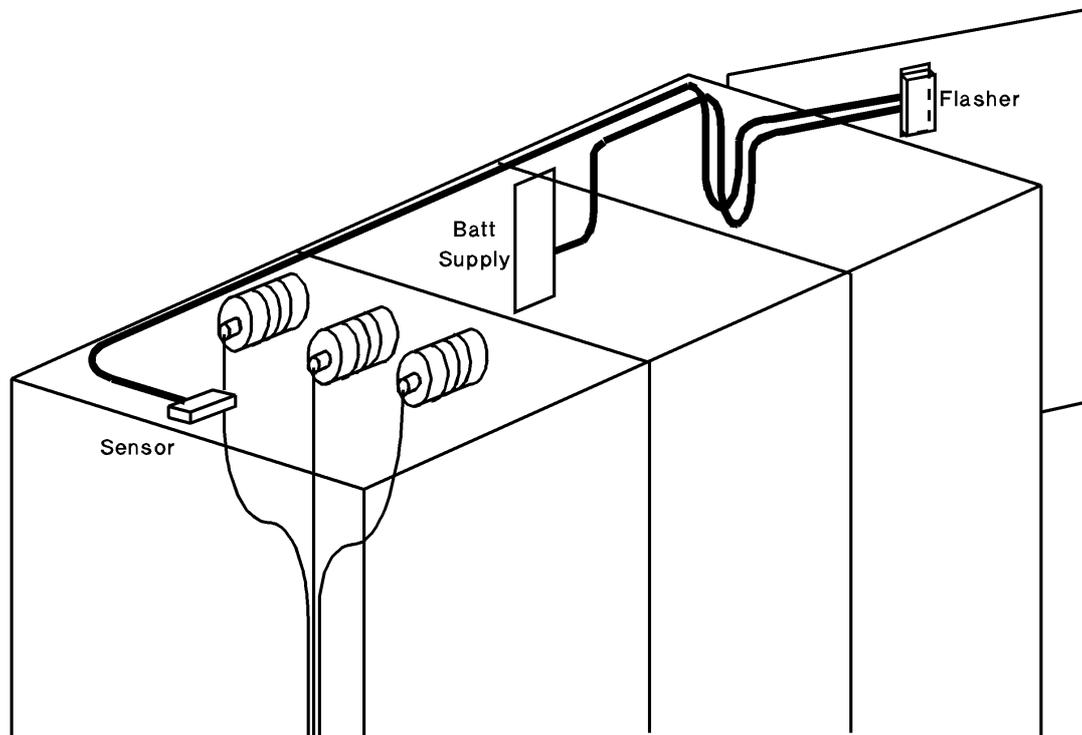


*New indoor and outdoor High Voltage instrumentation transducers
For SAFER electrical environments*

SURETECH™ Cable LIVE Flasher

The SURETECH Cable LIVE Flasher SAFELY measures AC voltage on HV / MV cables, switchgear, transformers, bus-bars etc, and translates the voltage to flash out on a single LED (Light Emitting Diode) what that voltage is. The user can request ONE, TWO or THREE digit resolution, depending on the level of operating staff. The Cable LIVE Flasher senses voltage through cable insulation (but not through earth screens). Besides the flashing LED output, the SURETECH Cable LIVE Flasher can also provide a range of other outputs such as 4-20mA, potential free contacts, data loggers, and RS232. The SURETECH Cable LIVE Flasher does not need VTs (Voltage Transformers) to measure voltage at any level, but rather relies on measuring the electric field around the cable. The SURETECH Cable LIVE Sensor can be fitted with signal processing options for a wide range of applications. In certain circumstances, the CLF can be installed live, without disrupting consumers. Best of all, the SURETECH CLF is value engineered for low cost reliable sensing.



General Features:

- ✓ Capacitively coupled to MV / HV source through air, results in **THE SAFEST POSSIBLE CABLE LIVE MEASUREMENTS**
- ✓ CLF HV sensor enclosure has resin potted components for long life and reliability, dimensions: 80x50x25mm
- ✓ CLF flasher is single hole mounted to the inside of a panel, dimensions: 100x50x25mm
- ✓ Integral cable connection facilitates "Plug-and-play" installation
- ✓ Transient suppression protects sensor against lightning and fault induced transients
- ✓ Wide selection of input and output options including LED flasher, logic, analogue and RS232
- ✓ Wide selection of auxiliary power supply options
- ✓ Galvanically isolated from HV source
- ✓ Accuracy is around 2%, and even better where environmental stability is maintained
- ✓ Frequency accuracy 0.01%
- ✓ For use on 50Hz and 60Hz systems
- ✓ Engineering backup to provide you support for design, applications information, installation & calibration, maintenance
- ✓ Patent pending

Typical Applications:

- ✓ Cable LIVE sensing for normal MV / HV operational cross-checks
- ✓ Cable LIVE sensors for the detection of cable theft
- ✓ Cable LIVE sensor for indication and protection
- ✓ Cable LIVE sensors for switch interlocks
- ✓ Safety interlocks in HV / MV panels
- ✓ Phase rotation sensor configuration available
- ✓ Sync signals for generator synchronisation configuration available
- ✓ HV / MV panel voltage alarms (upper & lower)
- ✓ HV / MV line re-closer or tap-changer voltage control
- ✓ HV / MV panel voltage measurements
- ✓ HV / MV frequency counter
- ✓ HV / MV Line fault location
- ✓ Measure voltage on the rotor of a motor or generator as it spins
- ✓ Monitor and measure induced voltages on power circuits.

