

General Specifications

Power Supply

The unit can be powered using AC or DC power. This is largely dependent on the manner in which outputs are controlled and the available power source.

- Alternating Current (AC) - 24 Volt AC transformed from 220 Volt or 380 Volt mains.
 - Direct Current (DC) - Directly from external 12 Volt DC battery with minimum size of 180 amp/hr.
- Optional solar panel to recharge external and internal battery as required with minimum panel output size of 80 Watt (A larger supply will be required for wireless control).

Keypad

39 Keys colour coded and clearly identified for ease of operation

- 12 Numeric keys to enter program variables.
- 9 Direction keys to move through the program menus, tables and cells.
- 1 Enter key for data entry.
- 2 Action keys to "Pause" and "Rain" stop the irrigation.
- 12 Shortcut keys providing instant access to a specific program menu.



Display

240 x 128 Dot Liquid Crystal Display in alphanumeric / graphics format with backlighting for operation in the dark. Backlighting is activated at the touch of a key and ceases operation within 30 seconds after the last key was released.

Outputs

A maximum of 128 outputs can be operated from the controller which can be defined as pumps, filters, chemical pumps, main valves, alarms, irrigation block valves or slave outputs. Outputs can be operated using the control methods described below.

- 24 VAC - Hardwired conventional 24 Volt AC system using an 8 Line AC output card/s
- 9/12 VDC - Hydraulically operated 9/12 Volt DC system based on 2 or 3 wire DC latch solenoids using an 8 Line DC output card/s
- Wireless - Radio operated system using a 128 output serial transmitter interface cards. This system is limited to 2.5 kilometers and may require licensing in different countries.

Combinations of the above methods can be used on one controller. For example, devices to be operated that are located closer to the controller can use 24VAC hardwired local outputs and devices that are located further away, can use wireless control.

Inputs

A maximum of 32 digital dry contact inputs which can be user defined as water meters, fertiliser or chemical meters, pressure stats, level switches, thermostats, remote switches, pressure differential switches, etc.

Communications Formats with Central System (PC).

Maximum number of field computers that are linkable to central personal computer is twelve which is equivalent to 60 independent irrigation systems.

- Radio - Two way dedicated radio with data telemetry transfer capabilities (May require licensing through local authorities dependant on the country). The maximum distance is dependant on terrain and radio transmitter output power.
- Modem (Point to Point) - Using telephone wires.
- RS 485 (two wire system) - Uses dedicated 2 wire 1.5mm² plain cable that can operate up to 8 kilometers from the central system.
- RS 232 serial connection can be used if only one gator is to be linked over short distances up to 5 meters.

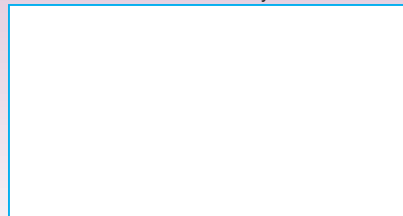
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Gator

Irrigation Controllers

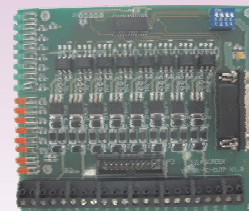
Series 2000

The **Gator 2000** irrigation controller is a powerful processor based field computer offering immense flexibility through a simple user friendly interface and software program. The Gator 2000 can be used as a stand alone unit or one or more units can be linked through a network to a personal computer allowing full programming and data retrieval from a central location.

Modular plug-in output and input cards allow a diverse range of control options and the ability to custom build every control system economically. This irrigation management tool is ideal for open field, turf, landscaping, nursery and greenhouse applications.

Main Features

- Five totally independent user definable irrigation systems each consisting of: a main water pump, a main valve, up to 10 filters, 2 fertilizer pumps and 32 irrigation outputs
- 128 user definable outputs and 32 user definable inputs
- The activation of output devices such as valves, pumps, filters, etc. Using hard-wire, hydraulics, wireless control or any combination of these format
- Application and control of irrigation and fertigation / chemigation on a volumetric or time bases or using any combination thereof
- 85 available daily start times per system
- 3 separate water and fertilizer programs for each irrigation valve
- Advanced windows software for central control incorporating automatic system scheduling



Scope Of Control

One GATOR 2000 field controller is capable of controlling up to five independently operated irrigation systems. Each system is able to control and monitor the following inputs and outputs:

Inputs (back indications) -

- 1 Water Meter
- 1 or 2 Fertiliser / Chemigation Meter
- 1 Rain "Stop" Input
- 1 Flush Start
- 1 Pause Input
- 1 Sequence Start Input
- 1 Emergency Input



Outputs -

- 1 Main Water Pump
- 1 to 2 Fertiliser / Chemigation Pumps / Valves
- 1 System Main Valve
- 1 System Alarm Output
- 1 to 10 Filter Flush Outputs
- 1 to 32 Irrigation Block Valves



Inputs and outputs can be shared between systems (e.g. common pump start output) however allocating an input or output to a system incorrectly can negatively influence the manner in which the controller operates.

