

WHELEN[®] ENGINEERING COMPANY INC.

51 Winthrop Road
 Chester, Connecticut 06412-0684
 Phone: (860) 527-9504
 Fax: (860) 527-4078
 Internet: www.whelen.com
 Sales e-mail: autosale@whelen.com
 Canadian Sales e-mail: autocan@whelen.com
 Customer Service e-mail: custserv@whelen.com

Installation/Operating Guide Programmable Hand-Held Siren/ Light Control System P/N 01-0884997-01

DANGER! Sirens produces extremely loud emergency warning tones! Exposure to these tones without proper and adequate hearing protection, could cause ear damage and/or hearing loss! The Occupational Safety & Health Administration (www.osha.gov) provides information necessary to determine safe exposure times in Occupational Noise Exposure Section 1910.95. Until you have determined the safe exposure times for your specific application, operators and anyone else in the immediate vicinity should be required to wear an approved hearing protection device. **FAILURE TO FOLLOW THIS RECOMMENDATION COULD CAUSE HEARING LOSS!**

Safety First

This document provides all the necessary information to allow your Whelen product to be properly and safely installed. Before beginning the installation and/or operation of your new product, the installation technician and operator must read this manual completely. Important information is contained herein that could prevent serious injury or damage.

- Proper installation of this product requires the installer to have a good understanding of automotive electronics, systems and procedures.
- If mounting this product requires drilling holes, the installer **MUST** be sure that no vehicle components or other vital parts could be damaged by the drilling process. Check both sides of the mounting surface before drilling begins. Also de-burr any holes and remove any metal shards or remnants. Install grommets into all wire passage holes.
- If this manual states that this product may be mounted with suction cups, magnets, tape or Velcro™, clean the mounting surface with a 50/50 mix of isopropyl alcohol and water and dry thoroughly.
- Do not install this product or route any wires in the deployment area of your air bag. Equipment mounted or located in the air bag deployment area will damage or reduce the effectiveness of the air bag, or become a projectile that could cause serious personal injury or death. Refer to your vehicle owners manual for the air bag deployment area. The User/Installer assumes full responsibility to determine proper mounting location, based on providing ultimate safety to all passengers inside the vehicle.
- For this product to operate at optimum efficiency, a good electrical connection to chassis ground must be made. The recommended procedure requires the product ground wire to be connected directly to the **NEGATIVE (-)** battery post.
- If this product uses a remote device to activate or control this product, make sure this control is located in an area that allows both the vehicle and the control to be operated safely in any driving condition. **DO NOT ATTEMPT TO ACTIVATE OR CONTROL THIS DEVICE IN A HAZARDOUS DRIVING SITUATION.**
- It is recommended that these instructions be stored in a safe place and referred to when performing maintenance and/or reinstallation of this product.
- **FAILURE TO FOLLOW THESE SAFETY PRECAUTIONS AND INSTRUCTIONS COULD RESULT IN DAMAGE TO THE PRODUCT OR VEHICLE AND/OR SERIOUS INJURY TO YOU AND YOUR PASSENGERS!**

| | |
|--|---|
| ACTIVATION OF THIS SIREN MAY DAMAGE UNPROTECTED EARS! | |
|  Wear Protection! | CAUTION Loud siren noise can cause hearing damage and/or loss. Refer to OSHA Section 1910.95 prior to putting ANY siren into service! |

For warranty information regarding this product, visit www.whelen.com/warranty

This Page Intentionally Left Blank

Specifications

General

| | |
|----------------------------------|----------------------|
| Input Voltage | 12.8 VDC \pm 20% |
| | Negative Ground Only |
| Siren Input Current | 16 Amps Max. |
| Siren Input Fuse | 20 Amps |
| Stand-by Current (backlight off) | < 1mA (typ) |
| Operating Temperature | -30°C to +60°C |
| Storage Temperature | -40°C to +70°C |
| Humidity | 99% (Non-condensing) |

Outlet Current

| | |
|-------------|--------------------------------|
| Outlet #1 | 10 Amps Max. (fused) |
| Outlet #2 | 10 Amps Max. (fused) |
| Outlet #3 | 10 Amps Max. (fused) |
| Outlet #4 | 10 Amps Max. (fused) |
| Outlet #5 | 10 Amps Max. (fused) |
| Outlet #6 | 10 Amps Max. (fused) |
| Outlet #7 | 10 Amps Max. (fused) |
| Outlet #8 | 10 Amps Max. (fused) |
| Icon Driver | 250 mA Max. (internally fused) |

NOTE: Outlets 1 thru 8 are “Positive Switching”. Loads connected to each relay output should be grounded to the battery.

