

**PROJECT: VINEYARD DISTRIBUTED CENTRAL
IRRIGATION NETWORK**

CLIENT: Oliver's Taranga Vineyards, South Australia

The system for this reputable South Australian vineyard consists of a **RAINMAN** centralised monitoring system and five **RAINMAN** controllers distributed throughout the vineyards, all linked to the central computer via radio communication.

The system controls and manages eight different water sources used for irrigation on the property. These water sources include recycled, mains, bore and dam water. Water usage is monitored at each water source with the data stored on the central computer as monthly and / or yearly volume graphs.

All real time data on current, flow rates and pressures throughout the system are displayed on the central computer. This data is stored and trended and is retrievable at any time. Customised reports have been created which include daily, weekly and monthly runtimes and water usage for each station.

Customised features added to this system include a Variable Speed Drive (V.S.D.) and Employee Clock-on facility. The V.S.D. maintains the pressure of the irrigation system to achieve optimal performance. The Employee Clock-on facility allows staff to log on / off at any controller which then automatically creates a time sheet for that employee.

The central can store unlimited amounts of historical information such as previously used irrigation programs. A program or programs can be imported back into the system to replace any existing programs. This feature can be used to log the irrigation history for previous irrigation seasons.

The **RAINMAN Handheld** unit included in the system is able to perform maintenance checks and turn valves and the water source pumps on / off. This method of control can be performed anywhere on the vineyard without the operator needing to access the irrigation controller cabinet therefore saving labour time and costs.

Alarms will appear at the controller and the central control computer when there is a change in set parameters for functions such as flow, pressure or run times. This alerts staff and enables them to rectify any problems in a short period of time.

PROJECT: GOLF COURSE CENTRAL IRRIGATION SYSTEM

CLIENT: Deniliquin Golf Course, New South Wales

The Deniliquin Golf Course, situated in rural New South Wales, underwent a reconstruction and shaping works program.

This program was undertaken on the back six holes of the course and involved the supply and installation of a new irrigation infrastructure, which includes 240 new valve in-head sprinklers.

To compliment this works program, new irrigation controllers and a central irrigation control system were installed to service the entire golf course.

RAINMAN was selected due to its extensive features and ease of use for operators of all levels.

Australian Irrigation installed eleven **RAINMAN** controllers around the course. These controllers are housed in powder-coated steel pedestal enclosures and are linked via radio to the central control computer.

A **RAINMAN WeatherMaster 2000** completes the system by providing live weather data back to the central.

An aerial photograph of the course was taken and incorporated into the customised central control system (see picture).

The aerial photo allows easy operation for the user as they can point and click their mouse to the Controller icons on the screen to obtain information for that site and make program changes. Zooming in and out shows pipe and valve locations for each hole and allows easy manual control.

RAINMAN will provide the Golf Course Superintendent and his staff with a much more efficient monitoring and control system that is able to incorporate additional features should they be required in the future.

**PROJECT: CENTRAL IRRIGATION CONTROL &
MANAGEMENT SYSTEM**

CLIENT: City of Stirling, Western Australia

The City of Stirling in Western Australia covers an area of 109.4km² with over 760 hectares of parks and recreation areas.

Spread throughout this area are 250 **RAINMAN** irrigation controllers which communicate back to a central control computer by radio. The City's intention is to connect all 303 existing irrigated sites to **RAINMAN** - subject to funding.

To enhance communications, sites in low lying areas or those without a clear communications path use an antenna on an upright pole to help communication. Towards the centre of the City, a water tower situated on high ground is being used to house a radio repeater to further improve communications across the vast areas within the City of Stirling.

The central control computer has been networked from the City's office to the Works Depot and is accessible via modem from laptop or the manager's home at any hour.

PROJECT: **CENTRAL IRRIGATION CONTROL &
MANAGEMENT SYSTEM**

CLIENT: **Albury City Council, New South Wales**

After months of intense market research by Albury City Council Parks and Recreation Department, the City of Albury called for tenders for a city wide Central Irrigation Control and Management System.

