

# PROMIX

## Transit Mixer Radio Remote Control System

21 JUN 17



**PLEASE READ ALL INSTALLATION AND OPERATING INSTRUCTIONS COMPLETELY BEFORE OPERATING MIXER. RETAIN FOR FUTURE REFERENCE.**

# **TABLE OF CONTENTS**

<b>Introduction</b>	<b>3</b>
<b>Operation via the Control Console</b>	<b>4</b>
<b>Operation via the Remote Control</b>	<b>5</b>
<b>Audible Warning System</b>	<b>7</b>
<b>Important Setup and calibration Information</b>	<b>7</b>
<b>Engine Revs Control Information</b>	<b>8</b>
<b>Signal Inputs from the Vehicle</b>	<b>9</b>
<b>Travel Mode Base Speed</b>	<b>10</b>
<b>Plant Mix Ramp Time</b>	<b>10</b>
<b>Wiring Codes and LED Diagnostics</b>	<b>10</b>
<b>Important Installation Information</b>	<b>13</b>

# **PROMIX TRANSIT MIXER RADIO REMOTE CONTROL SYSTEM**

## **PROUDLY DESIGNED AND MANUFACTURED IN AUSTRALIA**

The **WoodTech Electronics PROMIX TRANSIT MIXER RADIO REMOTE CONTROL SYSTEM** has been tested and approved by major hydraulic companies. It represents a large a step forward in the transportation and delivery of concrete. This system allows total and precise control of the product from batching plant to the customer.

## **FEATURES**

### **Australian Designed and Manufactured**

The entire Promix system is built in Australia by engineers who have extensive experience in designing, manufacturing and commissioning electronic control systems for the heavy equipment and transport industries. As a result, many unique features are included to enhance system operation, promote ease of use, reduce operator fatigue and minimize downtime.

- Protection against reverse polarity
- Solenoid current compensated for changes in voltage and temperature.
- Spike protected
- Over voltage protected
- Pump solenoid outputs short circuit protected
- Fail safe – loss of power results in no bowl rotation. (Bowl may be operated by manual overrides located on pump solenoids if this unlikely situation occurs.)
- Audible warning system to alert operator of certain conditions.
- Universal system suits all common hydraulics / vehicle combinations, selectable by onboard dipswitches.
- Major reduction in spare parts inventory due to wiring harness and main control board designed for universal application – one part suits all vehicles / hydraulics.

If a fault should occur, a comprehensive on board L.E.D. diagnostic system has also been incorporated to give a visual aid to repair, without the need for specialized tools or knowledge. If at any time a fault is detected in either the receiver board or the main pc board within minutes the board can be changed and the system can be back on line. This eliminates costly down time.

### **The Remote Control System**

The advanced 915MHz remote control system utilizes the latest in Frequency Hopping Spread Spectrum technology (FHSS). Why is this important? Because it is the most immune to interference and therefore works more effectively on the job site than either 433MHz or 27MHz systems.

The IP65 rated remote control hand piece contains a rechargeable battery, which is recharged automatically when returned to the cradle. Also supplied is a translucent silicone rubber cover to further assist in protecting the remote from environmental and physical damage.

As this system is Australian made, all components are readily available as spare parts at very cost effective prices. As your fleet of mixers grows spare parts could be held at your own depot to add in fast and efficient repair if they are required.

## **Operation via the Control Console**

Functions that are common to both the Remote Control and the Control Console operate in the same manner regardless of the operating position.

### **On / Off Switch**

Switches control system power on or off

### **Remote / Cabin Switch**

Switches operational control between the Control Console and the Remote Control

### **Engine Up / Engine Down Switch**

Pressing this switch up increases the Engine revs. Pressing it down decreases the Engine revs.

### **Discharge / Mix Switch & Travel Hi Speed**

Pressing this switch up increases the mix bowl speed smoothly from zero to maximum rpm. This allows for almost unlimited bowl speed control. Pressing the MIX switch whilst discharging will decrease the discharge bowl speed.

