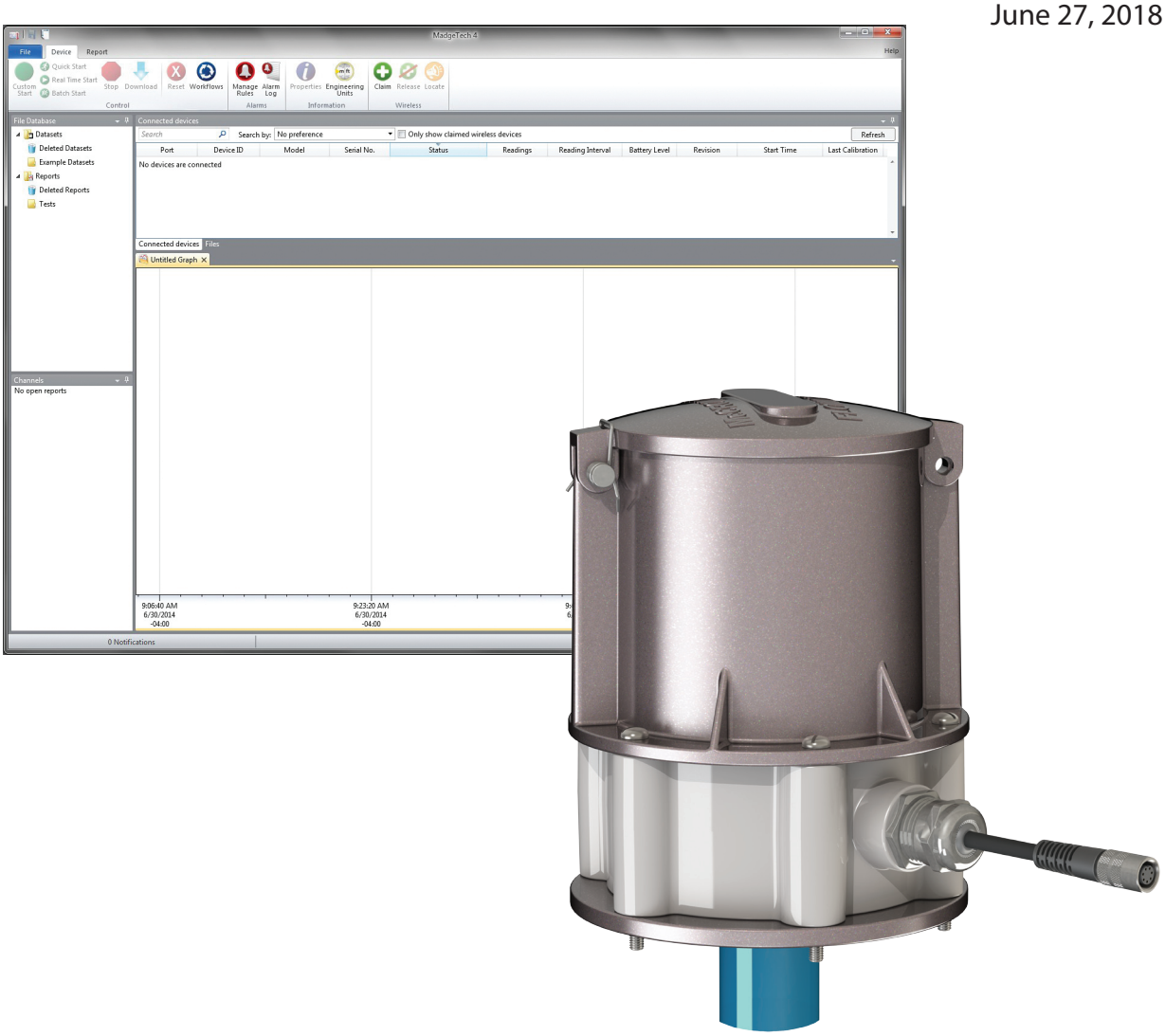
Mc Propeller Data Logger

Installation, Operation and Maintenance Manual For MadgeTech 4 Software

30122-04, Rev. 1.1
June 27, 2018



Contents

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1.0 MC20-D2 DATA LOGGER RETROFIT

1.1 Unpacking and Inspection

Your MC20-D2 Data Logger is engineered to be a highly reliable, accurate system. It has been systematically assembled, inspected, tested and calibrated; then carefully packed or installed on your new McCrometer flowmeter before shipment. If not installed, unpack the data logger carefully and inspect each assembly thoroughly for obvious shipping damage (Figure 1). Notify the freight carrier immediately upon discovery of any damage.

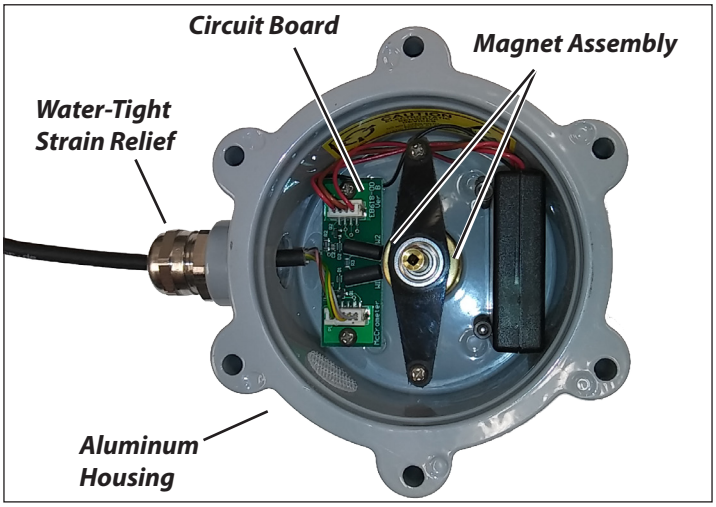

Figure 1. MC20-D2 Data Logger

Make sure that all parts are included in the shipment listed below:

- MC20-D2 Assembly
- Specification Sheet
- EH222-10 Installation Kit, containing:

• D0100-1.5	Cable Extension	1 each
• 10142-20	Screw 10-32 x 3" Long w/ Seal Hole	1 each
• 10142-30	Screw 10-32 x 2-3/4" Long	5 each
• 10285	O-Ring 3-5/8" OD	2 each
• 10013-00	Dry Pack, Silica Gel	1

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1.2 Disassembly

It is necessary to remove the existing canopy and register. The data logger mounts between the register and the register mounting plate already installed on top of the pipe protruding from the top of the meter.

THE FLOWMETER CAN BE IN FULL OPERATION DURING THIS PROCEDURE.

1.2.1 Canopy Removal

Remove the six screws holding the canopy to the mounting plate and discard, Figure 2. One of the screws has a seal attached, remove it prior to removing that screw. Lift off the canopy slowly, straight up to prevent damage to the register.

1.2.2 Register Removal

Loosen the pal nut located on the threaded shaft of the register. Carefully unscrew the register counter clockwise and lift it from the bushing. Remove the O-ring and discard it.

CAUTION

Protect the register from dust while it is outside of the canopy.

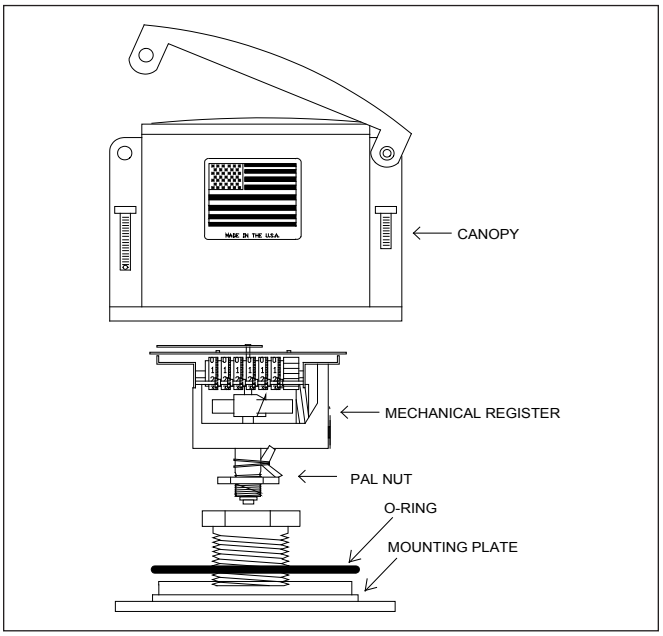

Figure 2. Canopy, Register Removal

You can now see the open end of the ell with the drive cable. (Figure 3) If the flowmeter is in operation the cable will be rotating.

If the flowmeter is not installed, turn the propeller by hand to check that the bearing and cable rotate freely.

If the meter is installed but not running, turn the drive cable with your hands. The drive cable may be difficult to reach with your fingers, and you may need to use pliers. If you feel resistance, the cable and propeller are properly attached. If the pipe is full of water, the cable may be difficult to turn.

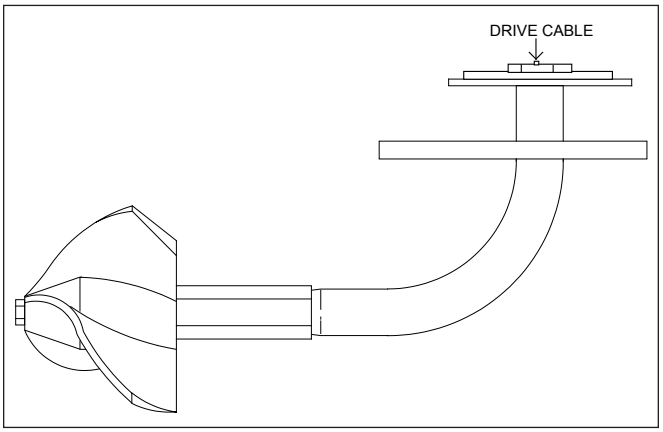

Figure 3. Location of The Drive Cable

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1.3 Re-assembly

1.3.1 Data Logger Installation

1. Place an O-ring over the lip on the mounting plate as shown in Figure 4. Use a small amount of silicone grease to lubricate the O-ring.
2. Rotate the data logger to align the wire leads to the desired position.
3. Lower the data logger to insert the cable into the center shaft of the data logger.
4. Continue to lower the unit until it touches the O-ring on the plate. Work the data logger carefully down over the O-ring, seat it firmly into place.

