

SURETECH NEWS

2005

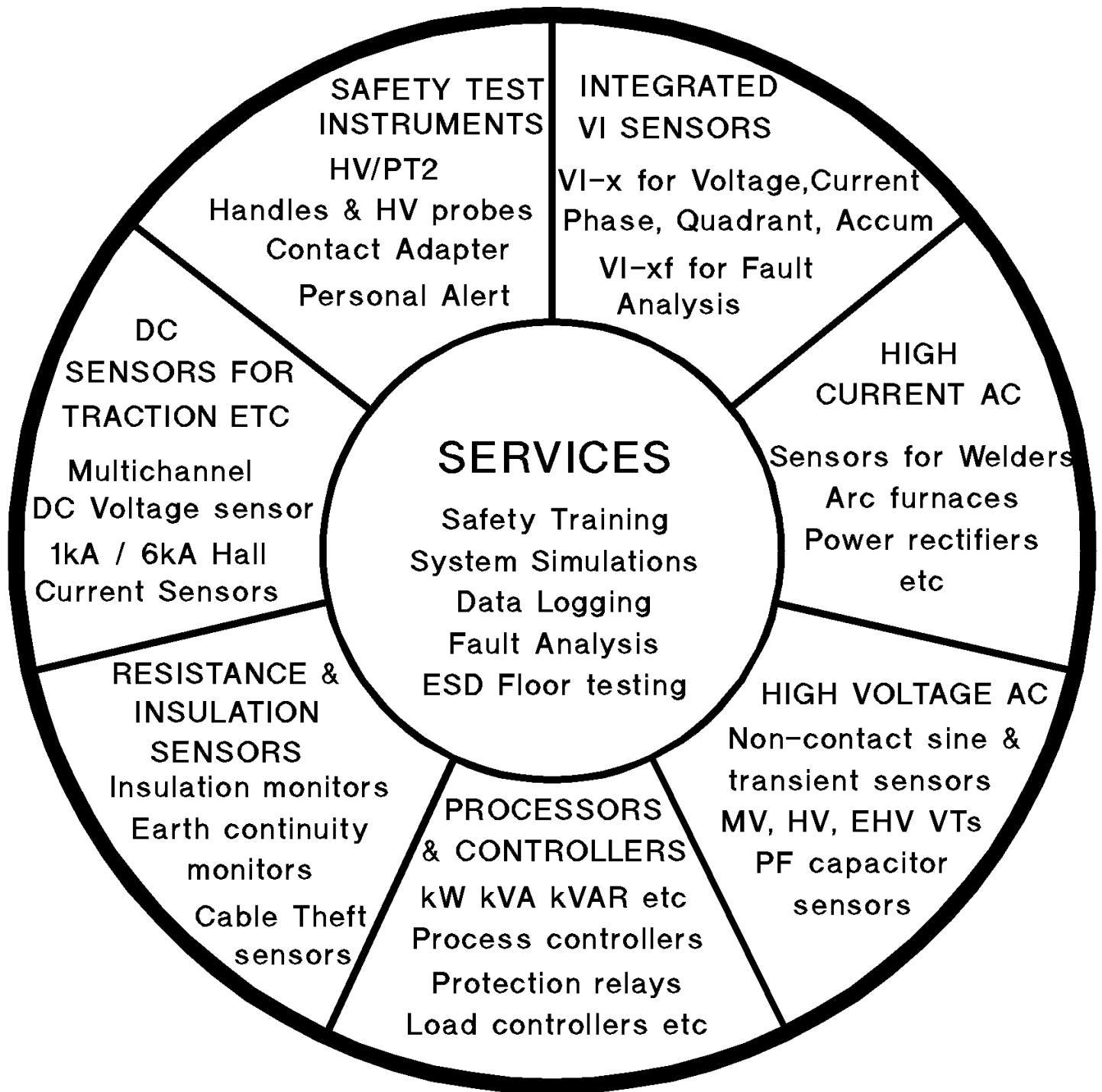


News from SURE Engineering, the High Voltage Instrumentation people

We design and manufacture state of the art voltage and current sensing systems

We welcome your feedback and suggestions for existing and new solutions, so please give us a call. If you would like to receive more information and pricing, please phone us.







