

SENTINEL® DATA LOGGERS

VOLTAGE & CURRENT

Real-time display
of waveforms
and harmonics!



- ▶ Three- and four-channel voltage and current loggers
- ▶ True RMS measurements
- ▶ DC measurements (model dependent)
- ▶ Low-cost, self-contained and portable
- ▶ Includes DataView® software for instrument configuration, data storage, real-time display, analysis and report generation
- ▶ Battery and line powered models
- ▶ USB 2.0 compliant communications port
- ▶ Records over 480,000 measurements (1MB)
- ▶ Three programmable storage modes
- ▶ Programmable storage rates
- ▶ Programmable start/stop times

SENTINEL[®] DATA LOGGER Voltage & Current



The Model SDL A302 recording AC current on a three-phase power panel.

The Sentinel[®] Data Logger line includes three- and four-channel voltage or current recording devices with Alkaline or rechargeable battery packs (model dependent). Line tracking is performed such that 64 samples over one line cycle are taken. Frequency tracking is performed over the range of $\pm 3\text{Hz}$ around the nominal line frequency (50 or 60Hz). Measurements are calculated from these 64 samples for all input channels.

The Sentinel[®] records RMS values for each of the inputs at a rate of up to four times per second. Measurements for each channel are taken sequentially. RMS calculations from the 64 samples are performed on each single line cycle measured for each input. DC measurements are also on all voltage models and probe dependent on current models.

The main advantage of the Sentinel[®] logger is its ability to perform a variety of recording tasks with easy and intuitive setup from a computer using the DataView[®] software, which is included.

Analog information on the input is sampled and converted to a digital signal. This digital signal is processed and stored along with scale and time information. An optically isolated Universal Serial Bus (USB) port facilitates the transfer of data from internal memory to the computer for analysis.

Three LEDs on the front panel (red, yellow and green) indicate recording and memory status at a glance. User selectable storage rate, recording length and recording modes are provided.

FEATURES

- ▶ Isolated differential inputs
- ▶ Record voltages up to 600VAc or 850Vdc on voltage models
- ▶ Record current from mA to 3000Aac (model dependent)
- ▶ Real-time display of waveforms and harmonics
- ▶ Three- and four-channel models available
- ▶ Records up to 480,000 measurements (1MB)
- ▶ Programmable storage rate from four per second to one per 12 hours
- ▶ Three programmable storage modes
- ▶ Simple one button operation with color LED indication
- ▶ Comprehensive data analysis and reporting software included

STORAGE MODES

Extended Recording Mode (XRM[™])

This unique recording mode provides the opportunity to continuously record over long periods of time by reducing the stored samples of the oldest data and maintaining matching resolution for the newest data. Each time the memory fills using XRM[™] every other stored sample is discarded making room for newer samples. This process continues until the recording is manually stopped.

FIFO

When the memory is full, a block of the oldest stored data is discarded to make room for the new sampled data. The sample/storage rate is unchanged.

Stop When Full

The memory is filled at the programmed sample/storage rate from four per second to one every 12 hours. When the memory is full, the recording stops automatically.

SENTINEL® AC & DC VOLTAGE LOGGER MODELS SDL V301 & SDL V401



Model SDL V401



SPECIFICATIONS

MODELS	SDL V301	SDL V401
ELECTRICAL		
Number of Channels	Three	Four
Input Termination	Recessed banana jacks	
Voltage Range	0 to 600V _{AC} ; 0 to 850V _{DC}	
Resolution	0.1V	
Accuracy	5 to 85V: ±1% of Reading ± 0.6V 85 to 600V _{AC} /850V _{DC} : ±0.25% of Reading ± 0.6V	
Sample Rate	64 samples/cycle	
Storage Rate	Programmable from 250ms to 12 hours	
Storage Technique	Stop when full, FIFO, and Extended Recording Mode (XRM™)	
Memory Capacity	480,000 measurements (1MB)	
Communication	USB 2.0 optically isolated	
Controls	One button to turn logger on/off and start/stop recording	
Indicators	Red, Yellow and Green status indicators	
Power Source	Four 1.5V C Alkaline batteries	AC power/rechargeable NiMH batteries
Battery Life*	100 hours to 90 days	Power ride through 10 hours
MECHANICAL		
Protection Index	IP50	
Dimensions	6.73 x 4.76 x 2.17" (171 x 121 x 55mm)	
Case Material	Polycarbonate UL94 V-2	
ENVIRONMENTAL		
Operating Temperature	14° to 122°F (-10° to 50°C)	
Storage Temperature	-4° to 140°F (-20° to 60°C)	
Relative Humidity	0 to 85% RH	
SAFETY		
Safety Rating	600V Cat. III, 300V Cat. IV	
Double Insulation <input type="checkbox"/>	Yes	

*Dependent on sample rate.

The Sentinel® Voltage Logger Models SDL V301 and SDL V401 are designed for recording AC and DC voltages. Available in both three- and four-channel models, they are easy to configure and use.

FEATURES

- ▶ True RMS voltage measurements
- ▶ DC voltage measurements
- ▶ Low-cost, self-contained, portable
- ▶ Differential three-phase inputs
- ▶ Programmable storage mode
- ▶ Programmable data storage rate
- ▶ Records up to 480,000 measurements (1MB)
- ▶ 64 samples per cycle
- ▶ Includes DataView® software
- ▶ Optically isolated USB 2.0 communication
- ▶ 600V Cat. III, 300V Cat. IV

APPLICATIONS

- ▶ Phase unbalance monitoring
- ▶ Surge and Sag recording
- ▶ Line surveys
- ▶ Battery bank monitoring



Sentinel® Voltage Logger Model SDL V301 includes three sets of color-coded (black and red) leads and alligator clips (one set pictured above). Model SDL V401 includes four sets of color-coded (black and red) leads and alligator clips.



Model SDL V301 recording three-phase voltage on a lighting panel.

