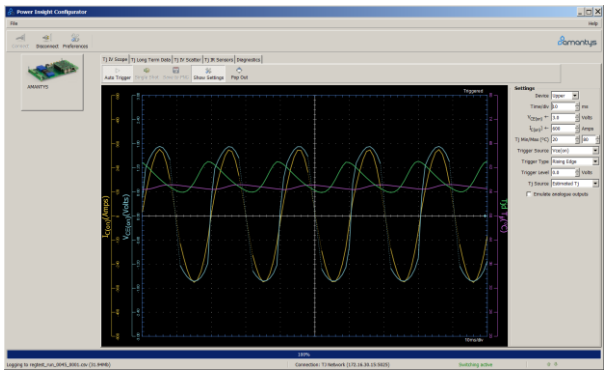
Amantys Data Logger

Power Semiconductor Data Acquisition and Logging System



The Power Semiconductor Data Acquisition and Logging System is an exciting new product developed at Amantys Power Electronics. It enables synchronized on state voltage and current measurements, data logging and processing capabilities, and provides accurate, reliable and synchronous measurements and datalogging functions for both the IGBT and diode devices in an operational converter.

Compatible with both Si IGBTs and SiC MOSFETs, the data recorded can be used for stack optimization, converter validation, and as the basis of Junction Temperature (Tj) calculations.

Technology Benefits

- Accurate on state IV measurements
- Signal isolation
- Si/SiC compatible
- Tj estimation enabler
- Condition monitoring
- Enhanced converter validation

Applications

- Inverter technology development
- Inverter stack design and characterisation
- Laboratory test and product validation
- Field test and on-site diagnostics
- Condition monitoring

Features

- Monitoring of key operating parameters in a half-bridge (phase leg)
- Accurate measurements of IGBT and diode on-state voltages $V_{CE(on)}$, V_F synchronized with on-state current.
- Works in any application:
  - Compatible with both Si, SiC and Hybrid modules
  - Compatible with any gate drive
- Supports modules up to 3300 V
- Flexible software platform designed for future upgrades and new features
- 4 BNC outputs supporting oscilloscope connection

Rapid Evaluation

The Amantys Data Logger has been designed as a flexible platform to support users in getting started quickly with extensive data logging of the inverter stack. The datalogger is suitable for use in both laboratory and field-testing environments.

Electrically isolated measurements of the IGBT and diode on-state voltage and current are processed and stored locally. This enables the user to estimate devices' junction temperature offline, giving confidence in validating converter rating and diagnosing operating issues.

It is compatible with any gate drive, including third party and Amantys products, and is directly attached to the switching devices with appropriate cables. No control signals are required from the gate drives. The system is compatible the device modules up to and including 3300 V rating as detailed below.

It is designed to work with hall-effect current sensors, and either an existing sensor (in feed-through mode) or a dedicated sensor may be used.

In addition to logging data on a USB memory stick, analogue outputs are available for convenient connection to an oscilloscope or other analogue data channels.

Compatibility

- IGBT and SiC modules up to 3300 V rating:
  - Half-bridge modules, e.g. $_{n}$HPD^{2}, XHP, LV100, LinPak, PrimePack, EconoDual (1 or more in parallel)
  - Pair of single switch modules, e.g. 140 x 190 mm devices
  - Reinforced insulation withstand (hipot) up to 7400 Vrms

- Si and SiC devices, including:
  - Si IGBTs and PiN diodes
  - SiC MOSFETs and Schottky diodes
  - Hybrid Si/SiC power modules

- Multiple PWM schemes up to 10 kHz (maximum 5 kHz recommended for Tj estimation)

Outline Specification

- Single power supply input (15 V)
  - Internal isolation for measurement circuits

- Simple connections to IGBTs/diodes

- Data logged at 1 ms rate to USB memory stick independently of switching frequency. Typical operation allows logging of data for several weeks.

- Measurement Parameters recorded:
  - V_{DC}, IGBT $V_{CE(on)}$, diode V_F for upper and lower switches
  - Phase current, using external current sensor
  - Switching pattern information (pulse timings)
  - Module NTC temperature (if present)
  - Baseplate temperature (up to 2 external lug mounted sensors)

- Selected measurements and signals delivered to 8 external analogue outputs (4 of which are BNC)

- Configurable from USB memory stick
  - Allows stand-alone operation

- Upgradeable functionality:
  - Measurement software (default)
  - Future upgrades, e.g. Tj estimation algorithms

Target Industries

- Electric Vehicles
- Renewable Energy
- Rail/Mass-Transit
- HVDC/FACTS

Applications

- Converter stack design and characterisation
- Dedicated data logger for test and diagnostics
- Laboratory testing and converter validation
- Field testing of converters
- Condition monitoring system for retrofit applications

Want to know more…?

For more information, please contact us at info@amantys.co.uk.

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