SURETECH Product Groups

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Our own SURETECH module range has been developed and extended. We can configure instrumentation systems to satisfy a wide range of customer requirements within the above range of applications. This SURETECH NEWS gives examples of some of the instruments that we have manufactured and delivered. This SURETECH NEWS is also formatted in accordance with this product group structure


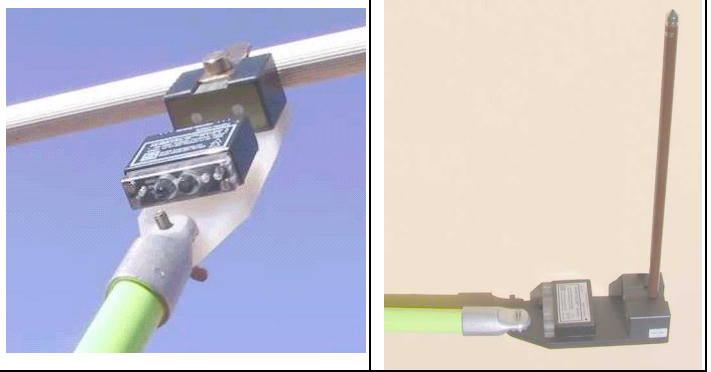

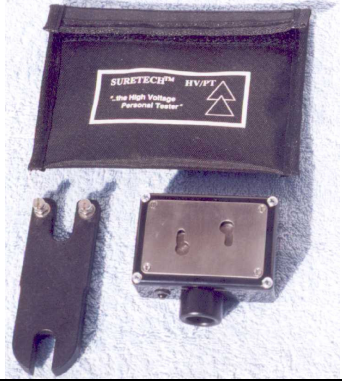

We get a lot of interest in our range of products. Should you want a particular configuration of instrument, please feel free to discuss your needs with us, and place your order on us.

**For more information about anything in this SURETECH NEWS
please feel free to phone:**

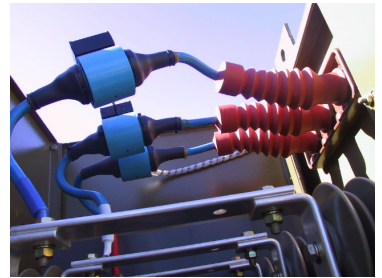

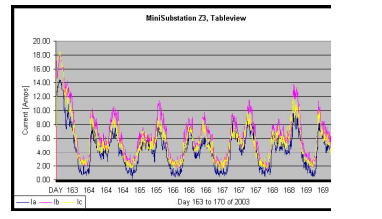
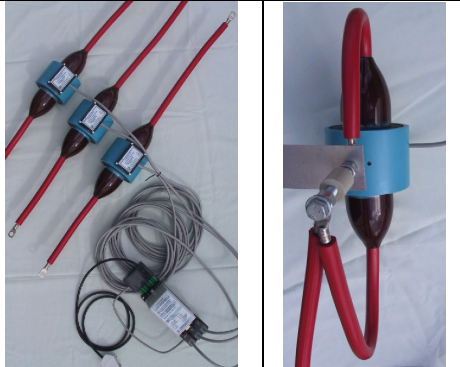