SENTINEL® CURRENT LOGGER MODELS SDL A301, SDL A302, SDL A303 & SDL A304



Model SDL A302

The Sentinel® Current Logger Models SDL A301, SDL A302, SDL A303 and SDL A304 are designed for recording AC current through integral flexible current probes for each input.

FEATURES

- ▶ True RMS current measurements
- ▶ Low-cost, self-contained, portable
- ▶ Integral 24" flexible current probes for three-phases
- ▶ Measures up to 1000A or 3000A
- ▶ Programmable storage mode
- ▶ Programmable storage rate
- ▶ Records up to 480,000 measurements (1MB)
- ▶ 64 samples per cycle
- ▶ Includes DataView® software
- ▶ Optically isolated USB 2.0 communication
- ▶ AC powered with rechargeable NiMH batteries (Models SDL A303 and SDL A304)
- ▶ 600V Cat. III, 300V Cat. IV

APPLICATIONS

- ▶ Load monitoring
- ▶ HVAC monitoring
- ▶ Energy management
- ▶ Preventative maintenance

SPECIFICATIONS

MODELS	SDL A301	SDL A302	SDL A303	SDL A304
ELECTRICAL				
Number of Channels	Three	Three	Three	Three
Input Termination	Hard-wired flexible CTs	Hard-wired flexible CTs	Hard-wired flexible CTs	Hard-wired flexible CTs
Current Range	5 to 1000A	15 to 3000A	5 to 1000A	15 to 3000A
Resolution	0.1A	0.25A	0.1A	0.25A
Accuracy	±1% of Reading ± 1.5A			
Sample Rate	64 samples/cycle			
Storage Rate	Programmable from 250ms to 12 hours			
Storage Technique	Stop when full, FIFO, and Extended Recording Mode (XRM™)			
Memory Capacity	480,000 measurements (1MB)			
Communication	USB 2.0 optically isolated			
Controls	One button to turn logger on/off and start/stop recording			
Indicators	Red, Yellow and Green status indicators			
Power Source	Four 1.5V C Alkaline batteries	Four 1.5V C Alkaline batteries	AC power/rechargeable NiMH batteries	AC power/rechargeable NiMH batteries
Battery Life*	100 hours to 45 days	100 hours to 45 days	Power ride through 10 hours	Power ride through 10 hours
MECHANICAL				
Protection Index	IP50			
Dimensions	6.73 x 4.76 x 2.17" (171 x 121 x 55mm)			
Case Material	Polycarbonate UL94 V-2			
ENVIRONMENTAL				
Operating Temperature	14° to 122°F (-10° to 50°C)			
Storage Temperature	-4° to 140°F (-20° to 60°C)			
Relative Humidity	0 to 85% RH			
SAFETY				
Safety Rating	600V Cat. III, 300V Cat. IV			
Double Insulation <input type="checkbox"/>	Yes			

*Dependent on sample rate.

SENTINEL® CURRENT LOGGER MODELS SDL A401 & SDL A402



Model SDL A402



SPECIFICATIONS

MODELS	SDL A401	SDL A402
ELECTRICAL		
Number of Channels	Four	Four
Input Termination	BNC	BNC
Sensor Type	24" AmpFlex® Flexible Probe	CT with BNC 1V output*
Current Range	5 to 1000A or 15 to 3000A, sensor dependent	Probe dependent
Resolution	0.25A	Probe dependent
Accuracy	±1% of Reading ± 1.5A	Probe dependent
Sample Rate	64 samples/cycle	
Storage Rate	Programmable from 250ms to 12 hours	
Storage Technique	Stop when full, FIFO, and Extended Recording Mode (XRM™)	
Memory Capacity	480,000 measurements (1MB)	
Communication	USB 2.0 optically isolated	
Controls	One button to turn logger on/off and start/stop recording	
Indicators	Red, Yellow and Green status indicators	
Power Source	AC power/rechargeable NiMH batteries	
Battery Life	Power ride through 10 hours	
MECHANICAL		
Protection Index	IP50	
Dimensions	6.73 x 4.76 x 2.17" (171 x 121 x 55mm)	
Case Material	Polycarbonate UL94 V-2	
ENVIRONMENTAL		
Operating Temperature	14° to 122°F (-10° to 50°C)	
Storage Temperature	-4° to 140°F (-20° to 60°C)	
Relative Humidity	0 to 85% RH	
SAFETY		
Safety Rating	600V Cat. III, 300V Cat. IV (factor of current probe)	
Double Insulation	<input type="checkbox"/>	Yes

*Use only specified current probes

The Sentinel® Current Logger Models SDL A401 and SDL A402 are designed for use with AEMC® detachable current probes or AmpFlex® sensors (model dependent – see chart on page 11).

FEATURES

- ▶ True RMS current measurements
- ▶ DC current measurements when used with Hall Effect Current Probes on Model SDL A402
- ▶ Low-cost, self-contained, portable
- ▶ Measures up to 1000A (probe dependent) (see Current Probe chart on page 11)
- ▶ Programmable storage mode
- ▶ Programmable storage rate
- ▶ Records up to 480,000 measurements (1MB)
- ▶ 64 samples per cycle
- ▶ Includes DataView® software
- ▶ Optically isolated USB 2.0 communication
- ▶ Detachable current probes
- ▶ 600V Cat. III, 300V Cat. IV

APPLICATIONS

- ▶ Load profiling
- ▶ Energy management
- ▶ Preventative maintenance
- ▶ Stray current monitoring



Model SDL A402 recording phase and neutral currents on a feeder.