NOTE: Total current of Outlets 1 - 9 not to exceed 75 Amps

Dimensions (Amp/Relay Module)

| | |
|--------------------------------|--------------|
| Height | 2.560 inches |
| Width (incl. mounting flanges) | 8.082 inches |
| Depth | 7.275 inches |

Dimensions (Control Head)

| | |
|--------|-------------|
| Height | 5.30 inches |
| Width | 2.25 inches |
| Depth | 1.12 inches |

Installation

Amp/Relay Module

1. Locate a suitable mounting location. A dry, cool compartment is a good choice.
2. Position the Amp/Relay module on the proposed mounting location. Using an awl or similar tool, scribe the mounting surface where the mounting holes are to be drilled. Make sure that this mounting area allows sufficient ventilation for the Amp/Relay module.

Caution: As mounting the Amp/Relay module will require drilling, it is absolutely necessary to make sure that no other vehicle components could be damaged in the process. Check both sides of the mounting surface before starting. If damage is likely, select a different mounting location.

3. Remove the module from its mounting area, and using a drill bit sized for a #10 sheet metal screw, drill a hole in each of the areas scribed in the previous step.
4. Return the module to its mounting location and using #10x3/4" sheet metal screws (provided), secure the module onto its mounting surface. Be sure to install a #10 internal tooth lock washer (included) onto each mounting screw before mounting the unit. **IMPORTANT:** The amp/relay module case must be either mounted on, or grounded to the vehicle chassis.

Hand-held Controller/Microphone

The system is controlled using a hand-held controller. This controller is comprised of a microphone (with Push-To-Talk key) and 12 illuminated push-buttons.

The mounting bracket for the controller should be located within a comfortable reaching distance from the operator.

IMPORTANT AIR BAG WARNING! Do not install this product or route any wires in the air bag deployment zone of your vehicle. Equipment mounted or located in air bag deployment zones will damage or reduce the effectiveness of the air bag, or become a projectile that could cause serious personal injury or death. Refer to your vehicle owners manual to learn the air bag deployment zones for the vehicle. The User/Installer assumes full responsibility to determine proper mounting location, based on providing ultimate safety to all passengers inside the vehicle.

Wiring

WARNING! All customer supplied wires that connect to the positive terminal of the battery must be sized to supply at least 125% of the maximum operating current and **FUSED** at the battery to carry that load. **DO NOT USE CIRCUIT BREAKERS WITH THIS PRODUCT!**

Refer to the wire chart on page 6 to help determine the required wire sizes needed for each circuit.

NOTE: Item numbers reference the illustration found on page 8.

IMPORTANT! Wires connecting to the Amp/Relay Module have the proper terminals pre-installed from the factory. **WHELEN DOES NOT RECOMMEND RE-TERMINATING ANY WIRES.**

System Power (Items 1-1 thru 1-4)

1. Locate the High-Current Molex™ connector and wires (included) sized to fit into the system power connectors (items 1-1 thru 1-4).
2. Route the BLACK wire (1-1) from the amp/relay module to the NEGATIVE battery terminal.
3. Route the three RED wires (1-2 thru 1-4) from the amp/relay module to the POSITIVE battery terminal. Fuse **each** of these wires as follows:

| | |
|-------------|--------|
| 1-2 (Siren) | 20 Amp |
| 1-3 (Relay) | 40 Amp |
| 1-4 (Relay) | 40 Amp |

NOTE: These fuses must be located within 2 wire feet of the battery.

