



**AEMC**<sup>®</sup>  
INSTRUMENTS

Chauvin Arnoux<sup>®</sup> Inc.

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# The Thermal Imaging IR Camera Model 1950



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**Featured Product:**

# **IR Camera Model 1950**

## **Connecting a Peripheral**

The AEMC® Model 1950 is a simple-to-use “focus free” thermal imaging infrared camera. It features a 20x20° field of view, and can be used as a real-time viewer for detecting hot spots and other temperature anomalies. Thermal images (also known as thermograms) can be recorded and stored on the instrument. These images can be valuable in industry sectors as diverse as:

- electric maintenance and troubleshooting
- metallurgy and steel-making
- natural gas exploration
- transportation
- petroleum
- fire-fighting

...and many others.

An important feature of the Model 1950 is its ability to connect to measurement instruments via Bluetooth®. Data from the instrument can be added to the image and stored in the camera’s memory. This allows you to store both visual and measurement data in a single file. Measurements can also be used to compensate for environmental factors. For example, the colors in the thermogram can be adjusted to account for the influences of ambient temperature and humidity.



Instruments supported by the camera include AEMC's Clamp-On Meters Models 407 and 607, and Chauvin-Arnoux's Metrix Multimeters Models MTX 3292-BT and 3293-BT.

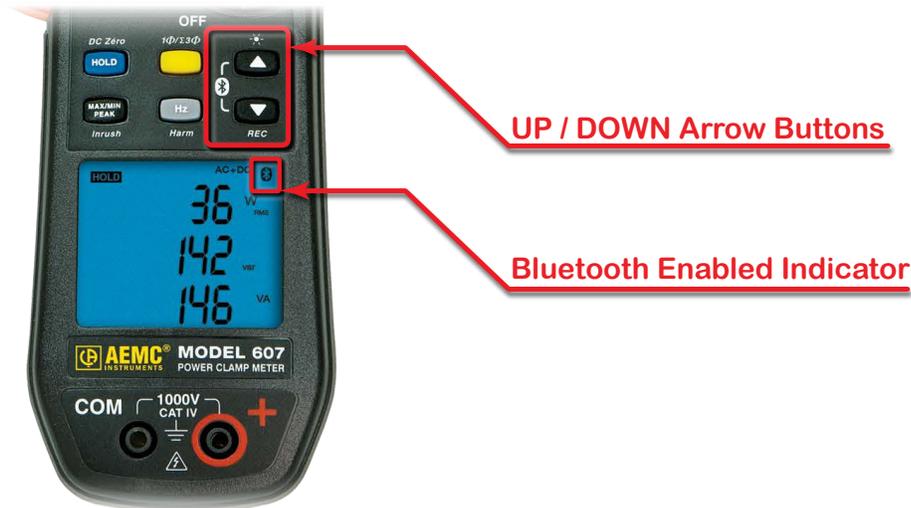


This article explains how to connect the Model 1950 to a measurement instrument. We will demonstrate this using the clamp-on meter Model 607. However, the connection procedure also applies to other supported instruments.

To begin, both the camera and the instrument must be powered on, with Bluetooth enabled.

### 1. Enable Bluetooth on the Model 607

To do this on the Model 607, turn the selection dial to any setting. Then press the up and down arrow buttons simultaneously. The Bluetooth symbol appears on the instrument’s display screen, indicating Bluetooth is enabled.



### 2. Enable Bluetooth on the Model 1950

Next, turn the camera ON. If you have previously connected to Bluetooth devices, including the headset that comes with the camera, a message appears asking if you want to reconnect. Since we are connecting a new device, press the F3 button to cancel.



Press the F1 button to display the Main configuration screen. Then use the arrow keys to highlight the Parameter icon, and press F2. This displays the Parameters screen.

Press the down arrow to highlight the Bluetooth icon, and press F2.