SOFTWARE

DataView[®]

Data Analysis and Reporting Software

FEATURES

- ▶ Display and analyze real-time waveform and harmonic data on your PC*
- ▶ Display waveforms, trend graphs, harmonics and text summaries
- ▶ Configure all data logger functions and parameters from your PC including sample rate, recording length, channel configuration and more
- ▶ Create and store a complete library of configurations that can be uploaded to the logger as needed
- ▶ Zoom in and out and pan through sections of the graph to analyze the data
- ▶ Download, display and analyze recorded data
- ▶ Create custom views and reports
- ▶ Print reports using standard or custom templates you design
- ▶ Free on-line software upgrades

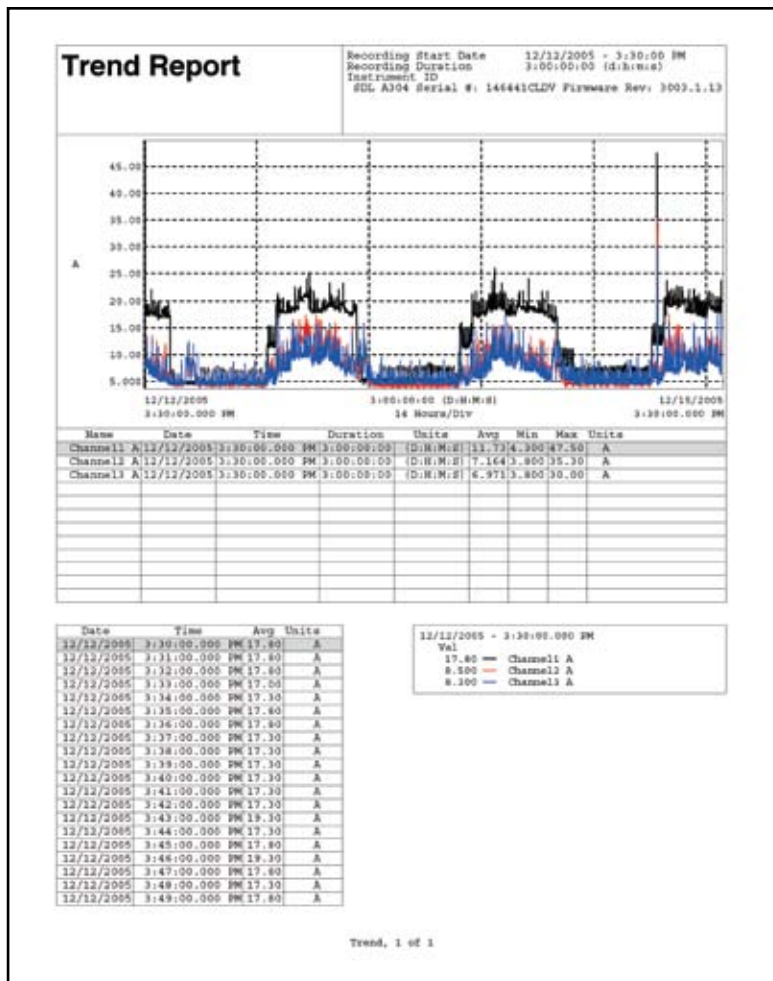


System configuration as well as data retrieval and analysis is easily accomplished using DataView[®] and Sentinel[®] connected to your computer using a USB port.

MINIMUM SYSTEM REQUIREMENTS

*Real-time data is not stored in the logger, but can be stored in your PC on demand.

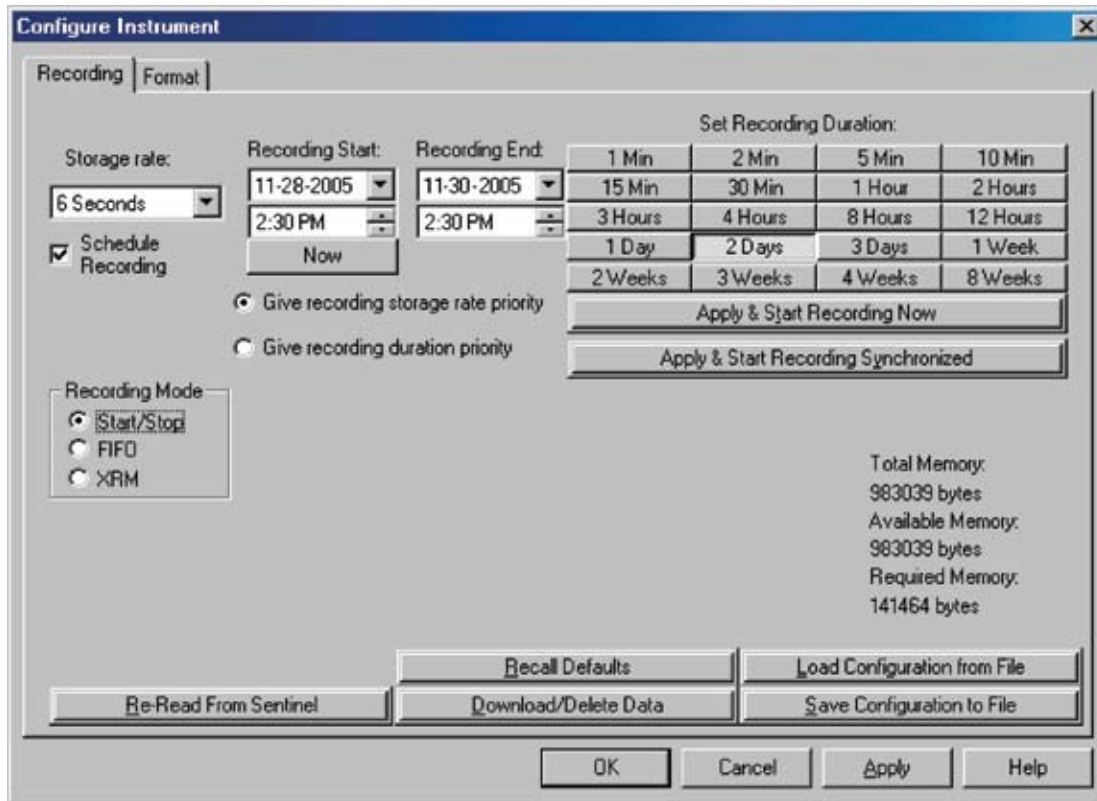
- ▶ Windows[®] 2000/XP/Vista
- ▶ 128MB of RAM for Windows[®] 2000 (256MB recommended)
- ▶ 256MB of RAM for Windows[®] XP
- ▶ 512MB of RAM for Windows[®] Vista
- ▶ 80MB of hard disk space (200MB recommended)
- ▶ CD-ROM Drive