Neil Jeffrey on +27-83-555-0149 or +27-21-701-8529

**Concentrate on working
SAFELY at all times !!**



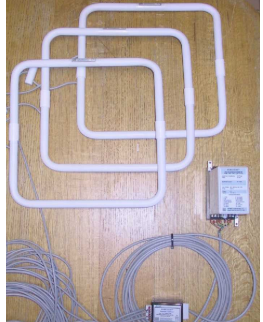



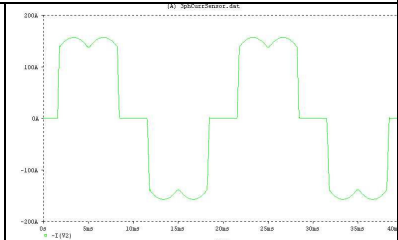
Electrical SAFETY test instruments

PRODUCT	DESCRIPTION	PICTURE
HV/PA the High Voltage Personal Alert	We told you we were working on this product for quite a while now, so here it is and we are very excited about it. The Personal Alert is worn on your wrist like a watch, or on the top of a hard hat, and is ready and waiting at all times to alert the user that he is close to live electrical equipment. There is NO on / off switch, it switches itself on and off to conserve battery life, but it senses all the time. The closer the user gets to the live equipment, the faster the unit flashes and beeps. The Personal Alert has been designed to beep at a rate of 2 times per second at a distance of 800mm at 11kV. The unit can also be used as a guardian angel to continuously monitor a conductor such as an out of commission electrical board, and caution the electrician the moment it becomes energised.	
Contact Adapter kit	For those users who need to make contact when doing electrical testing to meet the requirements of IEC61243-1, we have the HV/PT2 Contact Adapter kit available. Left picture shows the contact terminal, for use on all voltage ranges (11kV, 22kV, 66kV, 132kV). Right picture shows the resistive probe for use on voltages up to 22kV, for indoor MV switchgear and MV panels.	
HV/PT2	This remains South Africa's favourite electrical tester... and orders continue to grow... and we continue to improve QUALITY and reliability; and our market responds with "WE WANT IT!" The HV/PT2 continues to do well in Mexico and South America, with further good orders being shipped there. We have configured the instrument to meet their local voltage range requirements. Well done to Suparule SA for their marketing efforts!	
HV/PT2-L2 TELKOM Testers	Telkom has demonstrated their acceptance of the HV/PT2-L2, which we configured specially to meet their needs. The L2 tester is a simple unit that has one button to switch the unit on, and after a time of non-use, it automatically powers itself down.	
Reference Generator	Belt carried, battery powered proving unit is available to check whether the HV/PT2 is operating or not (even on the 132kV setting). The hand held, battery operated unit is carried in a pouch on the user's belt. Normally when a live line test is required, the tester needs to be proven on a known live source, the test is then made, and then followed by a third test on the known-live source again. But in the field sometimes there is no known live source of voltage; so this is where the portable proving unit is invaluable	

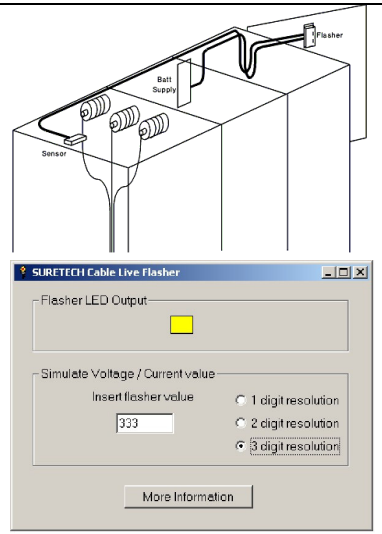


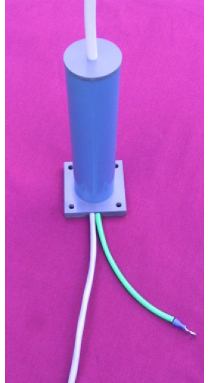
Integrated voltage and current sensing and processing systems

PRODUCT	DESCRIPTION	PICTURE
VI-x Sensor for Voltage, Current, and all other electrical parameters	<ul style="list-style-type: none"> Ultra SAFE, Ultra compact, Ultra cost-effective Technology can be used on MV voltages from 1kVac to 33kVac (11kV & lower available now) Existing cable can be used, or add-in cable to mount sensors Cable lengths can be supplied to users requirements with integrated sensors Can be configured for metering and protection from ONE sensor. (e.g. typical fault current FSD can be around 50 times higher than rated FSD) Withstands any level of fault current indefinitely without damaging sensor Immune to lightning discharges e.g. 95kV on 11kV cables Cylindrical sensor has resin potted components for long life, and stability. Maximum electric field strength is less than 1kV per mm, so partial discharge should not be present in sensor Integral cable connections between sensors and LV panel mounted SLP (Smart Load Processor) SLP is DIN rail clip on, and can be powered from a wide range of PSU sources (90-260Vac / dc or battery) Transient suppression on input and outputs Wide selection of input and output options including relays, opto-isolated, analogue and RS232, opto isolated, GSM etc. Galvanic isolation from HV source Isolation from HV source to earth can be pressure tested to 2.5 times operating voltage 	
		