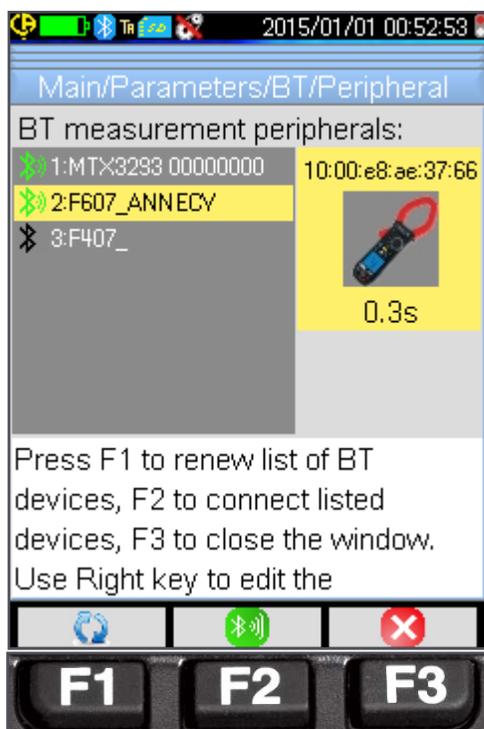
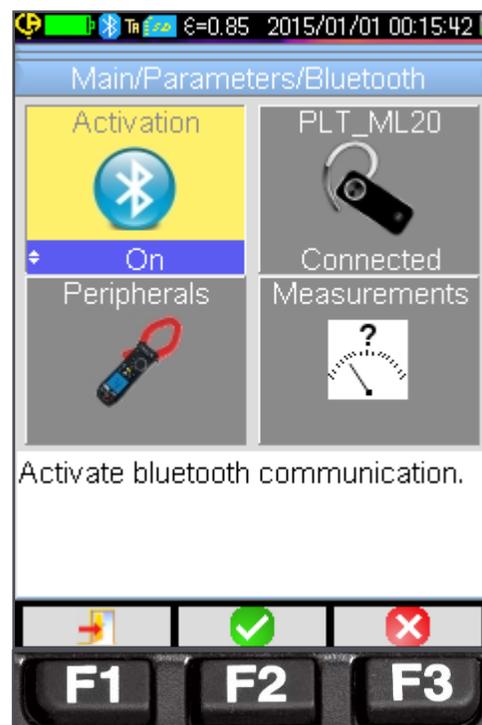
By default, Bluetooth is disabled to save the battery life on the camera. To enable Bluetooth, press F2, and press the up or down arrow to change Off to On. Then press F2 to confirm activation.

The Bluetooth icon appears in the status bar at the top of the camera display (see illustration to the right).

### 3. Connect the Camera to the Instrument

With Bluetooth enabled, we can now connect the camera to the Model 607. Press the down arrow to highlight the Peripherals icon, and then press F2. Next, press F1 to have the camera search for and connect to available Bluetooth devices, and press F2 to confirm.

After a few moments the camera displays any compatible devices it finds.



Connected instruments are identified by a green Bluetooth icon. If you subsequently disconnect an instrument, the Bluetooth icon turns black. To reconnect any disconnected instruments, press F2.

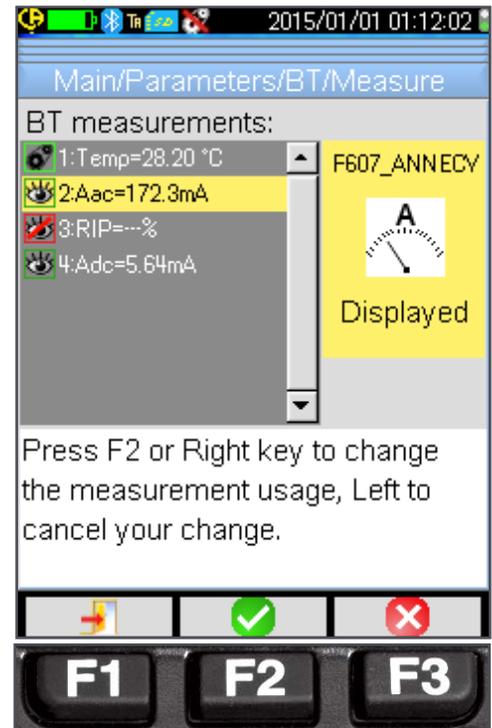
Instruments are listed by their Bluetooth name, which includes the model number. To the right is an icon that identifies the selected instrument type. The icon also shows the polling period for the instrument. This defines how often the measurement value is updated on the camera. Options range from three-tenths of a second up to 50 minutes. For our demonstration, we will leave the polling period at the default setting.

