Bird Power Viewer for Windows®

Operation Manual

Instruction Manual Part Number 920-BPV Rev. B

Safety Symbols

The following symbols are used in this manual to highlight important information.

NOTE

Notes call attention to supplemental information.

About This Manual

This manual covers the operating and maintenance instructions for the following software:

Bird Power Viewer Software

Changes to this Manual

We have made every effort to ensure this manual is accurate at the time of publication. If you should discover any errors or if you have suggestions for improving this manual, please send your comments to our factory. This manual may be periodically updated, when inquiring about updates to this manual refer to the part number and revision level on the title page.

Table of Contents

Chapter 1 Introduction

The Bird Power Viewer is a Windows® application that provides a user interface for configuring, acquiring, and viewing measurements from Bird Pulse Power Sensors.

The application is compatible with Windows 10 and 11 systems with NI VISA 19.0 or later installed.

Figure 1 Bird Power Viewer

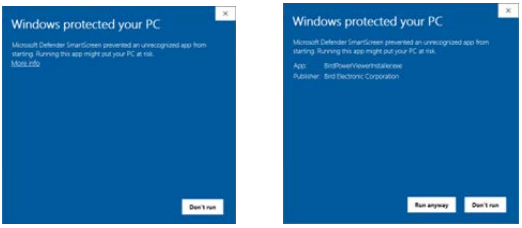
Software Installation

The Bird Power Viewer for Windows® is available for download from the Bird website, www.birdrf.com.

To install the Bird Power Viewer run **BirdPowerViewerInstaller.exe** and follow the prompts to complete the installation.

- Only one version of the Bird Power Viewer may be installed at a time. If a prior version is installed, a message will direct you to uninstall the prior version.
- The Bird Power Viewer is compatible with National Instruments VISA version 19.0 or later. The installer checks for a compatible version of National Instruments at startup and displays a message if it cannot find one.
- The installer is digitally signed, but you may still see a Windows Defender SmartScreen warning (Figure 2), since this is a new App and the SmartScreen algorithm has not encountered it enough times to accumulate data on it. If the warning shown in Figure 2 is displayed, click the "**More Info**" link, and then the "**Run Anyway**" button.

Figure 2 Windows Defender



Pulse Power Sensor

The Pulse Power Sensors are designed to bring superb accuracy and ease of use together for use in the laboratory and semiconductor fabrication environments. At the calibrated frequencies, 7027 sensors are capable of 1% accuracy (0.5% accuracy for 7037 sensors) of the gated power within a pulsed waveform.

Figure 3 Pulse Power Sensor

The Pulse Power Sensor measures the average power of up to four states within a pulse period.

USB Connection — Pulse sensor's are equipped for a USB interface connection, see "USB Connection" on page 4.

Network Connection — Pulse Sensors may be equipped with Ethernet Bridges. The Ethernet Bridges allow access to the Pulse Sensor over a network connection, see "Network Connection" on page 4.

Measuring RF Power

Refer to the sensor's user manual for information on RF connections.

To measure generator RF power, connect the windows PC with Bird Power Viewer software Installed to the Pulse Power Sensor, see "Sensor Data Connections" on page 3.

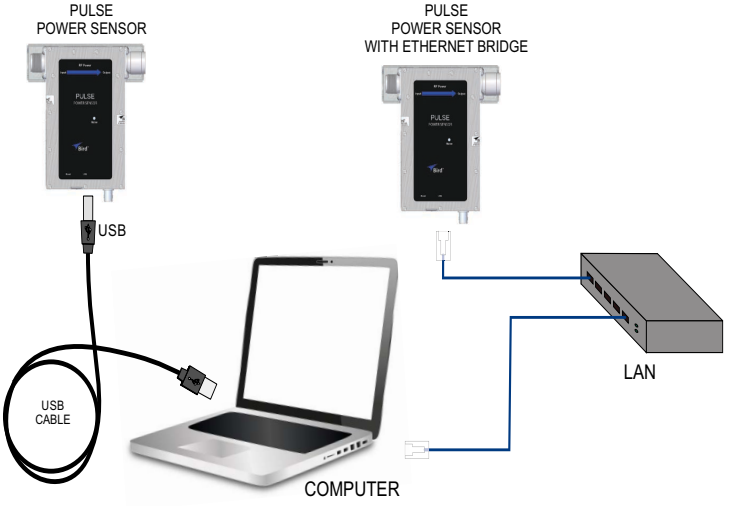
For details on how to use the Bird Power Viewer Software, see "User Interface" on page 11.

Chapter 2 Sensor Data Connections

The Bird Power Viewer is capable of connecting to a power sensor in two ways as shown in Figure 4.

- USB Connection, see "USB Connection" on page 4.
- Network Connection, see "Network Connection" on page 4.