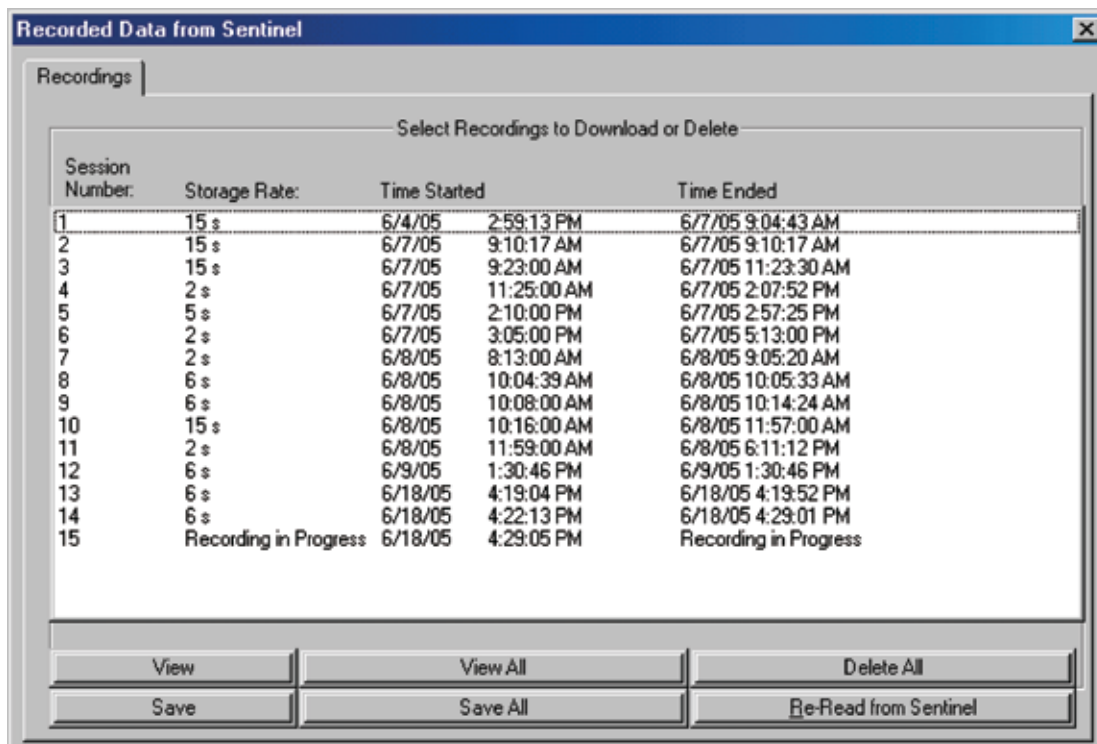
Typical report printout showing graphical text and information from recorded data.

DataView[®] is included with all Sentinel[®] Loggers

DATAVIEW DISPLAYS

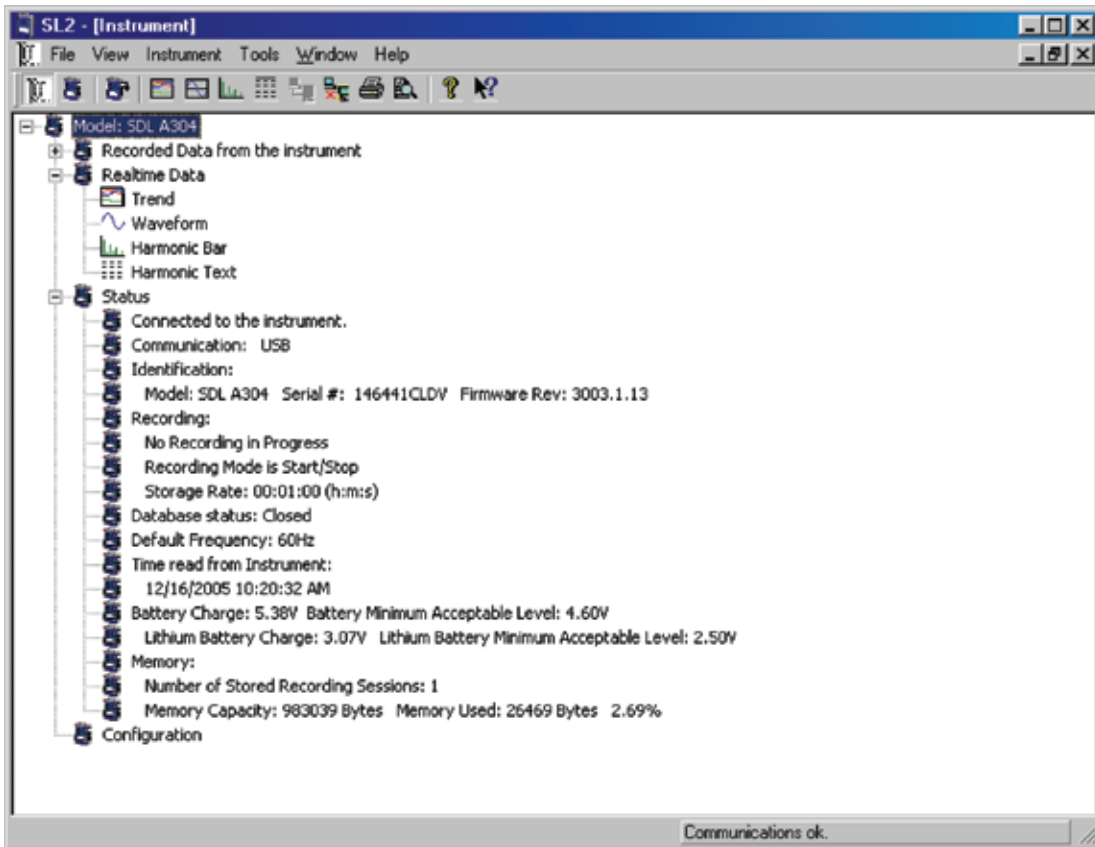


Tabbed configuration dialog boxes allow for easy setup of all recording functions.