Note: Proper alignment of the O-ring on the base plate can prevent damage to the O-ring.

1.3.2 Register Installation

1. Find the short cable extension in the installation kit and insert it into the center of the bearing on top of the data logger.
2. Place the register with the pal nut still in place on the cable extension and rotate it clockwise three or four turns. Stop when the register is positioned as it was prior to its removal and tighten the pal nut until it is snug.
3. If the flowmeter is operating, turn the register in until there is a slight binding of the cable in the register and then back out approximately two turns and then tighten the pal nut. This should give you smooth operation and the register should be correctly positioned.

1.3.3 Canopy Installation

1. Place an O-ring in the groove on top of the data logger. Use a small amount of silicone grease to lubricate the O-ring.
2. Place the canopy on top of the data logger.
3. Orient the canopy so that the lid of the register opens in a direction that is most convenient for the register to be read, with the lid hinge at the 12 o'clock position of the register.
4. Lower the canopy carefully over the lubricated O-ring and seat it firmly onto the data logger housing. (Figure 5)
5. Align the screw holes of the canopy with the screw channels of the data logger and with the threaded screw holes of the base plate.
6. Locate the long screws; insert the screws through the canopy, data logger housing, and the plate.

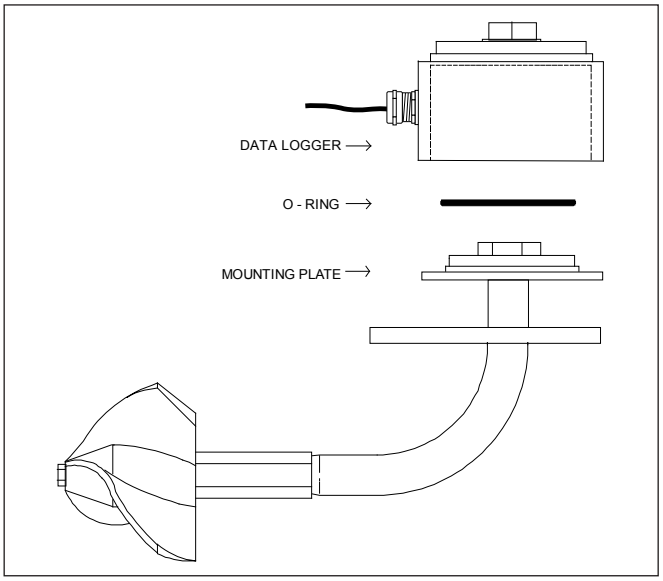

Figure 4. Installation Of The Data Logger

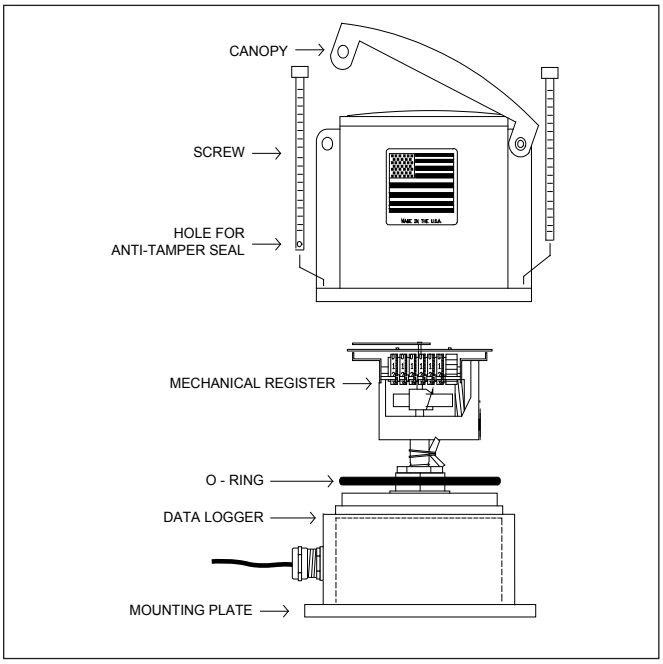

Figure 5. Canopy Installation

7. Tighten the screws using the crisscross method. Use caution when tightening the screws to prevent thread damage. The O-rings will seal the data logger and mechanical register from environmental contaminants.
8. Insert the anti-tamper seal through the hole in the security screw and attach the seal.

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2.0 DATA LOGGER SOFTWARE REQUIREMENTS

Thank you for your purchase of the Mc® Propeller Data Logger. The Mc Propeller Data Logger uses the Madgetech 4 Data Logging Software. This manual will guide you through the installation and operation of the data logger software.

MadgeTech 4 Data Logging Software requires an IBM or compatible PC with the following:

- PC-compatible Pentium-class system
- Windows XP/Vista/Windows 7 (32 and 64 bit), Windows 8, and Windows 10
- Color SVGA monitor (1024 x 768 resolution)
- 1 GB (or more) RAM
- At least 30MB free hard disk space (for installation)
- Available USB port (for USB logger interface cable)

(Note: Although the software is designed to work with the Windows Operating Systems listed above, MadgeTech cannot guarantee operation on Operating Systems no longer supported by Microsoft's Support Life Cycle Policy.)

3.0 SOFTWARE INSTALLATION

The MadgeTech 4 Standard Software is located on the flash drive provided with your system, or it can be downloaded from the MadgeTech website: http://www.madgetech.com/software-download.

3.1 Installing The Software From The Included Flash Drive

To install the MadgeTech software from a flash drive:

1. Insert the flash drive labeled MadgeTech Data Logger Software Version 4.X.X into an available USB port. After a few moments an Autoplay box will open. (Figure 6)

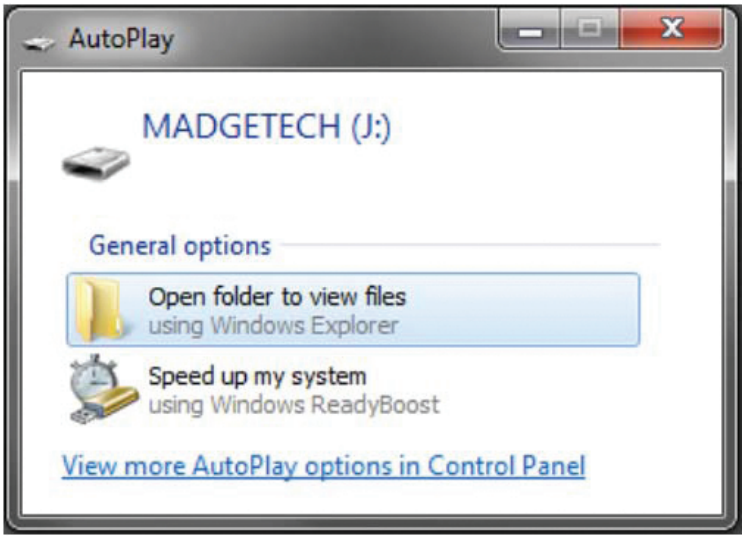

Figure 6. Autoplay Screen

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2. In the Autoplay box, click Open folder to view files to view the contents of the flash drive.
3. In the event that Autoplay is disabled, manually browse to the MadgeTech flash drive by clicking on the Start button or Windows Icon, navigate to Computer and double click the drive, MadgeTech4, to view the contents of the flash drive.
4. Once in the MadgeTech 4 file location, locate the exectuable file "autorun.exe". (Figure 7) Double-click "autorun.exe" to launch the MadgeTech 4 Installer Options.

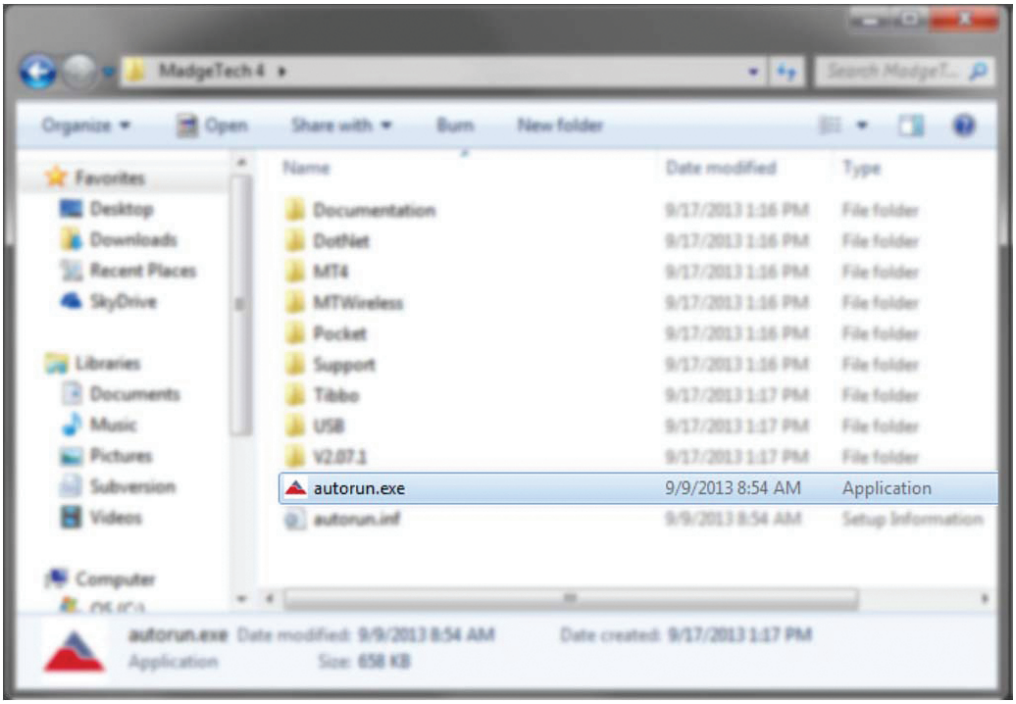

Figure 7. MadgeTech 4 Autorun File

5. The MadgeTech installer Options screen will appear. (Figure 8)
6. Click MadgeTech Software to open the Install MadgeTech Software options page.

