SeyWave® ® Wireless Host

Installation & Reference Manual
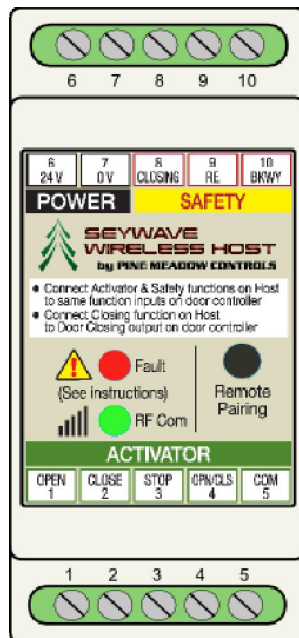
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CONVENTIONS USED THROUGHOUT THIS MANUAL

|	
WARNING	Items with this label must be carefully considered to avoid any damage to system components
NOTE	Items with this label should be considered for best results

1.0 Device Overview

The BTR wireless system is designed to work with industrial doors and gates for trouble free activation and safety. It is based on our proven SeyWave® Technology for low power consumption and reliable two-way RF communication. This is an FCC and IC licensed product operating in the 2.4 GHz spectrum for global compliance. The system has a maximum range of 150 ft and is capable of operating in harsh environments typically found in industrial facilities.

The Host Controller connects to a new or existing door or gate control system and passes through the following standard functions:

<div style="text-align:center">Open, Close, Stop, Open/Close, Reversing Edge and Breakaway</div>

It is powered by 12-24 volt AC/DC, has terminals for each function above and comes in a convenient DIN mounted enclosure. An additional terminal is provided for connection to any closing signal from your existing controller. It is used to confirm system integrity of the Sensor inputs before closing. The Stop and Reversing Edge functions can be configured for either normally open or normally closed for compatibility with interfacing controllers.
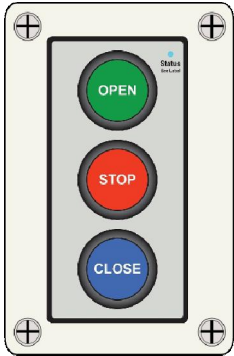
1.1 Interface Diagram
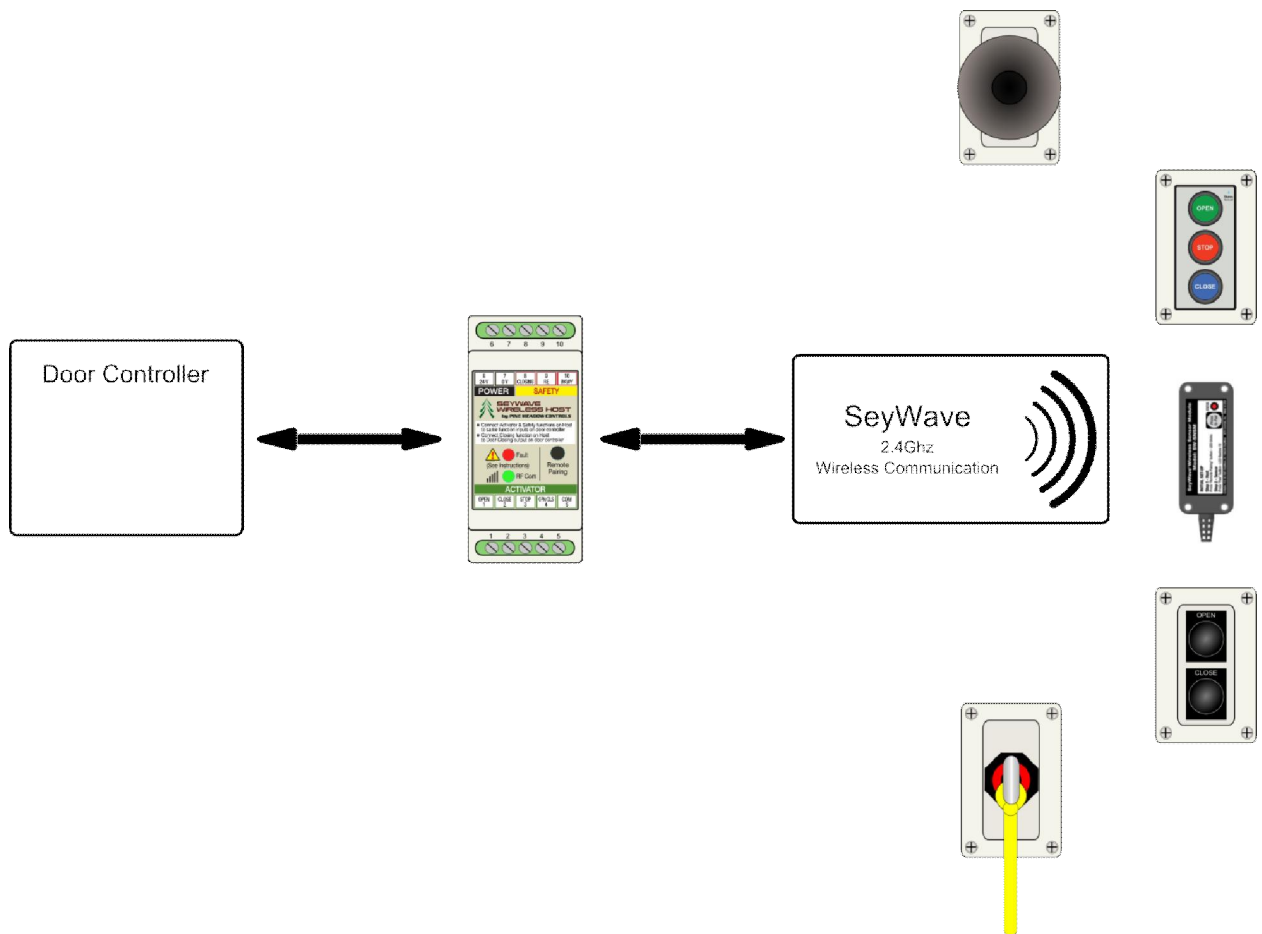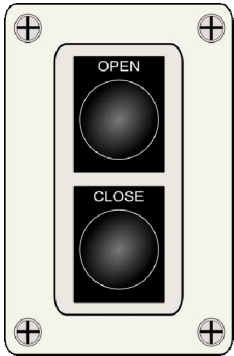
1.2 Operating Characteristics