Figure 4 Sensor Connection Examples

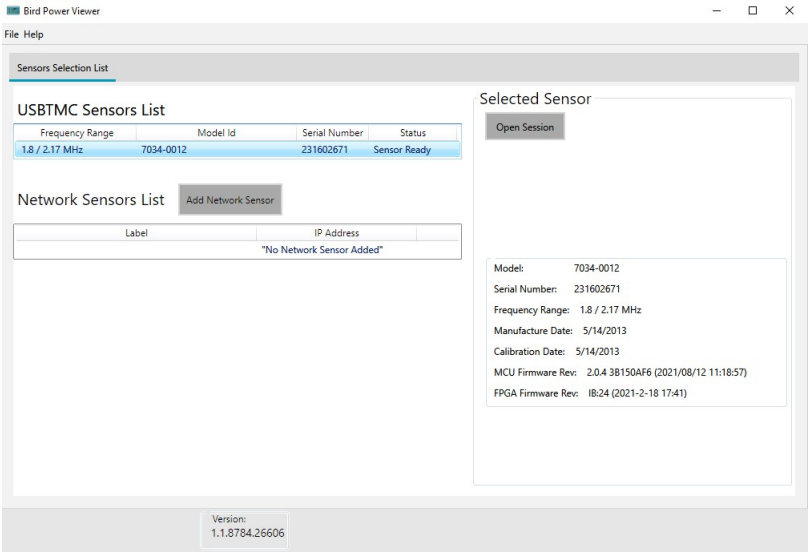


For a description of Bird Power Viewer displays and menus, see "User Interface" on page 11.

USB Connection

1. Connect one end of USB cable to Bird Pulse Power Sensor. See Figure 4 on page 3.
2. Connect the other end of the USB cable to the computer.
3. The power sensor model number and serial number will be displayed on the Bird Power Viewer Software Sensors Selection Screen.

Figure 5 Sensors Selection Screen



4. Double click the Power Sensor model number or click the Open Session button to open a measurement session with the Power Sensor.
   - A single click will display the selected sensor's information on the right side in the action panel.

Network Connection

NOTE

The Bird Power Viewer software is capable of connecting to an Ethernet enabled Pulse Sensor when the sensor is connected to the same network as the computer running the software.

Add Sensor

1. Connect the computer to the network supporting the Bird Ethernet enabled power sensor.
2. Click **Add Network Sensor** button.

3. Enter the IP address of the power sensor.
4. Enter a name in the label text box, if desired.
5. Click **Save** button.
6. Click the **Check** button.
   The Bird Power Viewer will verify the power sensor is available on the network.

Open Network Sensor Session

Open a session on a network sensor.

1. Click on sensor in the Network Sensor List on the Sensor Selection Screen.
2. Click **Open Session** button.

Remove a Network Sensor

Remove a sensor from the Network Sensor List on the Sensor Selection Screen.

1. Click on the sensor in the Network Sensor List.
2. Click the **Remove** button.

Chapter 3 Sensor Operation

This chapter offers general guidelines for working with the configuration settings of pulse sensors to get useful measurement results.

Questionable Measurement Indicators

Bird pulse sensors are designed to make precision measurements on pulsed RF signals within the designed bandwidth and power limits of the model sensor in use. If the signal passing through the sensor is outside these limits, the sensor may not be able to make a specific measurement or the measurement accuracy may be degraded. Under these conditions, the Bird Power Viewer will display one of two questionable measurement icons next to the measurement to indicate this condition.

This icon indicates that the sensor is unable to make the specific measurement. For example, if the Pulse Gates are set so that the gate width is <=0, the sensor cannot measure the Pulse Gate power. If you see this icon with a measurement value, it indicates that the value is stale (made in past).

This icon indicates that the measurement accuracy is degraded. This may occur if sensor is unable to measure the frequency (perhaps due to a noisy or very small signal) or if the measured frequency is outside the calibrated range of the sensor.

Bird Power Viewer Recommended Workflows

Bird recommends one of the following workflow outlines for using the BPV effectively with the pulse sensors to make useful measurements on your signals.

First Time Use for a specific Signal Scenario

NOTE

The first two steps ensure that you are starting from a known baseline in both the sensor and the Bird Power Viewer application.

1. Restart the Bird Power Viewer software.
2. Physically disconnect and reconnect your sensors.

   From the Sensor Selection view:
   Wait for the sensor status shown on the Sensor Selection View to show "Sensor Ready." The status LED on the sensor should be Green.
3. Open a session by double clicking the desired sensor.

4. Select the **Sensor Configuration** tab:
   a. Set configuration settings as desired.
      - See "Sensor Configuration Tab" on page 14.
      - See "General Guidelines" on page 9.
        - "Variable Frequency Signals" on page 9.
        - "Multi-State Pulsed Signals (More Than Two (2) States)" on page 9.

   b. Use the **File** > **Save Configuration As** command to save the configuration to a file for later reference.
5. Select the **Logging Configuration** tab (skip this if you do not intend to log measurements):
   a. Set your logging interval as needed. See "Logging Configuration Tab" on page 23.
   b. Click **Save** to make the settings persist when you close and restart the Bird Power Viewer application.
6. Select the **Measurements** tab:
   a. Click the **Measurement Selection** button and select the measurements to be displayed. See "Measurements Tab" on page 27.