Figure 8. MadgeTech 4 Software Selections

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7. The MadgeTech 4 Software requires the .Net 4.0 Framework to be installed on the intended PC. (Figure 9) The Windows 8 operating system comes with the 4.5 .Net Framework already installed. If the .Net 4.0 Framework has not been installed on the PC, click the Install .Net 4.0 Framework option and follow the wizard installation steps.

NOTE: If the .Net 4.0 Framework has already been installed and you attempt to run the Install .Net 4.0 Framework, a window asking to Repair or Remove the .Net 4.0 Framework will appear. It is recommended to select the Cancel button when this page appears.

Figure 9. MadgeTech 4 Software Installation

8. After the .Net 4.0 Framework installation has been confirmed, click the Install MadgeTech Software option. Select English when prompted for a language selection, then the Installation Wizard will walk through the installation steps to install the software.

   Figure 10 shows examples of the installation windows:

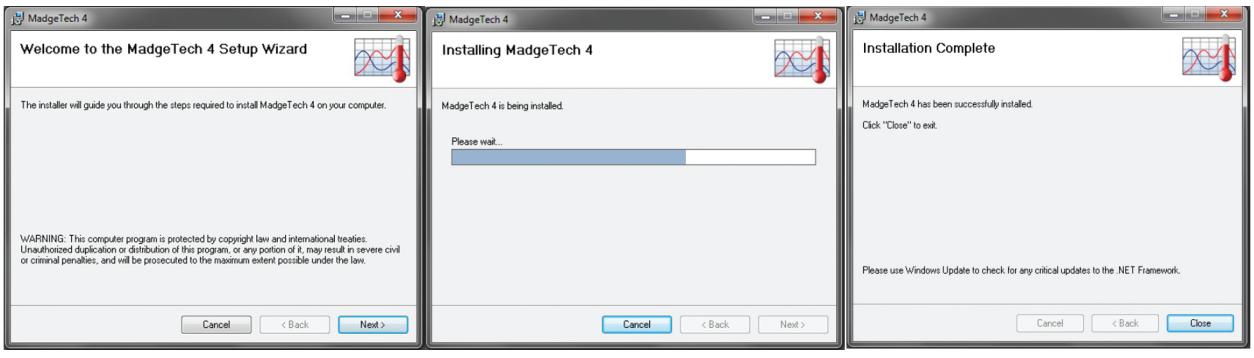

Figure 10. Software Installation Windows

When the Installation Complete screen appears, click Close to exit the wizard and return to the autorun, then Exit at the bottom to close the autorun. The MadgeTech 4 Standard Software is now installed on your PC.

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3.2 Installing The USB Interface Drivers

The USB interface drivers can easily be installed on the PC if they are not already available and running. From the MadgeTech Installer Options page, click Drivers and Third Party Tools to open the MadgeTech Device Drivers and Third Party Tools page. Then click Install USB Interface Drivers. (Figure 11)

Figure 11. USB Interface Drivers Installation Selection Window

The Datalogger Interface Driver Installer dialog box will appear. Click Install to start the driver installation. A dialog box will appear when installation is finished. (Figure 12)

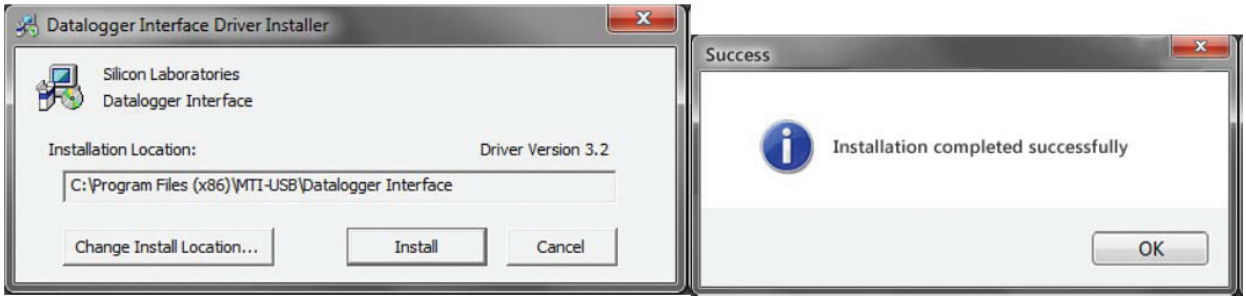

Figure 12. USB Interface Drivers Installation Windows

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4.0 CONNECTING THE MC20-D2 DATA LOGGER

4.1 Start the Data Logger Program

When you start the program, you will see the main screen, with the Device tab selected by default. (Figure 13)

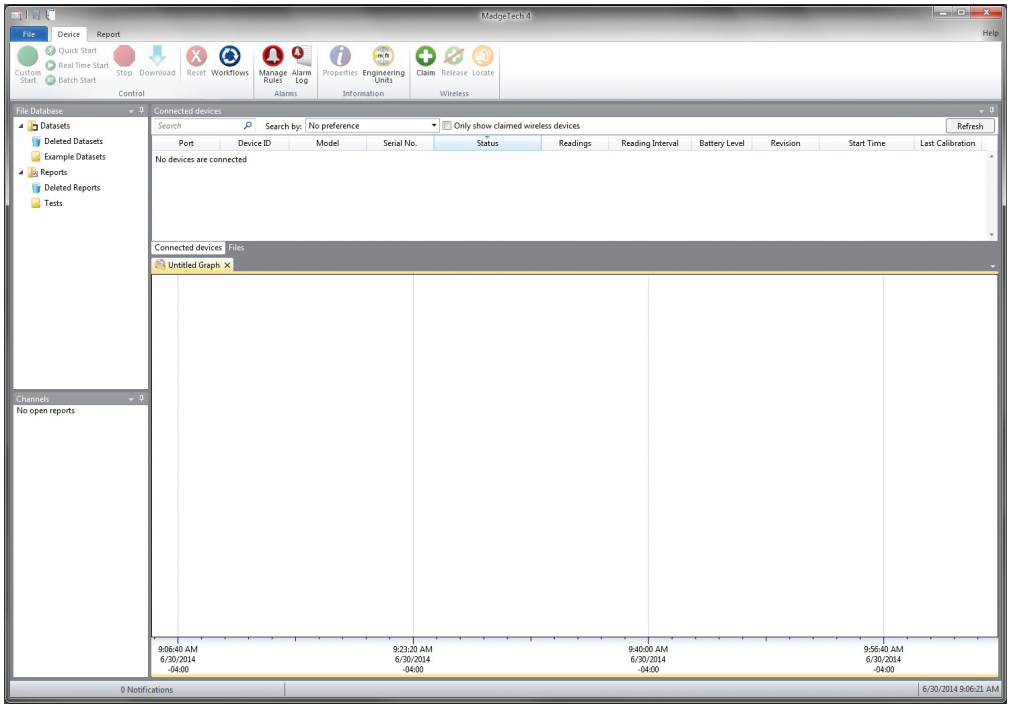

Figure 13. The MadgeTech 4 Opening Screen

NOTE
No devices are shown to be connected in the figure at right. You can connect the USB cable to the data logger either before or after you start the program.

4.2 Program Menus and Navigation

Figure 14 shows the different panels on the Device tab.

A full description of each command with the menu bar will be explained briefly in section 5.3.

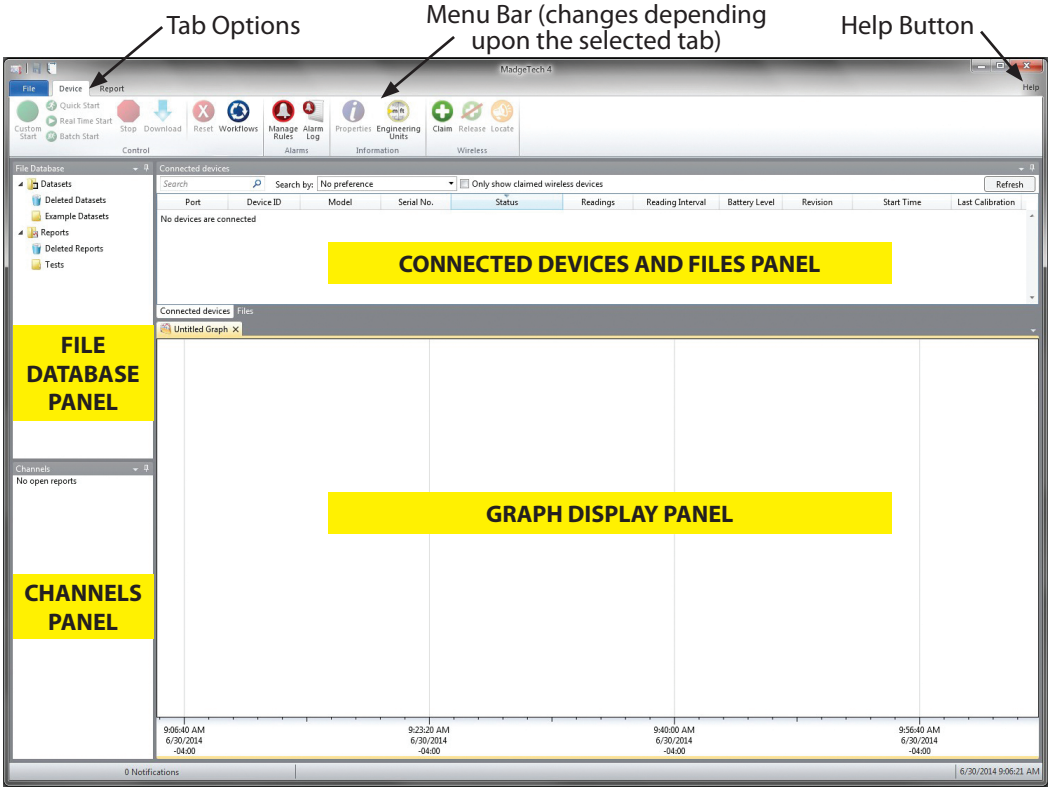

Figure 14. The MadgeTech 4 Panel And Menu Descriptions

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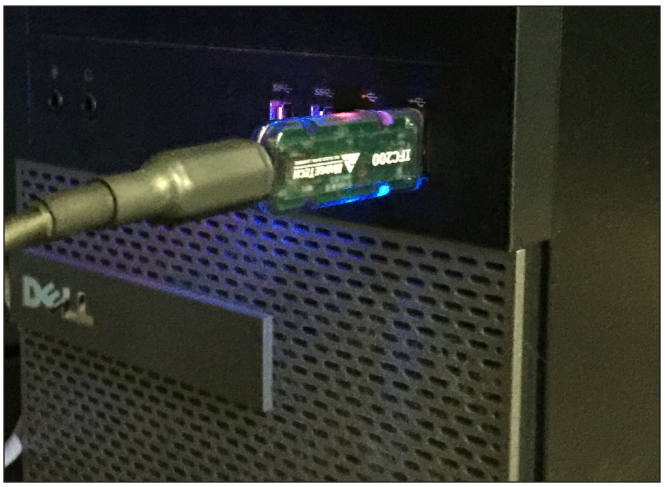
4.3 Connect the Data Logger to the Computer