		
VI-X data handling system	<ul style="list-style-type: none"> Output record rate is once per second: data output is: year, day number, time, temperature, sampling period, V, I, Ph, Quadrant, Acc VA, Watts, and VARs 1Mbyte data flash memory sampling periods can be set: 1, 2, 5, 10, 15, 20, 30 and 60 minutes A website is available to authorised end users who can obtain this information on-line. Call us to view this website NOW! 	<pre> 2003 220 23:59:00 T=015 DFct=0 U=4153 3706 3744 I=03254 03258 UAs=02710 05981 02405 44492 0 Wat=02577 16919 02223 13990 0 VAR=64903 08225 64793 36610 6 2003 221 00:00:00 T=015 DFct=0 U=4157 3710 3744 I=03257 03257 UAs=02758 25791 02448 55008 0 Wat=02623 12459 02263 05572 0 VAR=64891 55162 64780 13797 6 </pre>
VI-F	<ul style="list-style-type: none"> The first VI sensing system for fault location and analysis on MV has been installed on a coal mine to monitor power system transients VI-F uses the same hardware as the VI-X system, but captures V, I, Ph and Quadrant with 1 second sampling Data flash memory rolls over after 9 hours Data collection via modem, GSM, or PC download Picture on right shows retrofitted VIxf sensor easily fitted to an existing cable termination 	
Slip-On sensors	<ul style="list-style-type: none"> Slip the sensor over an insulated LV or MV cable to measure voltage and / or current These have been deployed to do a range of functions, like current indications, cable theft sensors measuring either voltage or current through the cable; motor protection sensors for MV motors Slip-On sensor is the budget version of the VI-X / F sensors 	




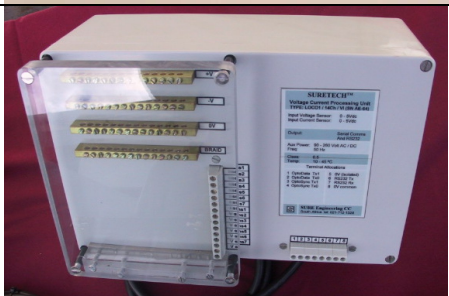

High current AC sensors for arc furnaces, welders and current protection

PRODUCT	DESCRIPTION		PICTURE
High Current AC sensor for fixed Bus-Bars	The picture shows the three Rogowski Coil sensors. The coils are of the fixed core type orientated to detect current passing through any cable or conductor dimensioned as flat bus-bars. Each sensor has a screened twisted pair cable connected to the signal processing module. These units were calibrated for 8000Amps FSD, and have extremely linear response over the full range.		
Extremely High current AC sensors from 10kA to hundreds of kA AC, using split core fixing	<p>APPLICATIONS INCLUDE:</p> <ul style="list-style-type: none"> • Large LV & MV motors • Arc furnaces • LV & MV substation fault current alarms • LV & MV substation fault current protection relays • LV & MV substation current meter indication • LV & MV line monitoring of current • Laboratory current measurements • High current seam welding machines • High current spot welding machines • Safety interlocks in HV substations 		
Quick Easy Low cost AC current monitoring, using split core fixing	<ul style="list-style-type: none"> • Very compact sensing coils can be designed to fit into very tight space constraints • They provide a very cost effective option to measure very high ac currents • Very wide range of currents can be catered for • Accurate with stable operating environment • Ultra Linear, Ultra SAFE 		
Tight spaces, very high current, using split core fixing	Control unit receives analog processed signals from Rogowski signal conditioners, which in turn receives raw signals from the Rogowski coils. Signals including amplitude, phase, and wide band harmonic information. A wide range of options for processing functions is available such as precision rectifiers, frequency (harmonic) analysers, analog to digital samplers, RS232 outputs, data loggers, threshold detectors, smart communications, process controllers, etc		
AC Rogowski sensors for DC applications	Shown to right is the current wave form into a 3 phase rectifier. Phase 2 and 3 currents are the same, but shifted in time (phase). By measuring this AC current, and processing this signal in our SLP (Smart Load Processor) we measure DC current with AC sensors. Rogowski sensors have wide bandwidth to handle these waveforms. Talk to us about these advantages.		