	Standard Operating Conditions (unless otherwise stated) Operating Temperature -10C to 40C			
Characteristic	Min	Typical	Max	Units
Supply Voltage	12	24	30	V
Operating Current	20	30	60	mA
RF Frequency		2.4		GHz
Range			150 (LOS)	ft
Output Voltage	12	24	30	V
Output Current			50	mA
Remote Battery Voltage				V

WARNING	Operating the Host outside of these specified limits may cause damage and will VOID the Warranty

1.3 Compatible Remotes

SeyWave® O/C/S Remote – SW-MB3

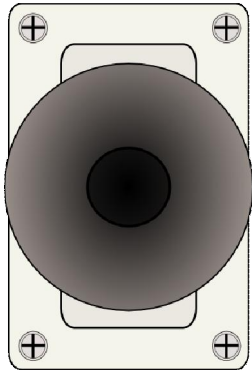|	• A maximum of 20 O/C/S Remotes can be paired with a Host. • Each paired O/C/S Remote is monitored by the Host at a specific time interval to ensure link integrity. If the link integrity is compromised, the Host signals an error. • In addition, the STOP input on each O/C/S Remote is monitored to ensure product functionality. If this monitored input fails validation, the Host signals an error. • The O/C/S Remote provides 3 inputs. The STOP input is monitored and mapped to the Host's STOP output. The OPEN button is mapped to the Host's OPEN output and the CLOSE button is mapped to the Host's CLOSE output.