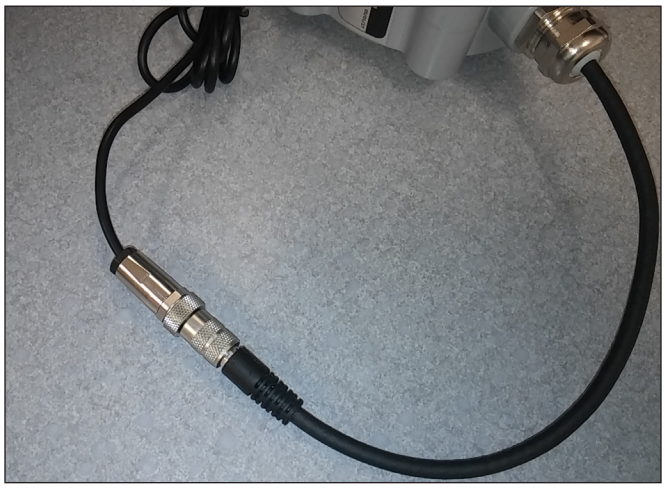
1. If it is not already running, start the MadgeTech 4 program.

2. Plug the 3.5mm cable into the rear of the IFC200 USB dongle.

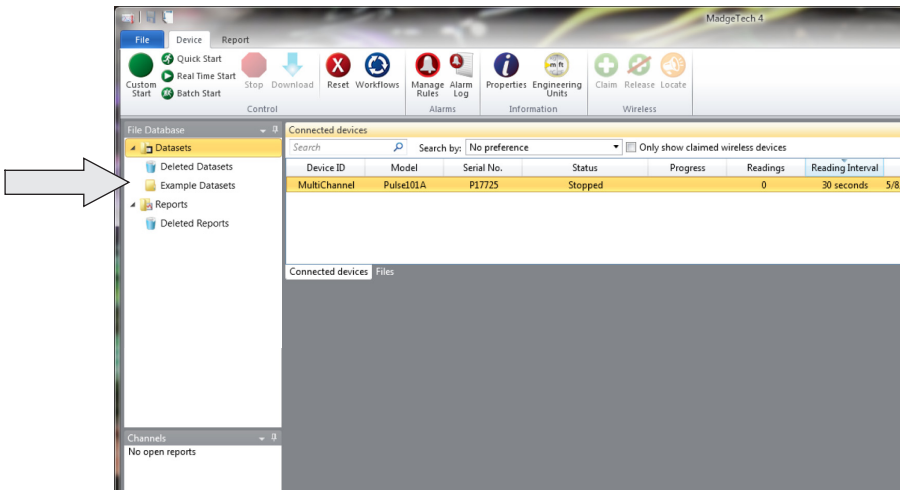
3. Plug the IFC200 USB into the computer.



4. Plug the other end of the 3.5mm cable into the MC20-D2.



5. Once the software has opened, it will take a few moments for the devices to show up under Connected Devices.



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5.0 PROGRAM FUNCTIONS AND COMMANDS

5.1 File Tab Commands

The tab titled "File" contains several options. (Figure 15) Below is a brief description of each item.

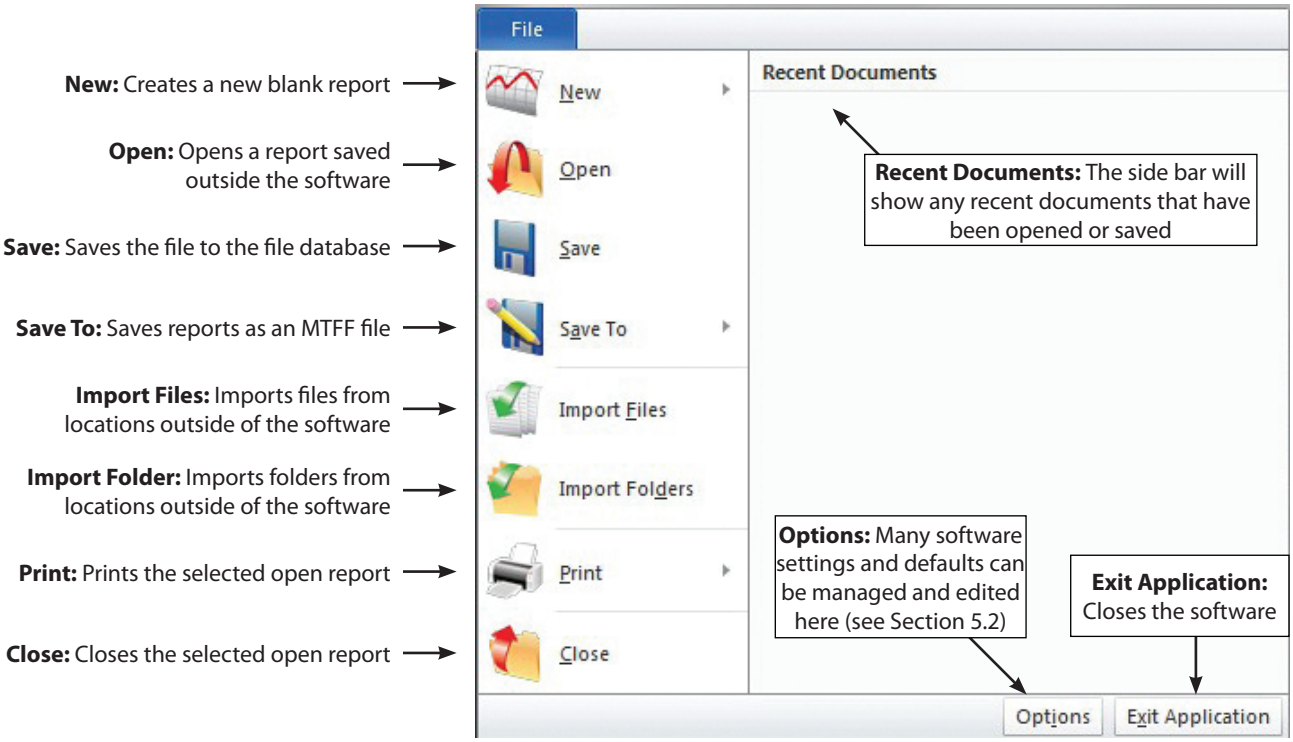

Figure 15. File Tab Contents

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5.2 Options Screen Commands

The **Options** button offers a variety of options that affect the appearance and default settings of the program. (Figure 16) Following is a description of the functionality of each of the available options:

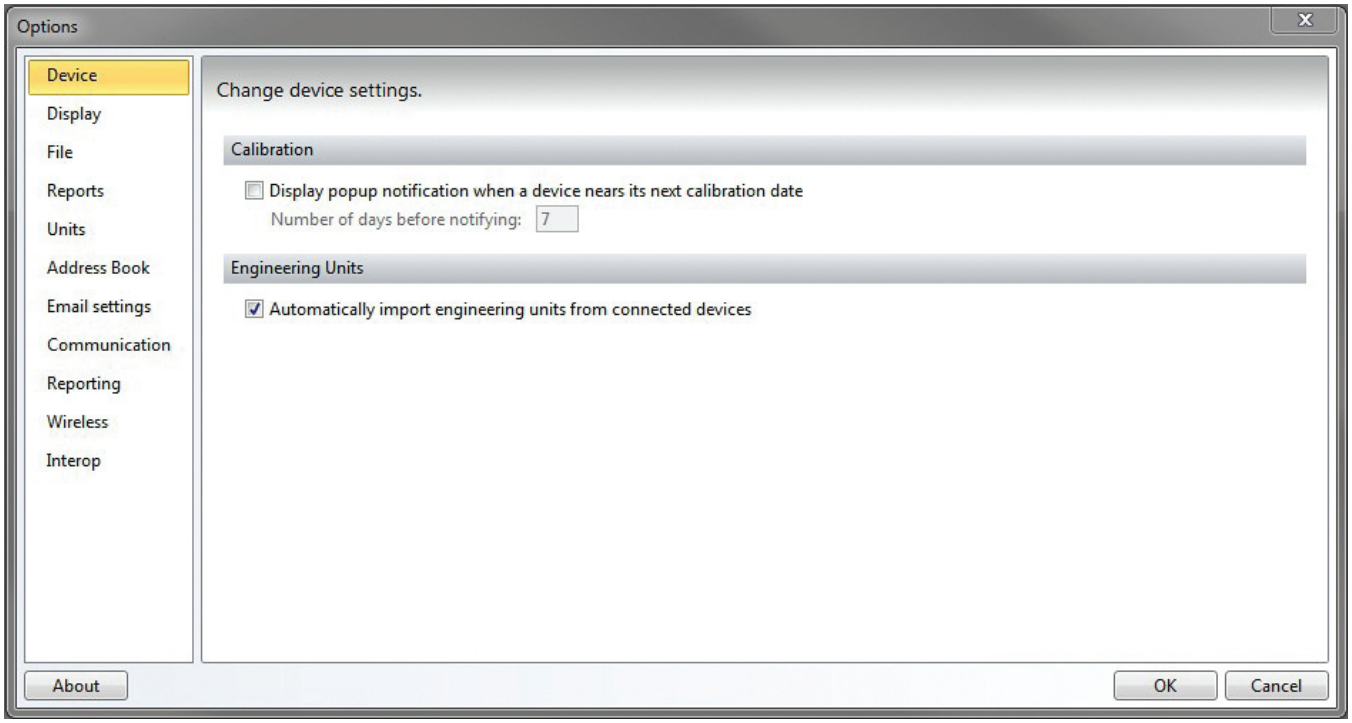

Figure 16. Options Screen

Device	Change device settings of a logger in regards to calibration notifications and importing engineering units from the currently connected devices.
Display	Edit the default settings when the software opens. • Page display allows the user to choose what measurement the page display can be: Inches, Millimeters or Centimeters. • Viewing data allows the user to edit the time format and channel grouping. • Cooling flags allows the user to choose the default cooling flags that can be displayed. • The Layout section allows the user to edit the ability to minimize to the system tray, the overall software color scheme, and resetting the screen layout.
File	Change how files are imported and where the preferences and file database are located.
Graph	Change the default graph properties.
Units	Change the default colors for the various unit types.
Address Book	Manage the contacts within the software.
Email Settings	Manage the server address, port and email authentication settings.
Communications	Configure and display detected interfaces.
Reporting	Change the software problem and usage reporting preferences.
Wireless	Configure the timeouts of wireless timeouts.

