

# WARRIOR

## DIN-9XWxR-MOD Receiver Manual

U123.0.0



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### FCC Statements

#### 15.19 – Two Part Warning

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.

#### 15.21 – Unauthorized Modification

**NOTICE:** The manufacturer is not responsible for any unauthorized modifications to this equipment made by the user. Such modifications could void the user's authority to operate the equipment.

#### 15.105(b) – Note:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

### Industry Canada Statement

This device complies with Canadian RSS-210.

The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's website <https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/radiation/safety-code-6-health-canada-radiofrequency-exposure-guidelines-environmental-workplace-health-health-canada.html>.

*Le appareil est conforme à la norme CNR-210 d'Industrie Canada.*

*Le programme d'installation de cet équipement radio doit s'assurer que l'antenne est située ou fait telle qu'elle n'émet pas de champ RF dépassant les limites de Santé Canada pour la population générale ; consulter le Code de sécurité 6, disponible auprès de Santé Canada site Web <https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/radiation/safety-code-6-health-canada-radiofrequency-exposure-guidelines-environmental-workplace-health-health-canada.html>.*

### Industry Canada Statement

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

*Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

### IC Unlicensed Devices EIRP Statements for Removable Antennas

**Part 1:** Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that necessary for successful communication.

*Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.*

**Part 2:** This radio transmitter (LOBSRF-310) has been approved by Industry Canada to operate with the antenna type listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

*Le présent émetteur radio (LOBSRF-310) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.*

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## **Cervis, Inc. Safety Precautions**

- ✓ **Read and follow all instructions.**
- ✓ **Failure to abide by Safety Precautions may result in equipment failure, loss of authority to operate the equipment, and personal injury.**
- ✓ **Use and maintain proper wiring. Follow equipment manufacturer instructions. Improper, loose, and frayed wiring can cause system failure, equipment damage, and intermittent operation.**
- ✓ **Changes or modifications made to equipment not expressly approved by the manufacturer will void the warranty.**
- ✓ **Equipment owner/operators must abide by all applicable Federal, State, and Local laws concerning equipment installation and operation. Failure to comply could result in penalties and could void user authority to operate the equipment.**
- ✓ **Make sure that the machinery and surrounding area is clear before operating. Do not activate the remote control system until certain that it is safe to do so.**
- ✓ **Turn off the handheld remote transmitter and disconnect power from the receiver before attempting any maintenance. This will prevent accidental operation of the controlled machinery.**
- ✓ **Use a damp cloth to keep units clean. Remove mud, concrete, dirt, etc. after use to prevent obstructing or clogging the buttons, levers, wiring, and switches.**
- ✓ **Do not allow liquid to enter the handheld transmitter or receiver enclosures. Do not use high-pressure equipment to clean the handheld remote transmitter or receiver. Water can damage the internal circuitry.**
- ✓ **Disconnect the radio receiver before welding on the machine. Failure to disconnect the receiver unit may result in destruction of or damage to the receiver.**
- ✓ **Operate and store units only within the specified operation and storage temperatures defined in this document's specifications.**
- ✓ **Keep high-energy radio frequency (RF) devices away from handheld remotes. Activating high-power communication radios, for instance, in close proximity to handheld remotes can cause interference and "false" circuit activation.**
- ✓ **Do not key two-way radios while using the handheld remote transmitter.**

## 1.0 Warrior DIN-9XWxR-MOD Receiver

The Warrior DIN-9XWxR-MOD is a low cost, DIN-rail-mounted wireless receiver designed to transmit operational commands to programmable logic controllers (PLCs) mounted on machinery. It runs an application that allows users to access specific registers to process transmitter/system information. This allows system integrators to freely develop PLC application software.

The bi-directional radio is available in FCC/IC license-free 900 MHz for maximum flexibility. The DIN-9XWxR-MOD accepts control commands from the complete line of Warrior handheld transmitters as part of a system.



