





# Industrial-Strength Load Challenges



From marine to industrial to water treatment applications, users require load banks for specific load types and sizes across a wide range of conditions.



Equipment manufacturers and mission-critical facilities require precise, repeatable load tests.




New energy developers need solutions for stabilizing power grids that are served by Distributed Energy Resources.

## SIGMA 2 Advanced Load Control and Test Automation

SIGMA 2 Load Control was developed as a sophisticated platform for testing the capacity and performance of engine-generator sets. It has evolved to become Avtron's most advanced load test solution for equipment manufacturers and mission-critical facilities that test resistive, reactive, and capacitive loads.

Product Knowledge

 [Benefits of Networking Load Banks](#)

### SIGMA 2 Compatibility

| SERIES | MODEL                                    |
|--------|------------------------------------------|
| 3000   | 3024, 3044, 3066, 3103, 3110, 3164, 3220 |
| 4000   | ALL                                      |
| 5000   | 5500, 5600, 5800, 5900                   |
| 6000   | ALL                                      |
| 7000   | ALL                                      |
| 8000   | ALL                                      |
| 9000   | ALL                                      |

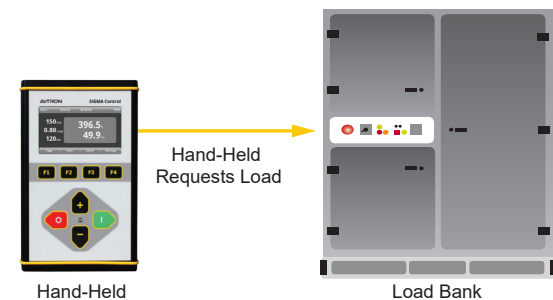


SIGMA 2 is Avtron's most flexible and configurable load control solution.

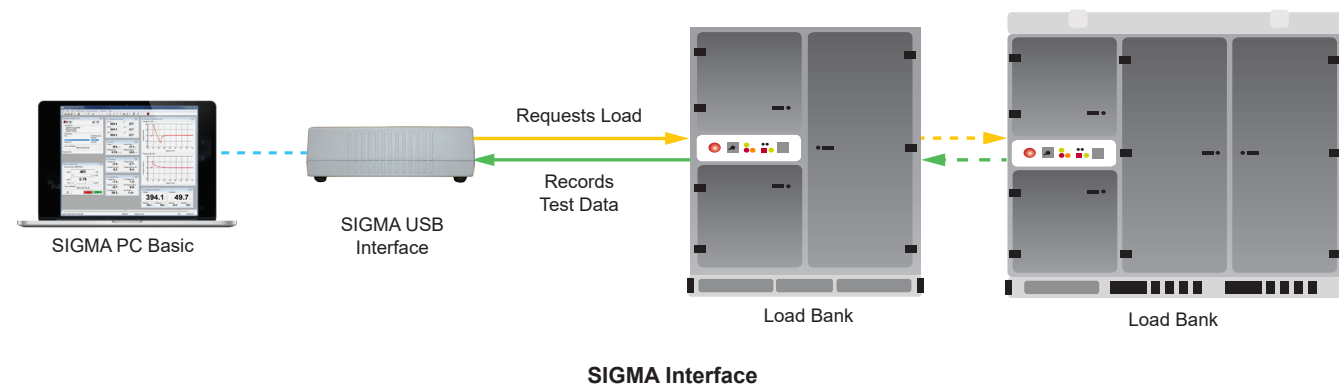


# Load Bank Monitoring and Control

In its simplest form, a load test requires a load bank and a means to control it. Here, a SIGMA 2 load bank connects to a hand-held remote for intuitive monitoring, control, and data collection. An Avtron hand-held can control up to 14 SIGMA 2 load banks.



Commonly, load tests require controlling one or more load banks, then collecting the resulting operating data. Some applications accomplish this using the SIGMA 2 Hand-Held. Other applications require enhanced functions offered by Avtron software run on a PC or server.



Avtron SIGMA 2 solutions include load banks, communication products, and software that enable the highest levels of configurability to meet the most pressing facility challenges.



SIGMA 2 features make load testing precise, repeatable, and productive test after test, even to ISO 8528 requirements.



## Product Knowledge

[Load Banks for Test Cell Applications](#)

[Using Load Banks to Verify Engine-Generator Performance](#)



SIGMA 2 solutions use permanent load banks to apply supplemental resistive, reactive, and/or capacitive load to meet the minimum requirements of power sources or to adjust power factor.



## Product Knowledge

[Manage Load to Avoid Diesel Wet-Stacking](#)



Load banks like the Avtron Model 8800 and SIGMA 2 controls can provide effective stabilization for grids powered by traditional and sustainable sources.



## Product Knowledge

[Three Approaches to Grid Stabilization](#)

[Load Banks for Microgrid Applications](#)


# SIGMA 2 Hand-Held


## SIGMA 2 Hand-Held and SIGMA PC Software

Either the SIGMA Hand-Held or SIGMA PC Software can be used to provide enhanced control and instrumentation.



