



IT4INDUSTRY

Editorial/White Paper

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Subject: City of Cape Town – Tygerberg Electrical SCADA Network Employs SSE Data Networks DNP3 RTU's

Introduction

SSE CAPE has been commissioned to provide City of Cape Town's requirements for the supply Remote Terminal Unit's (RTU's).

The system is to be used in the control and data acquisition of Distribution and Reticulation power networks for the Tygerberg Region.

The Tygerberg Region consists of East and West Master Station's employing **Citect SCADA**. The Citect Master consists of two 50 000 tag servers recently upgraded to the new Citect Version 6, Wirelan wireless LAN links form the basis for the WAN and the LAN (RTU to master) communications network employ the **MDS** high speed digital radios.

SSE Telemetry System Overview

The SSE Telemetry system is one of the most advanced, versatile and modular Telemetry Systems available in the world. By combining microprocessor technology, synthesised two-way radios, Cell-Phone networks, Fibre Optic and other communication mediums, the SSE Telemetry meets the requirements of modern Telemetry and Telecontrol Systems. The SSE Telemetry is designed for the reliable monitoring and control of remote and distributed systems.

The SSE RTU Telemetry can be used in numerous different applications:

- Remote Telemetry I/O Acquisition
- Remote data logging, with time stamped events, and scheduled data download
- Remote PLC. PLC type programs can be developed on a computer and down loaded via the communication network to the outstation. Complicated distributed control systems can be developed and implemented.

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The heart of every Telemetry station is one (or more) Remote Terminal Unit (RTU). This is the microprocessor that performs all data processing, criteria and integrity checks, I/O module processing and communications protocols and mediums. The RTU, also has I/O's on-board available which makes the RTU extremely powerful for its size.

SSE manufactures all telemetry equipment to ISO9001 Quality Standards

SSE RTU Telemetry System Philosophy

The SSE Telemetry system philosophy encompasses the use of standard, modular hardware in telecontrol installations, across a range of RTU applications.

To achieve these requirements, an essential feature required of the RTU is modularity and scale ability. This enables cost effective installations. The range of applications indicated in covers the full range in substations required in this Contract.

The functions that the SSE Telemetry system can perform (as standard functions or application programming in the RTU), for the control of the electrical network and associated data, include:

- Remote acquisition of Status and Alarm inputs
- Remote acquisition of operating values (V, I, P, Cos Φ) from standard transducers
- Remote acquisition of metering data
- Automatic fault isolation
- Automatic reconnection of unfaulted feeder sections
- Load balancing
- Quality of supply measurements
- Nodal balancing

These functions can be classed under the banner of Distribution Automation (DA).

DNP3 Protocol

SSE has implemented DNP3 Protocol up to Level3 in the Telemetry RTU. This has been done professionally, by implementing purchased command stacks (firmware) from recognised overseas vendors, and thorough testing in R&D phase.

The "SSE DNP3 RTU" has been independently tested by a few Electrical Departments in SA, for compatibility to existing Test Sets, Communications systems, and Master Station SCADA Software, in 2004.

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RTU Sizing

Mini RTU:

Mini RTU Basic:

Enclosure and Modules complete and wired for:

DIN	AIN	RLA
72	16	16

Small RTU:

Small RTU Basic:

Enclosure and Modules complete and wired for:

DIN	AIN	RLA
120	32	32

Medium RTU:

Medium RTU Basic:

Enclosure and Modules complete and wired for:

DIN	AIN	RLA
216	64	64

Large RTU:

Large RTU Basic:

Enclosure and Modules complete and wired for:

DIN	AIN	RLA
312	96	96

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Conclusion

The Tygerberg Electrical SCADA network is one of the first networks to employ DNP3 as a standard telecontrol protocol. The migration process has taken place over a number of years and the system is considered to be one of the most advanced standalone DNP systems in South Africa outside Eskom.

SSE Cape is proud to have been considered as a supplier of DNP RTU's, MDS Digital Radios & Citect SCADA for the City of Cape Town.

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