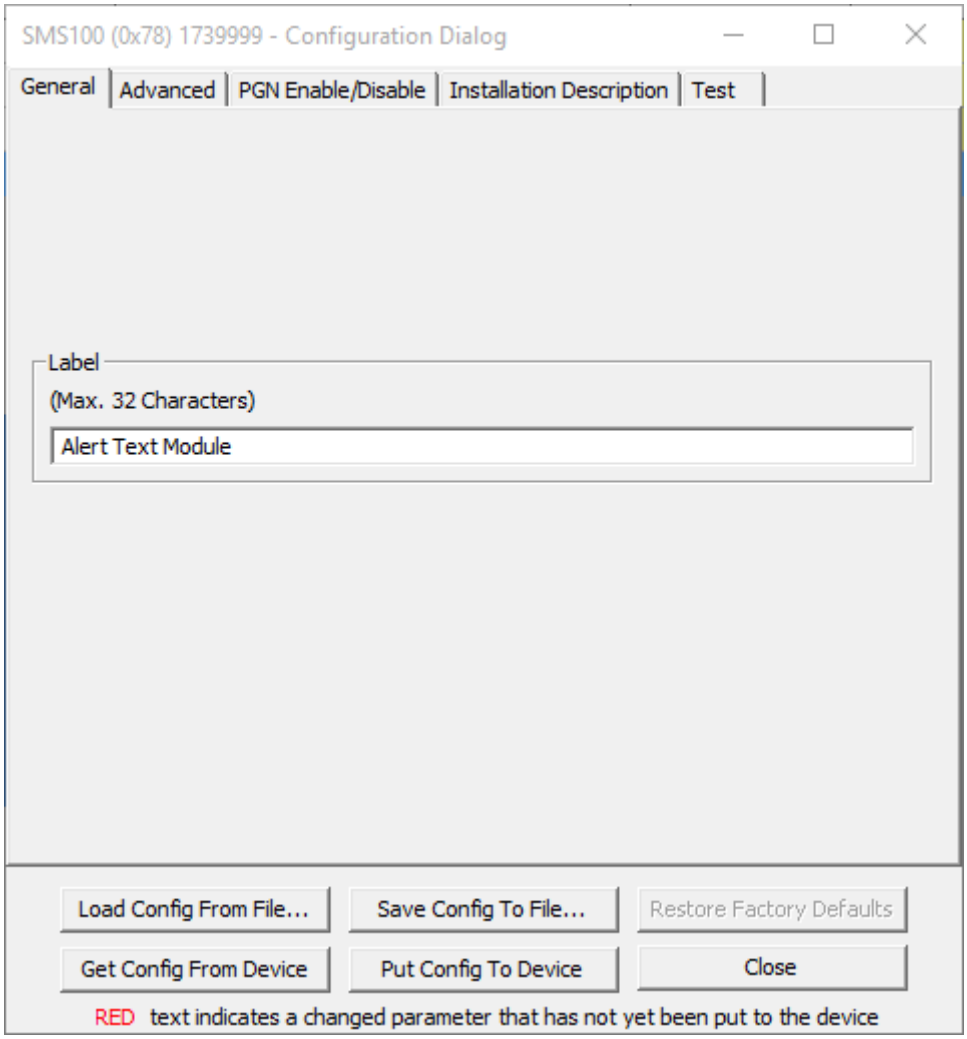


Figure 92 – SMS100 General Tab

4.7.23.2 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

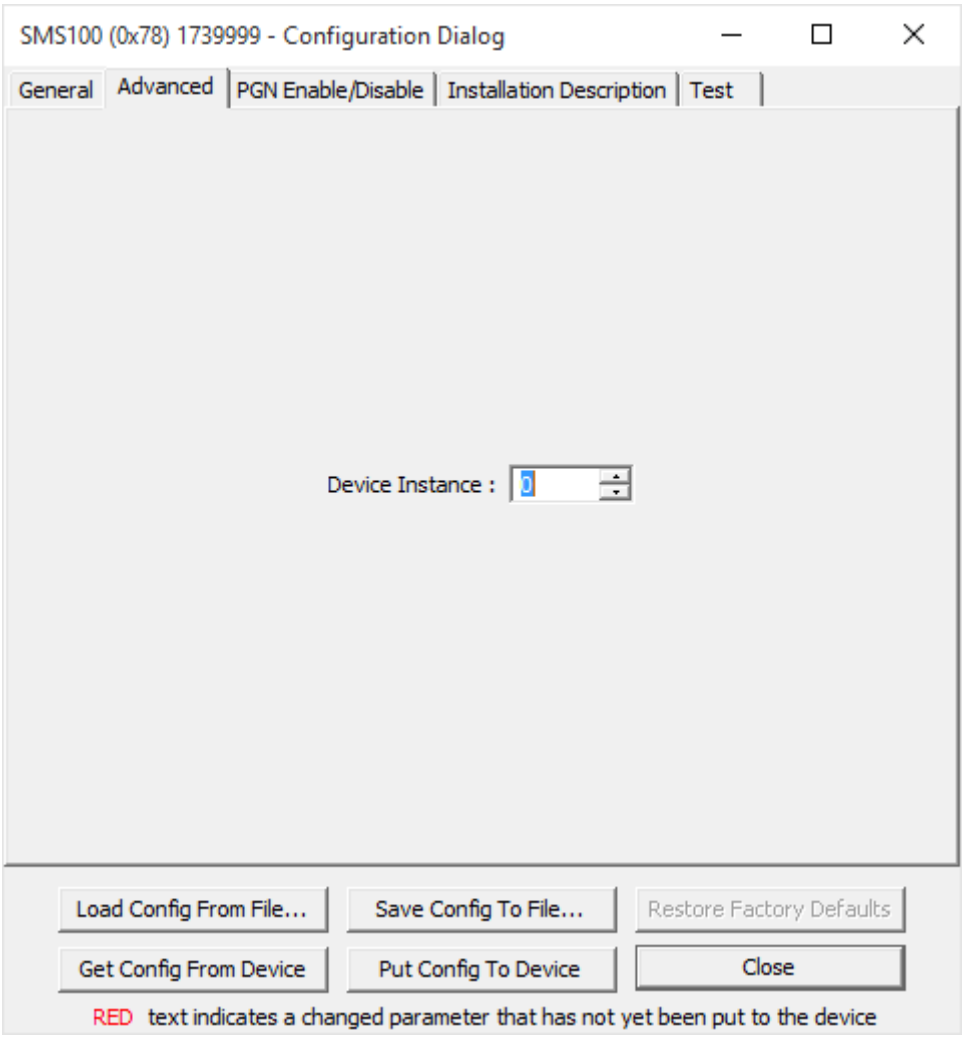


Figure 93 – SMS100 Advanced Tab

4.7.23.2.1 Device Instance

The device comes from the factory with the device instance value set to 0. If you have multiple of these devices on a network, you may find it necessary to set the device instances of other devices of this type so that they are different.

4.7.23.3 PGN Enable/Disable Tab

This tab allows you to enable or disable the transmission of the periodic messages output by the device. You may enable or disable the transmission of the messages, or may program the time interval between transmissions of a specific message, for devices which support the programming of time intervals.

When you first open the PGN Enable/Disable tab, a list of periodic PGN's transmitted by the device will appear. The mode column will read "On", if the device is currently transmitting the message, or "Off", if the message has not yet been detected from the device.

You may configure each periodic message with one of the following choices:

1) Disable – this will turn off the periodic transmission of this message
2) Default – this will turn on the periodic transmission of this message at the default rate
3) A numeric value that will turn on the periodic transmission of this message at the specified rate

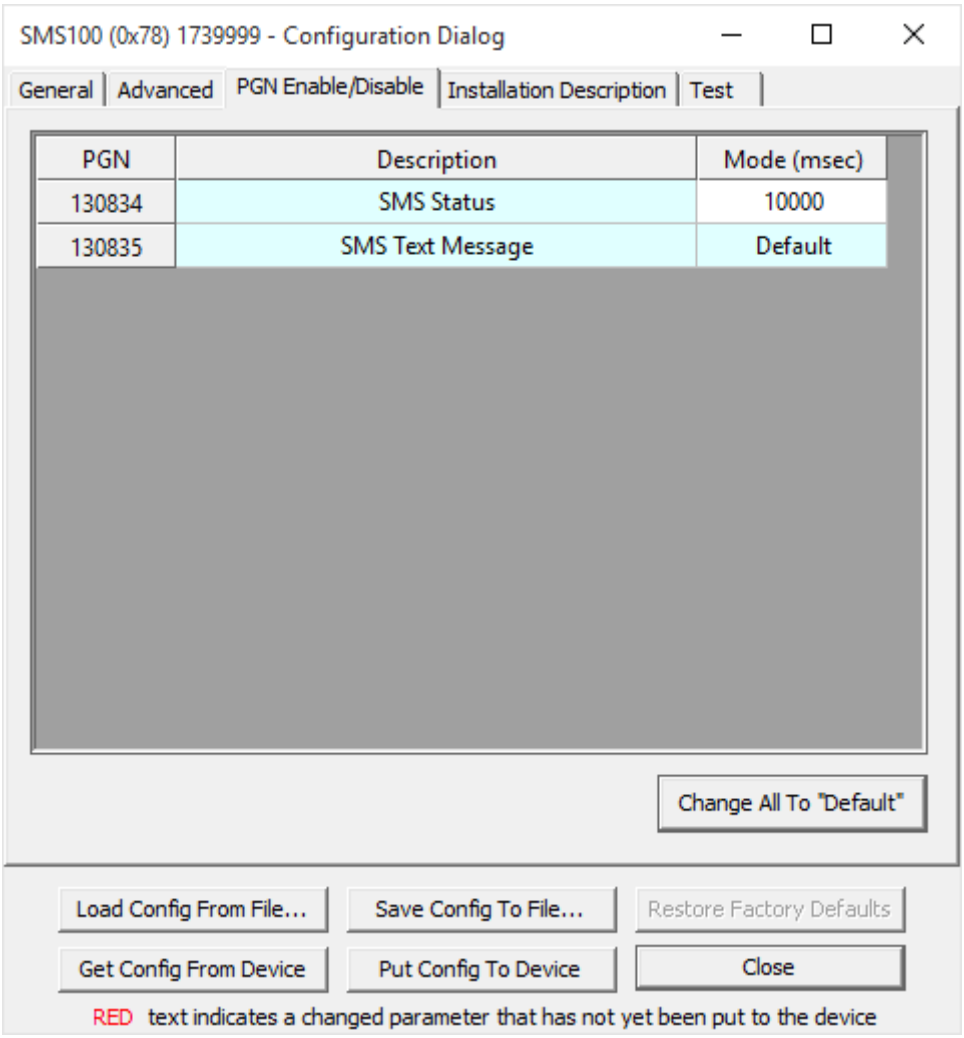


Figure 94 – SMS100 PGN Enable/Disable Tab

4.7.23.4 Installation Description Tab

This tab allows you to set values for the installation description properties of the device.

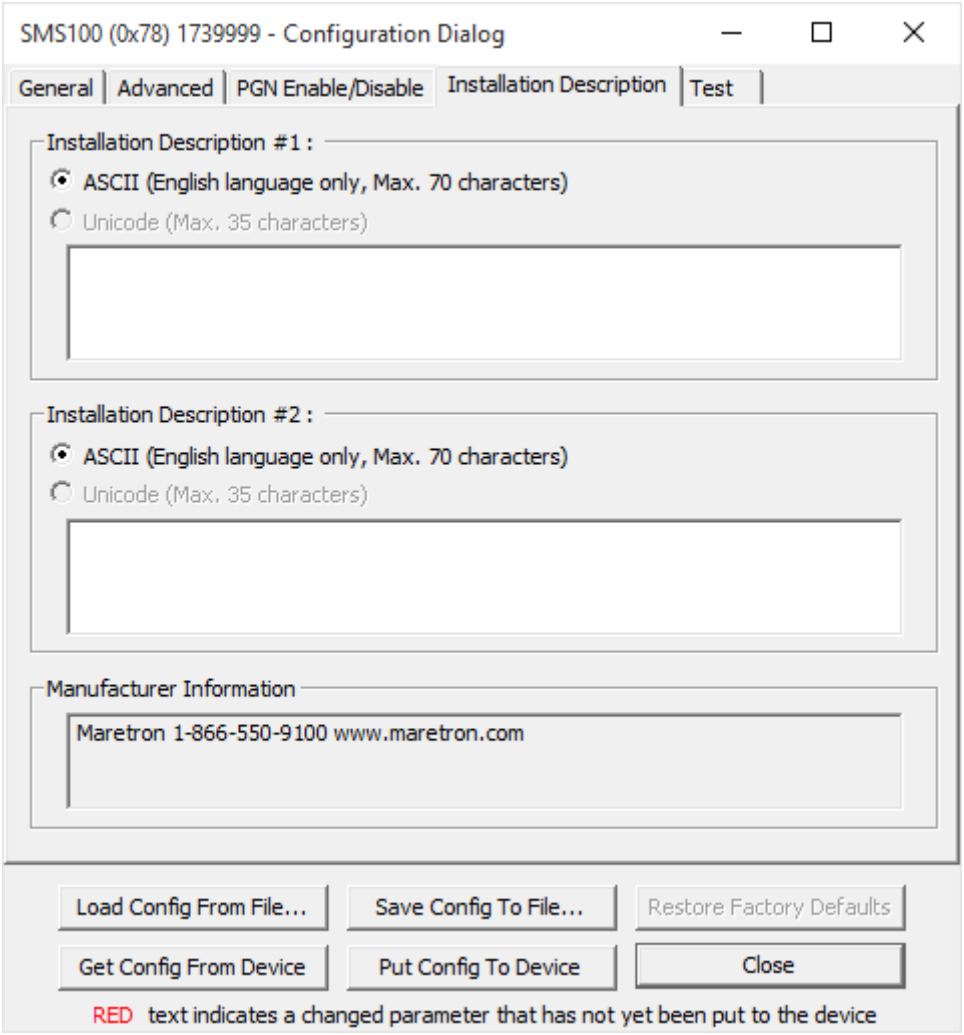


Figure 95 – SMS100 Installation Description Tab

4.7.23.4.1 Installation Description #1, #2

This device, along with all other Level A certified NMEA devices, has two user-programmable installation description fields. You may program these fields with information specific to the device, such as date installed, the initials/name of the installer, the physical location of the device, etc. This configuration option will allow you to program the values of these fields.

4.7.23.5 Test Tab

This screen allows you to perform some basic diagnostics of the SMS100 and its connection to the cellular network.

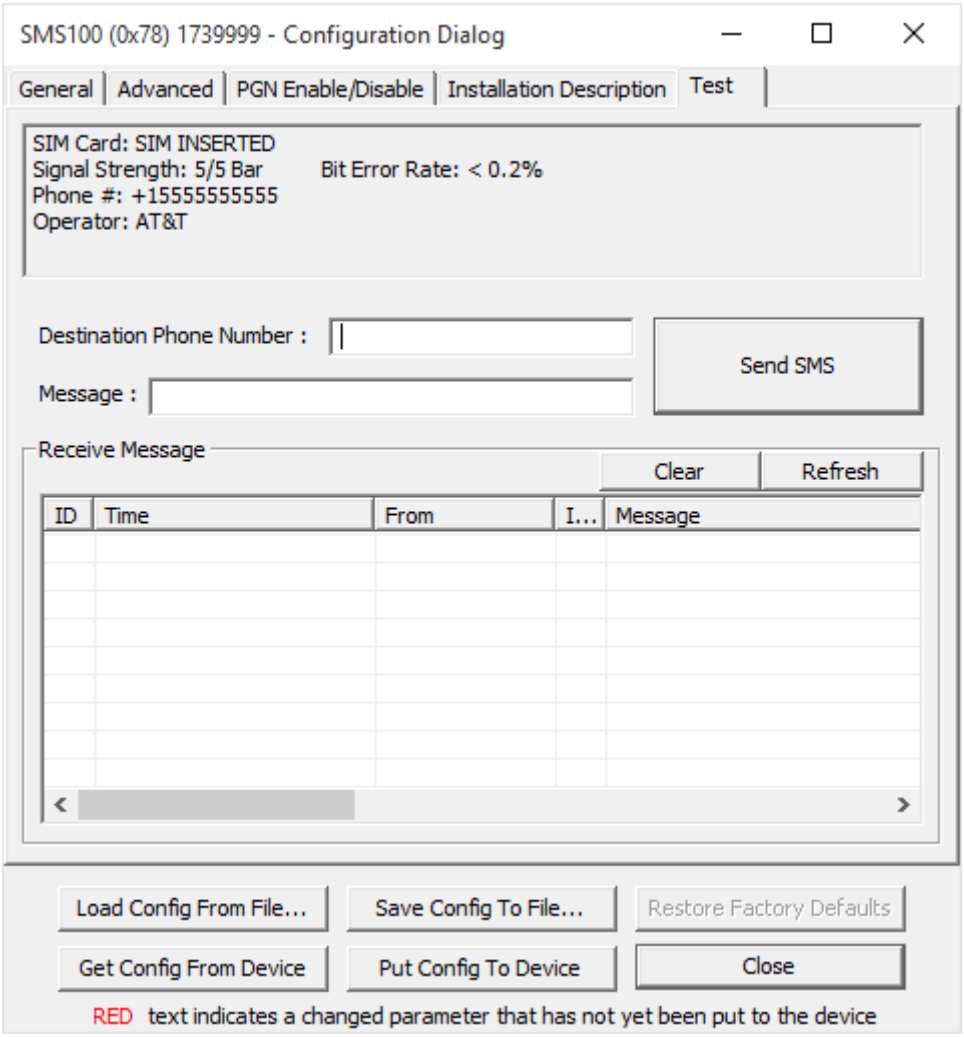


Figure 96 – SIM100 Test Tab

The top section of the screen shows the current operating status of the SMS100.

- **SIM Card** – This entry shows the status of the SIM card. Normally, it should show “SIM INSERTED”.
- **Signal Strength** – This entry shows the signal strength of the cellular network as seen by the SMS100. This signal strength is shown on a scale of one to five bars.
- **Phone #** - This entry identifies the phone number used by the SMS100. This phone number is defined by the SIM card which is installed in the SMS100.
- **Operator** – This entry identifies the cellular provider the SMS100 is currently connected to.
- **Bit Error Rate** – This entry shows the bit error rate of the cellular network connection. This figure may be requested by Maretron technical support personnel.

The middle section of the screen allows you to send a SMS text message to an arbitrary phone number. To send a test message, enter the phone number to which you wish to send the message into the "Destination Phone Number" field, then enter the text of the message to be sent into the "Message" field, and finally, scroll to the "Send" field and press the "Send SMS" button. The text in the Message field will be sent to the telephone number in the "Destination Phone Number" field.

The bottom section of the screen displays the SMS text messages most recently received by the SMS100. You can test SMS100 message reception by using a cellular telephone to send a SMS text message to the telephone number of the SMS100, and then watching for the message to appear on this section of the screen within a few seconds to a minute or longer, depending on the cellular network.

4.7.24 SSC200

4.7.24.1 General Tab

This tab contains commonly-used configuration items.

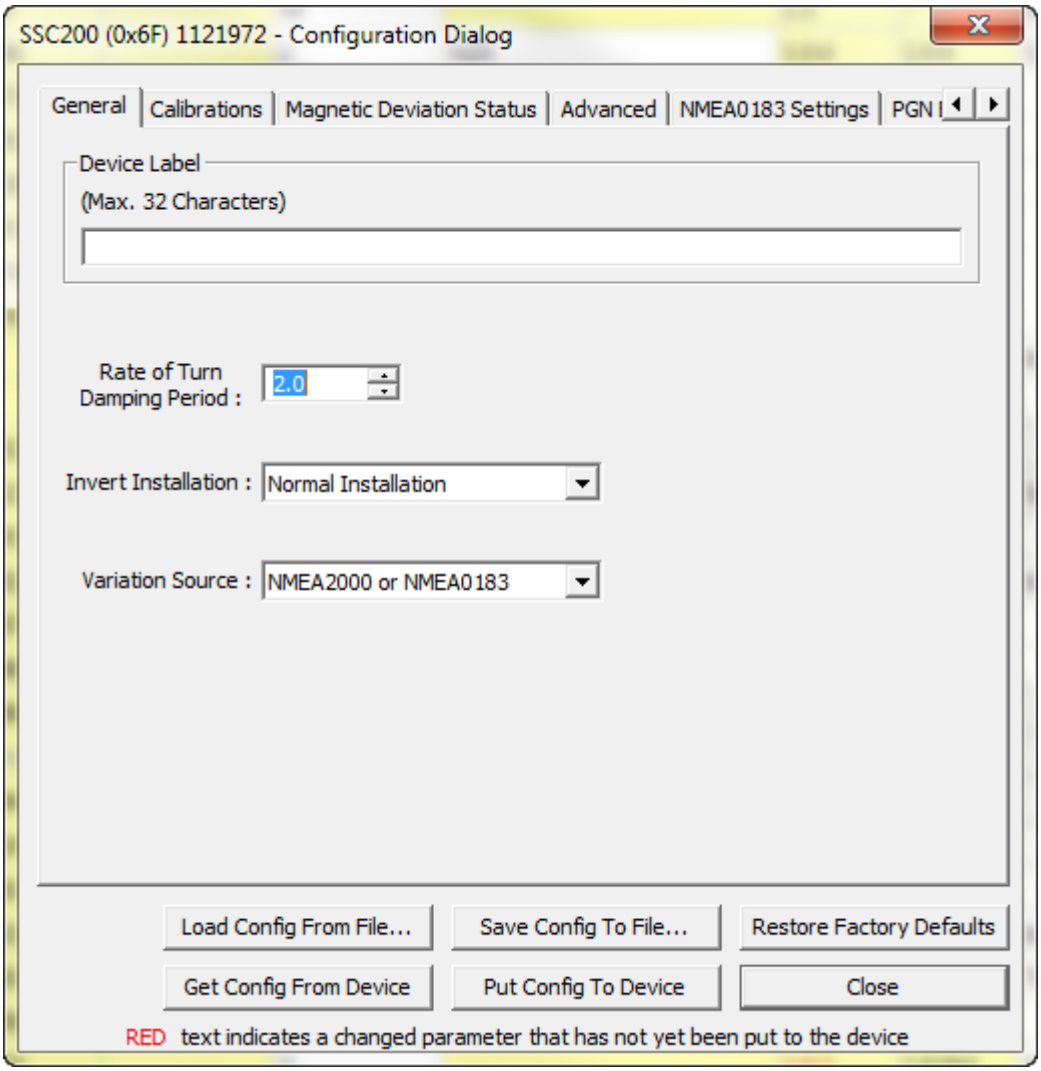


Figure 97 – SSC200 General Tab

4.7.24.1.1 Device Label

This text box allows you to assign a text label to the device. This label is visible in Maretron analysis and display products and allows you to easily identify the particular device.

4.7.24.1.2 Rate of Turn Damping Period

This command causes the SSC200 to use a rate of turn damping rate corresponding to the value programmed in this field. The damping period is programmable from 100ms to 60 seconds.

4.7.24.1.3 Invert Installation

Normally, the SSC200 is mounted so that the label on the compass is facing up and the NMEA 2000® and NMEA 0183 connectors are facing towards the bow of the vessel. A recent version of SSC200 firmware supports mounting the compass upside-down (for instance, to a ceiling), or backwards (with connectors facing towards the stern of the vessel, so that the SSC200 can be mounted to the aft side of a bulkhead). If either of these mounting options is used, this

parameter can be used to inform the SSC200 of this fact so that it can adjust heading, rate or turn, pitch, and roll readings to be corrected accordingly.

The choices that are offered are "Normal Installation" (default), "Backward Installation", "Upside-Down Installation", or "Upside Down and Backward".

4.7.24.1.4 Variation Source

The SSC200, being a magnetic compass, transmits heading information referenced to the magnetic north pole (magnetic heading). The SSC200 is capable of transmitting heading information referenced to the earth's geographic North Pole (true heading). In order to produce true heading, information regarding the magnetic variation at the current location is required. Please see the *SSC200 User's Manual* for more details on the use of magnetic variation by the SSC200 compass.

By default, the SSC200 is capable of receiving variation information on either its NMEA 0183 or NMEA 2000® interfaces. This causes the SSC200 to use variation data from either the NMEA 0183 interface or the NMEA 2000® interface.

You should need to alter this setting only if:

- There are variation sources available on both the NMEA 2000® and NMEA 0183 interfaces, or
- There is no magnetic variation source available.

If variation sources are available on both the NMEA 2000® and NMEA 0183 interfaces, you must tell the SSC200 which source to use. If you select the NMEA 0183 source, this causes the SSC200 to use variation data from the NMEA 0183 interface and ignore all other variation sources (i.e., NMEA 2000® interface and manual entries).

If there is no magnetic variation source available on either the NMEA 2000® or the NMEA 0183 interface, and you wish to display true heading information, you may manually enter a magnetic variation.

WARNING: Magnetic variation changes as your location on the earth changes; therefore magnetic variation should be adjusted with changes in position. The SSC200 will NOT make these changes automatically; they are the responsibility of the user.

4.7.24.2 Calibrations Tab

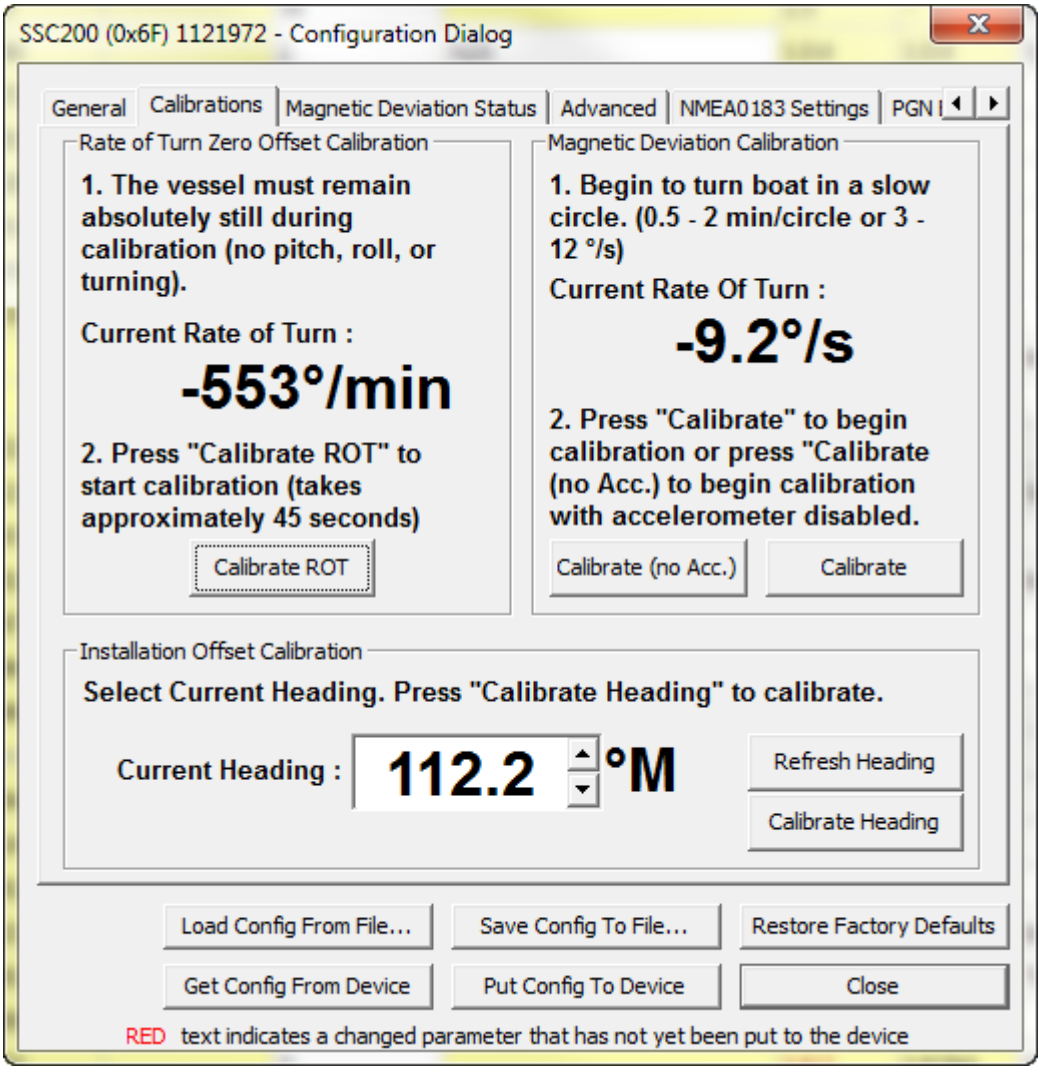


Figure 98 – SSC200 Calibrations Tab

4.7.24.2.1 Rate of Turn Zero Offset Calibration

The SSC200 transmits rate of turn information. Although the compass provides very accurate rate of turn information, it can drift away from zero even though the vessel is not turning. Fortunately, the SSC200 can learn the zero offset for different conditions found on the vessel. You teach the compass these zero offset values by pressing the “Calibrate ROT” button. The Rate of Turn Offset Calibration should be done before the Deviation Calibration.

