

## Installation Manual System 460

### IMPORTANT !

Read through this information **before** you install the equipment.

To ensure that the remote control system has a long lasting time and reliable Function, it is very important that the receiver and the antenna are mounted correctly.

Correctly installed equipment will provide better range and longer lifetime. It will be worthwhile spending a few minutes reading through these instructions.

### General Information

The 460 system operating frequency is 433.92 MHz (418 MHz). Interference from other electrical equipment's has less effect at this frequency than at 40 MHz (27 MHz). The System 460 operates with frequency modulation (FM). The major advantage of using FM rather than the more common AM, (amplitude modulation) is that FM is much less susceptible to interference from other sources. Radio control systems using AM technology are really only suitable for transmitting short duration impulse functions.

An advantage of using 433 MHz (418 MHz) is that the antennas can be made shorter than the corresponding 40 MHz (27 MHz) antennas.

The 460 system is designed to operate the output relays in the receiver continuously, which is more practical for winches or hoists etc.

One major advantage of the 460 system is that it is available with up to eight outputs, enabling four or eight functions to be controlled simultaneously if required.

The receiver can be configured to provide interlocking of outputs, to prevent simultaneous operation, of opposed functions such as Up/Down or In/Out.

One major advantage of the Robust transmitter, is that it is available with 2-step push buttons, allowing single-hand control for 2-speed functions.

Options: Rechargeable batteries, emergency stop and external antenna for longer range. (Robust)

### Installation of the receiver

To ensure that the remote control has long lasting time and reliable operation, it's very important, that the receiver and antenna are correctly mounted.

The positioning of the receiver is determined by the type of antenna to be used. There are three antennas to choose from - a shorter 1/4 wavelength and 1/2 wavelength or a longer 5/8 wavelength.

To obtain maximum range we recommend the longer 5/8 wavelength antenna. This antenna is supplied with 3 m (10 m) of low loss coaxial cable to allow maximum flexibility in positioning and enable it to be mounted as high as possible.

The advantage of the 1/4 and 1/2 wavelength antennas is that they have shorter dimensions. This allows it to be mounted directly on the receiver, when the available space is restricted. This antenna has a BNC connector fitted to enable this direct connection.

Check list for antenna installation

- Install the antenna as high as possible.
- If possible the antenna should be mounted clear of any other antennas or metal objects and away from any cables carrying high currents.
- Try to mount the receiver where it is protected from wind and weather.

The smaller 1/4 wave or 1/2-wave antennas are recommended where the 5/8 is not suitable. The 1/4 wave and 1/2-wave antennas are also a good choice if maximum range is not required, and it have also the advantage of not being ground dependant. This can be convenient when there is no earth to mount the antenna on (vehicle roofs, sheet metal roofing etc.).

If the antenna is to be wall mounted, ensure that it is angled away from the wall (fig 2). The 3 m long coaxial cable enable more flexible positioning of the antenna, allowing it to be mounted in higher positions.

To obtain maximum range, the antenna must be mounted clear of any metallic objects. If this is not possible, we recommend that one of the Tele Radio antenna holders are used, the VMI for wall mounted antennas (fig 3) or the FI for vehicle mounted antennas.

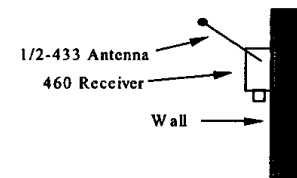


Fig. 2

### Coding the System 460

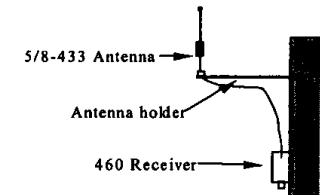


Fig. 3

To prevent the transmitter from operating any other receiver, the unit is coded in pairs. All units are supplied with a standard code.

It's very important that you give your own units an individual personal code, to prevent other 460 transmitters from operating your receiver.

There are 6561 different codes available.

**NOTE** - Your transmitter and receiver must be set with the same code to operate.

**To set the coding:**

- Open the transmitter.
- Set the transmitter code by adjusting the code switch levers.
- Repeat steps 1 and 2 on the receiver.
- Check that the relays are operating when the transmitter buttons are pressed, then reassemble the units.

