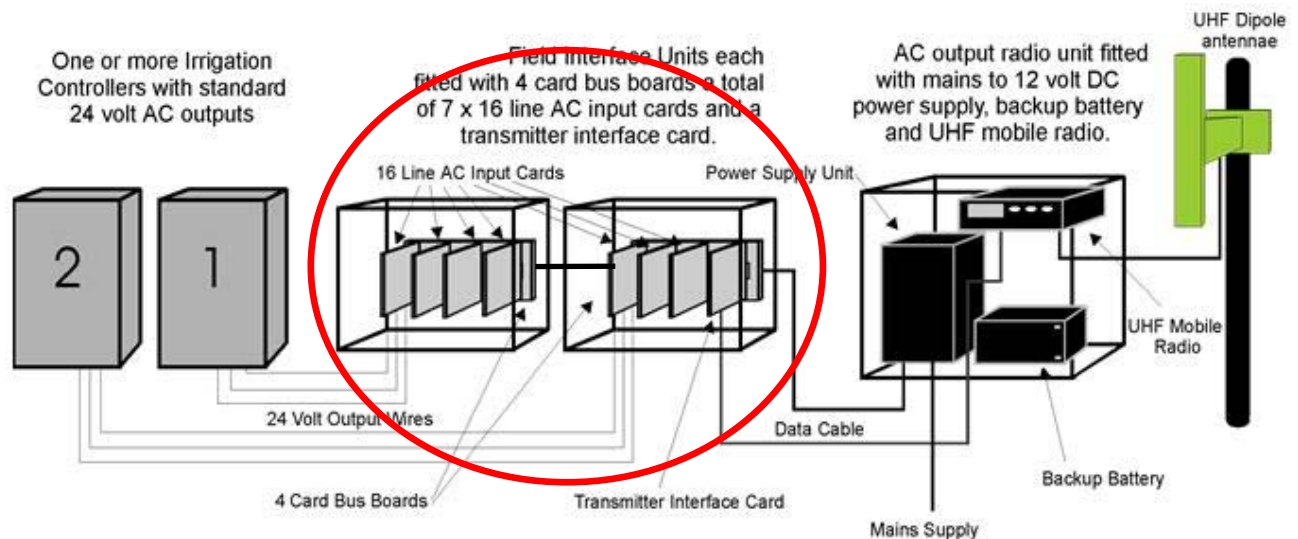


The GATOR Stand Alone wireless control system is generally used to convert conventional 24 volt (live and common) output signals generated by most makes of irrigation controllers into a radio signal used by the Gator G3.1 (or a later version) of the radio receiver switching module. It is also possible to use this system in conjunction with a 5 volt DC input card to convert dry contact signals into radio switching signals.

### SYSTEM COMPONENTS

#### The Field Interface Unit (FIU)

The Field Interface Unit (FIU) is a fibre glass enclosure which houses a collection of electronic circuit boards and equipment which is used to convert 24 volt AC or 5 volt DC input signals into a radio protocol that is transmitted through the AC output radio unit which is more fully described below. A standard FIU would typically house a 4 card bus board, the required number of input/s cards and one transmitter interface card for each radio control system. More than one FIU can be used in a single radio control system depending on the number of outputs in the system to be switched. When more than one FIU is used, the FIU's are interfaced to each other using a serial cable described later in this document.



#### The 4 Card (Slot) Bus Board

- Function - To allow up to four electronic cards to be accommodated in the same system and to act as the data highway for the movement of information in different directions.
- Power to the card - 5 volt DC from a converted 12 volts DC which is obtained from the power supply within the AC radio output transmitter unit.
- Maximum available slots - 4 allowing for 4 cards.
- Maximum number of bus boards that can be linked - 3 over a maximum length of 2 meters.
- Link method - Male to Female D type connectors on the side of the bus boards using a multi core cable.

#### Input Cards

- Function - To convert individual 24 volt AC or 5 volt DC inputs into serial data.
- Power to the card - 5 volt DC obtained from the bus board.
- Power to the inputs - 24 volt AC obtained from the irrigation controller or 5 volt DC obtained from the card and returned to the card via a dry contact switch.
- Number of inputs per card - 16
- Maximum number of cards per radio system - 8 cards (128 outputs).