Operating & Programming Features

Valve Irrigation Operation & Programs (How much to irrigate)

- Each valve in the system can be programmed to irrigate on a time basis or volumetrically.
- Each valve has a maximum of three independent programs containing three water quantities and three fertiliser / chemical quantities.
- Up to 3 extra outputs can be programmed to operate with any irrigation valve (co-valves). This is often used for booster pumps when irrigating higher lying blocks, etc.
- Every valve has its own overflow and underflow parameters.
- Editing of water quantities while irrigation is taking place is possible.

Fertigation / Chemigation Operation & Programs (How much to apply and how)

- Fertiliser can also be programmed to operate on a time or volumetric basis.
- Fertiliser can be injected on a proportionate basis to that of water or in one continuous cycle.
- Fertilizer pumps are independent of each other and can thus handle two separate fertilizer solutions.
- A pre-wash and post wash amount can be programmed per valve.
- Editing of fertilizer quantities while irrigation is taking place is possible.
- Fertiliser can be shut down during a filter flushing cycle.

Sequencing Valves (The order in which irrigation takes place)

- 17 available sequences per system with sequence number 17 having the highest priority for emergency operation (e.g. for cooling and frost protection, etc.).
- 16 irrigation steps (valves) per sequence.
- Sequences are able to follow on from one another on completion of there cycle. This allows continual looping or the ability to irrigate many blocks, one after each other.
- Sequences can be initiated and terminated by using a start and stop date.

Scheduling Sequences (When to start a sequence)

- Five start times per sequence per day providing 85 starts times daily in total per system.
- Sequences can be programmed to start on any day of the week.
- Overlapping sequences will be buffered and brought into operation once the current sequence has completed irrigation.
- Buffered sequences can be cleared if not required.

Filter Flush Programs (How to flush and when)

- Filters can be flushed on a volumetric or time basis.
- Filter batteries can be flushed in the normal manner by commencing the flush cycle at the same filter each time or by alternating the filters at each flush cycle.
- A systems main valve and / or the irrigation blocks can be closed during the flushing operation.
- A final flush cycle can be programmed before irrigation is terminated.
- A flush cycle can be activated through an input from a device such as a pressure differential switch.

General Programming

- System pumps and main valves can be delayed to start and stop in order to stagger system start up and shut down to protect equipment from damage within the system.
- Monitoring delays and alarm overrides are available under general programming.

Manual Operations

- Sequences can be started or stopped manually.
- Flushing cycles can be started and stopped manually.
- Individual outputs can be opened and closed manually. This feature helps when testing the system.
- Individual systems can be paused and resumed.
- Water and fertiliser can be globally increased or decreased on a percentage basis without the need to change each individual valves quantity.
- The status of each Input in the system can be monitored.

Other System Features

Logs and Records

- Events Log - All major events taking place within the controller will be logged to inform the user when the event took place (time and date). The event log records the last 100 events in the system.
- Other available logs include - Completed Irrigation logs, shortages, pending sequences, fault logbook, etc.

System Status Screen

The user can obtain the following information at any time during irrigation process for any system

- What sequence is operating.
- What irrigation valve is operating and what co valve/s (slave outputs) are active along with the irrigation valve.
- How much water and fertilizer / chemical has been given.
- How much water an fertilizer / chemical is still to be given.
- What the actual water and fertilizer / chemical flow rate is.
- Whether a flush cycle is active and what filter is currently being flushed in the cycle.
- Faults are sent to the system status screen to advise the operator of any system problems.
- Other messages such as "In pause" Power Down and Rain are also displayed on the system status screen.
- Actual operating outputs and valves per system are displayed during irrigation on the system status screen.

CURRENT STATUS		SYSTEM: A	
11H26:01 04-10-96		FRIDAY	
IRRIGATING (M3/H)		NO Flow	
SEQ:01 #01	wat =100%		
vlv:02	fert=100%		
OUTP: 003 017			
FERTIGATE: ON		FERT OUTP: 05 (OPEN)	
Water Flow	Fert Flow	FLUSHING	
0065 m3/H	0020 l/H	ON 01	
WAT LEFT*	WAT DONE	FER LEFT*	FER DONE
0085	0035	0015	0040

Central System Features

The Gator 2000 field controller (up to 12 units) can be linked to a central PC. The windows software provides all the operating and programming features as explained in this document which are relevant to Gator 2000 field controller.

Other features in the central system include:

- Printing and file management allowing the user to print records or store them on file for exporting to other programs or printing at a later date.
- An automatic scheduling import routine allows the scheduling of irrigation to be carried out externally of the GATOR software and once completed this can be introduced into the system and sent to update the field controllers. This import function supports scheduling software such as "The Probe" (neutron probe) and other spreadsheet driven software (Excel, Lotus, etc.)