The Central Control System was to be installed at the Albury Botanical Gardens and as well as controlling that site was to enable Council to efficiently monitor, manage and control multiple independent irrigation sites throughout the City of Albury. **RAINMAN** was chosen to implement the City's requirements.

Stage 1 of the project has now been completed with 10 separate sites around the City now online to the Central. Each site has been installed with an intelligent **RAINMAN** irrigation controller which communicates via radio to the Central. As well as managing irrigation scheduling the **RAINMAN** controllers will be connected to flow meters and moisture sensors for site monitoring and a weather station provides vital information allowing for fine tuning the system.

As **RAINMAN** controllers are intelligent devices, all monitoring of site conditions can be viewed at the Controller (as well as the Central) and programming changes can be made on site. (Controllers are protected by passwords to deny unauthorised access). If the Central computer is "off line" for any reason then **RAINMAN** controllers will continue to operate and record all site information which is downloaded to the central when it is back on line. The adding of further monitoring equipment is made easy with **RAINMAN** as all controllers were supplied with inputs to allow for future expansion of the system.

It is expected that the system will eventually have up to 100 independent irrigation sites on line with annual additions being determined by budgets.

As the **RAINMAN** system can be customised to client requirements and is not an "off the shelf" product, modifications can be made at any time.

PROJECT: **CENTRAL IRRIGATION CONTROL &
MANAGEMENT SYSTEM**

CLIENT: **Esperance Shire Council, Western Australia**

Esperance Shire Council's Central Irrigation Control and Management System includes a 96 station **RAINMAN** controller. Previously, 4 separate controllers located in different areas of the Town's main sportsground and drawing water from two separate pumps were providing inefficient control of this high profile area.

The 96 station **RAINMAN** controller provides a single location for on site programming and manual control with stations automatically activating the relevant pumps.

A smaller 32 station **RAINMAN** controller replaces three existing units on the Esplanade, again providing a single location for on site control. The new controller is housed in an existing brick building leaving the foreshore with no unsightly irrigation cabinets which can be susceptible to vandalism.

Esperance Shire Council maintain irrigated sites for smaller communities outside of town, some as far away as 40kms. The new **RAINMAN** controllers to be installed at these remote locations will eventually be connected to the Central Control Computer via the telephone network with the local sites operating over a radio telemetry network.

Esperance Shire Council now has a powerful telemetry system with on site controllers having the capability to monitor and control more than just irrigation valves and pumps. **RAINMAN** controllers can be used in the future to control, monitor and report on the treated effluent supply for irrigation systems and automatically activate and monitor bore pumps used to provide a satisfactory mix.

The Council is counting the amount of man hours that will be saved in travelling time to remote sites.

**PROJECT: GOLF COURSE IRRIGATION
CONTROL SYSTEM**

CLIENT: Hamersley Golf Course, Western Australia

Hamersley Golf Course, situated in Perth, Western Australia is a public course with 18 scenic tree lined holes.

The susceptibility of lightning hits to the course controllers was an ongoing problem with their previous irrigation system. Staff had to return to the course during lightning storms to physically disconnect each controller.

With such high labour and maintenance costs it was decided to replace the entire system with the **RAINMAN** Irrigation Control System.

The **RAINMAN** system monitors irrigation equipment such as pumps which will provide further cost savings to the course. The course superintendent and staff are able to concentrate more of their time and energy into other areas of the course to ensure it provides an attractive challenge to all golfers that visit Hamersley.

Hamersley's **RAINMAN** system consists of 16 field controllers, linked back to a central computer via radio. Ground staff have different passwords which only allows access to certain functions. Operators can use the controllers on the field as stand alone controllers, or by using the computer. As each controller has its own 'intelligence', if the computer fails or communication is lost, the field units will still function and will store any data, ready to update the computer when communications are restored.

