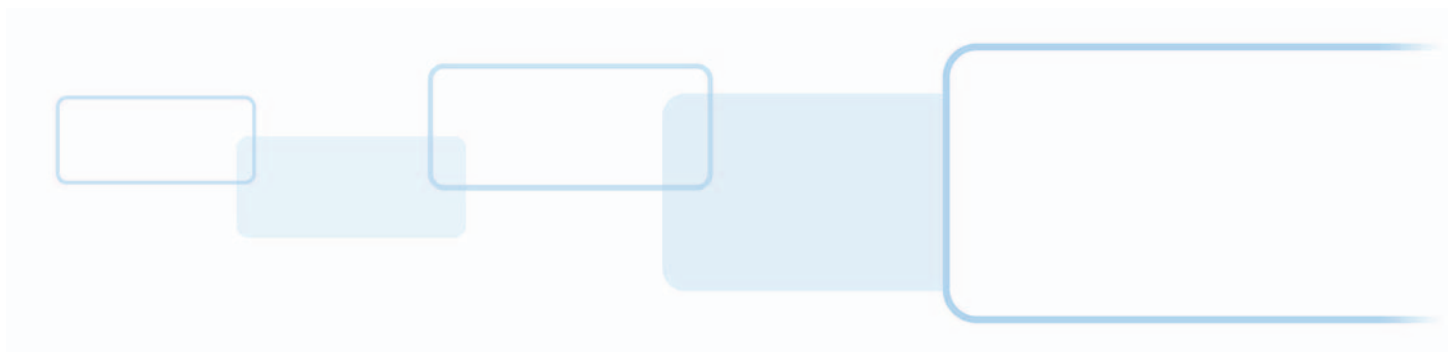


iCLASS SE U90 Reader User Guide

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1 Overview

The iCLASS SE U90™ Reader is a long-range Ultra High Frequency (UHF) reader that supports all EPC Global Class 1, Gen 2 compliant credentials. Together with HID's multi-CLASS tri-technology UHF credential, the U90 is part of a complete Physical Access Control System (PACS) for gated or monitored parking applications.

1.1 Features

- Autonomously identifies the driver/vehicle for access privileges
- SE enabled reader applying state-of-the-art security to verify the identity using password access and HID's Secure Identity Object (SIO)
- Supports Security Industry Association (SIA) Wiegand communication standard, including Hold functionality
- Supports SIA OSDP communication standard, v2.1
- Includes 3 each dry relays for operating external audio and visual indicators. Rated 30VDC, 2A Resistive.
- Flexible configuration using Ethernet port and local web portal
- IP65 and UL294 outdoor ratings

1.2 Specifications

Product	Base Part #	Input Voltage (VDC)	Current			Operating Temp	Cable Length	Regulatory Ref #
			Standby AVG ¹	Max AVG ²	Peak ³			
U90	RDRSEU90	12 VDC	320mA	400mA	1.0 Amp	-30° to 150° F (-35° to 65° C)	Power Supply Lines 40 ft (12 m)- 22 AWG 100 ft (30 m)- 18 AWG Communication Lines Wiegand / Clock-and-Data 500 ft (152 m) - 22 AWG RS-485 4,000 ft (1,219 m) - 24 AWG	U90A _{x1} _{x2} _{x3} U90.865 U90.915
		24 VDC	160mA	200mA	0.5 Amp			

¹ Standby AVG - RMS current draw without a card in the RF field.

² Maximum AVG - RMS current draw during continuous card reads.
Not evaluated by UL.

³ Peak - highest instantaneous current draw during RF communication.

UL Reference Number Deciphering

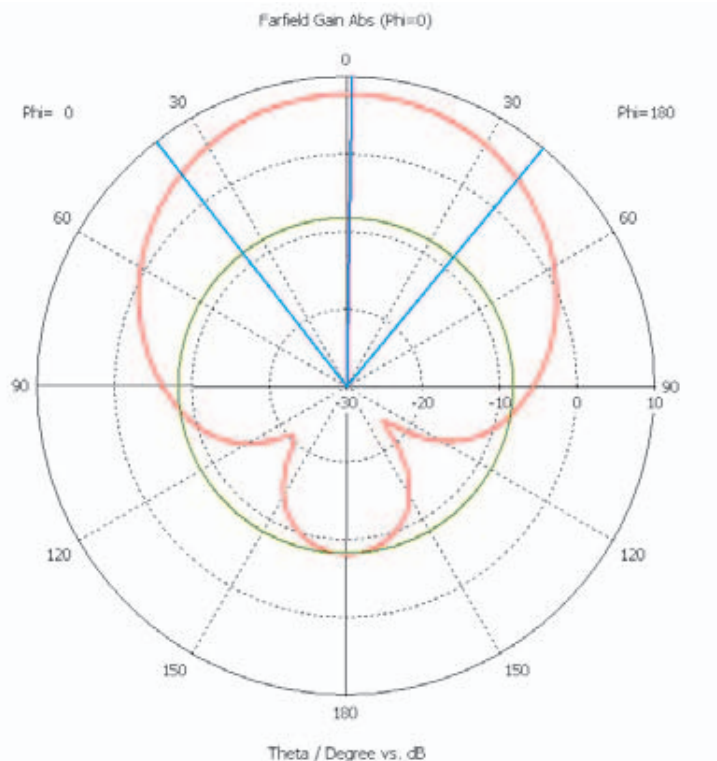
_{x1} Reader Colors: K = Black
_{x2} Wiring: T = Terminal
_{x3} Radio band: 8 = 865 to 868 MHz
9 = 902 to 908 MHz

2 Planning

2.1 Installation Planning

- By design, the reader has a directional radiation pattern where power and sensitivity are maximized between 3m to 5m along the front axis of the reader and are minimized behind and to the sides of the reader.

Top View of Antenna Radiation Pattern



- The front radiation lobe is still pretty wide and there is a small radiation lobe at the back of the reader
- Many surfaces including concrete, glass, and metal will reflect radiated energy which can have the effect of boosting power or sensitivity along any number of axes
- The combination of the characteristics listed above lead to the following ideal installation environment

Ideal Installation Environment

- Reader is suspended between 6 and 8 feet off the ground centered along the lane
- There is no reflecting surface behind the reader
- Reader is positioned either above or slightly ahead of the gate controller (when one exists)
- Reader is angled down approximately 20 degrees from the horizontal
- Power and sensitivity are adjusted to result in 3m to 5m of range with an HID multi-CLASS tri-technology card mounted in a vehicle windshield (see section 6)

- The ideal installation environment described above is intended to ensure that the reader does not read a vehicle in an adjacent lane or read vehicles that are behind a vehicle sitting at the gate
- It is also intended to result in an experience where the driver can go through a gate at a rolling stop instead of coming to a full stop
- If the reader must be mounted on a wall, it should be extended as far away from the wall as is practical.
- If the reader must be located along the side of a lane, then angle the reader as appropriate (see lane drawing).
- Avoid mounting two readers too close back to back, as shown in *Section 2.1.1.2: Lane Configuration*. This could result in one reader interfering with the other.