   NOTE

   If you are making measurements on a pulsed signal with more than 2 states (a multi-state pulse) do not select the pulse measurements. They will not be accurate for multi-state pulses)

   b. Enable or disable logging, as desired.
   c. Click **Start Measurement** to start the measurement stream.
7. Select the **Power Waveform** tab to view and interact with waveform time domain plots. See "Power Waveform Tab" on page 24.
8. Select the **Measurements** tab to view selected digital measurements.
9. Click **Stop Measurement** to end the measurement stream:
   - When you want to change something in the Sensor Configuration.
   - When you want to end your measurement session.

Using a Previously Saved Configuration:

1. With the Bird Power Viewer software running and a session open on the desired sensor:
2. Select the **Configuration** tab:
   a. Use the **File** > **Open Configuration** command to load a previously saved Configuration file.
   b. Change various configuration settings if desired
      - See "Sensor Configuration Tab" on page 14.
      - See "General Guidelines" on page 9.
        - "Variable Frequency Signals" on page 9.
        - "Multi-State Pulsed Signals (More Than Two (2) States)" on page 9.
3. Select the **Logging Configuration** tab (skip this is you do not intend to log measurements):
   a. Set your logging interval as needed.
   b. Click **Save** to make the settings persist when you close and restart the Bird Power Viewer application.
4. Select the **Measurements** tab:
   a. Click the **Measurement Selection** button and select the measurements to be displayed. See "Measurements Tab" on page 27.

   NOTE

   If you are making measurements on a pulsed signal with more than 2 states (a multi-state pulse) do not select the pulse measurements. They will not be accurate for multi-state pulses)

   b. Enable or disable logging, as desired.
   c. Click **Start Measurement** to start the measurement stream.
5. Select the **Power Waveform** tab to view and interact with Waveform time domain plots. See "Power Waveform Tab" on page 24.
6. Select the **Measurements** tab to view selected digital measurements.
7. Click **Stop Measurement** to end the measurement stream:
   - When you want to change something in the Sensor Configuration.
   - When you want to end your measurement session.

General Guidelines

Variable Frequency Signals

Bird pulse sensors cannot reliably measure frequency when the frequency is shifting, so using a fixed frequency in the center of the expected range will yield the best results from the sensor.

If making measurements on a signal that varies in frequency over time (for example from a frequency agile generator).

- Turn Auto Frequency off. See "Frequency Parameters" on page 16.
- Set the frequency to the center frequency of your signal's range.

NOTE

If the actual frequency differs from the one you set, the accuracy of the power measurement is reduced.

Power Waveform Measurements

Multi-State Pulsed Signals (More Than Two (2) States)

- Do not use auto period. See "Period Parameters" on page 17. The auto period algorithm was designed for 2 state pulses and will yield unpredictable results for pulses with more than 2 states.
  - Use the manual period parameter to set the period to the expected value.
- Do not use the standard pulse measurements in the sensor (period, repetition rate, width, and duty cycle). These are designed for simple 2 state pulses and will yield unpredictable results for pulses with more than 2 states.
  - Turn off these measurements using the Measurement Selection button on the Measurements view.
- When configuring the triggered gates for measuring power in specific states of a pulse, follow these guidelines for the begin and end delay parameters for the states:
  - The end time of each state should be greater than the begin time.
  - The total span of all the states (begin time of the first state to the end time of the last state) should be less than the period.
  - Finally note that all gate times are calculated from the gate reference point on the power waveform.
    - The gate reference point is offset from the trigger point by the trigger delay.
    - The trigger point will always be at T=0 on the waveform plot.
    - Note that T=0 may not be at the left edge of the plot. This point will move right or left based on the sweep delay time.

- Negative sweep delays will move T=0 to the right. Positive sweep delay times will move T=0 to the left.

Chapter 4 User Interface

This chapter contains descriptions on the user interface menus and displays. The Bird Power Viewer application consists of two Screens:

- The Sensor Selection View, see "Bird Power Viewer Sensor Selection Screen" on page 12.
- The Sensor Display, see "Sensor Session Displays and Menus" on page 14.

Menu Bar

The menu bar is shown on all Power Viewer screens. The menu bar contains the File menu and the Help menu.

File Menu — The file menu provides access to the session list.

New Configuration — This option sets the configuration to the default sensor configuration.

Open Configuration — This option provides the ability to load a saved configuration. When clicked, a window opens displaying all saved configurations.

Save Configuration — This option will save the current configuration. If the configuration has not been saved previously, a save configuration window will open, a file name must be entered to save the configuration. If the configuration has been previously saved, the saved configuration file will be updated with any changes to the existing configuration file.

Save Configuration As — This option can be used to save the current configuration under a different file name. This allows the user to open an existing configuration, makes changes, and save the new configuration under a different name.

Help — About Bird Power Viewer, displays version and copyright information.