Do not install these fuses into their holders until all wiring connections are completed!

4. Complete the connections and plug the connectors into the Amp/Relay Module.

Outlets

This system offers 8 Outlets. Each of these outlets provides +12VDC with a maximum circuit capacity of 8 Amps.

Icon Driver (Item 5-7)

This output provides +12VDC with a maximum circuit capacity of 250 mA. This output becomes active whenever a siren tone is active.

Siren Speaker (Items 6-1 & 6-2)

1. Route the wires from 6-1 and 6-2 from the amp/relay module to the siren speaker.
2. Connect 6-1 to the ORG speaker wire (speaker high).
3. Connect 6-2 wire to BRN speaker wire (speaker low).

NOTE: For dual speaker installation, connect the second speakers wires to the same destinations as the first speakers wires (see page 7).

Radio Rebroadcast (Items 5-1 & 5-6)

The wires from 5-1 & 5-6 are used to connect your two-way radio's external speaker for radio re-broadcast. This is an optional connection and will not effect the other operations.

Note: Radio re-broadcast will NOT work with amplified remote speakers! If your remote speaker is amplified (i.e.: contains a power amp circuit in the speaker assembly), do not enable the radio re-broadcast feature.

1. Locate the two wires that connect the external speaker to the two-way radio, cut one of them and splice one of the BLU wires into this circuit.
2. Cut the remaining speaker wire and splice the remaining BLU wire into this circuit.

Backlighting (Item 5-2)

1. Route the wire from 5-2 to the vehicle's marker light circuit.
2. Splice this wire into this circuit to enable the control head backlighting to be active whenever the vehicle's marker light is active.

LCPA Low Current Power Activation Inputs (5-3 or 5-8)

If desired, this system can be switched on (or activated) using Low Current Power Activation (LCPA) inputs. This is accomplished by connecting the appropriate LCPA input wire to the desired signal. If the polarity of the signal to be used is Positive (+), use LCPA Input 5-3. If the polarity of the signal is Negative (-), use LCPA Input 5-8.

Park-Kill (Optional Connection) (Item 5-5 or 5-10)

This feature will automatically suspend an active siren tone when the transmission is shifted into Park. If this feature is desired, the installer must first determine if the signal wire from the transmission neutral safety switch is switching the positive or negative side of the circuit. Use 5-5 if the signal is switching Positive. Use 5-10 if the signal is switching Negative.

Using 18 to 22 gage wire, extend and connect the appropriate wire from the amp/relay module to the vehicle's transmission neutral safety switch signal wire.

Hands-Free Siren (Items 33 & 37) (Optional)

Hands-Free connection allows siren tones to be initiated and controlled using the vehicle horn ring button. Using a customer supplied relay capable of handling the current of your vehicle horn, connect as shown on page 7.

PA Volume Adjustment

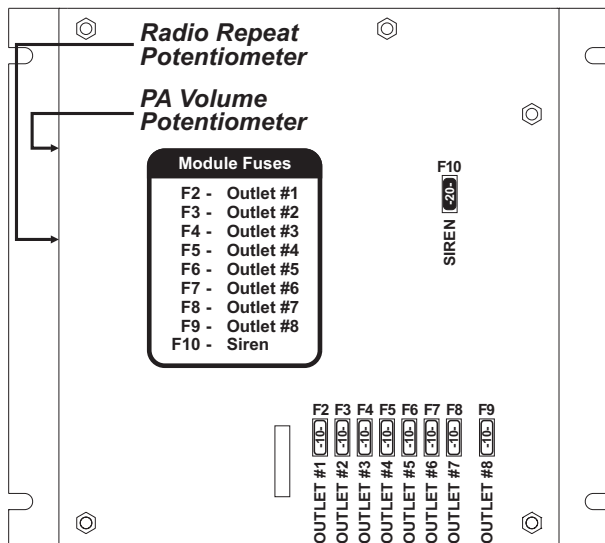
Locate the PA adjustment pot (potentiometer) on the side of the amp/relay module. Using a small, flat-blade screwdriver, set the potentiometer to its middle position. With the system on, activate the PTT (Push To Talk) feature on the optional microphone. Adjust the potentiometer until a satisfactory PA volume level is achieved using a normal speaking voice.