#### The Transmitter Interface Card and Cable

- Function - To convert the serial data obtained off the 4 card bus board into the communications protocol understood by the radio system.
- Number required per radio system - 1 only.
- Power to the card - 5 volt DC obtained from the bus board.
- Maximum number of outputs - 128 outputs.





## Gator Wireless Control Stand Alone System Installation and Setup Guide

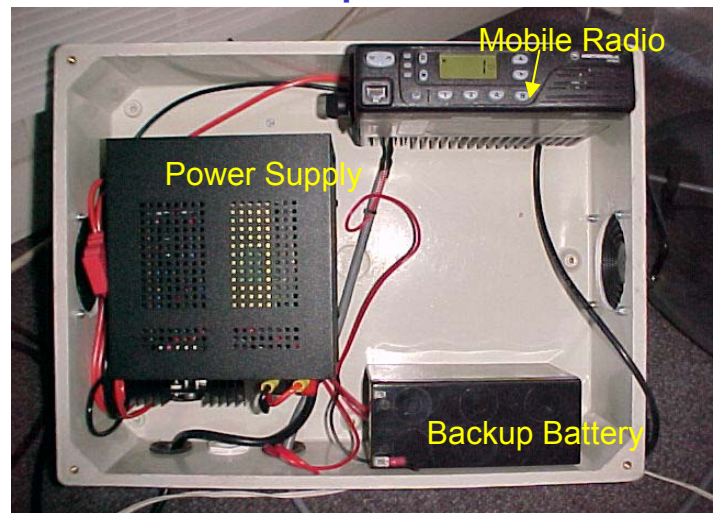
- System Addressing - 11 dip switch settings to address each radio system allowing a number of radio systems to be operated in the same location (where transmission overlap occurs).
- Test Signal - Built in test signal to allow the installer to check on reception in the field at the location of the receiver modules.

The above items are all housed within one or more FIU's

### The AC Output Radio Unit

The AC output radio unit is a ventilated fibre glass enclosure which houses a collection of equipment used to generate the radio signal which is to be sent to the field receiver modules. The AC output radio contains a mobile radio, a power supply and a backup battery. Information on the individual items are more fully described below.

### AC Output Radio Unit.



### Mobile Radio Transmitter

- Function - To transmit the coded protocol to the receiver units.
- Make - Motorola
- Model - GM340, GM350 or GM950
- Frequency Range - UHF 403 to 470 MHz
- Number of Channels – 128 or 4 depending on model (Generally only one channel is used)
- Voltage Supply - 10.8 to 15.6 volt DC obtained from power supply unit.
- Channel Spacing - 12.5 kHz or 25 kHz
- Output Power - Programmable from 5 to 25 watt (5 watt standard)

### Power Supply Unit.

- Function - The supply power to the system.
- Input voltage - 220/240 volts AC @ 50 Hz
- Output voltage - 12 volts DC
- Output power - 7 - 9 amps
- Other features - Built in battery backup and recharging facility.

### Backup Battery

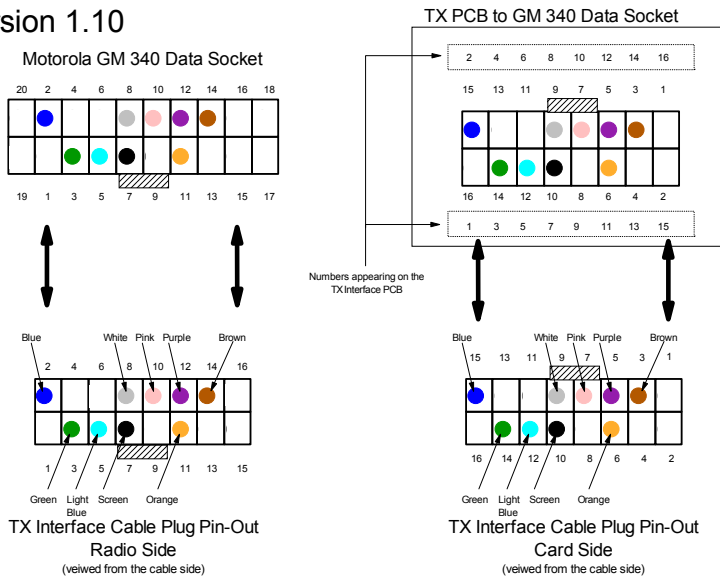
- Function - To provide backup to the radio system so that transmission can be conducted when there is a power failure allowing the systems valves to be shut down.
- Voltage - 12 volt DC
- Amperage - 7 amp/hr
- Type - Rechargeable lead sealed acid.