2.1.1 Location

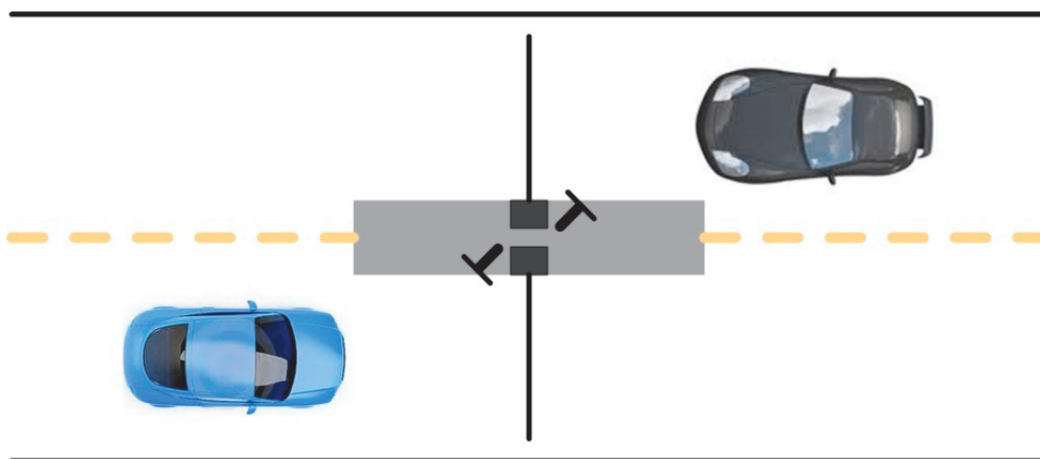
There are many items that need to be taken into consideration and planned out in detail, before the installation will take place. The following sections cover each item.

2.1.1.1 Environment (garage, gates, etc.)

- Where will the reader be required to be installed?
- Does the site require EPC or SIO or both?
- What items could cause interference?
- Exposed to weather
- Obstruction free area

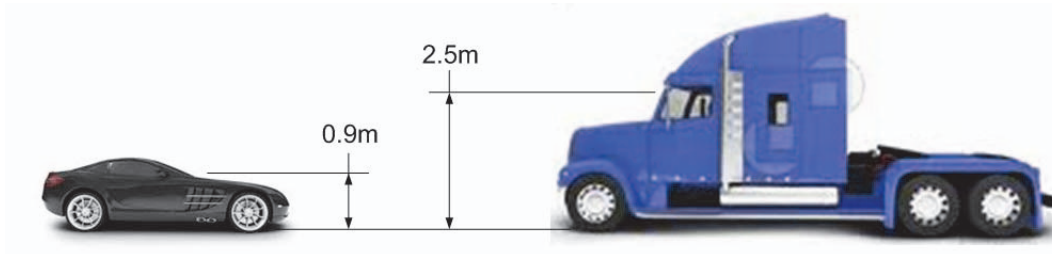
2.1.1.2 Lane Configuration

There are many possible lane configurations that can be considered. One Possible lane configuration is shown below:



2.1.1.3 Car Heights

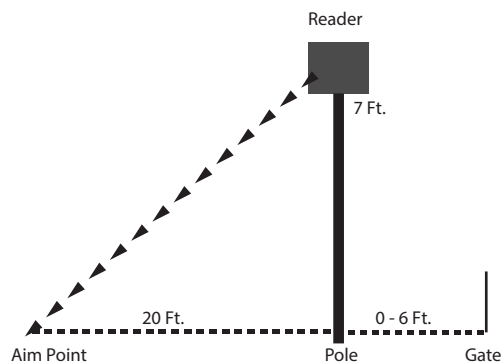
There are many possible car heights that need to be taken into consideration:



2.1.1.4 Mounting Type

The reader will need to be installed at a optimal hight and angle to read the cards properly.

- Wall
- Post



2.1.1.5 Interference (objects/radio/lights)

An obstruction free area is required for optimal performance.

2.1.2 Tools Needed

- Ladder
- Ethernet cable
- Drill
- Scissors
- Laptop with Ethernet connector
- Ethernet cable (to connect from the laptop to the reader)

3 Physical Installation

Once an installation plan has been defined, the following installation can begin.

3.1 Reader Position

Reader is positioned within 2 meters (~6 feet) of the access gate. Distances greater than this could allow a vehicle to be positioned past the reader's RF field and therefore the tag can not be read. Positioning the reader at or behind the gate will affect the perceived read range and driving habits. The reader is intended to have a 3 to 5 meter read range measured from the reader to the tag. The typical type and size of vehicle as well as the credential location with respect to the front bumper should be considered when positioning the reader.

The reader should be positioned 1.8 to 2.4 meters (6 to 8 feet) above the lane when space permits. This height provides excellent performance in open air applications with a mix of cars and full-size trucks.

The reader should be positioned near the edge of the vehicle lane but located such that it cannot be struck by passing vehicles. The reader can be mounted to a flat surface or post. A typical mounting post is the PS094-AVIB from The Housing Company and allows for additional adjustments to reader position through the curved design.

The use of an adjustable mounting bracket is recommended. Mounts are commercially available for flat surfaces and round posts:

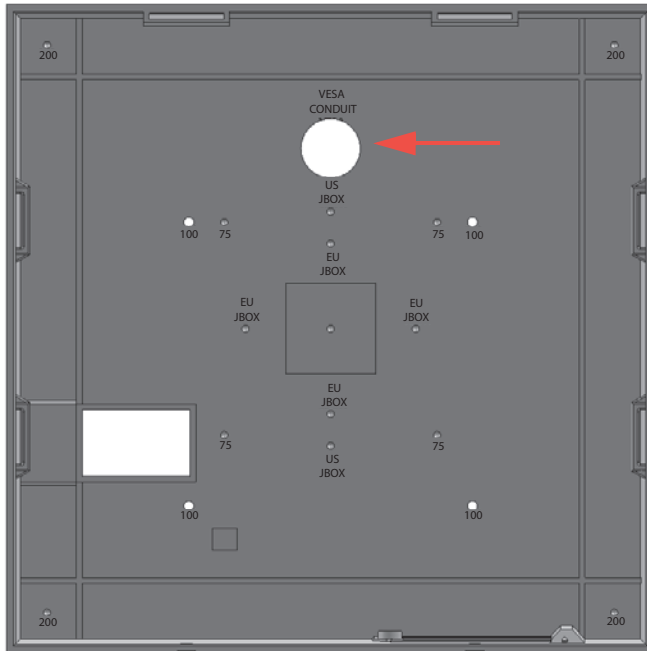
- The reader mounting box has drill points integrated for Video Electronics Standards Association (VESA) style brackets on 75mm, 100mm, and 200mm centers. Mounts of this type are available from many manufacturers and provide adequate articulation for reader aiming.
- For mounting to a round post, an AVI Clamp from The Housing Company or similar style mount has been successfully implemented in the field during product testing. The mounting box can be drilled as required to mate to the mount as it may not provide VESA mounting hole locations.