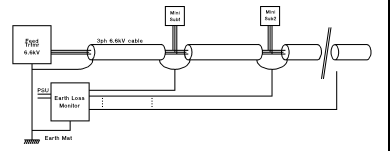




High voltage AC sensors for measurement of sine and transient parameters

PRODUCT	DESCRIPTION	PICTURE
Cable Live Flasher Voltage sensor in MV chambers **NEW**	<ul style="list-style-type: none"> Indicates voltage on MV / HV cable end boxes & chambers Single LED provides 1 or 2 or 3 digit flasher output for accurate voltage monitoring: mounted on LV chamber door / front panel; uses ONE M10 bolt with locknut Feed from sensor near HV, via 5m screened cable with RJ11 plug clicks sensor to Flasher together RS232 interface to PC for voltage logging and QOS monitoring <ul style="list-style-type: none"> Voltage scaled to any FSD value 1 or 2 or 3 digit flasher LED output selection Voltage threshold settable for alarms Real time clock synchronised to HV mains PSU: substation battery 10V to 40V; 1W; screw terminals FREE! Windows program to teach personnel about CLF Ultra SAFE, ultra quick installation, ultra linear, ultra low cost 	
HV/PPS the High Voltage Pulse Peak Sensor	<p>PULSE PEAK and SINE VOLTAGE MEASUREMENTS MADE WITHOUT PHYSICAL CONTACT</p> <ul style="list-style-type: none"> Accurate HV pulse peak impulse measurements used for: Cable and cord insulation pulse testing Laboratory HV and transient voltage measurements Lightning impulse measurements to hundreds of KV Safety interlocks in production equipment <p>(Ask us about our repeat exports to a large California electronics company deployed in their cable manufacturing & test facility)</p>	
Outdoor Live Line Voltage (proximity) sensors	<p>These Live Line Proximity Sensors are orientated to outdoor voltage measurement applications. Capacitance between HV source and sensor must remain fixed, so voltage is accurately measured via capacitive coupling. Accuracy of measurement is almost entirely dependant on the stability of this free space capacitance. Can be used to measure 50/60Hz applications, and can also be configured for transient applications such as lightning, surge and transient measurements, and impulse testing</p>	
Power Factor Capacitor - AC and DC Voltage Monitor	<p>The SURETECH Power Factor Capacitor Voltage Monitor measures various parameters on PF capacitors such as DC voltage, AC voltage, Phase rotation. These measurements enable users to make an assessment of the state of safety of personnel working on the equipment. Before working on, or coupling MV boards or cables, it is necessary to determine whether the capacitors are energized from AC AND / OR DC voltage</p>	

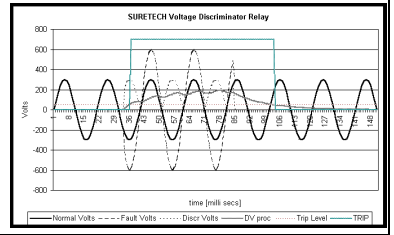
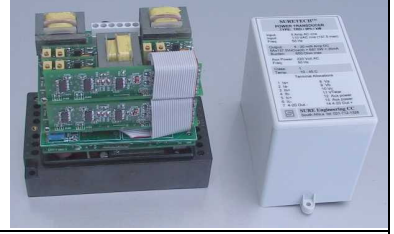
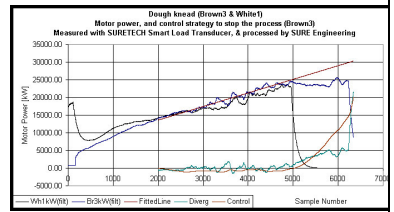

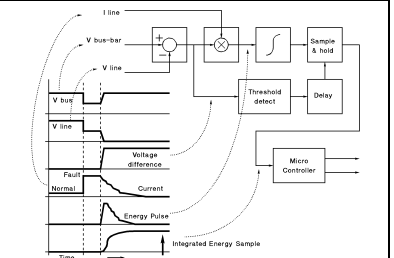
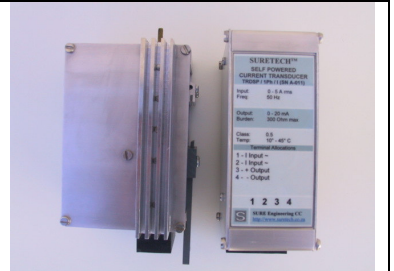
DC sensors for railway, traction and other DC applications