Pressing this switch down increases the discharge bowl speed smoothly from zero to maximum rpm. This allows for almost unlimited discharge rates to suit any job requirements. Pressing the DISCHARGE switch whilst mixing will decrease the mix bowl speed.

When in discharge, every three seconds the buzzer will emit a short beep and the red discharge lamp on the control console will flash.

### **Chute Raise / Chute Lower Switch**

Pressing this switch up will raise the chute.  
Pressing this switch down will lower the chute.

### **Stop & Halt / Resume Switch**

Pressing this switch up will stop the bowl rotation and returns the hydraulic pump to the neutral position. It also clears the Resume memory.

By using the MIX or DISCHARGE switch, you can simply press and hold until desired speed and direction is achieved. Now if you wish to HALT the bowl and retain that direction and speed setting, all you have to do is press the HALT / RESUME switch momentarily and the program will halt the bowl and store that setting for you (**do not press the STOP /CLEAR button as this will clear the program memory**). If you then wish to start the bowl rotating in the same direction and speed, you need only press the HALT / RESUME switch and the program will return the bowl to the same direction and speed as was previously stored.

**If the bowl is halted by pressing the HALT / RESUME switch, the MIX and DISCHARGE switches are locked out so that you cannot change the speed or direction of the bowl.**

If at any time the STOP switch is pressed when the bowl has been halted by using the HALT / RESUME switch, the RESUME memory will be cleared and the hydraulic pump will be returned to the neutral position. This will then allow you to reset the bowl direction to whatever you like. While the bowl is rotating in either MIX or DISCHARGE direction, you are able to vary bowl speed and direction.

### **Plant Mix / Travel Switch**

Pressing this switch up activates the Plant Mix function. Plant Mix increases the bowl speed to maximum and increases engine RPM to the preset upper limit. Plant Mix is stopped by briefly activating the Stop switch.

It is possible to switch directly between Plant Mix and Travel Mode (and vice versa)

Pressing this switch down activates the Travel Mode function. Travel mode maintains a constant preset drive to the hydraulics (usually around 2rpm) while the vehicle is in transit. This mode can be used whilst transporting the load from the batching plant to the job site. Travel mode is stopped by briefly activating the Stop switch.

Pressing the mix switch whilst in Travel will ramp the travel speed up. This is useful when going up a steep incline to reduce the risk of product spilling from the mixer. The operator is alerted to this mode by three short beeps and blinking of the front panel travel lamp every 5 seconds. Pressing the discharge switch will ramp the travel speed back down to the base travel speed.

### **Operation via the Remote Control**

Although the remote control transmitter is now commonly used in the mixer industry, there are added features programmed into the remote transmitter used in the WoodTech system. The most important system feature to understand the use of is the HALT / RESUME button.

When used on previous systems in conjunction with linear actuators to set the bowl rotation speed and direction, the STOP and RESUME buttons were simply used as a stop/start type system. With the introduction of the electronically controlled proportional hydraulics the use of the HALT / RESUME button has changed for the better. Please take the time to read and understand the use of the HALT / RESUME button.

To operate via the Remote Control, the REMOTE / CABIN switch on the control console must be in the REMOTE position.

### **Halt / Resume Button**

By using the MIX or DISCHARGE buttons on the remote control transmitter, simply press and hold until desired speed and direction is achieved. Now if you wish to HALT the bowl and retain that direction and speed setting, all you have to do is press the HALT / RESUME button momentarily and the program will halt the bowl and store that setting for you (**do not press the STOP /CLEAR button as this will clear the program memory**). If you then wish to start the bowl rotating in the same direction and speed, you need only press the RESUME button and the program will return the bowl to the same direction and speed as was previously stored.