3.2 Installation to the Mounting Surface

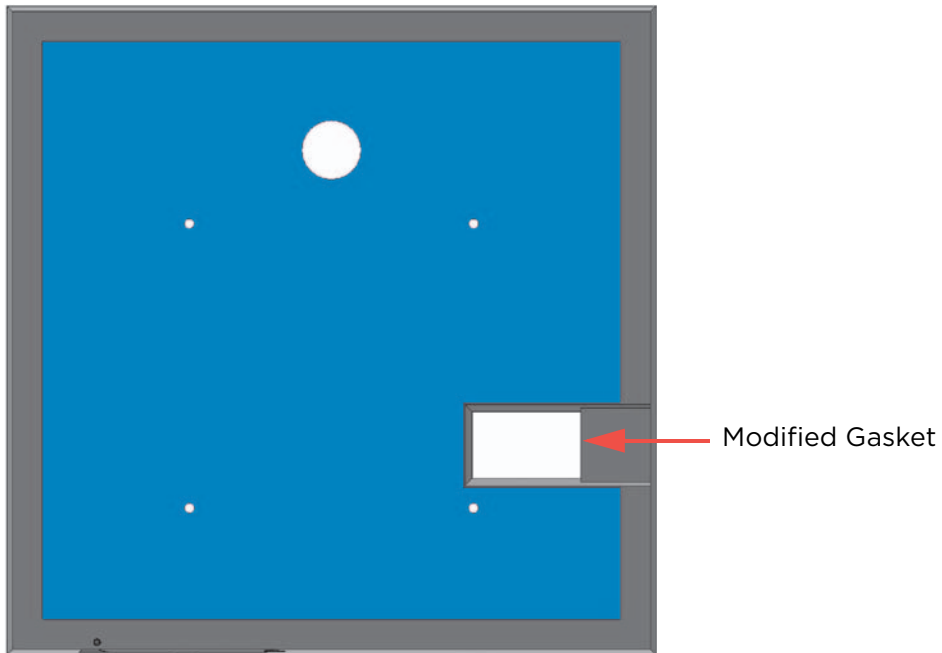
Note: Many of the steps below can be done before going to the installation site.

1. Remove the reader from the backbox.
2. Mounting holes need to be drilled in the back plate to mate with the mount selected for the site. **Note:** Basic holes are marked and labeled.
3. Drill the hole for the conduit, identified below.
Note: The conduit nut is intended to create an airtight and water tight seal to the outside elements.

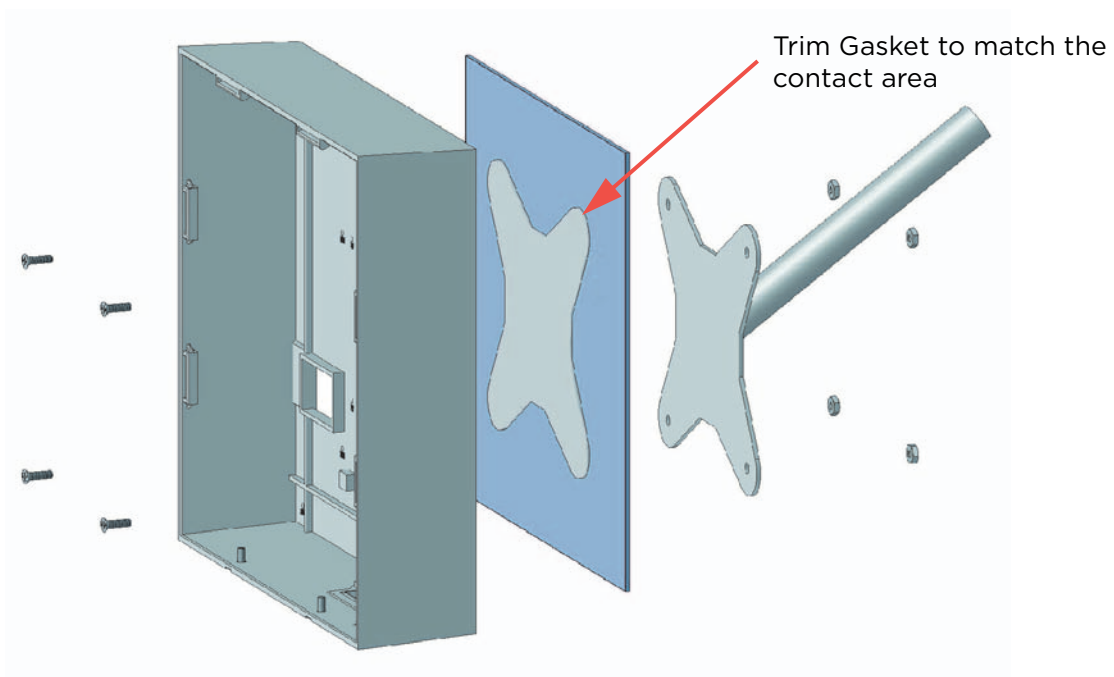


4. The gasket must be modified to match the holes created on this backbox. At a minimum the gasket must not cover the square opening shown below.

Note: This is done with scissors.



5. It is recommended that the gasket be modified to match the area between the mount and the box, to create a seal against the elements (example below). Attach the backbox with the gasket to the mount with the 4 screws provided as shown below.



3.3 Wiring

After the cable is brought through the backbox (conduit hole) and connected to the reader the hole must be sealed with RTV silicone to weatherproof the reader.

Note: We recommend the use of liquid tight conduit and fittings. RTV silicone can also be used as an alternative.