Check to ensure the Model 607 is listed, then press F3 to return to the Bluetooth menu.

### 4. Select Measurements to Display

We can now select which measurements to display. Press the right arrow to highlight the Measurements icon, and press F2. This displays a numbered list of variables measured by the connected instrument. (Note that if no measurements are displayed, change the selection dial on the instrument until the desired variables appear.)

Supported Measurement Types:	
	Temperature
	Current
	Power (Watts)
	Voltage
	Frequency (Hertz)
	Impedance (Ohms)
	Capacitance (Farads)
	Relative Humidity (%)
	Target Distance
	Other Measurement



Note that the measurement types listed in the Measurements screen depend on which instrument is currently connected. Some of the types listed in the preceding table may be unavailable on certain instruments.

Measurements can be hidden or visible. By default, all measurements are hidden. To make a measurement visible, select it by pressing the up and down arrows. Press the right arrow, and use the up or down arrow to change Hidden to Displayed. Then press F2 to confirm the setting. Visible measurements are identified by a green “eyeball”

Note that if the measurement is temperature, humidity, or target distance, a third option called “Influence” appears in addition to Hidden and Displayed. Selecting Influence enables the measurement to be used to adjust the image colors to compensate for environmental variables, as explained the in camera’s user manual.

## 5. View Measurements

Press F1 to return to the camera display screen. The measurement value now appears at the bottom of the display screen. This includes the measurement number, name, and value.

This concludes our brief explanation for connecting a Bluetooth instrument to the Thermal Imaging IR Camera Model 1950. To learn more about the Model 1950, visit our [web site](#). And be sure to check our [YouTube Channel](#) for instructional videos about other topics in electronics.



# All About Data Loggers

Data loggers comprise an important category of electronic measurement instruments. Data loggers come in a variety of types, ranging in size, capabilities, and price; and perform a broad spectrum of applications.



This article is a quick overview of data loggers. We explain what data loggers are and how they are used. We discuss a few points to consider when selecting the right data logger for your requirements. And we briefly review some of the data logger products provided by AEMC® Instruments.

## What are data loggers?

As the name suggests, a data logger records data over time. In its basic form, the instrument includes one or more external or internal sensors for making measurements, internal memory for storing data, and a microprocessor for controlling operation. More complex instruments may include features such as an LCD display screen, input keypad, control functions, and communications including email and text messaging.

Many data loggers are designed for very specific applications and environments, while others are more versatile and measure several different variables. Some instruments can operate as standalone devices, others must be connected to a computer for configuration and data download. They also range in complexity, from economical single channel fixed function loggers to more powerful programmable devices capable of processing multiple inputs.

The advantages of using data loggers compared with other types of data recording instruments include their simplicity and ease-of-use. Once configured, they do not need to be connected to a computer to function. Instead, they can run unattended for extended periods, up to several months or more, providing a detailed picture of the conditions being monitored. These can be environmental parameters such as air temperature and relative humidity, electrical data such as energy use and harmonics, and many others. Recorded data can then be downloaded to a computer for further display and analysis.

## How are data loggers used?

Data loggers are routinely used in applications that involve continuously monitoring one or more parameters without requiring the operator to be on site. Typical users include energy auditors, facility managers, electrical and environmental consultants, building managers, process engineers, water and wastewater engineers, and research scientists.

Data loggers can operate in indoor, outdoor, and underwater environments, performing a broad spectrum of tasks. A few examples include:

- Tracking electricity usage in facilities to define energy profiles and manage peak demand.
- Monitoring environmental variables such as temperature, humidity, light, sound, wind velocity, and others.
- Analyzing building operations and identifying electrical, mechanical, and other performance problems. Data loggers can then be used to evaluate and fine-tune corrective measures taken to address these issues.
- Monitoring equipment runtimes to ensure efficient operation.
- Optimizing HVAC system performance.
- Testing indoor air quality and temperature.
- And monitoring water usage, including pressure, temperature, and flow.



Recorded data can then be analyzed, graphed, and formatted for presentation or exported to other applications. This requires downloading the data from the instrument to a computer.