WARNING	The STOP input is a Cycle Stop only. It is not intended to replace an "Emergency Stop" circuit

SeyWave® Door Sensor Remote – SW-MSNS

	• Only one (1) Door Sensor can be paired with a Host. • The Door Sensor Remote is monitored by the Host at a specific time interval to ensure link integrity. If the link integrity is compromised, the Host signals an error. • When the Closing input on the Host is activated, a motion event from the Door Sensor must be detected and received by the Host within a specific window of time. If there is no verification, the Host will signal an error and keep the reversing edge function to the controller high. This sequence verifies that the Door Sensor's monitored input is valid for every closing cycle. • The Door Sensor battery voltage is monitored periodically. If a low battery condition is detected, the Host will signal an error. • The Door Sensor provides 2 inputs. Input 1 is mapped to the Host's REVERSING EDGE output and Input 2 is mapped to the Host's BREAKAWAY output.

SeyWave® O/C Remote

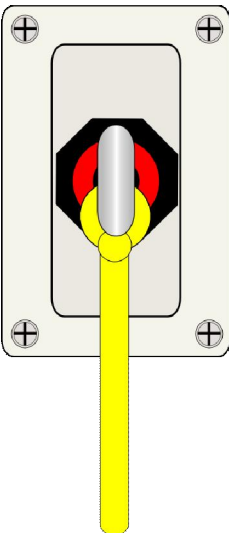|	• There is no limit to the number of O/C Remotes that can be paired with a Host. • The O/C Remote provides 2 inputs. The OPEN button is mapped to the Host's OPEN output and he CLOSE button is mapped to the Host's CLOSE input.

SeyWave® Palm Remote – SW-PLM	

	• There is no limit to the number of Palm Remotes that can be paired with a Host.
	• The Palm Remote provides 1 input. This button can be mapped to either the Host's OPEN/CLOSE output (default) or to the OPEN output. To select which output is used, move internal switch #1 as shown below:
	    o Switch 1 OFF -> Palm Remote activates the Host's OPEN/CLOSE output
	    o Switch 1 ON -> Palm Remote activates the Host's OPEN output
	• After any change to the switch above, the Palm Remote must be reset for the change to take effect. Simply remove 1 of the batteries from the holder, wait 10 seconds and reinsert the battery. The Remote will now be rest.

SeyWave® Pull Cord Remote – SW-PCD	

	• There is no limit to the number of Pull Cord Remotes that can be paired with a Host.
	• The Pull Cord Remote provides 1 input. This activator can be mapped to either the Host's OPEN/CLOSE output (default) or to the OPEN output. To select which output is used, move internal switch #1 as shown below:
	    o Switch 1 OFF -> Pull Cord Remote activates the Host's OPEN/CLOSE output
	    o Switch 1 ON -> Pull Cord Remote activates the Host's OPEN output
	• After any change to the switch above, the Pull Cord Remote must be reset for the change to take effect. Simply remove 1 of the batteries from the holder, wait 10 seconds and reinsert the battery. The Remote will now be reset.

See individual SeyWave® Remote product data sheets for more specific information

NOTE	Use only SeyWave® compatible Remotes produced by BTR Controls.

2.0 Installation

This section covers the Host installation.

- Section 2.1 - Mounting
- Section 2.2 - Wiring
- Section 2.3 - Power Up

WARNING	• Turn power OFF before making any connections to the Host. • Stay within Specified Operating Conditions as shown in 1.2 above. • Failure to follow above may cause damage to the Host.

2.1 Mounting

1. Mount the Host inside the door or gate control enclosure using standard 35mm DIN rail.

NOTE	• Plastic enclosures are recommended. • The Host is also available in a plastic enclosure with clear cover. • A metal enclosure may be used if there is a sufficient opening in the metal such as a plastic window. • Do not mount the Host in close proximity to other 2.4 GHz devices such as Wi-Fi routers or cordless telephones. • The internal antenna must have a path for the signal to radiate. • Contact BTR Controls if you are unsure of your installation environment.

2.2 Wiring

1. Connect power to Host 24 V. terminal #6 and 0 V. terminal #7.
2. Connect Host outputs - terminals #1 to #4 (activation), #9 & #10 (safety) to the corresponding door or gate controller inputs. Refer to the table below.
3. Connect the door or gate controller common for the inputs above (0-30V Max) to Host terminal #5 (common).
4. Connect Host terminal 8 to a point on the door or gate controller that becomes active with a closing command. This can be a connection from the control wire going to the close contactor coil or VFD, a closing output from the controller or VFD, etc.