Radio Repeat Volume Adjustment

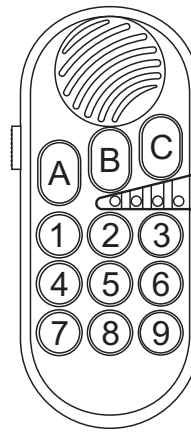
To Adjust the Radio Repeat Levels: Before placing this unit into service, the Radio Repeat output volume must be adjusted to satisfactory operating levels. To adjust this level, a small, flat blade screwdriver is needed. Locate the Radio Repeat adjustment potentiometer on the side of the amp/relay module. Set the volume of the vehicle's two-way radio to its normal operating level. Press the RAD button on the control head to activate Radio Repeat. As incoming transmissions are received, adjust the Radio Repeat potentiometer to set the desired level. Turn the potentiometer clockwise to increase the level and counter-clockwise to decrease the level.

Amp/Relay Module Fuses

For ease of access, all of the amp/relay module fuses are accessible from outside the case.



Hand-held Controller Default Push Button Operation



- A - Outlets 1 & 5 (Front Red)
 - B - Outlets 3 & 5 (Front Blue)
 - C - Outlets 1, 3 & 5 (Front Red & Blue)
 - 1 - Outlets 2 & 5 (Rear Red)
 - 2 - Outlets 4 & 5 (Rear Blue)
 - 3 - Air Horn
 - 4 - Outlet 6 (Left Alley)
 - 5 - Outlet 7 (Right Alley)
 - 6 - Siren
 - 7 - Outlet 8 (Take-Down)
 - 8 - Radio Repeat
 - 9 - Low Power Siren
- Outlet 1 - Front Red LED
 Outlet 2 - Rear Red LED
 Outlet 3 - Front Blue LED
 Outlet 4 - Rear Blue LED
 Outlet 5 - to In-Car Video System
 Outlet 6 - Left Alley
 Outlet 7 - Right Alley
 Outlet 8 - Take Down

Dip Switch Functions

The Amp/Relay module contains a bank of 4 dip switches. The function of each switch is as follows:

DS1 - This dip switch must remain in the ON position at all times.

DS2 - This switch determines the audio characteristics of the WAIL siren tone. If the DS2 is in the OFF (default) position, an 'electronic' siren tone will be generated. If DS2 is in the ON position, a simulated 'mechanical' siren tone will be generated.

DS3 - This switch controls the siren pursuit tone. If DS3 is in the ON position, the WAIL tone is generated when button 3 is pressed. If DS3 is in the OFF position, no siren tone is generated when button 3 is pressed.

DS4 - This switch determines the method that will be used to turn the siren system on. If the switch is in the ON position, the system is turned on by switching the high-current main power lines (1-3 & 1-4). If this is desired, a switch sized to handle the entire current load must be installed in-line with both 1-3 and 1-4.

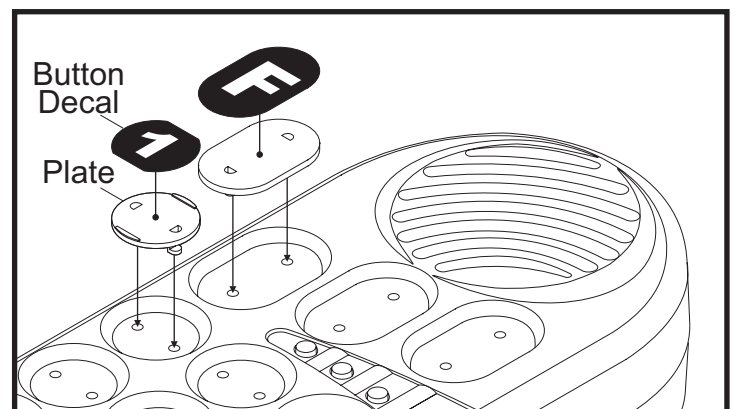
If the DS4 is in OFF position, the system is turned on via the LCPA wire (5-3 or 5-8).