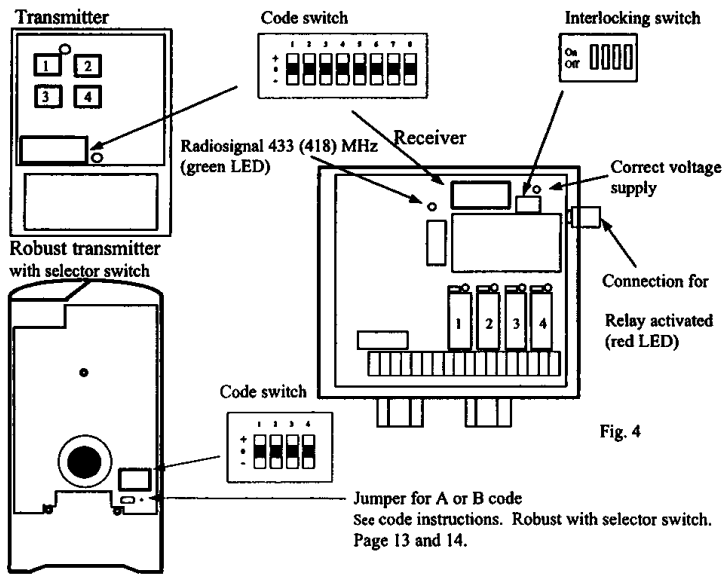


Fig. 4

Transmitter

Code switch

Interlocking switch

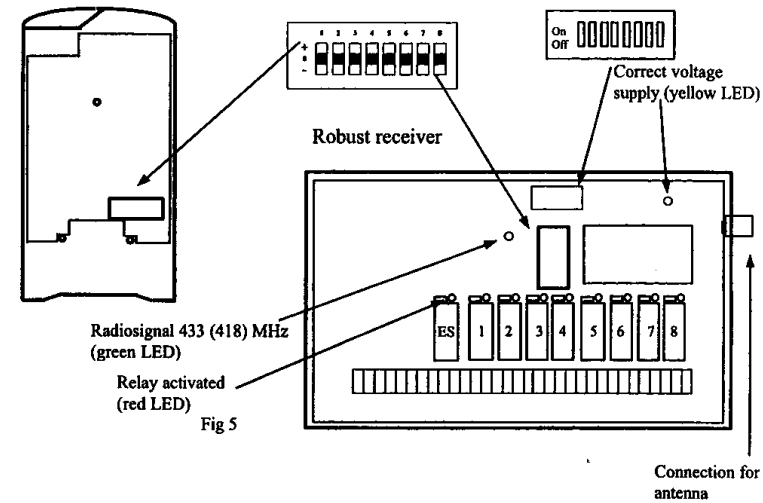
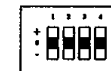


Fig 5

**Code instructions Robust with selector switch.**

The selector switch is used, to decide which receiver to control. Set the your own code at the code switch in the transmitter.



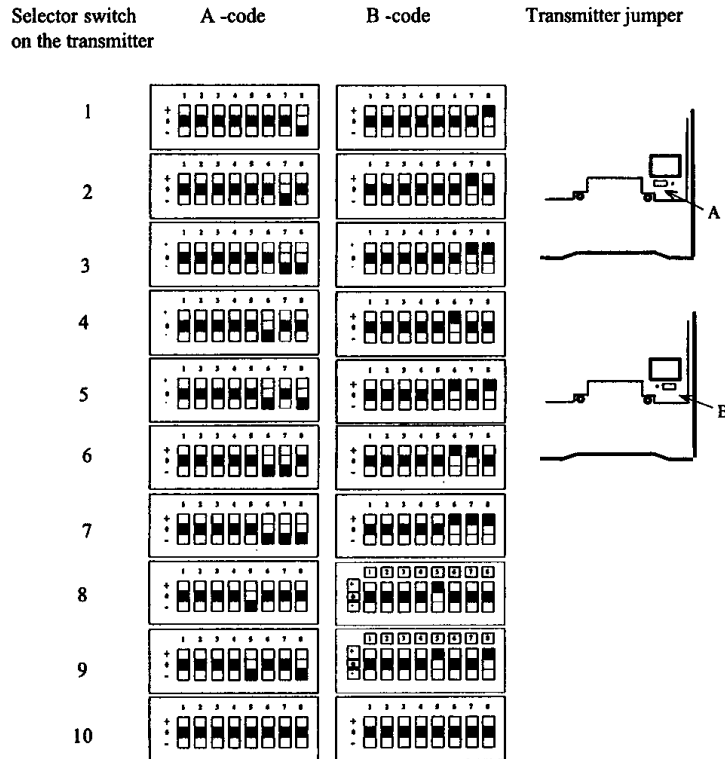
**Code switch transmitter**

Set the first 4 code switches (1-4) in the receiver identically like the 4 code switches in the transmitter.

The selection of receiver 1,2,3,4 etc is decided with the 4 last code switches (5-8) in the receiver. With guidance from the table on next page, it is possible to control 10 different receivers, in two different ways.

The jumper selection is made in the transmitter see next page.

### Receiver coding



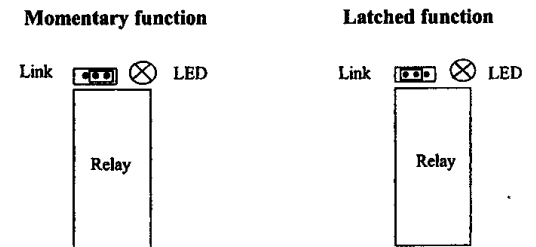
NB ! Position 10 is equal in both coding tables.

### Relay Function Adjustment.

The relays have two different modes of operation.

1. The relay is energised only when the transmitter button is pressed (momentary action). This is the standard setting.
2. The relay changes state every time the transmitter button is pressed (One push ON - one push OFF, latched action). This can be used for lights ON/OFF.

