

MASTER CLASS IN IEC 61850 SYSTEMS INTEGRATION



MASTER CLASS OBJECTIVES

At the end of this course, the participants will be able to:

- Use the application knowledge gained during this course to specify, design, configure and/or test protection and control systems based on IEC 61850.
- Learn how to mitigate the technical risks of IEC 61850 implementation, supplemented by a working demonstration.
- Understand different Ethernet network architecture options and the importance of a robust network design with built in security and monitoring features.
- Understand the IEC 61850 GOOSE protocol and the detailed requirements for application in protection schemes, for example isolation and test considerations.
- Understand the various features of the MMS standard used for SCADA communication and remote interrogation.
- Gain a working knowledge and understanding of substation configuration using IEC 61850 SCL to configure individual IEDs, SCADA systems and the underlying communication networks.
- Understand the documentation requirements for IEC 61850 based systems and the importance of configuration management.
- Understand time synchronisation methods and mechanisms used in IEC 61850 based systems.
- Be more efficient in your own work through the lessons learnt from others.



TARGET AUDIENCE

The target audience for this Master Class are Electrical Design and Field Engineers or field based Technicians with greater than four years of substation protection, SCADA or control systems related experience. This course will greatly assist engineers involved in the development and creation of new IEC 61850 systems. This course will further aid engineers charged with detailed design, systems integration or field testing and validation of IEC 61850 based substation protection and automation systems.

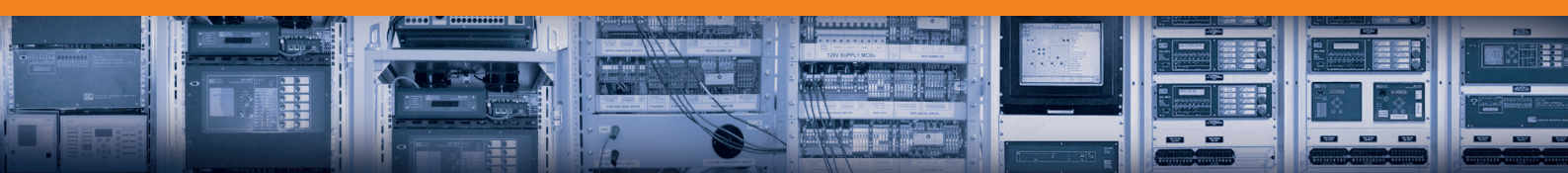


PRESENTERS

James Stokes is the Director of Jarrah Solutions Pty Ltd, a company specialising in Engineering and technology solutions. James graduated from the University of Western Australia with a first class honours Bachelor of Electrical and Electronic Engineering. James has over 17 years of power industry experience; working in private and public sectors across transmission, distribution, power generation, oil & gas and water treatment. As Principal Engineer at Western Power, James led the introduction of IEC 61850 into transmission substations from business case writing to on-site commissioning. The first IEC 61850 based 132kV zone substation went into service in June 2013 and numerous other installations are now underway. James is a member of Australian Standards Technical Committee EL-050 "Power System Control and Communications".

Pascal Schaub is the Director of D.T. Partners Pty Ltd, a specialist provider of products and consultancy services in the substation and grid automation domains. Pascal currently holds the position of Principal Process Control Engineer with Queensland Gas Company (QGC), providing the organisation with engineering expertise in power system automation and data networks. Pascal received a Bachelor degree in Computer Science from the University of Applied Sciences and Arts North-Western Switzerland. In his previous role of Principal Consultant Digital Technology Infrastructure working for Powerlink Queensland, Pascal led the development of IEC 61850 based Station and Process Bus solutions. Pascal is a member of Standards Australia Technical Committee EL-050 "Power System Control and Communications" and the international Working Group IEC/TC57 WG10 "Power System IED Communication and Associated Data Models".





COURSE OUTLINE

The international standard IEC 61850 'Communication and Systems for Power Utility Automation' is creating opportunities for a revolution in the world of electrical power systems. IEC 61850 enables business improvements by defining standardised methods of communication between devices. New integrated systems can now be built from multi-vendor products that are networked together to perform high criticality protection, monitoring, automation, metering and control functions over the same infrastructure platform.

The implementation of IEC 61850 enables companies to design and deliver significant improvements in safety, reliability and whole-of-life cost performance.

This Master Class will provide participants with a working knowledge of IEC 61850 systems integration based on today's technology, demonstrated with today's products. Demonstration will be performed using the API test rack. These demonstrations will show how the technical risks of implementing IEC 61850 can significantly reduce time in the engineering process and improve the quality of the final product.

The course will cover the theory of Ethernet network design, the IEC 61850 GOOSE and MMS protocols and the use of the Substation Configuration Language (SCL) to design and configure a substation automation system based on IEC 61850. The presenters will configure a test system as part of this course to demonstrate the individual steps required to implement and test a full substation automation system. The test system will consist of protection relays from different vendors communicating with a SCADA HMI and Gateway over an Ethernet network.

As the course is based on current working technology, it will be limited to IEC 61850 Edition 1 and 'Station Bus' only. 'Sampled Values' and 'Process Bus' will be outside of the scope of this Master Class. The presenters, from opposite sides of the country, have independently led the creation and implementation of IEC 61850 substation systems. Real life experiences will be shared with the participants to show how IEC 61850 can provide a real and working substation protection, automation and control system.

COURSE PRICE

The price of the course will be **\$1950 + GST** for non-API members and **\$1250 + GST** for API members. The course fees include catering and course material.

COURSE DATE

The course will be held in the following cities with the following dates:

- **Melbourne** – MON/TUE 12th & 13th May
- **Sydney** – THU/FRI 15th + 16th May
- **Brisbane** – MON/TUE 19th + 20th May
- **Perth** – MON/TUE 9th + 10th June

COURSE NUMBERS

Each Master Class will have a minimum of 12 participants and up to a maximum of 25 participants.

AGENDA

Duration	Start	Finish	Day 1 Topic	Day 1 Presenter	Day 2 Topic	Day 2 Presenter
0:15	8:15	8:30	Welcome & Introduction		Welcome & Introduction	
1:00	8:30	9:30	Industrial Ethernet Layer 2	by James Stokes	SCD development	by James Stokes
1:00	9:30	10:30	Industrial IP Layer 3	by James Stokes	Application of SCD to IEDS	by James Stokes
0:15	10:30	10:45	Morning Tea		Morning Tea	
1:30	10:45	12:15	Network Architectures	by Pascal Schaub	Application of SCD to SCADA	by Pascal Schaub
0:30	12:15	12:45	Time Synchronisation	by Pascal Schaub	HMI and Master Stations	by Pascal Schaub
0:45	12:45	13:30	Lunch		Lunch	
1:00	13:30	14:30	GOOSE schemes bay-level	by James Stokes	Working demo with testing	by James and Pascal
1:00	14:30	15:30	GOOSE schemes system-level	by James Stokes	Working demo with testing	by James and Pascal
0:15	15:30	15:45	Aternoon Tea		Aternoon Tea	
1:00	15:45	16:45	MMS in SCADA systems	by Pascal Schaub	Local expert presentation	by local expert
0:45	16:45	17:30	HMI functionality and use	by Pascal Schaub	Open forum	by all

REGISTRATION, ACCOMMODATION AND FURTHER INFORMATION

Registration available from Engineering Education Australia (EEA) Website at www.ee aust.com.au

Accommodation if required is the responsibility of participants.

Technical Enquiries on course content may be addressed to Australia Power Institute (API) Chief Executive, Mike Griffin, mcgriffin@caloundra.net.au