Figure 1. Warrior DIN-9XWxR-MOD Receiver and 900MHz External Antenna

### Warrior DIN-9XWxR-MOD Features

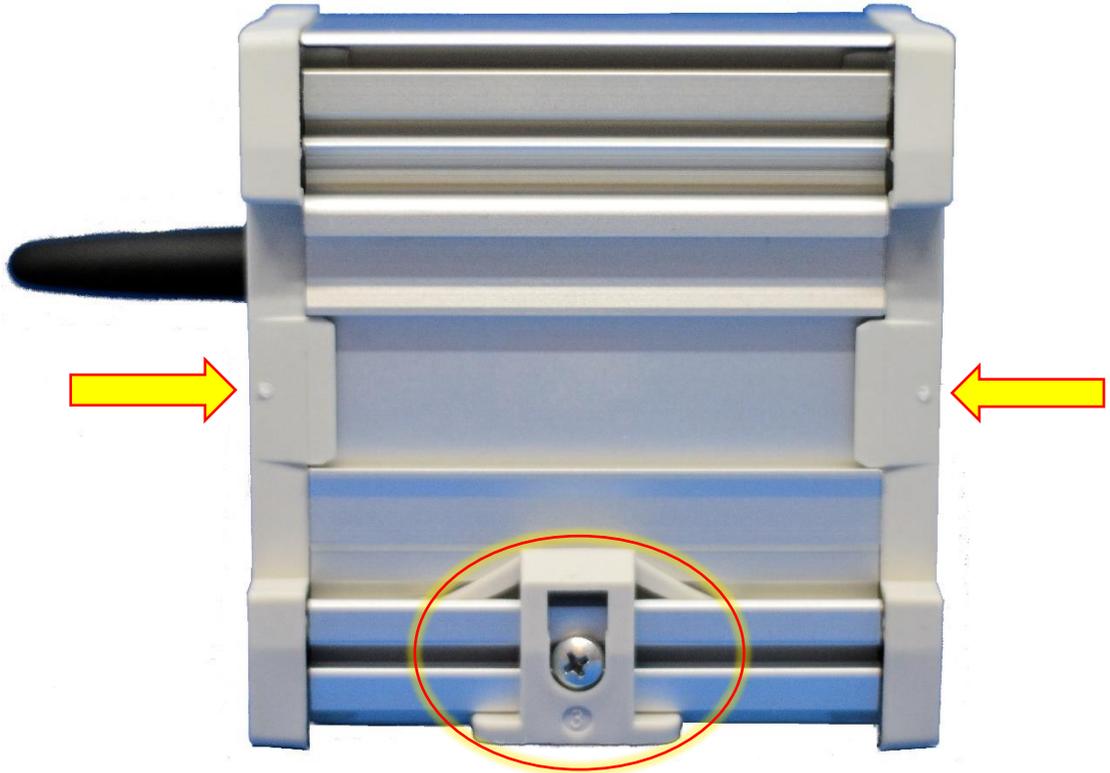
- ✓ RS-485/RS-422 MODBUS Interface
- ✓ Compact; Designed to IP40 Standards
- ✓ 900 MHz or 450 MHz @ 100 mW; No License Required for Operation
- ✓ Designed to ICS 8 NEMA Crane Specification
- ✓ External Antenna
- ✓ Mountable to 35-mm DIN Rails

Table 1. Available DIN-9XWxR-MOD Models

Model Number	Part Number	Number of Relays
DIN-9XW0R-MOD	19005501	None
DIN-9XW1R-MOD	19005502	Single

## 2.0 DIN-9WxR-MOD Receiver Mounting

The DIN-9WxR-MOD can be mounted to 35-mm DIN rails using the connector that attaches to the module's end caps. Figure 2 illustrates the mounting bracket (circled) and the end caps (arrows).

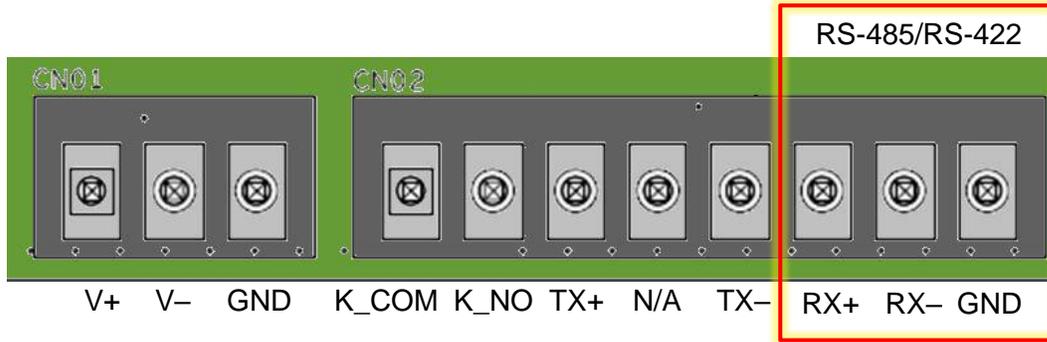


*Figure 2. DIN-9WxR-MOD Receiver Mounting*

### 3.0 DIN-9XWxR-MOD Receiver Wiring

Figure 3 illustrates which of the bundled wiring harness wires connect to particular screw terminals.

✓ **Note:** Flying leads that are not connected on the job site either must be insulated at the wire end or the wire must be disconnected from the appropriate terminal.



*Figure 3. DIN-9XWxR-MOD Receiver Terminal Standard Wiring*

## 4.0 DIN-9XWxR-MOD Receiver Diagnostic LEDs and DIP Switches

### 4.1 LEDs

The DIN-9XWxR-MOD receiver has four board-mounted system status LEDs that can be used as diagnostics tools to verify operation. Removing the DIN-9XWxR-MOD faceplate allows access to the LEDs. These LEDs (shown in Figure 4) are LED 1=Health; LED 2=TX; LED 3=RX and LED 4=Association. See Table 2.