Example Wiring
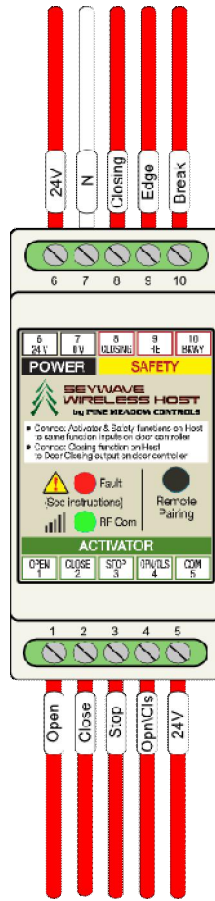
I/O Mapping Table							
Remote		Host Output					
		RE (9)	BKWY (10)	OPEN (1)	CLOSE (2)	STOP (3)	OPN/CLS (4)
Door Sensor	Reversing Edge	X					
	Edge Connection Fault	X					
	Breakaway		X				
	Low Battery	X					
O/C/S Remote (3 Button)	Open			X			
	Stop Resistor Fault					X	
	Stop					X	
	Close				X		
O/C Remote (2 Button)	Open			X			
	Close				X		
O-C Remote (1 Button)	Open/Close (Dipswitch 1 OFF)						X
	Open/Close (Dipswitch 1 ON)			X			

2.3 Power Up

WARNING	Ensure that all connections have been made according to this Manual before applying power.
NOTE	The Host has been shipped from the factory without any Remote pairing.

1) Check all connections to and from the Host.
2) Apply power to the Host.
3) Startup conditions:
   a) Normal: Both the RED and the GREEN LEDs illuminate momentarily and then turn OFF.
   b) Error: If only the RED LED remains ON, refer to Section 4.0 Troubleshooting in this Manual.
4) The Host is now ready to operate if in Normal condition.

Both Lights ON

Both Lights OFF
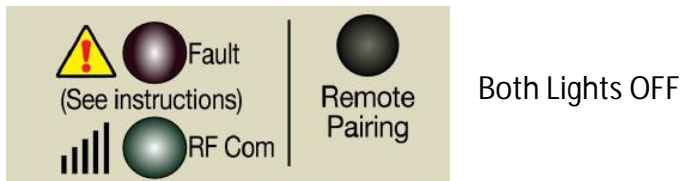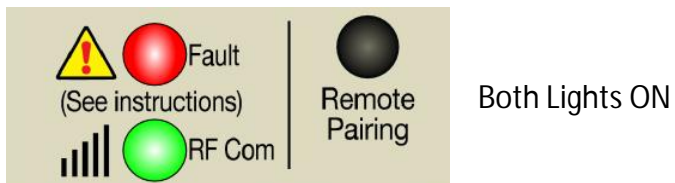
3.0 Programming

This section provides the following information on programming the host

- Section 3.1 - Resetting Communication Parameters
- Section 3.2 - Pairing Remotes
- Section 3.3 - Configuring Output Logic

3.1 Resetting Communication Parameters

WARNING	• Performing this operation will cause the Host to clear pairing with all Remotes. • All Remotes must be paired again for normal communications to be re-established.