4.7.24.2.2 Installation Offset Calibration

The installation offset (i.e., misalignment of installed SSC200 with vessel’s center line) may be calibrated using Maretron N2KAnalyzer. While executing “Installation Offset Calibration”, the vessel must stay still with no pitch and roll because SSC200 will also calibrate pitch and roll at this time. Once the compass is installed, point the vessel at a known heading, enter the known

heading value into the "Current Heading" text box, and finally press "Calibrate Heading" to perform the installation offset calibration.

4.7.24.3 Magnetic Deviation Calibration

N2KAnalyzer® can perform magnetic deviation calibration on a Maretron SSC200 solid state compass. The Rate of Turn Zero Offset Calibration should be done before the Magnetic Deviation Calibration. The Calibrations Tab gives instructions for performing the procedure. First, begin to turn the boat in a slow circle (either clockwise or counter-clockwise) at about 3 to 12 degrees per second. Then, press the "Calibrate" button. If you are in a large vessel, it may be difficult to turn the vessel in a small enough circle to avoid significant centrifugal force applied to the compass during magnetic deviation calibration. This can cause the built-in tilt sensors inside the compass to mistakenly believe that the compass is tilted during the magnetic deviation calibration, which can adversely affect the quality of the magnetic deviation calibration, especially in northerly latitudes where magnetic inclination (magnetic dip) is higher. If this is the case, instead of pressing "Calibrate" button, press the "Calibrate (No Acc)" button. This will cause the compass to ignore its tilt sensors and assume that the compass is level to the earth's surface during the calibration. You must keep the boat level during calibration if you choose this option.

After you press the "Calibrate" button, the Magnetic Deviation Calibration screen will appear. It will show the progress of the magnetic deviation calibration process. This progress screen shows the number of circles completed, the current heading, the current rate of turn, and the current status of compass calibration. If you do not wish to continue magnetic deviation calibration at this time, press Abort, and the currently stored deviation tables will be retained. Once calibration is successful, a completion screen will appear. If calibration is unsuccessful, a screen will appear indicating this, and you should repeat the calibration procedure.

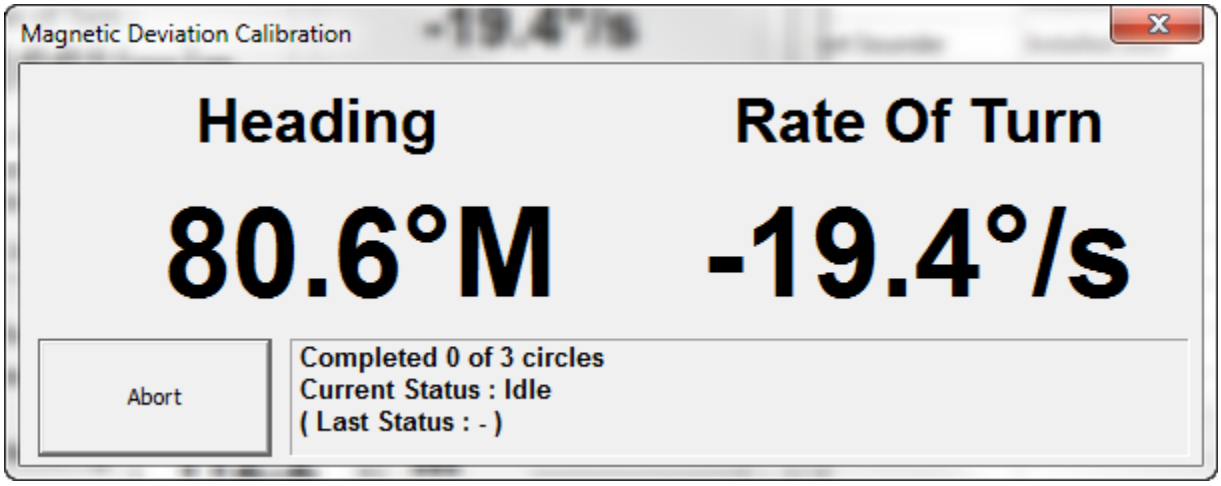


Figure 99 – SSC200 Magnetic Deviation Calibration Screen

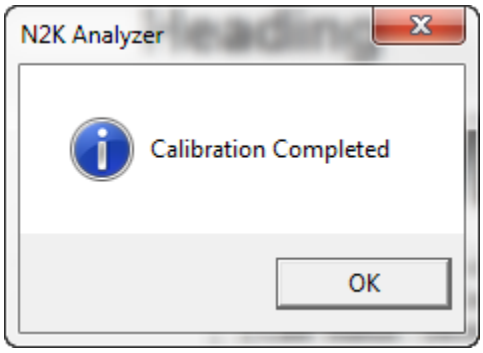


Figure 100 – SSC200 Magnetic Deviation Calibration Completion Window

4.7.24.4 Magnetic Deviation Status Tab

Selecting the Magnetic Deviation Status tab causes the Magnetic Deviation Status screen to be displayed, as shown below.

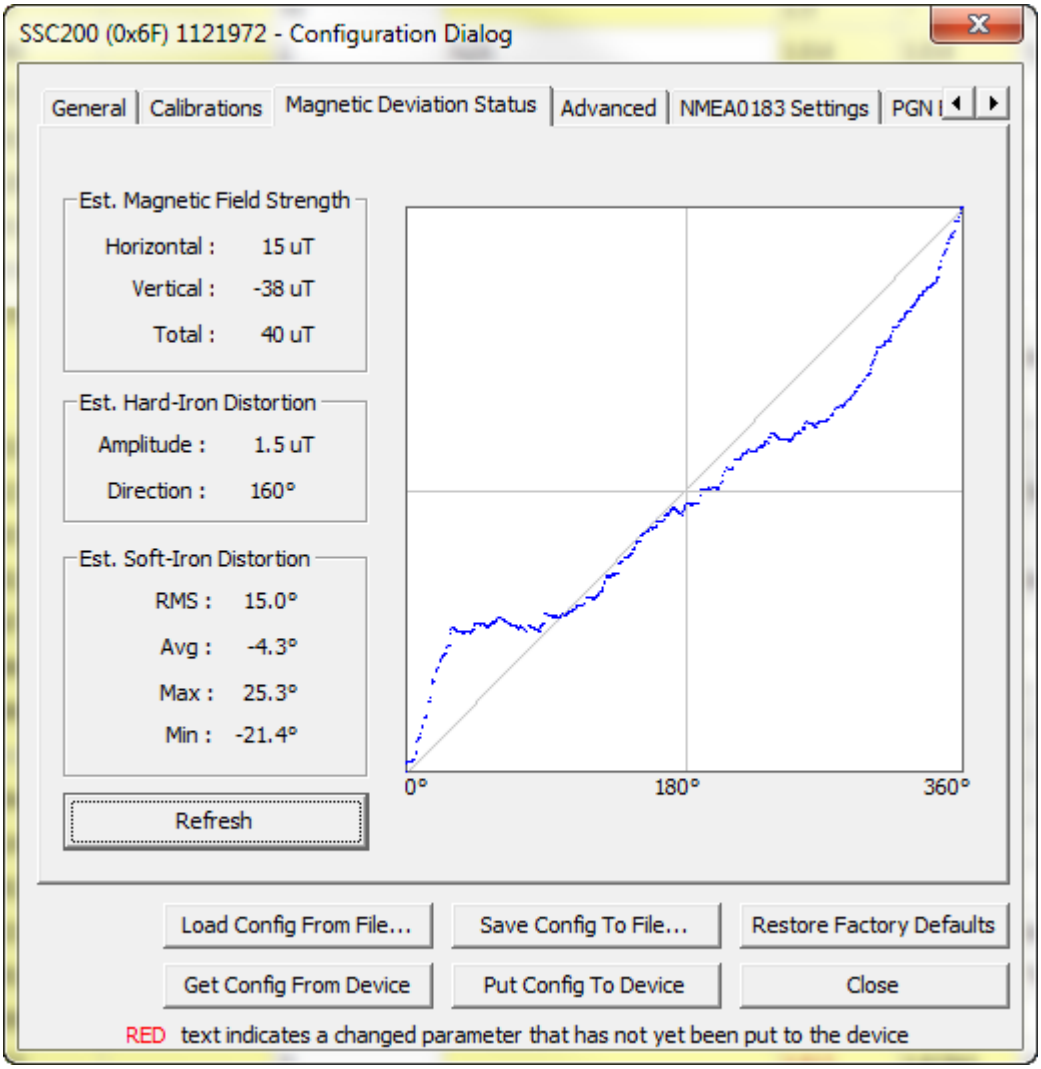


Figure 101 – SSC200 Magnetic Deviation Status Tab

4.7.24.5 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

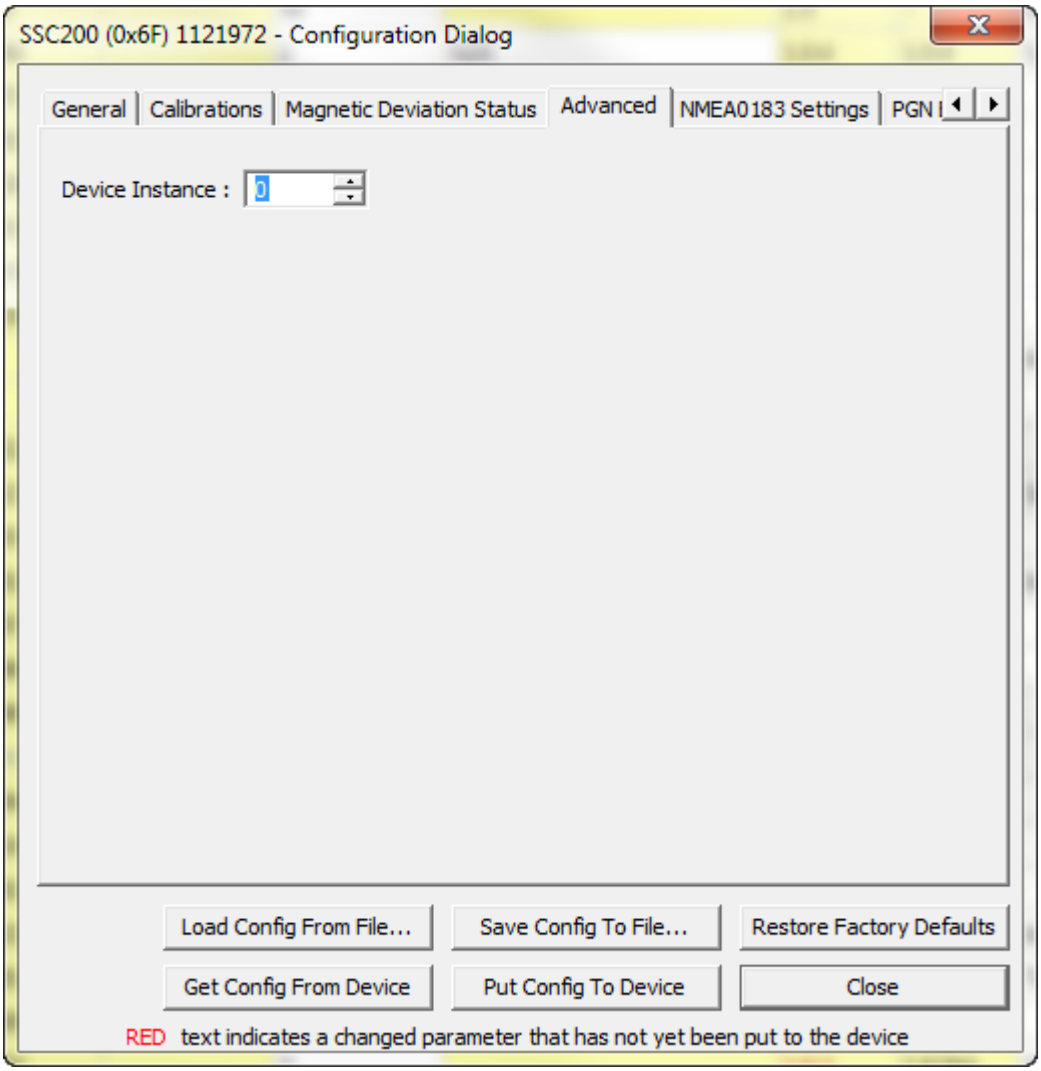


Figure 102 – SSC200 Advanced Tab

4.7.24.5.1 Device Instance

The device comes from the factory with the device instance value set to 0. If you have multiple of these devices on a network, you may find it necessary to set the device instances of other devices of this type so that they are different.

4.7.24.6 NMEA0183 Settings Tab

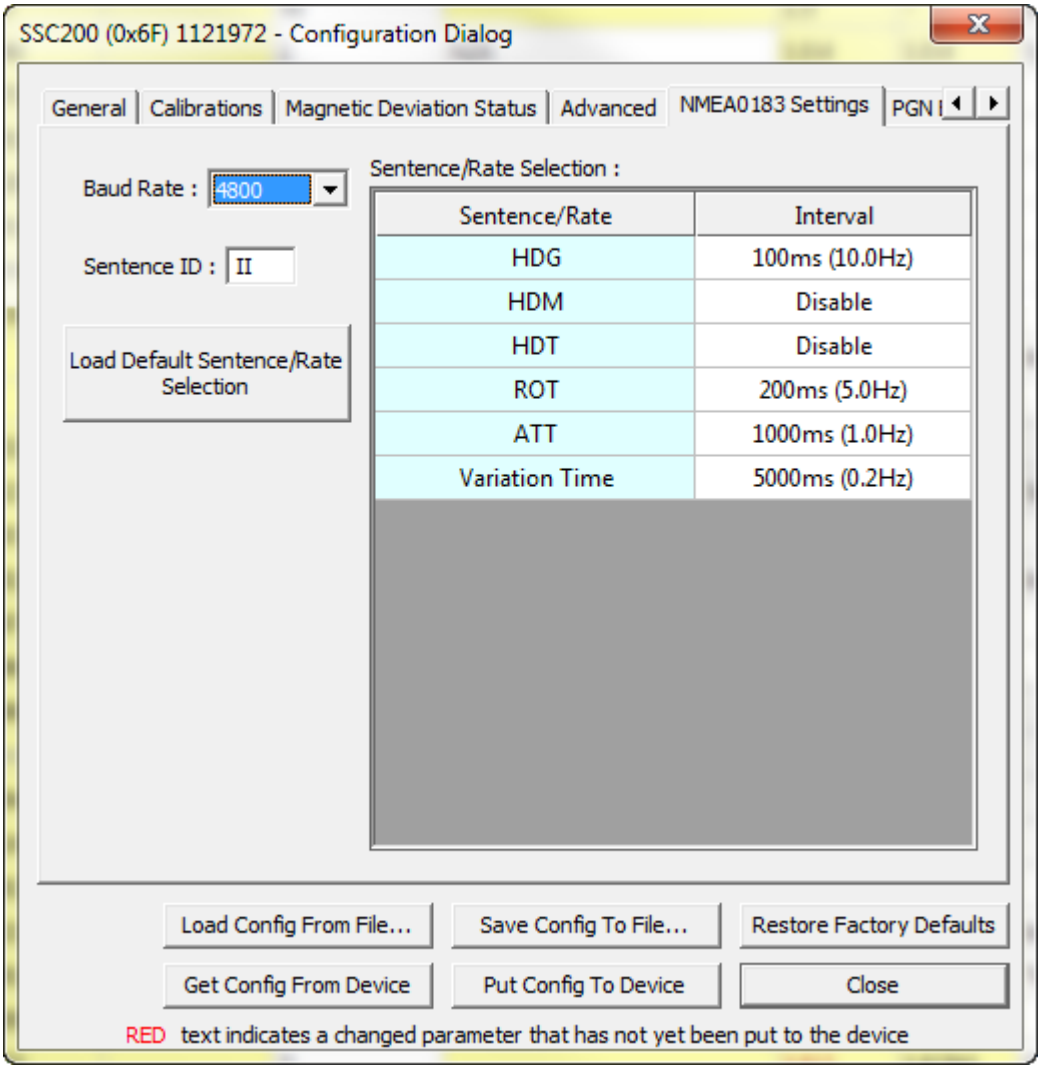


Figure 103 – SSC200 NMEA 0183 Settings Tab

4.7.24.6.1 Baud Rate

The usual baud rate on the NMEA 0183 port is 4800 baud. You may change the baud rate using this parameter.

4.7.24.6.2 Sentence ID

The normal NMEA 0183 sentence ID transmitted by the SSC200 is "II". If your NMEA 0183 equipment requires a different NMEA 0183 sentence ID, you may change it using this parameter.

4.7.24.6.3 Sentence/Rate Selection

The NMEA 0183 interface is a very low bandwidth interface. The SSC200 is capable of transmitting a wide variety of NMEA 0183 sentences, and can exceed the bandwidth of the

NMEA 0183 interface if all sentences are transmitted at maximum rates, causing lost data in NMEA 0183 multiplexers or on the SSC200 interface itself. It is important, therefore, to limit the types of NMEA 0183 sentences transmitted only to those that are necessary for other products which are connected to the NMEA 0183 interface. Using these parameters, you can selectively enable and disable the different NMEA 0183 sentences that the SSC200 can transmit, and you can program the transmission interval for the enabled sentences.

4.7.24.6.4 Load Default Sentence/Rate Selection

Pressing this button changes the NMEA 0183 sentence transmission rates to their factory default values.

4.7.24.7 PGN Enable/Disable Tab

This tab allows you to enable or disable the transmission of the periodic messages output by the device. You may enable or disable the transmission of the messages, or may program the time interval between transmissions of a specific message, for devices which support the programming of time intervals.

When you first open the PGN Enable/Disable tab, a list of periodic PGN's transmitted by the device will appear. The mode column will read "On", if the device is currently transmitting the message, or "Off", if the message has not yet been detected from the device.

You may configure each periodic message with one of the following choices:

4) Disable – this will turn off the periodic transmission of this message
5) Default – this will turn on the periodic transmission of this message at the default rate
6) A numeric value that will turn on the periodic transmission of this message at the specified rate

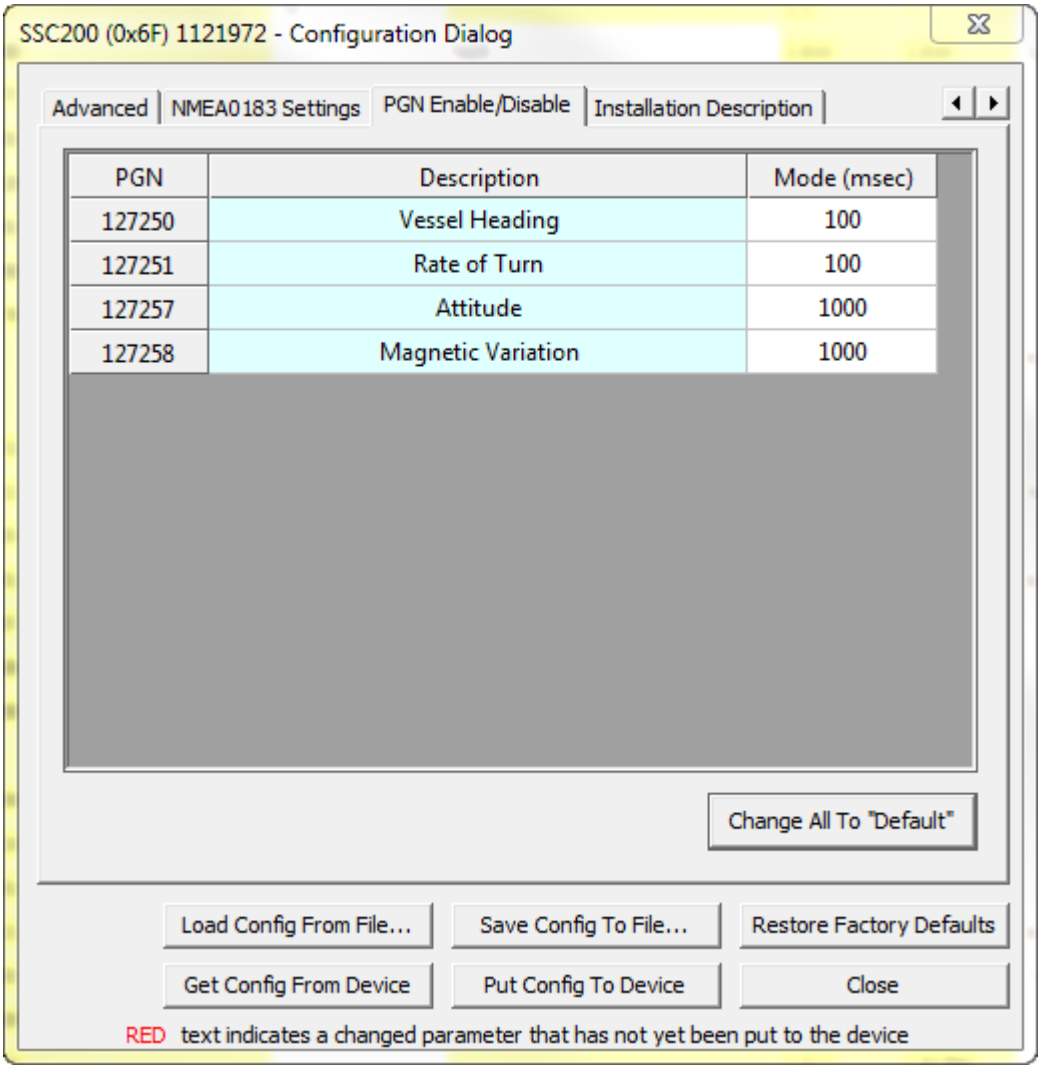


Figure 104 – SSC200 PGN Enable/Disable tab

4.7.25 TLA100

4.7.25.1 General Tab

This tab contains commonly-used configuration items.

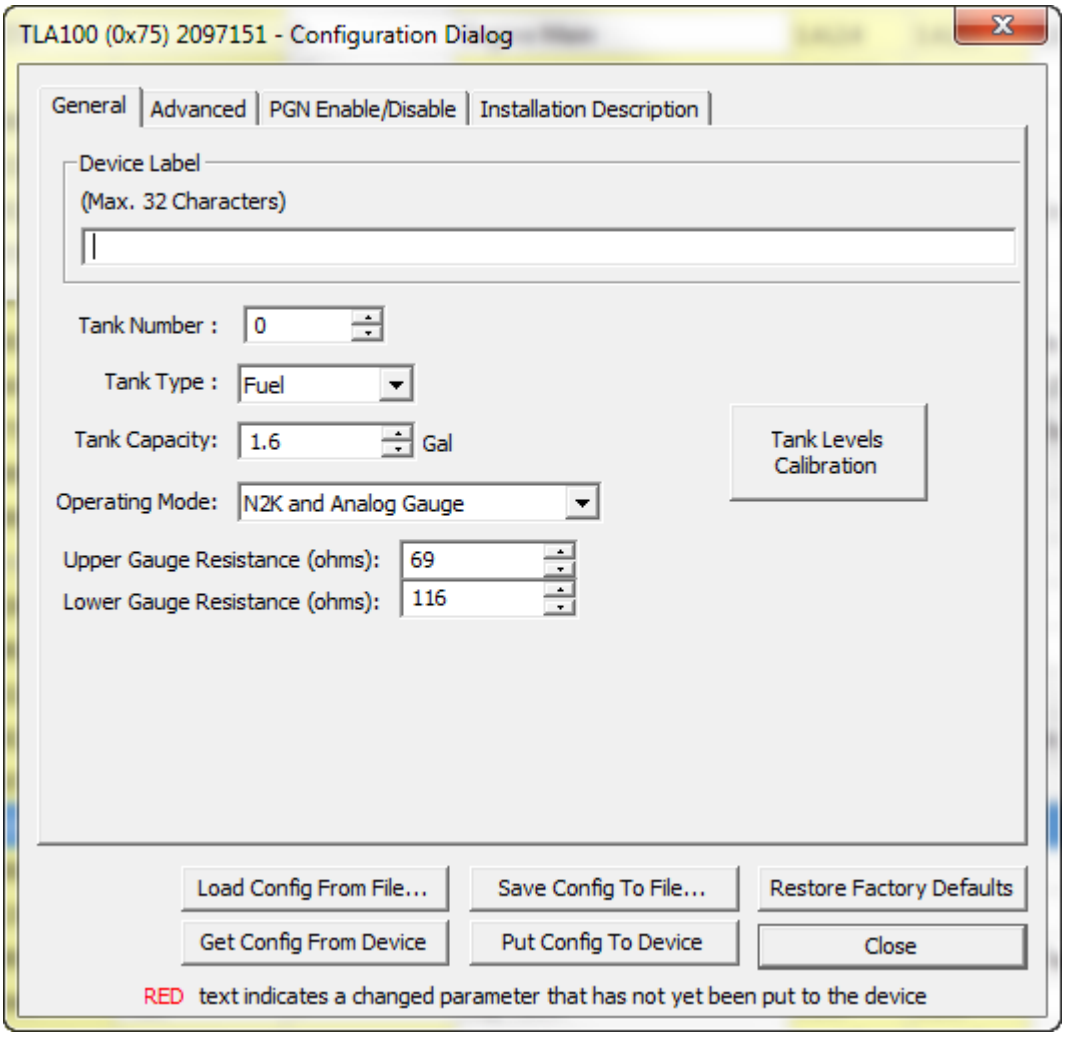


Figure 105 – TLA100 General Tab

4.7.25.1.1 Device Label

4.7.25.1.2 Tank Number

A tank number can have a value between 0 and 15. Each tank of a particular type must have a tank number that is different from all other tanks of the same type. For instance, only one TLA100 on a fuel tank may have tank number equal to “0”.

4.7.25.1.3 Tank Type

The TLA100 can be used in tanks containing any of a number of different types of fluids. So that network-connected monitoring devices can determine easily what sort of fluid is in the monitored tank, the TLA100 must be programmed to indicate the fluid type it is monitoring.

4.7.25.1.4 Tank Capacity

In order for the TLA100 to produce readings of the amount of fluid remaining in the tank, the tank capacity must be programmed into the TLA100 adapter.