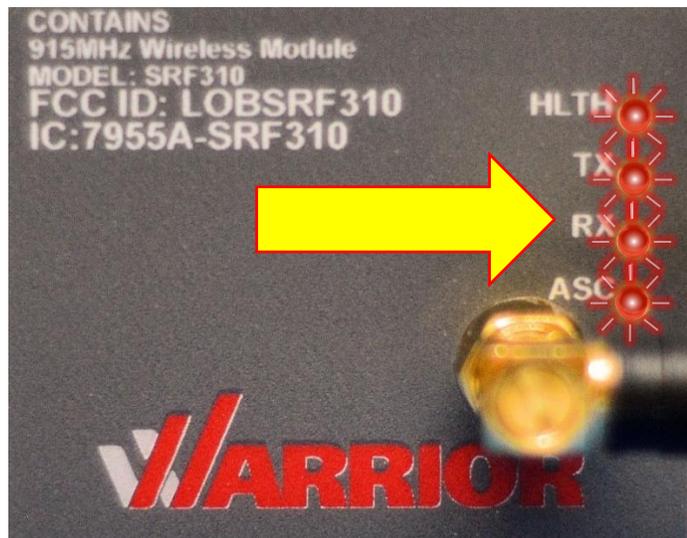


Figure 4. DIN-9XWxR-MOD LEDs

Table 2. DIN-9XWxR-MOD Diagnostic LEDs

LED	Name	LED State	Description
1	Health	Blinking	Unit OK, normal processor operation
2	TX (Transmit)	Flashing	Indicates radio frequency (RF) messages sent to handheld remote transmitter
3	RX (Receive)	Flashing	Indicates RF messages received from handheld
4	Association	Blinking	Used during association with a Warrior transmitter

## 4.2 DIP Switches

The Warrior DIN-9WxR-MOD features four DIP switches to control the module's functions. Table 3 lists each switch's functionality.

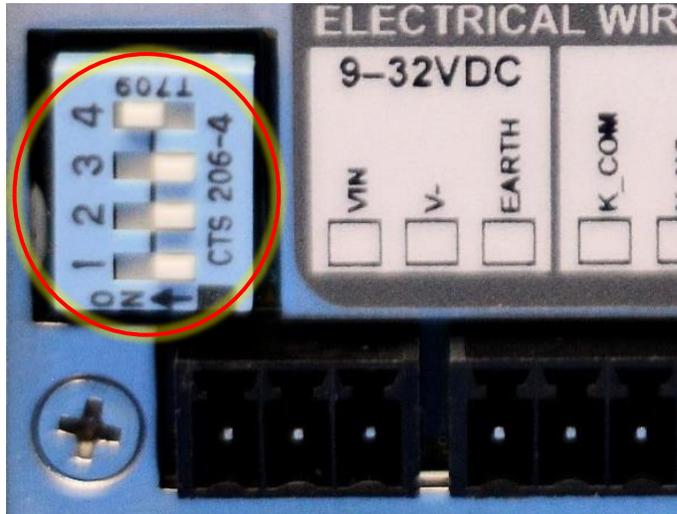


Figure 5. DIN-9WxR-MOD DIP Switches

Table 3. DIN-9WxR-MOD DIP Switches

Switch	Function	Description
1	Power	On (Left) – Relay controlled by master device Off (Right) – Relay closed when link established
2	N/A	Undefined
3	N/A	Undefined
4	Association	On (Left) – Association enabled Off (Right) – Association disabled

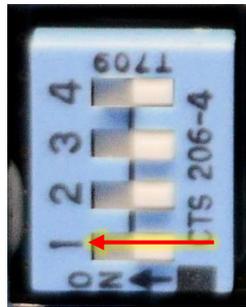
## 5.0 Associate with DIN-9XWxR-MOD

The Associate process is used when necessary to establish or re-establish the communication link with the DIN-9XWxR-MOD receiver. The association process varies depending on the type of Warrior remote control device you have. Consult your specific remote's user manual for its association process.