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5.3 Device Tab Commands

The Device tab, located at the top of the menu bar, contains all of the features for managing devices. (Figure 17) Within this tab are four different sections: Control, Alarms, Information, and Wireless. Below is a list of commands and options found in the device menu.

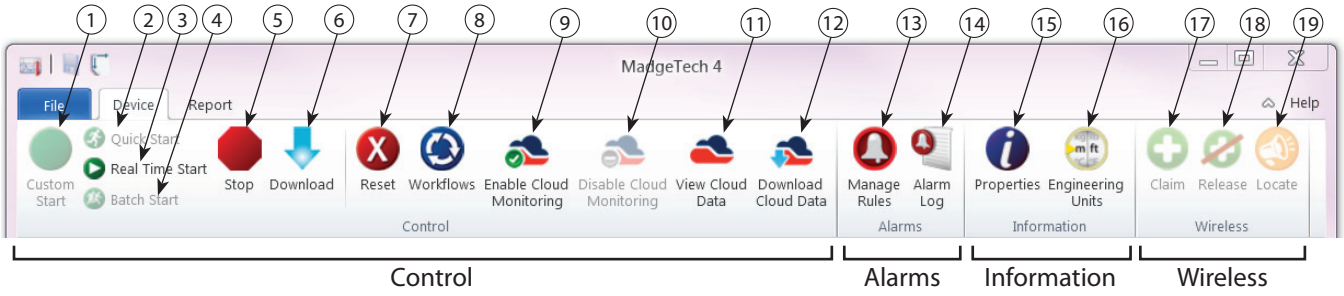

Figure 17. The Device Menu Screen

Control section		
1	**Custom Start**	Start the selected device(s) using custom settings
2	**Quick Start**	Start the selected device(s) using current settings
3	**Real Time Start**	Start the selected device(s) in real-time mode
4	**Batch Start**	Automatically start devices of the same type as they are connected
5	**Stop**	Stops the selected device(s)
6	**Download**	Download recorded data from the selected devices
7	**Reset**	Resets the selected device(s)
8	**Workflows**	Manage device automation workflows
9	**Enable Cloud Monitoring**	Add the selected devices to the cloud monitoring system
10	**Disable Cloud Monitoring**	Remove the selected devices to the cloud monitoring system
11	**View Cloud Data**	View cloud data in a web browser
12	**Download Cloud Data**	Download cloud data
Alarms section		
13	**Manage Rules**	Manage Rules: Manage Real-time alarm rules.
14	**Alarm Log**	Alarm Log: Displays past alarm notifications.
Information section		
15	**Properties**	View the properties and settings of the selected device.
16	**Engineering Units**	Manage engineering units.
Wireless section		
17	**Claim**	Add the selected wireless device(s) to the network.
18	**Release**	Remove the selected wireless device(s) from the network.
19	**Locate**	Find or identify a wireless device with an audible alarm.

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5.4 Report Tab Commands

The Report tab, located at the top of the menu bar, contains all of the features and options for managing reports. (Figure 18) Within this tab are five sections: Graph, Data Table, Statistics, Channels & Readings, and Report Options. Below is a list of commands and options found in the report menu.

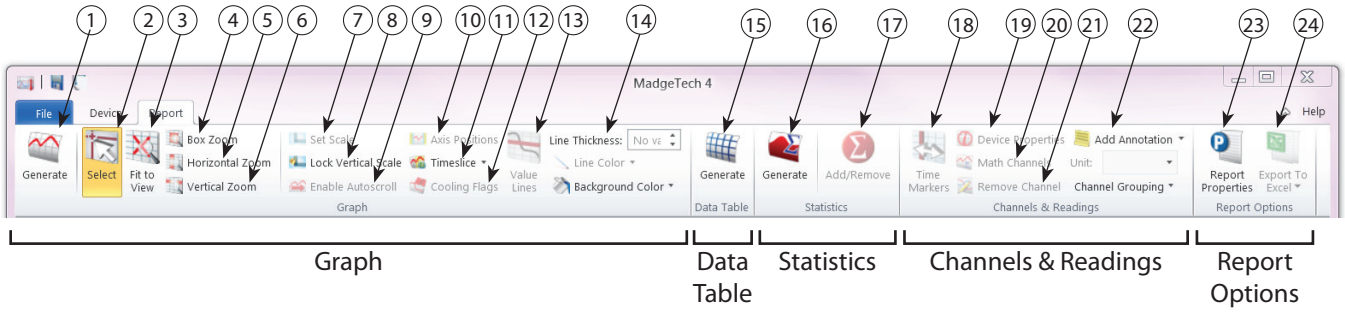

Figure 18. The Report Menu Screen

Graph section		
1	**Generate**	Generates a graph based on the current report, or a blank graph if no report is open.
2	**Select**	Change the cursor function to select data points.
3	**Fit to View**	Zoom out to fit all data In view.
4	**Box Zoom**	Change the cursor function to zoom in on a selected area.
5	**Horizontal Zoom**	Change the cursor function to zoom in on a selected length of time.
6	**Vertical Zoom**	Change the cursor function to zoom in on a selected unit range.
7	**Set Scale**	Set the scale of the graph.
8	**Lock Vertical Scale**	Lock the vertical scale of the graph.
9	**Enable Autoscroll**	Allow the graph to automatically scroll along the time axis as Real Time data points are added.
10	**Axis Positions**	Change which side of the graph each axis is positioned.
11	**Timeslice**	Manage timeslice options.
12	**Cooling Flags**	Set annotations for multiple temperature cooling points.
13	**Value Lines**	Horizontal lines that are fixed for Minimum, Maximum & Average Line values.
14	**Line Thickness**	Changes the thickness of the value lines in the graph. • Line Color - Changes the color of the value lines in the graph. • Background Color - Changes the background color of the graph.
Data Table section		
15	**Generate**	Generate a new grid based on the current report, or a blank grid if no report is open.
Statistics section		
16	**Generate**	Generate a new statistics view based on the current report, or a blank view if no report is open.
17	**Add / Remove**	Manage custom statistic information.
Channels & Readings section		
18	**Time Markers**	Allows graphs to be displayed with cycle duration properties.
19	**Device Properties**	View the properties of the selected channel's associated device.
20	**Math Channels**	Manage channels that generate values based on specified calculations.
21	**Remove Channels**	Remove the selected channel from the current report.
22	**Add Annotation**	Add a comment to the graph. • Unit - Change the unit for the selected channel. • Channel Grouping - Change how the channels are grouped; Serial Number, Device ID and Device name.
Report Options section		
23	**Report Properties**	View details about the current report.
24	**Export to Excel**	Copy the data of the current report to Microsoft Excel®.

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6.0 DOWNLOADING DATA

When the data logger is recording data, it stores the readings in its internal memory. To view the data, it must be downloaded from the device and viewed as a graph, a data table, or statistics report in the MadgeTech software. Downloaded data will remain stored on the device until the device is reset or restarted.

NOTE: The MadgeTech Software will not download the same data more than once.

6.1 Download From A Device

To Download Data from a device:

1. In the Connected devices panel, select the intended device to download data from.
2. On the Device tab, in the Control group, click Download. Users can also right-click the device and select Download in the context menu.

6.2 Automatically Display Reports of Data that have just been Downloaded

The user can also choose to have reports automatically appear to display data that have just been downloaded. (Figure 19)

To configure the appearance of reports:

1. Click the File tab, then click Options.
2. From the Options screen, click Display.
3. In the Viewing Data section, select the check box next to each report type the user wants to automatically open when data is downloaded from a device.

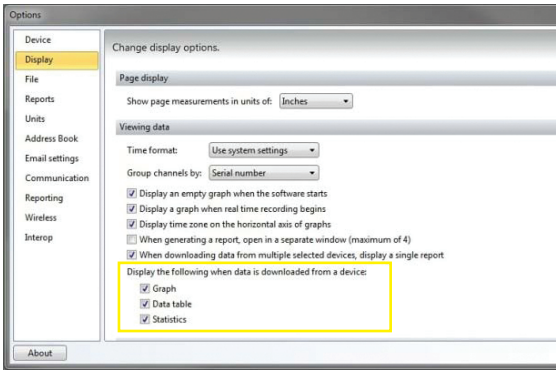

Figure 19. Menu To Configure The Appearance Of Reports

6.3 Download While Recording

Certain devices have the ability to download data in the software while recording. The reading interval must be two seconds or slower, and the memory wraparound must be disabled.

To download data while the device is still recording:

1. In the Connected devices panel, select the intended device to download data from. Confirm the intended device has been selected by making sure the device is highlighted.
2. On the Device tab, in the Control group, click Download. To the right is an example of the following dialog box that will appear, asking to stop the device from recording.
3. Click Yes to stop the data logger and download the data. Click No to download the data and have the data logger continue to record. Click Cancel to neither stop the device nor download any data. ***McCrometer recommends selecting "No" when asked to stop the data logger.*** (Figure 20)

IMPORTANT
If the data logger is stopped while downloading data it must be restarted again using the device tab.