4.7.25.1.5 Operating Mode

The TLA100 can be operated in one of two operating modes, depending on the installation.

NMEA 2000 (the only thing that is connected to the resistive sender is the TLA100)
NMEA 2000 & Analog Gauge (in addition to the TLA100, the resistive sender is also connected to a dual-coil analog gauge).

It is important that this setting be performed correctly in order for the TLA100 to produce correct level measurements.

4.7.25.1.6 Upper Gauge Resistance

If the desired operating mode is "NMEA 2000 & Analog Gauge", the two gauge resistances must be programmed (please refer to the *TLA100 User's Manual* for details on how to perform these measurements).

4.7.25.1.7 Lower Gauge Resistance

If the desired operating mode is "NMEA 2000 & Analog Gauge", the two gauge resistances must be programmed (please refer to the *TLA100 User's Manual* for details on how to perform these measurements).

4.7.25.1.8 Tank Levels Calibration

Pressing this button opens the Tank Calibration dialog, which is shown below.

There are two methods of calibration: Manual Table and Step Fill Table

4.7.25.1.9 Manual Table

Using the manual table method, you enter each entry of the measured parameter (depth) and the level of fluid in the tank. The table may have as few as 2 entries (for a tank with rectangular cross-section) or as many as 16 entries (for a tank with a complex cross-section).

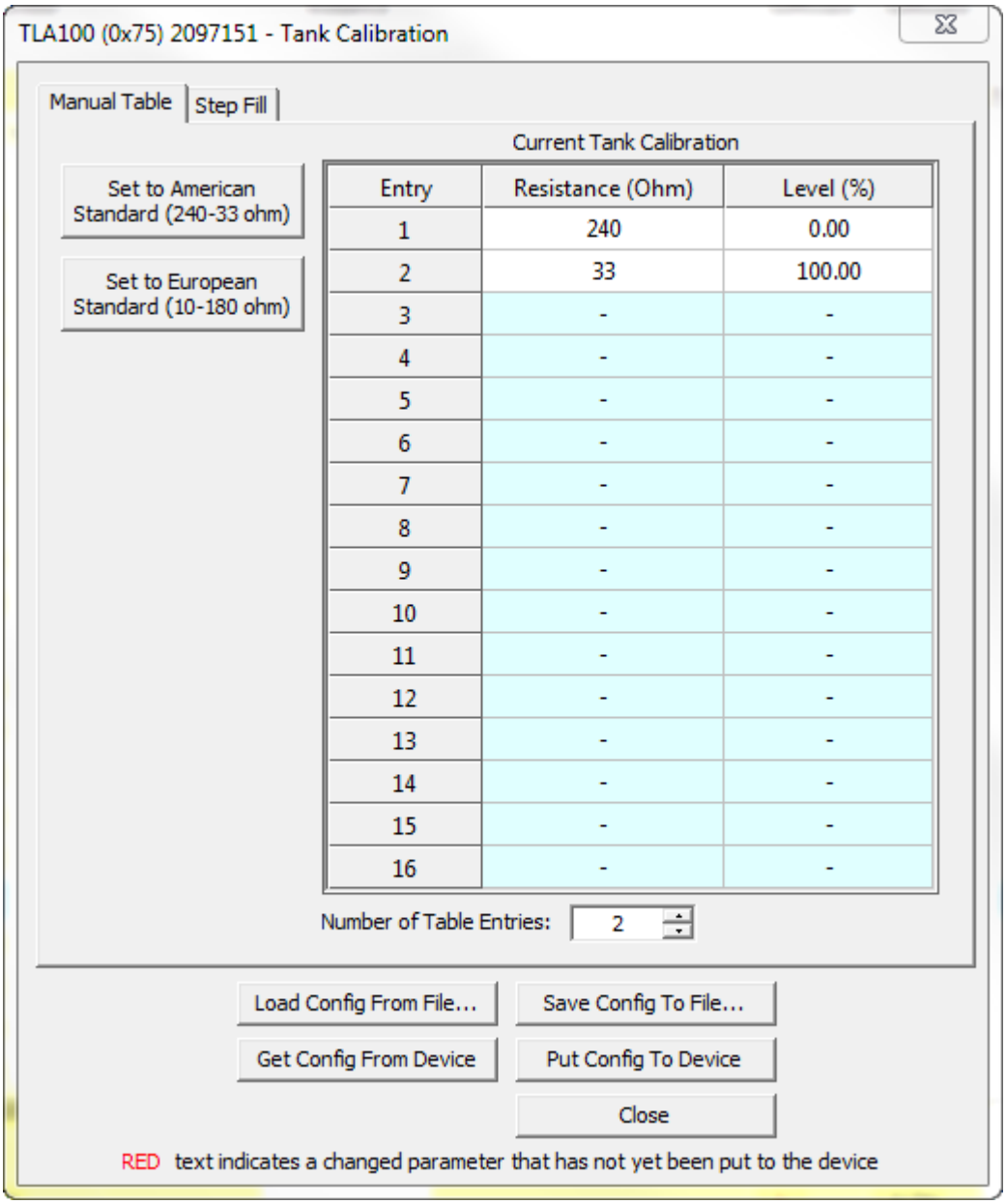


Figure 106 – TLA100 Tank Calibration: Manual Table

4.7.25.1.9.1 Number of Table Entries

You may choose the number of entries to be in the calibration table. Two is sufficient for a tank with a rectangular cross-section. The FPM100 supports up to 16 table entries for supporting tanks with more complex cross-sections.

4.7.25.1.9.2 Current Tank Calibration

This grid shows the values of the tank calibration table. Each line of the grid has two entries:

1) Resistance – this is the resistance of the tank level sender
2) Level (%) – this is the percent full the tank is at the specific resistance

4.7.25.1.10 Step Fill Table

In the Step Fill Table method, you start with an empty tank, and then fill the tank with fluid, stopping at intermediate points to enter the amount of fluid put into the tank thus far, ending once the tank is full. You may enter between two and sixteen calibration points.

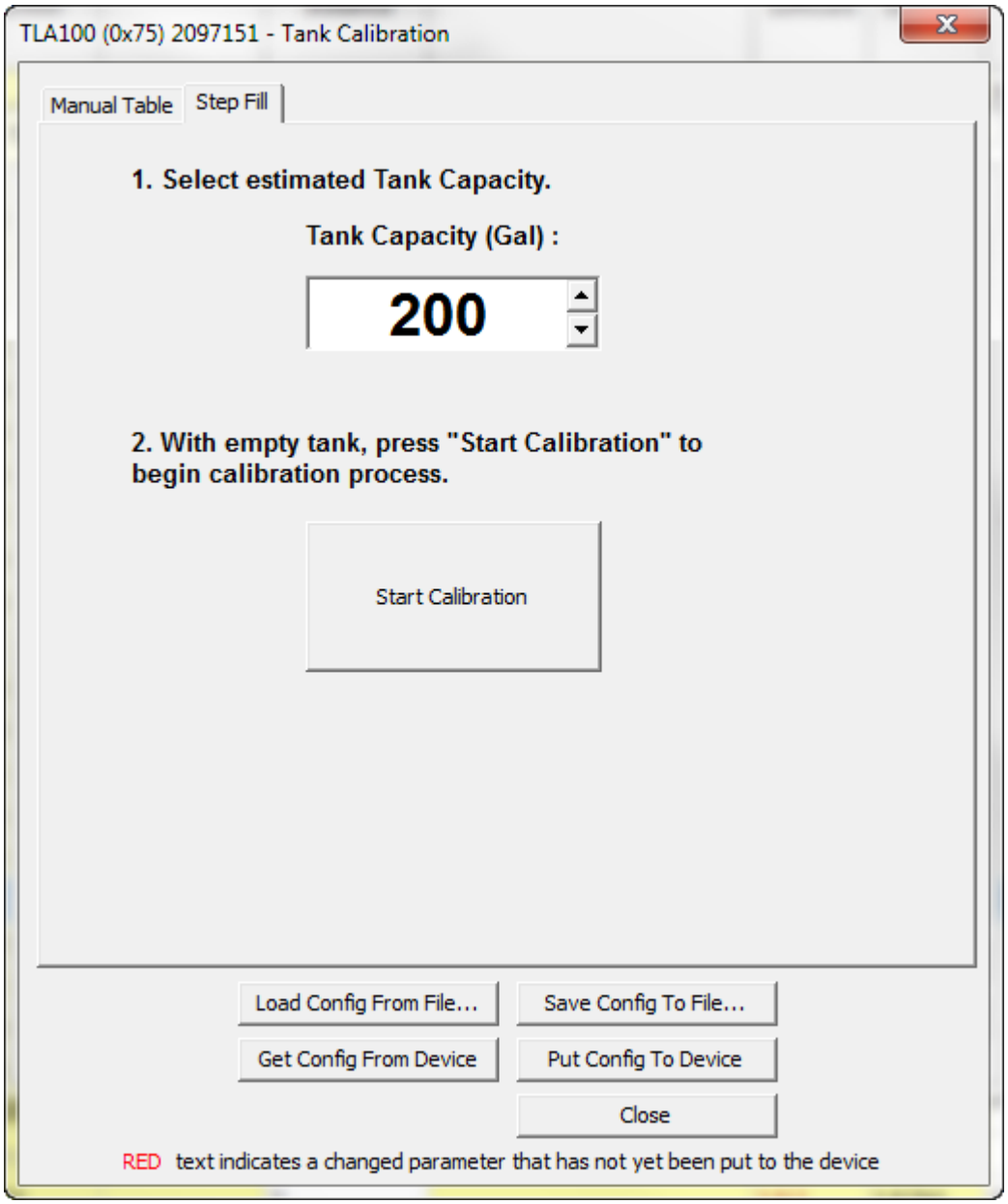


Figure 107 – TLA100 Tank Calibration – Step Fill Initial Window

To use this method, use the following steps:

1) Enter the estimated total capacity of the tank into the “Tank Capacity” text box.
2) Press the “Start Calibration” button. You will now see the Step Fill Calibration window displayed, as shown below.

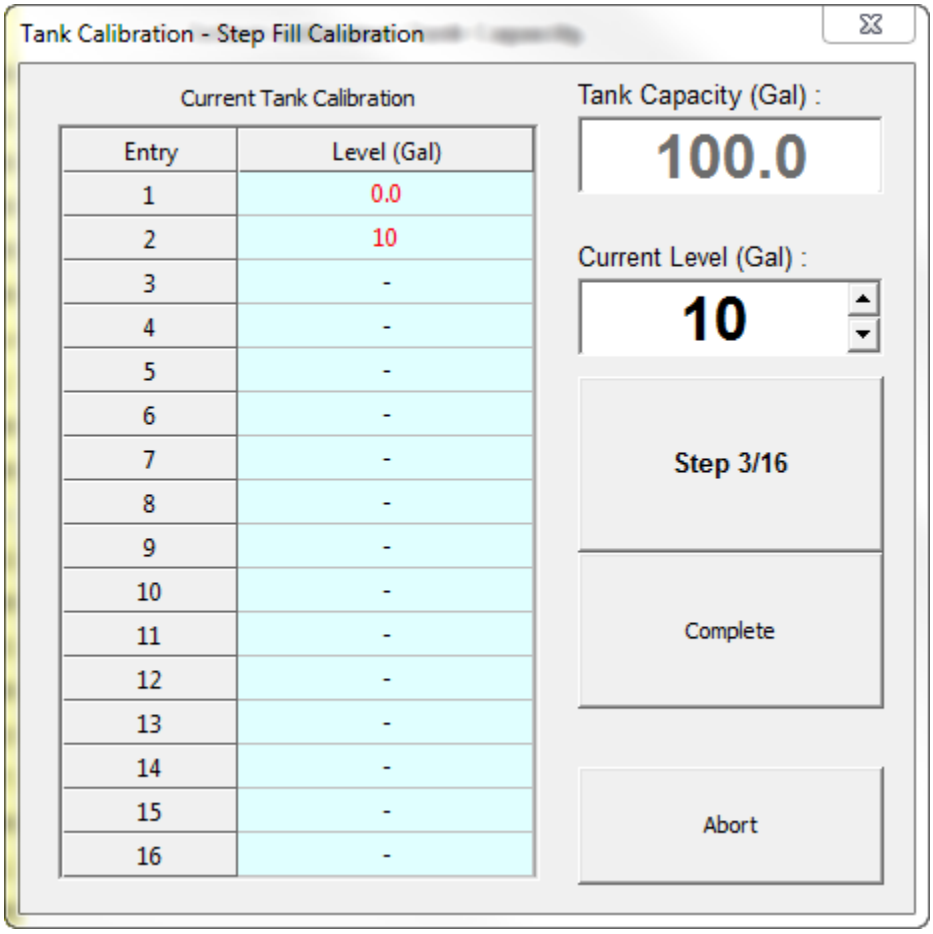


Figure 108 – TLA100 Step Fill Calibration Continuation Window

3) Enter "0" into the Current Level text box, and press "Step". You have now entered the first point of the table.
4) Partially fill the tank. Enter the amount of fluid pumped into the tank into the "Current Level" text box, and press "Step" (if you make a mistake entering a level, you can press "Back" and re-enter the level, If you want to cancel the process, press the "Abort" button).
5) Repeat the previous step until the tank is completely filled.

Once you have entered the last point, where the tank is 100% full, press "Complete". This will cause the table to be stored in the device.

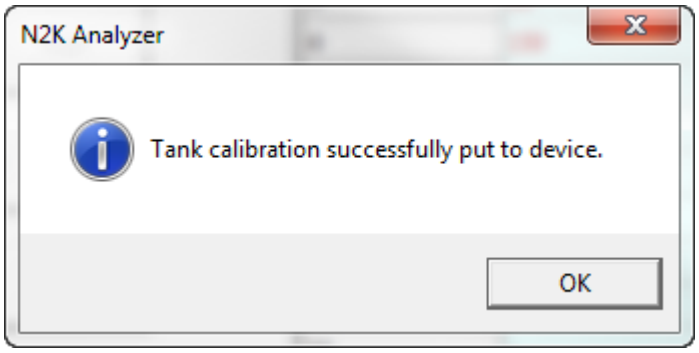


Figure 109 – TLA100 Tank Fill Confirmation Dialog Box

4.7.25.2 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

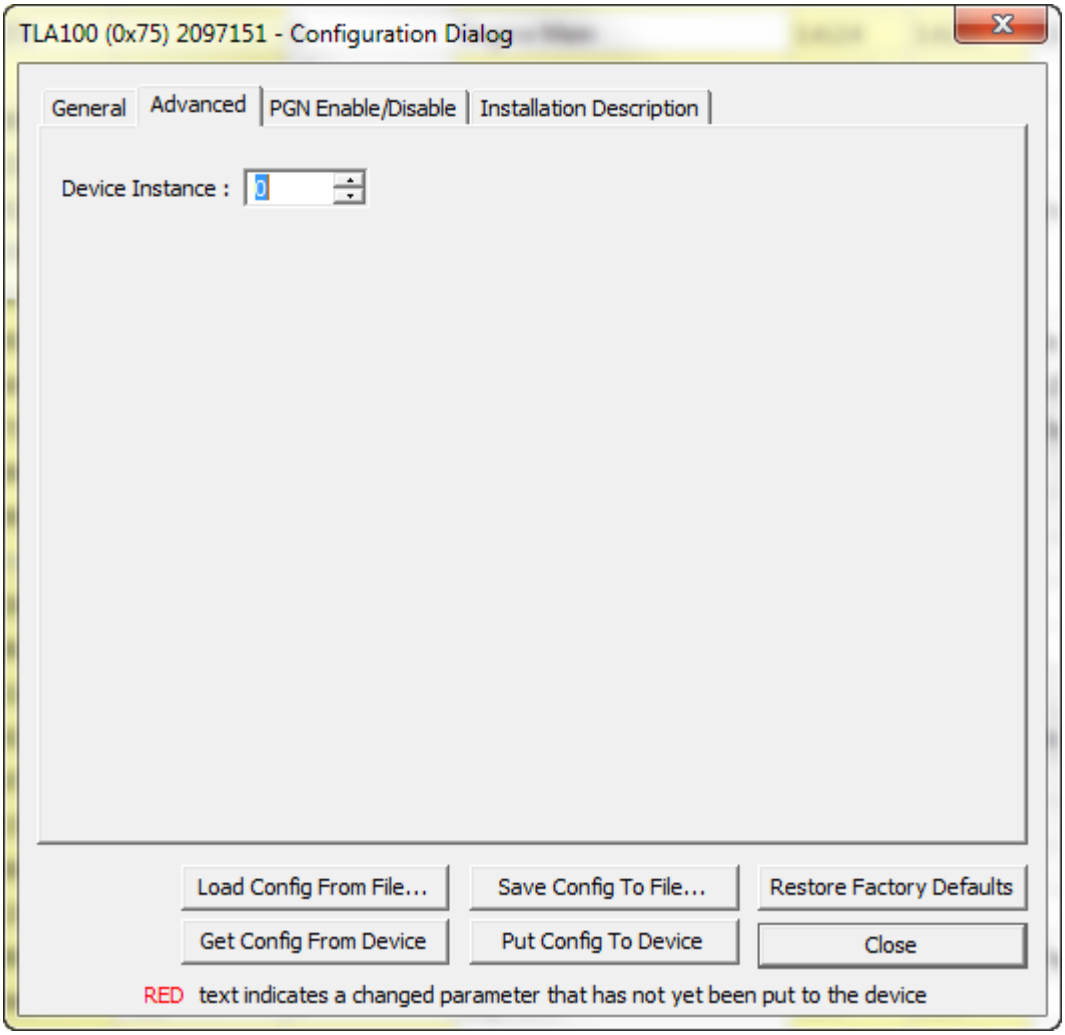


Figure 110 – TLA100 Advanced Tab

4.7.25.2.1 Device Instance

The device comes from the factory with the device instance value set to 0. If you have multiple of these devices on a network, you may find it necessary to set the device instances of other devices of this type so that they are different.

4.7.25.3 PGN Enable/Disable Tab

This tab allows you to enable or disable the transmission of the periodic messages output by the device. You may enable or disable the transmission of the messages, or may program the time interval between transmissions of a specific message, for devices which support the programming of time intervals.

When you first open the PGN Enable/Disable tab, a list of periodic PGN's transmitted by the device will appear. The mode column will read "On", if the device is currently transmitting the message, or "Off", if the message has not yet been detected from the device.

You may configure each periodic message with one of the following choices:

1) Disable – this will turn off the periodic transmission of this message
2) Default – this will turn on the periodic transmission of this message at the default rate
3) A numeric value that will turn on the periodic transmission of this message at the specified rate

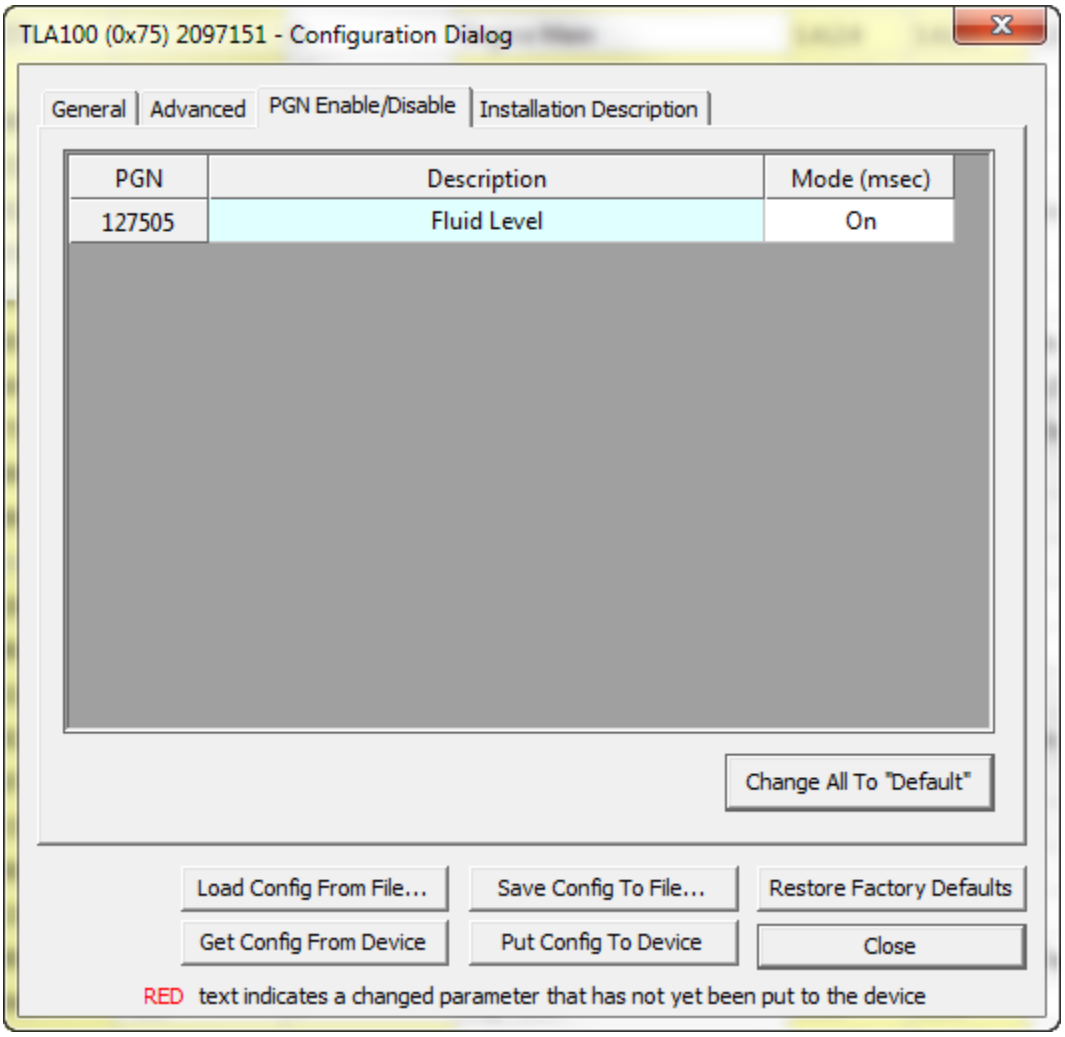


Figure 111 – TLA100 PGN Enable/Disable tab

4.7.25.4 Installation Description Tab

This tab allows you to set values for the installation description properties of the device.

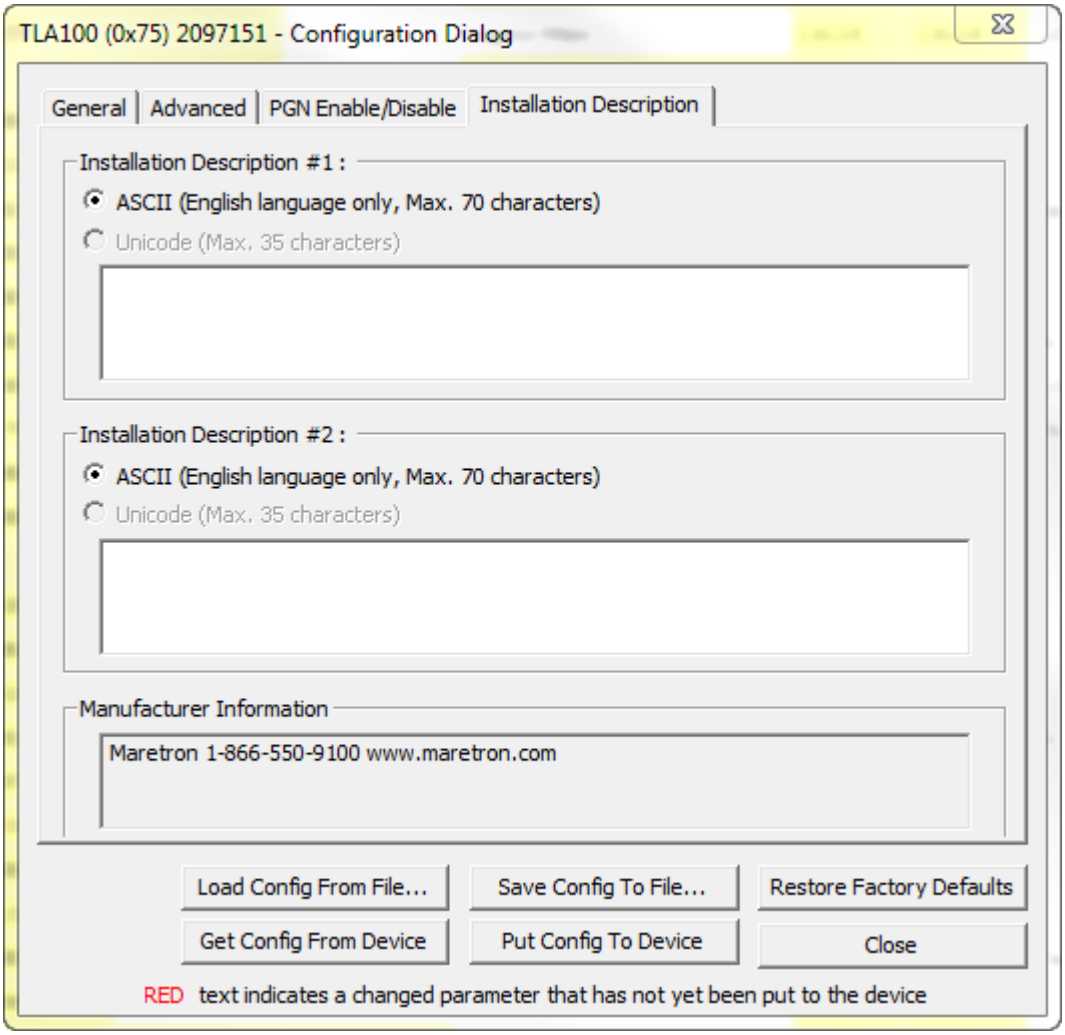


Figure 112 – TLA100 Installation Description Tab

4.7.25.4.1 Installation Description #1, #2

This device, along with all other Level A certified NMEA devices, has two user-programmable installation description fields. You may program these fields with information specific to the device, such as date installed, the initials/name of the installer, the physical location of the device, etc. This configuration option will allow you to program the values of these fields.

4.7.26 TLM100, TLM150, TLM200

4.7.26.1 General Tab

This tab contains commonly-used configuration items.