Above every relay there is a link and a red LED. By changing the position of the link, you can set the relay to have either momentary or latched operation.



**Important!** The transmitter emergency stop and the receiver emergency stop will not work when latched function is used.

### Interlocking alternatives

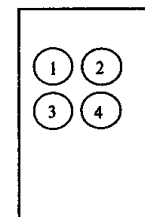
All outputs of the 460 system are normally simultaneous in operation.

However, in some applications this is not desirable.

For instance, if you want to control a winch with IN and OUT commands, controlling the motor via a solenoid operated switch, damage could result if both command buttons are pressed at the same time. To prevent this the 460 system can be configured to give priority to one relay with respect to the other. This is possible with interlock function.

This interlocking is achieved by adjusting the blue 4 or 8-pole switch. (Fig 4,5 and 6)

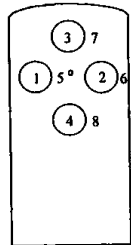
#### Transmitter



#### Receiver interlocking switch

Function 1	Has priority over	Function 2	Switch 1 = ON
-"- 1	-"-	-"- 3	-"- 2 = ON
-"- 2	-"-	-"- 4	-"- 3 = ON
-"- 3	-"-	-"- 4	-"- 4 = ON

Robust transmitter



Robust receiver

Function 1	has priority over	function 2	Switch	1 = ON
-"-	3	-"-	4	2 = ON
-"-	5	-"-	6	3 = ON
-"-	7	-"-	8	4 = ON
-"-	5	-"-	1	5 = ON
-"-	6	-"-	2	6 = ON
-"-	7	-"-	3	7 = ON
-"-	8	-"-	4	8 = ON

Exp: In the winch above where function 1 (IN) needs priority over function 2 (OUT), switch 1 is turned on and the rest of the switches are left off.

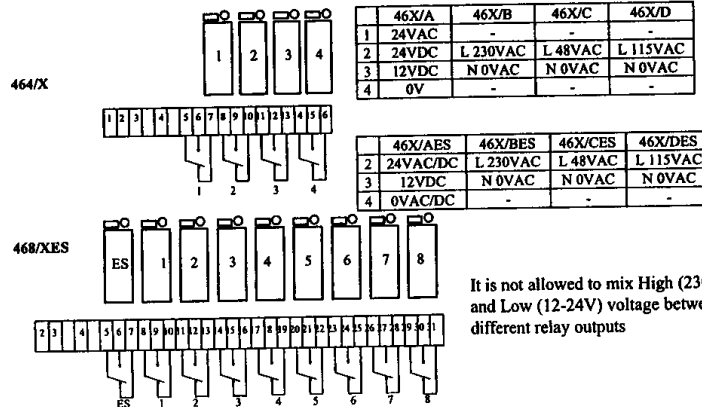
Other applications where interlocking is likely to be required, are any other opposed functions such as up/down, left/right etc. All units are supplied with the switches OFF.

### Charging the transmitter with built-in charger.

The Robust transmitter can be equipped with built-in charger and rechargeable batteries. The transmitter LED indicates battery power by changing colour between green and red light. When charging the transmitter the LED indicates red until the transmitter is fully charged, then it changes into green. When the battery power goes below 10% of the battery capacity the green LED turns red, which means that it is time to charge the transmitter. Charge time until fully charged: approximately 3 hours. Operating time: approximately 10 hours.

Charging: 12V DC

### Wiring diagram



It is not allowed to mix High (230V) and Low (12-24V) voltage between different relay outputs

## TROUBLE SHOOTING SYSTEM 460

We assume that you have carefully read the Installation Manual for this system and one more emphasise how very important it is with a correct installation.

LED indications for the receiver:

- Yellow LED- Indicate that the receiver has correct voltage.
- Green LED- Indicate that the receivers receive radio signals
- Red LED- Indicate if a relay is active.

If the equipment does not function properly please go through this checklist.

Defects	Possible Reasons	Measure
The receiver does not work when transmitting.	The receiver is not connected properly. Not correct voltage. The fuse is broken.	Check the wiring. Check the voltage. Change fuse. *
The green LED in the receiver is lighting but relay is not active.	The code setting in the transmitter does not match the code setting in the receiver.	Set the code identical in the receiver and the transmitter.
The green LED in the receiver does not light when transmitting.	The battery is empty. The transmitter is broken.	Change battery. Test with a new transmitter.
The green LED in the receiver lights when not transmitting.	Other radio equipment is transmitting at the same frequency.	Contact your dealer.
The LED in the transmitter does not light when transmitting.	The battery is empty. The transmitter is broken.	Change battery. Test with a new transmitter.
The range is too short.	The battery is almost empty Antenna, Antenna-cable is injured or not correctly installed.	Change battery. Check antenna, antenna-cable and mounting.

\* Fuse S1 50mA. (230V receiver)

Fuse S2 500mA.

If you still have problems after this checklist please contact your dealer.