Data loggers often come with software that enables you to process downloaded data and perform other tasks. This software should also provide data graphing, report generation, and export. In addition, the software may include features for configuring the instrument and displaying measurements in real-time.

## How to choose a data logger

As we've noted, data loggers come in a wide variety of types, capabilities, and sophistication. There are a number of factors to consider when deciding which data logger is right for your applications and requirements.

- **Data Type:** Data loggers are designed for many different applications, It is therefore essential to select the instrument appropriate for the data to be measured.
- **Input Signal:** Some data loggers are designed for a single input type, such as voltage or current, while others can be configured to accept multiple types of inputs.
- **Number of Channels:** Data loggers are available in both single and multi-channel designs.
- **Size:** In many applications space is a limitation. In these situations the size of the data logger may be a critical selection parameter.
- **Speed and Memory:** The higher the data recording rate, the more memory is required for storing it. Therefore when selecting a data logger it is important to determine the storage rate and duration, which can be used to calculate the required memory. This is often a determining factor in the overall cost of the system.
- **Real Time Operation:** In some applications it may be advantageous to display measurement data on the computer in real time. This allows operators to check the system status while the recording is in progress.
- **Alarms:** Alarm functionality is essential for monitoring a parameter that needs to stay within a critical range, for example temperature in a cold storage facility. Also consider the alarm delivery medium, such as email or text message.
- **Accuracy:** Accuracy specifications vary widely among different types of data loggers. Understanding how accurate your measurement must be can help avoid paying for a high-precision instrument you may not need.
- **Location:** Consider whether your location requires a data logger designed specifically for this type of environment, or whether a more general-purpose instrument will suffice.
- **Downloading Data:** Downloading may consist of simply removing the instrument's memory card and inserting it into the computer. In environments where this may be difficult, consider an instrument that can communicate directly to the computer through a medium such as USB cable, wireless Bluetooth or Wi-Fi.

## AEMC® Data Loggers

Whatever your data logger requirements, AEMC® likely has an instrument that meets your needs. AEMC® is a leader in easy-to-use data loggers. Most models are supported by DataView, AEMC's report generation and data analysis software.

### Simple Logger® II

The Simple Logger II Series includes 1, 2, and 4-channel models.



These instruments are low cost, battery operated data loggers that require minimal user setup. They can automatically adjust both their scale and storage rate to optimize the recording of data, including temperature, events, thermistor, 4 to 20 milliamps, AC and DC voltage, and AC and DC current. The 4-channel models are used primarily to measure AC, and accept voltage, current probe, and current sensor inputs. Voltage inputs are directly measured up to 600 volts, and current inputs up to 3000 amps. Two and 4 channel models use captive AmpFlex® current sensors. Harmonic measurements are available in real-time, and for some models Bluetooth communication provides data transfer from the instrument to a computer.

The Clamp-On Simple Logger is a self-contained data logging AC current probe. The logger requires minimal user setup and can automatically adjust its storage rate. One button operation makes the clamp-on logger extremely easy and quick to use.

## Model L452

The Data Logger Model L452 combines the capabilities of multiple data logger instruments, while providing advanced usability and interface features.

The L452 can log DC voltage, DC current, pulse, or digital data, using either one or two independent channels. Measurements can be performed directly on the instrument, or through a variety of sensors. This data is stored in the instrument’s large 32MB internal Flash memory. You can set up the instrument and view real-time measurement data through the front panel LCD screen and input buttons. The L452 features an on-board menu-based interface for navigating measurement data and selecting configuration options.



## 8-Channel Data Loggers

AEMC® 8-Channel Data Loggers are versatile, powerful and cost effective data loggers for handling analog, digital and other types of variables with high resolution and speed. They offer high performance and are easy to configure and operate.



## Environmental Line

The upcoming AEMC® Environmental Line series of data loggers record a variety of environmental quantities. For instance, the Model 1110 light meter measures light with spectral error compensation on LED or fluorescent sources, and the Thermo Anemometer Logger Model 1227 measures air speed and flow rate. Both feature map mode; Min, Max, Average, and Hold functions; and spot or continuous recording up to 1 million points. The Thermo-Hygrometer Logger Model 1246 measures humidity and temperature. In addition, the Models 1821, 1822, and 1823 Logger contact thermometers offer versatility and high performance for temperature measurements.