IMPORTANT
if the data logger is stopped while downloading data all stored/logged data on the data logger will be deleted once the data logger is restarted.

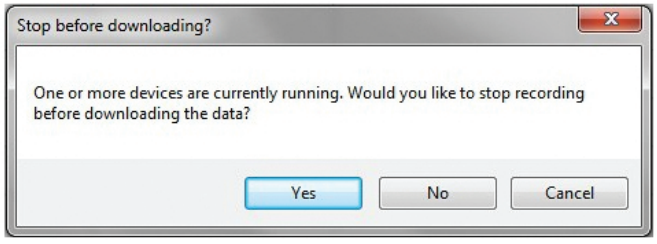

Figure 20. Stop Before Downloading Dialogue Box

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6.4 Export Data to Excel Format

For the purpose of this instruction, use the sample data in the Example Datasets folder.

1. Select the Report tab.
2. In the File Database panel, select the Example Datasets folder. A list of sample datasets will be listed in the Connected Devices and Files panel.
3. Select the dataset you want to export and double click on it. A graph of the data will appear in the Graph Display Panel.
4. Select Report Options and then select Export to Excel.
5. When the dialog box asking if you want the exported spreadsheet to include a graph, select your preference. The first tab of the spreadsheet will resemble the graph displayed in the Graph Display Panel.

The data will be exported to a spreadsheet and your spreadsheet program will open. If you are satisfied with the exported data, save the file with a new file name.

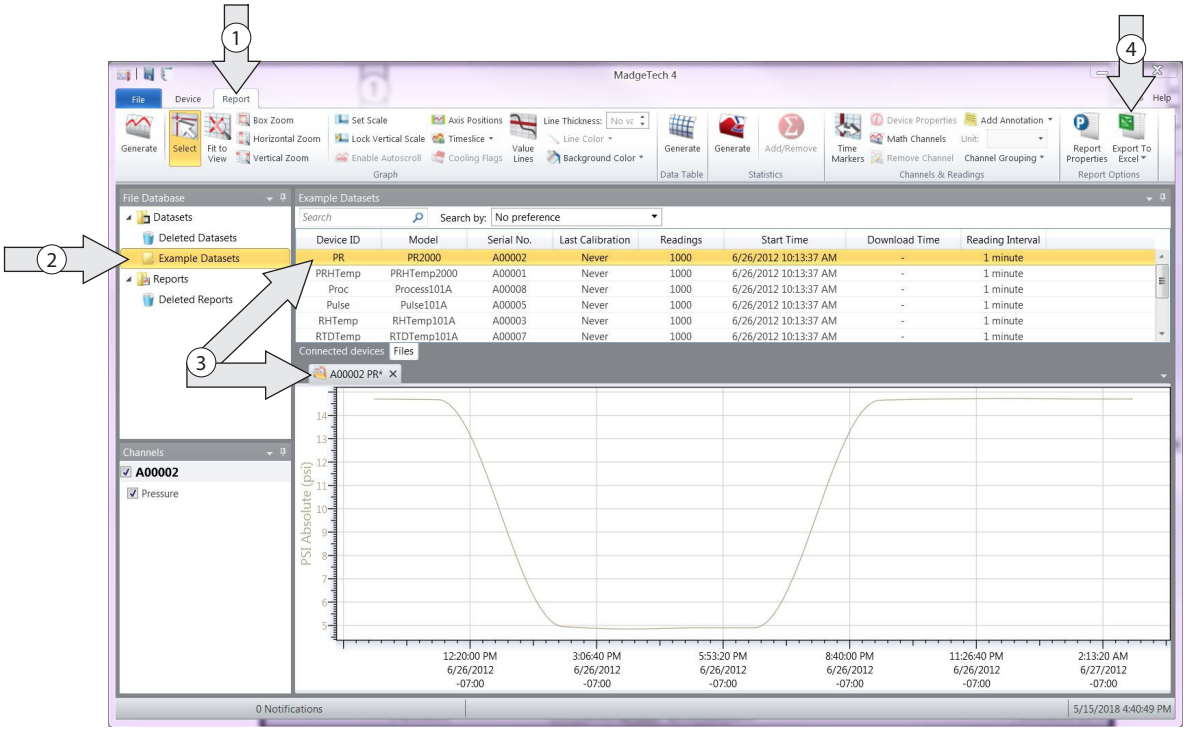

Figure 21. Exporting data to Excel

7.0 INTERFACE CABLES

Check that the software recognizes the interface cable. If a device is not appearing in the Connected Devices panel, it may be that the interface cable is not properly connected.

7.1 Check That The Software Recognizes The Interface Cable

To check that the software recognizes the interface cable:

1. In the software, click the File button, and then click Options.
2. In the Options window, click the Communications tab. (Figure 22)
3. The Detected Interfaces box will list all of the available communication interfaces. If an interface cable is listed, the software has correctly recognized it and is ready to be used.

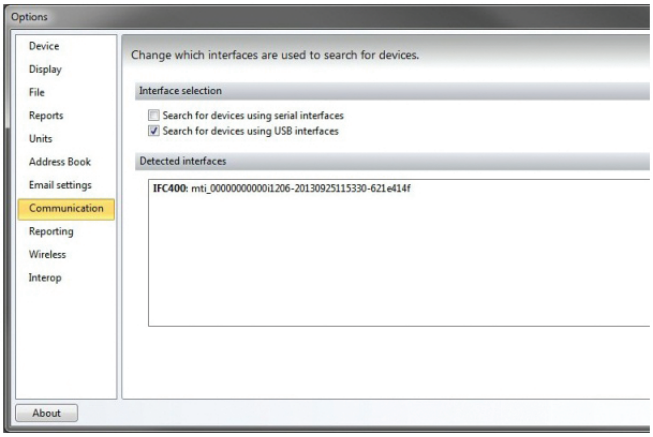

Figure 22. Communication Window

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7.2 Check that Windows Recognizes the Interface Cable

If the software does not recognize the interface cable, there may be a problem with Windows or the USB drivers.

To check that Windows recognizes the interface cable:

1. On the Windows desktop, click Start, right-click Computer and choose Properties.
2. Click Device Manager.
3. In the File > Options window of the MadgeTech software, click Communications. Depending on the type of interface cable in use, choose one of the following steps accordingly:
    - Interface cables that use MadgeTech drivers: (old IFC200, IFC300, IFC400, RFC1000
        1. Click Universal Serial Bus Controllers.
        2. Look for an entry for Data Logger Interface.
    - If the entry is present, and there are no warning messages or icons, then windows has correctly recognized the interface cable.
    - If the entry is not present, or has an exclamation point icon next to it, USB drivers may need to be installed.
    - Interface cables that use Windows drivers: (new IFC200/202
        1. In the Windows Device Manager, click Human Interface Devices.
        2. Look for one or more entries listed as HID-compliant device. If there are no entries, Windows has not recognized the interface cable.
        3. Right click the entry and choose Properties.
        4. In the Properties window click the Details tab.
        5. From the Property combination box, choose the Hardware ID's item.
        6. Verify that the Hardware ID string HID/VID_10C4&PID_8748 is present.

- If the entry is present, and there are no warning messages or icons, then windows has correctly recognized the interface cable.
- If the entry is not present, or has an exclamation point icon next to it, USB drivers may need to be installed.

7.3 Ensure that the USB end of the Interface Cable is Securely Connected to the Computer

To ensure that the USB end of the interface cable is securely connected to the computer:

1. Identify the type of interface cable being used.
2. Locate the USB-A plug of the interface cable.
3. If the interface cable is connected to the PC, unplug it.
4. Wait ten seconds, and then reinsert it.
5. Check to make sure that the blue LED is lit, indicating a successful connection.

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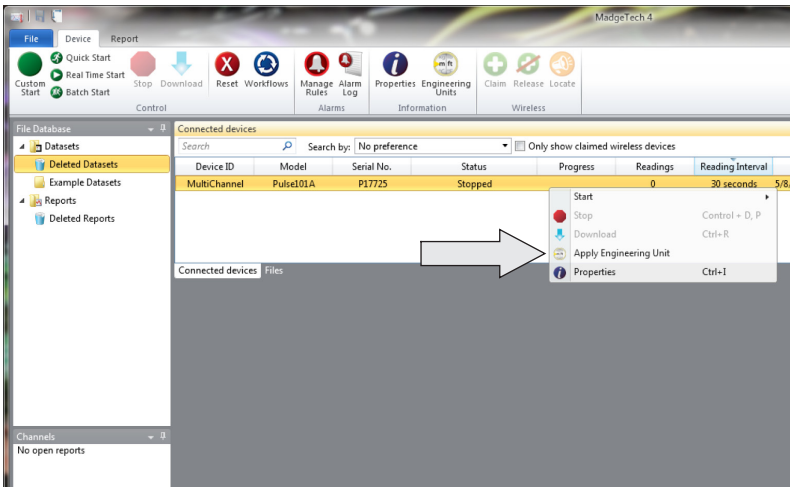
8.0 SETTING UP THE ENGINEERING UNIT

8.1 Selecting an Existing Unit of Measure

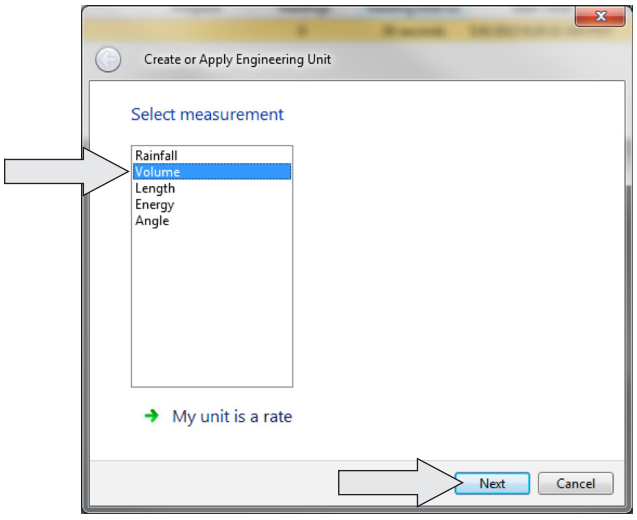
The Engineering Unit refers to the unit of measure you will record your water flow in. If you want to record your measurement in units other than the default, follow these steps to either select an existing unit of measure or to create a custom unit.

