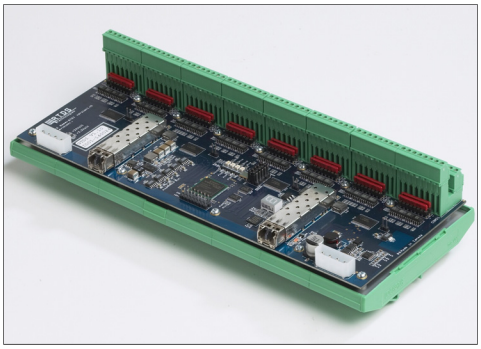
GTIO CARDS

The Giga-Transceiver Input/Output (GTIO) cards have been developed for use with the PB5 Processor Card (PB5) card and are driven from the Giga-Transceiver (GT) optical ports provided on the PB5. To allow greater freedom of connection and flexibility, the cards have been designed to allow a daisy-chain connection between them. Depending on the configuration, as many as 8 GTIO cards can be connected to each GT port.

The physical link between the PB5 and the GTIO cards is provided by a fibre optic cable with industry standard LC connectors. The GTIO cards are normally mounted on DIN rails in the rear of the RTDS Simulator cubicle. However, the 2 Gbit/s bandwidth of the link allows the GT-I/O cards to be located up to 35 m from the RTDS Simulator cubicles.

GTDI – Giga-Transceiver Digital Input Card

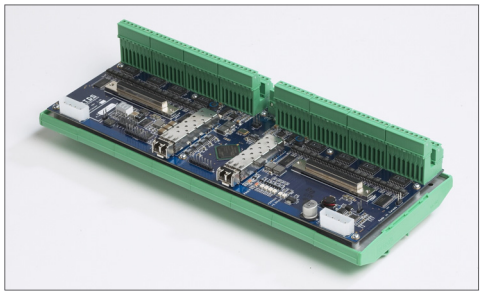


The GTDI provides optically isolated digital input to the real time simulation from external equipment. The card has a total of 64 inputs for use in regular or small timestep (1-2 µs) simulations running on the PB5 card.

The GTDI input is current driven (~10 mA), allowing a wide range of input voltages to be connected to the card by providing the appropriate value of current limiting resistor.

If being used in a small timestep simulation, the GTDI card should be first in the daisy chain.

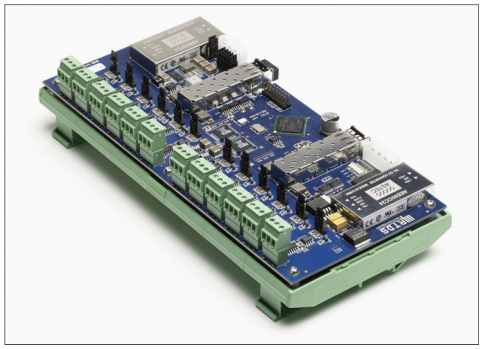
GTDO - Giga-Transceiver Digital Output Card



The GTDO provides optically isolated digital output from the simulation to external equipment. The card has a total of 64 outputs which can be sent from either a regular or small timestep simulation running on the PB5 card.

The GTDO has a source driven output that can provide up to 100 mA with a voltage supply range from +7 to +24 V.

GTAI - Giga-Transceiver Analogue Input Card



The GTAI provides optically isolated analogue input from external equipment to the simulation. The card has a total of 12 true differential inputs which can be read by simulation components running on the PB5.

The GTAI can provide updates to the PB5 card at a minimum of 6 µs intervals.

The GTAI input can range between a maximum of ± 10 Vpeak.

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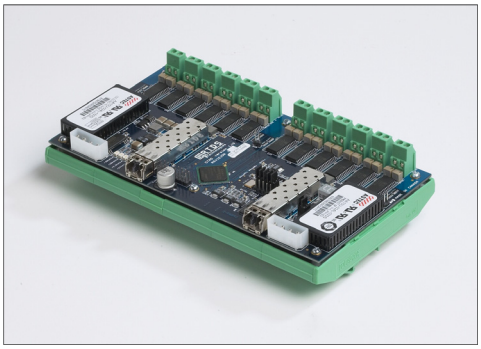
GTAO - Giga-Transceiver Analogue Output Card

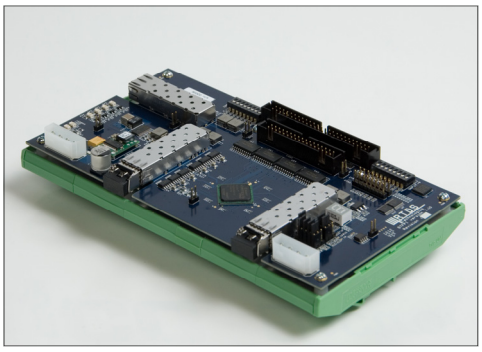


The GTAO provides optically isolated analogue output from the simulation to external equipment. The card has a total of 12 outputs which can be sent from either regular or small timestep simulations running on the PB5.

Special care has been taken in the design of the GTAO to provide the communication bandwidth required for small timestep applications.

The GTAO output can range between a maximum of ± 10 Vpeak. When operating with a regular timestep simulation, the GTAO card can provide oversampling of the output at 1.0 µs intervals.

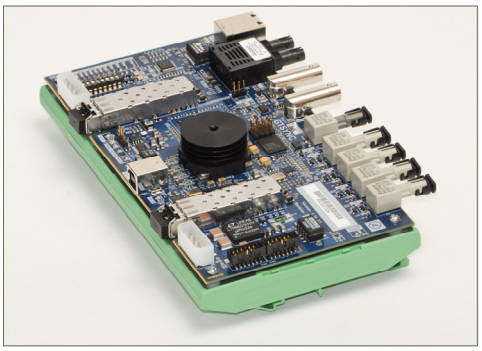
GTFPI – Giga-Transceiver Front Panel Interface Card



The GTFPI card is used to read and write signals between the front panel and the RTDS Simulator. The GTFPI can be used with both the TTL level digital I/O panel and the dry contact (high voltage) panel.

Data exchange between the front panels and the GTFPI is via a ribbon cable, while the data exchange between the GTFPI and PB5 is via a GT port.

GTSYNC – Giga-Transceiver Synchronization Card



The GTSYNC card is used to synchronize the RTDS simulation timestep to an external time reference (eg. GPS clock) and to synchronize devices under test. The GSYNC connects to the GT port on the GTWIF and cannot be daisy chained to other I/O cards.

The GTSYNC supports 1 Pulse Per Second (1PPS) over BNC coax or ST type fibre connectors, IEEE 1588 over RJ45 or ST fibre connectors as well as IRIG-B over a BNC coax connection. Synchronization of the simulation timestep to an external time reference is necessary for PMU benchmark testing and it is advantageous for IEC 61850-9-2 sampled value output.