CLOUDMASTER
IRRIGATION CONTROL SYSTEM
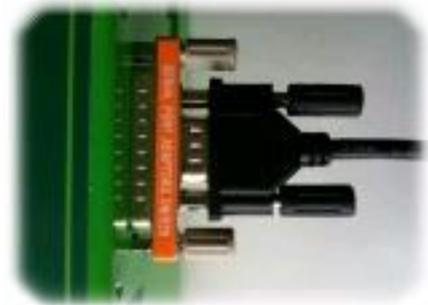
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## Electronics

Cellular Modem Installation

IMPORTANT – If nothing else, please read this

1. Modem GND (black wire) does **NOT** go to solenoid common
2. Modem will not work until initialised with OP85
3. Signal strength must be checked with OP22
4. If red light on modem is not blinking then it will not work

Electrical Connection

Power down Cloudmaster. The modem is powered directly from the Cloudmaster, thus avoiding plug packs. The power cable red wire connects to the Cloudmaster terminal marked '12V' (or 'Spare' on older units). The black wire connects to the terminal immediately to the left of 12V i.e. the far right hand terminal of the four way block. Insulate other unused wires as shown. The serial cable & DB9 to DB25 adapter connects the modem to the DB25 on the side of the Cloudmaster.
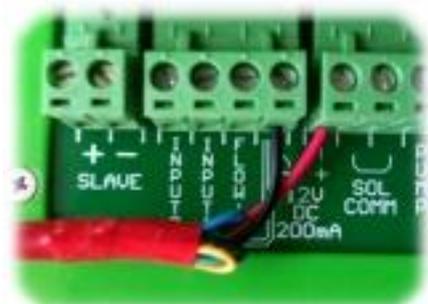
Mounting the Antenna

The antenna should be mounted as far from electrical cabling and metallic objects as possible. Received signal strength is primarily determined by proximity to the local cell. You may get away with the stubby antenna screwed directly onto the modem mounted inside a fully enclosed metal enclosure, but it is important to check the received signal strength as described below. If a sufficient signal strength reading cannot be obtained then a higher gain, external antenna can be purchased.

Inserting the SIM Card

The SIM card is inserted into the modem by sliding the black retainer away from the slot and then pressing the SIM card into the slot (cut away corner first and with the gold contacts facing the front), until it clicks into place. Then slide the retainer across the edge of the SIM card. To remove the SIM card, slide the retainer away and press and release the SIM card into the slot. It should then pop out a short way so it can be removed. If the small red light adjacent to the SIM card slot does not start blinking within about a minute after powering the modem up see fault finding below.

Note, older modems have a button next to the SIM card to eject the SIM card holder.

Initialising the Modem with OP85

This procedure ensures the modem is correctly configured to operate with the Cloudmaster controller. After installing the SIM card into the modem, turn the Cloudmaster unit on and wait until the red light on the modem begins to blink slowly. Run OP85 and observe the 'OK' response from the modem on the lower line of the LCD. After the LCD returns to the clock then switch the power to the Cloudmaster & modem off and back on again. This completes the procedure. See the fault finding section below if you cannot observe the 'OK' response from the modem. The last 2 commands do not return the OK response.

It does not matter how often the initialisation process is performed, but it must complete successfully at least once before the modem will function correctly. If in doubt, repeat the process.

Signal Strength Testing with OP22
For reliable operation the signal strength must be checked for sufficient level. This is equivalent to the number of bars on your mobile phone. Run OP22 from the Cloudmaster keypad. The number on the bottom left is the signal strength as a number from 9 to 31. It updates every second so this can be a useful way to find the best location for the antenna before permanently mounting it. If the bottom line of the LCD remains blank then refer to fault finding below.

If the antenna is mounted inside a metal enclosure, it is important to check the signal strength with the door closed. To do this run OP22 and then hold the door in the shut position for at least 30 seconds before opening the door and observing the signal strength.

The value must be greater than 17 for a reliable connection. Optimum value is between 24 and 30. If you cannot achieve these values then refer to previous section 'Mounting the Antenna'.

SIM Card Requirements
There are three important things to observe when specifying SIM card requirements:

1. SIM card needs to be either GSM or 3G depending on modem type supplied.
2. For central PC connectivity, the SIM card must have a Circuit Switched Data (CSD) number as well as the voice number. This is not the same as internet access. A CSD number is not required for an SMS only system.
3. All value added services must be turned off. Call waiting, call diversion, message bank and any other extra services must all be deactivated.
4. The password must be disabled. To achieve this the SIM card can be inserted into any mobile phone and the password or PIN disabled in security settings.

Any of the major service providers can supply a suitable SIM card but it is important that they are given the above information. Be sure to explain what CSD stands for as this request is often confused with internet access.

A Caution Regarding Telstra SIM Cards
We have seen cases where it is not possible to connect to the data number of a Telstra SIM card from a non Telstra landline. Consequently, we suggest using the same provider for your SIM card and the land line from which the Cloudmaster will be dialled.

Fault Finding
Fault: No lights appear on the modem even though Cloudmaster is switched on.
Fix: Check power cable is connected to correctly on the Cloudmaster and the modem.

Fault: Red light on modem remains on steady after Cloudmaster is switched on.
Fix: This indicates the modem is not registering with the network. Check antenna, signal strength, SIM is inserted correctly, SIM is correct GSM or 3G type and is paid up and activated.

Fault: OP22 is showing a blank bottom LCD line or OP85 is not displaying 'OK'.
Fix: Set RS232 baud rate to 96 using OP91, power cycle the unit and reinitialise with OP85. If this does not fix the problem then run OP99 and then try it again.

Fault: Modem rings but does not pick up the call.
Fix: Same as previous fix.

Fault: Call drops out or SMS messages can take a long time to get through.
Fix: Check signal strength is within optimum range.

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