1. Right click on the device and select Apply Engineering Unit.

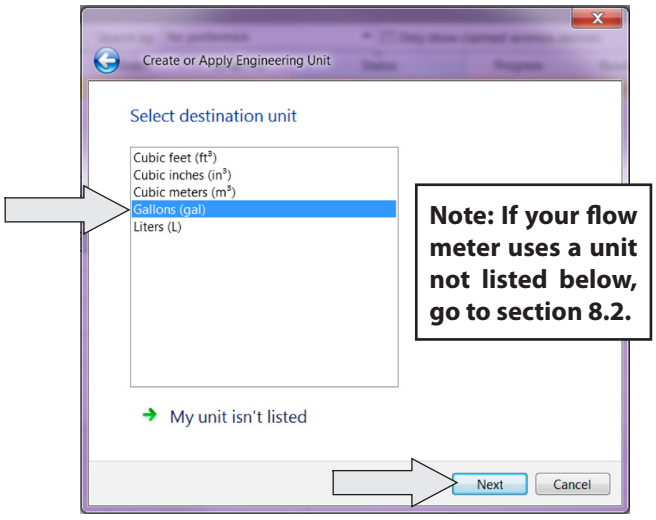
NOTE: The engineering unit is the unit of measure the flow meter will measure water flow. To select and apply the engineering unit, you will need to know particular ratio of pulses per gallon for your flow meter. If you do not have that information contact McCrometer technical support.



2. Window will open that will allow you to create your own unit. Select Volume and then next.



3. Select **Gallons (gal)** as the destination unit.



Note: If your flow meter uses a unit not listed below, go to section 8.2.

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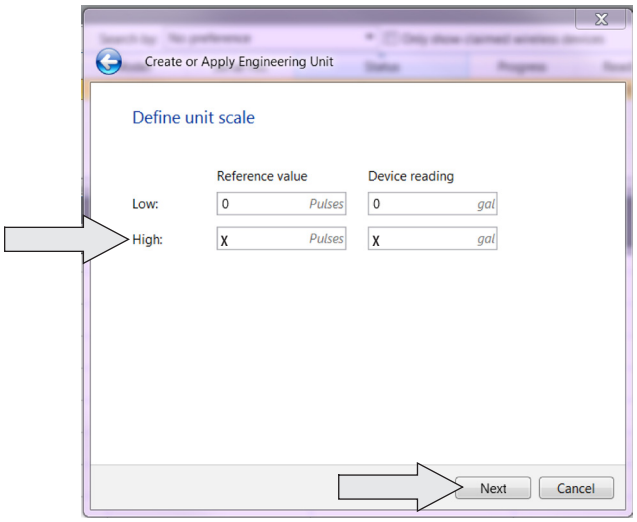
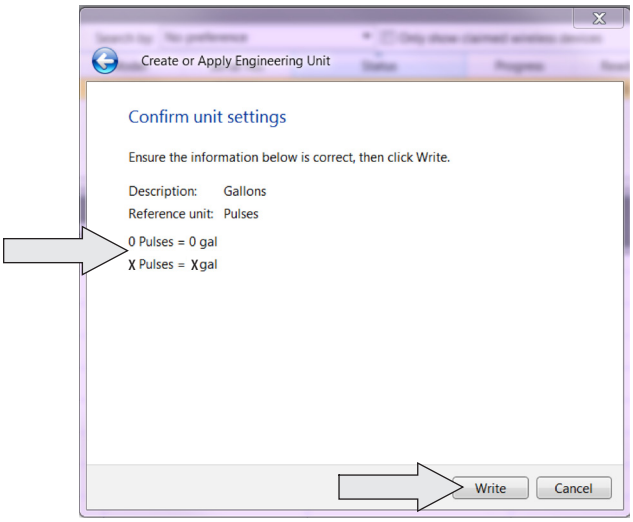
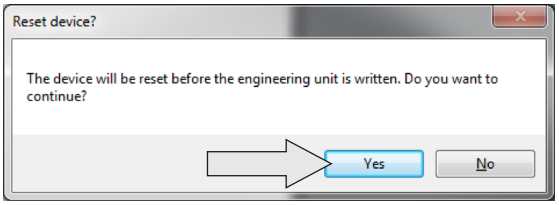
4. Enter the high reference value and the high device reading that will define the unit scale



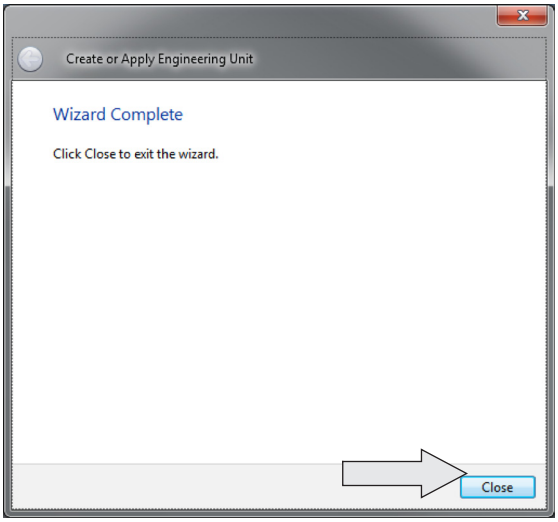
5. Verify the information and click **Write**.



6. When the **Reset Device** window pops up, click **Yes**.



7. Once complete, click **Close**.



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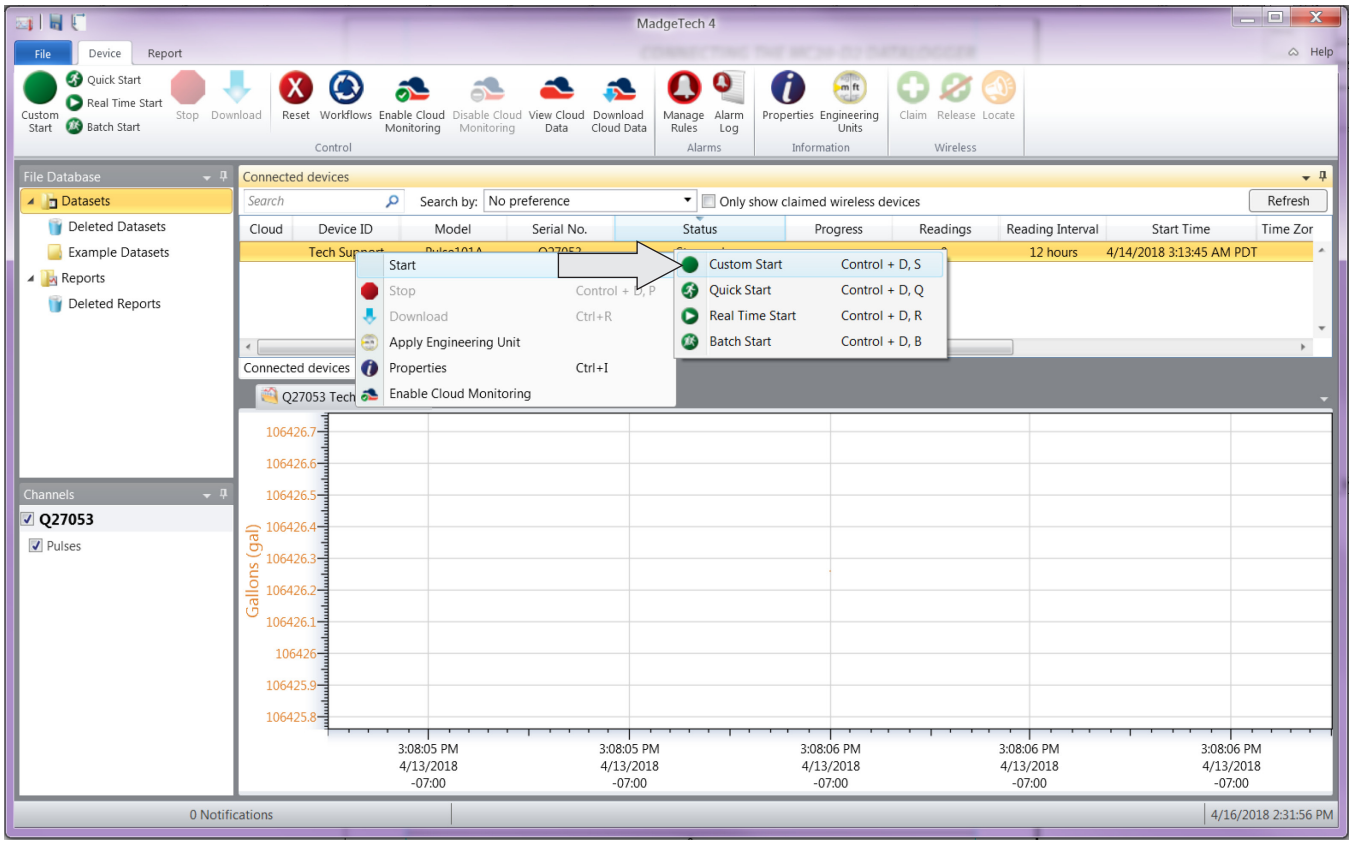
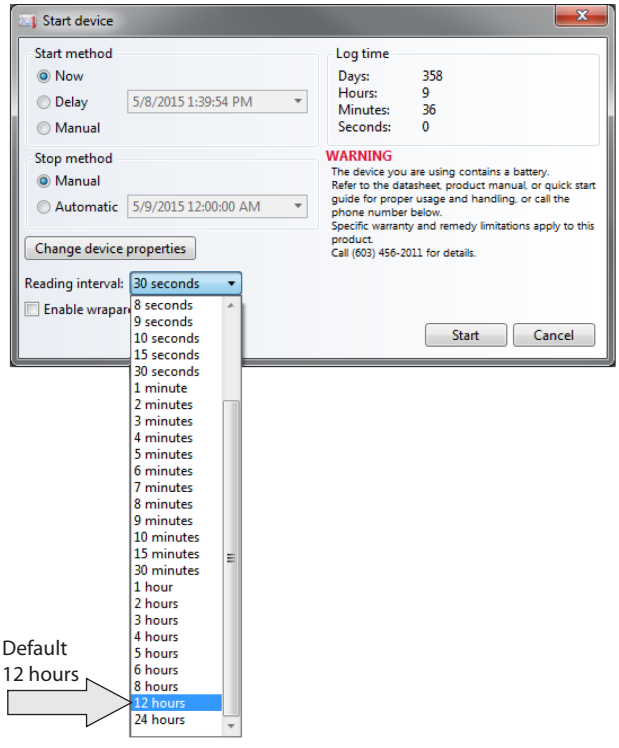
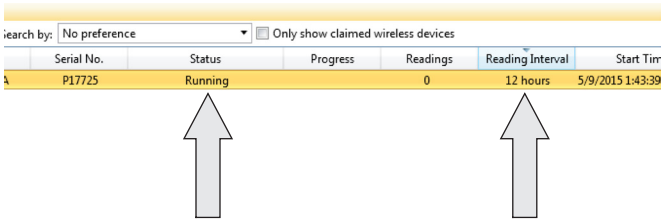
8. Start device section.