PROJECT: **GOLF COURSE IRRIGATION
CONTROL SYSTEM**

CLIENT: **Point Walter Golf Course, Western Australia**

Point Walter Golf Course, situated on a point overlooking the Swan River in Western Australia is a picturesque 9 hole course. As a busy public course the maintenance of Point Walter is a priority to ensure the course is looking its best and coping with the heavy traffic flow of golfers. The old irrigation control system consisted of bits and pieces from several different brands of controllers, independent of each other, and linked back to a makeshift control board in the main office with a tangle of wires. Parts of the system were non-operational and causing extra work for the grounds staff.

With the perfect location, perfect views and a golfing public expecting the best, the decision was made to throw out the old system and invest in **RAINMAN**. By using a central control system, with controllers able to work as stand alones when necessary, Point Walters' golf course superintendent expects to save time on electrical problems and maintenance, and spend more time on landscape maintenance for the course.

The **RAINMAN** system designed for Point Walter consists of:

- 60 station controller
- 30 station controller
- Pump controller
- Central control computer linking the three controllers

Three bores are used to pump water into a storage tank. Water from this tank is then used to irrigate the course. The **RAINMAN** pump controller controls and monitors the operations of two reticulation discharge pumps from the water tank, and monitors the water level in the tank. The pump controller monitors flow, pressure and motor current, eliminating the need for separate measurement meters. Alarm points can be set for high pressure, low flow etc, and alarms can trigger a shutdown, warning or skip over.

The two field controllers are programmable at the controller or at the central control computer, which is used to control and monitor the system from the main office. The central control computer logs information and produces reports such as flow graphs which show the flow used for each program run.

**PROJECT: CENTRAL IRRIGATION CONTROL &
MANAGEMENT SYSTEM**

CLIENT: City of Melbourne, Victoria

The City of Melbourne previously had their parks and reserves divided into three regions, with each group being irrigated under different control systems.

The City called for one system to control and monitor irrigation for all regions that could be easily operated by Council staff.

The **RAINMAN** Central Irrigation Control and Management System provided a solution to the City's request and **RAINMAN** were awarded the contract.

RAINMAN irrigation controllers have been installed at 48 sites across the City and operate manually on-site and via a centralised control computer located at the City's head office. Council staff are able to make changes to the system at this computer, which will automatically update the site controllers. The communication between the central control computer and the site controllers is via radio.

The system for City of Melbourne has been designed with the inclusion of **RAINMAN** Handheld controllers.

The **RAINMAN** Handheld gives the operator complete control of a controller by communicating via radio through the satellite antenna. It can be used for testing the irrigation system by opening and closing valves from any point on the site and has the ability to read and monitor any measured input and display all system parameters.

Some of the sites include:

- ◆ Carlton Gardens
- ◆ Fitzroy Gardens
- ◆ Flemington Road
- ◆ Kings Domain
- ◆ Royal Park Zoo
- ◆ Shrine Gardens
- ◆ St Kilda Road
- ◆ Treasury Gardens
- ◆ Yarra Park

PROJECT: **CENTRAL IRRIGATION CONTROL &
MANAGEMENT SYSTEM**

CLIENT: **City of Swan, Western Australia**

Micro Control Engineering has supplied and installed a **RAINMAN** Centralised Computer Irrigation Control System for the City of Swan in Western Australia.

The City of Swan is the largest metropolitan local government area within suburban Perth and encompasses the boundary between the coastal plain and the Darling escarpment.

The City boasts the largest river frontage in Perth and is home to the Swan Valley, a renowned viticulture area.

The **RAINMAN** system for the City of Swan includes a centralised computer which links to twenty-six **RAINMAN** controllers. The controllers are installed throughout the City's parks, ovals, sports grounds and other facilities.