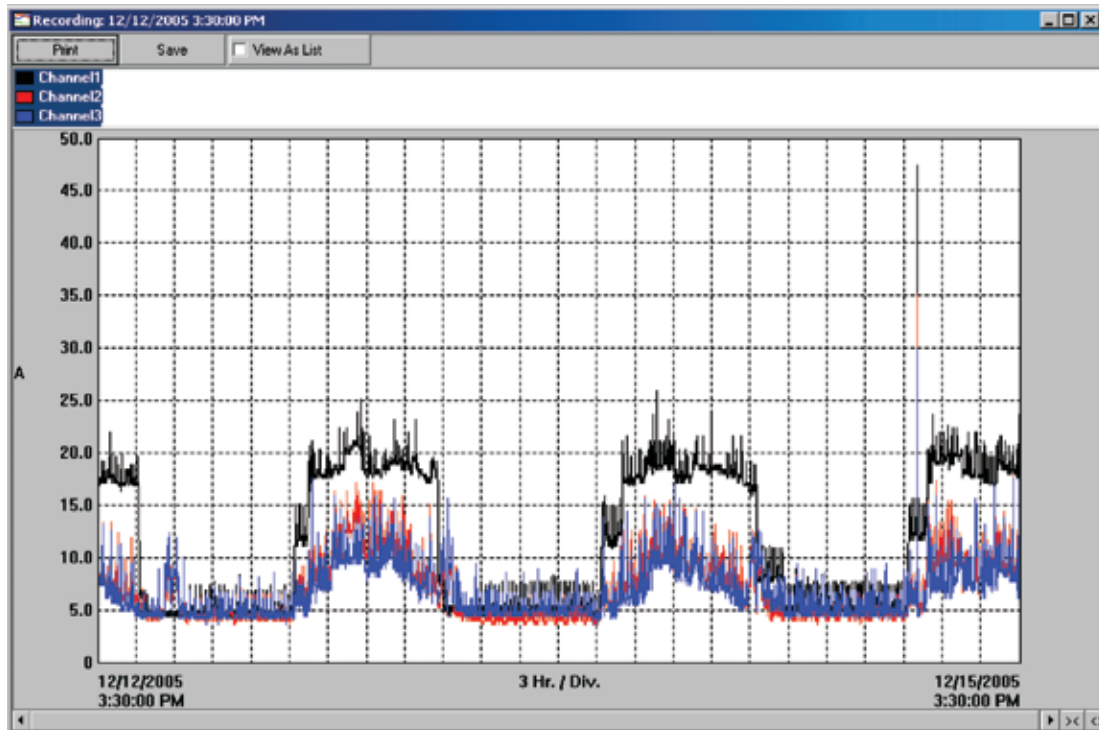


Recorded data dialog box allows clear and easy access to all stored data sessions in the Sentinel® data logger. You can choose an individual session or all sessions to download.

DATAVIEW DISPLAYS

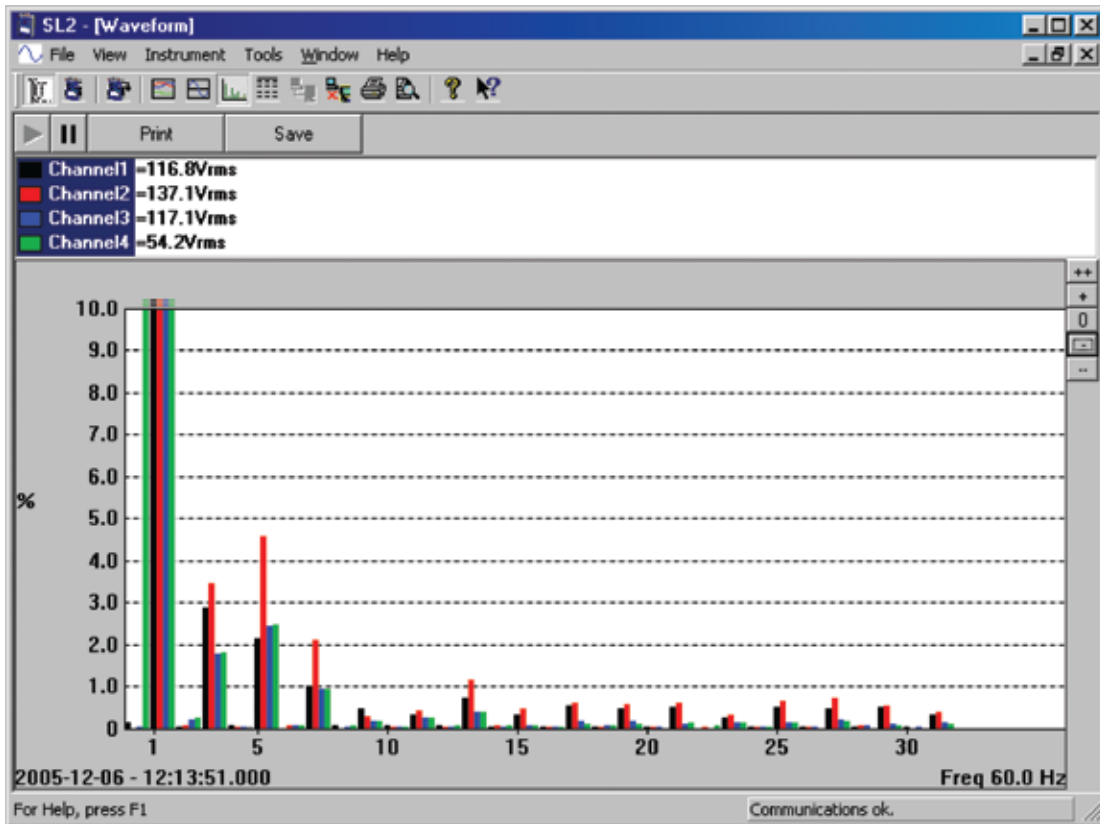


Clear and easy-to-read status update is displayed when DataView® and Sentinel® Loggers connect. From this menu you can view real-time data, download recorded data and configure the Sentinel® Logger.



