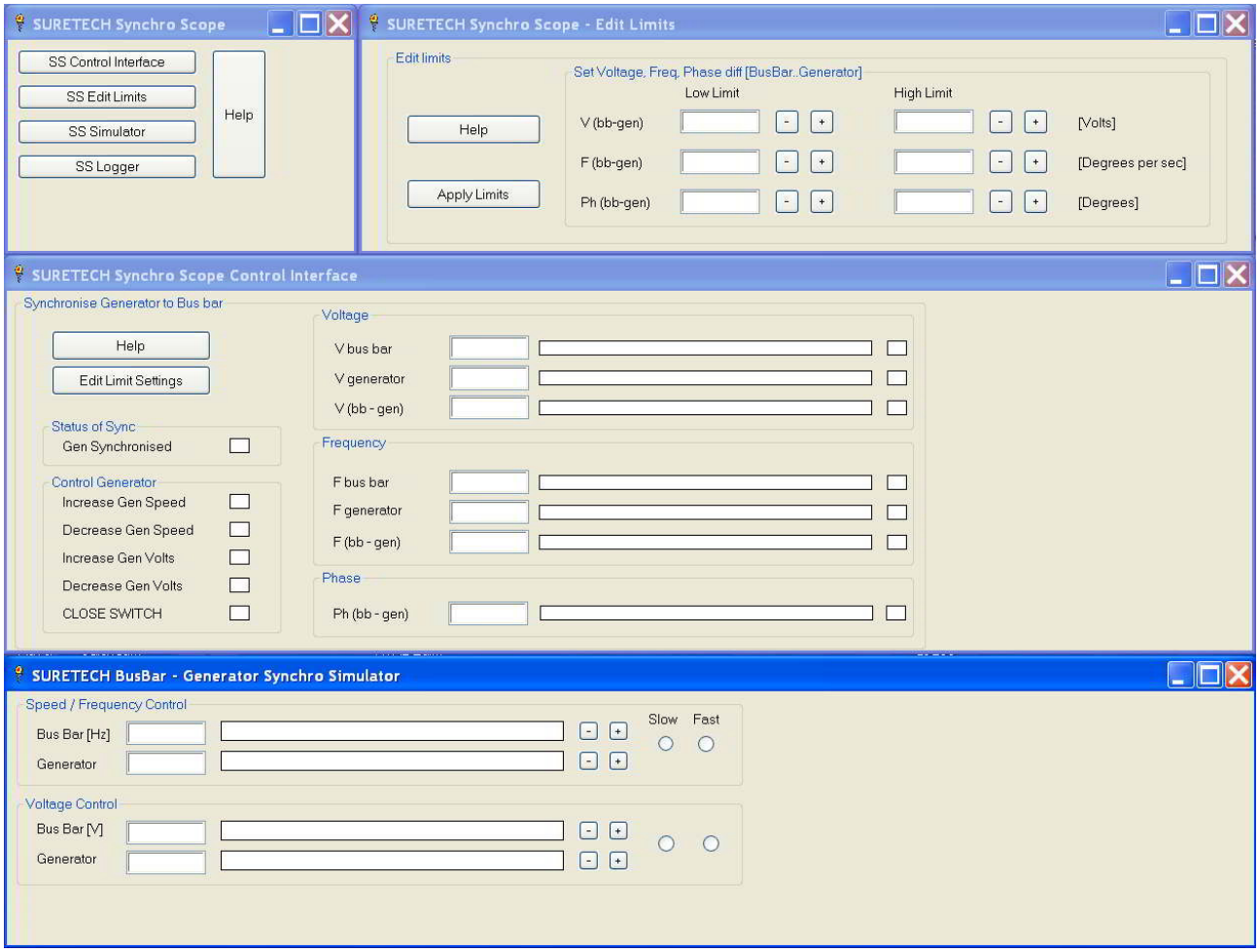
Everyone needs instruments to measure electrical parameters

SURETECH Synchro-Scope



The SURETECH Synchro-Scope measures various electrical parameters of two electrical sources (A and B). The Synchro-Scope measures:

- frequency of source A (bus-bar)
- frequency of source B (generator)
- phase angle difference (PA – PB)
- voltage of source A (bus-bar)
- voltage of source B (generator)
- differential voltage (VA – VB)

Before coupling two electrical systems, bus-bars or cables it is necessary to ensure that phase angle, phase rate and differential voltages are all compatible. This ensures that the two sources have reached sufficiently small deviations of voltage, frequency and phase angle so that they may then be connected together by means of circuit breaker.