A **RAINMAN WeatherMaster 2000** automatic weather station is installed at Altone Park. The WeatherMaster measures rainfall, windfall, wind direction, air temperature, relative humidity, solar radiation & evaporation rate. Each sensor continuously sends information to a data logger, which processes and stores the data in its memory. The data is then available for collection at the central control computer.

Three **RAINMAN** Handheld devices will complete the system by allowing operators to obtain data from the controllers and test stations on-site without need to access the irrigation controller cabinet.

PROJECT: **TURF FARM RESEARCH FACILITY**

CLIENT: **University of Western Australia**

The University of Western Australia is conducting a research project titled:

**“Reducing Water Use by Turf Grasses in a Mediterranean Environment:
Evaluation of Diverse Species”**

This project is researching eleven different turf species which include couch, buffalo and rye and seeks to determine the most suitable grass types and watering schedule for the Perth climate.

The research site has 20 experimental turf plots, each divided into 12 sections (see figure below). In the middle of the plots is a water channel. A travelling irrigator which is supported by a rail system draws water from the channel to irrigate.

The different turf types have been planted into each plot, with the twelfth section left as a vacant control. Each section of each plot is monitored and measured to determine the affects on the eleven turf types given different irrigation treatments in each plot.

The control system designed for this experiment consists of a **RAINMAN** base station controller and a **RAINMAN** controller which sits on the travelling irrigator.

Each plot has its own watering schedule and uses the position sensors to determine when irrigation starts and stops.

The **RAINMAN** control system:

- ◆ starts the travelling irrigator engine and the pump at pre-programmed times
- ◆ controls the speed of the irrigator using the position sensors
- ◆ turns sections of the boom on/off at designated trigger points
- ◆ controls forward and reverse
- ◆ monitors pressure and flow

PROJECT: **EFFLUENT DISPOSAL FROM
WASTEWATER TREATMENT FACILITIES**

CLIENT: **Goulburn Valley Water, Victoria**

Goulburn Valley Water has Wastewater Treatment Plants (WTP) located at Euroa, Mansfield, Yea, Seymour, Broadford and Kilmore in Victoria.

These WTPs dispose of treated effluent to various local sites to be used in irrigation. The effluent is dispersed at these sites via Drip, Sprinkler, Two-Wire and Centre Pivot irrigation.

Micro Control Engineering has supplied **RAINMAN** integrated control systems to each of these sites that consist of irrigation and pump control, weather stations and a centralised control system (CCS).

The CCS communicates with the **RAINMAN** irrigation and pump control switchboard and weather station via radio telemetry enabling complete remote operation of the system(s) and logging of all Alarms, Events and Trends. Access to all components within the system is security password protected denying any unauthorised access.

The Kilmore site has a **Two Wire Irrigation Network (TWIN)** translator module integrated with the **RAINMAN** controller. The TWIN is used for fixed irrigation of infill areas located outside the pivot controllers irrigation boundary.

Direct input from the **RAINMAN WeatherMaster 2000** weather station and soil moisture probes enable the system(s) to cater for environmental conditions on site and meet stringent disposal guidelines.

These weather conditions are:

➤ Rainfall Shutdown

Allows the user to pause and then shutdown any automatic irrigation in the event of excessive rainfall. If enabled, irrigation will be paused as soon as the daily rainfall exceeds the user-defined setpoint.

➤ Wind Speed Pause

Allows the user to pause and then shutdown any automatic irrigation due to excessive wind speed from a prescribed direction. This eliminates the potential for wind drift effecting effluent disposal from the properties.

➤ Maximum Pause Time

This is used to define the maximum time for which automatic irrigation can be paused before it is stopped altogether.

➤ Soil Moisture Input

Soil moisture input is directly inputted to the **RAINMAN** Centre Pivot irrigator panels from various positions within the irrigation site. Once the prescribed value is met the Centre Pivot will advance dry to the next irrigation segment to avoid over watering and site effluent run off.