Mounting arrangement:

- ✓ CLF flasher is mounted to the front panel with one hole; this bolt includes the flashing LED
- ✓ CLF sensor is mounted symmetrically inside the MV chamber on an earthed panel (top or rear), and close to the MV cables
- ✓ The interconnect cable is tied away from HV cables to interface CLF sensor to CLF flasher
- ✓ Round plug-in connector is provided to interface CLF sensor to flasher
- ✓ Battery supply must be supplied to CLF flasher screw terminals (cable not supplied)

Flasher Output Operation:

The user can select either 1, or 2, or 3 digit resolution. Output is a string of LED flashes (**F**), separated by one second delay between digits (s...), and three seconds delay between readings (s...s...s...). The operator simply counts the number of flashes (**F**) to determine the voltage. A zero is flashed out as a very short flash **f**. The CLF can be ordered to be factory or field programmed for 1, 2, or 3 digit resolution

- ✓ E.g. if the CLF is programmed to 1 digit, and the voltage is say 80%, the CLF would flash as follows:
 - ✓ **FFFFFFFF** s...s...s... **FFFFFFFF** s...s...s... [repeated]
- ✓ E.g. if the CLF is programmed to 2 digits, and the voltage is say 73%, the CLF would flash as follows:
 - ✓ **FFFFFFFF** s... **FFF** s...s...s... **FFFFFFFF** s... **FFF** s...s...s... [repeated]
- ✓ E.g. if the CLF is programmed to 3 digits, and the voltage is say 11,4kV, the CLF would flash as follows:
 - ✓ **F** s... **F** s... **FFFF** s...s...s... **F** s... **F** s... **FFFF** s...s...s... [repeated]

Advantages of CLF:

- ✓ CLF can differentiate between induction on the cable, or back-fed voltage
- ✓ CLF can differentiate between three phases alive, from only one phase alive
- ✓ Accurate voltage measurements can be made, even to determine brown-out levels, and QOS pre-checks
- ✓ Even when the cable is de-energized, the user can know that the CLF is still healthy
- ✓ Lesser skilled people dispatched to an MV substation should be able to count and report flash counts over the radio / telephone etc.
- ✓ Unskilled labour could tell the boss whether the unit is flashing AT ALL
- ✓ Easy installation for new or retrofit equipment
- ✓ Ultra SAFE, Ultra low cost measurements for a **SAFETY CRITICAL APPLICATION**

ONE sensor covers all voltages

For outdoor applications, the CLF sensor should be ordered as the SURETECH ODLLS (Out Door Live Line Sensor). For indoor applications, the SURETECH Voltage Proximity sensor is used.

Only the mounting distance changes for different voltages: the following distances are coarsely calibrated by mounting distance. Fine calibration by means of PC interface at factory OR in field.

Voltage	Nominal mounting distance
3.3 kV	50 mm
11 kV	150 mm
33 kV	300 mm
66 kV	600 mm
132 kV	1200 mm
400 kV	2500 mm

Outputs Available:

Output type	Options & extras	Ranges
LED Flasher	Standard	1digit OR 2 digit OR 3 digit flasher
Relay contact	High and Low voltage thresholds / alarms	Factory OR field settable
Opto-Isolated transistor	High and Low voltage thresholds / alarms	Factory OR field settable
Analog current	0-1mA, 5mA, 20mA, 4-20mA	Drive PLCs etc.
Data logger	1Mbyte data flash memory in CL Flasher	~1 year time stamped info
RS232	Voltage, frequency, phase angle	PC GUI software available

Power Supply Options:

Auxiliary Power Supply	Tolerance	Power requirement
Battery	10 Vdc to 35Vdc	1 Watt
90-260 Vac (50 / 60 Hz)	+/-15%	1 Watt

Extended capabilities available:

- ✓ Accurate voltage difference measurements over time
- ✓ Logging of voltage for QOS prechecking
- ✓ High / Low voltage threshold alarms
- ✓ PC RS232 data logging of voltage
- ✓ Harmonic voltage modules available for QOS pre-checking before expensive QOS instruments are deployed
- ✓ PC Graphical User Interface software available for ease of installation, monitoring and PC logging
- ✓ Frequency, phase measurements

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