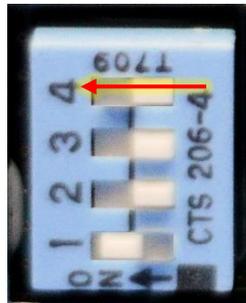
✓ **Note:** *DIN-9XWxR-MOD association can only occur during the first two minutes following unit power-up. If you exceed this two-minute window of opportunity before attempting to Associate with the handheld transmitter, the attempt will be rejected, and the DIN-9XWxR-MOD must be powered off and then turned on again, allowing for the two-minute window to reactivate.*

✓ **Note:** *A receiver that is in use with another handheld transmitter cannot be associated.*

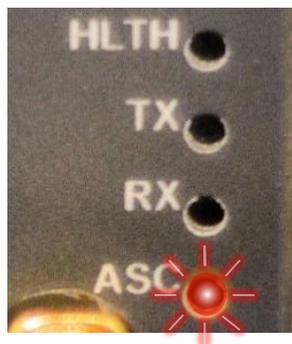
1. Turn the DIN-9XWxR-MOD on by flipping DIP switch 1 (Power) to the **ON** position (Left).



2. Put the DIN-9XWxR-MOD into association mode by flipping DIP switch 4 (Association) to the **ON** position (Left).



The ASC LED flashes, indicating that the module is in Association mode.



3. Follow your specific remote's association steps.
4. Association is successful when all four LEDs on the DIN-9XWxR-MOD flash.

## 6.0 DIN-9XWxR-MOD Receiver Antenna

The DIN-9XWxR-MOD comes with a 915 MHz right angle external antenna (BB3-08) that attaches to the receiver via its built-in 902–928 MHz RP-SMA connector mount.



Figure 6. DIN-9XWxR-MOD 900MHz External Antenna

**Caution!**



*RF interference may cause poor performance.*

## 7.0 Warrior DIN-9XWxR-MOD Receiver Specifications

Table 4. DIN-9XWxR-MOD Receiver Specifications

Item	Description	
<b>Power</b>	<b>V<sub>in</sub></b>	9 to 36 VDC
<b>Environment</b>	<b>Operating Temp</b>	−13 °F to 158 °F (−25 °C to 70 °C)
	<b>Storage Temp</b>	−40 °F to 176 °F (−40 °C to 80 °C)
	<b>Humidity</b>	0–95% non-condensing
<b>Radio</b>	<b>Frequency</b>	906–924 MHz @ 100mW
	<b>License</b>	None required, license-free
	<b>Modulation</b>	Channel-Hopping Direct Sequence Spread Spectrum (CH DSSS)
	<b>Antenna</b>	External (RP-SMA)
<b>Enclosure</b>	<b>Material</b>	Aluminum
	<b>Faceplate</b>	Stainless Steel
	<b>End Caps</b>	Polyamide
	<b>DIN Rail size</b>	35 mm
	<b>Dimensions</b>	Inches: 2.96 x 2.81 x 1.25 mm: 75.06 x 71.48 x 31.75
	<b>Weight</b>	0.5 lb. (
<b>Indicators (Red)</b>	<b>HLTH</b>	Health – Blinks 1x/sec when OK
	<b>TX</b>	Transmit – Flashing when transmitting
	<b>RX</b>	Receive – Flashing when receiving
	<b>ASC</b>	Association – Used during association
<b>DIP Switches</b>	<b>1</b>	On/Left – Relay controlled by master device Off/Right – Relay closed when link established
	<b>2</b>	Undefined
	<b>3</b>	Undefined
	<b>4</b>	On/Left – Association Enabled Off/Right – Association Disabled

## Appendix A: Exposure to Radio Frequency Energy

Warrior handheld remote transmitter units and receivers contain radio transceivers. When active, a handheld remote sends out radio frequency (RF) energy through its internal antenna. The Warrior handheld remote complies with limits set by the United States Federal Communications Commission (FCC) for operating distance from human tissue.

## Appendix B: RF Exposure Considerations

The radio module may be used in a variety of host applications that fall into two general categories:

1. **Mobile applications:** Any operating locations that are **not** on a human body. In mobile applications, the host application is typically fixed to mobile equipment, with either an internal or external antenna.
2. **Portable applications:** Those where the transmitting equipment **is** located on the hand, arm, or other part of the human body. In portable applications, the equipment is typically held in the hand of an operator or affixed to either a belt or harness on the torso.

Equipment containing the radio module was evaluated for RF exposure hazards by two approaches:

1. Maximum Permissible Exposure (MPE) for mobile applications
2. Specific Absorption Rate (SAR) for portable applications.

The required separation distances are measured from the actual location of the radiated part of the antenna. An antenna may be inside the host application, affixed to the enclosure of the host application, or at the end of an optional extension coaxial cable.

### **Mobile Applications**

Equipment **must** be located in a location at least 20cm away from areas likely to be occupied by an unaware person.

### **Handheld Applications**

All operators of the handheld equipment with any type of antenna require proper equipment operation training, and such training must include RF exposure safety instructions. Once training is completed, they are considered to be “aware persons.”

If the portable operating pose is on the hand or arm, a 5mm separation between the radiating part of the antenna and nearby human tissue is required.

### **Required Training**

All installers and operators of host applications that include an SRF310 radio transceiver module **must** be trained to use proper RF safety precautions.



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