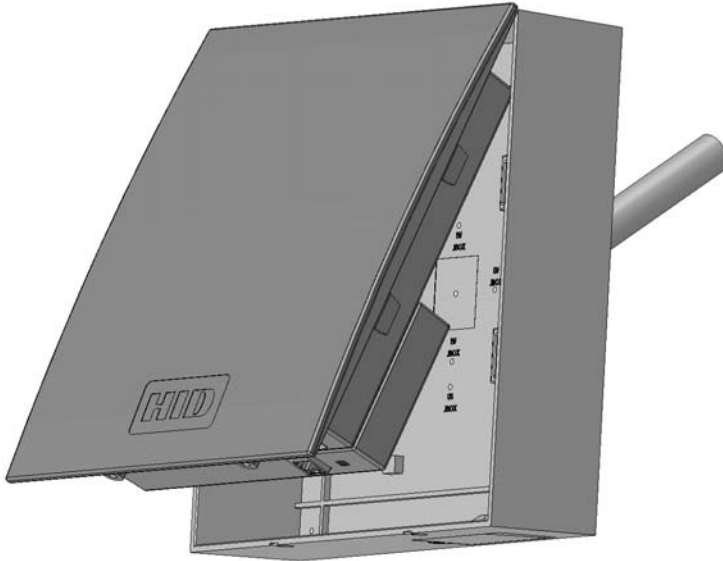
ATTENTION

Observe precautions for handling
ELECTROSTATIC SENSITIVE DEVICES

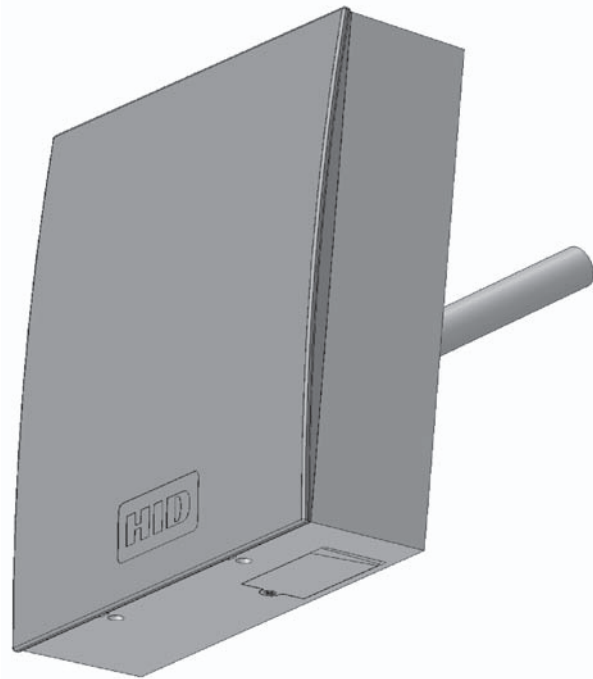
Terminal	Description	Terminal	Description	Terminal	Description
P1-1	Beeper Input (BEEP)	P2-1	GPIO4 (RS485-Y / TXA)	P3-1	Functional Earth Ground (symbol)
P1-2	LED Input (GRN)	P2-2	GPIO3 (RS485-Z / TXB)	P3-2	Normally Closed (NC) - Relay 1
P1-3	Ground (GND)	P2-3	**Wiegand Data 0 / Data (DATA0/DATA)	P3-3	Common (COM) - Relay 1
P1-4	+VDC	P2-4	**Wiegand Data 1 / Clock (DATA1/CLK)	P3-4	Normally Open (NO) - Relay 1
P1-5	Unused (DRAIN)	P2-5	*Open Collector Output / Tamper (OC/TMPR)	P3-5	Normally Closed (NC) - Relay 2
P1-6	LED Input (RED)	P2-6	GPIO2 (RS232-R / RS485-RXB)	P3-6	Common (COM) - Relay 2
P1-7	Hold Input (HOLD)	P2-7	GPIO1 (RS232-T / RS485-RXA)	P3-7	Normally Open (NO) - Relay 2
* Tamper Output - When activated, output synchronizes to ground (default). ** Dependent upon reader configuration. See the HTOG for Wiegand and Clock-in-Data configurations. OSDP: GPIO1 and GPIO2 are RE-485 lines that carry OSDP messages. GPIO3 and GPIO4 are an auxiliary input and output respectively, which can be monitored/controlled via OSDP.				P3-8	Normally Closed (NC) - Relay 3
				P3-9	Common (COM) - Relay 3
				P3-10	Normally Open (NO) - Relay 3

3.4 Installing the Reader to the Backbox

1. Install the reader to the backbox. It is hinged on the top and should fit snugly at the bottom.
Note: The sides of the Reader will snap as the features align.



2. Use the 2 screws that were removed earlier to secure at the bottom of the assembled piece.



3.5 Initial Aiming

The Reeder should be aimed at a point in the center of the vehicle lane 6meters (20 feet) from the reader. This will result in approximately a 20° downward angle. This setting will work in most applications. Fine adjustments can be made during performance testing.

3.6 Installation Examples

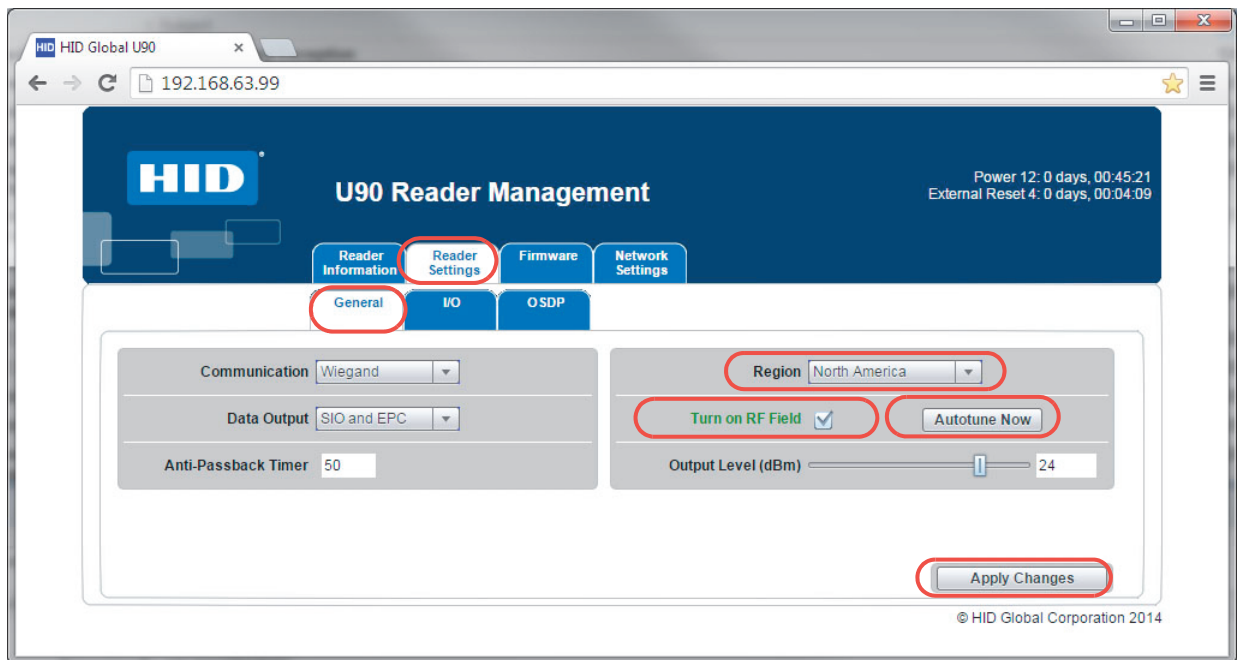
The following is an example of a U90 installation.