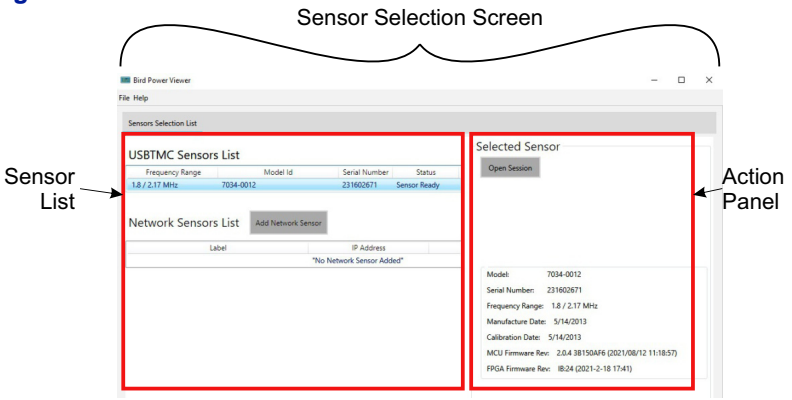
Bird Power Viewer Sensor Selection Screen

The parts of the Sensor Selection Screen are shown in Figure 6.

The left side of the screen displays a panel with two sensor lists. One for USBTMC sensors, and one for Network Sensors.

The right side of the screen is used to display an action panel. The action panel presents controls used to display sensor information or manage the sensors in the two sensor lists.

Figure 6 Sensor Selection Screen



Sensor List

The Sensor List is displayed when no measurement session is active.

- Select a sensor in one of the Sensor Lists to show sensor information in the Action Panel for that sensor.
- Double Click any sensor in one of the Sensor Lists to directly open a session on that sensor.

NOTE

If the sensor is Not Ready or cannot be reached on the network, an attempt to open a session will fail.

NOTE

Only one sensor can be opened in a measurement session at one time. To view a measurement session for more than one sensor, an additional instance of the Bird Power Viewer must be opened for each sensor.

USB List

The USBTMC list shows the frequency, model, serial number, and ready state for all USBTMC pulse sensors physically connected via USB to the same PC running the Bird Power Viewer.

Pulse Sensors enumerate on the USB interface very quickly, but take up to 30 seconds or more to initialize and be ready for measurements. The Bird Power Viewer application will not open a session on a sensor that is not ready.

Network list

The Network list shows labels and IP addresses for user configured Ethernet pulse sensors and an Add Network Sensor button to add new sensors to the list.

- Click Add Network Sensor on the Network Sensor list to show the Add Sensor view in the action panel.
- The Add Network Sensor view shows fields to specify a Label and IP address or Host name, a Check button to verify that a sensor is present at the specified IP address or Host name, and Save and Cancel buttons to finish or abandon adding the sensor.

Action Panel

Select a sensor in one of the Sensor Lists to show sensor information in the Action panel for that sensor.

NOTE

If the sensor is not ready or cannot be reached on the network, an attempt to open a measurement session will fail.

NOTE

Only one sensor can be opened in a measurement session at one time. To view a measurement session for more than one sensor, an additional instance of the Bird Power Viewer application must be opened for each sensor.

USB Sensor Action Panel

For USBTMC sensors the Action View shows:

- Additional information about the sensor.
- Open Session button: starts measurement session for selected sensor.

Network Sensor Action Panel

For Network Sensors, the action view shows:

- The Label and IP address. Click into these fields to edit them.
- Open Session button: starts measurement session for selected sensor.
- Check button: verifies the sensor is present at the specified IP address or host name and displays additional information about the sensor.
- Remove button: removes the sensor from the Network list.

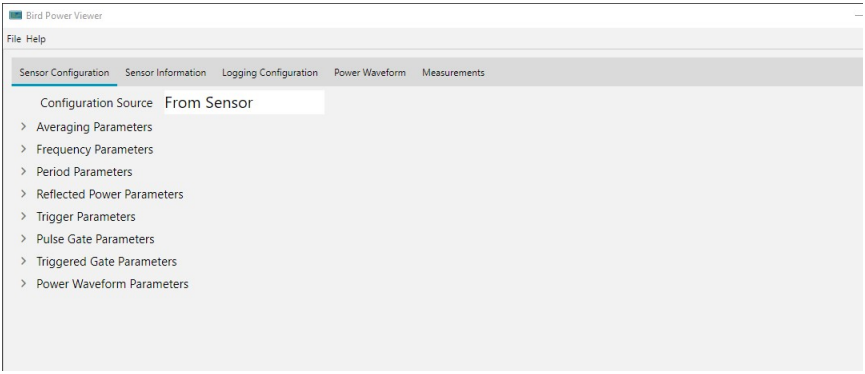
Sensor Session Displays and Menus

The Sensor session screen displays sensor options and measurements on the following tabs. When selected, the contents of the tab is displayed, and may be interacted with.

Sensor Configuration Tab

The configuration tab provides sensor specific options for preparing the Bird Power Viewer software to accurately display sensor measurements.

Figure 7 Sensor Configuration Tab



Configuration Source

Shows the source of the configuration values.

