CERTUS WIRELESS REMOTE SYSTEM – INDUSTRIAL VERSION

Please read the manual thoroughly before installing or using the radio remote control. The customer must fully understand this manual. If there are questions or concerns, please contact the company delivering the unit or the manufacturer. The radio remote unit is only allowed for use in products whose use offers no danger for person or property if there is an interruption in transmission or receiving of the signal. Additionally, there should be a manual emergency stop which is able to shut down the entire unit of machinery apart from the radio remote stop. It is not allowed to use a radio remote control with machinery which could be subject to heightened accident risk. The manufacturer cannot judge whether the proper procedure has been followed with the installation of the remote unit. Improper installation or improper use of the remote unit by the user could result in injury or destruction of property. For that reason, the manufacturer cannot be responsible for personal injury, property damage or loss of any time resulting from either improper installation, improper use or wrong use of the product. Likewise, the manufacturer assumes no liability for damages resulting from improper maintenance. The manual should be kept within easy reach and should be given to the next owner in case of a sale.

General Information

The system operates on a frequency of FM 869.85 MHZ (EU) or FM 914.5 (US) and utilizes frequency modulation generally known as FM technology. While an FM signal is much less susceptible to electrical interference than an AM signal, there can never be total protection against outside interference. Interference can result from the turning on and off of electronic equipment and stronger interference can come from proximity to relay stations, industrial equipment and types of computer equipment. Another interference factor could be the close proximity of strong electric motors. The above factors should be considered when installing the wireless system. Also, the greatest range will be achieved if the receiver is not enclosed in metal.

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1.1 Safety of this radio remote control

This wireless system is equipped with electronic safety devices

THE FOLLOWING IS IMPORTANT FOR YOUR SAFETY

Misuse or abuse of this equipment could result in injury to the user or others and/or damage to property.

Everyone who uses this equipment must:

- Be qualified to use the machinery and have been introduced to the wireless system
- Follow exactly the safety rules
- Have read the manual with care

Safety Factors

1) The product may only be installed, maintained and used by trained professionals. Repairs must be done by Superwinch.
2) Never leave the transmitter unattended.
3) The transmitter is only to be used within the confiners of the working space and this space is to be clearly defined.
4) Using more than one transmitter for one receiver box is not allowed. If you own or purchase a backup transmitter it is important to note: improperly stowing a second transmitter is a security risk. When the system is first put into use, the backup unit should be tested then have it's battery removed and the unit should be stored in a secure place. If these safety regulations are not followed closely, the machine could be set in motion by a non-professional by accident and this could result in serious injury or death.
5) Both the transmitter housing and buttons should be checked on a daily basis and, if damage is present, the transmitter should be taken out of use.
6) Also, the battery level must be checked daily. If the battery level is too low and LED light 2 on the transmitter is flashing, then the battery should be changed.
7) The stop button should be checked before each shift to see if the signal is reaching the receiver.
8) In an emergency situation, pressing the red emergency stop button should immediately activate the stop relay in the receiver and the electrical current to the machine should be cut.

1.6 Safety Features

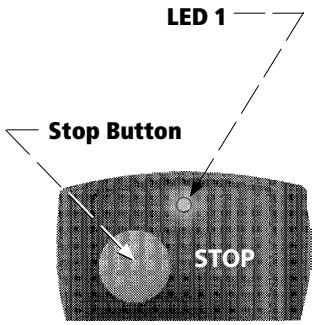
The machine will be brought to a stop if:

– the red stop button is activated
– the operating range is exceeded
– system encounters the same frequency from an outside source
– five minutes go by since the last transmission

These safety features are engineered into the system to protect personnel and equipment and should never be changed, taken out or bypassed.

1.7 Emergency Procedure

If an emergency situation arises immediately press the emergency stop button (red) on the transmitter. Then follow the procedures as outlined in the manual for the machinery being used.



2. Instructions for Use

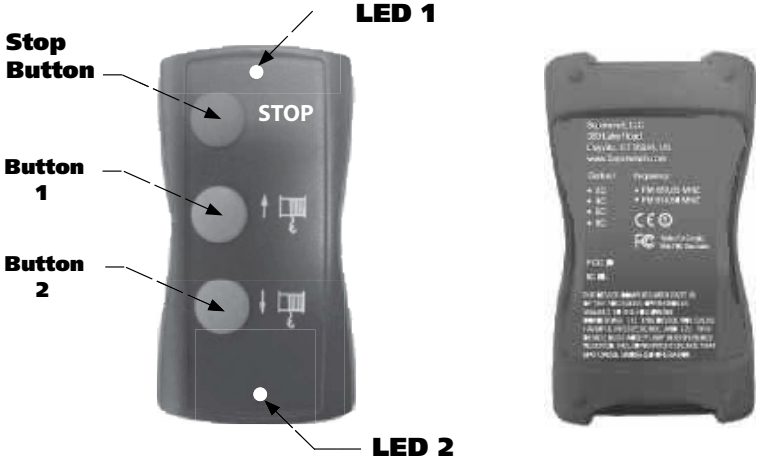
Before using the wireless unit, make sure to have read and fully understood this manual, especially Chapter 1 on safety and safety features.