4 Setup and Testing of the Reader

Once the Physical installation is complete, the reader is powered up and connected to a laptop, and the U90 Reader Management GUI is displayed, then perform the following steps to configure the reader:

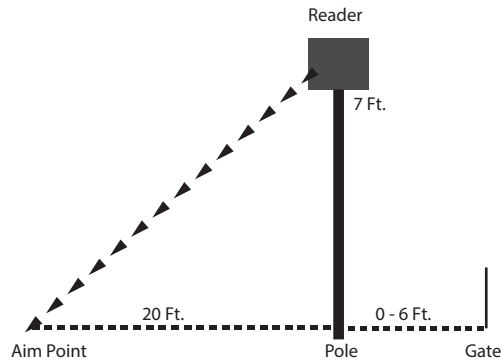
1. Enter the User password to access to the **Reader Settings** tab. See *Section 5: U90 Reader Management Configuration* for detailed information on the GUI configuration windows.
2. Select the **General** tab, and select the appropriate region from the **Region** drop-down list.
3. The system will accept the setting and bring you back to the login screen. Re-enter the User password.
4. Select the **Turn on RF Field** option.



5. Click **Autotune Now** to immediately run the autotune function.
Note: The diagnostic LED is Blue while reader is autotuning, and Red when complete.
6. Click **Apply Changes**.

The final setup of the reader installation area may take some custom setup for optimum performance. Since there are many installation configurations, a basic example will be used.

1. The reader must be installed and adjusted to an angle to properly read credentials located on the vehicles windshields.



2. Once the reader is properly angled, it must be tested. Initially, you could walk through the lane with a credential to perform an initial test. However, it is recommended to run a test with a car and a truck to verify that the credentials can be read at different heights to allow a range of vehicles to gain proper access to the site.

5 U90 Reader Management Configuration

The U90 Reader Management GUI is provided for configuration of the U90 Reader. The following is the instructions for this process.

5.1 Preparation

Before configuring the reader the following items are required.

- Laptop with an Ethernet connector
- Required files for configuration (firmware updates, configuration files) loaded on the laptop
- Ethernet cable for connection between laptop and Reader (adequate length to reach reader)

5.2 Configuration

1. The reader must be installed and powered up.
2. Connect an Ethernet cable from a laptop to the U90 reader (located on the bottom of the unit under the access door).
3. Enter the following IP address on a web browser: **192.168.63.99**.
4. The U90 Reader Management GUI will display.
5. Login to the U90 Reader Management application. See *Section 5.4: Login Window*.
6. Update the firmware if needed. See *Section 5.5: Update Firmware*.

5.3 General Information

As fields are modified, the color of the field name will change from Black to the following:

Green: Indicates the field has been modified to an acceptable level and has been implemented in the reader, however the change has been stored in temporary memory and will be lost if the reader is re-booted either through a power cycle or the **Reboot System** button on the Reader Information screen.

Red: Indicates that the field has been modified to a value that is out of range or not acceptable. No changes occur in the reader. The current saved value can be restored by any of the following methods: refreshing the browser window, rebooting the reader, or power cycling the reader.

Blue: Indicates that the value has not been accepted yet, or that the U90 Reader Management has lost communication with the reader. No changes will occur in the reader until the field turns **Green**.

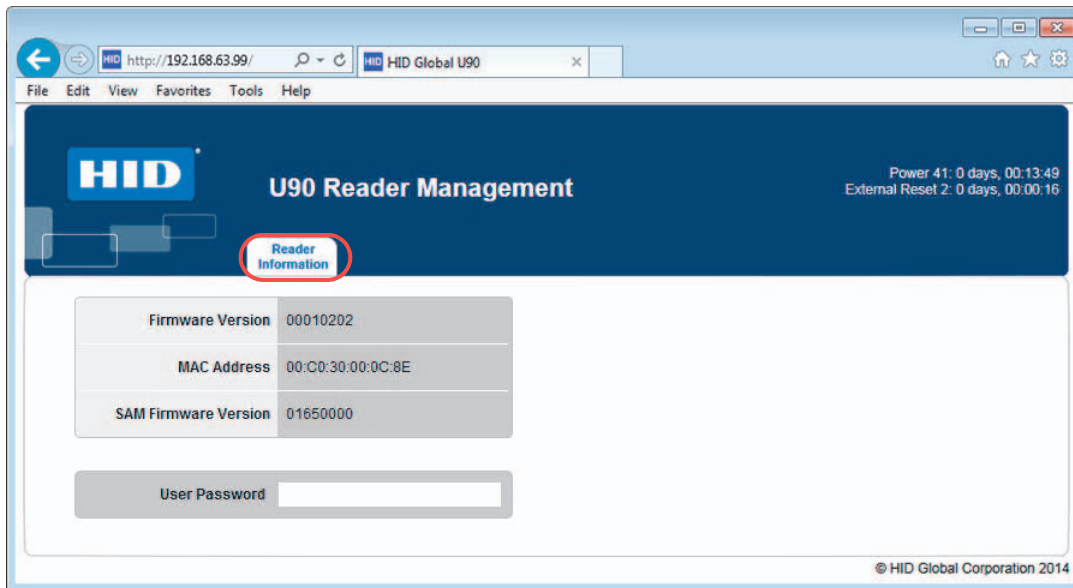
Notes:

- Always click Apply changes when configuration changes are made to store them in permanent memory. If Apply Changes is not clicked the changes will be lost during a reboot or power cycle.
- To restore settings to the values prior to the last Apply Changes, click Reboot System or power cycle the reader.
- Changing the Region setting will always cause the reader to reboot, all changes that have not been applied will be lost.
- A **Green** label will turn Black if the browser is refreshed. Changes can still be applied regardless of label color.