- Shows “From Sensor” if the configuration was loaded from the sensor and has not been saved to a file.
  - If the configuration has been modified since it was last loaded from or sent to the sensor, it is highlighted in Yellow.
- Shows a filename if the configuration was loaded from or saved to a file.
  - If the configuration has been modified since it was last loaded from or saved to the filename a '*' character is appended to the filename.

Averaging Parameters

Parameter	Writable	Min	Max	Description
Enabled	yes	0 (not selected)	1 (selected)	Enables an exponential moving average of the following parameters over all acquired pulses over multiple measurements: • Pulse Power • Pulse Width • Pulse Period • Pulse Duty Cycle • Pulse Repetition Rate • Gate n Power
Count	yes	1	2^31-1	Sets the value of "k" in the exponential moving average: $\overline{Xi} = \frac{xi}{k} + \frac{(k-1)\overline{Xi}-1}{k}$

Frequency Parameters

The Bird Pulse sensors are calibrated over a specified frequency band. The Frequency Parameter configures how the sensor determines what frequency to use when applying the calibration to measurements.

If measuring variable frequency signals, see "Variable Frequency Signals" on page 9 for settings requirements.

Parameter	Writable	Min	Max	Description
Auto Frequency	yes	0 (not selected)	1 (selected)	Enables/Disables auto frequency detection in the sensor. If auto frequency is on, the sensor attempts to measure the frequency of the signal and uses this measured frequency to look up calibration coefficients.
Frequency (MHz)	yes	Min sensor RF frequency	Max sensor RF frequency	Applies if Auto Frequency is off. If auto frequency is off, the sensor uses this frequency to look up calibration coefficients. Must be between min and max frequency for the specific sensor model. The min and max are displayed in the configuration view for reference.
Max Frequency (MHz)	No	N/A	N/A	Read from the sensor. The accuracy of the sensor is not guaranteed above this frequency.
Min Frequency (MHz)	No	N/A	N/A	Read from the sensor. The accuracy of the sensor is not guaranteed below this frequency.

Period Parameters

Bird pulse sensors attempt to measure several fundamental pulse parameters in each measurement frame. All of these depend first on determining the period of the pulsed signal. The sensor can be configured to do this automatically, or the user may tell the sensor what period to use.

For multi-state pulsed signals with more than two states, see "Power Waveform Measurements" on page 9 for settings requirements.

Parameter	Writable	Min	Max	Description
Auto Period	yes	0 (not selected)	1 (selected)	Enables/Disables auto pulse period measurement in the sensor. If auto period is on, the sensor attempts to determine the period using an iterative algorithm on a captured sample buffer. All other pulse measurements (repetition rate, width, & duty cycle) depend on this measurement of the period.
Period (ms)	yes	0.1	10	Applies if Auto Period is off. If auto period is off, the sensor uses this period value and proceeds with the rest of the pulse measurements accordingly. If the period is known, using this option will yield faster measurements in the sensor. Note that the limits are sensor models specific, the limits shown here cover nearly all the production models. A few models will work with limits beyond this range.

Reflected Power Parameters

When reflected power measurements are disabled, the sensor may yield faster measurements for use cases where speed is most important.

Parameter	Writable	Min	Max	Description
Enabled	yes	0 (not selected)	1 (selected)	Enables reflected power measurements in the sensor. When set to off, the sensor will not make any measurements of the reflected power.

Trigger Parameters

Power Waveform framing in the pulse sensors depends on a trigger event. The sensor can be configured to accept an external trigger (a TTL pulse) or to generate an internal trigger based on edge detection in the captured sample buffer. Subsequent waveform processing and triggered gate measurements proceed from this trigger event.

Parameter	Writable	Min	Max	Description
Source (INT/EXT)	yes	INT	EXT	Sets the trigger source to external or internal.
Slope (POS/ NEG)	yes	NEG	POS	Sets the polarity of the trigger event for both external and internal triggers. NEG means the sensor will look for a falling edge, POS means the sensor will look for a rising edge.
Auto Level	yes	0 (not selected)	1 (selected)	Enables/Disables auto trigger level detection for the internal trigger algorithm. If auto trigger level is on, the sensor will set the trigger level midway between the min and max samples in the buffer.
Level (W)	yes	0	Max P	Desired trigger level in Watts. Applies if Auto Trigger Level is off. If auto trigger level is off, the sensor looks for the signal to cross this level (either rising or falling depending on the slope setting). The max trigger level should be set below the max power for the sensor (see the sensor specs for this value).
Delay (ms)	yes	-Max Pd	+Max Pd	Trigger delay. Shifts the trigger point to the left or right of the relevant edge. The trigger delay is sensor model specific. The limits shown (+/- the period) will work for most sensors.

Pulse Gate Parameters

Pulse Gate Parameters control the behavior of the automatic gated pulse measurements in the Pulse Sensors. These measurements are designed for use with simple 2 state pulses, and should not be used for pulsed signals with more than 2 states. See "Power Waveform Measurements" on page 9.