PRODUCT	DESCRIPTION	PICTURE
DC Voltage and Current Sensing System for locomotives	SURETECH HECS and DC Voltage Sensors forms the backbone of a locomotive control system. Shown are 6x 1kA current sensors, 7x 3kV voltage sensors, 1x 6kA current sensors. Each of 6 motors is individually monitored for V, I, and power, signals marshalled through a receiver module (top right), fed through 15kV galvanically isolated link, and distributed to 4-20mA outputs	
Hall Effect Current Sensor (HECS)	SURETECH HECS uses the Hall effect to sense current. The Hall effect sensor is used to sense the magnetic field within a gapped iron core. Magnetic field shaping and shielding of the gap is provided. This shaping and shielding also eliminates the effects of stray fields. Input and output current has galvanic isolation. In the event of fault conditions, the magnetic core saturates but does not damage the sensor. If required for retrofitting, then a split core system is normally implemented. The magnetic core uses Grain Orientated Silicon Steel. AC harmonic response is also good. The HECS can in general measure AC or DC current on switch-gear, cables etc. The HECS can measure current over an extremely wide range, from less than one amp up to tens of thousands of amps	
DC Voltage Sensor for railway systems	These DC Voltage sensors have a FSD voltage capability of 1kV to tens of kV DC. 3kVDC is shown here. The sensor is encapsulated in a resin insulator, and is equipped with a very special high voltage resistor divider chain. The sensor is powered from our standard isolated power supplies. Any output can be specified which is galvanically isolated from the input circuit.	
Multi-channel Current and Voltage Sensors	Processor for multi-channels (14x here) of sensors. Any combination of current and voltage sensors are sampled at a rate that exceeds the sampling rate for control systems. All sampled channels are fed through a 15kV (or higher) opto-isolated link to the galvanically isolated output processor	
50kV DC Voltage sensor	50kV dc sensor for process separators and precipitators. Built in surge suppressor operates in this unit at 70kV. Input impedance is 220Mohms. Great care is taken in the frequency response using grading capacitors. Bandwidth is from Zero Hz to 1MHz, so should be useful to accurately measure transients and flash overs. Instantaneous and 4-20ma outputs are available.	

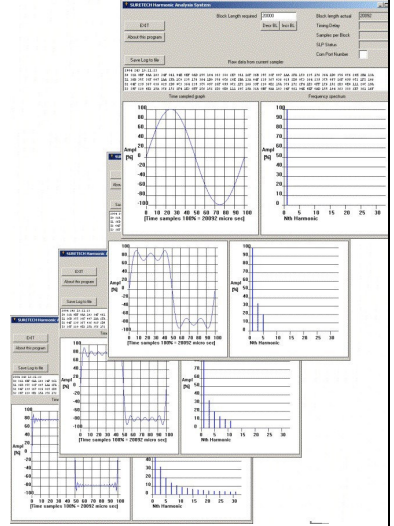
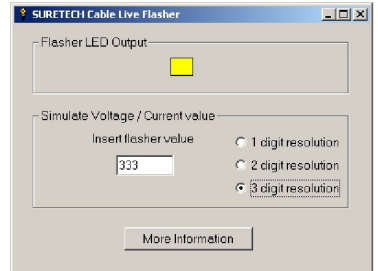
Resistance monitors for detection of Earth loss, and insulation degradation

PRODUCT	DESCRIPTION	PICTURE
Multi-Channel Earth Loss Monitor	Here's your chance to CATCH A CABLE THEIF!! The Earth-Loss Monitor (ELM) measures the resistance to earth of cable armouring in such a way that the user can actually LOCATE the earth loss. This resistance should normally be very low value. If however an earth becomes disconnected due to theft, or corrosion, or a fault, then the SURETECH ELM will detect this. System voltages from mains (380 / 220V) as well as higher voltage MV systems can have their earth resistance continuously monitored. A range of output formats are available, such as relay contacts, 4-20mA, RS232 etc. When a section of earthing / armouring becomes disconnected, then all of the ELM's furthest away from the feed transformer all will read a high resistance to earth. Locating earthing problems is easily done by reading which LEDs are ON or OFF. Better still, relay contact alarm dispatches a security company directly to the appropriate location	 
Multi-Channel Insulation Monitors	Motor insulation monitoring LV AC to 6.6kV; Hospital operating theatre electrical systems, Sub-station batteries (0-250Vdc), floating DC supplies (0-250Vdc), under water applications, ships wiring, Earth and cable armour continuity. This instrument can monitor a full motor panel by simply wiring one winding from each motor into the MCMIM.	
Single channel Motor Insulation Monitor	Why use a Motor Insulation Monitor <ul style="list-style-type: none"> • Cost of production stoppage and production restart due to motor failure • Cost of loss of production due to motor failure • Cost of motor rewind vs possible minor motor repair • Cost of destroyed motor repair from blow-up vs cost of appropriate repair only (when a motor fails, it can often cause flash-over, and mechanical damage due to high forces involved resulting in bearings being over-stressed, and motor support structures being bent etc.) • MIM facilitates planned scheduling of plant outage for general repairs • Production stoppages can normally be eliminated completely motor failures 	
4 channel Insulation monitor	Old NEWS is sometime the best NEWS!! Shown here is our first Insulation monitor, which was designed a number of years ago to monitor water ingress in an under sea diamond digging crawler. We have met a number of repeat orders for this unit, which monitors (under live conditions) whether a cable supplying power (AC or DC) has developed water ingress.	
Insulation Monitoring application rationale	Shown here is our Insulation Monitor (IM) deployed on undersea diamond digging equipment. It is necessary for operators of such equipment to ensure that it operates without water ingress in cabling, so we developed both AC and DC instruments to monitor this insulation degradation as it occurs; our IM equipment detects degradation long before this degradation stops equipment from performing its critical mission	