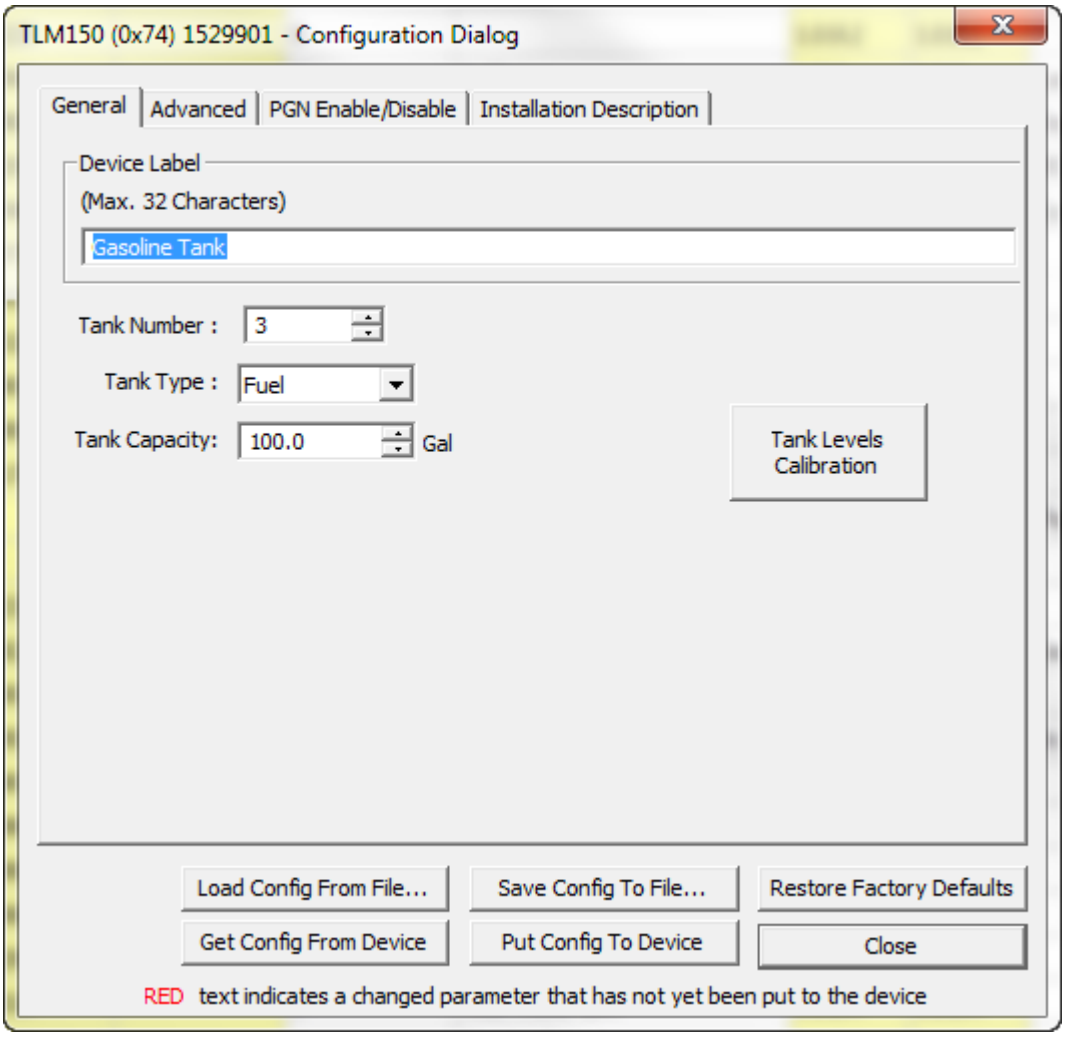


Figure 113 – TLMxxx General Tab

4.7.26.1.1 Device Label

4.7.26.1.2 Tank Number

As shipped from the factory, the TLMxxx transmits the Tank Number as “0”. The TLMxxx supports up to sixteen tanks (0 through 15) for a given type of tank, which means you can monitor up to 16 separate fuel tanks or 16 separate fresh water tanks. The TLMxxx is configured or programmed by choosing a TLMxxx tank number using a display product such as the Maretron DSM250. Refer to the user’s manual of the particular product that will be used for configuring the TLMxxx as these manuals provide detailed instruction on configuration procedures.

4.7.26.1.3 Tank Type

As shipped from the factory, the TLMXXX transmits the tank type as "Fuel". You can reconfigure the TLMXXX for any of these tank types:

- Fuel
- Fresh Water
- Waste Water
- Live Well
- Oil
- Black Water
- Reserved-1 through Reserved-7 (if none of the above types apply)

4.7.26.1.4 Tank Capacity

In addition to indicating the fluid level within a tank, the TLMXXX also has the ability to be configured or programmed with the attached tank's capacity. This way, you will be able to view the tank's capacity as well as the amount of liquid remaining anywhere on the vessel where there is an NMEA 2000® compatible display.

4.7.26.1.5 Tank Levels Calibration

Pressing this button opens the Tank Calibration dialog, which is shown below.

There are two methods of calibration: Manual Table and Step Fill Table

4.7.26.1.6 Manual Table

Using the manual table method, you enter each entry of the measured parameter (depth) and the level of fluid in the tank. The table may have as few as 2 entries (for a tank with rectangular cross-section) or as many as 16 entries (for a tank with a complex cross-section).

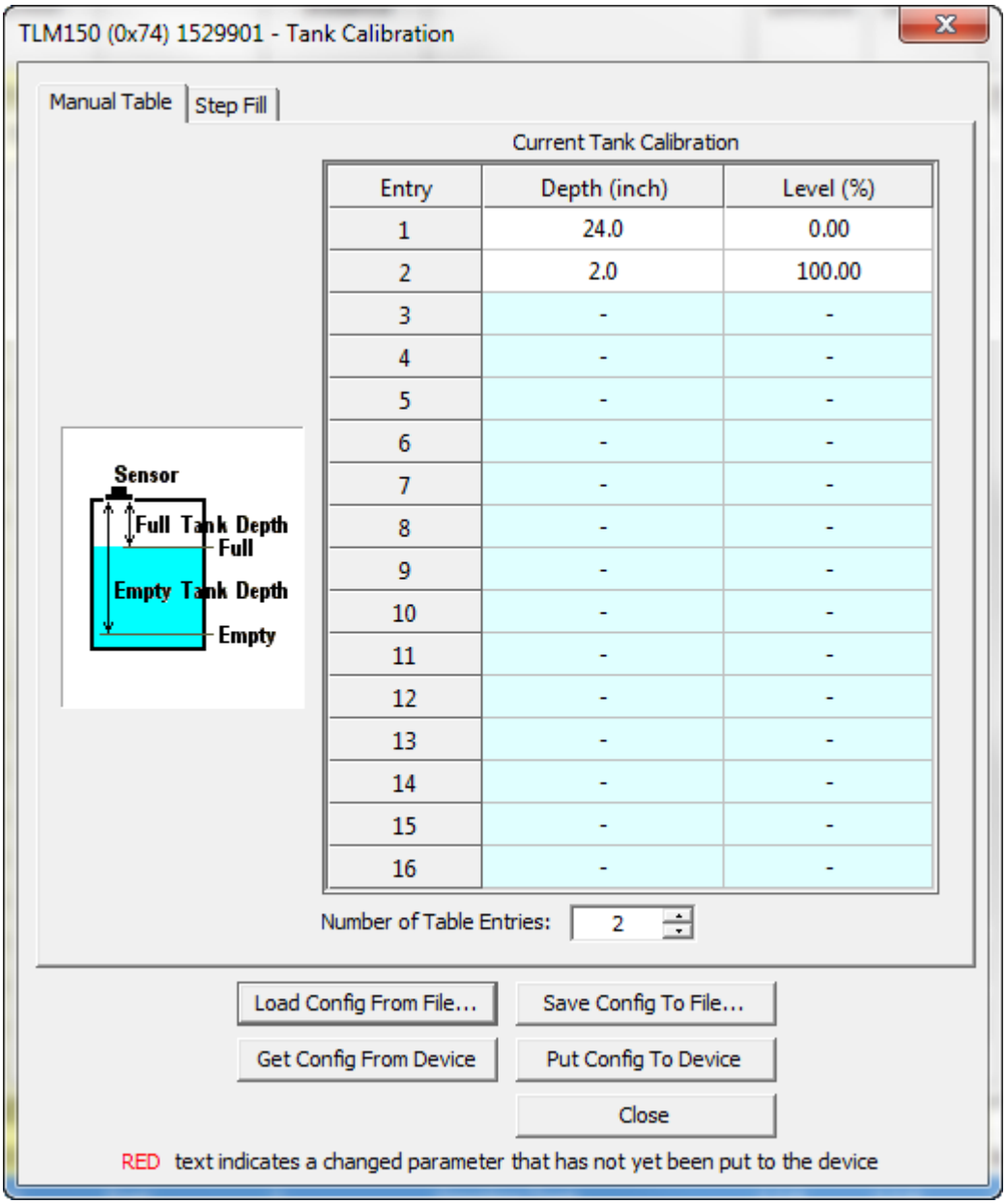


Figure 114 – TLMxxx Tank Calibration: Manual Table Tab

4.7.26.1.6.1 Number of Table Entries

You may choose the number of entries to be in the calibration table. Two is sufficient for a tank with a rectangular cross-section. The FPM100 supports up to 16 table entries for supporting tanks with more complex cross-sections.

4.7.26.1.6.2 Current Tank Calibration

This grid shows the values of the tank calibration table. Each line of the grid has two entries:

1) Distance – this is the distance from the face of the ultrasonic sensor to the surface of the fluid
2) Level (%) – this is the percent full the tank is at the specific distance

4.7.26.1.7 Step Fill Table

In the Step Fill Table method, you start with an empty tank, and then fill the tank with fluid, stopping at intermediate points to enter the amount of fluid put into the tank thus far, ending once the tank is full. You may enter between two and sixteen calibration points.

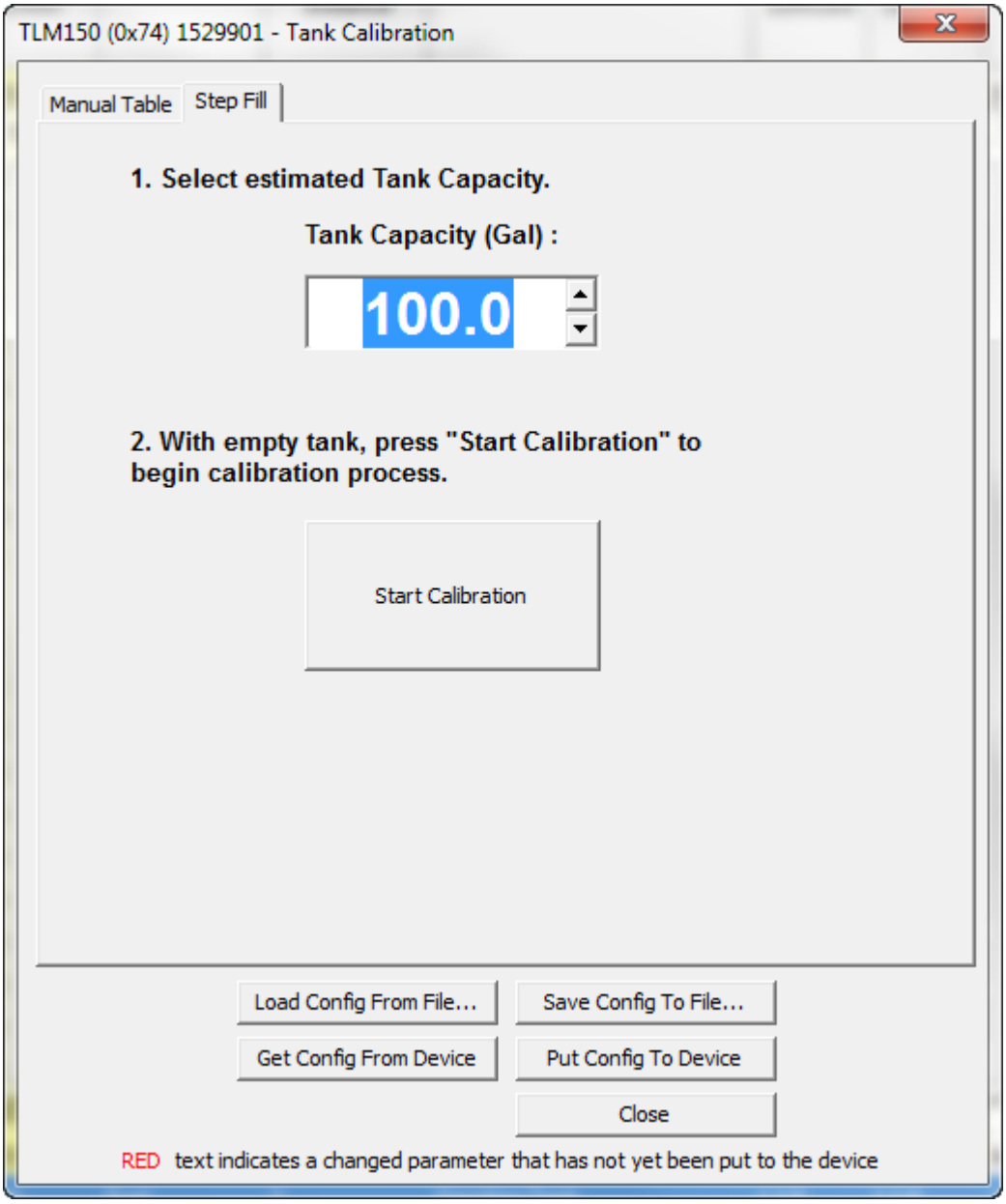


Figure 115 – TLMxxx Tank Calibration – Step Fill Initial Window

To use this method, use the following steps:

1) Enter the estimated total capacity of the tank into the “Tank Capacity” text box.
2) Press “Start Calibration”. You will now see the Step Fill Calibration window displayed, as shown below.

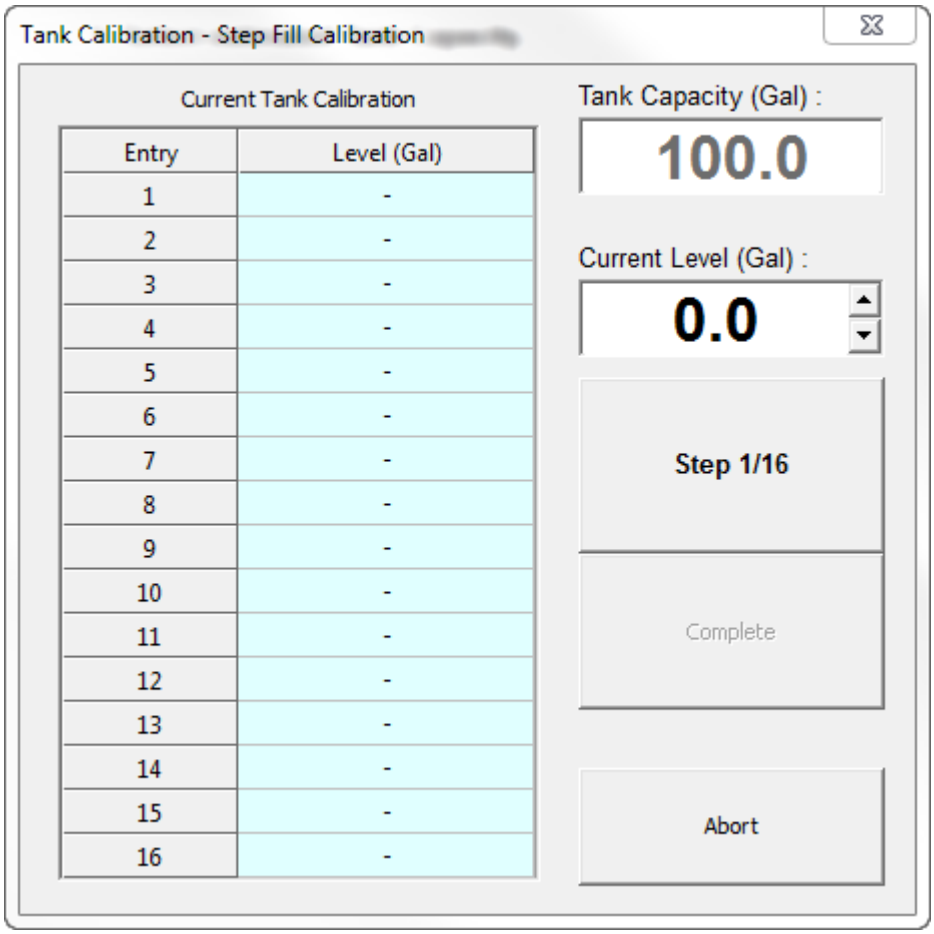


Figure 116 – TLMxxx Step Fill Calibration Continuation Window

3) Enter “0” into the Current Level text box, and press “Step”. You have now entered the first point of the table.
4) Partially fill the tank. Enter the amount of fluid pumped into the tank into the “Current Level” text box, and press “Step” (if you make a mistake entering a level, you can press “Back” and re-enter the level, If you want to cancel the process, press the “Abort” button).
5) Repeat the previous step until the tank is completely filled.

Once you have entered the last point, where the tank is 100% full, press “Complete”. This will cause the table to be stored in the device.

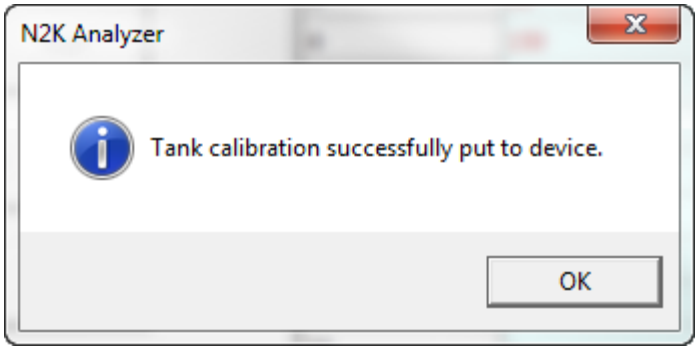


Figure 117 – TLMxxx Tank Calibration Conformation Dialog Box

4.7.26.2 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

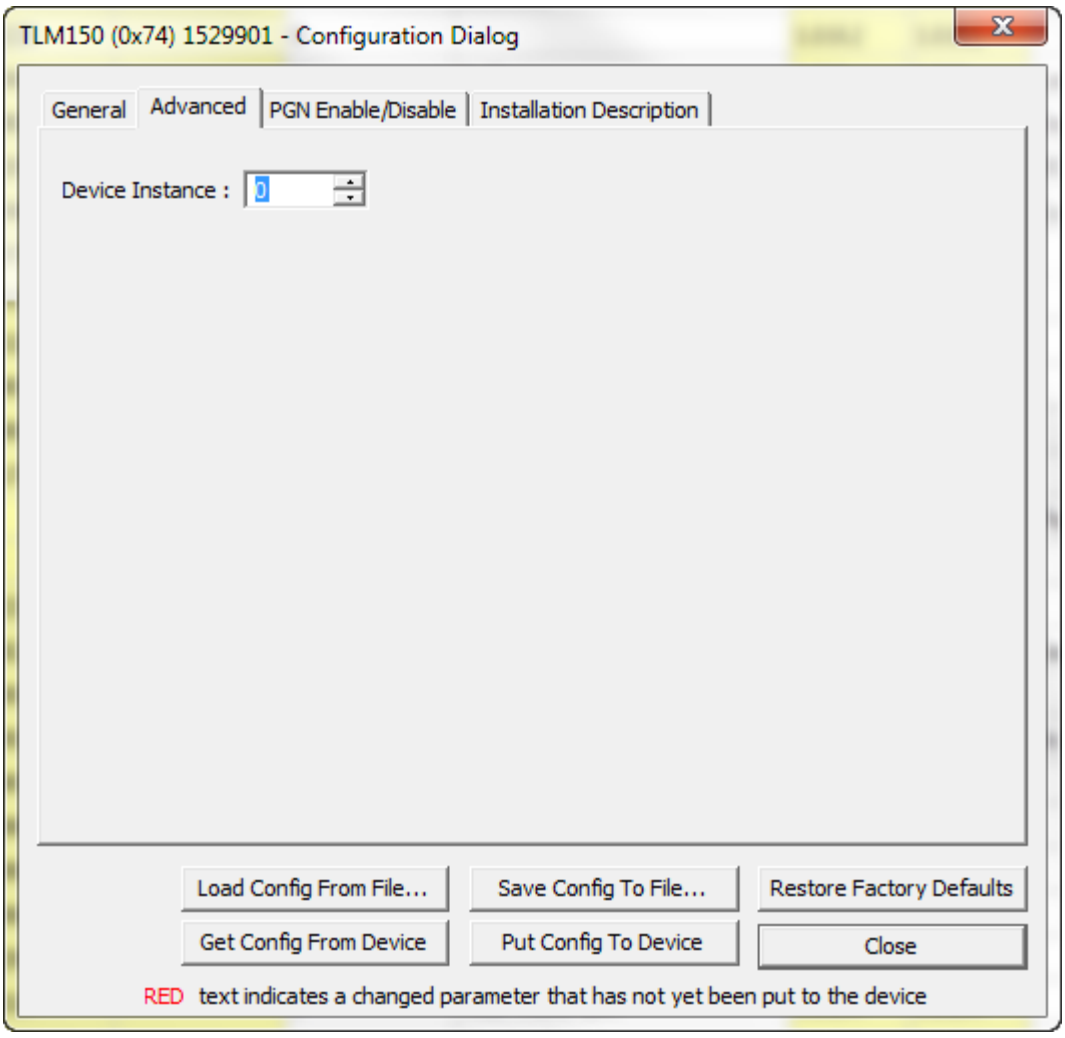


Figure 118 – TLMxxx Advanced Tab

4.7.26.2.1 Device Instance

The device comes from the factory with the device instance value set to 0. If you have multiple of these devices on a network, you may find it necessary to set the device instances of other devices of this type so that they are different.

4.7.26.3 PGN Enable/Disable Tab

This tab allows you to enable or disable the transmission of the periodic messages output by the device. You may enable or disable the transmission of the messages, or may program the time interval between transmissions of a specific message, for devices which support the programming of time intervals.

When you first open the PGN Enable/Disable tab, a list of periodic PGN's transmitted by the device will appear. The mode column will read "On", if the device is currently transmitting the message, or "Off", if the message has not yet been detected from the device.

You may configure each periodic message with one of the following choices:

1) Disable – this will turn off the periodic transmission of this message
2) Default – this will turn on the periodic transmission of this message at the default rate
3) A numeric value that will turn on the periodic transmission of this message at the specified rate

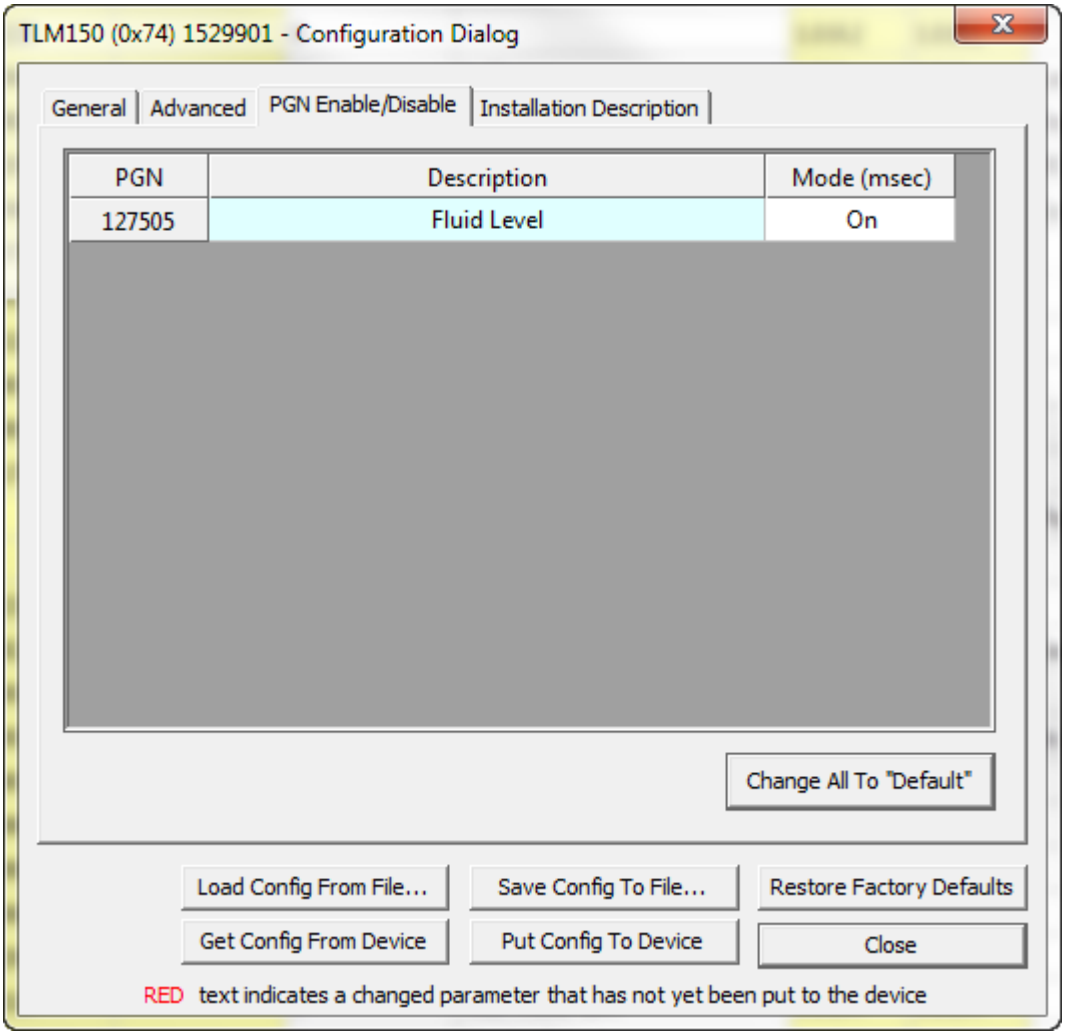


Figure 119 – TLMxxx PGN Enable/Disable tab

4.7.26.4 Installation Description Tab

This tab allows you to set values for the installation description properties of the device.

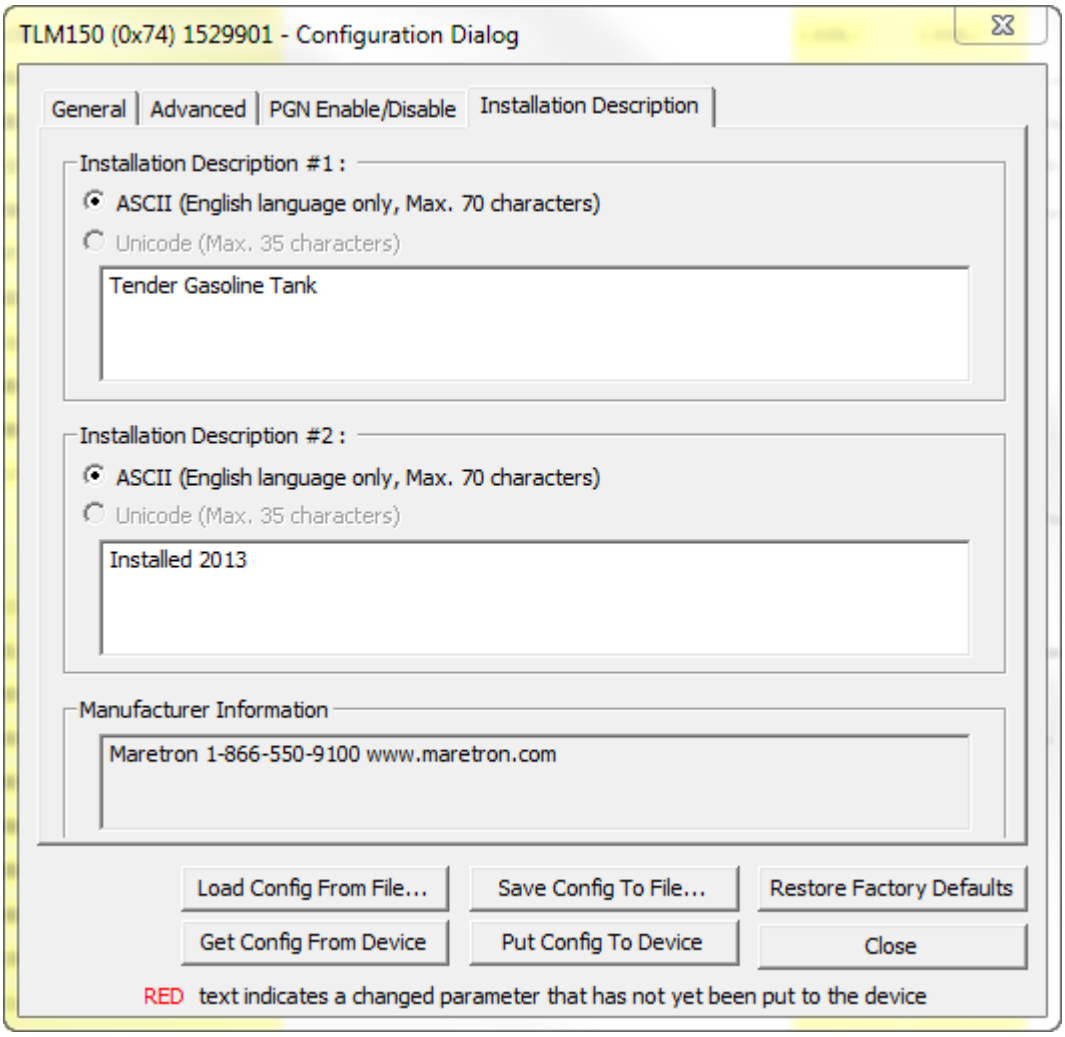


Figure 120 – TLMxxx Installation Description Tab

4.7.26.4.1 Installation Description #1, #2

This device, along with all other Level A certified NMEA devices, has two user-programmable installation description fields. You may program these fields with information specific to the device, such as date installed, the initials/name of the installer, the physical location of the device, etc. This configuration option will allow you to program the values of these fields.