### INSTALLATION

- 1) Unpack the equipment supplied.  
**Note!!!** Prevent the equipment from making any contact with moisture or water.
- 2) Mount the FIU and the AC Radio Output Unit against a suitable wall / surface using the mounting brackets fitted to the rear of the enclosures.  
**Note!!!** This allows for good air circulation around the enclosures.
- 3) Mount the irrigation controller/s against the same wall / surface in reasonable proximity to the FIU and AC Radio Output Unit.
- 4) Once all equipment has been mounted, open the FIU and remove the lid of the AC Radio Output Unit.
- 5) Carry out the following checks within the AC Radio Output Unit -
  - o Make certain the TX interface cable (the grey multi core cable) is plugged into the data socket of the Motorola radio as per the sketches provide below.

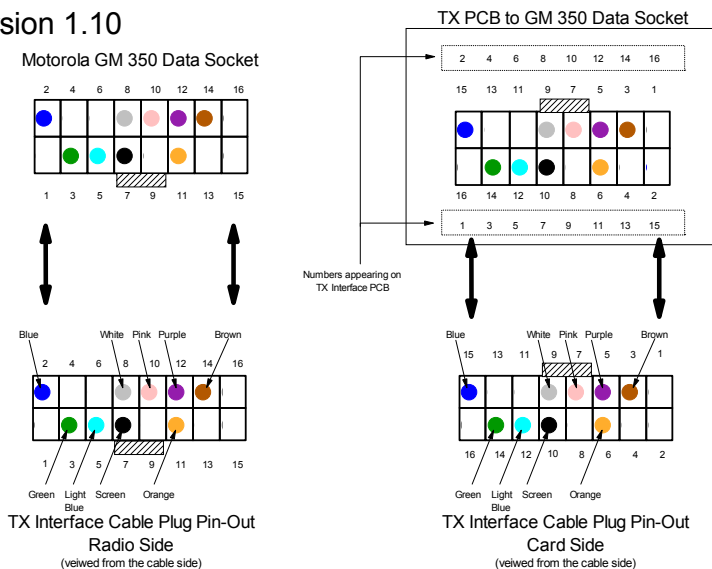
For the Motorola GM 340 Radio

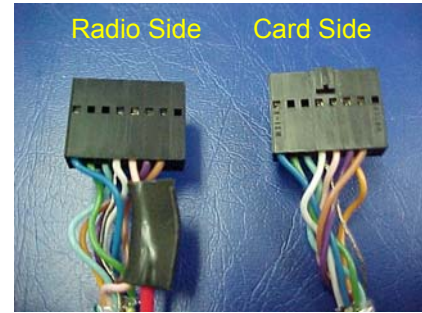
Version 1.10



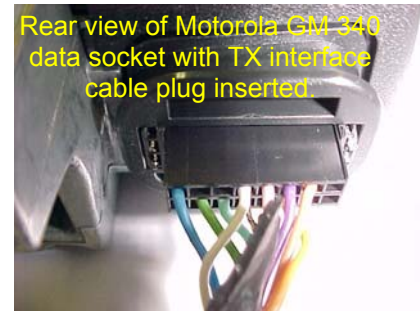
For the Motorola GM 350 radio

Version 1.10



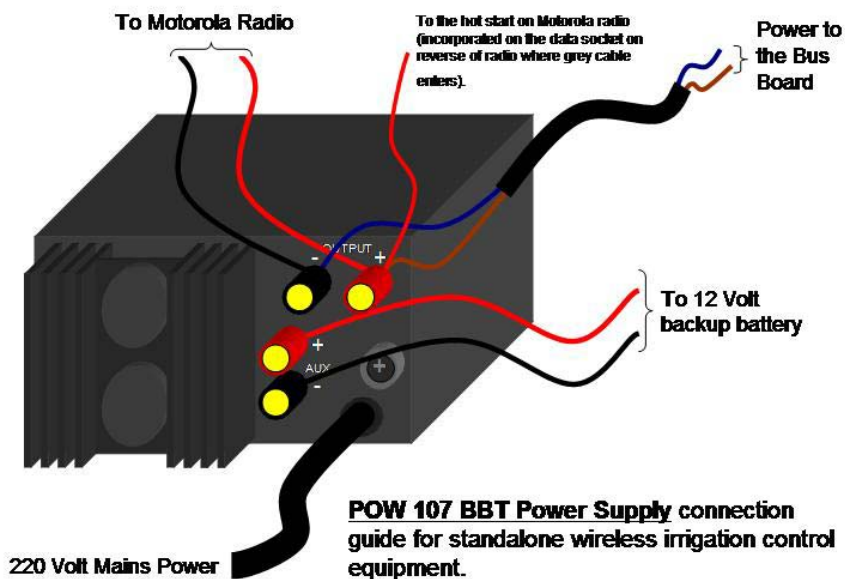


Rear view of Motorola GM 340 radio data socket.



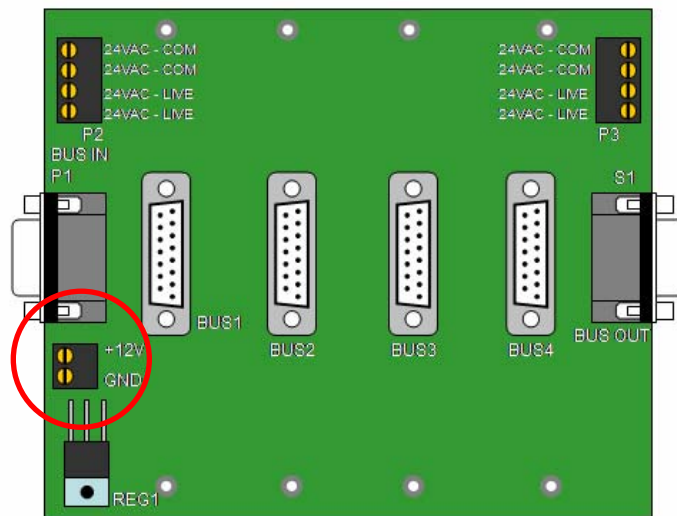
Rear view of Motorola GM 340 data socket with TX interface cable plug inserted.

- Make certain the antennae cable is plugged (the smaller BNC type connector) into the antennae port of the Motorola radio. **Note!!!** Make certain the cable is not kinked or stressed during the installation as this can damage the cable.
- Make sure the 12 volt power supply cable to the Motorola radio is plugged into the power socket at the rear of the radio and that the other end of the radio power harness is connected to the power supply as per the diagram below.



- Make certain the hot start wire from the radio is attached to the positive terminal on the rear of the power supply unit as per the sketch above.

- Make certain the backup battery wires are connected correctly to the power supply but do not connect the battery to these wires.  
**Note!!!** Do not apply either battery or mains power to the unit until the installation is complete.
  - Make certain the 12 volt power cable (the black two core cable) required to power the bus board/s in the FIU/s is correctly connected as per the diagram above.
- 6) Carry out the following work within the FIU –
- Feed the power supply cable from the AC Radio Output Unit into the FIU box and connect power to the bus board by connecting the brown wire to the 12 volt positive position on the terminal block and the blue wire to the 12 volt negative position on the terminal block.  
**Note!!!** Do not reverse the polarity of these wires.