Parameter	Writable	Min	Max	Description
Begin Level Low (%)	yes	0	50	The low threshold level for the leading edge of the pulse (% of the total power span). The power must cross this level from low to high to qualify as a leading edge candidate.
Begin Level High (%)	yes	50	100	The high threshold level for the leading edge of the pulse (% of the total power span). The power must cross this level from low to high to complete the detection of the leading edge.
Begin Delay (ms)	yes	0	0.9	The left edge of the pulse gate measured from the leading edge (a positive number).
End Level Low (%)	yes	0	50	The low threshold level for the trailing edge of the pulse (% of the total power span). The power must cross this level from high to low to complete the detection of the trailing edge.
End Level High (%)	yes	50	100	The high threshold level for the trailing edge of the pulse (% of the total power span). The power must cross this level from high to low to qualify as a trailing edge candidate.
End Delay (ms)	yes	-0.9	0	The right edge of the measurement gate measured from the trailing edge (a negative number)

Triggered Gate Parameters

Triggered Gate Parameters control the behavior of up to four triggered gate states in a multi state pulse. The pulse sensor will calculate the mean, min, and max power for each enabled state. Note that Begin/End times for triggered gates are set relative to the sync point of the sweep. The combined width of all the states should be less than the period specified for the sweep.

Parameter	Writable	Min	Max	Description
Gate 1-4, Per State (up to 4 states)				
Enabled	yes	0 (not selected)	1 (selected)	Enables or disables measurements for this state.
Begin (ms)	yes			Sets the left edge of the state relative to the sync point. Limits depend on the number and width of all the enabled states and on the programmed period. See "Power Waveform Measurements" on page 9.
End (ms)	yes			Sets the right edge of the state relative to the sync point. Limits depend on the number and width of all the enabled states and on the programmed period. See "Power Waveform Measurements" on page 9.

Power Waveform Parameters

The pulse power sensor is able to capture Power Waveform data in the time domain. The Sweep Parameters control the details of the Power Waveform acquisition.

Parameter	Writable	Min	Max	Description
Sweep Delay (ms)	yes	-Max Pd	+Max Pd	Sweep delay shifts the start of the Power Waveform relative to the trigger event. The limits shown (+/- the period) will work for most sensors.
Auto Sweep Time	yes	0 (not selected)	1 (selected)	Enables/Disables Auto Sweep Time for the Power Waveform measurement. When this is enabled, the sensor will automatically determine the time frame captured for this measurement. Auto sweep time works best for simple two state pulsed signals, and does not work reliably for pulsed signals with more than 2 states or for CW signals. See "Power Waveform Measurements" on page 9.
Sweep Time (ms)	yes	0.1	2 x Pd	When Auto Sweep Time is off, the Sweep time parameter establishes a maximum time frame for the Power Waveform acquisition. The time returned will be less than or equal to this number. The min sweep time is sensor specific. The listed min time of 0.1 ms will work for all sensor models.
Auto Sweep Frames	yes	0	100	When Auto Sweep Time is on, this parameter tells the sensor how many periods to try to include in the Power Waveform.

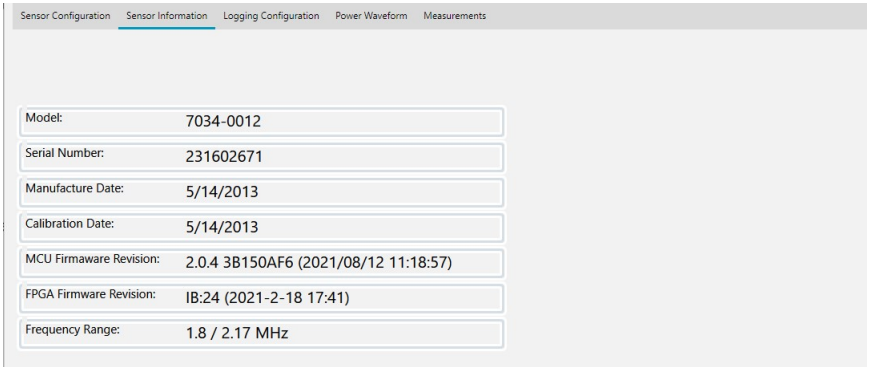
Parameter	Writable	Min	Max	Description
Max Samples	yes	16	4096	Max Samples sets a limit for the number of samples to include in the Power Waveform. The actual number of samples will typically be less than this number since the achievable sample rates are restricted by the fundamental ADC sample rate in the sensor and the re-sampling math used to construct the Waveform dataset.

Sensor Information Tab

Displays Model, SN, MCU and FPGA revisions, and other information about the sensor.

There are no user configurable options on this tab.

Figure 8 Sensor Information Tab



Logging Configuration Tab

Displays settings for the Bird Power Viewer measurement logging feature.

- Sensor Defined Minimum Logging Rate will log all the measurements as fast as they are received from the sensor.

  The interval between samples in the log file will be somewhat variable since the sensor measurements are also somewhat variable and they depend on indeterminate system latency for transmission to the Bird Power Viewer application.

- User Defined Logging Rate allows you to choose a defined logging rate from 10 ms to 24 hours.

  The Bird Power Viewer application will log the most recent measurements from the sensor to the file on the specified time interval.