**If the bowl is halted by pressing the HALT / RESUME button, the MIX and DISCHARGE buttons are locked out so that you cannot change the speed or direction of the bowl.**

If at any time the STOP /CLEAR button is pressed when the bowl has been halted by using the RESUME button, the RESUME memory will be cleared and the hydraulic pump will be returned to the neutral position. This will then allow you to reset the bowl direction to whatever you like. While the bowl is rotating in either MIX or DISCHARGE direction, you are able to vary bowl speed and direction.

### **Stop / Clear Button**

The STOP / CLEAR button stops the bowl rotation and returns the hydraulic pump to the neutral position. It also clears the Resume memory.

### **Engine Up Button**

Increases the Engine revs.

### **Engine Down Button**

Decrease the Engine revs.

### **Mix Button**

Pressing and holding this button increases the mix bowl speed smoothly from zero to maximum rpm. This allows for almost unlimited bowl speed control. Pressing the MIX button whilst discharging will decrease the discharge bowl speed.

### **Discharge Button**

Pressing and holding this button increases the discharge bowl speed smoothly from zero to maximum rpm. This allows for almost unlimited discharge rates to suit any job requirements. Pressing the DISCHARGE button whilst mixing will decrease the mix bowl speed.

When in discharge, every three seconds the buzzer will emit a short beep and the red discharge lamp on the control console will flash.

### **Chute Raise Button**

Raises the chute.

### **Chute Lower Button**

Lowers the chute.

## **Audible Warning System**

The audible warning system has been designed to alert the operator to certain system conditions. Below is listed the buzzer type and condition.

<b>BUZZER</b>	<b>CONDITION</b>
Continuous Tone	Remote control not in cradle
1 beep every 3 seconds	Bowl rotation in discharge
3 beeps every 3 seconds	High speed Travel mode active

## **Important Setup and Calibration Information**

Your PROMIX control system is delivered with preset calibration and setup parameters. These parameters are based on the information supplied to us at time of initial order regarding the specific vehicle / hydraulic combination. These presets will allow the control unit to function “out of the box”.

To achieve optimum performance, minor adjustments and calibrations may need to be made to the following functions:

- Engine Revs Control
- Travel Mode base speed
- Plant Mix

Please consult the relevant section of this manual for calibration and setup procedures. Vehicle specific wiring diagrams and information are supplied in addition to this manual.

### **Remote Control Transmitter and Receiver**

The remote control transmitter supplied with your system has already been coded to the receiver. Multiple transmitters can be coded to the receiver if necessary.

Both the transmitter and receiver contain a 12way dipswitch. In order for your transmitter and receiver to work together, dipswitch positions 1 to 12 must be the same. If the original transmitter hand piece is no longer operational and

Please see Figure 1 for the dipswitch locations on both the remote control transmitter and the radio receiver.

The remote control transmitter contains a rechargeable, Nickel Metal Hydride (Ni-MH), 9 volt battery. Service life is expected to be approximately one year, however the number of charge / discharge cycles will ultimately determine useful service life. Should the battery require replacement, only use the same size and type.

If the battery becomes discharged, the red LED on the remote control transmitter will flash slowly when a function is pressed. Returning the remote to the holder will automatically charge the battery (vehicle ignition switch must be on, emergency stop not activated).

## Main Control Board Dipswitch Settings

The dipswitches on the main control board configure the various control system parameters to suit different vehicle / hydraulic combinations. They also select calibration mode for some functions. Only trained and competent personnel should make adjustments. See Figure 3 for location.

Dipswitch	Function	On	Off
1	Park Brake input required for Engine revs	Yes	No
2	A/T neutral input required for Engine revs	Yes	No
3	Engine revs control type	Cruise / Linear act.	Analogue
4	Proportional hydraulics type	Danfoss	Rexroth
5	Hydraulic pump control	Manual / Linear act.	Electronic
6	Reserved	-	-
7	Travel calibration mode select	Calibration mode	Normal
8	Plant Mix calibration mode select	Calibration mode	Normal
9	Reserved	-	-
10	Travel Mode	Yes	No

## Engine Revs Control Information

### Cummins

The Promix control system currently uses the Cummins PTO / Cruise function for control of engine rpm. Three wires connect to the PTO / Cruise switch wiring and duplicate the function of the in-dash switch. Refer to the Cummins wiring diagram for connection information. Dipswitch 3 must be in the on position for this configuration.