NOTE: The controller is shipped without any button decals installed. Do not place button decals directly onto the buttons. Install a plate onto each button first and then adhere the desired button decal onto that plate.

Programming

The button functions of the controller may be reprogrammed using the Configuration software. The Amp/Relay module must first be connected to the programming computer via the USB Port.

Refer to the online help provided with the software for programming procedures.



Wire Gauge Calculation Chart

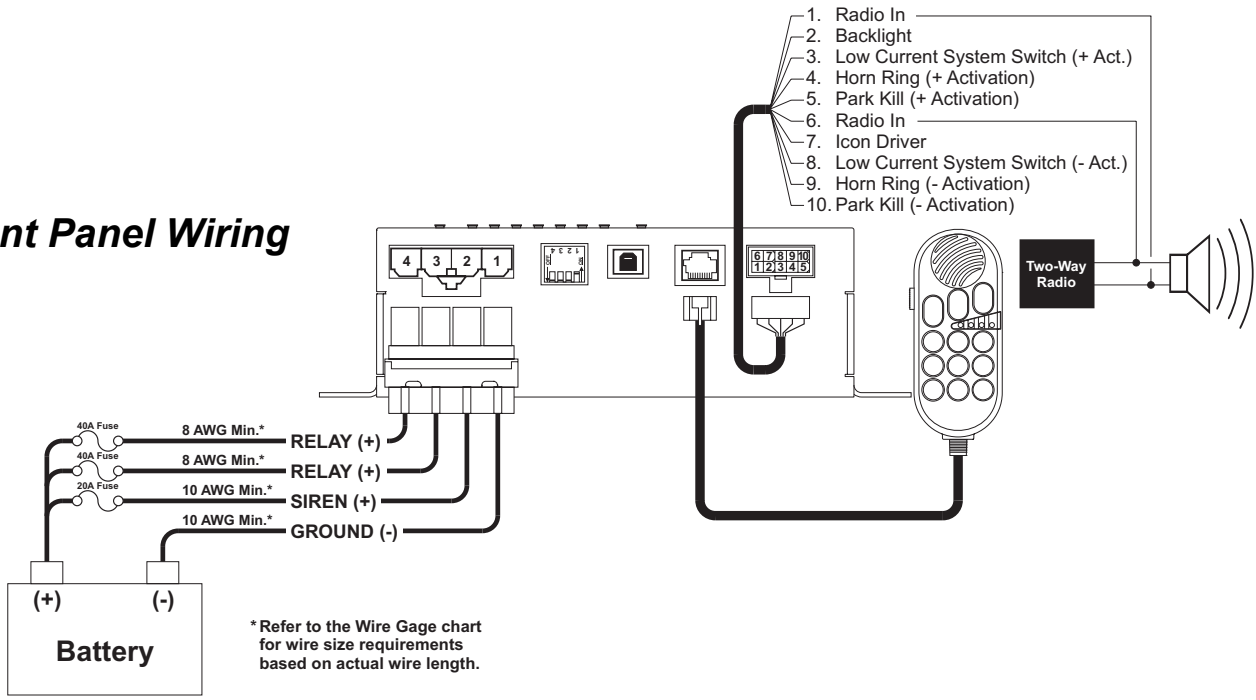
Maximum Current Draw Through The Wire

| Wire Gauge | 5 Amps | 10 Amps | 15 Amps | 20 Amps | 25 Amps | 30 Amps | 35 Amps | 40 Amps | 45 Amps | 50 Amps |
|------------|------------|------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 22 AWG | 6 Feet | 3 Feet | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient |
| 20 AWG | 9.5 Feet | 5 Feet | 3 Feet | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient |
| 18 AWG | 15 Feet | 7.5 Feet | 5 Feet | 4 Feet | 3 Feet | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient |
| 16 AWG | 24.5 Feet | 12 Feet | 8 Feet | 6 Feet | 5 Feet | 4 Feet | 3.5 Feet | 3 Feet | Insufficient | Insufficient |
| 14 AWG | 39 Feet | 19.5 Feet | 13 Feet | 9.5 Feet | 8 Feet | 6.5 Feet | 5.5 Feet | 5 Feet | 4.5 Feet | 4 Feet |
| 12 AWG | 62 Feet | 31 Feet | 20.5 Feet | 15.5 Feet | 12.5 Feet | 10.5 Feet | 9 Feet | 7.5 Feet | 7 Feet | 6 Feet |
| 10 AWG | 98 Feet | 49 Feet | 32.5 Feet | 24.5 Feet | 19.5 Feet | 16.5 Feet | 14 Feet | 12.5 Feet | 11 Feet | 10 Feet |
| 8 AWG | 156 Feet | 78 Feet | 52 Feet | 39 Feet | 31 Feet | 26 Feet | 22.5 Feet | 19.5 Feet | 17.5 Feet | 15.5 Feet |
| 6 AWG | 248.5 Feet | 124 Feet | 82.5 Feet | 62 Feet | 49.5 Feet | 41.5 Feet | 35.5 Feet | 31 Feet | 27.5 Feet | 25 Feet |
| 4 AWG | 395 Feet | 197.5 Feet | 131 Feet | 98.5 Feet | 79 Feet | 66 Feet | 56.5 Feet | 49.5 Feet | 44 Feet | 39.5 Feet |
| 2 AWG | 629 Feet | 314 Feet | 209 Feet | 157 Feet | 125.5 Feet | 104.5 Feet | 89.5 Feet | 78.5 Feet | 69.5 Feet | 63 Feet |