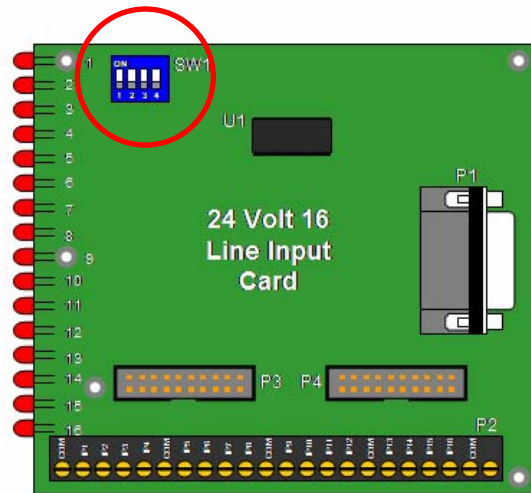


- Setup the 16 line AC input card/s as per the instruction provide below –
  - With the card/s removed from the system, set the dip switch SW1 on each card to the desired card ID. For example a card that is to control outputs 1 to 16 will be set as card 1 (refer to the table below). A card that us to be set to control outputs 113 to 128 will be set as card 8 (refer to the table below).

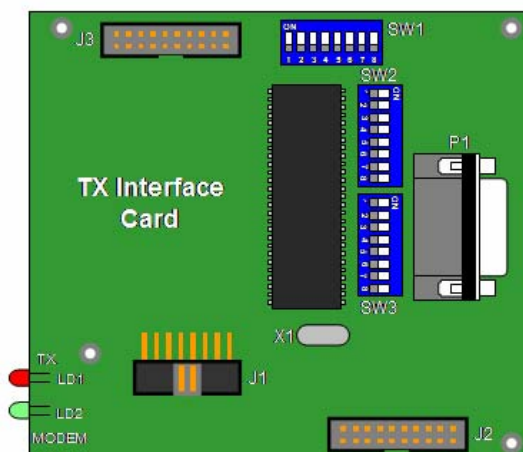
<u>Card Number</u>	<u>Output Numbers</u>	<u>Dip Switch Setting</u> (Starting from switch 1 to 4)
1	1 – 16	1111
2	17 – 32	0111
3	33 – 48	1011
4	49 – 64	0011
5	65 – 80	1101
6	81 to 96	0101
7	97 to 112	1001
8	113 to 128	0001

**Note!!!**            1 = "ON"                            0 = "OFF"

**Note!!!** It is not possible to change the dip switch settings while the card/s is/are plugged into the system and while being powered up.



- Connect the irrigation controller/s output common wire to the common on the terminal block of any of the 16 line 24 Volt AC input cards. **Note!!!** Only one common is required to be connected from the irrigation controller to the complete system. The commons do not need to be looped from one card to the other.
  - Connect each of the irrigation controller/s output wires that are to be controlled by the radio system (per station) to the relevant input number on the terminal block of the 16 line 24 volt AC input card/s baring in mind that card 1 is output 1 o 16, card 2 is 17 to 32 and so forth.
  - Once all outputs have been wired between the controller and the 16 line 24 volt AC input card/s, plug each of the cards into the bus board.
- Setup the TX interface card as per the instruction provide below –
- With the card removed from the system, set dip switch SW1, SW2 and SW 3 on the card.



- The setup of the TX interface card must match the exact number of input cards installed in the system. This is carried out by setting SW1 switches 1 to 4 to the correct input/output start number and SW1 switches 5 to 8 to the correct input/output stop number.



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Start #	1	2	3	4	Input/Output
Stop #	(5)	(6)	(7)	(8)	
Off	Off	Off	Off	Off	1 – 8
On	Off	Off	Off	Off	9 – 16
Off	On	Off	Off	Off	17 – 24
On	On	Off	Off	Off	25 – 32
Off	Off	On	Off	Off	33 – 40
On	Off	On	Off	Off	41 – 48
Off	On	On	Off	Off	49 – 56
On	On	On	Off	Off	57 – 64
Off	Off	Off	Off	On	65 – 72
On	Off	Off	Off	On	73 – 80
Off	On	Off	Off	On	81 – 88
On	On	Off	Off	On	89 – 96
Off	Off	On	Off	On	97 – 104
On	Off	On	Off	On	105 – 112
Off	On	On	Off	On	113 – 120
On	On	On	Off	On	121 – 128

