ASCO® LOAD BANKS

SIGMA Load Control

Froment

ASCO®

WHAT IS SIGMA?

SIGMA is a multifunctional embedded load control system specifically designed for ASCO® Avtron and ASCO Froment load banks. Flexible, Feature Rich and Cost Effective it is best-in-class providing a solution for any application.

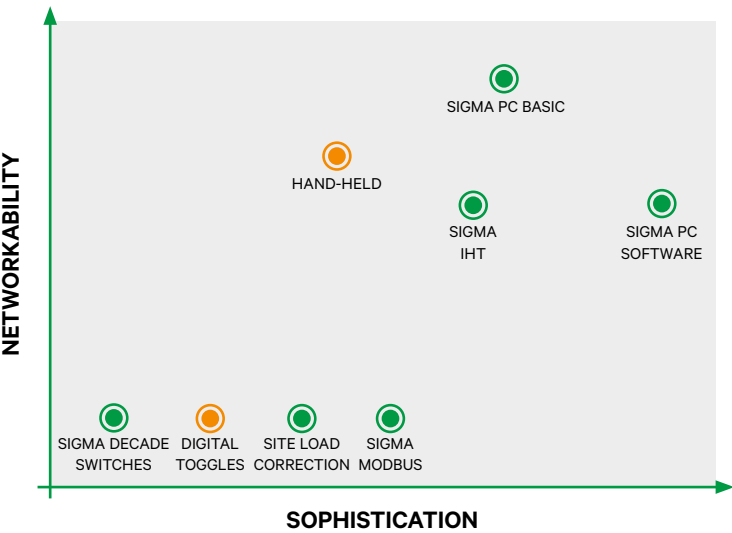SIGMA is available in two platforms:

SIGMA^{LT}

SIGMA^{LT} is an entry level load bank control system for selected 2000 and 3000 SERIES load banks. It provides simplistic load test capabilities including multiple networked load banks. SIGMA^{LT} offers the following control methods:

- **DIGITAL TOGGLE SWITCHES -** Local control
- **HAND-HELD -** Remote control

SIGMA 2

SIGMA 2 provides the most comprehensive load bank control with high level instrumentation, data acquisition to ISO8528 and a wide range of control types for any application. SIGMA 2 offers the following control methods:

- **DECADE SWITCHES -** Local control
- **SITE LOAD CORRECTION -** Application specific control
- **SIGMA MODBUS -** Application specific control
- **SIGMA INTELLIGENT HAND-HELD TERMINAL -** Remote control
- **SIGMA PC BASIC -** Remote control
- **SIGMA PC SOFTWARE -** Remote control

NETWORKABILITY

SIGMA PC BASIC

HAND-HELD

SIGMA IHT

SIGMA PC SOFTWARE

SIGMA DECADE SWITCHES

DIGITAL TOGGLES

SITE LOAD CORRECTION

SIGMA MODBUS

SOPHISTICATION

KEY:

- SIGMA^{LT} Control
- SIGMA 2 Control

SIGMA ^{LT} - DIGITAL TOGGLE SWITC HES

Digital toggle switches are fitted to all SIGMA^{LT} load banks and offer simple local control. This method of control is a perfect for quick load tests and useful as a local backup to the SIGMA^{LT} hand-held.

TYPICAL APPLICATIONS

- Generator AVR and Governor testing.

- Rental and service companies can use digital toggles as a fast, local control method or connect the hand-held to utilise all available features.

KEY BENEFITS

- Digital LED, single and three phase instrumentation.

- Correct load is applied whether in single or three phase mode.

- Synchronous load changes: unlike traditional toggle switches, load changes that require multiple steps are applied instantaneously.

- Connect the hand-held at any point to switch between control methods.

- Reliability and longevity.

TECHNICAL FEATURES

- Cycle between available instrumentation: 3 phase voltage and currents or voltage, frequency and power.

- Improved load accuracy in dual voltage (240/480V) versions.

- Limit the load to prevent accidental overloading of the supply-on-test.

- 10 times the operational life of traditional toggle switches (10,000 vs 100,000 actuations).

SIGMA^LT - HAND-HELD

The SIGMA^LT hand-held is a touch screen remote control encased in a robust aluminium enclosure enabling the user to optimise and maximise all SIGMA^LT features and benefits.

TYPICAL APPLICATIONS

- Data centre HVAC testing and verification - Networked load banks can be controlled simultaneously or individually to provide heat zones in data centre halls.

- Small load banks can be networked to provide high capacity testing in places a larger load bank cannot be used e.g. roofs and basements.

KEY BENEFITS

- Individual remote control of the load bank up to 250m.

- 25 load banks can be connected in a network and controlled by a single hand-held.

- One hand-held enables control of all or individual load banks in the network.

- Log test data to a USB flash drive and open in PC spreadsheet software for further analysis.

- 4.3" full colour touch screen control encased in robust aluminium.

- Add or remove load banks to the network quickly to increase or decrease the available capacity.

TECHNICAL FEATURES

- Use the SIGMA gateway to integrate the SIGMA^LT load banks into existing PLC and BMS systems.