## Model PEL 100 Series

For demanding requirements, the Power and Energy Loggers Model PEL family of products provide all the necessary functions and features for power/energy data logging for most 50, 60, and 400Hz and DC distribution systems worldwide.



Primary users include contractors performing power system evaluation and monitoring. These instruments measure phase-to-phase, phase-to-neutral, and neutral-to-earth voltage, with the PEL 105 capable of measuring up to 1000V in measurement category IV, with pollution degree 4. These instruments also measure phase and neutral current, using a variety of external current sensors. A total of 17 types of electrical hook-ups are supported, including single-phase, split-phase, 3-phase 3-wire, 3-phase 4-wire, open leg, and DC 2-, 3- and 4-wire. This measurement data is then used to calculate numerous values, including active, reactive, and apparent power and energy; crest factor, harmonics and total harmonic distortion; and others. Quantities can be aggregated from 1 min to 1 hour and stored in a SD-Card.

## PowerPad®/PowerPad III

The PowerPad and PowerPad III families combine data logging with sophisticated power quality analysis.



These instruments are portable three-phase network analyzers designed to:

- Measure RMS values, powers, and fluctuations of electric hookups
- Deliver a snapshot of the principal characteristics of a three-phase network
- Track variations of specified parameters over time.

These instruments enable utility company technicians and engineers to measure single and three-phase networks, and perform diagnostics and power quality analysis. Trend data can be recorded for days, weeks or even months. Inrush current can also be captured and stored.

## DataView®

For processing recorded data, AEMC® provides DataView. This software, available free to North American, South American, and Australian users, enables a computer to connect to and interact with a variety of AEMC® data loggers.

With DataView, you can:

- Download recorded data from the instrument
- Display and analyze data on the computer via a frames style interface
- Generate reports for viewing and printing the data, using standard templates or ones you customize to your requirements
- Export data to a Microsoft Excel-compatible spreadsheet

For some models, DataView lets you view real-time data from the connected instrument. DataView also enables you to configure the instrument from the computer, though a dedicated Control Panel interface.



## In conclusion

Let's take a moment to review some of the key points we've covered in this article:

- Data loggers are electronic measurement instruments that come in a wide range of sizes, capabilities, and prices.
- Data loggers are routinely used to continuously monitor one or more parameters without requiring the operator to be on site. Typical users include energy auditors, facility managers, electrical and environmental consultants, building managers, research scientists, and others.
- Data logger applications include tracking electricity usage in facilities, monitoring environmental variables, analyzing building operations and identifying electrical, mechanical, and other performance problems, to name a few.
- There are a number of factors to consider when deciding which data logger is right for your applications and requirements. These include data and input types; number of channels; instrument speed, accuracy, and available storage memory; and the environment in which the instrument will be placed.
- AEMC® offers a wide variety of data loggers for recording numerous environmental and electrical parameters. Models range from the Simple Logger II family to the Power and Energy Loggers Model PEL family. Many of these instruments are supported by DataView, AEMC's data analysis and report generation software.