4.7.27 TMP100

4.7.27.1 General Tab

This tab contains commonly-used configuration items.

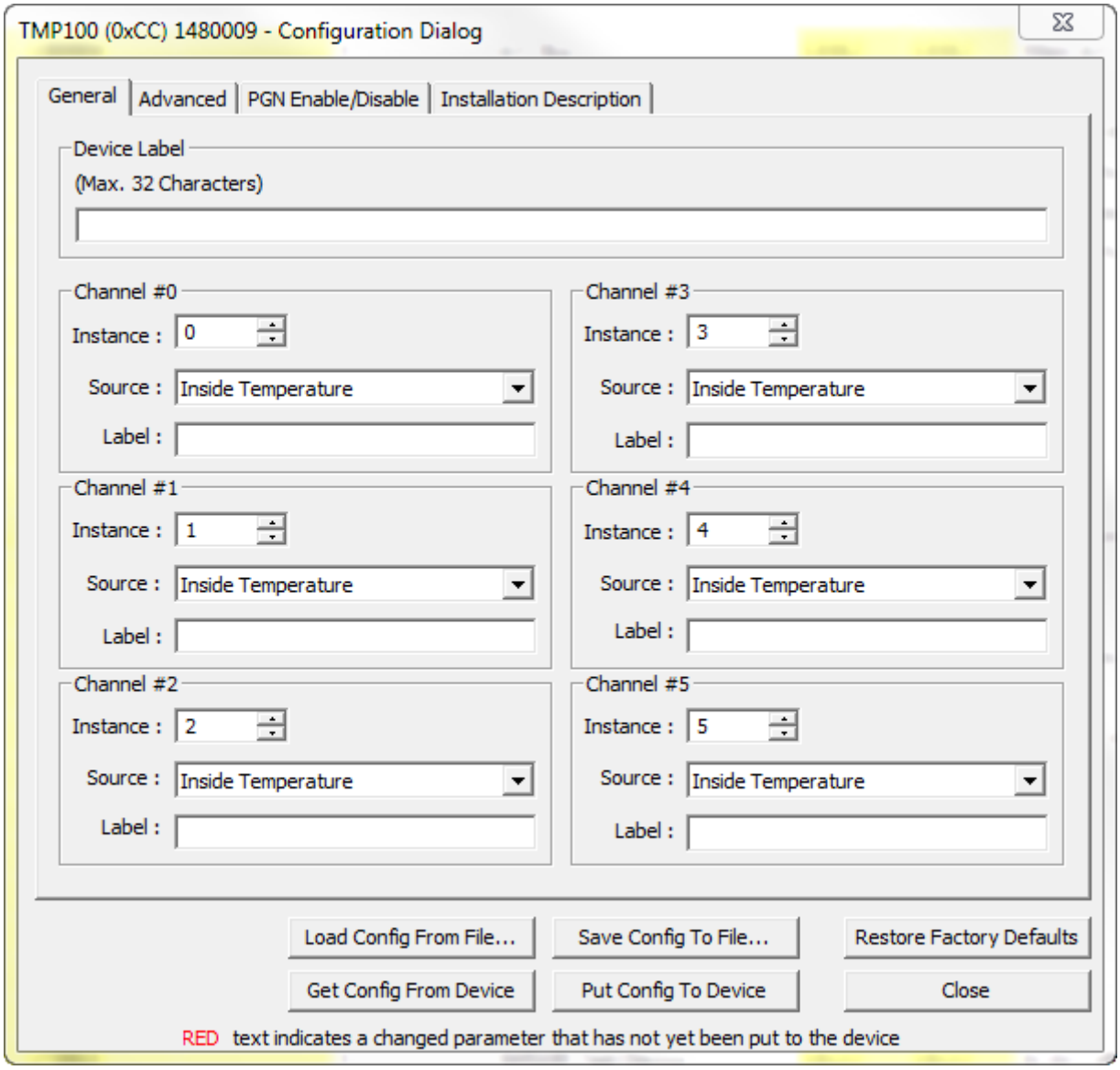


Figure 121 – TMP100 General Tab

4.7.27.1.1 Device Label

This text box allows you to assign a text label to the device. This label is visible in Maretron analysis and display products and allows you to easily identify the particular device.

4.7.27.1.2 Channel #x Instance

Each temperature measurement with a given source must have a unique instance number associated with it. This enables monitoring software and displays to distinguish different temperature measurements from one another. For example, if a channel is programmed to transmit a source type of Exhaust Gas Temperature and the instance for that channel is set to a value of 0, then no other Exhaust Gas Temperature measurement on the network may use an instance number of 0.

4.7.27.1.3 Channel #x Source

You must configure the TMP100 as to what type of temperature measurement it is transmitting. Possible values for channels 0 and 1 include Sea Temperature, Outside Temperature, Inside Temperature, Engine Room Temperature, Main Cabin Temperature, Live Well Temperature, Bait Well Temperature, Refrigeration Temperature, Heating System Temperature, Freezer Temperature, Exhaust Gas Temperature, and User Defined Temperature #129-#144. You may also disable the channel by programming the “Disabled” value into this field.

4.7.27.1.4 Channel #x Label

Each channel that can be monitored by the TMP100 may be programmed with a text label that will be displayed in monitoring software and displays that recognize labels, such as the Maretron N2KView Vessel Monitoring System and the Maretron DSM250 display. The label will let you assign an easy-to-remember text label (example: “Forward Bilge Pump”) to make it easy for you to identify the device as you are configuring the monitoring software or display, as well as when alerts are generated.

4.7.27.2 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

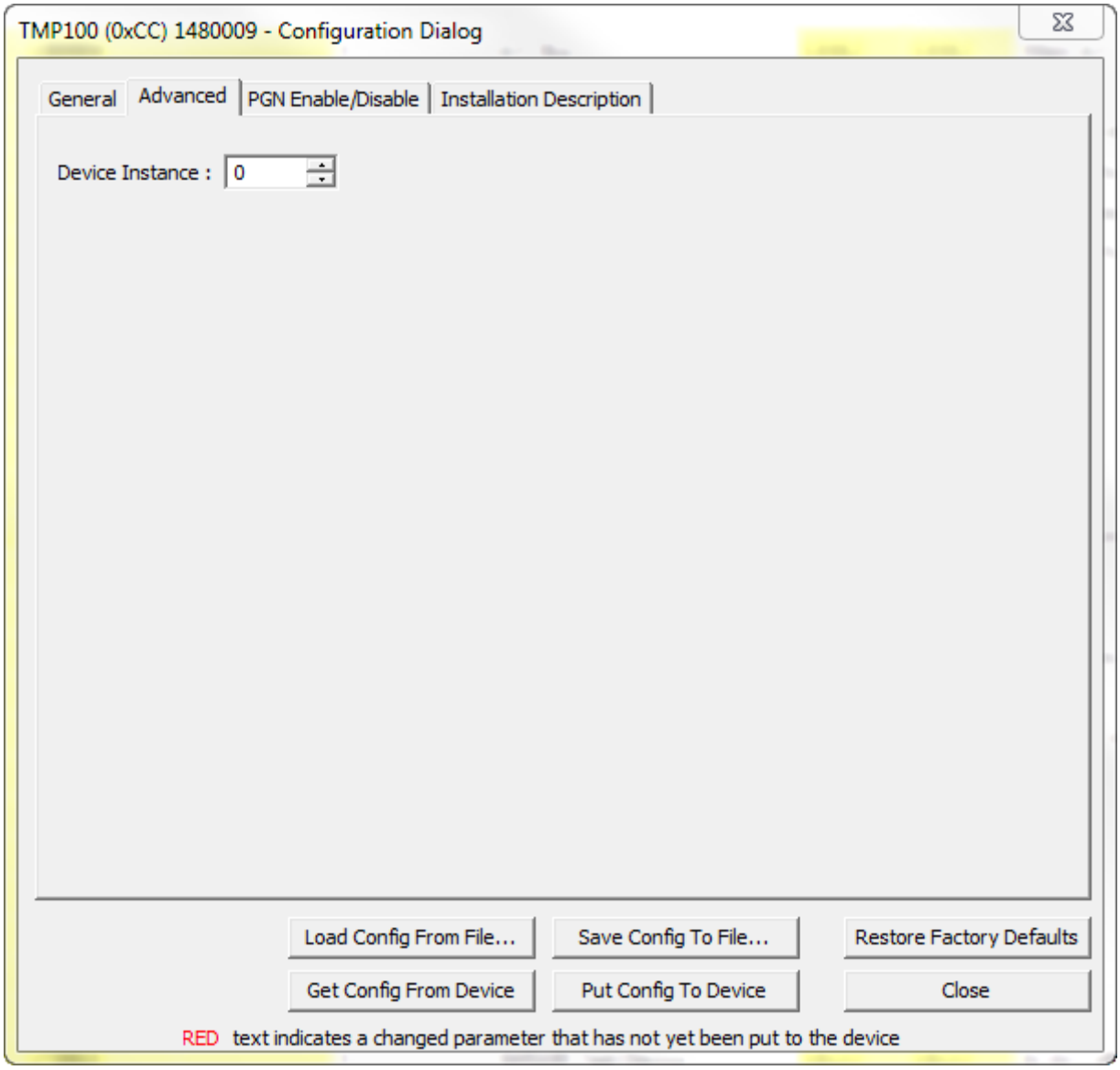


Figure 122 – TMP100 Advanced Tab

4.7.27.2.1 Device Instance

The device comes from the factory with the device instance value set to 0. If you have multiple of these devices on a network, you may find it necessary to set the device instances of other devices of this type so that they are different.

4.7.27.3 PGN Enable/Disable Tab

This tab allows you to enable or disable the transmission of the periodic messages output by the device. You may enable or disable the transmission of the messages, or may program the time interval between transmissions of a specific message, for devices which support the programming of time intervals.

When you first open the PGN Enable/Disable tab, a list of periodic PGN's transmitted by the device will appear. The mode column will read "On", if the device is currently transmitting the message, or "Off", if the message has not yet been detected from the device.

You may configure each periodic message with one of the following choices:

1) Disable – this will turn off the periodic transmission of this message
2) Default – this will turn on the periodic transmission of this message at the default rate
3) A numeric value that will turn on the periodic transmission of this message at the specified rate

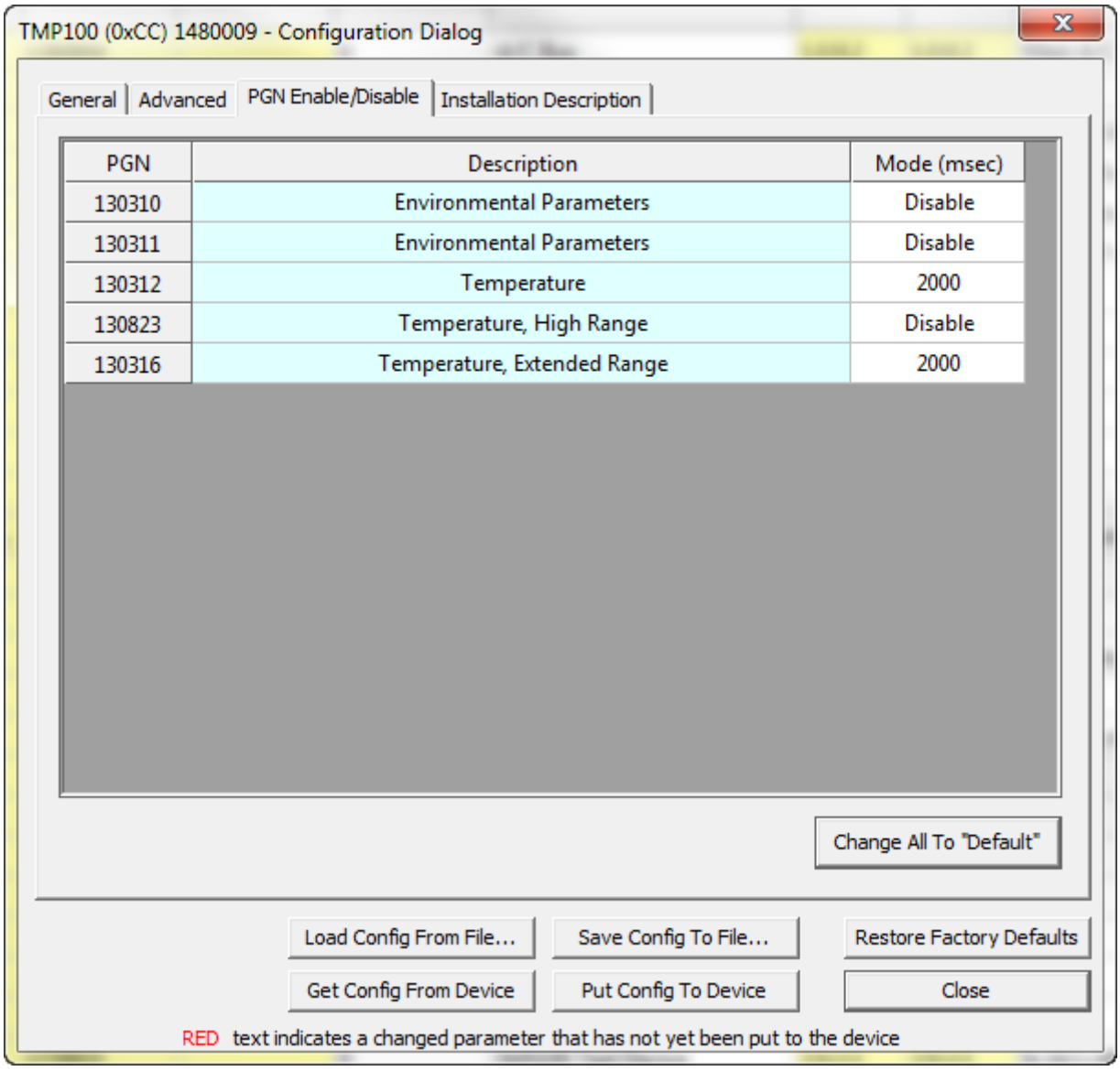


Figure 123 – TMP100 PGN Enable/Disable tab

4.7.28 USB100

4.7.28.1 General Tab

This tab contains commonly-used configuration items.

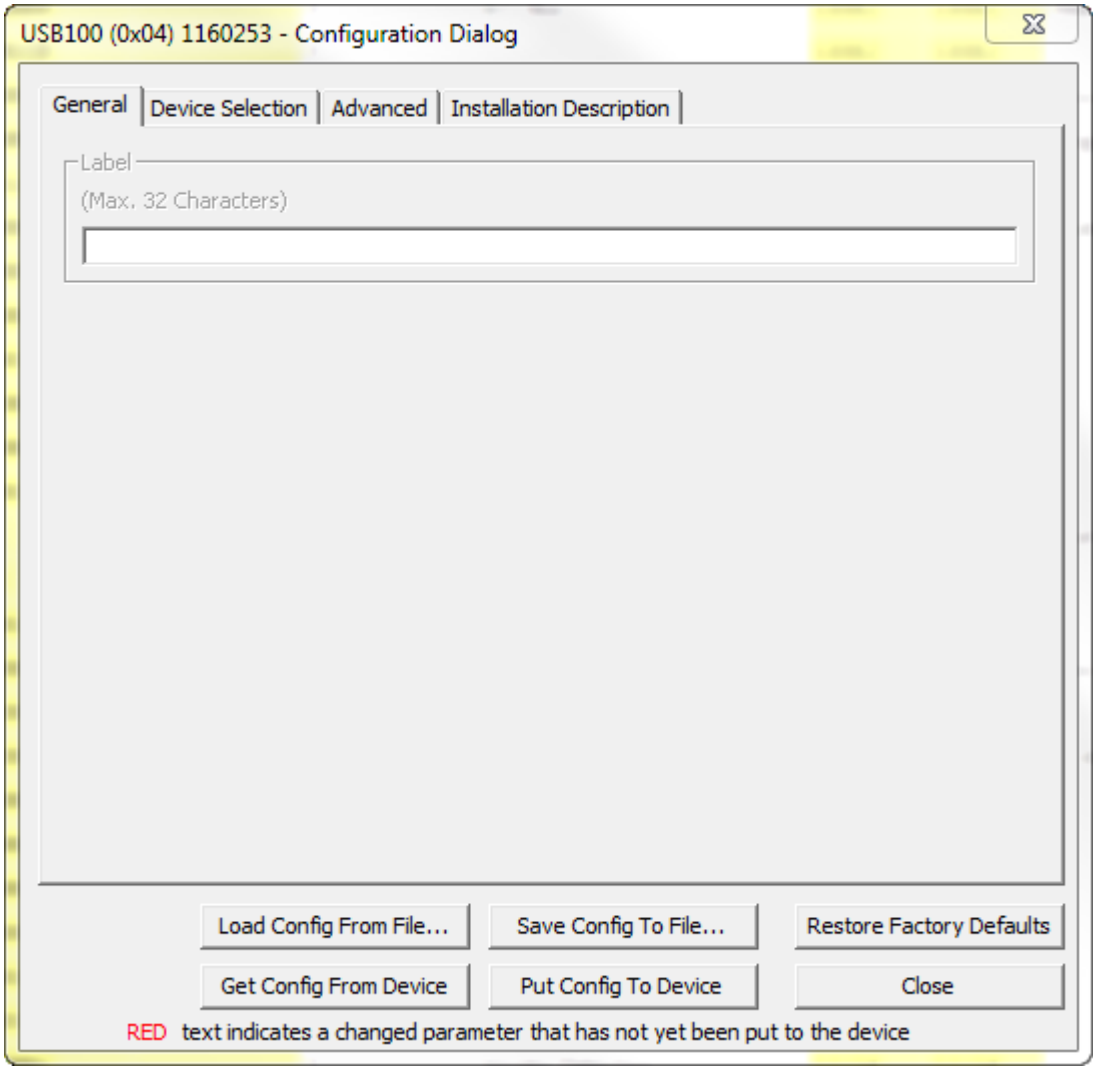


Figure 124 – USB100 General Tab

4.7.28.1.1 Label

This text box allows you to assign a text label to the device. This label is visible in Maretron analysis and display products and allows you to easily identify the particular device.

4.7.28.2 Device Selection Tab

The Maretron NMEA 2000® to NMEA 0183 gateway (USB100) can be configured to select which NMEA 2000® devices are selected for display on the computer attached to the USB interface of the USB100. In this manner, multiple devices of the same type may be used on a

NMEA 2000® network in a fail-safe configuration.

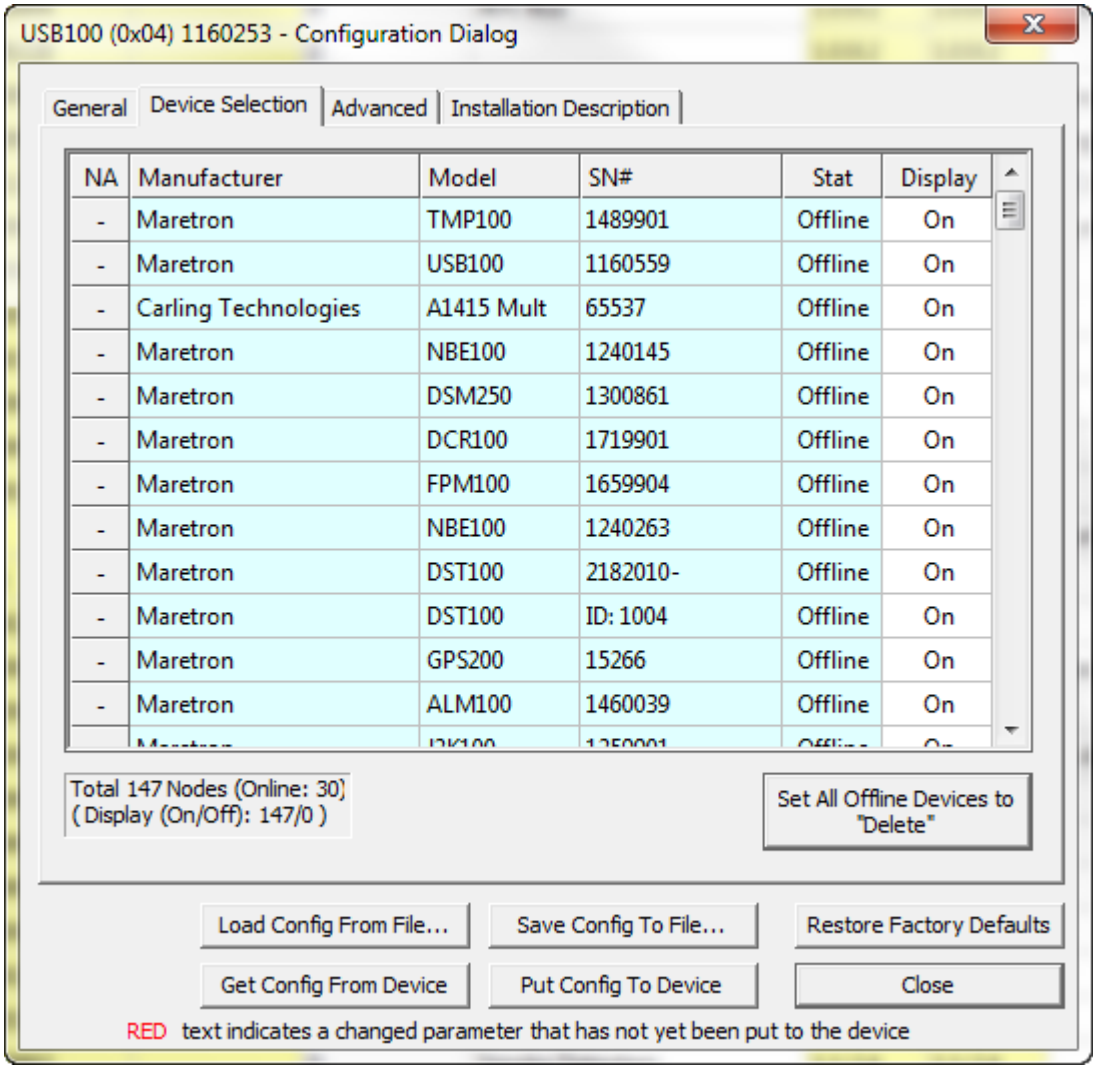


Figure 125 – USB100 Device Selection Tab

The Device Selection Tab shows the following columns:

- The "**NA**" column of the menu displays the node address the device is using.
- The "**Manufacturer**" column of the menu displays the manufacturer of the device.
- The "**Model**" column displays the model number of the device.
- The "**SN#**" column displays the serial number of the device, so that any of two or more devices of the same manufacturer and model number may be distinguished from one another.
- The "**Stat**" column indicates whether the device is currently connected to the bus and is responding to queries ("Online"), or has been disconnected from the bus, has lost power, or for some other reason is not responding to queries ("Offline").

- The "**Display**" column indicates whether data from that particular device is accepted for display by the USB100 ("On") or that the USB100 ignores data transmitted by this device ("Off"). You may click on this field to change its value. The USB100 will retain information on devices that have been removed from the bus or powered down ("Offline") so that when they are placed back on the bus, they will assume their prior "Display" setting.

4.7.28.3 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

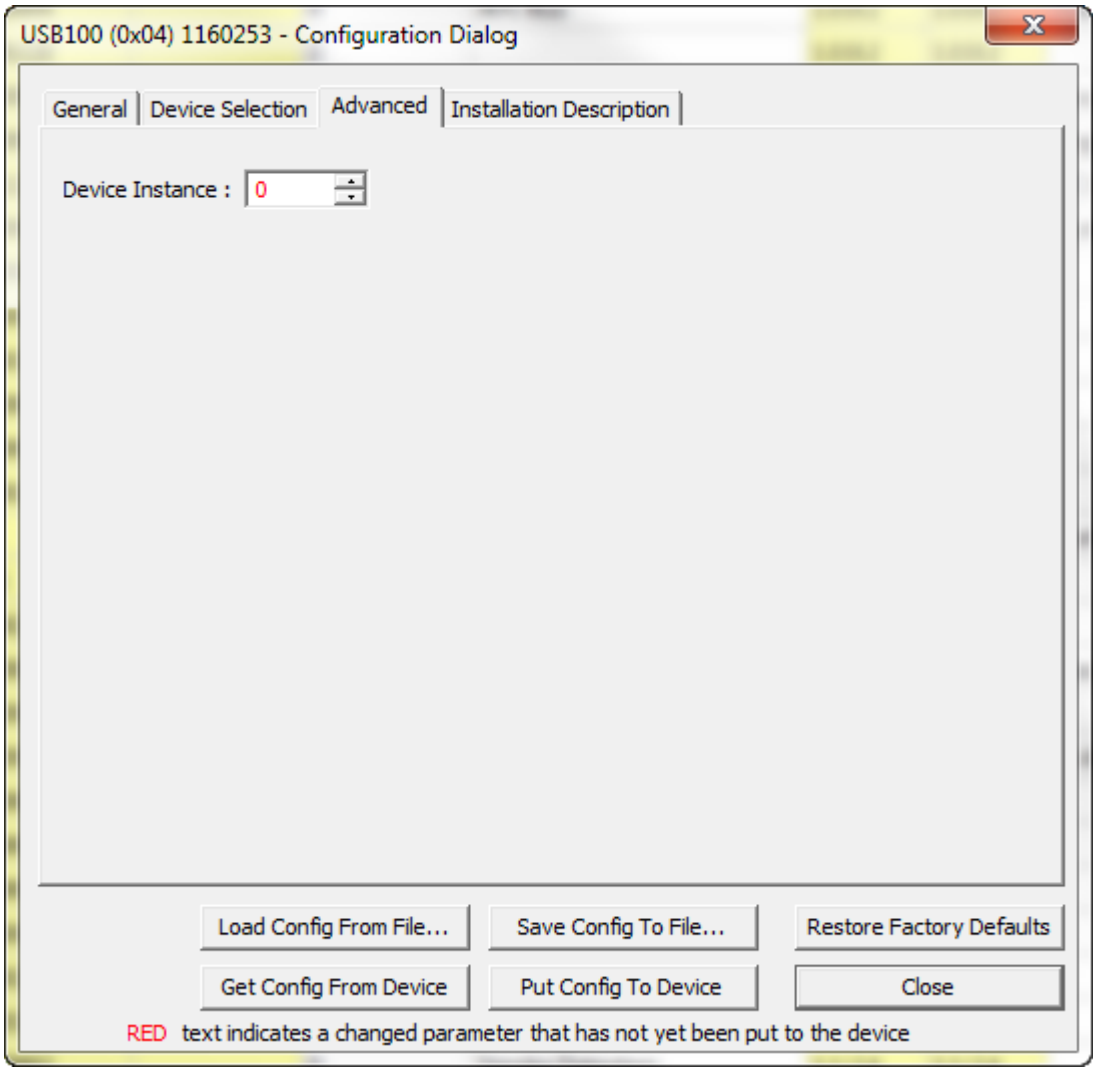


Figure 126 – USB100 Advanced Tab

4.7.28.3.1 Device Instance

The device comes from the factory with the device instance value set to 0. If you have multiple of these devices on a network, you may find it necessary to set the device instances of other devices of this type so that they are different.