Features:

- ✓ RS-232 output feeds directly into a Laptop Computer
- ✓ Graphical User Interface (GUI) (shown above) is provided to Control generator, Simulate generator, and Edit limit settings required by user
- ✓ GUI provides LED type lights to indicate what the operator should be doing: either increase or decrease generator voltage, and either increase or decrease generator speed.
- ✓ When the generator is running at the correct speed and is generating the correct voltage, a LED type indicator shows that the user can close the circuit breaker to synchronise generator onto bus-bar

- ✓ Available as a portable, battery powered instrument, or panel mount
- ✓ Voltage sensors are available to take inputs from 110Vac VTs, or directly from Medium Voltage bushing-shields
- ✓ LCD 2xline (or 4xline) by 16 character displays are standard
- ✓ Bar-graph lines on LCD display indicate instantaneous values
- ✓ External analog instruments also available
- ✓ External LEDs are available to show voltage, phase and frequency windows of synchronisation opportunity
- ✓ RS232 output is used for control and data logging
- ✓ Options include an extension lead for measuring across the length of a sub-station control room, or switch-gear chamber
- ✓ Instrument extension is available for auto synchronising, i.e. the SURETECH SS-Auto. Please enquire
- ✓ Various methods of mounting are available, please enquire
- ✓ Backup to provide support for design, application, installation, and maintenance information

Summary specifications:

DESCRIPTION	RATING	UNIT	ACCURACY
• frequency of source A	45-65	Hz	0.5%
• frequency of source B	45-65	Hz	0.5%
• phase angle difference (PA – PB)	-180 to +180	Degr	0.5%
• phase angle rate (differential frequency dPA - dPB)	3600	Degr/sec	
• voltage of source A	300		
• voltage of source B	300	Volts	1%
• differential voltage (VA – VB)	300	Volts	1%
• Standard enclosure size	220x160x120	Volts	1%
• Auxiliary Power Supply (24Vdc also available)	90-260	mm Vac rms	

Interface:

Measures:

- Input voltage = 110, 230Vac rms
- Voltage of source A and source B
- Differential voltage (VA – VB)
- Frequency of source A and source B
- Phase angle difference (PA – PB)
- Phase angle rate (differential frequency dPA - dPB)

User settable:

- Voltage thresholds (upper & lower)
- Voltage difference thresholds (upper & lower)
- Frequency thresholds (upper & lower)
- Phase angle thresholds (upper & lower)

Outputs LEDs:

- Voltage A within thresholds
- Voltage B within thresholds
- Voltage difference within thresholds
- Freq A within thresholds
- Freq B within thresholds
- phase angle difference within thresholds
- phase angle rate within thresholds

Output Relay contacts:

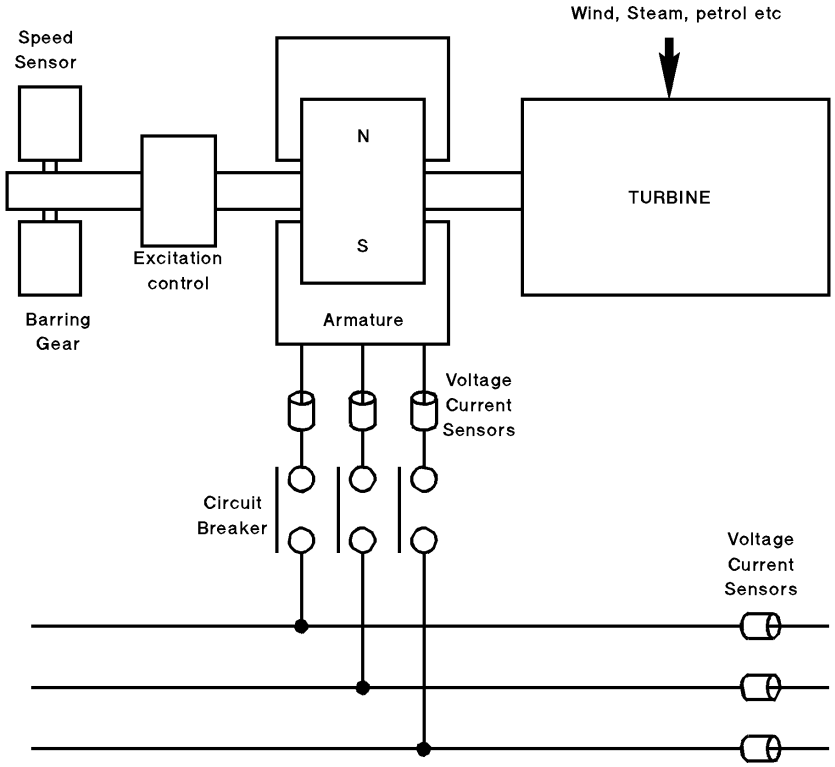
- Output relay contacts can either drive Lights to tell the user how to control voltage and speed of generator OR they can directly control generator speed and voltage
- Relay contact NO/NC, energised when all thresholds are within targets
- Relay contact to increase voltage B
- Relay contact to decrease voltage B
- Relay contact to increase frequency B
- Relay contact to decrease frequency B

Instrument Enclosure:

- Panel mount with push button user interface
- RS232
- Terminations: screw barrier connector for V_phase A, V_phase B, and output relay contacts
- Enclosure SURETECH Modbox
- Aux PSU 90-260Vac

SAFETY and synchronisation time windows:

- When two large electrical systems are being connected / synchronised, then the user needs to take great care with fault level capacities of associated switchgear.
- Appropriate protection and transient protection equipment needs to be in place
- Switchgear needs to be rated to be able to trip without failure or damage, on the highest fault level of the electrical system.
- If for example, a generator is being synchronised to a power grid, then depending on the fault level rating of the generator OR the power grid, one will always be higher than the other so users need always to take care to understand what fault levels they are dealing with, and the implications of synchronising equipment



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