9. Change the reading interval to the desired interval and select start.



10. Confirm devices status says running and the reading interval is at 12 hours.



Programming is now complete.

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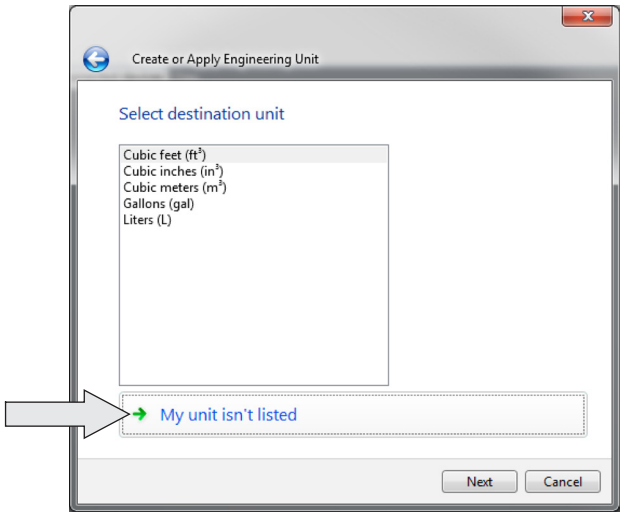
8.2 Creating and Selecting a New Unit of Measure

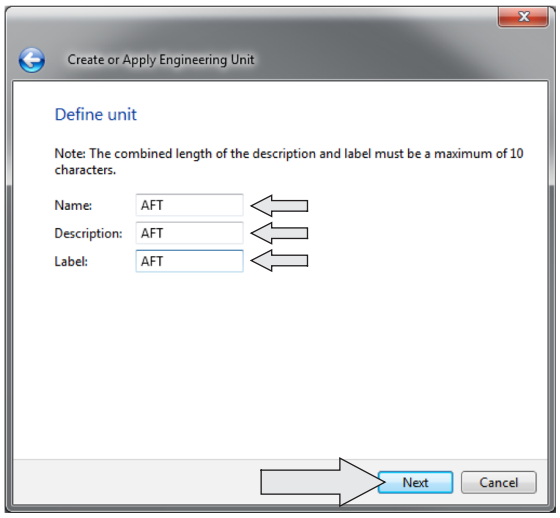
NOTE: The engineering unit is the unit of measure the flow meter will measure water flow. To select and apply the engineering unit, you will need to know particular ratio of pulses per gallon for your flow meter. If you do not have that information contact McCrometer technical support.

The example below shows entering a unit of acre feet, which is abbreviated as AFT. The values for your particular flow meter will vary.

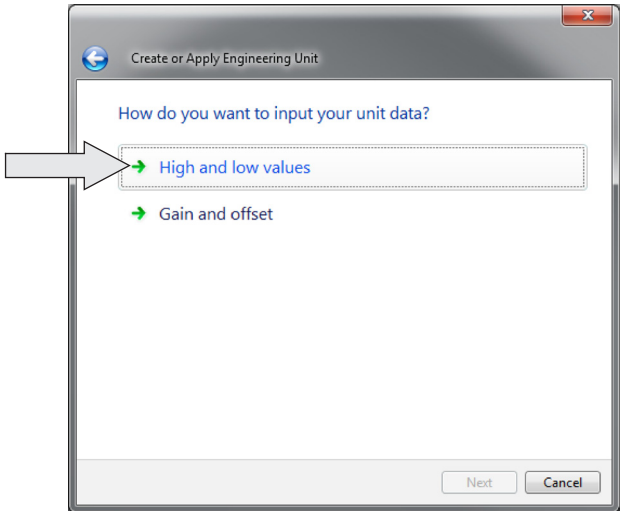
1. Beginning from the **Create or Apply Engineering Unit** screen, select the **My unit isn't listed** option.



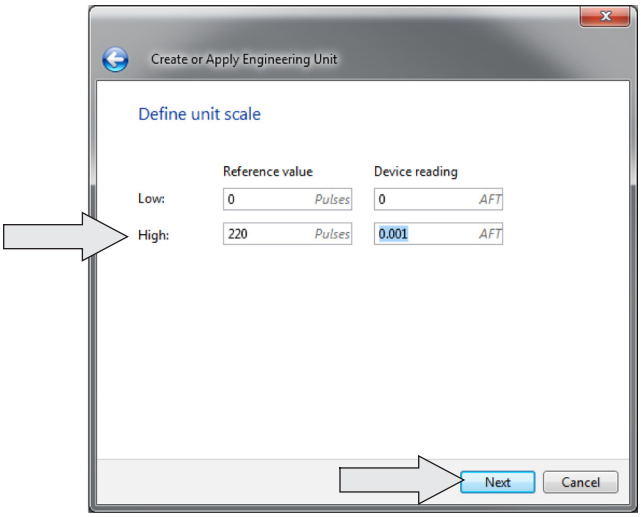
2. Fill in the **Name**, **Description** and **Label** (units must be in capitals) and hit **Next**.



3. Select the **High and low values** option.



4. Fill in the low reference value, low device reading, high reference value, and the high device reading. Then click **Next**.



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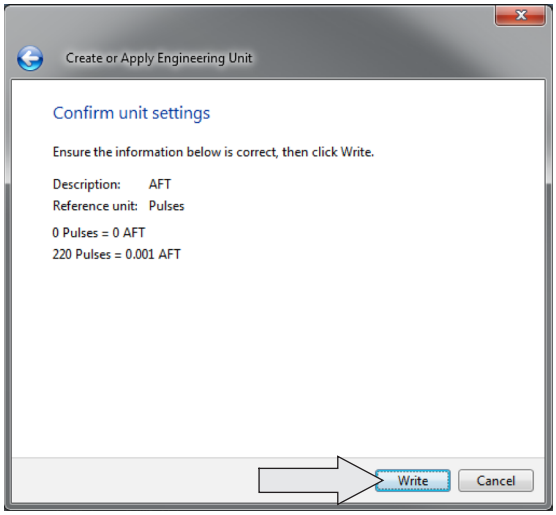
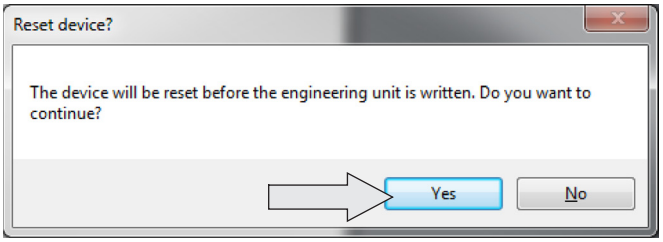
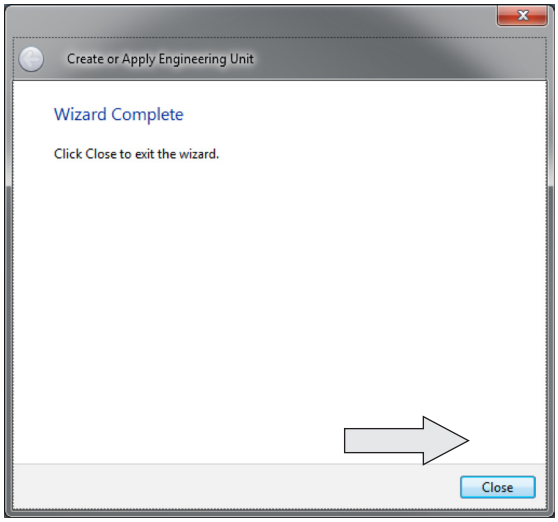
5. Verify the information and click **Write**.



6. When the **Reset Device** window pops up, click **Yes**.



7. Once complete, click **Close**.



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9.0 TROUBLESHOOTING

This section of the manual contains information that will help users answer questions to correct common connection missteps or other errors while using the software or devices.

WHY ARE MY DEVICES NOT APPEARING?

Sometimes a device connected to the computer does not appear in the Connected devices panel. This is often due to a minor connectivity issue. If a data logger does not show up in the Connected devices panel, or an error message is received while using a data logger, try the following:

1. Check that the interface cable is properly connected to the PC and the data logger. See section 7.0 for further details.
2. Ensure that the battery in the data logger is not discharged. For best voltage accuracy, use a voltage meter or multi-meter connected to the battery of the device. Alternatively, try swapping out the battery of a device that is connecting successfully, if one is available.
3. Ensure that no other data logging software is running.
4. Ensure that the Connected devices panel is large enough to display devices. This can be verified by positioning the cursor on the edge of the Connected devices panel until the re-size cursor appears, then dragging the edge of the panel to re-size as necessary.

For more information:

- See the built-in Help menu.
- Watch the video tutorials at www.madgetech.com/software-download

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