Typical real-time waveform display of data being monitored or recorded.

DATAVIEW DISPLAYS



Harmonic content displayed in bargraph form in real time using DataView® for any or all inputs.

Waveform

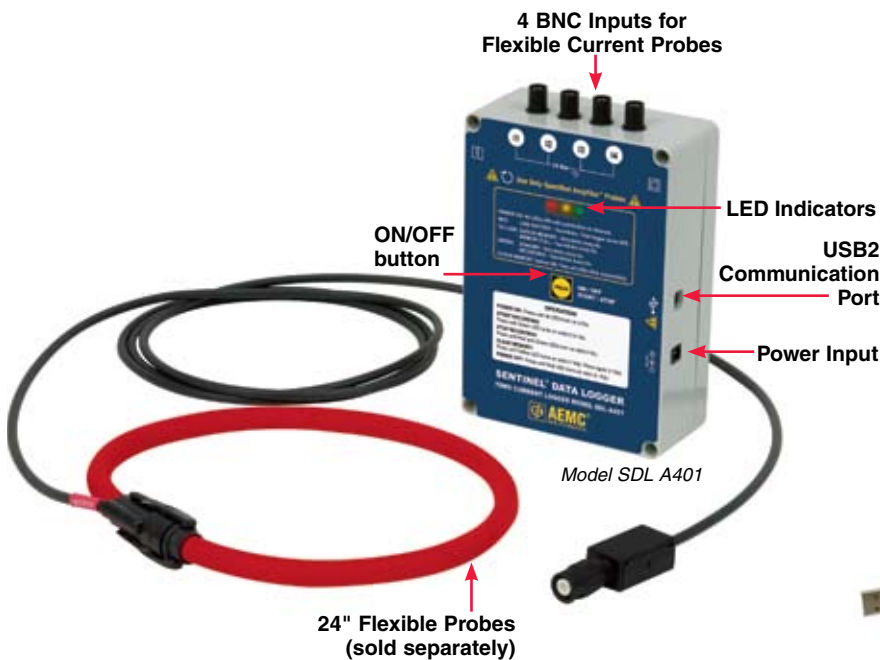
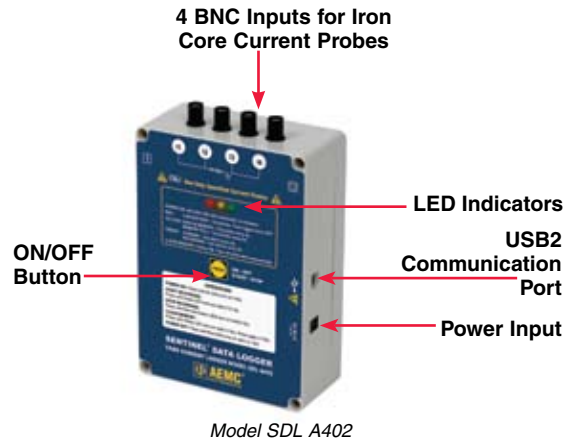
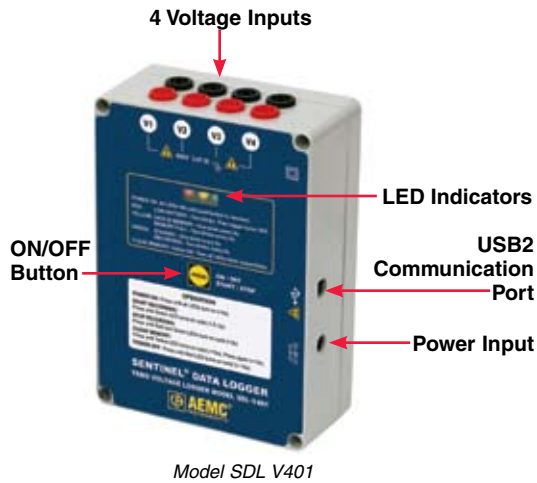
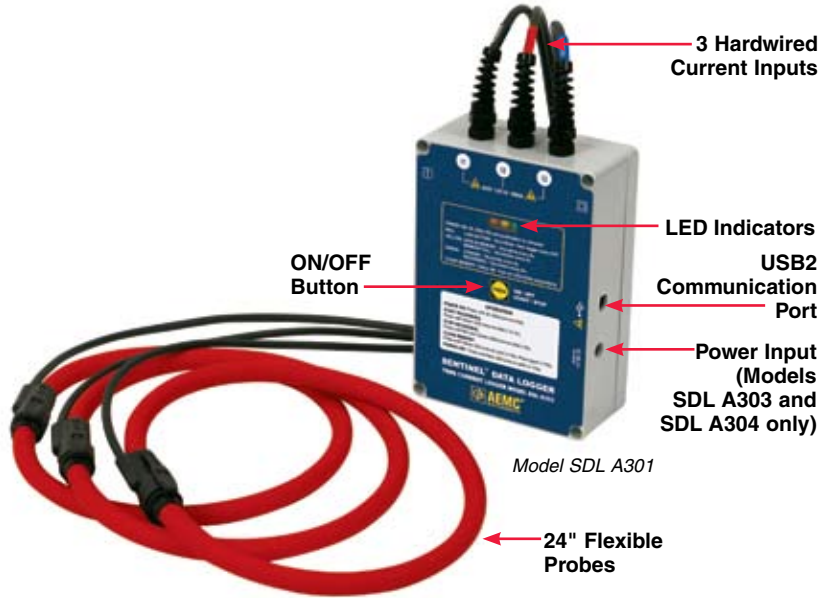
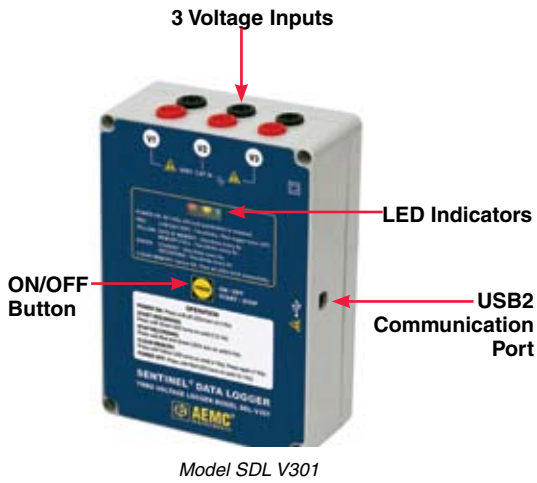
Channel1 =40.00Arms
 Channel2 =1.75Arms
 Channel3 =2.00Arms