5.4 Login Window

The Login window allows the user to view the basic Reader Information and to log into the U90 Reader Management configuration GUI. Default login: **u90pwd**

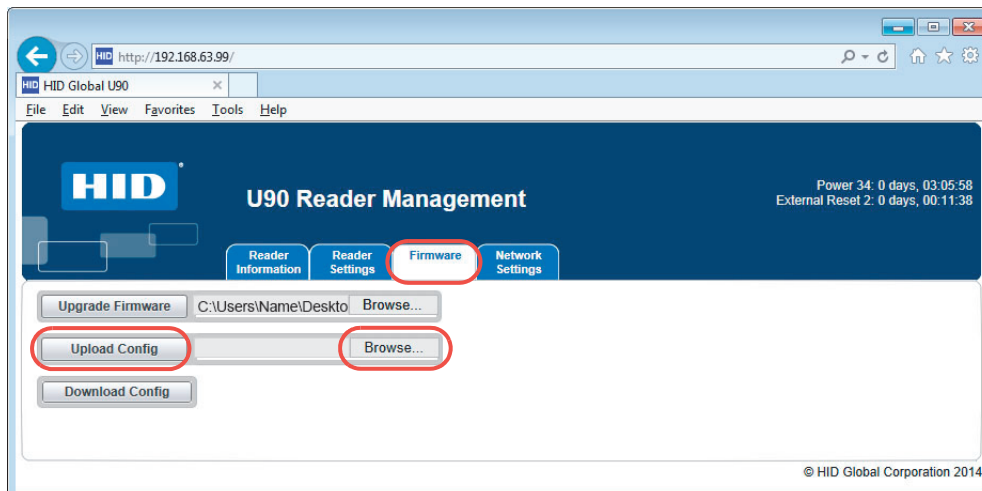
Note: This password should be changed as soon as possible for security reasons. See *Section 5.7: Reader Information Tab* for information on this process.



5.5 Update Firmware

To update the U90 firmware, use the following:

1. Select the **Firmware** tab.
2. Click **Browse** and locate the firmware file.
3. Click **Upgrade Firmware**.



4. The firmware will update, and the Login window will appear. Verify the Firmware Version displays the correct updated version. See *Section 5.6: Main Window*.

5.6 Main Window

The U90 Reader Management GUI consists of the following tabbed Sections:

Note: The following are links to the sections in this guide.

- **Reader Information Tab**
- **Reader Settings Tab**
 - **General Tab**
 - **I/O Tab**
 - **OSDP**
- **Firmware Tab**
- **Network Settings Tab**

HID Global U90 x

192.168.63.99

HID **U90 Reader Management**

Power 12: 0 days, 00:47:16
External Reset 4: 0 days, 00:06:04

Reader Information Reader Settings Firmware Network Settings

Firmware Version	00010209
MAC Address	00:C0:30:00:0C:A4
SAM Firmware Version	01650000

User Password

Region	North America
RF Field	On
Communication	SIO and EPC
Data Output	Wiegand
Output Level (dBm)	24

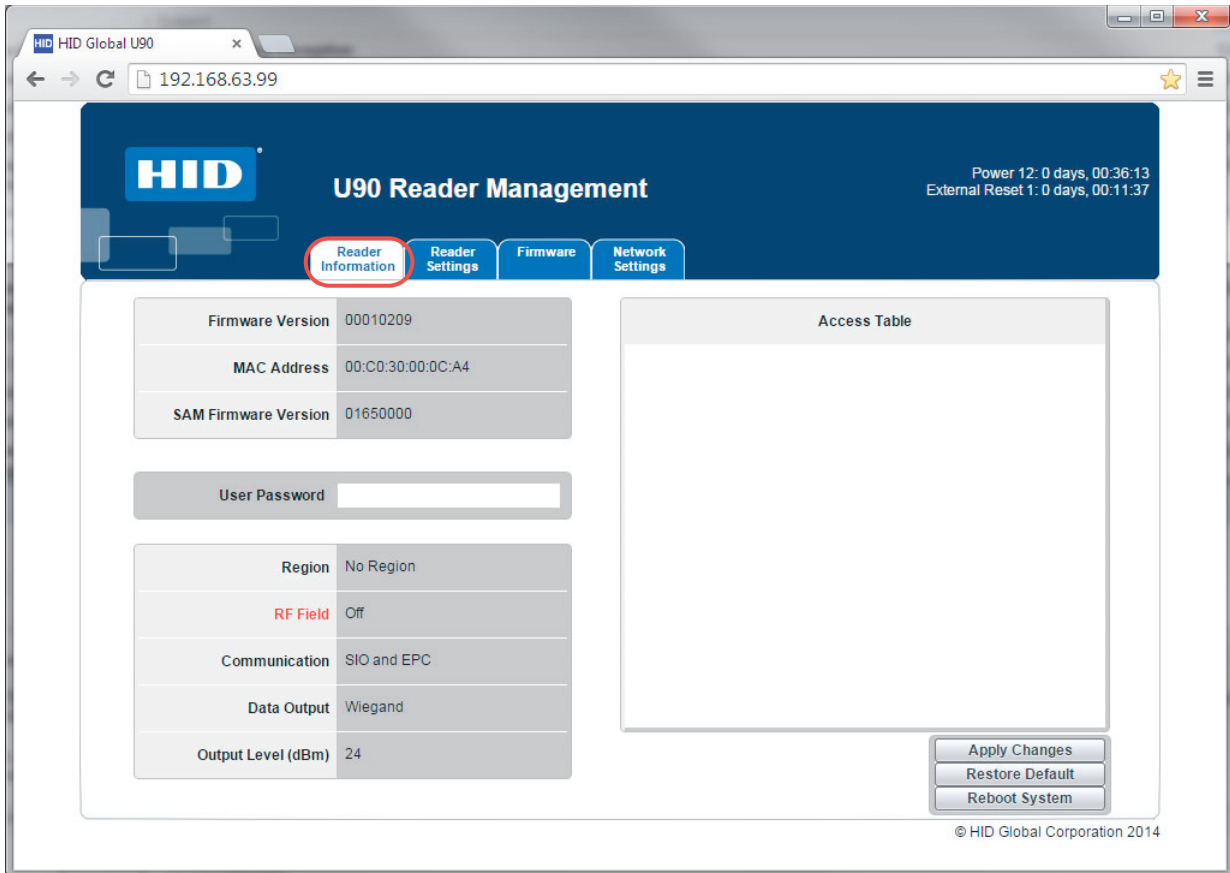
Access Table

Apply Changes
Restore Default
Reboot System

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5.7 Reader Information Tab

The Reader Information tab provides basic reader information such as firmware versions and a table of any tags within the readers field.