### Isuzu, Hino

The Promix control system interfaces to the remote accelerator connector for control of engine rpm. Refer to the appropriate wiring diagram for connection information. Dipswitch 3 must be in the off position for this configuration.

Ensure the correct lockouts for Park Brake, Footbrake and transmission have been established before commencing the following procedure.

Start the engine and engage the PTO. Activate the Increase Revs switch and the engine revs should slowly increase. The maximum required engine RPM can be adjusted with the "HI" adjustment. Turning clockwise will increase the RPM. Activate the Decrease Revs switch and the engine rpm should return to idle.

The rate at which the engine revs ramp up and ramp down can be adjusted with the "RAMP" adjustment pot. Turning this pot clockwise makes the ramp time slower. Even when set to the fastest setting (fully anti clockwise), the vehicle ECU ultimately determines how quickly it will allow the engine to change rpm.

Most remote accelerator applications require a voltage of approx. between 0.4 – 1.5v before the engine will increase above idle. Because of this, there can appear to be some "dead time" from idle as you hold the Increase Revs button. The "LO" adjustment pot "tunes out" this dead time by setting a minimum voltage somewhere between 0 – 1.5 volts. Turning the "LO" pot clockwise increases this initial voltage.

If the setting of the "LO" pot is too low, there will be noticeable "dead time" when initially increasing the rpm above idle. If the setting of the "LO" pot is too high, the engine will not return fully to idle RPM. A little time spent getting this adjustment "just right" will improve the overall smoothness and operation of the system.



## **Caterpillar**

The Promix control system currently uses the Caterpillar PTO / Cruise function for control of engine rpm. Three wires connect to the PTO / Cruise switch wiring and duplicate the function of the in-dash switch. Dipswitch 3 must be in the on position for this configuration.

## **Signal Inputs from the Vehicle**

### **Fuse Box Connections**

Red wire with 15A fuse – 12v Ignition positive for control system  
Red wire with 20A fuse – Battery positive to fan relay  
Black wires – Negative to control box

Note: The battery feed to the fan relay and also the negative wires can carry up to 20amps of current, depending on the type of hydraulic cooler fan installed. It is important to make sound connections to wiring in the vehicle that can support this amount of current.

### **Park Brake Wiring**

The blue wire must be connected to the Park Brake switch. If the Park Brake switches negative, the blue wire on the main pcb input side must be connected to #13 (marked P/BRK-). If the Park Brake switches positive, the blue wire on the main pcb input side must be connected to #12 (marked P/BRK+).

### **Stoplight Wiring**

Connection to the stoplight switch is always required.

The Yellow/Red wire must be connected to the footbrake switch. It requires a positive signal when the footbrake is activated.

### **Automatic Transmission**

If the vehicle is equipped with an automatic transmission, the dark green wire must be connected to the neutral switch. If it switches negative, the dark green wire on the main pcb input side must be connected to #16 (marked NEUT-). If it switches positive, the dark green wire on the main pcb input side must be connected to #15 (marked NEUT+).

### **Recommended Dipswitch Settings – Manual Transmission vehicles:**

Blue wire connected to Park Brake  
Dipswitch1 – ON  
This setting selects the Park Brake Lockout to be active.

### **Recommended Dipswitch Settings – Automatic Transmission vehicles:**

Park brake setting as above and also:  
Dark green wire connected to transmission neutral switch  
Dipswitch2 - ON  
This setting selects Transmission Neutral Lockout to be active.

