

NovaTech Substation Automation Application Note

Customer and Project Scope:

Tucson Electric Power Co., Tucson, AZ. Rancho Vistoso Substation (one of six automated substations)

Dates of Implementation:

Initial install 1998; upgraded 1999 and 2001

Type of Substation Automation Project:

- Smart RTU (connected to IEDs)
- Remote Engineering Interface to protective relays
- Substation HMI
- 1mS High Resolution SER
- Equipment Monitoring
- Automatic LTC control
- Capacitor Bank Monitoring and Switching
- Substation Control; above plus bus restoration and fault isolation

NovaTech Hardware, Software and Service Products:

- Wonderware InTouch Substation HMI configured by NovaTech
- NovaMux (BM85 Bridge Mux) with protocols: L&G 8979, SEL Relays, NovaHost, Modbus Plus
- Monaghan SER System in Modicon PLC with SER PLC loadable software function
- Momentary Change Detect Software Loadable for PLCs
- LTC TAPP and LTCC sensing and control Loadables for PLC
- Custom PLC 984 Ladder Logic Programming
- Systems Engineering
- Commissioning
- Training

Responsibilities of NovaTech, Other Vendors and Utility:

NovaTech engineered complete system and provided a factory acceptance test, on-site commissioning services and training. TEP personnel were responsible for installation and energization for the initial system implementation. Two subsequent system upgrades have been performed with engineering provided by the factory and installation provided by TEP utility personnel.

Substation Local Area Network(s):

Modbus Plus

SCADA Network and Protocol:

L&G Telegyr 8979

IED Interface Details:

IED (connected to NovaMux)	Number	Interface Protocol	Data Retrieved	Control through IED?	Other
Modicon PLC (1 Quantum, 3 Compact)	4	Modbus Plus to PLCs	Breaker status, 1mS SER time stamps, XFMR LTC Tap Pos	Yes, breaker trip/close, LTC Raise/Lower	Modicon Remote I/O LAN
NovaMux with SEL Protocol	9	Modbus Plus to other mux. SEL protocol to SEL relays	SCADA status and analog data, fault data	Yes	Connected to various SEL relays
NovaTech Orion16	1	Modbus Plus to other mux. SEL protocol to SEL relays	SCADA status and analog data, fault data	Yes	Connected to various SEL relays
Bitronics Meters	8	Modbus Plus	Feeder Analog Values	No	

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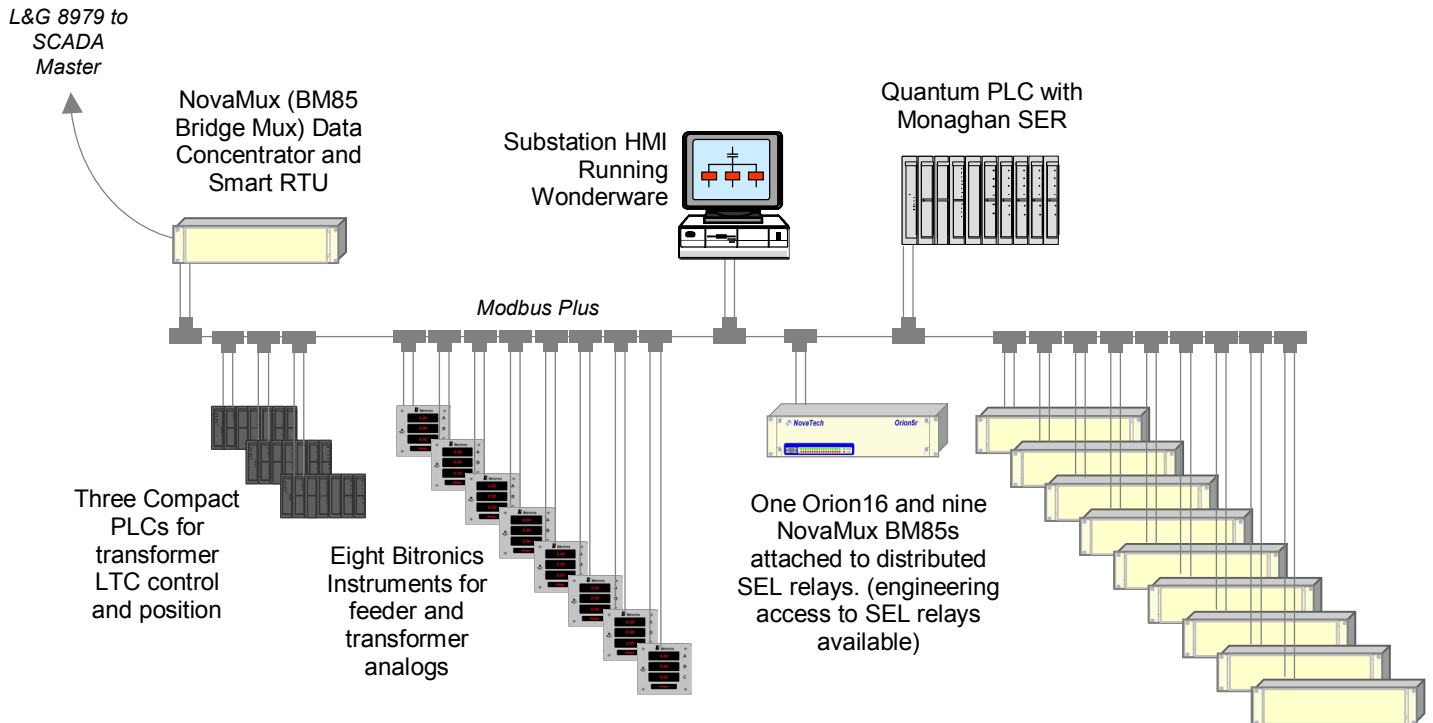
In-Substation Wonderware InTouch HMI Details:

- Sequence of Events capture and retrieval
- Pass-through engineering access to SEL protective relays
- Oscillographic file retrieval
- Alarm display and logging
- Station One-Line Diagrams
- Historical Data Logging
- Breaker Trip/Close; Select Before Operate
- Reclose Block; Ground Trip Block
- LTC Raise/Lower
- Alarm/Event Reporting & Logging
- Pseudo-Point Processing
- Multiple Drill-Down Levels
- Dial-up Remote Access
- Display of Breaker and LTC Usage and Maintenance Data (Op Counters, I²T)

Other Notable System Functions:

- Local and remote engineering access to SEL relays
- Breaker and LTC maintenance data captured and annunciated

Diagram of Tucson Electric Power Co. Rancho Vistoso Substation



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