E.G. if there is one input card in the system and it is set as card number one (outputs 1 – 16) then the settings for switches 1 to 4 are 0000 and switches 5 to 8 are 1000. If on the other hand 3 input cards were installed as cards 1 (outputs 1 – 16), 2 (outputs 17 – 32) & 3 (outputs 33 – 48) in the system, the settings for switches 1 to 4 are 0000 and switches 5 to 8 are 1010.

- This radio systems unique identification number is (I.D.) set using SW2. This number must be allocated to the installer by Irri-Gator Products and should correspond with the receiver module/s ID number as well.

This ID number is a binary number and the switch settings are as per the table below.

	Switch 1	Switch 2	Switch 3	Switch 4	Switch 5	Switch 6	Switch 7	Switch 8
Value "On"	128	64	32	16	8	4	2	1
Value "Off"	0	0	0	0	0	0	0	0

E.G. If the systems identification number is allocated as 193 the following switches would be set to the on position to provide this binary total.

Switch 1, 2 & 8 all "On" others all "Off"

**Note!!!** Irri-Gator Products (Pty) Ltd reserve the rights to control the allocation of system ID numbers and as such cannot be held responsible for complications arising due to ad hoc allocation of addresses selected by the installer or user that is not logged with us on our data base.

- Dip Switch SW3 switches 2, 3 & 4 are used to set the TX interface card up for stand alone usage and allows for certain test modes to be performed as well . The last 3 switches on this dip switch are extra system identification numbers. Switches 1 and 5 should always be left "Off"

Normal setting of SW3 for standalone usage would be as follows –

Switch 2, 3 & 4 all "On" and 1 "Off"

Switch 5, 6 & 7 are for setting the extra system ID



## Gator Wireless Control Stand Alone System Installation and Setup Guide

Switch 8 is reserved

For testing output numbers 1 and 2 in a 30 second cyclic loop on the standalone system, set SW3 switches 2, 3 & 4 as follows -

Switch 2 and 4 "On" and switch 3 "Off"

Extra system ID numbers are binary numbers and the switch settings are as per the table below.

	Switch 5	Switch 6	Switch 7
Value "On"	1	2	4
Value "Off"	0	0	0

E.G. If the systems extra identification number is allocated as 6 the following switches would be set to the on position to provide this binary total.

Switch 6, & 7 "On" and switch 5 "Off"

**Note!!!** Irri-Gator Products (Pty) Ltd reserve the rights to control the allocation of system ID numbers and as such cannot be held responsible for complications arising due to ad hoc allocation of addresses selected by the installer or user that is not logged with us on our data base.

- Plug all cards into the bus board once the above setup and wiring has been completed.
- 7) Fit the lightning protection equipment and the mains filter if this equipment has been provided with the system. It is most preferable to fit this equipment in the mains distribution board which provides power to the irrigation system.
- 8) Return to the AC output radio unit and connect the terminals from the power supply unit to the backup battery.

Plug the power supply into the mains unit and switch the power supply "On". The Motorola radio should be powered up at this stage.

The TX interface card installed in the FIU will commence transmission once it receives power for the first time.

- 9) Apply the 24 volt AC power to the irrigation controller/s.  
**Note!!!** A common power transformer should be used if two or more irrigation controllers are to be used in this system. Two separate transformers will not work.
- 10) Open each valve individually that is to be controlled by the radio system manually through the irrigation controller.

You will observe that when an output on the controller has been activated a light will illuminate on the 16 line 24 volt AC input card (in the FIU) to which this output / station has been connected.

A radio signal containing an instruction for that output to open will then be sent within several seconds after the output/s is activated. This will be repeated constantly while the output is on (more frequently for the first few minutes and less frequently thereafter unless a new instruction is received by the radio system)

- 11) The receivers can now be tested in the field for proper operation provided they have been setup and installed as per the receiver setup instructions.