	%		%		%		%		%		%
H00	0.4	H01	100.0	H02	0.8	H03	60.1	H04	0.7	H05	22.5
H06	0.4	H07	21.0	H08	1.1	H09	13.6	H10	1.0	H11	12.5
H12	0.6	H13	10.8	H14	0.1	H15	8.8	H16	0.7	H17	8.7
H18	1.4	H19	6.7	H20	0.4	H21	6.8	H22	0.4	H23	6.6
H24	1.0	H25	6.5	H26	0.7	H27	5.3	H28	0.8	H29	6.6
H30	1.0	H31	6.7								

12/16/2005 - 11:10:13.000 AM Freq 60.0 Hz


Harmonic content information can be displayed in a text format for all harmonics out to the 30th.

CONSTRUCTION









ACCESSORIES

AEMC® AmpFlex® Sensors Compatible with Model SDL A401

	Probe Model	Measurement Range		Sensor Length Inches (mm)	Maximum Conductor Size Inches (mm)	Output Connection	Catalog No.
		AC	DC				
	SDL 24-1000A BNC	5 to 1000A		24" (610mm)	8" (190mm)	Lead/BNC	2129.00
	SDL 36-1000A BNC	5 to 1000A		36" (910mm)	11" (290mm)	Lead/BNC	2129.01
	SDL 24-3000A BNC	15 to 3000A		24" (610mm)	8" (190mm)	Lead/BNC	2129.02
	SDL 36-3000A BNC	15 to 3000A		36" (910mm)	11" (290mm)	Lead/BNC	2129.03

AEMC Current Probes Compatible with Model SDL A402

	Probe	Measurement Range		Output Signal Voltage	Maximum Conductor Size		Output Connection	Catalog No.
		AC	DC		∅ Cable	Bus Bar		
	MN103*	1mA to 10A 1 to 100A	–	1mVAC/mAAC 1mVAC/AAC	0.47" (12mm)	N/A	Lead	1031.02
	MN114*	1mA to 10A	–	100mVAC/AAC			Lead	2110.71
	MN251*	0.1 to 240A	–	1mVAC/AAC	0.78" (20mm)	N/A	Lead	2115.77
	MN307*	10mA to 12A	–	100mV/AAC			Lead	2116.23
	MN375*	0.1 to 10A	–	100mV/AAC			Lead	2115.41
	SL201*	50mA to 1.5A 500mA to 120A	50mA to 2A 500mA to 150A	1mV/mAAC/DC 1mV/AAC/DC	0.46" (12mm)	N/A	Lead	1201.40
	SL206*	10mA to 1.5A 50mA to 60A	10mA to 2A 50mA to 80A	1mV/mAAC/DC 10mV/AAC/DC			Lead	1201.45
	SL261	100mA to 10A 1 to 100A	100mA to 10A 1 to 100A	100mV/AAC/DC 10mV/AAC/DC			Lead w/BNC	1201.51
	MD301*	2 to 500A	–	1mVDC/AAC	1.18" (30mm) 2 x 500MCM	2.48 x 0.20" (63 x 5mm)	Lead	1201.07
	MD314*	4 to 500A	–	1mVAC/AAC			Lead	2110.75
	SR652*	0.1 to 1000A	–	1mVAC/AAC	2.05" (52mm)	1.96 x 0.19" (50 x 5mm)	Lead	2113.46
	SR752*	0.1 to 1000A	–	1mVAC/AAC			Lead	2116.32
	SR759*	1mA to 1A 10mA to 10A 0.1 to 100A 1 to 1000A	–	1000mVAC/AAC 100mVAC/AAC 10mVAC/AAC 1mVAC/AAC			Lead	2116.33
	MR461	0.2 to 40A 0.5 to 400A	0.4 to 60A 0.5 to 600A	10mV/AAC/DC 1mV/AAC/DC	One 1.18" (30mm) Two 0.95" (24mm) 2 x 500MCM	Two 1.2 x 0.4" (31.5 x 10mm)	Lead w/BNC	1200.72
	MR561	0.2 to 100A 0.5 to 1000A	0.4 to 150A 0.5 to 1500A	10mV/AAC/DC 1mV/AAC/DC	One 1.5" (39mm) Two 0.98" (25mm)	One 1.96 x 0.49" (50 x 12.5mm) Two 1.96 x 0.19" (50 x 5mm)	Lead w/BNC	1200.73

Consult AEMC® Instruments for other probe selections.

Note: Leads are attached and not shown in above Current Probe images.