PROJECT: **CENTRAL IRRIGATION CONTROL &
MANAGEMENT SYSTEM**

CLIENT: **City of South Perth, Western Australia**

Micro Control Engineering (MCE) has supplied and installed a **RAINMAN** Centralised Computer Irrigation Control System for the City of South Perth in Western Australia.

The City of South Perth occupies an area of land bordered on three sides by the Swan River. Boasting a collection of parks, historical sites and the Perth Zoological Gardens makes the City one of Perth's most vibrant communities.

The City's parks and gardens area covers 4.3km² and includes Sir James Mitchell Park, a high traffic area for family picnics and outings.

With such beautiful parks and garden areas to maintain, the **RAINMAN Mp** was the obvious choice for this project. MCE installed eleven **RAINMAN Mp** controllers throughout the South Perth foreshore with all units being linked back to a Centralised Control System at the City's head office.

A **RAINMAN WeatherMaster 2000** automatic weather station completes the system measuring rainfall, windfall, wind direction, air temperature, relative humidity, solar radiation & evaporation rate. Sensors continuously send information to a data logger, which processes and stores the data in its memory. The data is then available for collection at the central control computer and assists in determining system shutdown or irrigation program stoppages.

PROJECT: IRRIGATION CONTROL FOR OLIVE GROVE

CLIENT: Barnadown Olives, Victoria

The system for this olive grove plantation consists of a **RAINMAN Mp** Two Wire Irrigation Network (TWIN) control switchboard inclusive of irrigation and pump control and a variable frequency drive.

Remote access to the control switchboard is via a centralised control system that communicates through a GSM wireless modem.

The TWIN component of the system consists of field decoders attached to an underground field cable and a translator unit located at the switchboard. The decoders interpret on / off signals sent down the field cable allowing them to open and close solenoid valves for irrigating the olive grove.

A **RAINMAN WeatherMaster 2000** automatic weather station completes the system measuring rainfall, windfall, wind direction, air temperature, relative humidity, solar radiation & evapotranspiration rate. Sensors continuously send information to a data logger, which processes and stores the data in its memory. The data is then available for collection at the central control computer and assists in determining system start up or shutdown of irrigation program(s).

PROJECT: CENTRAL IRRIGATION CONTROL & MANAGEMENT SYSTEM

CLIENT: Gladstone City Council, Queensland

Micro Control Engineering has supplied and installed a **RAINMAN** Centralised Irrigation Control System for the Gladstone City Council in Queensland.

This harbour City has many attractions including the Tondoon Botanical Gardens.

The **RAINMAN** system for this project includes a Centralised Control System (CCS) and 12 **RAINMAN** controllers. The controllers are linked back the CCS via a network that consists of a combination of landline and radio communications.

Another feature of this system is the use of Remote Irrigation Controllers (RICs). The RICs are intelligent radio devices that control the activation of irrigation solenoid valves. These valves can be positioned through the irrigation system without the need for wires. All irrigation programming for the RICs is done via the **RAINMAN** controller.

PROJECT: **CENTRAL IRRIGATION CONTROL AND
MANAGEMENT SYSTEM**

CLIENT: **Kings Park and Botanic Gardens, Western Australia**

Kings Park and Botanic Gardens is the premier showpiece for Perth Western Australia.

This major tourist attraction covers 400ha of which 267ha is bushland. Along the tree lined avenues throughout the park are plaques for servicemen who gave their lives whilst serving their country in times of war. Other attractions include the Flame of Freedom War Memorial, Western Power Parklands and Lotterywest Federation Walkway.

With such beautiful parks and recreation areas to maintain and with undoubtedly the best views of Perth and the Swan River, **RAINMAN** was the obvious choice to support this "A" class reserve's irrigation system.

The park's irrigation system includes a combination of conventional and two-wire stations.

The project includes 13 **RAINMAN** irrigation controllers and a computerised central control system. Two of the controllers are used to monitor and control the parks pump stations, including the water treatment process.