Field	Description
Firmware Version	Displays the current core firmware version running on this unit.
MAC Address	Displays the MAC address of this unit.
SAM Firmware Version	Displays the current Secure Application Module (SAM) firmware version.
User Password	This field allows the user to change the User Password. The user will enter the new password (twice).
Region	Displays the current setting for region.
RF Field	This field will display Red if RF Field is not off and Green if it is on. This options is required.
Communication	Sets the Host Output mode. <ul style="list-style-type: none"> • Wiegand (Default) • Clock & Data
Data Output	<ul style="list-style-type: none"> • SIO and EPC (Default) • SIO Only • EPC Only

Field	Description
Output Level (dBm)	Displays the current Output Level (dBm).
Access Table	Displays the access tags that have been read by the Reader. Tags will be removed from the table when the Grant Access APB time has expired on the specific tag.
Apply Changes	The Apply Changes button will apply any of the changes that have been made to the configuration (fields will be green) and save them to the configuration. Once saved the green fields should turn back to black.
Restore Default	The Restore Defaults button will restore all settings except for the Region to factory defaults. Note: This includes the User Password.
Reboot System	The Reboot System will initiate a soft reset of the U90 reader.

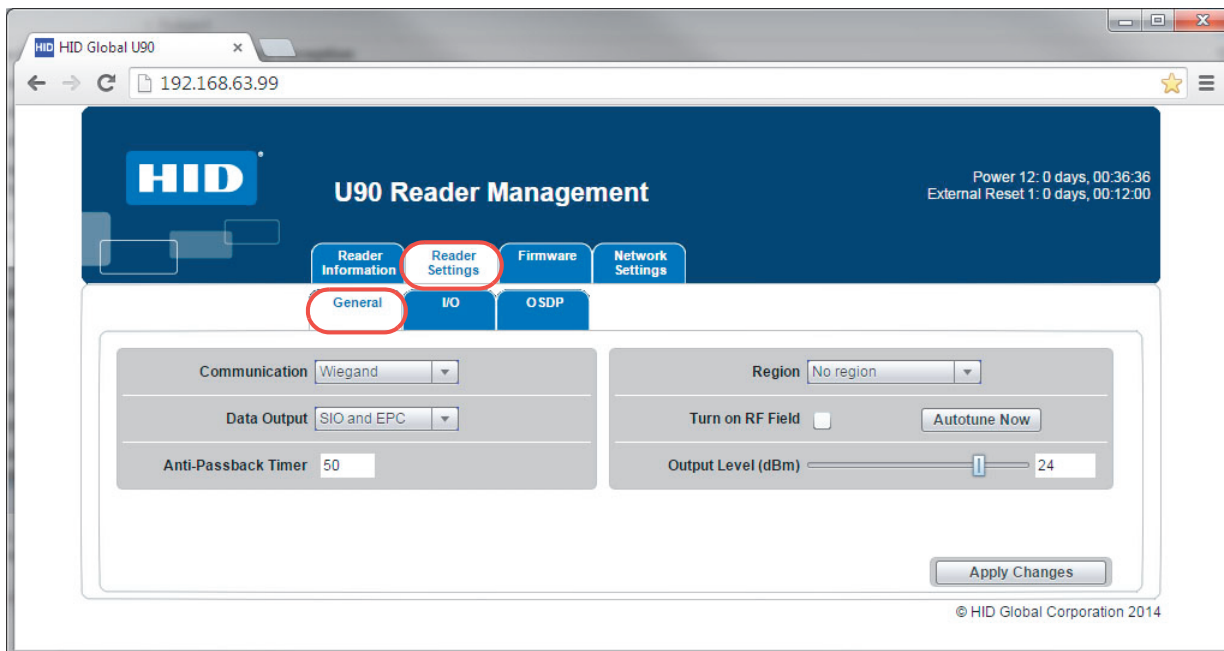
5.8 Reader Settings Tab

The Reader Settings tab provides all available settings for the configuration of the reader. The settings consist of configuration for communications, I/O, Region/Tuning, and OSDP.

Note: This tab has many sub tabs that will require configuration by the customer.

5.8.1 General Tab

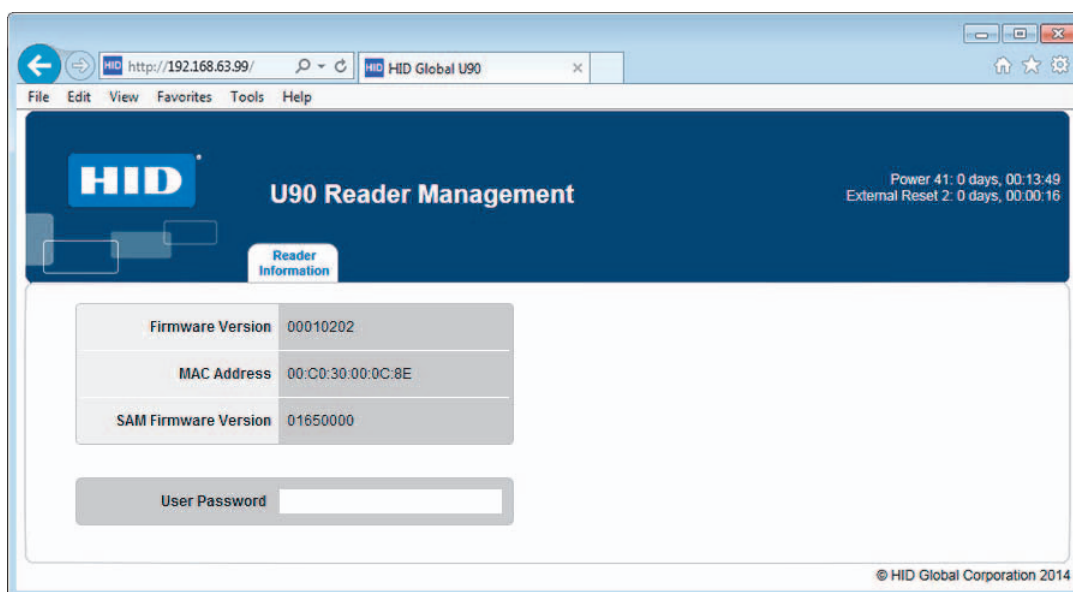
The General tab is configurable for either Wiegand or Clock and Data communication. This communication must meet the requirements of the PACS.