1. With power applied to the Host, carefully insert a thin screwdriver into the "Remote Pairing" slot. Keeping the screwdriver pointing straight into the slot, move the tip down until the "Remote Pairing" button is located.
2. Using the screwdriver, apply pressure to the "Remote Pairing" button until the GREEN LED illuminates and hold for at least 5 seconds.
3. When the GREEN LED turns OFF, remove pressure from the button.
4. The GREEN LED will again turn ON for 1 second to signify that the operation was performed successfully.
5. The Host will now automatically RESET causing both the RED and the GREEN LED's to briefly turn ON and OFF.
6. The communication parameters have now been successfully RESET.
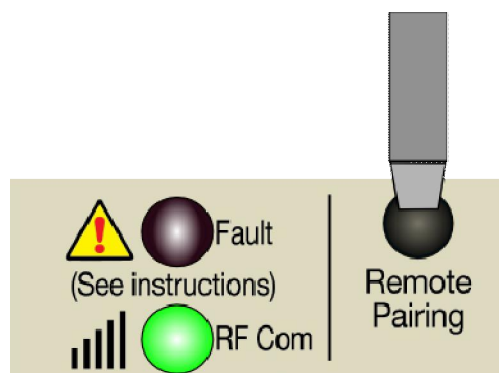
3.2   Pairing Remotes and Sensor

NOTE	A complete Wireless System can consist of multiple Remotes and one Sensor paired to a Host. Each Remote and Sensor must be paired separately to the Host. Attempting to pair multiple units at the same time will result in pairing errors. Follow the procedure below for each Remote and Sensor to be paired.

1. Begin by having each Remote powered and ready. See the individual Remote Data Sheets for detailed instruction.
2. Open the cover of each Remote enclosure and locate the Pairing button. In the case of the Molded Sensor, it can be found on the back of the device.
3. With power applied to the Host, carefully insert a thin screwdriver into the "Remote Pairing" slot. Keeping the screwdriver pointing straight into the slot, move the tip down until the "Remote Pairing" button is located.
4. Using the screwdriver, apply momentary pressure to the "Remote Pairing" button. The GREEN LED will illuminate and flash once a second to indicate that the Host is now in its pairing mode.
5. Take one Remote or Sensor and press its PAIR button. The AMBER LED will now flash once a second to indicate that it is in pairing mode and searching for a Host.
   a. For the Molded Sensor, make sure that the proper reversing edge is connected. The connected edge can also be used as the pairing button. Please see the Molded Sensor Instructions.
6. When the selected Remote has been discovered and correctly paired (a process that should only take a few seconds), the Host will automatically RESET causing both the RED and the GREEN LED's to briefly turn ON and OFF.
7. If the Host was unable to discover and pair with the Remote, the GREEN LED will continue to blink once a second until the timeout period of 60 seconds. Refer to Section 4.0 Troubleshooting in this Manual for pairing issues.
8. To test the Remote for correct pairing, activate one of the Remote inputs. This should cause both the GREEN LED on the Host and the AMBER LED on the Remote to briefly flash once. If either the GREEN LED on the Host does not flash or if the AMBER LED on the Remote flashes more than once, the pairing process was not successful and should be reattempted. Refer to Section 4.0 Troubleshooting in this Manual for pairing issues.
9. Repeat this process for each Remote to be connected to this Host.

3.3 Configuring Output Logic

NOTE	The output logic of the Stop terminal #3 and the Reversing Edge terminal #9 can be changed to either normally open (default) or normally closed.

1. To begin, apply power to the Host, do not operate the door or gate and do not activate any Remotes.
2. Connect a jumper between + POWER terminal 6 and the CLOSING input terminal #8 on the Host.
3. With the jumper connected, carefully insert a thin screwdriver into the "Remote Pairing" slot. Keeping the screwdriver pointing straight into the slot, move the tip down until the "Remote Pairing" button is located and apply pressure to the button.
4. With the jumper still connected, hold the "Remote Pairing" button in for 2 seconds. The GREEN LED will illuminate indicating the Output Setup Mode has been entered.
5. Release the "Remote Pairing" button and remove the jumper from only the CLOSING input terminal #8.
6. The GREEN LED indicates which output is currently selected as follows:
    a. A steady GREEN LED for the Reversing Edge terminal #9.
    b. A blinking GREEN LED for the Stop terminal #3.
7. To toggle between terminal #9 and terminal #3, again use the screwdriver to press and hold the "Remote Pairing" button until the GREEN LED changes state at which time the button is released.
8. To change the logic for the selected output, again use the screwdriver to only momentarily press the "Remote Pairing" button. This will toggle the RED led which indicates the configuration for the current output as follow:
    a. RED ON, the output is configured for normally closed.
    b. RED OFF, the output is configured for normally open.
9. Once the outputs have been configured, again apply the jumper to the CLOSING input terminal #8 and again simultaneously apply pressure using a screwdriver to the "Remote Pairing" button.
10. Continue to hold this position until one or both LEDs turn OFF.
11. Release pressure to the "Remote Pairing" button and remove the entire jumper.
12. The Host has been reset and any changes to the output configurations have been stored.

