

Notes on installing and using the USB-5201 and USB-5203 data logging devices



Thank you for purchasing the USB-5201 or USB-5203 device from Measurement Computing! Please read this sheet to help you set up your new USB-based data acquisition and data logging device.

Use *InstaCal* to configure and test your device before you acquire and log data. After logging data, download and convert the data from the memory card with TracerDAQ™. You can optionally use *InstaCal* to copy or convert data directly from the data logging device (this method is not recommended for users running non-XP systems, as data transfer may be slow on other systems).

Configuring channel sensors

1. From the *InstaCal* main form, double-click on the name of the device to open the **Board Configuration** dialog.
2. Configure the sensor options for your data logger channels.
 - **USB-5203:** Select a sensor category using the **CH(n-n)** tabs for each pair of analog input channels — choices are RTD, thermistor, thermocouple, and semiconductor — and configure the settings that are enabled for the selected sensor.
 - **USB-5201:** Click on the **TC Type** tab and select a thermocouple type for each analog input channel.

Configuring data logging options

1. Click on the **Data Logger > Logger Data** tab and select your data logging preferences.
 - Select the time format, time zone, and temperature units to apply to converted files.
 - Click on the **Format Storage** button and format your flash storage (required for initial use).
2. Click on the **Data Logger > Logger Setup** tab and select your data logging options:
 - Set up each analog channel to log either temperature measurements (°C) or raw resistance/voltage measurements.
 - Select CJC data and/or time stamp data options if you want to log this data in addition to the channel measurements.
 - Select the mode to start logging data.
 - Enter the interval (seconds) between samples and the file number of the first file logged.
3. Click on the **Data Logger > Alarm Setup** tab if you want to set up the alarm options. Each digital I/O bit is independently configurable as an alarm output. The input to each alarm is one of the temperature input channels.

Set the following:

- Select the channel number to use as the input to the alarm.
 - Set the output type (active high or low) of the alarm bit when an alarm is triggered.
 - Select the threshold condition that triggers the alarm.
 - Specify the format of the logged alarm data (temperature or raw). This setting is independent of the format selected on the **Logger Setup** tab.
4. If you want to save the configuration settings to your hard drive, click on the **Saved Configurations** tab and enter a name to save the settings in the **Configuration Name** text box.
 5. Click on the **OK** button at the bottom of the **Board Configuration** window. A dialog appears which asks if you want to write the new configuration settings to the board.
 - Click **Yes** to write the settings to the USB device. All logging options are stored on the USB device in non-volatile memory in EEPROM, and are loaded when you connect external power to the device.

After configuring the sensor and logging options, the device will perform a self-calibration.

Testing the data logging device

Before logging data, verify the sensor options by running *InstaCal*'s Temperature Test. To run this test, select **Analog** from the **Test** menu on the *InstaCal* main form.

Logging data

External power is required to log data. Disconnect the USB cable from the device, and connect the supplied external power supply. The logging options that are stored on the device are loaded. You are now ready to log data!

Ending a data logging session

To end a data logging session, press and hold the data logging button until the LED turns off. To prevent data loss, do not remove the memory card from the logging device while the device is logging data.

Downloading and converting data using TracerDAQ™

Reading data from a card reader

You can use TracerDAQ to download a binary file, convert it to a .CSV file, and plot the data directly from a card reader. Do the following:

1. Remove the memory card from the data logging device and insert it into a card reader connected to your computer. Make sure that you stop the current logging session before removing the memory card. To end a data logging session, press and hold the data logging button until the LED turns off.
2. Run the TracerDAQ Strip Chart application.
3. Pull down the **File** menu, and select **Data Logger > Download Data**. A Download Data dialog opens.
4. Select the binary file to download from the card reader, the destination path to store the file after it is converted, and the preferences to apply to the converted file (time format, time zone, and temperature unit).
5. If you want to plot the data on the strip chart click on the **Plot Data** button and select the channels to plot.
 - The channels that you can plot on the strip chart are listed in the **Available Channels** area.
 - Click in the check box of each channel you want to plot and then click on the **Plot** button

If you don't want to plot the data, click **Done** to close the dialog. You can plot the data at any time using TracerDAQ's **File >Data Logger>Plot Data** option.

Note: The converted file must contain at least two samples of data to be plotted on TracerDAQ's strip chart.

Downloading and converting data using InstaCal

You can use *InstaCal* to copy and convert log files directly from the data logging device.

Note: The following method of reading data from the device can be extremely slow if you are not running Windows XP. For best performance, we recommend that you use a CF card reader to read data from the memory card.

To copy/convert data from the device using *InstaCal*:

1. After logging data, re-connect the data logging device to a USB port or hub on your computer.
2. Run *InstaCal* and double-click on the name of the data logging device from the *InstaCal* main form. The **Board Configuration** dialog opens.

3. Click on the **Data Logger** tab.

The **Logger Data** tab displays by default. Use this tab to select which binary file to copy or convert, and to set the preferences to apply to converted data.

4. To *copy* a file, click on the name of a binary file and click the **Copy** button.

A **Browse for Folder** dialog opens for you to select the destination where you want to store the copied file.

5. To *convert* a file, select the options that you want to apply to the converted file (time format, time zone, and temperature unit) and click on the **Convert** button.

A **Convert Log File** dialog opens for you to select the following options:

- The destination name and path where you want to store the converted file.
- The type of file to convert to (*.CSV or *.TXT). When converting to a text file you can also select the delimiter character used to separate fields in the converted file. When converting to an Excel *.CSV file the delimiter character defaults to comma.
- The range of the file to convert — you can convert the entire file, or specify a range of data to convert using the date and time list boxes.

6. Click on the **OK** button to convert the file.

7. Click on the **OK** button to close the **Board Configuration** dialog and return to *InstaCal*'s main form.

A dialog opens for you to save your settings to the configuration file.

You can plot .csv data on TracerDAQ's strip chart:

1. Launch TracerDAQ from *InstaCal*'s **Applications** menu. The Strip Chart's **Data Source Setup** dialog appears. Click on the **OK** button to close this dialog. The **TracerDAQ – [Strip Chart]** window then opens.
2. Pull down the **File** menu and select **Data Logger > Plot Data**. The **Plot Data** dialog opens.
3. Click on the **Browse** button. An **Open** dialog appears.
4. Click on the .csv that file you want to plot and then click on the **Open** button.

The data channels that you can plot on the strip chart are listed in the **Available Channels** area.

5. Click in the check box of each channel you want to plot and then click on the **Plot** button. The data is plotted on the strip chart.

Note: The converted file must contain at least two samples of data to be plotted on TracerDAQ's strip chart.

For additional information about the data logging device, refer to the device's hardware manual. You can download this manual when you install the software from the *Measurement Computing Data Acquisition Software* CD.