## **WARNING:**

Although it is possible to bypass the lockouts by leaving Dipswitch1 and Dipswitch2 switched off, **THIS MAY COMPROMISE THE SAFETY OF THE SYSTEM. WE STRONGLY ADVISE INSTALLATION AS PER THE ABOVE RECOMMENDATIONS.**

## **Travel Mode Base Speed**

Base travel speed is set by trimpot VR4. Turning VR4 clockwise will increase base travel speed. Pressing the mix switch whilst in Travel will ramp the travel speed up. Pressing the discharge switch will ramp the travel speed back down to the base travel speed.

## **Plant Mix Ramp Time**

The following information is only applicable on vehicles where engine speed is controlled by cruise function (eg. Cummins), with Dipswitch 3 ON and Dipswitch 10 ON.

Plant Mix engine ramp up and down time is adjustable within the range 4 to 20 seconds using the "RAMP" pot.

Plant Mix will apply full mix bowl speed and ramp engine speed up. Pressing the Stop switch or Travel switch will reduce bowl speed and ramp engine revs down. Plant Mix can be cancelled at any time by pressing Foot Brake.

## **Wiring Codes and LED Diagnostics**

### **Control Console Wiring – 37 pole connector**

Pin Number	Colour	Function
1	Black	Ground
2	-	-
3	-	-
4	Pink	Dump valve – manual pump only
5	-	-
6	-	-
7	-	-
8	-	-
9	-	-
10	-	-
11	Light Green	Rexroth solenoid common / Danfoss Pin A
12	Green / White	Rexroth discharge solenoid / Danfoss Pin B
13	Brown / White	Rexroth mix solenoid
14	Light Green	Rexroth solenoid common (looped internally to Pin 11)
15	-	-
16	Purple / Orange	Chute lower solenoid
17	Yellow / White	Cruise – revs down / Manual throttle – linear actuator
18	Yellow	Cruise – revs up / Manual throttle – linear actuator

19	Green / Brown	Fan on warning light
20	Green / Red	Fan relay terminal 86
21	Purple	Chute raise solenoid
22	Yellow / Pink	N.O. contacts of internal cruise / linear actuator relays
23	White / Orange	Manual pump – linear actuator
24	White	Manual pump – linear actuator
25	Brown	Remote accelerator port – Negative
26	Grey	Remote accelerator port - Signal
27	Orange	Remote accelerator port - +5v
28	Yellow / Purple	N.C. contacts of internal cruise / linear actuator relays
29	Blue	Park brake input
30	Yellow / Red	Stoplight (Footbrake) input
31	Green	Neutral input
32	Yellow / Green	Tacho input
33	Yellow / Blue	Reverse Input
34	Yellow / Black	Spare input 1
35	Yellow / Brown	Spare input 2
36	-	-
37	Orange / Blue	+12v ignition input

### **Emergency Stop Relay connections**

Terminal Number	Wire colour	Function
30	2 x Red	1- Fuseholder with 15A fuse; 2- to E/stop switch
87	Orange / Blue	+12v Ignition to control console
86	Blue	From E/stop switch
85	Black	Ground

### **Fan relay connections**

Terminal Number	Wire Colour	Function
30	Red	Fuseholder with 20A fuse
87	Red / Yellow	Positive to fan
87	Green / Brown	Control console pin 19
86	Green / Red	Control console pin 20
85	Black / white	Fan thermo switch

Note: If the hydraulic cooler fan does not require a thermo switch, the following three wires can be joined together at the cooler fan connection:

- Black 3mm wire
- Black 4mm wire
- Black / White 3mm wire

### **Onboard diagnostic LED's – Inputs (Yellow)**

Led Number / ID	Legend on PCB	Input Function
1	HLT/RES	Halt / Resume
2	STOP	Stop
3	ENG UP	Engine Up
4	ENG DN	Engine Down
5	MIX	Mix