- CAN Bus network connection for enhanced speed and reliability even when 25 load banks are connected.

- Multi-lingual options.

- Automatic detection of load banks with overview status.

- Load step resolution is of the smallest load bank in the network providing fine load steps even when testing high capacities.

SIGMA DECADE SWITCHES

LOAD CONTROL

X 100kW   X 10kW   X 1kW

REJECT   ACCEPT

SIGMA decade switches provide local manual control with the option to add other SIGMA 2 control types including the IHT and PC software.

TYPICAL APPLICATIONS

- Simplistic resistive only load testing where no instrumentation or data capture is required.

- Quick and easy generating set maintenance solving wet stacking issues.

- Fixed local control in more complex installations where the main control source is located elsewhere.

KEY BENEFITS - DECADE SWITCHES

- User friendly, quick and easy load selection with load accept and reject buttons.

- Can be utilised as a local method of SIGMA control to support other control types.

- Use as a control redundancy if other control methods are unavailable.

TECHNICAL FEATURES

- Works with single or three phase supply.

- Selectable load step resolutions down to 1kW.

- Indicator lamps show current status of load bank operation, load control and status of the supply-on-test.

- 'Accept' button must be pressed each time a load is applied for synchronous load changes that are not possible with traditional toggle switch controls.

SITE LOAD CORRECTION
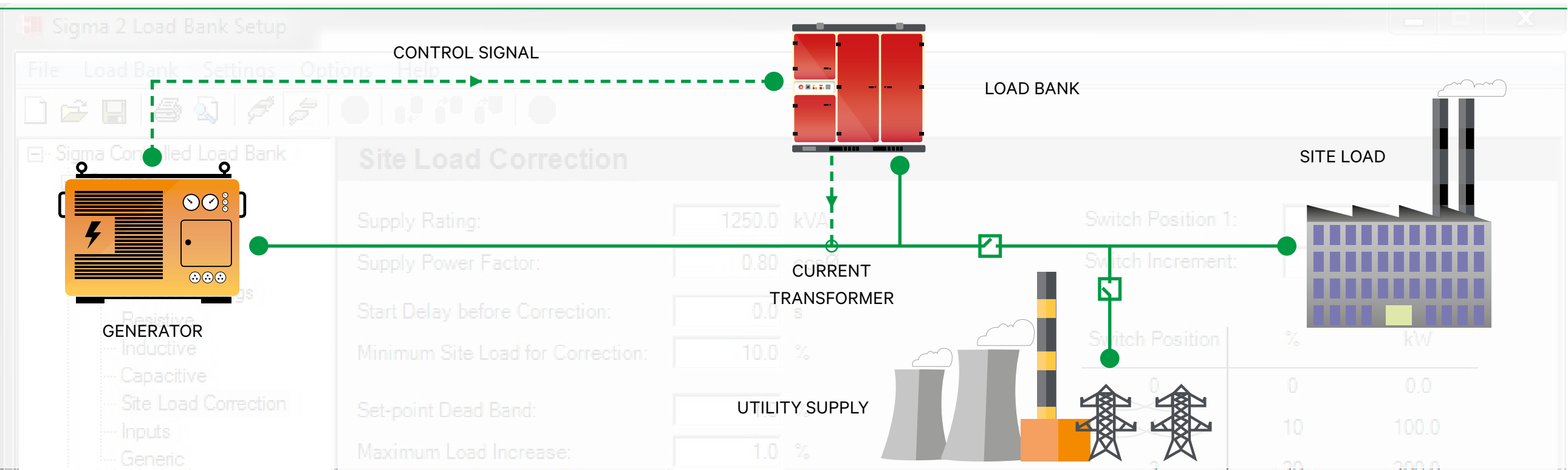
SIGMA site load correction automatically maintains the required levels of loading on a gen-set to prevent problems associated with light loading. Externally mounted current transformers monitor load from the gen-set to the site and apply load when the gen-set is light loading.

TYPICAL APPLICATIONS

- Primarily used in locations where the main source of power is from a gen-set. Site load correction automatically applies load when it drops below a predetermined threshold thus maintaining optimum operating conditions on the gen-set.

KEY BENEFITS

- Maintains gen-set load levels to prevent wet stacking.

- High precision current transformers provide precise data into the SIGMA load bank.

- Pre-set a number of variables of how and when the load bank will apply and reject load.

- Configure load correction points locally at the load bank if required.

- The load bank can be controlled by the IHT or PC software for other load test requirements when site load correction is not in operation.

TECHNICAL FEATURES

- Each load step is applied only when site load is continuously below that of a pre-set minimum load for a predetermined time. Load steps are released when site load increases above the present selected load step.

- Select a number of pre-set variables for the load application including: time delay before correction, maximum load increase, supply power factors and three phase correction.

SIGMA MODBUS

Modbus is an industry-wide serial communications protocol standard supported by many PLC and industrial control manufacturers. Modbus allows the integration of a SIGMA load bank with the gen-set control system, test cell automation and building supervisory and monitoring systems through PLC, HMI or SCADA systems.

TYPICAL APPLICATIONS

- BMS (building management systems) are able to integrate load banks and instrumentation into existing control.