Signal Processors, controllers, transducers, protection relays

PRODUCT	DESCRIPTION	PICTURE
Voltage Discriminator or Relay	A simplified VDR is available to sample waveforms over each half cycle. Using analog and digital signal processing we are able to track the "normal" system voltage, and differentiate it from the instantaneous (fault?) voltage. The difference is fed to a digital filter and decisions are taken every half cycle whether a fault or surge is in progress, and hence the decision can be made: to trip or not to trip!	
Affordable sub-metering of buildings with SLP	Using a SLP, a useful application is the sub-metering within buildings. We have been developing a software protocol whereby meters are multi-dropped on an RS485 serial bus or low power radio. This is a cost effective method to implement sub-metering. Some of the popular protocols to implement this is Modbus plus or IP (Internet Protocol). We can also make other protocols available, with encryption if needed	
Bread Dough Mixing controller	Using a SURETECH SLP, a control strategy has been developed to perform optimal bread dough mixing at a large bakery. Most bread in South Africa is under-mixed, resulting in poor quality bread. The reason is that a human operator normally decides when the dough has been mixed enough, and this is not optimal. Using proper power measurements with proper DSP (Digital Signal Processing), optimal mixing is achievable. We did this in conjunction with a large bakery in the Western Cape. This type of controller, usually costs many tens of thousands of Rands when purchased from Europe.	
SLP for V, I, kW, kVA, kVAR, PF, etc	The Smart Load Processor (SLP) for three phase, measures ALL electrical parameters in one instrument. The SLP measures: Voltage, Current, kW, kVA, kVARs, Power Factor, Phase angle, Frequency, and kWH, and other accumulated parameters if required. All of these parameters are downloaded to your computer directly into the RS232 port. Data is fed directly into your favorite spreadsheet, or we could process it for you, email results to you, or we could upload it to a website of your choice.	
Transient Sensor and Accumulator	The Transient Sensor and Accumulator (TSA) captures breaker trips, and accumulates these energy transients. In order to determine whether the breaker still meets its fault rating, the TSA measures the switching transient energy and will help you to determine when the switch-gear will need overhauling, or maintenance? These switch transient parameters can be fed to your SCADA system, or downloaded to your laptop computer via the RS232 port, etc.	
CT powered PSU	PSU provides power derived from a CT source, either 1amp or 5amps. The CT (5A or 1A) is connected in series with the power supply. The burden on the CT is a number of diode drops on 1amp or 5amp CT. Our special switch mode power supply (SMPS) converts this energy from less than one volt up to +16V (user can specify), required to supply the equipment. The SMPS galvanically isolates the inputs and outputs. Output power is 0.5 to 1Watt.	
Other controllers	Systems can be configured to satisfy a wide range of applications. E.g Phase rotation, protection, metering, process control etc.	YOU TELL US WHAT YOU WOULD LIKE TO SEE HERE


Software for Windows

PRODUCT	DESCRIPTION	PICTURE
Signal processing on your Windows PC **NEW**	Harmonic Analysis System <ul style="list-style-type: none"> Windows application runs on PC computer for monitoring, processing and PC logging of sampled data Current (or Voltage) input is sensed directly from CTs, or 110V/220Vac, or directly from our SURETECH HV sensors for current or voltage RS-232 interface to control and upload data to PC / laptop FFT (Fast Fourier Transform) processing is performed and updated in real time Surge suppression on inputs and outputs Wide range of auxiliary power supply options available, 90V to 260V is standard, battery as well Aluminium enclosure for panel or DIN rail mounting, with screw terminal connections Time window presents oscilloscope picture of sampled waveform, Frequency window presents a spectrum analyser picture of sampled waveform Raw data window shows the sampled time stamped data Time and date of HSM can be synchronised to PC clock Captured data can be further processed with your favourite spreadsheet, such as: Excel Complex frequency can be made available 	
Cable Live Flasher Voltage sensor in MV chambers **NEW**	FLASHER Technology: <ul style="list-style-type: none"> 0.1% resolution can be displayed on a single LED 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: FFFFFFFFFF 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: FFFFFFF 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] <p>FREE!!! Ask us for the CLF Windows FLASHER for you to teach your personnel from your PC</p>	