6	DISCH	Discharge
7	CHTE UP	Chute Raise
8	CHTE DN	Chute Lower
9	REMOTE	Remote mode selected
10	TRAVEL	Travel mode
11	P/MIX	Plant Mix mode
12	P/BRK+	Park Brake Input - positive
13	P/BRK-	Park Brake input - negative
14	F/BRK	Stoplight (footbrake) input
15	NEUT+	A/T Neutral input - positive
16	NEUT-	A/T Neutral input - negative
17	TACHO+	Tacho input – positive. Note: uses same LED as input #18
18	TACHO-	Tacho input – negative
19	RVRSE	Reverse input
20	SPR1+	Spare input 1 - positive
21	SPR1-	Spare input 1 - negative
22	SPR2+	Spare input 2 – positive
23	SPR2-	Spare input 2 – negative
24	-	Not implemented
25	-	Not implemented
26	-	Not implemented

#### **Onboard diagnostic LED's – Outputs (Orange)**

LED Number / ID	Legend on PCB	Output Function
11	E/STP	Not Implemented
12	OUT E	Not Implemented
13	DIS LED	Discharge LED
17	OUT D	Travel Lamp
18	OUT C	Plant Mix Lamp
20	OUT B	Engine Up Output
23	OUT A	Engine Down Output
25	CHT DN	Chute Lower
26	CHT UP	Chute Raise

#### **Onboard diagnostic LED's – Power (Green)**

LED Number / ID	Legend on PCB	Function
2	+12V	+12v on control board
-	RX PWR	Power to receiver

#### **Onboard diagnostic LED's – Overcurrent Faults (Red)**

LED Number / ID	Legend on PCB	Fault / Circuit
1	-	Programming port +12v supply
2	-	Main 12v supply to +5v regulator
3	-	Danfoss solenoid +12v supply
4	-	Output relays +12v supply
5	-	Rexroth solenoids +12v supply

## **Important Installation Information**

### **Through Glass Antenna Installation**

Please follow the instructions on the leaflet enclosed within the antenna packaging. The through glass antenna will perform the best when it is located high up on the vehicle and clear of other metallic objects. It is essential to clean the mounting areas thoroughly with the supplied alcohol cleaning pad to ensure maximum adhesion to the glass.

Window tinting can contain metallic film and affect operation of through glass antennas. A small square of the tinting film can be cut away where the antenna is to be mounted, or alternatively, mount the antenna on another window. The tinted strip across the top of some windscreens does not affect antenna performance.

Route the antenna cable from the antenna mounting location to the control console. Excess cable may be coiled up. Pass the cable through the cable gland and plug in to the mating connector on the receiver – hand-tighten only! Allow enough antenna cable inside the control box for the lid to close easily. Once the lid is closed, the cable gland may be hand tightened to hold the antenna cable secure. See Figure 2 for details.

### **Suggested installation procedure**

Mount control box on pedestal or suitable support in cab.

Run wiring harness supplied under floor mat to passenger side of vehicle, making sure that there are no sharp objects that may cut or rub harness.

Locate suitable place in firewall or floor for 32mm cable gland to be fitted.

Using 32mm hole saw cut hole in firewall and fit cable gland if necessary.

Run main harness through cable gland (to first breakout point) and down passenger side of chassis rail towards rear of vehicle. When choosing route for harness avoid excessively sharp turns and sharp objects that may cut or rub harness. Avoid excessive heat sources such as exhaust systems.

Secure main harness using cable ties.

Referring to wiring diagram, connect harness to accessories as optioned.

Fit and wire hydraulic cooler fan as per wiring diagram.

