

11M-LINK SERIES

Single Channel, PC-Based Universal Power and Energy Monitor



*Also traceable to NRC-CNRC

Key Features

- THE UNIVERSAL METER**
 Reads ALL Heads:
 - Power: Thermopiles, Photo Detectors and Pyroelectrics
 - Energy: Thermopiles (in single shot mode), Photo Detectors and Pyroelectrics
- MEASURE fJ ENERGY LEVELS**
 Thanks to a unique digital method for suppressing the noise on the lower ranges
- EXTERNAL TRIGGER**
 Synchronize you 11M-LINK to your pulsed laser or digital chopper
- DIGITAL (USB) OUTPUT**
 Connect the 11M-LINK module directly to your PC
- POWERFUL LABVIEW SOFTWARE**
 Features include:
 - Complete instrument controls: Range, Trigger, Wavelength, etc.
 - Live display in J and J/cm² or W and W/cm²
 - Full Statistics: Min, Max, Mean, Standard Deviation, RMS Stability , Repetition Rate, etc.
 - Graphic Displays: Strip Chart, Histogram, Tuning Needle and more
 - Data File Collection and Analysis/Channel

Connectivity



PC-BASED UNIVERSAL POWER/ENERGY MONITOR

This PC-Based monitor is compatible with ALL types of detectors - including thermopiles, pyroelectrics and photo detectors - for both power and energy measurements. The device is available as a single channel unit that directly interfaces with a computer using a USB2.0 connection. The LabView software is included and comes with all the necessary features. The 11M-LINK also presents a unique digital technique of suppressing the noise, thereby extending the measurement range all the way down to the fJ level.



VERSATILE SOFTWARE FOR THE UNIVERSAL 11M-LINK

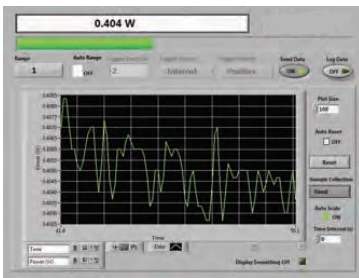
What makes the 11M-LINK so universal is its compatibility with every detector type and model we make, and our smart software that recognizes the type of detector attached, and configures itself accordingly. Some of the basic software features include:

- | | |
|----------------------|-----------------|
| Live Digital Reading | Full Statistics |
| Strip Chart | Histogram |
| Analog Tuning | Data Logging |



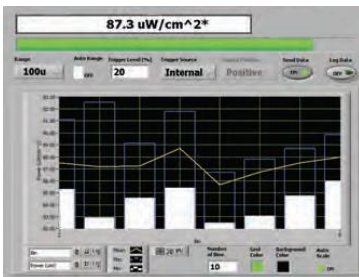
MEASURE POWER WITH A PHOTO DETECTOR

If you need to measure low power levels, from pW to mW, then we recommend one of our 11PH or 11PH-B detectors. In the software screen shown on the left, we have taken a data set working in the **"STATS"** display mode. We have set the batch size to 100 data points in the manual reset mode. You can see the live power (138 nW) and full complement of statistics: mean, max, min, RMS and PTP stability. In the bottom left hand corner you will note that a wavelength of 300 nm is displayed. This is where you will enter the wavelength of your laser and engage the wavelength correction factor.



MEASURE POWER WITH A THERMOPILE DETECTOR

You can select any of our Thermal Detectors to measure your laser power from a few μW up to 30 kW. We used one of our most sensitive thermopile detectors, model 11XLP12-3S-H2, to generate the software screen shown on the left. We have selected the **"SCOPE"** mode, where you can view the live power reading (0.404 W), a bar graph and a strip chart while monitoring the power. This high level screen also provides access to range, trigger, auto scale, and many other monitor functions.



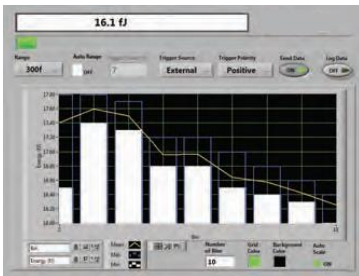
MEASURE POWER WITH A PYROELECTRIC DETECTOR

Need to measure the Radiant Flux (Watts) or Irradiance (W/cm²) of a broadband source like the sun, a lamp, a temperature controlled black body and/or a mid or far-IR laser? Our broadband pyroelectric detectors of the 11UM-B Series would be a great choice. To make the measurement that is displayed at the right, we set up our 11UM9B-BL detector with 11M-LINK, an SDC-500 Chopper running 10 Hz and our 725 °C Black Body Source. The 11M-LINK recognizes the 11UM9B-BL detector, sets the wavelength to 633 nm where it is calibrated and prepares it to measure the voltage square wave it generates. We have engaged the area correction as the 9 mm detector is over filled with radiation. We are therefore measuring Irradiance in W/cm².



