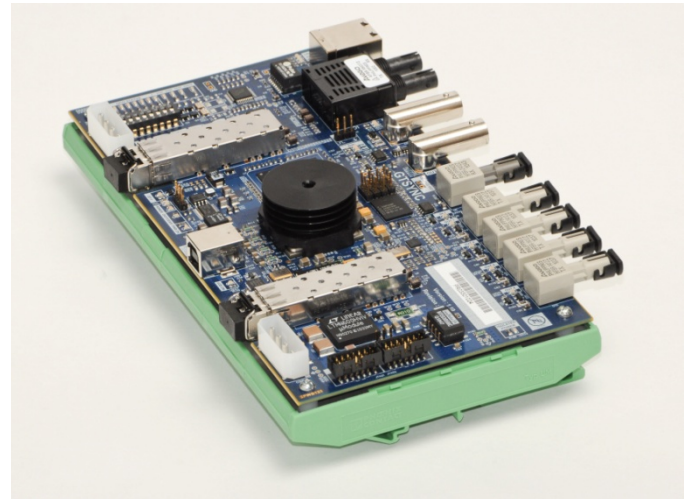
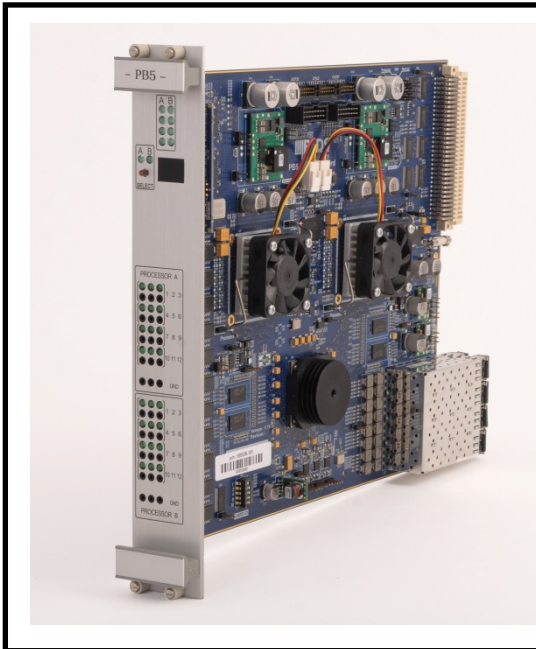


# RTDS NEWS

July 2011

Real time digital simulation for the power industry



## New Hardware Developments – The PB5 and GTSYNC Cards

We have recently released our newest and most powerful in processing technology. The PB5 processor card is the latest generation of processor cards developed for the RTDS<sup>®</sup> Simulator. New simulators are being based exclusively on PB5 processor cards. The PB5 is also fully compatible with the GPC processor card and can be used to upgrade and enhance the capabilities of existing GTWIF – GPC based simulators. There are several key advantages that the PB5 processor card has over the GPC card.

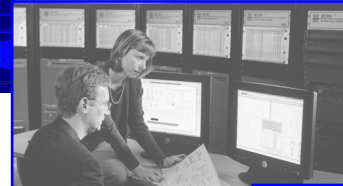
Each PB5 card has two Freescale MC7448 PowerPC RISC processors operating at a clock frequency of 1.7 GHz. The number of load units per processor has increased from 10 for the GPC to 12 for the PB5. This provides a 20% increase in computing capacity compared to the GPC card. This means that more components can be simulated using less hardware.

One of the other significant new features provided by the PB5 is that it has eight (8) GT fibre ports. Two (2) GT ports are reserved for connecting to I/O and the other six (6) ports can be used to communicate directly to other PB5 or GPC cards. This is a big advantage over the GPC card which only had two (2) GT ports

dedicated for card to card communication. The increased number of ports will simplify the modeling of large scale systems using Small Timestep Subnetworks. This can be valuable for modeling distribution networks which have many short lines and can be difficult to model using a typical 50  $\mu$ s timestep.

