Gateway to Down Under Irrigation

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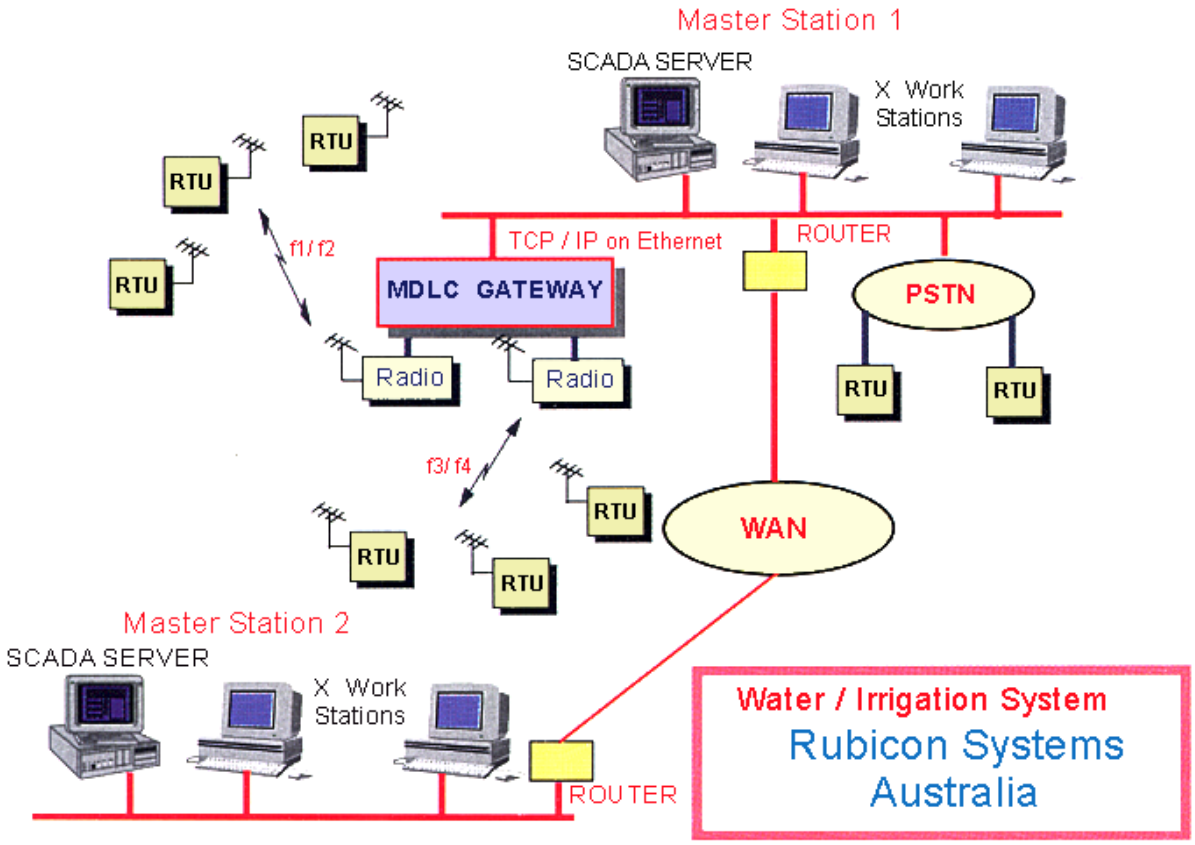
Goulburn Murray Water Co. System

In most Australian open channel irrigation systems, irrigators must order their water requirements in advance to enable the supplier to make the necessary calculations and scheduling to meet the demand for water with a minimum of regulation effort and wastage. With a growing population and resulting demand for additional irrigation, the Goulburn Murray Water Co. began a search for a computerized system that would enable better management and control and also considerable savings in manpower.



Rubicon to the Rescue

Rubicon Systems, because of its extensive experience in the development of a wide range of software and hardware products for the Australian irrigation industry, was selected to provide SCADA systems, fully integrated advanced database systems and decision support tools.

The three major Rubicon developments for the Goulburn Murray system are:

- Water system network model
- Water system flow and quality management
- Remote Surveillance and control of water system assets

Water System Flow and Quality Management

Rubicon built a kit of planning and analysis tools that work from the water system network model database. The kit enables the water production people to analyze the data in order to determine short, medium and long-term operational strategies for the water network. This is a critical requirement for many Australian systems where the demand for water often exceeds the supply. The toolkit includes a graphically driven demand scheduling system to enable the more precise adjustments to match the system supply with customer demand, taking into account network production constraints and corporate production strategies.

Remote Surveillance and Control of Water System Assets

Rubicon's SCADA technology is based on Motorola's DARCOM radio and MOSCAD RTUs. This enables the system operators to monitor the behavior of the irrigation supply system and to control the key system components from the office computer. The company has developed a range of hardware and software modules around the Motorola technology to facilitate the monitoring of many different important water system indicators, such as: channel water level, flow and volume delivered, pipeline pressures, and water quality parameters such as salinity and water turbidity. The control center computer is based on the Monitrol real-time development environment, developed by Hilco Technologies. The Hilco system enables full integration of real-time data into the production database and the graphical integration of SCADA schematics into the Rubicon graphic environment.

Rubicon is also developing a range of standardized remote site equipment for key water system monitoring and control points. This equipment includes modular irrigation gate systems, actuated by solar powered electric motors, that can be easily retrofitted into existing channel structures. Reusable software modules have been developed for the MOSCAD RTU for reliable and efficient data collection and channel management for the many different gate configurations in the field. These modules enable automation of some open channel functions, such as maintaining a constant water level or flow at a regulator site.

Motorola MDLC Gateway for TCP/IP

The Rubicon control center software solutions, described above, are built on HP UNIX workstations, hooked up to an Ethernet LAN, using TCP/IP. It is essential that all data can be effectively transmitted across LAN and WAN to support production planners and operators using industry standard networking technologies. The Motorola MDLC Gateway for TCP/IP is a key feature of Rubicon SCADA architecture. The Gateway is located between Motorola's MDLC real-time telemetry network and the control center Ethernet environment and enables data to flow between the operators in the office and telemetry networks in the field. The Gateway's client/server architecture means that any computer on the office network can access the telemetry network. Since the Gateway hardware is self contained, it does not require special installation – it simply plugs onto the office network using standard Ethernet connectors.

Motorola Gateway technology significantly simplifies the effort normally required to achieve network interconnectivity and also assists with telemetry data integration into applications residing on the TCP/IP networks, such as Rubicon's Monitrol system. This is achieved by seamlessly managing the routing of data between the two network environments and by providing software engineers with an application software interface to the MDLC system. This is very important because without the application software interface, such an advanced telemetry protocol, could be very difficult to integrate into third party software systems and networks.

Gateway to Two Worlds

The Gateway solution enables taking the maximum advantage of the best features of the two networking environments. Most network architectures employ front-end telemetry processors or field interface devices. These systems require network definition data to be loaded into the control center software, the front-end processors and the field interface devices. This results in multiple data redundancy which is costly and difficult to manage medium and large telemetry networks. By using the MDLC Gateway, this extra level of network definition is eliminated, removing one level of data redundancy in the SCADA system.

Motorola's MDLC gateway – opening more arable land to Australian farming.