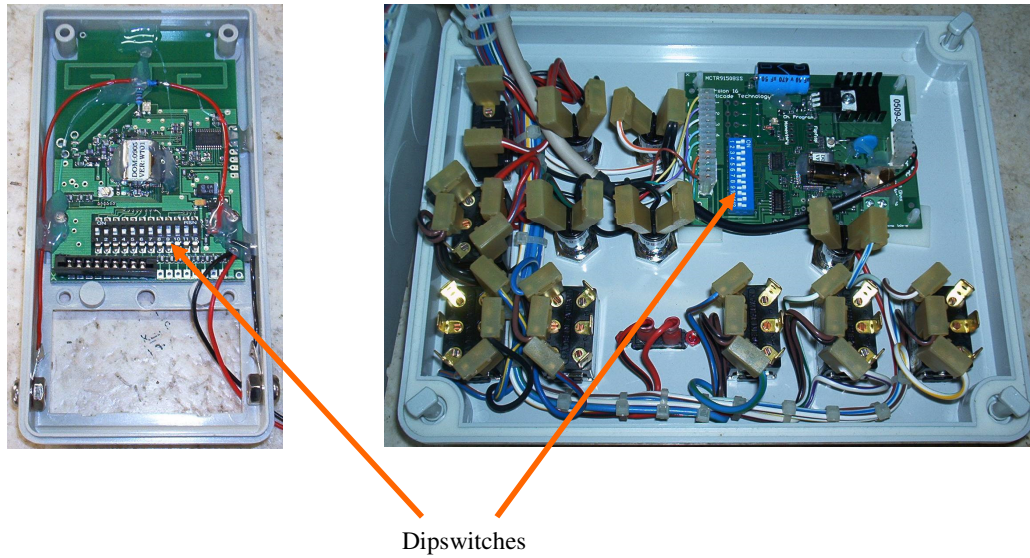
In fuse box locate suitable point to connect line fuses for fan relay (battery feed 20 amp) and control box (ignition feed 10 amp).

Connect black wires to secure and clean earth.

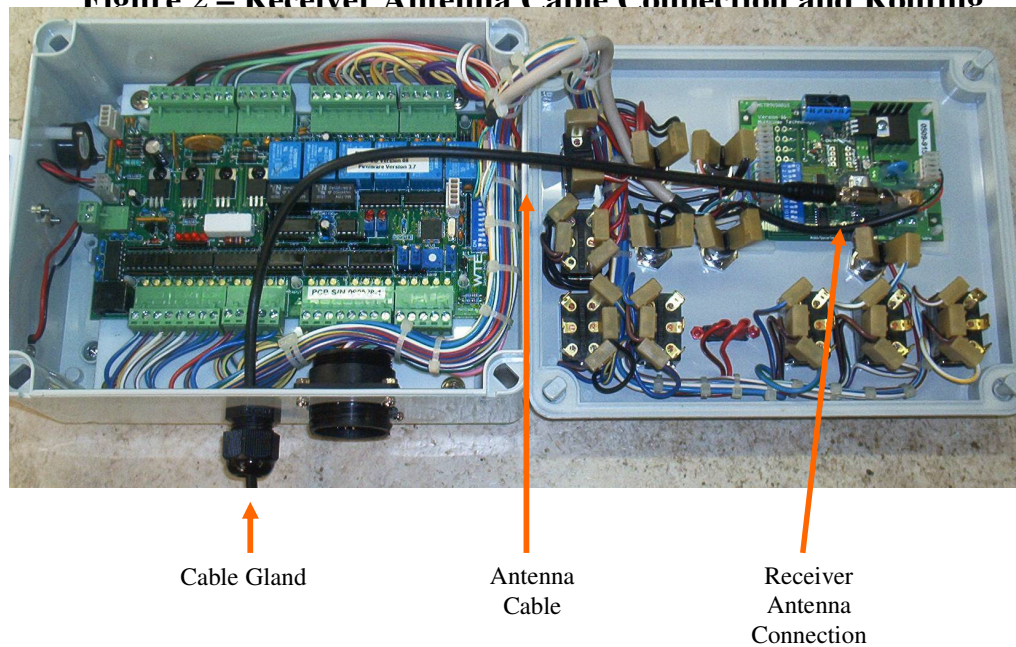
Install through glass antenna as per supplied Instruction sheet

System should now be ready for testing. Please take the time to run through all functions from both the control console and the remote control. Perform adjustments / calibrations if necessary, referring to the relevant sections of this manual.

**Figure 1 – Remote Control Transmitter and Receiver**



**Figure 2 – Receiver Antenna Cable Connection and Routing**



**Figure 3 – Main Control Board**