2.1 Transmitter

2.1.1 Front and Back views and operational controls

Illustration 1 :
Front of Transmitter

Illustration 2 :
Back of Transmitter



2.1.2 Technical Data – Transmitter

Frequency	FM 914.5 MHZ
Number of Functions	2 plus emergency stop
Antennae	internal (wire antennae 50mm)
LED light for transmission	red
LED light battery level	red
Battery	9 volt
Dimensions	120mmx65mmx25mm
Weight	
Ingress Protection Level	IP65
Operational Temperature	-20 C to +50 C

2.1.3 Encoding the system

Before using the wireless system for the first time or after installation, the transmitter must be matched to the receiver. To do this open the back of the transmitter by way of the 4 small screws under the rubber protective cover. **(see Illustration 4 Opening the transmitter).** After removing the back cover, you can see an 8 position code bank directly above the battery. **(see Illustration 3 A & B).** Set your personal code, which must be the same for the transmitter and for the receiver.

Illustration 3A

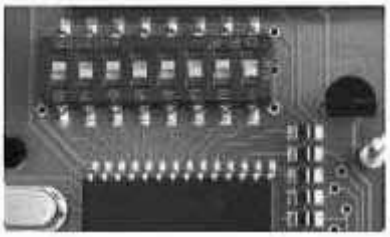


Illustration 3B

Encoding must occur prior to connecting the receiver to the source of electricity.

2.1.4 Optical signals on the transmitter

The transmitter has 2 LED lights. **(Illustration 1)** LED 1 lights up when one of the buttons is depressed. This signal shows the transmitter is sending a signal to the receiver. LED 2 shows the status of the battery. As long as this light does not go on when the transmitter is being used, the battery has enough energy to work correctly. As soon as this light goes on during operation, however, the battery must be changed immediately as further operation of the unit cannot be guaranteed and injury to person or property might result.

2.1.5 Changing the battery

To change the battery, open the back of the transmitter by removing the small screws behind the rubber protective cover. **(Illustration 4 opening the back cover)** After removing the cover, carefully remove the old battery and replace it only with one as described by the manufacturer. (see 2.1.2 Technical Data) Before installing the new battery insure that the connector is free from corrosion. Should this not be the case, any corrosion can be easily removed by means of a small brush. After the new battery has been installed, replace the cover carefully by means of the four small screws.

After changing the battery, please make sure the rubber seal on the transmitter is in place correctly or the sealing of the unit cannot be guaranteed. Used batteries should be disposed of according to national regulations.

Illustration 4 :
Opening the Transmitter
and changing the battery

2.1.6 Internal Antenna

The transmitter utilizes an internal antenna. This antenna cannot be shortened, moved or otherwise altered. The manufacturer has no liability if the antenna has been altered in any way.

2.1.7 Operation of the Transmitter

The transmitter has 2 pressure buttons (green) as well as a stop (red). Each button corresponds to a switch in the receiver and activates this switch as long as the button is depressed. The stop button, when depressed, turns off all switches in the receiver. The stop button always has priority so that it will turn off all switches even if one of the other buttons is being operated. The stop button automatically puts the unit in standby mode.

2.2.1 Open view and components

Illustration 5 : Receiver

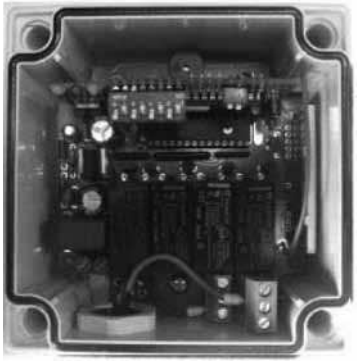
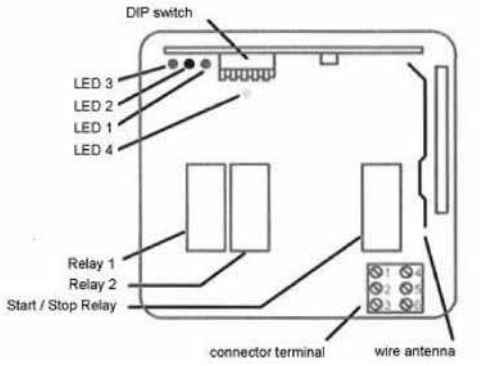