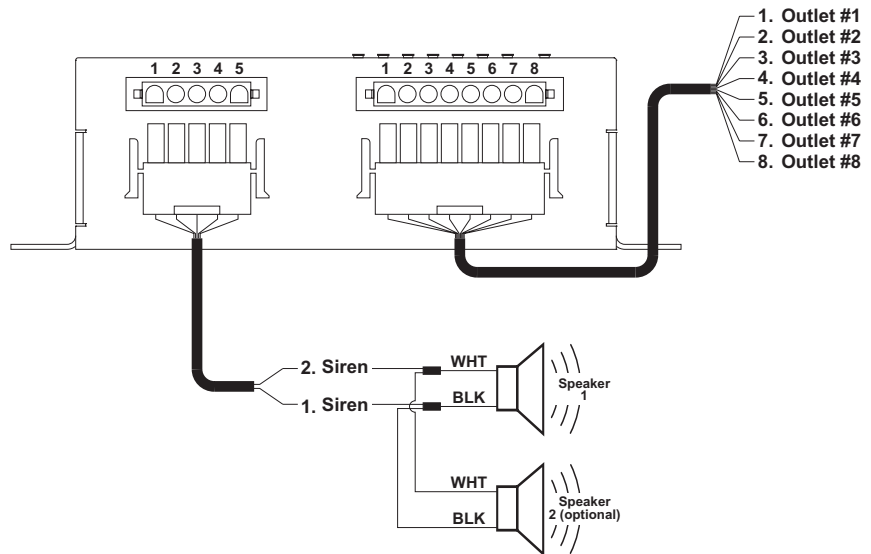
Maximum Current Draw Through The Wire

| Wire Gauge | 55 Amps | 60 Amps | 65 Amps | 70 Amps | 75 Amps | 80 Amps | 85 Amps | 90 Amps | 95 Amps | 100 Amps |
|------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 22 AWG | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient |
| 20 AWG | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient |
| 18 AWG | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient |
| 16 AWG | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient |
| 14 AWG | 3.5 Feet | 3 Feet | 3 Feet | 3 Feet | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient |
| 12 AWG | 5.5 Feet | 5 Feet | 5 Feet | 4.5 Feet | 4 Feet | 4 Feet | 3.5 Feet | 3.5 Feet | 3.5 Feet | 3 Feet |
| 10 AWG | 9 Feet | 8 Feet | 7.5 Feet | 7 Feet | 6.5 Feet | 6 Feet | 6 Feet | 5.5 Feet | 5 Feet | 5 Feet |
| 8 AWG | 14 Feet | 13 Feet | 12 Feet | 11 Feet | 10.5 Feet | 10 Feet | 9 Feet | 8.5 Feet | 8 Feet | 8 Feet |
| 6 AWG | 22.5 Feet | 20.5 Feet | 19 Feet | 17.5 Feet | 16.5 Feet | 15.5 Feet | 14.5 Feet | 14 Feet | 13 Feet | 12.5 Feet |
