

Typical Mine Site Water Pumping Telemetry System

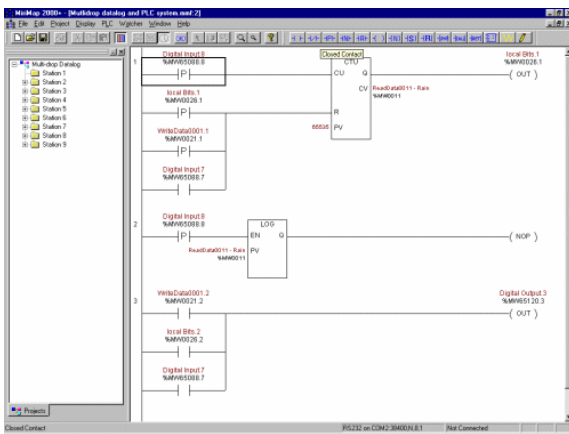
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The Thunderbox Gold Mine in Western Australia illustrates a very typical application for the AD2000 Telemetry Unit. Every mine, regardless of the ore being extracted, requires a good water supply as part of the treatment process. Convenient and accessible underground water table locations are often located several kilometres from the actual mine site where the ore deposit is mined and processed.

Traditional labour intensive methods for manual operation to start and stop underground water pumps are not economic or sufficiently reliable for the 24 hour process operations that most mine sites run. Some convenient method of monitoring and controlling the remote electrical equipment is required. With little or no telecommunications infra-structure such as telephone services being available and with distances in the 10-20km range making laying cables or fibre optic uneconomic radio offers a reliable and convenient way of enabling this monitoring. Indeed this application has been repeated hundreds of times over the many years of business that Oval has conducted in this area and they have refined the solution to produce the AD2000 product. Without too much bias, Oval is the true expert in this field and offers a price competitive product and many years of valuable experience enabling solutions for remote monitoring and control for just about any mine site.



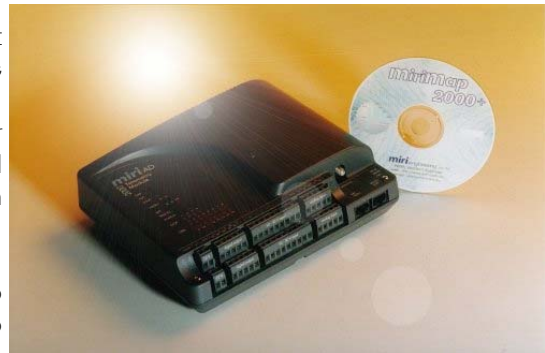
Several remote underground water bores are used to extract water into a feeder pipeline then into a dam storage area at the mine site. At each bore the flow rate is monitored via a 4-20mA current loop



from a flow meter and transducer (the AD2000 has 8 analogue inputs available for such monitoring). The digital status of the pump running, fault, remote selection and ready status is monitored directly by some of the 16 digital inputs on the AD2000 unit. The control of the pump from start initiation, whether from the plant control system or locally via manual operator action, is controlled by the logic internal to the AD2000. This Ladder Diagram functionality is enabled via the OvalMap2000+ software package which provides an easy to use graphical interface that runs on any Microsoft Windows platform from Windows 95 and later. You may know Ladder Diagram by its other name Relay Ladder Logic or RLL, common in the PLC

market. This common and easy to use graphical programming language allows local low flow monitoring and tripping to be programmed to suit the local conditions with variable low flow timer delays. Flow totalisation is also possible via pulse inputs or accumulation of analogue flow rates.

All the status and control points are then fed into a plant control PLC (in this case an Allen Bradley PLC5 but the AD2000 supports several common industrial protocols) which are then made available to the plant operator interface (in this case Citect but the AD2000 has and will readily interface directly to other popular packages such as ifix, Wonderware, Cimplicity etc.).



