Remote Control the TW3 for Less than £100

Using a low cost PAYG mobile phone as a receiver, the Tonick TW3 irrigation controller may be remotely controlled from any other mobile phone.

The Sony Ericsson SPIRO is one such mobile phone that is suitable. It costs a little over £50 as a Pay As You Go (PAYG) from the major phone suppliers.

The phone should be configured to auto-answer only on phone numbers in its contact list. This prevents malicious callers operating the irrigation system.

A low cost cable from Tonick is then plugged into the 'Walkman' socket to feed the 'Remote Control' terminals in the TW3.

The phone's charger is left permanently connected so the battery never runs down. A dashboard mount can be used to secure the phone on the wall next to the controller.

With the phone thus installed, the designated mobile phone(s) can dial the receiver and once connected, a simple sequence of digits pressed on the sending phone's keyboard will operate a station, a series of stations or (using TW3 V2.x up firmware) put the controller from RUN to SYSTEM OFF and vice verse.

There is no need to remain connected whilst watering is taking place, only to send the command key presses. After this, the call may be terminated until another command is needed.

If the optional cable is chosen with a microphone built-in, the caller can confirm the pumps are running, providing the controller is mounted nearby.

With PAYG, it is necessary to make one call every 3 months to keep the SIM current. This need only be a few seconds long and to one of the numbers in the contact list. Alternatively, if the phone is on contract, this is not a requirement

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Remote Control.

General Description

The TW3 may be remotely operated by injecting a sequence of audio tones into the terminals marked "Remote Control". The signal is isolated from controller ground by an audio signal transformer.

These tones are the same as produced by a touch-tone phone or mobile (cellphone) when dialling and are called DTMF (Dual Tone Multi-Frequency).

The DTMF sequences may be generated in several ways:

- A licensed portable mobile radio transceiver equipped with a keyboard and DTMF dialling capability.

- The Underhill DTMF microphone, plugged into a portable mobile radio transceiver that does not have its own DTMF capability. This may be a low cost, licence-free USA Family Radio System (FRS) transceiver, such as the Motorola Talkabout, or EU licence-free mobile 446MHz.

- A mobile phone (cellphone), with the stored number of the receiving cellphone.

In all cases, there must be a receiver next to the controller with the audio taken out through the accessory socket and connected to the controller's remote control terminals. This receiver is advantageously kept on charge to always be ready.

The following types of receiver can be chosen as appropriate to the sending device.

- A standard scanner receiver, pre-programmed to only pick up the frequency of interest.

- The other half of a low cost licence-free transceiver pair, permanently in its charging cradle.

- A mobile phone (cellphone) programmed to auto answer a particular number or numbers. A socket in it for the headset and a separate socket for the charger.

- The Sony Ericsson SPIRO has all the above features and is very inexpensive. Additionally it can be programmed to auto-answer only to listed telephone numbers, which gives security to malicious attempts to control the watering by unauthorized persons.

Contact Tonick for the availability of suitable audio cables.

It should be noted, that except for the DTMF microphone, the raw tone strings must be composed using the DTMF keys. These are described in the following section.

The Underhill DTMF Microphone automates these key sequences, when plugged into a transceiver with no DTMF buttons. A simple 5 button cluster and an 8 character alphanumeric LCD makes remote control a simple process.

Key Sequences:

The following functions may be performed under remote control. These mostly correspond to those available under 'Manual Watering' from the TW3 key board (see Manual Watering and Electrical Tests)

- **Manual water one station.** Turns the station on for just over 9 hours to allow manual operations on the valve/sprinkler assembly at the operator's leisure. The Master valve is turned on immediately

- **Turn the station off.** Note, this leaves both the 2 wire decoder path energised and the Master Valve on.

- **Run a manual program**. Enter starting station, finishing station and number of minutes for each. A zero time in minutes will run each station for about 1 second, with a 3-5 second pause between each. This is useful as a zone test.

- **Abort**. This turns off any station running manually or kills a manual program. If an automatic program is running, this will continue as normal. If there are no automatic programs running, the 2 wire path will be de-energised and the Master Valve will be turned off. This will also happen after any automatic programs have finished, as long as the Abort has been previously issued.

- **Flip between RUN and SYSTEM OFF.** Useful if for instance the controller needs to be turned off if rain starts after the end of the working day and a click-type rain gauge is not fitted.

Manual Turn On One Station:

* A nnn *

Where:

- * is start of message
- A is the on off/command
- nnn are 3 digits of station number from 001 to 127. These must always be 3 digits
- * is turn **ON**

For those DTMF keypads that do not have the letter A, the tone sequence can be composed by using the number 6 instead of A.

Thus,

 *6 nnn * will work the same as * A nnn *

Manual Turn Off One Station:

* A nnn #   or * 6 nnn #

Where:

- * is start of message
- A is the on off/command; can be substituted for the number 6
- nnn are 3 digits of station number from 001 to 127. These must always be 3 digits
- # is turn **OFF**

Manual Start Program:

* B nnn * or * 7 nnn *   Set minutes to nnn 000-545

* C nnn * or * 8 nnn *   Set starting station to nnn 001-127

* D nnn * or * 9 nnn *   Set finishing station to nnn 001-127

* A 000 * or * 6 000 *   Start the program. nnn must = 000

Manual Stop the Program:

* A 000 #   or * 6 000 #

Where:

- 000 refers to the program rather than a station 001-127

- # is stop

This command leaves the 2 wire path and the Master Valve energised

Abort:

# # #

Where 3 or more #'s will abort whatever manual is under way, single station or program.   If automatic programs are running concurrently, these will continue as normal.. If there are no automatic programs running, the 2 wire path will be de-energised and the Master Valve will be turned off. This will also happen after any automatic programs have finished, as long as the Abort has been previously issued.

It is a good idea to start any new operations with three or more #'s to clean out any previous half-entered commands. Any mistakes keying in the sequences can be erased in this way.

Flip between RUN and SYSTEM OFF:

Turn controller to RUN

*1 000 *

Where:

- * is start of message

- 1 is the on flip command;

- 000 are refer to the controller and not a station number. These must always be 3 zerodigits

    * is goto RUN

Turn controller to SYSTEM OFF

*1 000 #

Where:

- * is start of message

- 1 is the on flip command;

- 000 are refer to the controller and not a station number. These must always be 3 zerodigits

    # is go to SYSTEM OFF