  If the interval is less than the sensor's measurement rate, repeated measurements will be recorded in the log.

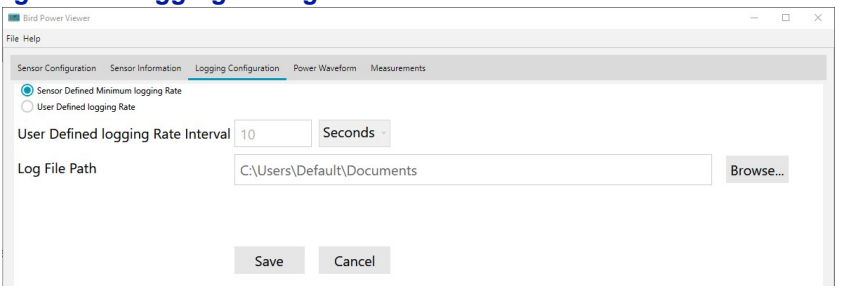
The Save button saves the log configuration so that it is persistent through boot cycles.

NOTE

Logging is enabled/disabled on the Measurements and Power Waveform views.

- Log File Path sets where the Bird Power Viewer application will write measurement log files.

Figure 9 Logging Configuration Tab



Power Waveform Tab

Displays a plot of the time domain Power Waveform as captured by the sensor. This view is similar to an oscilloscope. It displays sequential time domain frames that are aligned on a defined trigger event. See Figure 10.

Sensor information and a measurement frame counter (when measurements are running) are displayed below the waveform.

The Command Bar includes the following Commands:

- **Start/Stop Measurement** toggles the measurement stream on and off. The button turns green when measurements are on.
  - Clicking **Start Measurement**, sends the configuration to the sensor and starts the measurement stream from the sensor.

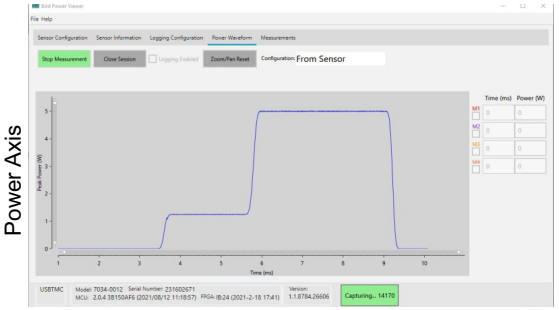
    When measurements are running, an incrementing frame count is displayed in a green box in the status bar below the plot.
  - Clicking **Stop Measurement** stops the measurement stream from the sensor.
- **Close Session** Stops measurements (if they are running), closes the sensor session and returns the application to the Sensor Selection View.
- **Logging Enabled** enables/disables logging.

  The control is disabled while the stream is running.

  When Logging is enabled, the log file is written to the path set in the "Logging Configuration Tab" on page 23.

  A new log file is written each time measurements are started.
- **Zoom/Pan Reset** resets the plot time and power axes to the default scales as set by the waveform content received from the sensor.

Figure 10 Power Waveform Tab

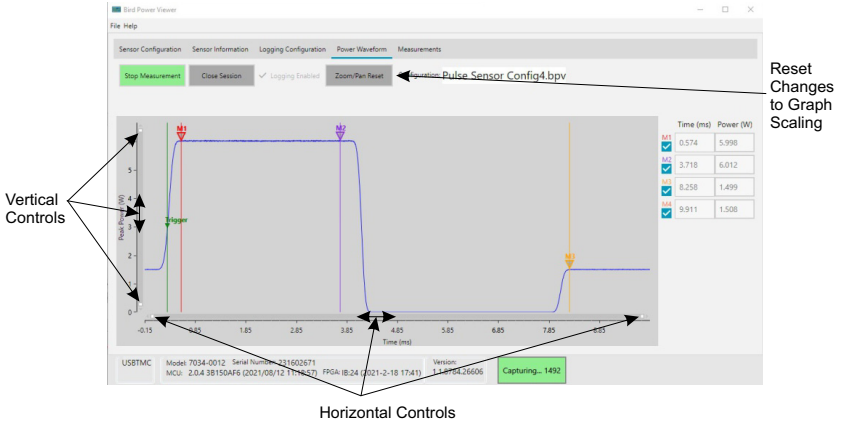


This Power Waveform tab is designed for viewing stable pulsed signal. It is not designed for analysis of signals with rapidly changing time/power content.

Zoom/Pan Controls

The time and power axes are scaled automatically based on the content of the received frames (min power scale is 0 to 0.1 W).

Figure 11 Zoom/Pan Controls



Zoom Handles — Each axis has handles at each end to adjust the scale limits. Simply drag the handle to zoom the associated axis.

Pan Controls — Click and drag on the zoom bar from the center of the scale to pan up/down or left/right.