- Control and monitor the load banks in a centralised control centre typical in larger data centres.

KEY BENEFITS

- Offers all the features and benefits of the IHT and PC software through a third party control system.

- Integration is available with resistive, inductive and capacitive load banks.

- Integrate load banks into bespoke control systems quickly and effectively.

- Customise load bank testing to suit requirements.

TECHNICAL FEATURES

- Modbus RTU is the industrial standard over serial RS232/ RS485/ Ethernet.

- All instrumentation and diagnostics are available.

- If the load bank is setup for site load correction (see page 7) load steps can be configured.

- Local breaker control or remote breaker control outside of the load bank.

- Use a SCADA system to configure when the load bank starts and stops.

For more information about MODBUS please visit www.modbus.org

SIGMA INTELLIGENT HAND - HELD TERMINAL (IHT)

Housed in a robust, industrial polycarbonate enclosure with IP65 protection, membrane keyboard and back-lit graphic LCD, the IHT allows remote load testing with live display information showing all the main electrical parameters. Connect up to 14 load banks in a network with a single IHT for high capacity unity and non-unity power factor testing.

TYPICAL APPLICATIONS

- Used as control in routine maintenance and verification of generating sets and UPS systems.

- Its rugged construction provides reliability in the toughest of environments and is ideal for rental and service applications.

KEY BENEFITS

- Robust hand-held terminal housed in industrial polycarbonate enclosure with PVC hand grips providing IP65 protection.

- Full load control and three-phase instrumentation.

- No need for any pre-calculations.

- Network up to 14 load banks with a single IHT for high capacity testing.

- Network together resistive, inductive and capacitive load banks for non-unity power factor testing - all controlled by a single IHT.

- Control load banks up to 1000m meters away.

TECHNICAL FEATURES

- All instrumentation measurements are made using high accuracy voltage and current transformers located within the load bank. This information is processed digitally, using high speed sampling of the raw data. This provides full three-phase, high speed, true rms measurements with high update rates to class 0.5 accuracy.

- Comprehensive overload and stall protection is provided, based on the rating of the supply-on-test.

- When carrying out full-load testing, one page shows all the true rms three-phase measurements of voltage (V), frequency (Hz), current (A), power (both kW and kVA) and power factor (Cos ø).

- In built 'HELP' options.

- For transient-response testing, the voltage and frequency of the last load change are captured and displayed on the dynamic graph including maximum and minimum data.

- In-built test editors allow easy set up of load including % load, power factor and time.

- Automatic load control provides up to 16 timed load steps including cyclic testing.

SIGMA PC BASIC

SIGMA PC Basic provides an intuitive user interface with powerful functionality and the ability to control up to 42 load banks in a single network. Load distribution, individual load bank status and control can be accessed when more than one load bank is connected to the network.

TYPICAL APPLICATIONS

- Data centre HVAC testing and verification - Networked load banks can be controlled individually to provide specific heat zones in data centre halls.

- Fast and accurate gen-set load testing on either a Windows™ desktop, laptop or tablet.

KEY BENEFITS

- Live graphical display of the load test with the option to toggle time and live instrumentation.

- Icon based display for quick and simple operation on either a laptop, PC or tablet.

- Link up to 42 load banks in a single network.

- Individual load bank instrumentation and control within the network.

- Export test data to spreadsheet software for analysis.

TECHNICAL FEATURES

- Customise supply-on-test specifications.

- Single and three phase operation.

- Primary load bank selection and load bank status for comprehensive diagnostics.

- Work in %, kW, KVA or kVAr with both leading and lagging power factor options.

- Multi-lingual options.

SIGMA PC SOFTWARE

SIGMA PC software is a Windows™ based alternative to the Intelligent Hand-held Terminal (IHT). It provides further enhanced load control along with transient speed instrumentation, full data acquisition reporting with graphical displays, real time data such as recovery times and % errors necessary for testing to ISO8528.

TYPICAL APPLICATIONS

- OEM test cells with verification and certification to ISO8528 class G1, G2 or G3.

- Automated heat run tests for routine maintenance of generating sets.

- Witness testing, commissioning, verification and sign off.

- Verification for risk insurance.

KEY BENEFITS

- Enhanced load control with transient speed instrumentation, data acquisition and reporting with graphical displays including real time data such as crest factor, recovery times and % errors.

- Unity and non-unity power factor testing with the functionality for purely resistive, capacitive, inductive and combined load testing.

- Results data can be printed as a customised report or exported to other software for further analysis.

- Link up to 14 resistive, inductive, capacitive and combined load banks for combined high capacity load testing.

TECHNICAL FEATURES

- Supply-on-test properties including ratings, alternator, engine, customer and additional notes can be saved with test results for future reference or template creation.

- Commissioning and verification to ISO8528.

- Precision load control and load step resolution.

- Adaptive load correction facility ensures correct load is applied when voltage drops.

- Automatic load control provides multiple timed load steps including cyclic testing.

- In built simulation mode for practicing test modes and functionality.

- Customizable front-panel window layouts.

- Utilise with the SIGMA instrumentation system (SIS) as providing a means of measuring actual medium and high voltage parameters.

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