4.7.28.4 Installation Description Tab

This tab allows you to set values for the installation description properties of the device.

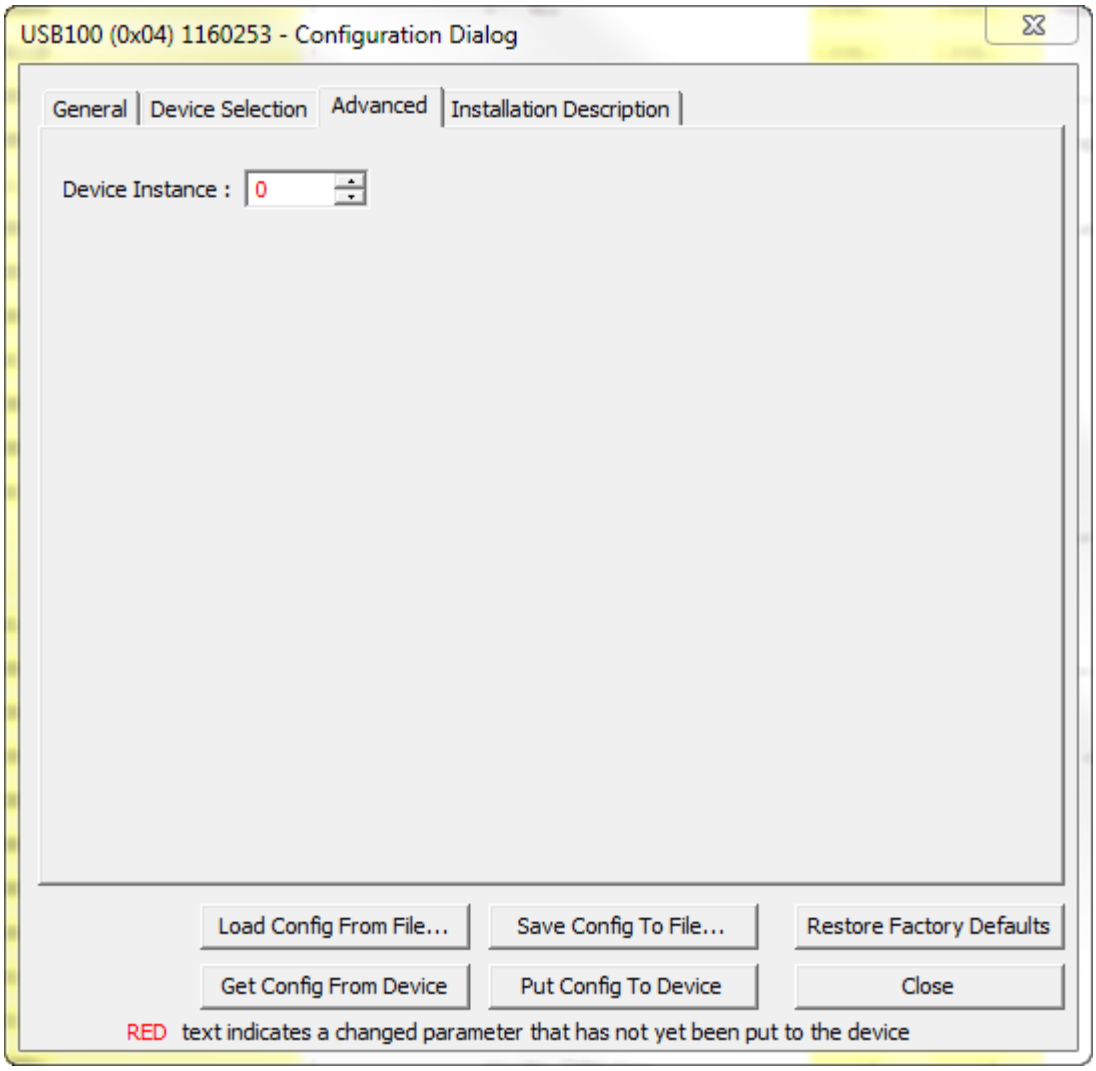


Figure 127 – USB100 Installation Description Tab

4.7.28.4.1 Installation Description #1, #2

This device, along with all other Level A certified NMEA devices, has two user-programmable installation description fields. You may program these fields with information specific to the device, such as date installed, the initials/name of the installer, the physical location of the device, etc. This configuration option will allow you to program the values of these fields.

4.7.29 WSO100

4.7.29.1 General Tab

This tab contains commonly-used configuration items.

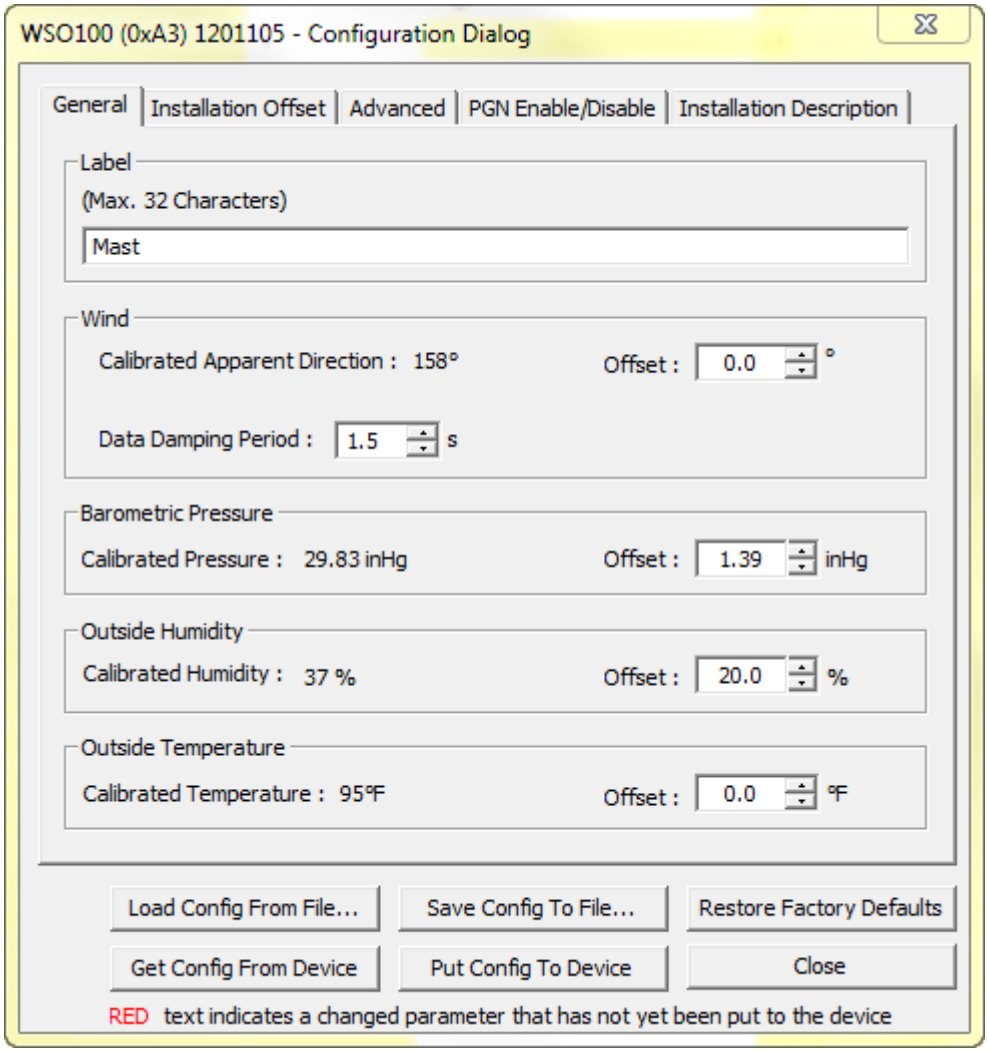


Figure 128 – WSO100 General Tab

4.7.29.1.1 Label

This text box allows you to assign a text label to the device. This label is visible in Maretron analysis and display products and allows you to easily identify the particular device.

4.7.29.1.2 Wind Calibrated Apparent Direction

This shows the apparent direction being transmitted by the WSO100, with the offset applied.

4.7.29.1.3 Wind Offset

You can program an offset value to be added to the raw apparent direction reading from the WSO100 sensor when it is transmitted over the NMEA 2000 network. You can use this offset value to compensate for the fact that the WSO100 may not be oriented exactly along the boat's keel.

4.7.29.1.4 Wind Data Damping Period

As shipped from the factory, the WSO100 uses a damping period of 1.5 seconds to filter short-term variations in wind speed and direction and provide a more stable, usable output. This damping period can be changed by the user to increase or decrease the amount of filtering.

4.7.29.1.5 Calibrated Barometric Pressure

If you wish to adjust the barometric pressure reading output by the WSO100 to match an independent source, you may adjust the barometric pressure output by the WSO100 using this parameter. This will apply a constant offset to the barometric pressure reading calculated by the WSO100 before it is transmitted over the NMEA 2000° network.

4.7.29.1.6 Barometric Pressure Offset

You can program an offset value to be added to the raw barometric pressure reading from the WSO100 sensor when it is transmitted over the NMEA 2000 network.

4.7.29.1.7 Calibrated Outside Humidity

If you wish to adjust the outside humidity reading output by the WSO100 to match an independent source, you may adjust the outside humidity output by the WSO100 using this parameter. This will apply a constant offset to the outside humidity reading calculated by the WSO100 before it is transmitted over the NMEA 2000° network.

4.7.29.1.8 Humidity Offset

You can program an offset value to be added to the raw humidity reading from the WSO100 sensor when it is transmitted over the NMEA 2000 network.

4.7.29.1.9 Calibrated Outside Temperature

If you wish to adjust the outside temperature reading output by the WSO100 to match an independent source, you may adjust the outside temperature output by the WSO100 using this parameter. This will apply a constant offset to the outside temperature reading calculated by the WSO100 before it is transmitted over the NMEA 2000° network.

4.7.29.1.10 Outside Temperature Offset

You can program an offset value to be added to the raw outside temperature reading from the WSO100 sensor when it is transmitted over the NMEA 2000 network.

4.7.29.2 Installation Offset Tab

The WSO100 comes from the factory with a preset orientation, so that mounting it with the orientation marks facing the bow of the vessel, the sensor will read 0° apparent wind angle when the vessel is sailing directly into the wind (please refer to the *WSO100 User's Manual* for

details). However, the WSO100 can be installed in any orientation with respect to the vessel and any misalignment with respect to the factory preset can be easily compensated for using this tab Installation Offset calibration menu item.

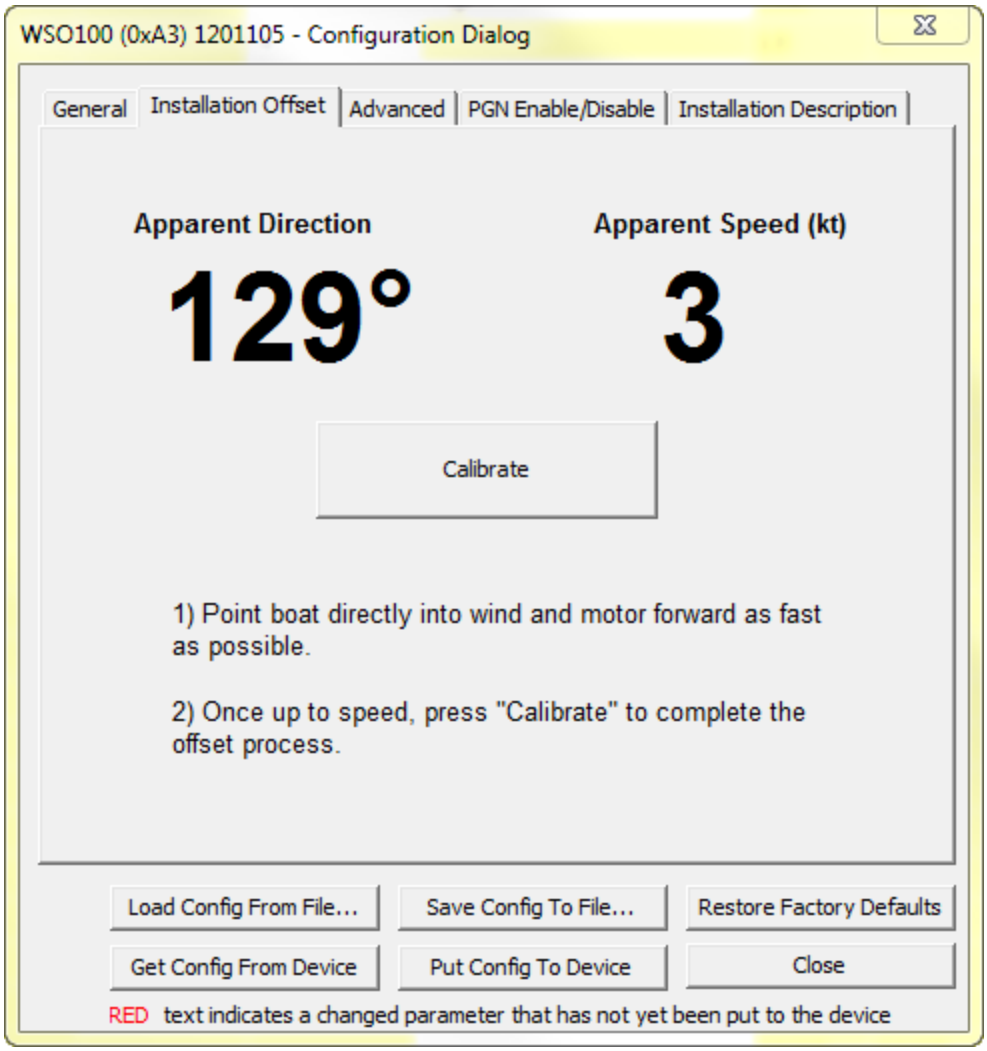


Figure 129 – WSO100 Installation Offset Tab

4.7.29.3 Calibrate Button

As shipped from the factory, the WSO100 will read 0° apparent wind direction when the wind blows into the sensor directly from the direction of the post nearest the black humidity sensor that protrudes from the bottom of the sensor. If the WSO100 is mounted with this post facing directly towards the bow of the boat, no adjustment is necessary; however, if the sensor is mounted in any other orientation, the installation offset can be used to compensate the apparent wind direction reading such that it will read 0° when the apparent wind is blowing directly into the bow of the vessel.

In order to calibrate the installation offset, first point the boat directly into any wind and motor forward into the wind. Then, press the “Calibrate” button. Once the installation offset has been set, the following window will appear:

Figure 130 – WSO100 Installation Offset Calibration Confirmation Dialog Box

4.7.29.4 Advanced Tab

This tab contains entries that need to be changed only in specific cases; for instance, if there are multiple instances of this device on a network.

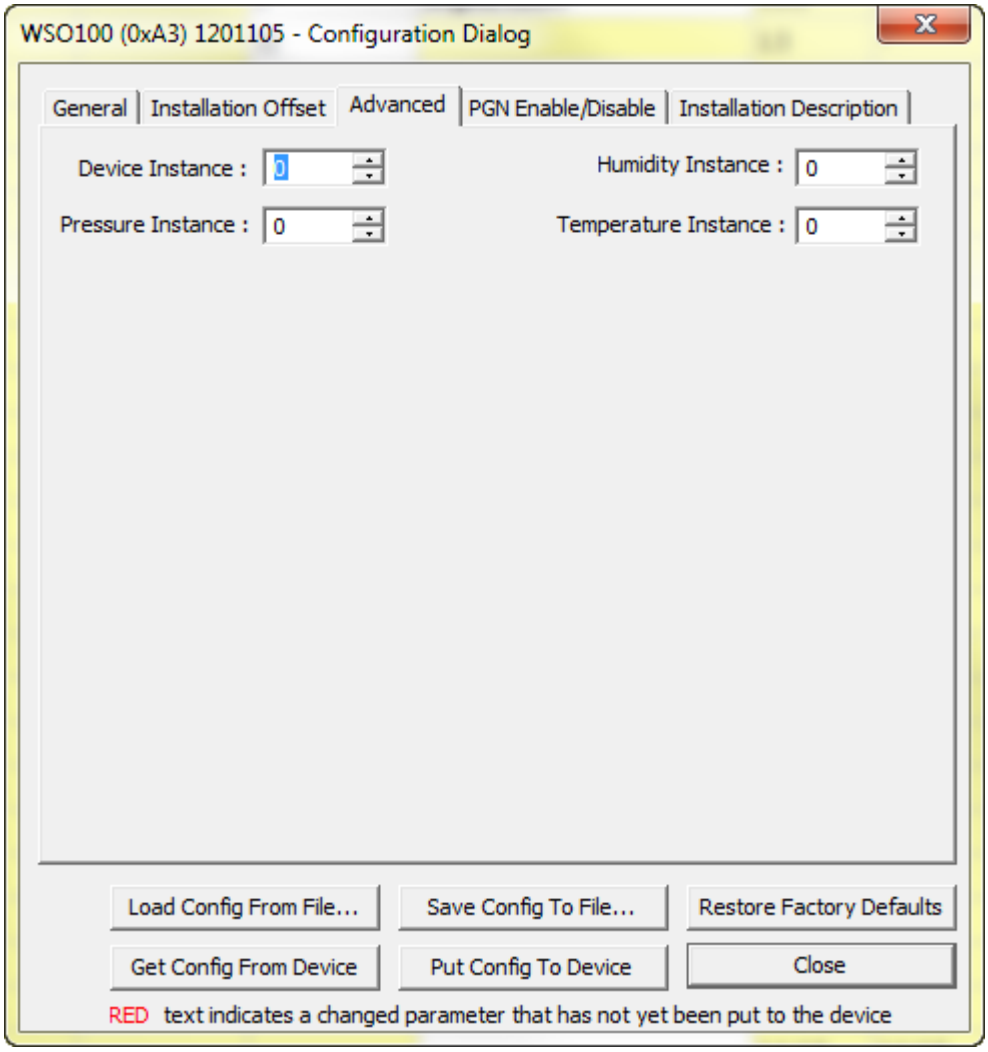


Figure 131 – WSO100 Advanced Tab

4.7.29.4.1 Device Instance

The device comes from the factory with the device instance value set to 0. If you have multiple of these devices on a network, you may find it necessary to set the device instances of other devices of this type so that they are different.

4.7.29.4.2 Pressure Instance

This entry allows you to program the NMEA 2000 device instance for the air pressure transmitted in PGN 130314. You usually will not need to modify the default value of "0" unless you have multiple pressure sensors on the network.

4.7.29.4.3 Humidity Instance

This entry allows you to program the NMEA 2000 device instance for the humidity transmitted in PGN 130313. You usually will not need to modify the default value of "0" unless you have multiple humidity sensors on the network.

4.7.29.4.4 Temperature Instance

This entry allows you to program the NMEA 2000 device instance for the temperature transmitted in PGN 130312. You usually will not need to modify the default value of “0” unless you have multiple temperature sensors on the network. Note that the TMP100 module also generates these PGNs.

4.7.29.5 PGN Enable/Disable Tab

This tab allows you to enable or disable the transmission of the periodic messages output by the device. You may enable or disable the transmission of the messages, or may program the time interval between transmissions of a specific message, for devices which support the programming of time intervals.

When you first open the PGN Enable/Disable tab, a list of periodic PGN’s transmitted by the device will appear. The mode column will read “On”, if the device is currently transmitting the message, or “Off”, if the message has not yet been detected from the device.

You may configure each periodic message with one of the following choices:

1) Disable – this will turn off the periodic transmission of this message
2) Default – this will turn on the periodic transmission of this message at the default rate
3) A numeric value that will turn on the periodic transmission of this message at the specified rate

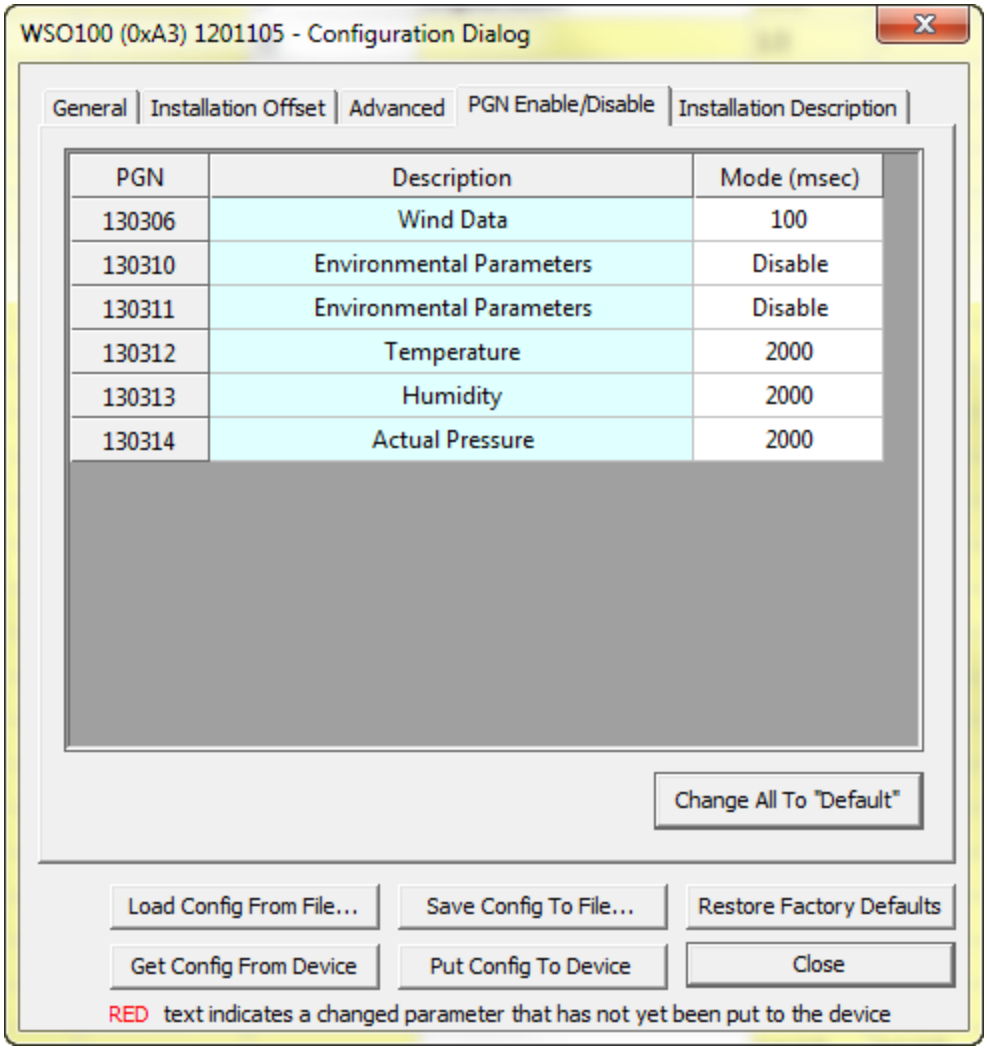


Figure 132 – WSO100 PGN Enable/Disable tab

4.7.29.6 Installation Description Tab

This tab allows you to set values for the installation description properties of the device.

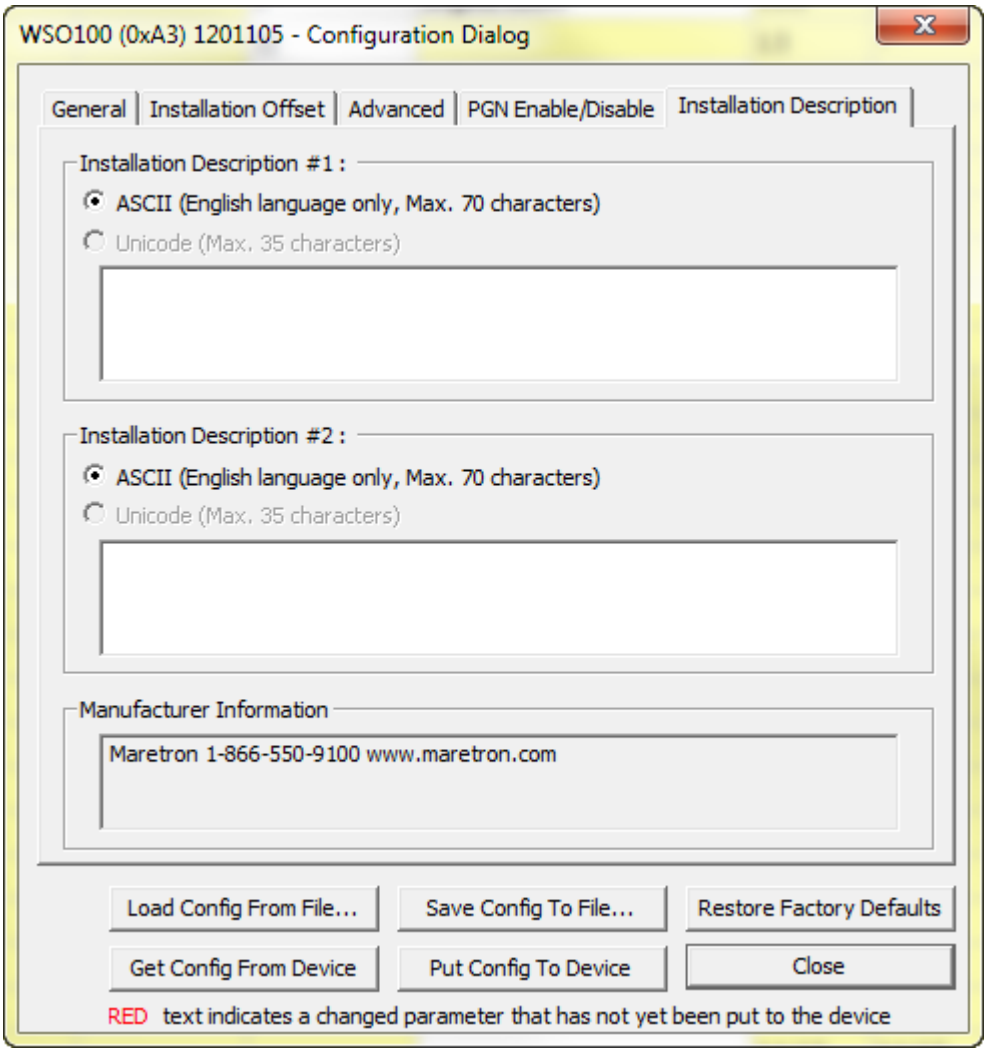


Figure 133 – WSO100 Installation Description Tab

4.7.29.6.1 Installation Description #1, #2

This device, along with all other Level A certified NMEA devices, has two user-programmable installation description fields. You may program these fields with information specific to the device, such as date installed, the initials/name of the installer, the physical location of the device, etc. This configuration option will allow you to program the values of these fields.