Illustration 6 : Components – Receiver



Components of the receiver (Illustration 6 Components – Receiver)

DIP switch	8 pole DIP switch used to set personal code
LED 1	green light turns on when activated
LED 2	red light activated when receiving signal from transmitter
LED 3	green light activated when receiver is in ready mode
LED 4	yellow light activated when
Relay 1	activated when in ready mode if button 1 is depressed
Relay 2	activated when in ready mode if button 2 is depressed
Start/Stop Relay	activated when emergency stop is pressed
Connector terminal	Connection from the receiver
Wire antenna	internal antenna to receive signal from transmitter

2.2.2 Technical Data - Receiver

Frequency	FM 914.5 MHZ
Voltage supply	12 – 24 Volt DC
No signal current	12V 25mA, 24V 35mA
High load voltage	Max. 24V DC
High load current	Max. 5 amp pro Channel
Number of Functions	2 + Stop function
Antenna	internal
LED Standby	green
LED ready mode	green
LED signal	red
LED mode	yellow
Encoding	8 bit DIP switch
Dimension	100mm X 100mm X 60mm
Weight	350g
Ingress protection	IP65
Temperature levels	-20C - + 50C

2.2.3 Encoding the Receiver

Before using the wireless for the first time or after installation before the electricity is delivered to the unit, the receiver must be matched to the transmitter. To do this, take off the clear top of the receiver (use proper screwdriver). After the top has been taken off set the code in the DIP switch. **(see Illustration 6 Receiver components and illustration 5 Receiver picture)** Set your personal code, which must be the same for the transmitter and for the receiver. The code can only be set when there is no electrical source.

2.2.4 Optical signals in the Receiver

Easily seen on the top of the Receiver (left side) are three LED lights. These signals show if the unit is working correctly.
The green LED 1 shows voltage supply is present and the receiver is on.
The red LED 2 shows when a button on transmitter is being pressed. As long as the light is on when the button is being pressed, the unit is working perfectly.
If the light starts to flash, there is interference in the signal or the signal is weak.
The red LED 3 is on when the receiver is functional. Only when this light is on can the signal be received and the functions carried out.

2.2.5 Internal Antenna

The receiver utilizes an internal antenna. This antenna cannot be shortened, moved or otherwise altered. The manufacturer has no liability if the antenna has been altered in any way.

2.2.6 Functions of the Receiver

The receiver works with 2 relays and a start/stop relay. The relays switch the current to the proper switch output. **Please see the technical data Section 2.2.**

The following functions are built into the receiver:

a) Standby Mode

When hooked up to the supply voltage, the receiver is in standby mode and LED lights 1 and 4 are on. LED 2 and 3 are not on. **(see Illustration 8)** In standby mode no function can be varied out. The relays are not functional.

b) Operational Mode

In the operational mode the switching relays can be initiated through depressing the buttons on the transmitter. This mode can be reached only from standby mode. In operational mode, the LED 1, 3 and 4 are lit.

c) Automatic stop with frequency interference

The receiver can automatically mode to standby mode when another transmitter with the same frequency is detected.

d) Automatic stop upon reaching end of operating distance

The receiver can also move to standby automatically when the transmitter is used outside of safe operating distance.

c) Time release

For safety reasons the receiver also moves to standby mode when more than 5 minutes have elapsed between signals from transmitter to receiver.

2.2.7 Allocation fop Terminals

There is a six pole connection terminal in the receiver box at the bottom right.

Illustration 7 :
Connection terminal

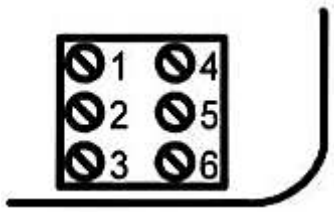


Illustration 8 :
Photo of Receiver

Map of Terminals

Terminal 1	Output switching relay 1
Terminal 2	Output switching relay 2
Terminal 3	Ground
Terminal 4	open contact start/stop relay
Terminal 5	+12 – 24 V DC power supply
Terminal 6	Output switching relay 3 (optional)

3. Tips for Connector Allocation and start up

Mounting, setting up and maintenance of the system is only to be done by schooled professionals. Furthermore, connecting the wireless unit to the machine being controlled can only be done by a recognized expert in the type of machines being used.