The number of nodes per network solution has increased from 66 single-phase nodes with the GPC processor card to 72 single-phase nodes (24 three-phase buses) with the PB5 processor card. Along with the node increase, perhaps the most significant feature of the PB5 processor card is its ability to support dual network solutions (i.e. two subsystems) in one rack. This means that the maximum number of nodes per rack is now 144 (2 x 72). As before, the subsystems must be split with a travelling wave transmission lines, cables or subsystem splitting transformer.

Existing clients who participate in the extended hardware maintenance program will be eligible to exchange older processor cards (i.e. GPC, 3PC, TPC, etc.) to obtain a 50% discount on the purchase price of the PB5 card. Please contact RTDS Technologies Inc. for more information regarding the exchange program.



### GTSYNC Card

Some simulation applications such as PMU (Phasor Measurement Unit) testing and protection studies involving IEC 61850-9-2 Sampled Values (SV) require precision timing. Since the clock used to generate the simulation timestep has an accuracy of 100ppm, the phase of signals generated inside the RTDS will drift relative to external equipment that is synchronized to a precision time reference. The GTSYNC card was developed to facilitate simulation where a high precision time reference is involved.

The GTSYNC card is a rail mount card that allows the simulation timestep to be synchronized to a 1 Pulse Per Second (1PPS) or IEEE 1588 PTP time reference signal. The 1PPS signal can be connected to the GTSYNC using either a BNC coax cable connector or ST style fibre optic connector. The IEEE 1588 synchronization is performed over Ethernet using 100BASE-TX via RJ45 connector or 100BASE-FX via ST style fibre optic connectors.

### C37.118 PMU Protocol

Development is also underway on a new firmware for the GTNET which will implement the PMU communication protocol C37.118 output that will allow communication from simulated PMU's to external Phasor Data Concentrators (PDC's). The firmware release is planned for Fall 2011.



*KEPCO (Korean Electric Power Corporation) is in the process of performing a significant upgrade to their RTDS Simulator at the KEPS Power System Analysis Center. All 26 racks are being upgraded to GPC – GTWIF technology to make it one of the largest and most powerful Real Time Digital Simulators in the world. Look for a feature article about this upgrade in the next RTDS News.*

### User's Group Meeting

An RTDS User's Group Meeting was held at the offices of Southern California Edison on May 10 – 12. With over 30 participants and numerous technical presentations over the three days, the meeting was deemed a success. The intention is that an RTDS User's Group Meeting will be held every two years.

The new PB5 processor card, GTSYNC card and various new RSCAD features were announced at the meeting. A demonstration showing application of the large scale RTDS Simulator available at SCE was made.

Technical presentations made at the meeting are available by contacting [christine@rtds.com](mailto:christine@rtds.com).

RTDS Technologies would like to express our thanks to SCE for hosting the event and to Jim Kelly, Senior Vice-President of SCE, for his Keynote Address. RTDS Technologies would also like to thank all those who attended and especially those who made technical presentations.

### RTDS Training Course

An RTDS Introductory Training Course was recently held at our facility in Winnipeg. The course was well attended by customers and industry users wanting to learn how to use the RTDS Simulator. The final two days of the week long course focused on Protection & Automation.

We are planning a two-day Advanced User's course on October 6 & 7, following the IEEE EPEC Conference being held in Winnipeg. Please contact [christine@rtds.com](mailto:christine@rtds.com) for more information.

### **UPCOMING EVENTS**

- IEEE General Meeting**  Power & Energy Society™  
Hospitality Suite July 25 & 26, 2011 in Detroit, USA
- IEEE EPEC**  Power & Energy Society™  
Exhibition Oct. 3 – 5, 2011 in Winnipeg, CANADA
- APAP 2011**   
Exhibition Oct. 17 – 20, 2011, Beijing, PR CHINA