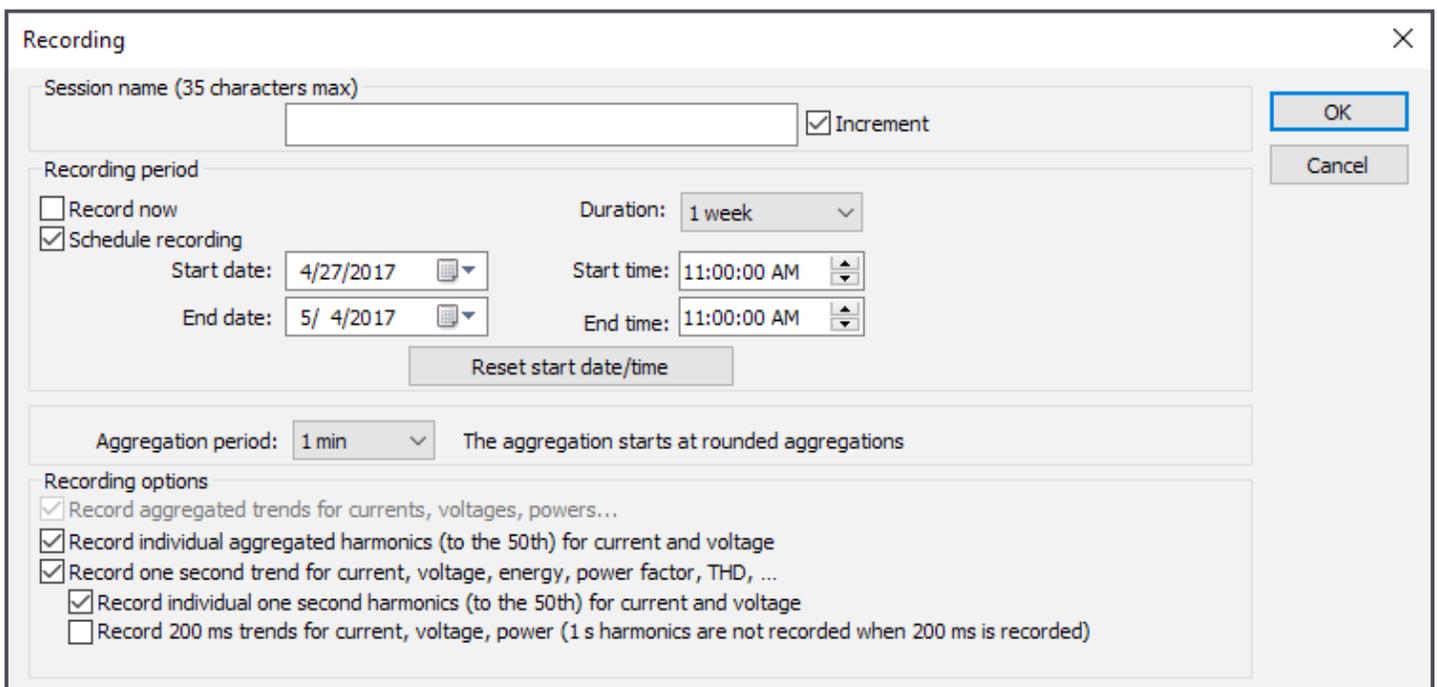
We hope you found this quick introduction to data loggers helpful. To learn more about AEMC® data loggers, please visit our [web site](#).

# Customer Support Tip: Running Simultaneous Recording Sessions on Multiple Model PEL Instruments

Starting in DataView 3.50, the PEL Control Panel lets you create a single configuration to run simultaneous recording sessions on multiple instruments. This allows you to run the same recording session configuration on some or all instruments in your PEL network. In previous versions of DataView, recording sessions could only be configured for each instrument separately.

To configure a multi-instrument recording session, ensure each PEL is actively connected to the computer. Check the instrument’s name in the PEL Network folder, and make sure it has a green check mark next to it. Then do the following:

1. Select the PEL Network folder in the navigation frame to display a list of PEL instruments in the data frame.
2. Select each instrument on which you want to run a recording session. To select all listed instruments, click the PEL name checkbox at the top of the list.
3. Click the  button at the top of the data frame. The program checks each selected instrument to determine whether or not it is running an active recording session. If it is, a pop-up appears asking you whether or not to end the recording session on that instrument. If you select No, the instrument will be excluded from the new recording session.
4. The Recording dialog box appears. The settings entered into this dialog box will apply to all instruments on which the recordings will run.



The fields of the Recording dialog box are as follows:

**Session name** lets you name the recording session. This name will then be part of the session's data. You can have the instrument include the session number in the name string by selecting the Increment check box. If you select Increment, the session number uses 5 characters; in this case you can enter up to 35 characters in the Session name field.

**Recording period** defines the time period over which the data is to be recorded.

- To start a recording session now, select the **Record now** check box and use the **Duration** drop down box to specify how long you want the session to run. The Duration field lets you select a predefined duration for a recording, or indicate that the recording is to run until it is manually stopped.
- To schedule a recording, select the **Schedule recording** check box. Then use **Start date** and **Start time** to define when the recording starts, and **End date** and **End time** to specify when the recording stops. Alternately, you can define the end of the session through the Duration drop down box.
- To reset the starting time for a scheduled recording, click the **Reset Start Date/Time** button. This sets the start of the session to the current date and time, and the end of the session to the current date and time plus whatever value is entered in the Duration field.