The **RAINMAN** units control 8 separate irrigation systems that provide fully automatic online flow management and adjustment of the irrigation due to evapotranspiration (ET). The systems are linked back to a centralised control system via a network that consists of a combination of landline and radio communications.

A customised feature of this **RAINMAN** project includes the control of the park's fire sprinklers.

Other features for this project include:

- **RAINMAN TWIN** Two Wire Irrigation Network is a proven decoder-based system that controls the activation of solenoid valves. The network consists of 2-wire decoders attached to an underground field cable and a translator unit that is integrated with the on-site **RAINMAN** controller;
- **RAINMAN WeatherMaster 2000** automatic weather station measures rainfall, windfall, wind direction, air temperature, relative humidity, solar radiation & evapotranspiration rate. The weather station continuously monitors its sensors and stores the data in its memory. The data is then available for collection at the central control computer and assists in determining system start up or shutdown of irrigation program(s);
- **RAINMAN** Handheld device allows the operators to obtain data from the controllers and test stations on-site without the need to access the irrigation controller cabinet.



Flame of Freedom War Memorial



View of the city of Perth and the Swan River from Kings Park

PROJECT: **IRRIGATION CONTROL &
ENVIRONMENTAL MONITORING FOR
NURSERY**

CLIENT: **Forrest Products Commission, Western Australian**

The Forrest Products Commission is constructing a controlled growing environment for the purpose of growing tree species seedlings, using the propagating techniques of direct seedlings and cuttings. This plant propagation nursery is located in Manjimup, Western Australia.

Micro Control Engineering has supplied this nursery with a **RAINMAN Mp** irrigation controller to optimise the application of water via irrigation misters (sprinklers) to the seedlings and cuttings and maintain the growing environment within a constant range of temperature and humidity levels.

The controller has the following significant features for nursery use:

- Humidity sensor input
- Two temperature sensor inputs
- Humidity program
- Nursery program

PROGRAMS

Humidity Program

The humidity program activates the irrigation misters when the humidity drops below a predetermined set point. It will stop any other programs that are running and will continue to cycle until the humidity comes up above the set point.

Nursery Program

The nursery program is a special purpose program that monitors temperature and humidity to control a blanket, a heater, two evaporative coolers and a venting fan.

Cooling Process

The cooling process starts when the temperature is above the maximum temperature (day or night as appropriate). It will stop immediately and shut down the coolers and vent fan once the temperature gets down to the target temperature.

It is the Commissions intention to install several nursery controllers to their Manjimup site and have them all linked to a computerised Central Control System (CCS). The CCS will log and record nursery data from the controller such as temperature and humidity conditions, irrigation applied and the heater and cooler operations.

PROJECT: **IRRIGATION CONTROL &
MONITORING FOR ORCHARD**

CLIENT: **Cobram Irrigation, VIC.**

Panda Ranch is a 35,000 acre stone fruit development in north western Victoria which supplies both domestic and export markets.

Two **RAINMAN Mp** grouping controllers monitor and control the application of irrigation water to the property. A **RAINMAN Mp** pump controller is also utilised to activate the irrigation pumps located at the orchard.

The **Mp**'s have 15 standard irrigation programs that can activate up to 20 groups of station valves and have up to 5 start times. All groups will cycle through sequentially until finished with the controller then switching to an idle status.

There are 5 optional programs available if required for frost protection, heat protection, fertigation, looping and filter flush.

A **RAINMAN TWIN** (Two Wire Irrigation Network) controls the activation of solenoid valves throughout the irrigation system. The TWIN consists of 24VAC 2-wire decoders attached to a two-wire field cable network and translator unit that is integrated with the **RAINMAN Mp** controller.

To complete the system a **RAINMAN Mp** Central Control System (CCS) is used to control and administrate the controllers in the orchard from a nearby computer. The orchard is graphically represented on the computer screen and allows the user to simply point and click on any controller icon to obtain information and make programming changes.