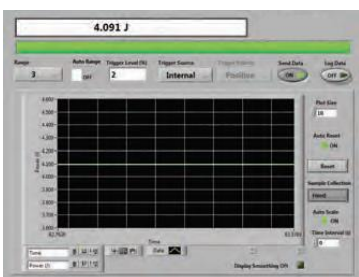
MEASURE ENERGY WITH A PYROELECTRIC DETECTOR

You can select one of our many large area Pyroelectric Detectors of the QE Series for energy measurements ranging from 50 nJ to 250 J and from DUV to Far IR. To demonstrate this capability, we have selected our 11QE8SP-B-BL and the 11M-LINK. We are looking at the **"HISTOGRAM"** screen, where you can continue to view the live measurement and a histogram that shows the energy distribution of your data set, along with a best-fit Gaussian curve. Note that you still have access to the instrument controls, like range, trigger, wavelength, etc.



MEASURE AT THE fJ LEVEL WITH A 11PE-B DETECTOR

For measurements in the fJ to μJ range, and from UV to Near-IR we suggest our 11PE3B-Si detector. It represents the state-of-the-art in low-end energy detector technology. Take advantage of our proprietary pulse averaging, noise reduction techniques available with 11M-LINK. In the example shown at the right, we have captured a data set while running in the **"AVERAGING"** mode. The bars represent minimum (white) and maximum (blue) energy values. The strip chart is based on the average energy value. You get to select the number of "BINS" represented here. "Pulse Averaging" is available in the Statistics screen.



MEASURE A HIGH ENERGY PULSE WITH A UP DETECTOR

If you are trying to measure a relatively high energy (Joules) single pulse (up to 300 msec long), you will select one of our Thermopile Power detectors (like the 11UP50-W9), have it calibrated in single shot mode and use the 11M-LINK to make the measurement. In the screen at the right, we have captured a long pulse that had duration of a few hundred milliseconds and are displaying the energy in the **"SCOPE"** screen. Using a variety of our thermopile detectors, you can measure from 12 μJ to 500 J in a single pulse.

Specifications

11M-LINK	
DETECTOR TYPES	ALL MODELS: Thermopiles, Pyroelectrics, Photo Detectors
DISPLAY	PC-Based
POWER METER SPECIFICATIONS	
Power Range	4 pW to 30 kW
Resolution (Digital)	Current Scale/3000
Monitor Accuracy	$\pm 0.5\% \pm 2$ digits
Statistics	Current Value, Max, Min, Average, Std Dev., RMS & PTP Stability, Time
ENERGY METER SPECIFICATIONS	
Energy Range	30 fJ to 30 kJ
Resolution (Digital)	Current Scale/3000
Monitor Accuracy	$1\% \pm 2$ digits (<1 kHz)
Software Trigger Level	0.1 to 99.9%, 0.1% resolution, default 2%
Repetition Rate ^a	1 000 Hz
Real Time Data Transfer	1 000 Hz with time stamp, no missing point
Statistics	Current Value, Max, Min, Average, Std Dev., RMS & PTP Stability, Pulse #, Repetition Rate, Average Power
DETECTOR COMPATIBILITY	
Thermopile	Average Power & Single Shot Energy
Pyroelectric	Pulse Energy & Average Power
Photo Detectors	Average Power & Pulse Energy
GENERAL SPECIFICATIONS	
Digital Display	Computer Screen
Data Display	Real Time, Scope, Averaging, Statistics and Digital Tuning Needle
Serial Commands and Data Transfer Via	USB
Real Time Data Transfer Rate	1 000 Hz with time stamp, no missing point (for pyroelectrics only)
Analog Output	0-2 Volts, Full Scale, $\pm 2\%$ (joulemeters) $\pm 4\%$ (wattmeters)
Rising or Falling Edge External Trigger	4.5 to 10 V @ 20 mA, optically isolated
Dimensions	106W x 34H x 147D mm
Weight	0.424 kg
Product Name	
	11M-LINK

a. Maximum repetition rate may vary with PC and detector speeds.

Specifications are subject to change without notice