**Aggregation period** specifies a period of time over which the instrument determines the average value for a given measurement parameter. This is the interval over which the instrument performs measurement aggregation. In addition to the average, the 1 second minimum and maximum values (along with time stamps) are also stored. The **Aggregation period** drop-down field lists the available demand intervals supported by the instrument.

**Recording options** consists of the following check boxes:

**Record aggregated trend for current, voltage, energy, power factor...** is an information-only field that indicates the instrument always records aggregated trend data for these values. This field is grayed out and cannot be changed.

- **Record individual aggregated harmonics (to the 50th) for current and voltage** determines whether or not individual aggregated harmonics data will be included in the recording. This feature is not supported by the PEL 102 or 103, so if the selected instruments consist solely of these models this option is grayed out and inactive.
- **Record one second trends for current, voltage, energy, power factor, THD...** specifies whether or not to record individual single second measurements from which the aggregated data is generated. One second trend measurements consume a considerable amount of SD-Card memory and increase the time required to download recordings from the instrument. If one second measurements are not needed, you can improve system performance by unchecking this option.

- **Record individual harmonics (to the 50th) for current and voltage** determines whether or not to record current and voltage harmonic measurements made by the instrument. Harmonic measurements also consume a considerable amount of SD-Card memory. If harmonic measurements are not needed you can improve system performance by leaving this option unchecked. Note that this field is only active if the **Record one second trends...** field is selected; otherwise this field is grayed out and inactive.
- **Record 200 ms trends for current, voltage, power...** selects whether or not to record 200ms measurements from which the one second data is generated. As with one second trend measurements, 200ms trend measurements consume a considerable amount of SD-Card memory so you should uncheck this option if 200ms measurements are unnecessary. This feature is not supported by the PEL 102 or 103, so if the selected instruments consist solely of these models this option is grayed out and inactive.

Note that you cannot have both the option **Record individual harmonics (to the 50th) for current and voltage** and the option **Record 200 ms trends for current, voltage, energy...** selected at the same time. If you check one option, the other will be automatically unchecked.

**5.** After you complete these fields, click OK to save the configuration.

At the bottom of the Recording tab is a field listing the instruments on which this recording will run. If this includes PEL 105 instruments along with earlier models (PEL 102 and/or PEL

PEL name	
PEL 105-13446 1NEH	
PEL 103 DV Test	Only model number 105 can record aggregated harmonics or 200 ms trend

103), this field lists any selected feature not supported by the PEL 102/103 instruments.

The recording will run on these instruments, but the unsupported data will not be included in the recording for these instrument. (The data will be recorded on instruments that support it.)

This concludes our quick review of creating a multi-instrument recording configuration for Model PEL instruments. For more information about this and all other PEL Control Panel features, consult the Help system that comes with the software.

# New Product: Cable Locator Transmitter/Receiver Model 6681

The AEMC® Cable Locator Model 6681 detects buried (in ground or in walls) telecommunications cables, electric power and other cables, and metal pipes, during modification or maintenance work on installations of category III (or lower), at voltages of 300V (or less) with respect to ground. The system can locate open circuits, shorts, track cables and locate fuses or circuit breakers.

The instrument is a portable system that includes a transmitter, a receiver, and accessories. The transmitter and receiver both have a large backlit LCD and large keys.

The transmitter applies a modulated AC to the circuit that is to be located, which creates a proportional alternating electric field. The transmitter is also an AC/DC voltmeter; the display of the measured voltage is accompanied by a symbol warning of the presence of a voltage. In addition, the transmitter has a self-test function, indicating good transmission between transmitter and receiver. Both the transmitter and receiver units include a flashlight feature that assist the operator when working in dark unlit areas.

The receiver features a sensitive sensor that generates a display proportional to the electric field detected. The variations of this signal, after decoding, processing, and shaping, enable the user to determine the location of underground cables and pipes, and detect any faults in them. The receiver also includes a buzzer that changes pitch as a function of the strength of the detected signal.





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