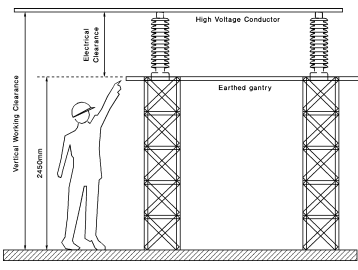
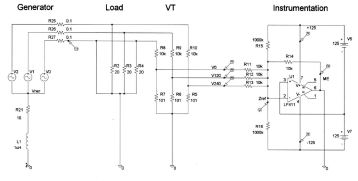
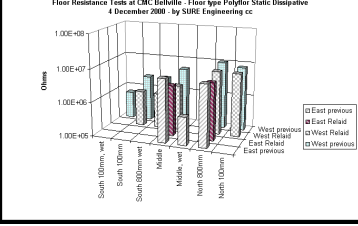


SURETECH special Modules

These modules are either general “work-horse” modules that we use over and over again, or else special modules that we have developed to meet a special user need

PRODUCT	DESCRIPTION	PICTURE
Module: Opto Isolators **NEW**	Opto Isolator for 60kV <ul style="list-style-type: none">• Light pipes are very often a more cost effective alternative to fibre optic cable• Where HV flashovers occur often under normal plant functioning such as precipitators etc, the extremely high levels of EMI inhibit normal microprocessors from functioning reliably, so this is where these opto-modules have been proven to operate well• Infra Red LEDs and matching photo-transistor links• Crystal controlled PWM generator for ultra-stable analog transfers even at high temperatures• PWM filters optimised for fast settling catering for fast analogs that can be used in control loops	
Module: Power supplies **NEW**	Power supply modules <ul style="list-style-type: none">• Off Line Switch Mode Power Supply: 90-260V, +12, -9, +24V 2W to 10W, surge suppressor protection on inputs• Battery powered Switch Mode Power Supply: 10 to 40V, +12, -9, +24V 2W to 10W, surge suppressor protection on inputs• Ask us for other power supplies & modules	

SERVICES we provide

PRODUCT	DESCRIPTION	PICTURE
Electrical SAFETY Training Course	Course material covers: General Operating Principles, Dangers of Electricity, OHS Act, Earthing, Equipment & Instrumentation handling. SAFETY is everyone's concern, and should undergo continuous improvement. Our model of SAFETY places it on four pillars, Procedures, Training, Equipment and the Operator . If any one of the pillars becomes defective, or degrades, or cracks due to a breakdown in communications, then operator safety is jeopardised. SAFETY can never be absolutely guaranteed, but rather everyone concerned should take the approach of continuously improving SAFETY.	
Data logging services	Do you need a logging or recording system to monitor any of the following? Power Factor for monitoring or control, High Voltage Transient monitoring, Corona discharge monitoring, Partial discharge monitoring. We can most likely help you with these as our sensors have these capabilities built in. We continue to work towards bringing you sensors and systems to enable you to monitor these parameters in a cost-effective manner. Talk to us about it	12 3fr4 6rt6 w3d4 12 3fr4 6rt6 w3d4
Fault analysis services	As an integral part of our design process we often simulate the problem at hand. We can offer you the use of these simulation services to do fault analysis for you. If you have a fault situation on your power system that you do not quite understand and would like to get a better handle on what is the most likely cause of the problem, then simulation is a very useful tool. Talk to us about it.	
Electro Static Discharge Floor Testing	Manufacturers of special flooring products (such as Polyflor) sell ESD (Electro Static Discharge) conductive, or ESD dissipative floor coverings. Typical installations include, electronics manufacturers, petro-chemical and explosives plants. We perform testing on these floors to ensure that they meet manufacturers installation requirements	
System simulation	Very often an electrical problem can be solved by simulation Talk to us about this.	SYSTEM SIMULATIONS



Get SURETECH eNews each month

We are sending out a monthly eNews letter to keep you informed and updated on the following main headings:

SURETECH Instruments eNews letter - (January 2005)

PRODUCT GROUP UPDATE

SERVICES GROUP UPDATE

SURETECH MODULE NEWS

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