

## VR101S Voltage Event Recorder System

Set up, plug in, download, and analyze



Homes, offices, hospitals, and factories depend on electronic devices. And electronic devices depend on good power quality. The Fluke VR101S is the perfect system for catching sags, swells, transients, outages and frequency variations on line voltage at receptacles, where the most sensitive loads are connected.

The VR101S is a starter system that includes a compact VR101 event recorder, an optical interface cable, and EventView™ software that turns your PC into a power quality reporting tool. Additional VR101 event recorders can be purchased individually, so you can monitor several voltage conditions at multiple locations at once.

To set up a VR101 event recorder, just enter the event capture limit parameters on your PC and load them into the recorder. EventView software and the optical interface cable make it easy. Then plug the recorder into the outlet you need to test, and leave it—there's no need to leave a computer hooked up. The compact recorder stores any voltage event that goes outside your limits. The VR101 recorder can store up to as many as 4000 events and a flashing LED tells you when events have been captured. The recorder also checks for proper hot and neutral wiring for any grounded outlet.

To get data out of the recorder, hook it back up to your computer. EventView software can download a complete history of the events that occurred while the recorder was plugged into the receptacle. The software lets you build a detailed report of sags, swells, transients, outages and frequency variations with time-stamps and durations.

Your PC communicates to the VR101 through an optical interface cable. This means the PC and VR101 are insulated from each other for safety. The event recorder is self-powered by a 7-year lithium battery, so it is not affected by power outages. Each VR101 Recorder has its own real-time clock for time-stamping voltage events and is identified by a unique factory-assigned code. With their clocks and ID codes, multiple recorders can be placed throughout a facility to give a complete picture of power quality.

Site Report - SN F10953

| Status                       |                               | Events   |  |
|------------------------------|-------------------------------|--|--|
| Hot to Neutral Thresholds    |                               | Frequency Thresholds   |  |
| Swell Voltage [Vrms]:        | 130                           | Minimum (Hz):  | 58.8                                   |
| Sag Voltage [Vrms]:          | 105                           | Maximum (Hz):  | 61.2                                   |
| Transient Deviation (V):     | 90                            | <input type="radio"/> 50 Hz                                    | <input checked="" type="radio"/> 60 Hz |
| Neutral to Ground Thresholds |                               | Options:   |  |
| Swell Voltage [Vrms]:        | 3                             | <input checked="" type="radio"/> Stop Recording When Full      |  |
| Transient Deviation (V):     | 50                            | <input type="radio"/> Overwrite Oldest Events When Full        |  |
| RealTime                     |                               | <input checked="" type="checkbox"/> Flash when Events Captured |  |
| Line Frequency (Hz):         | 0                             | Logger Info  |  |
| Line Voltage [Vrms]:         | 0                             | 18 Events Recorded:  |  |
| Ground Voltage [Vrms]:       | 0                             | from 10/23/96 9:14:08 AM                                       |  |
|                              |                               | to 11/15/96 12:17:28 PM.                                       |  |
|                              |                               | VER-001 Firmware Version 4                                     |  |
| User Names:                  |                               |  |  |
| Site Description:            | Fluke Corp / receptacle P4/19 |  |  |
| File Name:                   | C:\EV101\ZTEST#1.VER          |  |  |
| Default Setup                |                               | Save as Default Setup  |  |
| Send Setup/Clear Logger      |                               |  |  |

Site Report - SN F10953

| Status  |                      | Events           |          |                          |
|---------|----------------------|------------------|----------|--------------------------|
| Event # | Start Time           | Event            | Extreme  | End time/Duration/Degree |
| 0       | 11/15/96 12:15:44 PM | Outage           | 0 Vrms   | Open Event               |
| 18      | 11/15/96 12:15:44 PM | 9 N-G Transients | -469 Vp  | 271°                     |
| 17      | 11/15/96 12:15:36 PM | 9 H-N Transients | +414 Vp  | 91°                      |
| 16      | 10/25/96 8:51:36 AM  | Outage           | 0 Vrms   | 11/15/96 12:15:28 PM     |
| 15      | 10/25/96 8:51:20 AM  | Outage           | 0 Vrms   | 00:00:08                 |
| 14      | 10/25/96 8:46:40 AM  | Low Frequency    | 58.8 Hz  | 0.5 cycles               |
| 13      | 10/25/96 8:44:08 AM  | Outage           | 0 Vrms   | 00:02:32                 |
| 12      | 10/25/96 8:44:00 AM  | Outage           | 0 Vrms   | 7.5 cycles               |
| 11      | 10/25/96 8:43:52 AM  | N-G Swell        | 26 Vrms  | 22.0 cycles              |
| 10      | 10/25/96 8:43:44 AM  | H-N Sag          | 86 Vrms  | 17.5 cycles              |
| 9       | 10/25/96 8:43:44 AM  | H-N Swell        | 141 Vrms | 16.0 cycles              |
| 8       | 10/25/96 8:43:44 AM  | 1 N-G Transient  | +414 Vp  | 330°                     |
| 7       | 10/25/96 8:43:36 AM  | 1 N-G Transient  | -405 Vp  | 266°                     |
| 6       | 10/25/96 8:43:36 AM  | 1 N-G Transient  | +423 Vp  | 111°                     |
| 5       | 10/25/96 8:43:36 AM  | 1 H-N Transient  | -1049 Vp | 278°                     |
| 4       | 10/25/96 8:43:36 AM  | 1 H-N Transient  | +561 Vp  | 259°                     |
| 3       | 10/25/96 8:43:28 AM  | 1 H-N Transient  | 929 Vp   | 100°                     |