4.8 DSM250 Emulator

For devices which do not support native N2KAnalyzer configuration, you may use the built-in DSM250 emulator, which you can access by selecting the *Analyze→DSM250 Viewing…* menu item. This emulator operates exactly the same as the Maretron DSM250 Multifunction Display, and is shown in Figure 134 below. Please refer to the *Maretron DSM250 Multifunction Display User's Manual* for details on configuring particular devices.

Figure 134 – DSM250 Viewing Window

4.9 Viewing and Changing Installation Description

You can view and change the installation description information which can be programmed into NMEA 2000 devices which support this capability by selecting the *Configure→Installation Descriptions* menu item. The Installation Descriptions dialog box shows the Installation Description #1 and Installation Description #2 fields. These are free-form text fields that may be programmed by the installer in devices that support field programming of this information. To set the value of one of these fields, type the desired information into the text box and click the OK button once you are finished. This will cause the entered value to be permanently programmed into the device's non-volatile memory.

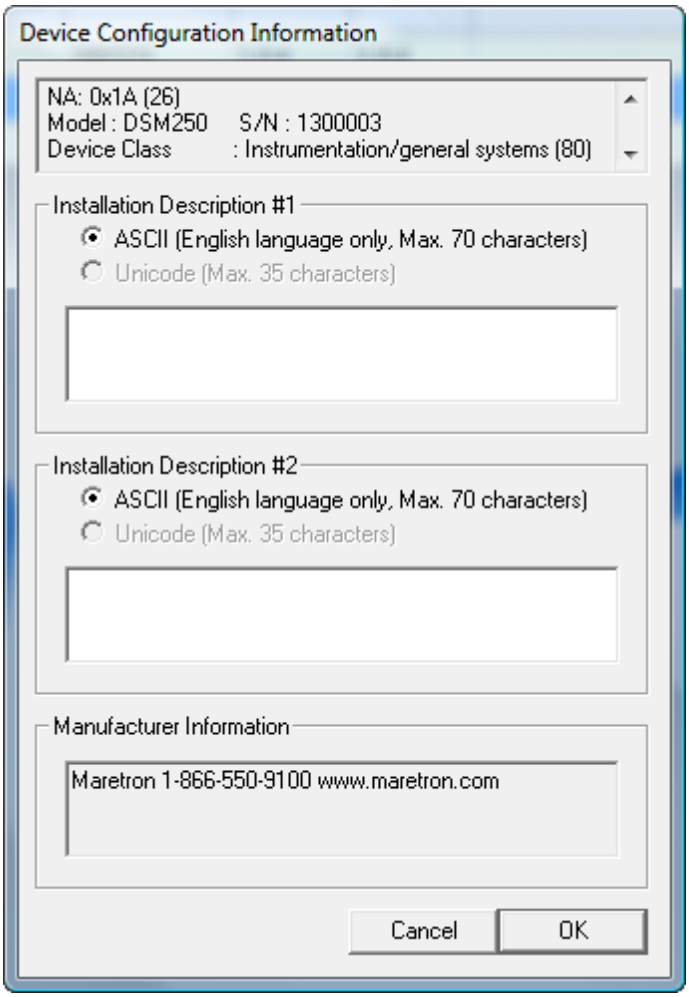


Figure 135 – Device Properties Window: Installation Description Tab

4.10 Viewing NMEA 2000 Messages

4.10.1 Using the Transmitted PGNs Window

You can view the messages transmitted by a particular device on the network by first left-clicking on the device in the device list window, and then either selecting the *Analyze→Transmitted PGNs* menu item or by right-clicking on the device and selecting the *Analyze Transmitted PGNs* menu item from the pop-up context menu. A window appears listing the PGN's transmitted by the device. The contents of the window are updated in real time. The messages appear one line per message. You can click on the "+" icon on the left side of the message to expand it and show the contents of the individual message fields. Click once more to collapse the message display into a single line.

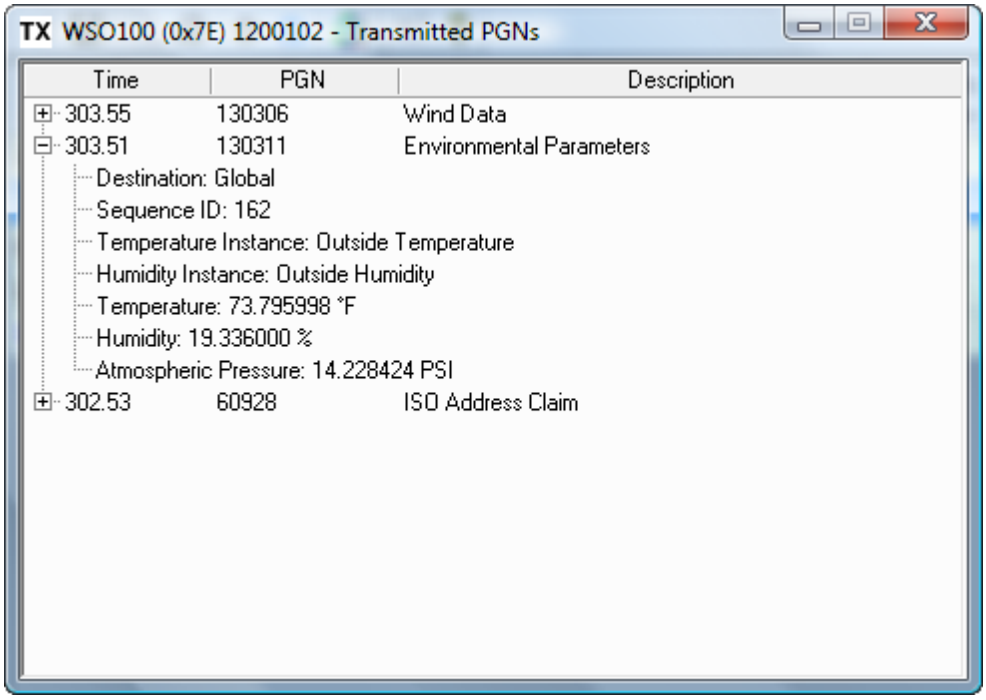


Figure 136 – Transmitted PGNs Window

4.11 Analyzing NMEA 2000 Instancing

When configuring an NMEA 2000 network, it is important to ensure that all devices transmitting the same type of information (for example, Fuel tank level) are programmed with distinct instance numbers. This is so that a display device can correctly identify the source of the measurement.

There may be some cases where having two devices with the same instance numbers is desirable, specifically, when redundancy is desired. For example, you may choose to install two GPS antennas for redundancy. In that case, if both GPS antennas

N2KAnalyzer® is capable of analyzing the device information and network traffic to determine whether any conflicts exist. You can run this analysis function be selecting *Analyze→Instancing* menu item. After you select that menu item, you will see an introductory dialog box (shown in Figure 137).

Figure 137 – Instancing Analyzer Introductory Dialog

Click the “OK” button to begin the analysis. Once you click “OK”, the dialog will close and the Instancing Analysis Results Window will appear. It will display any detected instancing conflicts as they occur, along with recommended actions to resolve the conflicts. The results window is shown in Figure 138 below.

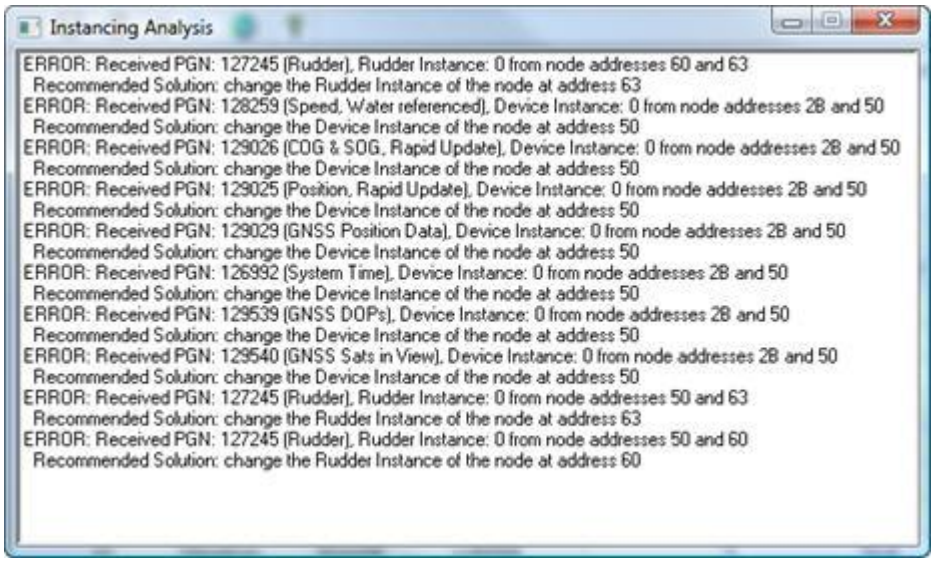


Figure 138 – Instancing Analysis Results Window

The analysis will complete after 30 seconds have elapsed. Once the analysis has completed, a dialog box will appear indicating whether or not any conflicts were detected. Click the “OK” button to close the dialog box (shown in Figure 139 below).

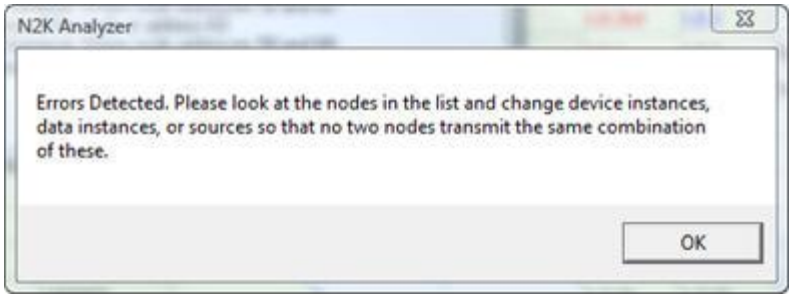


Figure 139 – Instancing Analysis Errors Detected Dialog

Once you have completed instancing analysis, resolve any undesired conflicts by either performing the recommended actions, or by changing instance numbers and/or source types. Repeat this entire process until you do not have any unexpected conflicts.

5 Window Elements

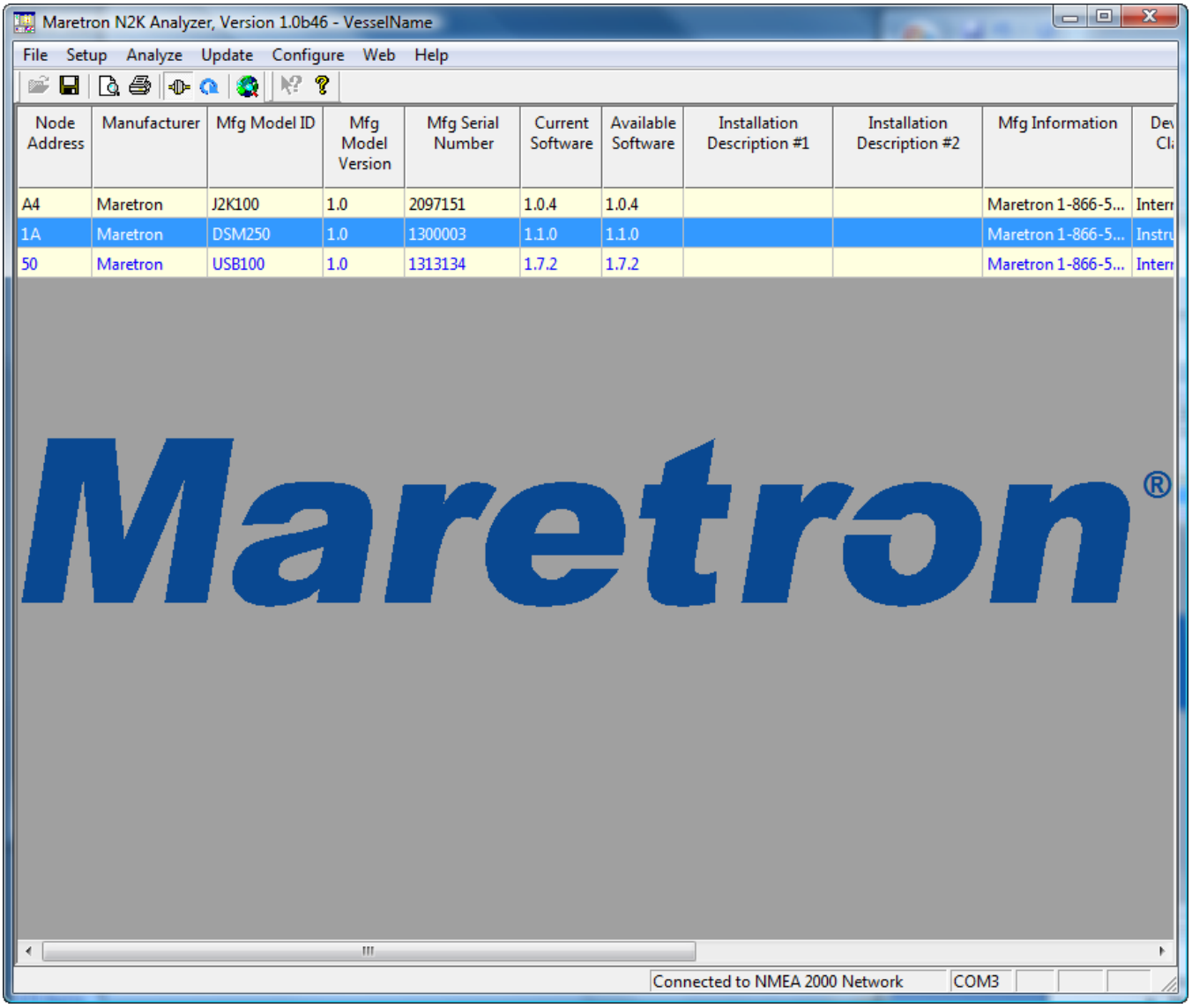


Figure 140 – Window Elements

The following window elements are present in the N2KAnalyzer® software:

- Menu
- Toolbar
- Device List Window
- Status Bar

5.1 Menus

5.1.1 File

5.1.1.1 Open...

The File→Open... menu item allows you to open a "boat file".

5.1.1.2 Save As...

Opens a window which allows you to choose the filename to which to save a "boat file". The “boat file” contains the current state of the network you are monitoring.

5.1.1.3 Print…

Prints the current contents of the Device List Window to a printer.

5.1.1.4 Connect to NMEA 2000 Network

Connects N2KAnalyzer® to the NMEA 2000 network through the currently selected NMEA 2000 gateway, and queries the attached NMEA 2000 network for devices and fills the device list table with this information.

5.1.1.5 Disconnect from NMEA 2000 Network

Disconnects N2KAnalyzer® from the NMEA 2000 gateway. All information that was previously available from the attached NMEA 2000 network which N2KAnalyzer® was in online mode is still available.

5.1.1.6 Refresh

Refreshes the device list window by asking all devices on the NMEA 2000 network to transmit their information.

5.1.1.7 Exit

Changes from online mode to offline mode, if necessary, and exits N2KAnalyzer® completely.

5.1.2 Setup

5.1.2.1 Software Update Directory...

This opens a dialog box allowing you to select the directory which contains the software image files to use when updating Maretron equipment on the attached NMEA 2000 network.

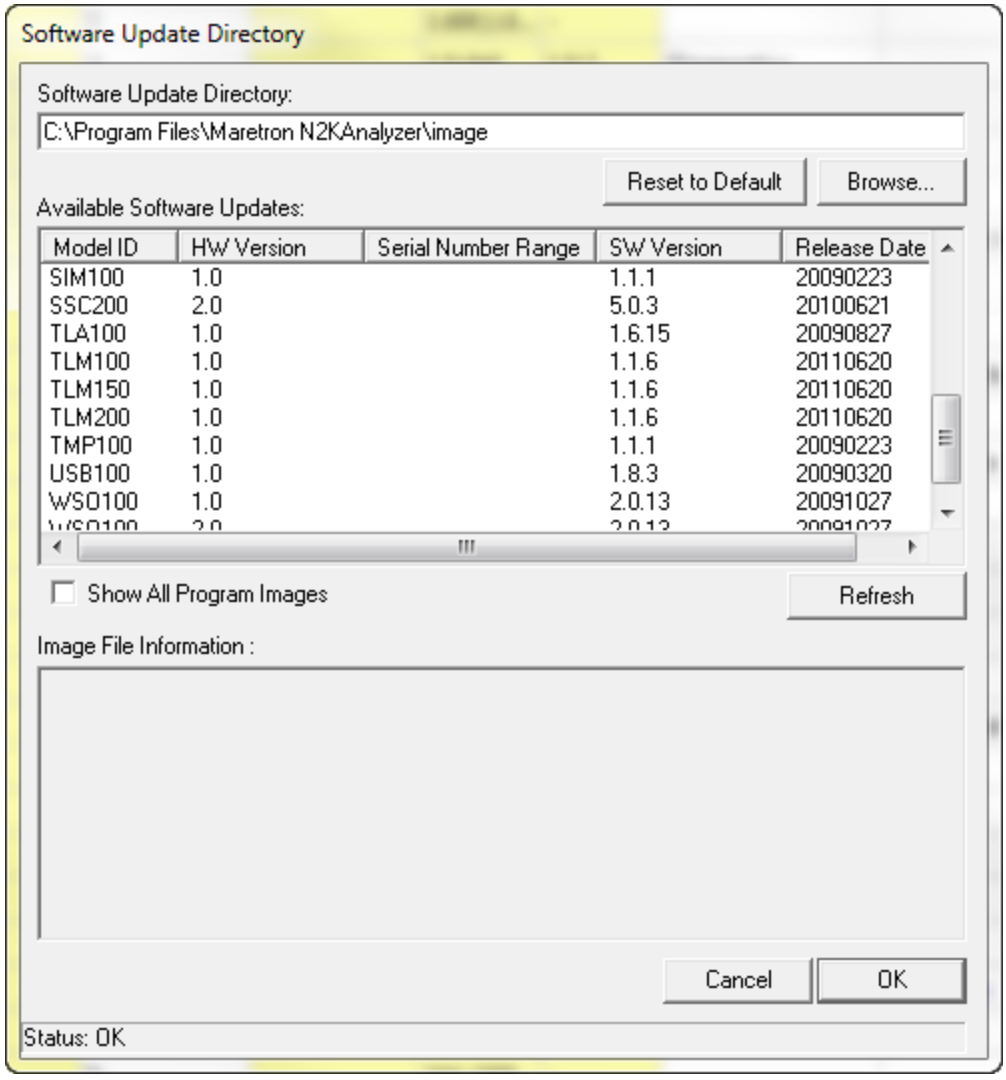


Figure 141 – Software Update Directory Configuration

5.1.2.2 Configure Gateway...

This opens a dialog window allowing you to select a specific NMEA 2000 gateway to connect to when entering online mode.

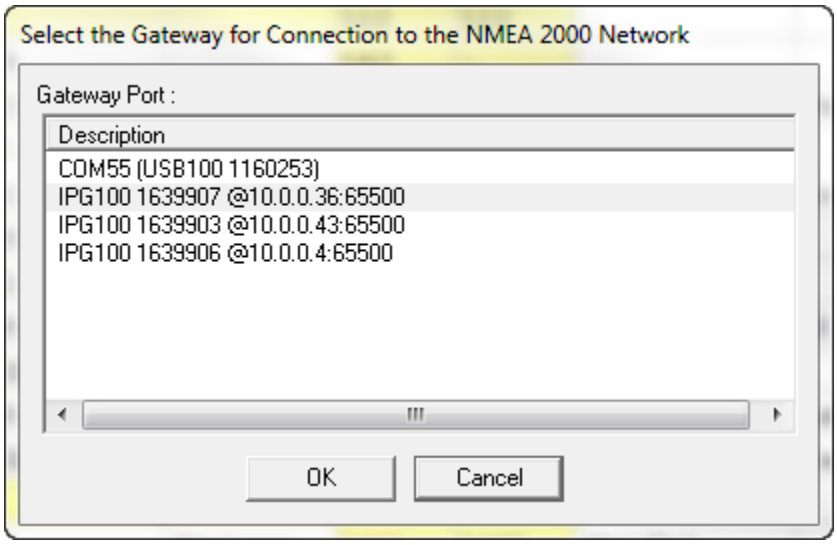


Figure 142 – Gateway Configuration Dialog

5.1.2.3 Units…

This opens a dialog window allowing you to choose from standard or metric units for the different data types displayed in the Transmitted PGN's windows.

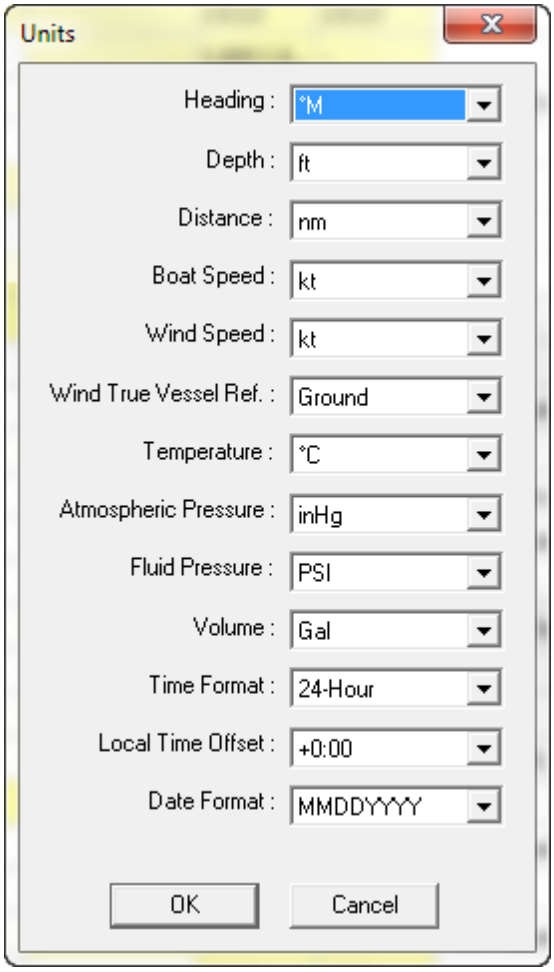


Figure 143 – Units Configuration Menu

5.1.2.4 Download Software Updates On Startup

If checked, this selection causes N2KAnalyzer® to check for new versions of the program and device software every time it is started. If desired, you can disable this behavior by clicking on this selection to clear the checkmark. In either case, you can manually check for updates at any time by clicking on the *Web→Download Software Updates* menu selection.

5.1.2.5 Listen Only

If checked, this selection causes N2KAnalyzer® to not transmit any requests for information, such as Address Claim or Product Information messages. The benefit of this mode is that N2KAnalyzer® can be used to observe the network without having any effect on network operation.

5.1.2.6 Recover Device

It is possible, but extremely rare, for a device to get into a state in which it cannot be accessed by N2KAnalyzer® in normal mode. An example of this is a device which is being programmed with new firmware, and the firmware update process is aborted or fails for some reason.

Subsequently, when you need to re-program the device, you are asked for a part number. If you supply the wrong part number, the device will get flashed with firmware intended for another device. The device will then appear unresponsive on the network. You can use the "Recover Device" menu option to place the device into a state in which you can program it with the correct firmware release.

5.1.2.7 Show Tips on Startup

If checked, this selection causes N2KAnalyzer® to display a "tip of the day" when started.

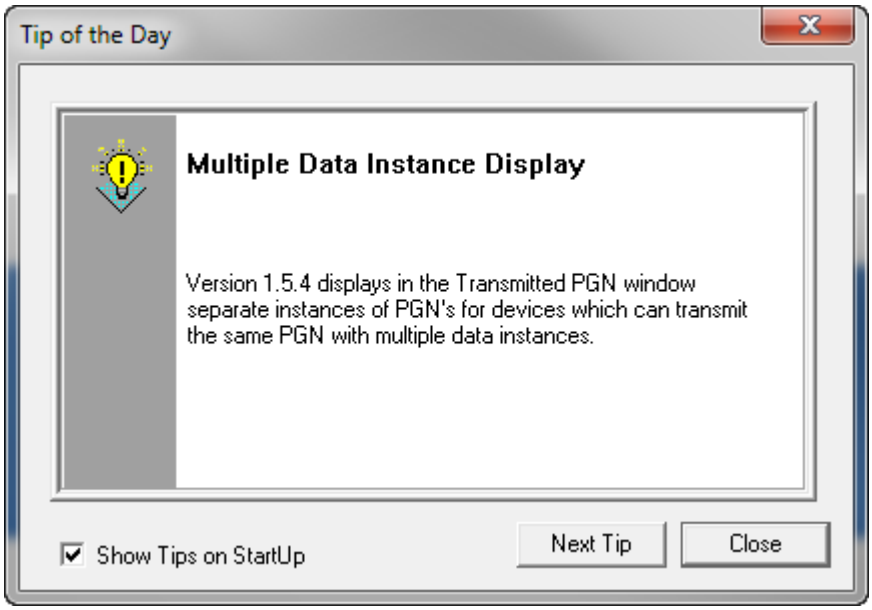


Figure 144 – Tip of the Day Dialog

5.1.2.8 Columns

The columns selection opens a submenu which lists all of the available columns that can be displayed in the device list window. The columns that are currently enabled for display are denoted by a checkmark. To enable or disable a column for display, click on it in this menu.

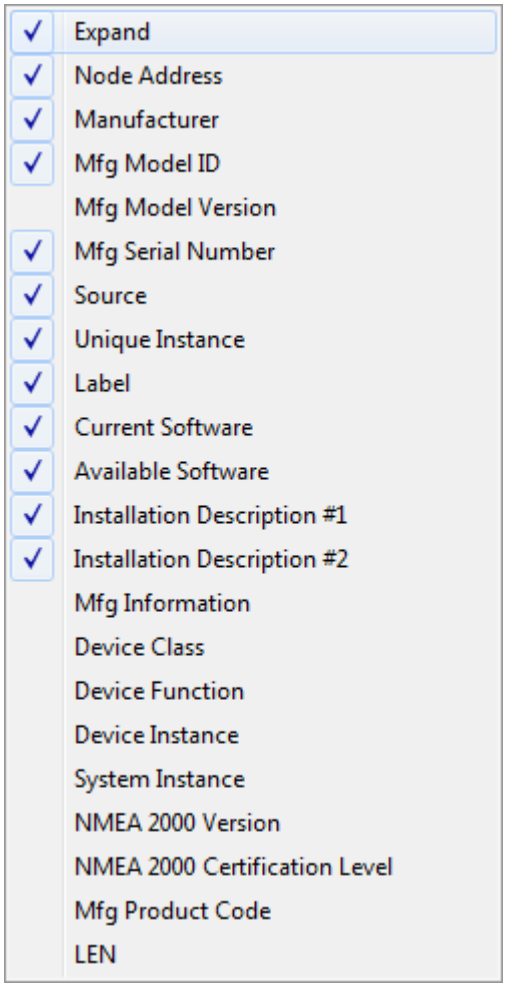


Figure 145 – Columns Selection Menu

5.1.3 Analyze

5.1.3.1 Received PGNs

This opens a window displaying the PGN's that the device reports as being able to receive, including a description of all the data fields.