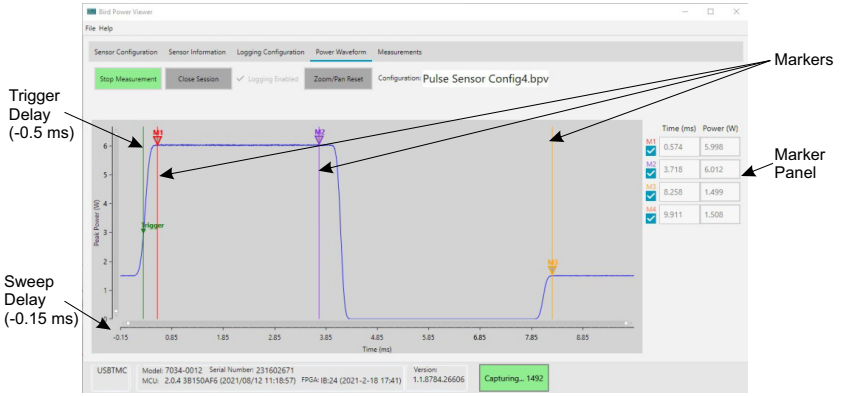
Click the Zoom/Pan Reset button to restore the scales to the full view.

Markers and Delays

Trigger Delay — The trigger position (a vertical green marker labeled "Trigger") is displayed on the left side of the plot. Trigger delay setting is available in "Trigger Parameters" on page 18.

Sweep Delay — The left edge of the time scale is set by the Sweep Delay parameter. The Sweep delay setting is available in "Power Waveform Parameters" on page 21.

Figure 12 Markers and Delays



Marker Time/Power Table — The Time and Power table to the right of the plot is used to display up to four Data Markers.

- Check/Uncheck each marker to enable/disable them.
- Position markers by dragging them with the mouse or by editing the Time value shown in the panel.
- Markers are initialized to T=0 when a sensor session is started.
  - After that, the position of the markers is persistent when you disable/enable them.
- When moving markers, they will snap to the nearest data sample on the plot.
- Marker Power values update when the plot receives new data.

Measurements Tab

Displays information about the sensor and a measurement frame counter (when measurements are running).

Displays a Command Bar with the following Commands:

The following commands are the same as in the Power Waveform View:

- Start Measurement
- Stop Measurement
- Close Session
- Logging Enabled

Measurement Selection displays a list of available measurements from the sensor.

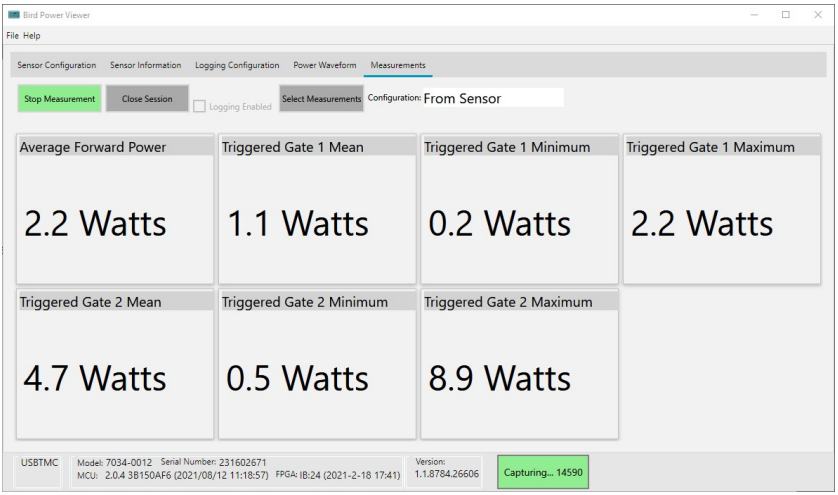
- Click a measurement to check/un-check it.
- Checked measurements will be displayed in the view and updated when the measurement stream is running.

The Measurements Tab displays tiles for each selected measurement.

- Tiles are arranged automatically.
- You can drag tiles to rearrange them.

See "Questionable Measurement Indicators" on page 6 for a description of questionable measurements.

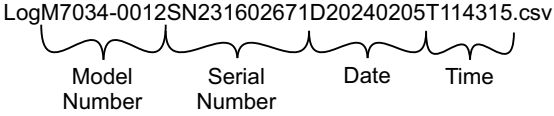
Figure 13 Measurements Tab



Logging

Sensor data can be logged by the Bird Power Viewer software. Logging saves all the sensors active readings into a text file. Logging can be started on the Sensor Menu. Logs are saved using the following file naming convention:

Figure 14 Log File Name Example



Viewing Logged Data

The Log files are saved on the computer running the Bird Power Viewer software, in the Documents folder.

The data is saved in CSV format in the log file. The data is broken into two sections and is shown below.

The data may be viewed as text in any text editor, or imported into a spreadsheet program.

Log File Definition

Section 1: Data Definition, often referred to as an Object. The data logged will vary according to the sensor connected when the log file is created.

Section 1 includes:

- Model, serial number, date and time log was created
- Readings definition
- Mode definition, including settings

Section 2: Data Array. The values recording in the log file are defined by the readings definition in section 1. Each array of values is prefaced by the word “results”. Each log file will contain multiple data arrays, even hundreds or thousand depending on the length of time logging was allowed to run.