## Specifications

**Memory size:** 4000 events

**Battery type:** 3.5V lithium (non-replaceable)

**Battery life:** 7 years

**Electrical** (voltage versions, plug style, and manual languages are determined by country)

| Voltage Version | Operating Range | Nominal Frequencies | Power Consumption |
|-----------------|-----------------|---------------------|-------------------|
| 120V Version    | 70V to 140V     | 50 Hz or 60 Hz      | 2W                |
| 230V Version*   | 140V to 270V    | 50 Hz or 60 Hz      | 3W                |

\*Not intended for use on U.S. 240V power systems.

### Sags, Swells and Outage Measurements

| Voltage Version |                   | Range         | Accuracy | Resolution |
|-----------------|-------------------|---------------|----------|------------|
| 120V Version    | Hot-to-neutral    | 0 to 200V rms | ±2V rms  | 1V rms     |
|                 | Neutral-to-ground | 3 to 200V rms | ±2V rms  | 1V rms     |
| 230V Version    | Hot-to-neutral    | 0 to 400V rms | ±4V rms  | 2V rms     |
|                 | Neutral-to-ground | 3 to 120V rms | ±2V rms  | 1V rms     |

### Transient Measurements

|                   | Range                       | Accuracy             | Resolution |
|-------------------|-----------------------------|----------------------|------------|
| Hot-to-neutral    | 100 to 2500V peak           | ±(10% reading + 10V) | 10V        |
| Neutral-to-ground | 50 to 2500V peak            | ±(10% reading + 10V) | 10V        |
| Phase angle       | 20° to 180°<br>200° to 360° | ±1°                  | 1°         |

Minimum pulse width: 1 µs

### Frequency Measurements

| Range       | Accuracy               | Resolution |
|-------------|------------------------|------------|
| 45 to 65 Hz | ±0.1 Hz (3 cycles min) | 0.1 Hz     |

**Time Measurements:** Events < 1 second

|                   | Accuracy    | Resolution |
|-------------------|-------------|------------|
| Hot-to-neutral    | ±0.5 cycles | 0.5 cycles |
| Neutral-to-ground | ± 1 cycle   | 1 cycle    |

**Events ≥ 1 second (time stamp)**

|  | Accuracy              | Resolution |
|--|-----------------------|------------|
|  | ± (2 sec/day + 8 sec) | 8 sec      |

### Mechanical

**Physical size:** 3.35 in x 2.65 in x 1.35 in  
(85 mm x 68 mm x 35 mm)

**Weight:** 4 oz (120g)

### Environmental

**Operating temperature:**

-40 to 160°F (-40 to 70°C)

**Relative Humidity:**

0 to 95% (non-condensing)

**Safety:** CSA listed, CSA-NRTL (to UL 3111) listed, Complies with requirements of EN61010-1:1993. CAT III 300V

### Computer Hardware Requirements

IBM PC or 100% compatible, with Windows® 3.1 or Windows 95 installed and operating

At least one free RS-232 serial port

A pointing device (recommended)

2 MB hard drive space

4 MB RAM (8 MB for Windows 95)



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## Accessories and Ordering Information

### Included Accessories

#### VR101S

VR101 Voltage Event Recorder, Optical interface cable, 9-to-25 pin adapter, EventView Software on two 3 1/2 inch floppies, Users Manual

#### VR101

VR101 Voltage Event Recorder, Instruction Sheet

### Ordering Information

(Note: At least one VR101S is required for proper operation.)

**VR101S** Voltage Event Recorder System

**VR101** Voltage Event Recorder for 120

**Need Technical Assistance? Call:**

**1-800-44-FLUKE**

Toll-free in the U.S.

(800) 36-FLUKE in Canada

(425) 356-5500 other countries

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