Output Terminations



Lead with BNC:
Insulated 6.5 ft (2m) coaxial cable with insulated BNC connector rated 600Vrms



Lead:
Double/reinforced 5 ft (1.5m) lead with safety 4mm banana plug



*Requires Banana Plug (female) to BNC (male) to connect the probe to the logger (below).
Catalog # 2118.46

COMPARISON CHART

MODEL	SDL V301	SDL V401	SDL A301	SDL A302	SDL A303	SDL A304	SDL A401	SDL A402
Input Type	AC/DC Volts	AC/DC Volts	AC Amps	AC Amps	AC Amps	AC Amps	AC Amps	AC/DC Amps
AC Range	0 to 600V _{AC}	0 to 600V _{AC}	5 to 1000A	15 to 3000A	5 to 1000A	15 to 3000A	5 to 1000A or 15 to 3000A, sensor dependent	Probe dependent
DC Range	0 to 850V _{DC}	0 to 850V _{DC}	–	–	–	–	–	Probe dependent
Resolution	0.1V	0.1V	0.1A	0.25A	0.1A	0.25A	0.25A	Probe dependent
Input Termination	Recessed banana jacks	Recessed banana jacks	Hard-wired flexible CTs	Hard-wired flexible CTs	Hard-wired flexible CTs	Hard-wired flexible CTs	BNC	BNC
No. of Inputs	Three	Four	Three	Three	Three	Three	Four	Four
Sample Rate	64 samples/cycle	64 samples/cycle	64 samples/cycle	64 samples/cycle	64 samples/cycle	64 samples/cycle	64 samples/cycle	64 samples/cycle
Memory Capacity	(1MB) 480,000 measurements	(1MB) 480,000 measurements	(1MB) 480,000 measurements	(1MB) 480,000 measurements	(1MB) 480,000 measurements	(1MB) 480,000 measurements	(1MB) 480,000 measurements	(1MB) 480,000 measurements
Power Source	Alkaline batteries	AC power/ NiMH batteries	Alkaline batteries	Alkaline batteries	AC power/ NiMH batteries	AC power/ NiMH batteries	AC power/ NiMH batteries	AC power/ NiMH batteries
Battery Life	100 hours to 90 days	Power ride through 10 hours	100 hours to 45 days	100 hours to 45 days	Power ride through 10 hours	Power ride through 10 hours	Power ride through 10 hours	Power ride through 10 hours
What's Included	Six color-coded leads, DataView® software, batteries, user manual	Eight color-coded leads, DataView® software, batteries, 120V wall charger, user manual	Three hard-wired flexible CTs, DataView® software, batteries, user manual	Three hard-wired flexible CTs, DataView® software, batteries, user manual	Three hard-wired flexible CTs, DataView® software, batteries, 120V wall charger, user manual	Three hard-wired flexible CTs, DataView® software, batteries, 120V wall charger, user manual	DataView® software, batteries, 120V wall charger, user manual	DataView® software, batteries, 120V wall charger, user manual

ORDERING INFORMATION	CATALOG NO.
Sentinel® Voltage Logger Model SDL V301 (3-Channel, 600V _{AC} , three color-coded leads and alligator clips, four C-cell batteries)	Cat. #2134.10
Sentinel® Voltage Logger Model SDL V401 (4-Channel, 600V _{AC} , four color-coded leads and alligator clips, rechargeable NiMH batteries, 120V US wall charger)	Cat. #2134.11
Sentinel® Current Logger Model SDL A301 (3-Channel, 1000A _{AC} , 24" AmpFlex® attached, four C-cell batteries)	Cat. #2134.15
Sentinel® Current Logger Model SDL A302 (3-Channel, 3000A _{AC} , 24" AmpFlex® attached, four C-cell batteries)	Cat. #2134.16
Sentinel® Current Logger Model SDL A303 (3-Channel, 1000A _{AC} , 24" AmpFlex® attached, rechargeable NiMH batteries, 120V US wall charger)	Cat. #2134.17
Sentinel® Current Logger Model SDL A304 (3-Channel, 3000A _{AC} , 24" AmpFlex® attached, rechargeable NiMH batteries, 120V US wall charger)	Cat. #2134.18
Sentinel® Current Logger Model SDL A401 (4-Channel, for use with AmpFlex® sensors with BNC Output, rechargeable NiMH batteries, 120V US wall charger) (Sensor not included)	Cat. #2134.19
Sentinel® Current Logger Model SDL A402 (4-Channel, for use with Iron Core 1V current probes with BNC Output, rechargeable NiMH batteries, 120V US wall charger) (Current probes not included)	Cat. #2134.20
Sentinel® Current Logger Model SDL A401 Kit (4-Channel, three 1000A 24" AmpFlex® with BNC Output, rechargeable NiMH batteries, 120V US wall charger, carrying bag)	Cat. #2134.21
Sentinel® Current Logger Model SDL A401 Kit (4-Channel, four 1000A 24" AmpFlex® with BNC Output, rechargeable NiMH batteries, 120V US wall charger, carrying bag)	Cat. #2134.22
Sentinel® Current Logger Model SDL A401 Kit (4-Channel, three 3000A 36" AmpFlex® with BNC Output, rechargeable NiMH batteries, 120V US wall charger, carrying bag)	Cat. #2134.23
Sentinel® Current Logger Model SDL A401 Kit (4-Channel, four 3000A 36" AmpFlex® with BNC Output, rechargeable NiMH batteries, 120V US wall charger, carrying bag)	Cat. #2134.24
Accessories (Optional)	
Set of one black and one red leads with alligator clips	Cat. #2118.51
Banana (Female) – BNC (Male) Adapter (XM-BB)	Cat. #2118.46
Bag – Large Classic Tool Bag	Cat. #2133.71
AmpFlex® Model SDL 1000A 24" with BNC for use with Model SDL A401	Cat. #2129.00
AmpFlex® Model SDL 1000A 36" with BNC for use with Model SDL A401	Cat. #2129.01
AmpFlex® Model SDL 3000A 24" with BNC for use with Model SDL A401	Cat. #2129.02
AmpFlex® Model SDL 3000A 36" with BNC for use with Model SDL A401	Cat. #2129.03



Call the AEMC® Instruments Technical Assistance Hotline for immediate consultation with an applications engineer: **(800) 343-1391**

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