- **All work on the piece of machinery or on the receiver must be done with no electricity connected.**

The mounting position chosen for the receiver should be easy to reach and not inside the vehicle. Also the receiver box should be able to be seen easily for diagnostic purposes. This position should not be exposed to either direct sunlight or rainfall. The mounting surface should be flat to prevent contortion of the box which could allow water to enter the unit. The mounting holes can be accessed by removing the cover. The cables going outward from the box should be orientated downwards. Use the cable connections delivered with

the system and run the wires through the connector units. If the receiver is being mounted on a vehicle, there should be four rubber grommets between the box and the body of the vehicle to reduce shock to the receiver.

It is important to operate the machine with no electrical connection prior to the supply voltage being supplied to the receiver. After all components are connected the supply voltage can be delivered to the receiver.

The effective operating distance of the transmitter and the receiver are partially dependent on the landscape features and can vary greatly. Also electrical motors can add interference and the receiver should not be mounted in close proximity to such motors. The greatest operating distance can be achieved by mounting the receiver box high and away from contact with metal surfaces.

4. Operation of the Radio Remote System

Before using the wireless system, the following safety steps must be followed:

4.1 Optical Test

- Check to see if the transmitter has been damaged
- Are all safety features available and working?
- Are all the rubber parts including protective cover and buttons undamaged?

If any parts of the system show damage or signs of wear they should be repaired before further use.

4.2 Safety check and starting the wireless system

- Turn on the supply voltage to the receiver. LED lights 1 and 4 should be lit up.
- Press buttons 1 and 2 simultaneously for 3 or more seconds. LED light 3 should light up and remain on.
- The start/stop relay engages and should remain engaged.
- Check to see if the operation of the transmitter corresponds to the operation of the machinery.
- Check the stop function. After pressing the stop button, the machine should not be able to be controlled by the transmitter.
- If the checks are finished and everything is functional, press buttons 1 and 2 again for 3 seconds.
  The system is operational.

If the test is not positive then the machine must be stopped immediately and the manufacturer should be contacted. Do not work with a machine whose emergency stop is not working correctly. Damage to persons and/or property could be the result.

Any action that does not follow these guidelines will result in the voiding of the warranty.

5. Care and Maintenance

Every year the wireless system should undergo a test administered by an expert in the field of wireless transmission.

An expert is defined as a professional with a background in wireless transmission and with experience in this area. This person must also possess knowledge of regulatory environment involved with these products and with the safety rules and regulations of the country in which the system is operating.

Care of the system components

Both the transmitter and the receiver should be washed with a moist cloth using no further chemicals once a week.

6. Troubleshooting

Problem	Possible Cause	Solution
Receiver shows no reaction after supply current has been connected. LED 1 does not light up	Supply current not available, Connections reversed	Check polarity. Test current into receiver. Turn on main power.
Receiver shows no reaction after current is supplied and button on transmitter is pressed. LED 1 and 4 are on but LED 2 does not light up when button 1 or 2 is pressed.	Transmitter and Receiver are not encoded correctly.	Compare codes Encode units per 2.1.3 and 2.2.3
Receiver can be taken out of standby mode but quickly shuts down again	Another source is transmitting on the same frequency	Deactivate other transmitter
System does not have enough effective range	Receiver mounted incorrectly Receiver surrounded in metal Weak Battery	See Mounting instructions Change battery per 2.1.5

7. Declaration for testing and mounting of the system.

The manufacturer assumes no responsibility and liability for installation of the wireless system. The user must insure that the wireless unit and machinery to be controlled and its components are compatible. The user is also responsible for the application of the safety rules. (see Chapter 1 Safety)

Information for Machinery

Manufacturer _____

Part Number/Type _____

Manufacture Date _____

Serial Number _____

Information for Wireless System

Manufacturer _____

Type _____

System _____

Serial Number Transmitter _____

Serial Number Receiver _____

Note:

The serial number for the transmitter can be found under the battery.
The serial number for the receiver can be found on the circuit board.

The person signing below brought the wireless service into use and is responsible that the safety tests have been carried out per applicable laws and regulations.

Name _____

Company _____

Date _____

Signature _____

NOTICE:
This device complies with part 15 of the FCC Rules [and with RSS-210 of Industry Canada].
Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

NOTICE:
Changes or modifications made to this equipment not expressly approved by, SUPERWINCH LLC, may void the FCC authorization to operate this equipment.

NOTE:
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

NOTICE:
This Class (A) digital apparatus complies with Canadian ICES-003

Radiofrequency radiation exposure information:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of environment. This equipment should be installed and operated with minimum distance of (1.1cm) between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.