Product Knowledge

 [SIGMA Control Overview Brochure](#)

 [SIGMA 2 Brochure](#)

- Fast and accurate testing with maximum productivity
- Hand-Held or PC control automates testing and is easy-to-use
- High-accuracy voltage and current transformers in each load bank enable robust instrumentation. They provide true RMS measurements with high sampling rates up to Class 0.5 accuracy.
- Automatic calculation and display of line current and power values eliminates pretest calculations, limiting potential errors
- Load step resolutions as small as 0.1kW or kVAr
- Selectable leading and lagging power factors
- Comprehensive overload and stall protection
- Medium voltage load banks supported on all interfaces
- Transient load testing
- Automated load control offers timed load step sequences including manual override and cyclic testing
- Built-in test editors enable adjustment of percent load, power factor, test duration, and more
- Select and display load as kW, percent load, or kVA
- Hand-held can operate load bank networks over distances up to one kilometer away
- Simple plug-socket connections enable Avtron load banks of differing capacities and load types to be controlled from one Hand-Held or PC
- The hand-held offers a multilingual user interface - English, French, German, Spanish, and Italian

## Digital Communication for Monitoring and Control

SIGMA 2 load bank controls make it easy to visualize, capture, and understand the status of load banks and the systems they serve. SIGMA 2 load banks can be connected to:



- ASCO [Critical Power Monitoring Appliances](#) that visualize and archive operating data and bring real-time power alerts, notifications and reporting to authorized users
- Schneider Electric [EcoStruxure – Buildings](#) for advanced digital integration and intelligent management of power infrastructure.
- A customer's PLC-controlled systems via Modbus by mapping Avtron data via code registers

In addition, SIGMA 2 Load Banks provide fault logs for test evaluation and troubleshooting.

## SIGMA Instrumentation System



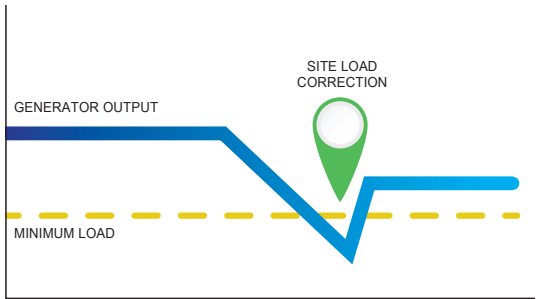
The SIGMA Instrumentation System directly measures the actual power, voltage, current, and frequency in medium and high-voltage applications.

For medium-voltage applications, low-voltage load banks with suitably rated transformers enable smaller load steps for increased precision. The SIGMA Instrumentation System enables the application of both medium and low voltage load using a single load bank system when a step-down transformer is used.

Product Knowledge

 [SIGMA Instrumentation System Data Sheet](#)

## Site Load Correction



Avtron SIGMA 2 Site Load Correction ensures that minimum required loads are applied to a power source at all times. When demand is insufficient Site Load Correction automatically adjusts one or more load banks to supplement the load. When demand increases, Site Load Correction reduces or terminates load bank operation.

Product Knowledge

 [Site Load Correction](#)




# SIGMA Gateways

Avtron offers both wired and wireless Gateways for use with the SIGMA 2 platform. The Avtron SIGMA Wired Gateway can be used to communicate with Avtron SIGMA LT load banks and multiple gateways can be used to control any type of Avtron Load Bank. Their features are compared below.



## Product Knowledge

 [SIGMA Wireless Gateway](#)

 [SIGMA Gateway](#)

| Wired Gateway                                                                                                                     | Wireless Gateway                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Communicates through micro-USB cable for SIGMA PC and SIGMA PC Basic. Ethernet cable for SIGMA Network Pro or Modbus applications | Communicates via Wireless TCP/IP or Wired Ethernet Cable, Modbus TCP/IP for PLCs, or SIGMA PC Basic on Windows®       |
| Connects with up to 14 SIGMA 2 resistive, reactive or combined load banks                                                         | *One Wireless Gateway connects up to 14 load banks.                                                                   |
| Can also connect load banks controlled by Avtron's SIGMA LT control system                                                        | Enables SIGMA 2 reactive, capacitive, and combination load banks to connect with Avtron SIGMA LT resistive load banks |

Note:  
\* Requires a Wireless Access Point  
Less than 10 Wireless Gateways - One Avtron gateway can be used as a wireless access point  
Greater than 10 Wireless Gateways - A separate Avtron wireless access point will be needed.

# SIGMA Software


Additional SIGMA software expands SIGMA 2's capabilities

| Characteristics                                       | SIGMA PC | SIGMA PC Basic                                            | SIGMA Network Pro                                     |
|-------------------------------------------------------|----------|-----------------------------------------------------------|-------------------------------------------------------|
| Windows® PC Platform                                  | Yes      | Yes                                                       | Yes                                                   |
| TCP/IP Communication                                  | No       | No                                                        | Yes                                                   |
| SIGMA Gateway (Wired)                                 | Yes      | Yes                                                       | Yes                                                   |
| SIGMA Gateway (Wireless)                              | No       | No                                                        | Yes                                                   |
| Maximum Number of SIGMA 2 Load Banks                  | 14       | Up to 3 groups of 14 - each group controlled by a gateway | Control up to 14 - dependent on network configuration |
| Controls Load Banks Individually                      | No       | Yes                                                       | Yes                                                   |
| ISO 8528 Test Scripts and Automatic Pass/Fail Reports | Yes      | No                                                        | No                                                    |
| Interface for Windows® Tablet Devices                 | No       | Yes                                                       | No                                                    |

## Product Knowledge

 [SIGMA PC](#)

 [SIGMA PC Basic](#)

 [SIGMA Network Pro](#)

## The SIGMA 2 Platform

Controls multiple load banks using SIGMA Gateways and SIGMA Software.





[www.avtronpower.com](http://www.avtronpower.com)

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