

# CTI Micro-Nano Event

2015

## ORION : Modular platform for high availability power system

### Context

This KTI project has been initiated by Delta Energy Systems (Switzerland) AG together with the School of Engineering and Architecture of Fribourg. This was a successful 21 month project seeing collaboration with software engineers from the Delta R&D team in Bern and from the HTA-FR.

Since more than ten years the *ORION* controller and its predecessor, *PSC 3*, are successful products used worldwide for controlling and monitoring telecom power systems. Both software and hardware have been adapted and extended over the years with new features to meet the customer needs and expectations.

### Goal

The aim of this project is to make *ORION* software ready for the future by reworking the core application with a more modular design. With an history of more than ten years of development, the software has reached a state where adding new features is difficult and time consuming. Modifying the existing code base is a risky operation because of the tight coupling between software components.

### Some metrics about ORION C++ software

- ~400k LOC (productive) + ~300k LOC tests (5000+ unit tests)
- 250 Web pages with more than 1500 configurable parameters
- 50+ hardware extension modules

### Outcome

- Analysis and modularization of the core application
- Improve the reliability and robustness of the Unit Test infrastructure
- Full support for UTF-8 (for international language support, e.g. Myanmar)
- New features
  - Introduction of loadable user management
  - Configurable communication for Modbus Energy Meter
  - Improved system security and connectivity with HTTPS, IPv6, VLAN
  - Introduction of a USB port with backup / restore from memory stick
  - New user friendly concept for I/O mapping

### Added value

- Basis for expansion to new markets (USA, Japan, Myanmar)
- Faster feature development (lower „Time to market“)

### Team

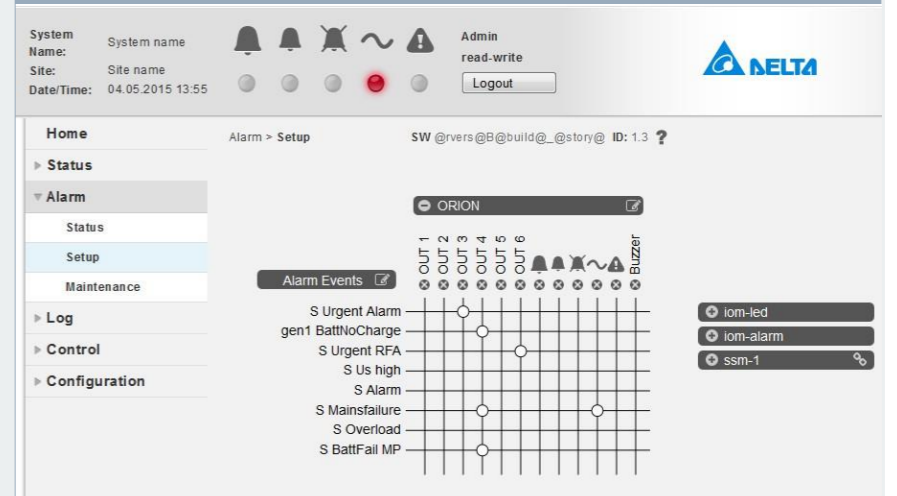
- KTI responsible person: Dr. Wolfram Luithardt (HTA-FR)
- Project leader ORION: Adrian Plüss (Delta Energy Systems (Switzerland) AG)
- 2 teachers from the HTA-FR
- 4 engineers from the HTA-FR (always 2 fulltime during the project)
- 9 engineers from Delta R&D Bern



ORION controller with Ethernet and USB



720kW Data Center application with 120 rectifiers



ORION Web Interface (Alarm Mapping)

### Field of research

Embedded Software Development

### Starting date, duration

1.1.2013, 21 months

### Research partner

Hochschule für Technik und Architektur  
Freiburg, Prof. Dr. Wolfram Luithardt

### Industrial partner

Delta Energy Systems (Switzerland) AG,  
Adrian Plüss

### Project Nr.

14064.2 PFNM-NM



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