4.0 Troubleshooting

This section provides troubleshooting information as well as possible corrective actions for the SeyWave® Wireless Host.

4.1 Error Signals

Hardware Error

On power up, for normal operation, both the RED and the GREEN LEDs should illuminate momentarily and then turn OFF. If only the RED LED remains ON, a hardware error has occurred and BTR Controls should be contacted.

Operational Error (System has been setup and operating)

Operational errors will be indicated by a blinking RED LED. These will apply to either the RE terminal #9 or STOP terminal #3 output becoming active during normal conditions according to the table below.

4.2 Cause of Error

Error Condition		
RED LED Flashing	Output Active	
	RE (9)	STOP (3)
Possible Cause	• Door Sensor battery Low • Door Sensor Connection Fault • Door Sensor Communication Loss	• O/C/S Remote Connection Fault • O/C/S Communication Loss

NOTE	To determine if a Host output is active, connect a voltmeter between terminal #7 and the selected output. If there is voltage, it is high. If there is no voltage, it is low.

4.3 Possible Solutions

Reported Operating Errors		
Cause	Description	Possible Solutions
Connection Fault	One of the Remotes or Sensor has reported an invalid reading for a monitored input.	• Check the Sensor connections to ensure a parallel resistor is installed. Note – a resistor must be installed parallel to a monitored input in order to function properly. • Check batteries & replace if low. • Reset communication parameters Sect 3.1 and then re-pair the Remotes and Sensor.
Communication Loss	• A Remote has not reported to the Host within a set time allotment. • An O-C-S Remote has been moved or is out of range. • An external RF device operating on 2.4 GHz is causing intermittent operation	• Ensure the Remote is powered and that the battery level is within range. • Bring the Remote closer to the Host to check for range issue. • Reset communication parameters Sect 3.1 and then re-pair the Remotes and Sensor.
Battery Low	An O-C-S Remote or Door Sensor has reported a low battery.	• Replace the batteries in the Remote. • Reset communication parameters Sect 3.1 and then re-pair the Remotes and Sensor.

NOTE	When the Host LED indicates an error, check each monitored Remote and Sensor for the following:
	• Remote: LED will be blinking if in error
	• Sensor:
	    o Blinking LED indicates low battery
	    o No LED indicates problem with connected edge

4.4　Other General Troubleshooting Ideas

1. Experiencing limited or degraded RF range.
   - Ensure that the Host has been mounted according to section 2.1 of this manual.
   - Try to minimize the number of solid objects that the RF signal must pass through. Each intersection diminishes any RF signal.
   - Follow Section 3.1 of this Manual to reset the Host's communication parameters. Performing this operation forces the Host to use a different slot and channel within the 2.4 GHz band.
   - Remote should be positioned in front and across from a Host for maximum signal strength.
   - Contact BTR Controls if additional assistance is needed.
2. Battery life is shorter than expected.
   - Battery life is directly related to usage. The O-C-S Remote & Sensor are continuously monitored by the Host. The Host acknowledges every signal sent from these units. If the Host is left without power for extended periods of time, these monitored units are still trying to communicate and look for an acknowledged signal. If none is received, the monitored unit immediately sends up to 2 more messages. This retry process consumes minimal power, but it does use more power than when the Host is powered.
   - Use only high quality AA alkaline batteries for the Remotes.

NOTE	Rechargeable batteries are not recommended for this application.

4.5　Technical Assistance

Contact:

> BTR Controls, Inc.
> 1570 Todd Farm Dr.
> Elgin, IL 60123
> (847)608-9500

"This device complies with Part 15 of the FCC Rules. 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."*