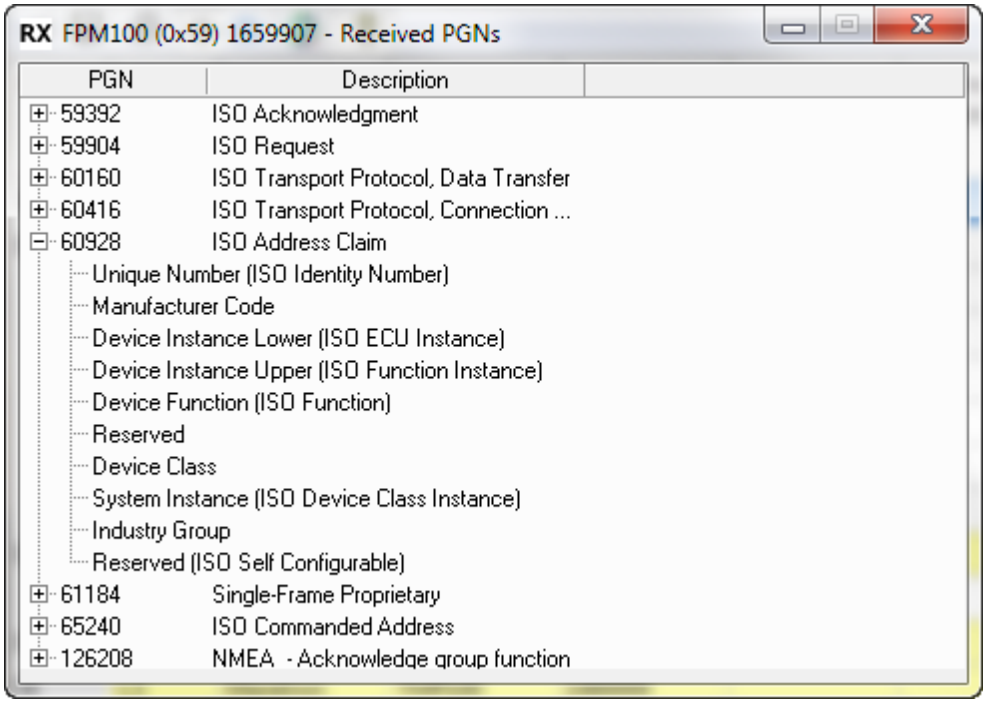


Figure 146 – Received PGNs Window

5.1.3.2 Transmitted PGNs

This opens a window displaying the transmitted PGN's from the selected device, including a timestamp and a description of all the data fields.

Click on the “+” sign at the left of each message type to expand details of the message.

You may see multiple entries of the same message type. These are different occurrences of the same message type which represent different, independent measurements. For example, a Maretron TMP100 Temperature Monitor has six independent channels transmitting six independent temperature readings, so the Transmitted PGNs window for a TMP100 will have up to six occurrences of the 130312 Temperature message, representing the measurements for each of the six channels.

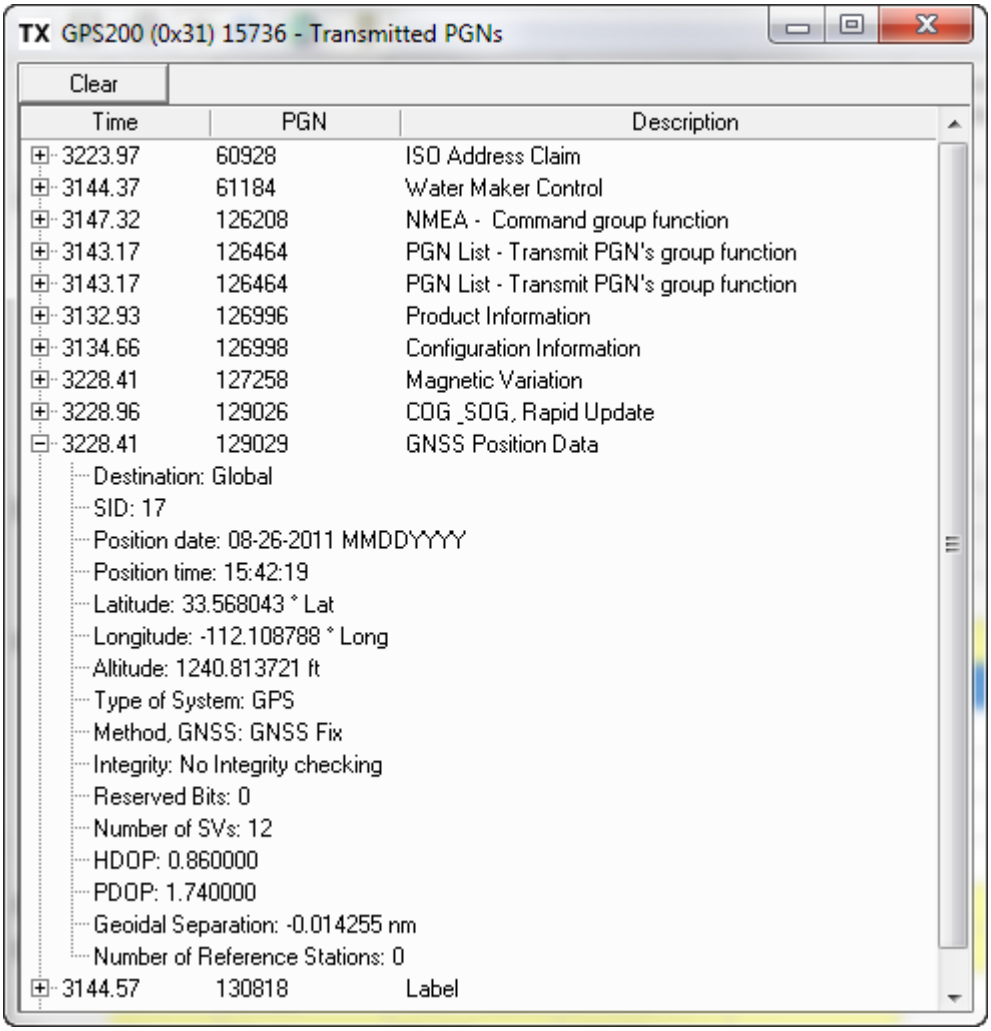


Figure 147 – Transmitted PGNs Window

At any time, you may press the "Clear" button to clear the list.

5.1.3.3 Device Properties

This opens a window displaying information on the selected device, including general properties, the installation description fields, and a list of PGN's that the device reports that it transmits and receives. Please refer to Section Viewing Device Properties for details.

5.1.3.4 Instancing

This causes N2KAnalyzer® to scan the network information and traffic, searching for conflicting instancing information that may cause displays to report incorrect information. It will open a window that will display conflicts and recommendations for resolving the conflicts.

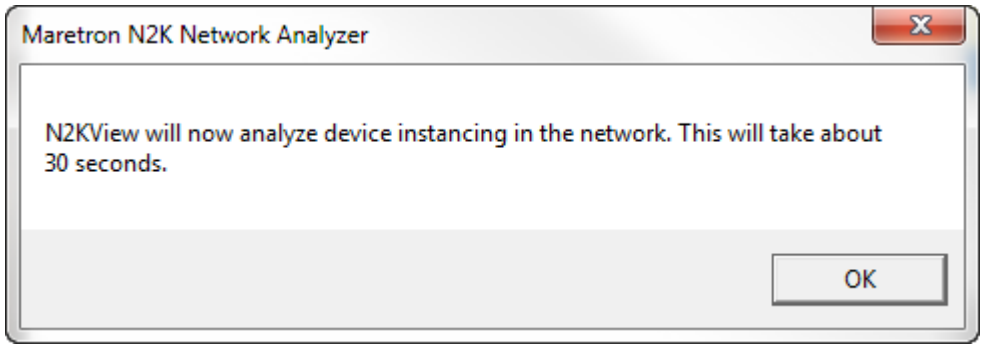


Figure 148 – Instancing Analysis Introduction Window

If instancing conflicts are detected, the following window will appear.

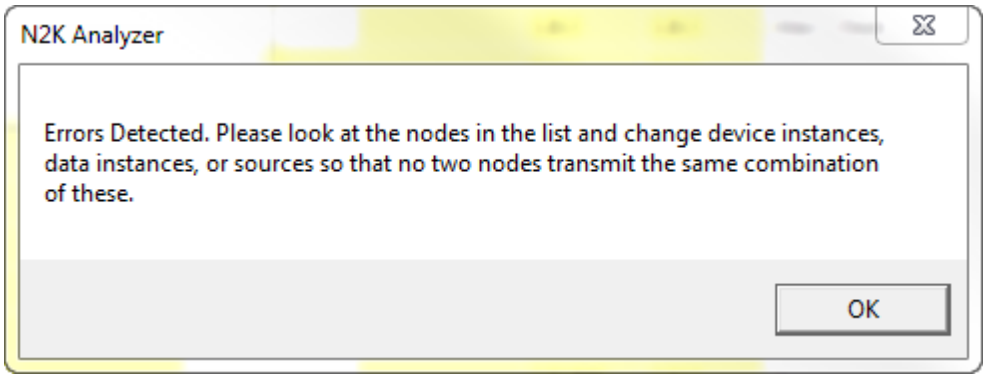


Figure 149 – Instancing Conflict Notification Window

Click “OK” and check the “Instancing Analysis” window for details of the instancing conflicts that were detected. Each line of detail includes a suggestion for resolving the instancing conflict.

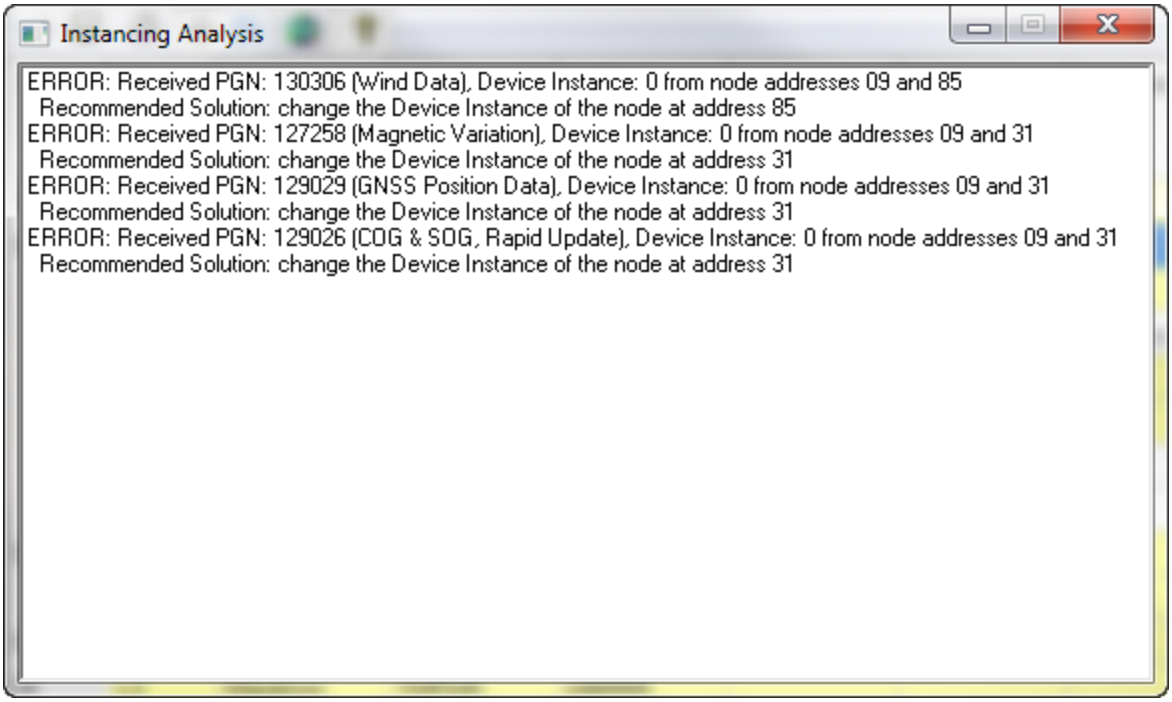


Figure 150 – Instancing Analysis Details Window

5.1.3.5 DSM250 Viewing…

This opens a window containing an emulation of the Maretron DSM250 Multi-function display, which allows you to view a wide variety of data on the attached NMEA 2000 network.

5.1.3.6 EEPROM Contents…

This allows you to write the EEPROM contents from a supported Maretron device to a HEX file on your hard disk. Maretron technical support may request you generate this file and e-mail it to them in certain situations.

5.1.4 Update

5.1.4.1 Selected Device's Software...

This will update the software on the device that has been highlighted in the device list window to the most recent version. This menu item is available only in online mode. Please refer to Section 4.5 for details.

5.1.5 Configure

5.1.5.1 Installation Descriptions

This will enable you to change the installation descriptions fields of the selected device, provided that the device supports field modification of these fields. You can fill these fields with any desired data; for example, the location of the device, date installed, date calibrated, etc.

5.1.5.2 Device Instance

This will enable you to change the upper device instance and lower device instance fields of the device, provided that the device supports modification of these fields over the network (some devices provide instead the ability to modify these fields by DIP switches or rotary switches on the devices themselves; please consult the device's user manual for details).

5.1.5.3 DSM250 Configuration…

This opens a window containing an emulation of the Maretron DSM250 Multi-function display in configuration mode, which allows you to configure any Maretron devices on the attached NMEA 2000 network. Please refer to the *DSM250 User's Manual* for detailed instructions on configuration of NMEA 2000 devices. This menu item is available only in online mode.

5.1.5.4 Restore Factory Defaults

This will return the currently selected device to the condition it was in when it was shipped from the factory, except that the device will retain its current node address.

5.1.6 Web

5.1.6.1 Download Software Updates

Connects to the Maretron website and checks whether a newer version of N2KAnalyzer® software or updates to device software are available. If newer software is available, N2KAnalyzer® will prompt you to download and install the new version.

5.1.6.2 Maretron Website

Opens your default web browser and directs it to the Maretron home page, where you can find information about Maretron products and solutions.

5.1.6.3 Knowledge Base

Opens your default web browser and directs it to Maretron's support knowledge base, where you can find answers to questions about the installation, configuration, and use of Maretron products.

5.1.7 Help

5.1.8 User's Manual

Displays this user's manual.

5.1.9 About N2KAnalyzer®

Displays a dialog box with information about N2KAnalyzer®, including the current version number and copyright information.

5.2 Toolbar

Figure 151 – Toolbars

The following icons appear on the toolbar, in order from left to right:

Open (same as *File→Open…*): Loads a network configuration from a boat file.

Save (same as *File→Save As…*): Saves the current network configuration to a boat file.

Print: Prints the contents of the Device List Window.

Connect/Disconnect: Connects N2KAnalyzer® to a NMEA 2000 network if it is currently disconnected from the network, and vice versa.

Refresh: Causes N2KAnalyzer® to refresh the state of the Device List window.

Web: This feature is not yet implemented.

About: Displays the About window.

5.3 Device List Window

The device list window shows information on all devices currently connected to the NMEA 2000 network. The N2KAnalyzer® software broadcasts a request to all nodes on the NMEA 2000 network, which in turn broadcast their identifying information. It then fills the device list window with information as it is received from the other devices on the network. This process repeats every ten seconds, and the device list window contents are updated accordingly.

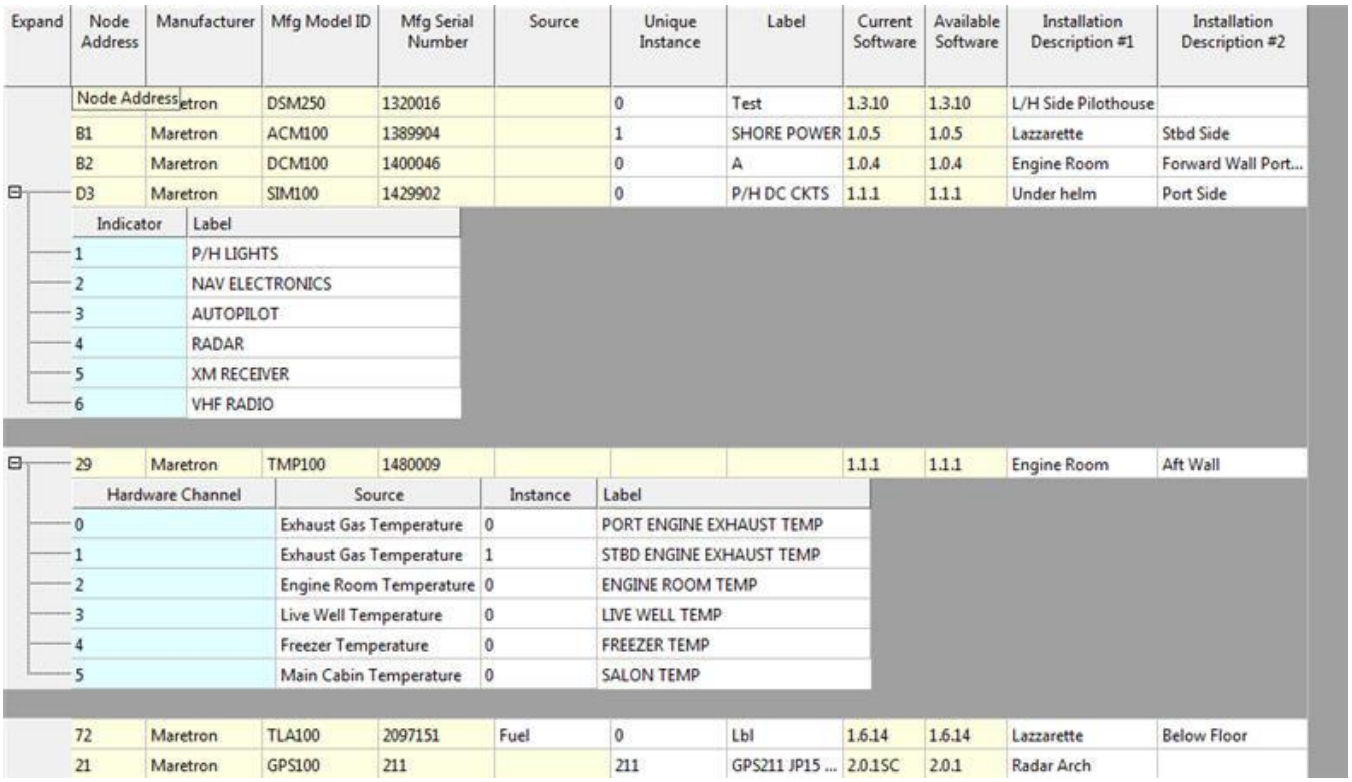
The text for each device is normally displayed in black. Different colors are used to signify different characteristics of devices:

Blue – identifies the gateway that is being used by the N2KAnalyzer® software

Red – identifies that a new revision of firmware is available for that device.

Grey – device is not responding or has been removed from the network.

Some parameters of devices, including the Unique Instance, Label, Installation Description #1 and Installation #2, can be edited directly in the device list window, just as you might do with a spreadsheet program. The device parameters that can you can change have a white background, as opposed to device parameters that are not user-changeable, which have a yellow background.



Expand	Node Address	Manufacturer	Mfg Model ID	Mfg Serial Number	Source	Unique Instance	Label	Current Software	Available Software	Installation Description #1	Installation Description #2
	Node Address	etron	DSM250	1320016		0	Test	1.3.10	1.3.10	L/H Side Pilothouse	
	B1	Maretron	ACM100	1389904		1	SHORE POWER	1.0.5	1.0.5	Lazzarette	Stbd Side
	B2	Maretron	DCM100	1400046		0	A	1.0.4	1.0.4	Engine Room	Forward Wall Port...
⊟	D3	Maretron	SIM100	1429902		0	P/H DC CKTS	1.1.1	1.1.1	Under helm	Port Side

Indicator	Label
1	P/H LIGHTS
2	NAV ELECTRONICS
3	AUTOPILOT
4	RADAR
5	XM RECEIVER
6	VHF RADIO

⊟	29	Maretron	TMP100	1480009				1.1.1	1.1.1	Engine Room	Aft Wall

Hardware Channel	Source	Instance	Label
0	Exhaust Gas Temperature	0	PORT ENGINE EXHAUST TEMP
1	Exhaust Gas Temperature	1	STBD ENGINE EXHAUST TEMP
2	Engine Room Temperature	0	ENGINE ROOM TEMP
3	Live Well Temperature	0	LIVE WELL TEMP
4	Freezer Temperature	0	FREEZER TEMP
5	Main Cabin Temperature	0	SALON TEMP

	72	Maretron	TLA100	2097151	Fuel	0	Lbl	1.6.14	1.6.14	Lazzarette	Below Floor
	21	Maretron	GPS100	211		211	GPS211 JP15 ...	2.0.1SC	2.0.1	Radar Arch	

Figure 152 – Device List Window

5.3.1 Expand

Some NMEA 2000 devices can transmit more than one distinct parameter (this is referred to as having multiple hardware channels). If a particular device can display more than one parameter, a “+” sign appears in the “Expand” column of the screen. You can click on this “+” sign, and the single device row will expand to add a row for each hardware channel in the device.

5.3.2 Node Address

Each device on an NMEA 2000 network claims a node address between the value of 0 (0x0 hexadecimal) and 251 (0xFB hexadecimal). These node addresses may change as new devices are added to the network. This column shows the node addresses claimed by each device on the network.

5.3.3 Manufacturer

This column shows the manufacturer reported by each device. The manufacturer’s names are read from a table in the N2KAnalyzer® software which translates the manufacturer’s code reported by the device. If a new NMEA 2000 manufacturer has been added since the N2KAnalyzer® software was released, this will show up as a numeric value. If this happens, please either

Update your N2KAnalyzer® software by selecting *Web→Download Firmware Updates* menu item, or

Check the NMEA website for the current list of manufacturer codes.

5.3.4 Mfg Model ID

This column shows the model ID (sometimes known as Device Model, Model Number, or Model Name) reported by each device.

5.3.5 Mfg Model Version

This column shows the hardware version number reported by each device.

5.3.6 Mfg Serial Number

This column shows the serial number reported by each device.

5.3.7 Source

This column shows the source type for the device, if the device has a single hardware channel and a source type. Currently, Maretron TLA (Tank Level Adapter) and TLM (Tank Level Monitor) devices fall into this category.

5.3.8 Unique Instance

This column shows the Unique Instance for the device. The Unique Instance is the instance number that is used to identify the device in N2KView or DSM250. It may correspond to the device instance or to a channel instance, depending on the device.

5.3.9 Current Software

This column shows the software version number reported by each device.

5.3.10 Available Software

This column shows the most recent version of software that is available for each device that can be updated by the N2KAnalyzer® software. This number will be highlighted in red if it is newer than the version of the firmware currently installed on the device. If this number is lower than the version number shown in the *Current Software* column, then please download a more recent copy of N2KAnalyzer® from http://www.maretron.com/downloads.

5.3.11 Install Description #1

This column shows the "Install Description #1" field of the Product Information message, which is user-programmable in some devices and may be used by a user to describe various information; for example, the location of the equipment.

5.3.12 Install Description #2

This column shows the “Install Description #2” field of the Product Information message, which is user-programmable in some devices and may be used by a user to describe various information; for example, the location of the equipment.

5.3.13 Mfg Information

This column shows the Manufacturer’s Information field of the Product Information, which is programmed by a device manufacturer to describe various information; for example, contact information for the manufacturer.

5.3.14 Device Class

This column shows the NMEA 2000 device class as reported by each device.

5.3.15 Device Function

This column shows the NMEA 2000 device function (this is a more-specific indication of the device function within the context of the device class) reported by each device.

5.3.16 Device Instance

This column shows the NMEA 2000 device instance reported by each device.

5.3.17 System Instance

This column shows the NMEA 2000 system instance reported by each device.

5.3.18 NMEA 2000 Version

This column indicates the version of the NMEA 2000 standard to which the device was designed.

5.3.19 NMEA 2000 Certification Level

This column indicates the level of network functionality implemented by the device. Current values include “A”, which indicates full functionality, and “B”, which indicates reduced functionality.

5.3.20 MFG Product Code

This column indicates the numeric product code assigned to the device by NMEA.

5.3.21 LEN

This column indicates the Load Equivalent Number reported by the device. Each LEN indicates 50mA current consumed by the device. For example, a device with LEN equal to 3 will consume a maximum of 150mA current. This information is required for network cabling and power supply planning.

5.4 Device Channel Information

If a device supports multiple hardware channels, clicking on the "+" symbol in the "Expand" column will open another grid showing information for the hardware channels. This window will contain different information depending on the device. Following is a list of columns that are supported:

5.4.1 Hardware Channel

This column identifies which hardware channel the information in that row is for. For some types of devices, this column will contain a number corresponding to the number of the hardware channel the information is for. For other devices, this column may contain a text string describing the function of the channel.

5.4.2 Indicator

For RIM and SIM devices, this column contains the number of the indicator the information in that row is for.

5.4.3 Source

For hardware channels which indicate a source type, this column contains the name of the source type currently selected for that channel.

5.4.4 Instance

For channels which indicate a numeric instance, this column contains the number of the data instance currently selected for that channel.

5.4.5 Label

This column contains the text label which is assigned to that channel. This label will appear in N2KView and DSM250 when you are selecting parameters to display in a component or on a favorite screen.

5.5 Status Bar

The status bar at the bottom of the main program window displays information about the current operating mode of the N2KAnalyzer® software.

Figure 153 – Status Bar

5.5.1 Status Message Area

This area displays the current status of the N2KAnalyzer® software, as well as help for toolbar buttons over which the mouse cursor is located.

5.5.2 Connection Status Indicator

This area displays “Connected to NMEA 2000 Network” if the N2KAnalyzer® software is currently connected to a NMEA 2000 network through a gateway, and “Disconnected from NMEA 2000 Network” at all other times.

5.5.3 Gateway Selection Indicator

If the N2KAnalyzer® software is operating in online mode, then this area of the status bar will display the name of the gateway (COM port or IP address) being used to connect to the NMEA 2000 gateway.

5.5.4 Caps Lock Indicator

This area of the status bar displays “CAP” if caps lock is active on the keyboard, and is blank otherwise.

5.5.5 Num Lock Indicator

This area of the status bar displays “NUM” if num lock is active on the keyboard, and is blank otherwise.

5.5.6 Scroll Lock Indicator

This area of the status bar displays “SCRL” if scroll lock is active on the keyboard, and is blank otherwise.

6 Troubleshooting

SYMPTOM: When trying to enter online mode, you see a dialog box with the message ‘Failure to connect to NMEA 2000 Gateway on port “COM*x*”’.

This message indicates that the N2KAnalyzer® software was unable to establish a connection to the NMEA 2000 network through the NMEA 2000 gateway on the indicated serial port. Following are some steps you can take to resolve the problem.

- Select the *Setup→Configure Gateway…* menu item to select a valid NMEA 2000 gateway.
- Check that the NMEA 2000 gateway is connected to a powered NMEA 2000 network and is receiving power through the NMEA 2000 network connection.
- Check that the NMEA 2000 gateway is connected to the computer and that the connecting cable is good. Try reconnecting the NMEA 2000 gateway to the computer with a different cable.
- Check the security of all NMEA 2000 network connections.
- Try disconnecting and reconnecting the cable between the computer and the NMEA 2000 gateway.
- Reboot the computer.

SYMPTOM: You see only the NMEA 2000 Gateway in the device list window. This means that the NMEA 2000 Gateway is properly connected to the computer, but is unable to communicate with other NMEA 2000 devices. Following are some steps you can take to resolve the problem,

- Ensure that the proper drivers are installed for the NMEA 2000 gateway.
- Check that the NMEA 2000 network has two termination resistors installed.
- Check the security of all NMEA 2000 network connections. Ensure that at least one other device is connected to the NMEA 2000 network.

7 Technical Support

If you require technical support for Maretron products, you can reach us in any of the following ways:

Telephone:	1-866-550-9100
Fax:	1-602-861-1777
E-mail:	support@maretron.com
World Wide Web:	http://www.maretron.com
Mail:	Maretron, LLP Attn: Technical Support 9014 N. 23rd Ave Suite 10 Phoenix, AZ 85021 USA