| 4 AWG | 36 Feet | 33 Feet | 30.5 Feet | 28 Feet | 26.5 Feet | 24.5 Feet | 23 Feet | 22 Feet | 21 Feet | 19.5 Feet |
| 2 AWG | 57 Feet | 52.5 Feet | 48.5 Feet | 45 Feet | 42 Feet | 39 Feet | 37 Feet | 35 Feet | 33 Feet | 31.5 Feet |

Front Panel Wiring



Rear Panel Wiring



Amp/Relay Module Input/Output Identification

Item #1

- 1-1 Ground (-)
- 1-2 Siren (+)
- 1-3 Relay (+)
- 1-4 Relay (+)

Item #2

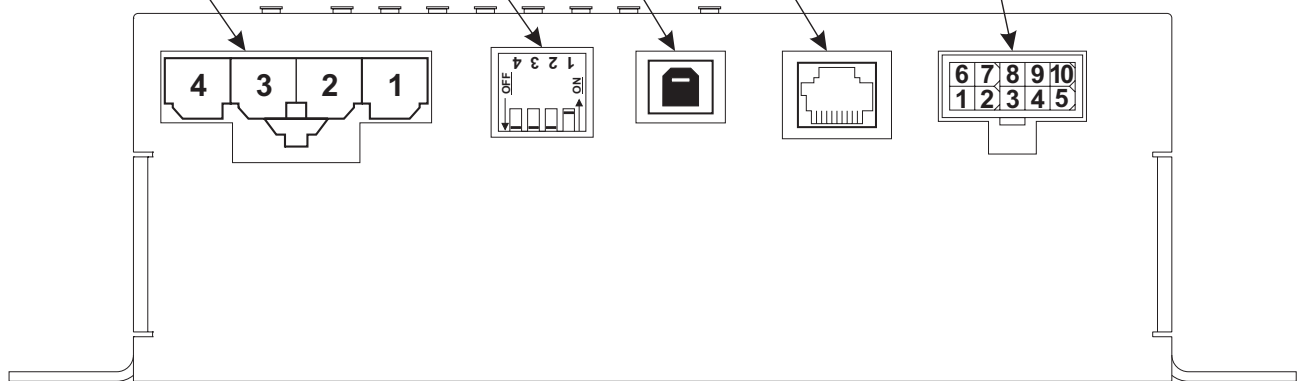
- 2-1 Dip Switch #1
- 2-2 Dip Switch #2
- 2-3 Dip Switch #3
- 2-4 Dip Switch #4

Item #3
USB Port

Item #4
Controller Port

Item #5

- 5-1 Radio In
- 5-2 Backlight
- 5-3 Low Current System Switch (+ Activation)
- 5-4 Horn Ring (+ Activation)
- 5-5 Park Kill (+ Activation)
- 5-6 Radio In
- 5-7 Icon Driver
- 5-8 Low Current System Switch (- Activation)
- 5-9 Horn Ring (- Activation)
- 5-10 Park-Kill (- Activation)



Item #6

- 6-1 Siren
- 6-2 Siren
- 6-3 Not Used
- 6-4 Not Used
- 6-5 Not Used

Item #7

- 7-1 Outlet #1
- 7-2 Outlet #2
- 7-3 Outlet #3
- 7-4 Outlet #4
- 7-5 Outlet #5
- 7-6 Outlet #6
- 7-7 Outlet #7
- 7-8 Outlet #8

