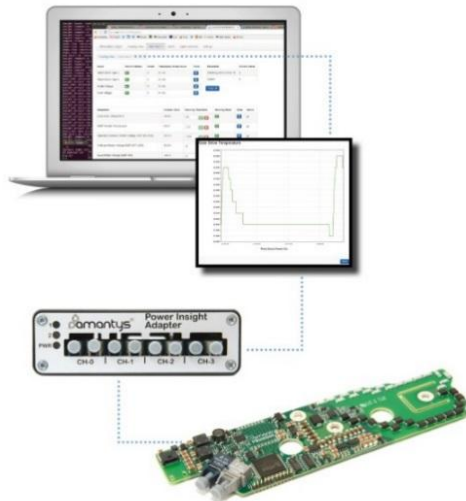


Amantys Power Insight allows the power converter stack designer to gain new insights into the performance of the converter without a major additional change or overhead to the system design. Through the incorporation of Power Insight technology on an Amantys Gate Drive, the power converter stack designer can get access to real time data on the performance of the system and remotely configure the gate driver over the fibre optic link. The time to test and commission a converter power stack is reduced.



Power Insight allows a Windows based PC to communicate with the gate drive using a Power Insight Adapter

## Key Benefits

- Low design in complexity
  - Incorporated into Amantys gate drives
  - Compatibility mode for existing systems
  - Easy to upgrade an existing system
- Reduced number of sensors
  - Extra data generated without additional sensors
  - Monitoring of DC Bus voltage presents potential to remove the voltage sensor
- High reliability design and testing
- Simplified system design and commissioning
  - Remote configuration of gate drive resistors
- High system observability
  - Remote monitoring of key parameters
- Early failure detection of IGBTs
  - Long term analysis of key system parameters to identify early failures or high stress IGBTs
- Improved maintenance schedules
  - Easy converter evaluation and development

## Outline Specification

- Amantys Power Insight Protocol
  - Compatibility mode for data transfer with existing industry protocols
  - Power Insight mode with configuration and control data superimposed on PWM transmit channel and receive channel
- Export of several key measurements from the gate driver
  - $V_{CE}$ ,  $V_{CE(sat)}$ ,  $V_{GE}$ ,  $V_{SUP}$ , switching time, driver and module temperatures and calculated parameters
  - Accessible by local convertor controller or via an internet compatible protocol stack
- Remote configuration
  - Gate drive resistors
  - Desaturation detection timings
  - Warning and alarm thresholds
  - Firmware re-flash for in-field upgrades
- Configuration and inventory management data
  - Production and inventory control

Monitored parameter	Identifier	Typical resolution
Collector emitter voltage, IGBT OFF (DC link voltage)	$V_{CE(OFF)}$	1V
Saturated collector emitter voltage (IGBT ON)	$V_{CE(SAT)}$	100mV
Gate drive supply voltage	$V_{SUP}$	10mV
Gate emitter voltage OFF (IGBT turn-off)	$V_{GE(OFF)}$	10mV
Gate emitter voltage ON (IGBT turn-on)	$V_{GE(ON)}$	10mV
Switch-on time Input to $V_{CE}$ going below $V_{CE(DESAT)}$ threshold at turn-on	$t_{sw(on)}$	25ns
Switch-off time Input to $V_{CE}$ going above $V_{CE(DESAT)}$ threshold at turn-off	$t_{sw(off)}$	25ns
Pulse width	$t_{pulse}$	25ns
Gate Drive ambient temperature	$T_G$	0.5°C
IGBT Module NTC Thermistor (where available)	$T_M$	0.5°C



## Supporting Products

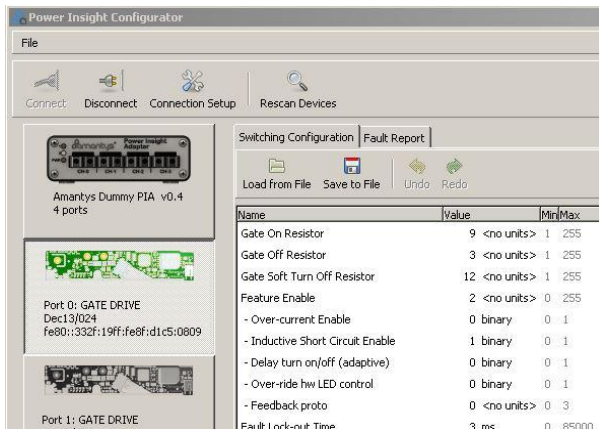
### Power Insight Adapter



The Power Insight Adapter allows a Windows based PC to interface to four Power Insight enabled gate drives.

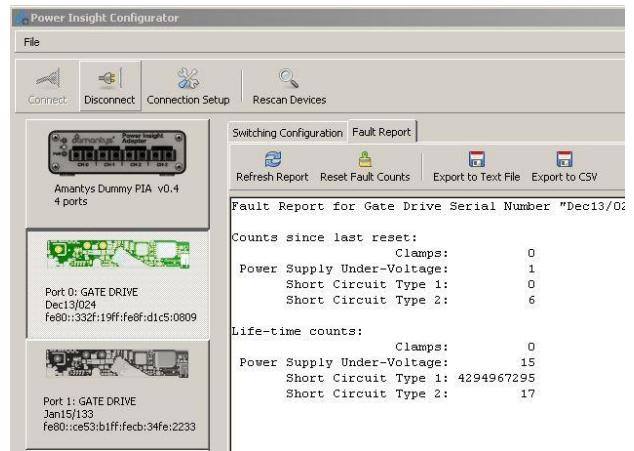
The Power Insight Adapter can control four gate drives directly. When used with the Power Insight Configurator it can be used to generate double pulse tests for testing a Power Converter Stack and also be used to read back the fault counters stored in the gate drives.

### Power Insight Configurator

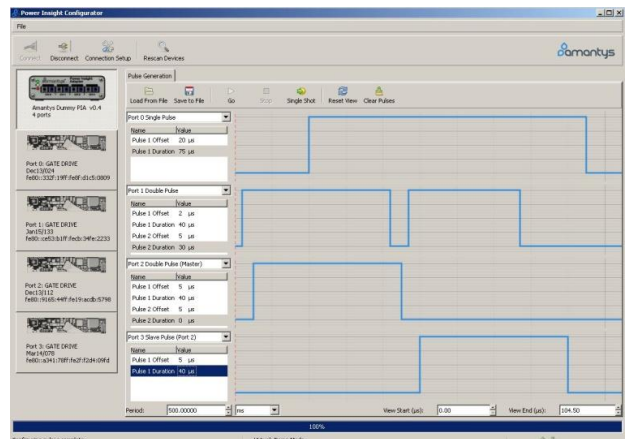


The Power Insight Configurator is a Windows PC based software tool that can be used to configure a Power Insight enabled gate drive and monitor the fault reports generated by the gate drive.

The fault counters of the gate drive are observable in the Fault Report Pane of the Power Insight Configurator. An example is shown in the figure below.



The Power Insight Configurator is used to control the pulse generation function of the Power Insight Adapter. The Power Insight Adapter can generate test pulses for testing the IGBT modules and gate drives within a Power Converter Stack. An example of the pulse generator pane is shown in the figure below.



The combination of the Power Insight Adapter and the Power Insight Configurator simplifies the process of testing and commissioning a Power Converter Stack using Power Insight enabled gate drives from Amantys.



Medium voltage motor drives



Locomotive traction & marine drives



Wind turbine & solar inverters



High voltage DC infrastructure