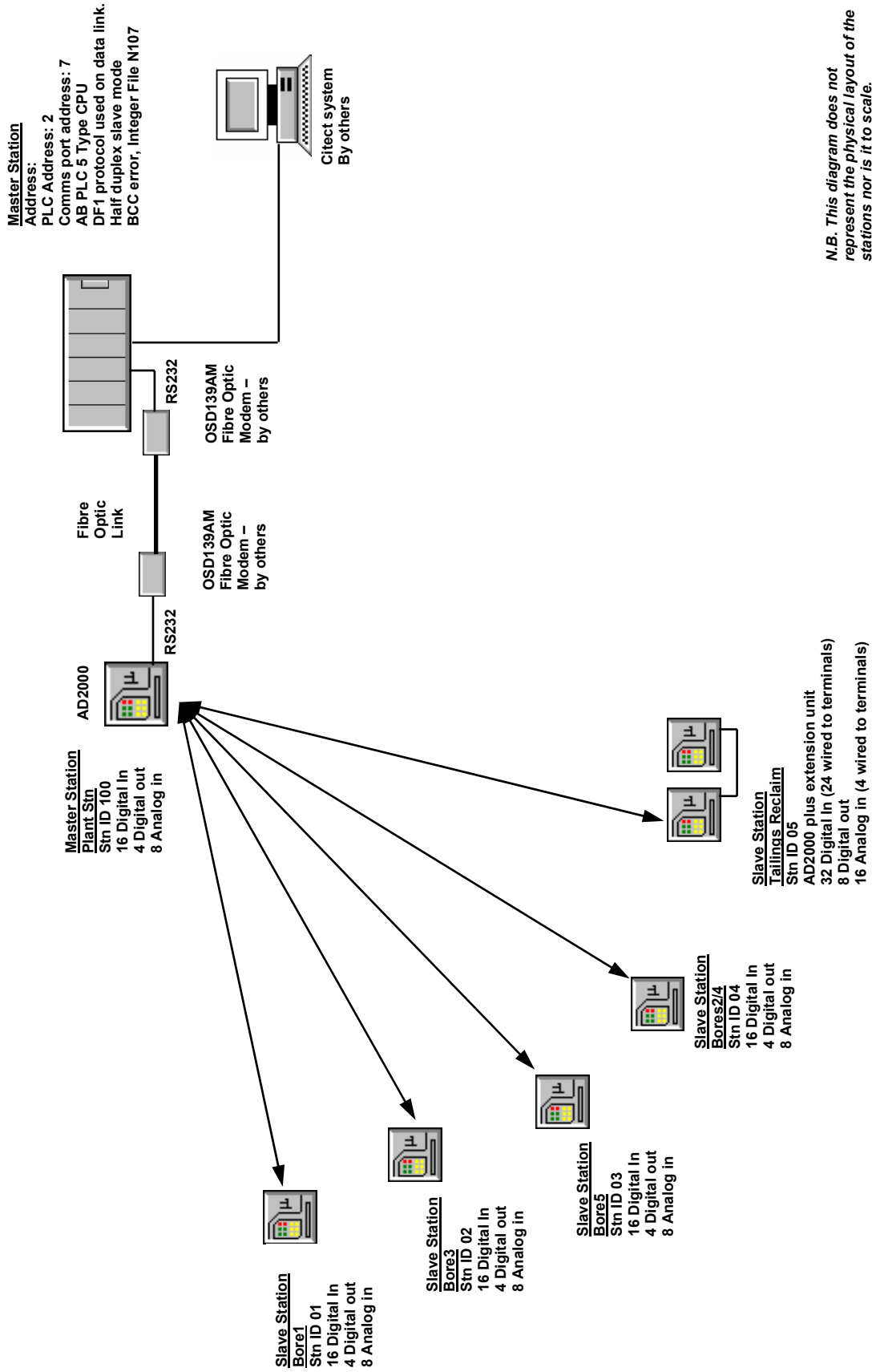
The radio system utilises the internal digital data radio that is integral to the AD2000 facilitating radio diagnostics and secure data transfer at baud rates up to 4.8k. The diagram on the next page illustrates the system layout. For further detail & information contact Oval.

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N.B. This diagram does not represent the physical layout of the stations nor is it to scale.