Field	Description
Communication	Sets the communication mode. <ul style="list-style-type: none"> • Wiegand (Default) • Clock & Data
Data Output	<ul style="list-style-type: none"> • SIO and EPC (Default) • SIO Only • EPC Only
Anti-Passback Timer	<p>Set the Anti-Passback for n polling. Range: 0-255. Default: 50.</p> <p>Note: The reader will only send data to the PACS once for the period of time that the tag is read plus the time defined in this field. A tag that leaves and re-enters the field while APB is still active will not be reported and will reset the timer to the defined value. All tags that have been read and are active in the APB timer will be displayed in the <i>Access Table</i> on the <i>Reader Information</i> tab.</p>

Field	Description
Region	<p>The region pull-down menu, has the following options: No region, Europe, USA, Brazil, India and China. Default is No region. Select the region that applies to the site location.</p> <p>Note: All changes that have not been saved (with <i>Apply Changes</i>) will be lost when the region is applied. If unsure of the appropriate region, please contact HID technical support. See <i>Section : The I/O tab is used for optional settings such as anti-tamper, external relays, and I'm alive signal.</i> for information on the countries supported in each Region.</p>
Turn on RF Field	<p>Select this option to enable RF.</p> <p>Note: The reader must have a region properly configured before the UHF field can be enabled.</p>
Autotune Now	<p>This option will immediately run the autotune function. The diagnostic LED is blue while Reader is Autotuning, and Red when Complete.</p> <p>Note: UHF Autotune Enable must be selected to use this option.</p>
Output Level (dBm)	<p>Set the output level (the customer will need to set/adjust this field). Range: 2 - 30 by 2dBm steps. Default: 24. Note: 30 dBm = 1 watt</p> <p>Note: The output level is used to adjust the RF field strength. When setting the output level, it is recommended that the installer begins with 24dBm. An increase in power will increase the read range for a tag but also increase the possibility of inadvertent reads from trailing vehicles, vehicles passing through adjacent gates, or tag reflections. Installer must test these conditions and ensure proper function through output level.</p>
Apply Changes	<p>The Apply Changes button will apply any of the changes that have been made to the configuration (fields will be green) and save them to the configuration. Once saved the green fields should turn back to black.</p>

Once a region has been entered, the system will reset and the window will return to the home screen. The user will need to enter a password again to enter the application.



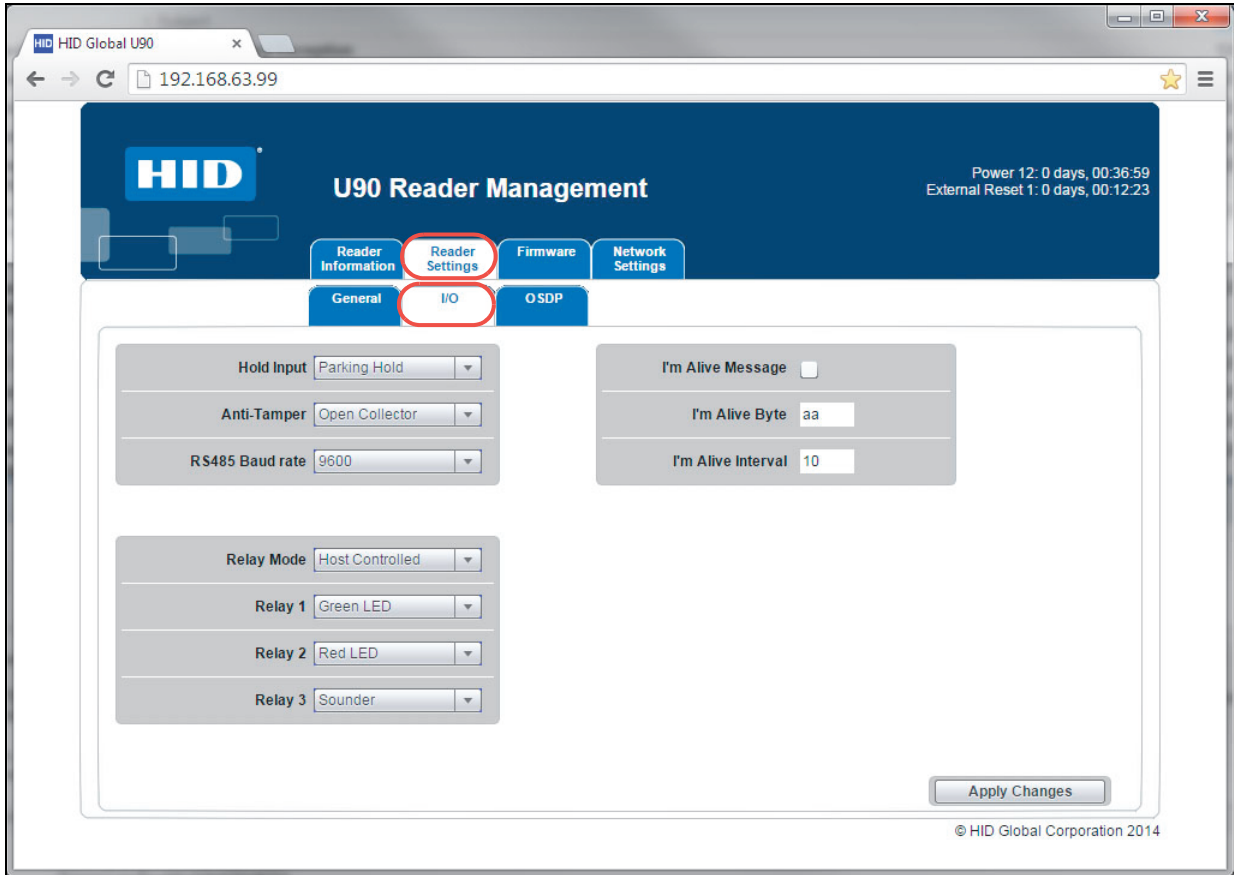
5.8.1.1 Region Groups

The following countries are supported by the U90. To set the region for the correct Country, select the Region for the associated Country from the drop-down menu.

Country	Region
Austria	Europe
Belgium	Europe
Brazil	Brazil
Bulgaria	Europe
Canada	North America
China	China
Croatia	Europe
Cyprus	Europe
Czech Republic	Europe
Denmark	Europe
Estonia	Europe
Finland	Europe
France	Europe
Germany	Europe
Greece	Europe
Hungary	Europe
India	India
Ireland	Europe
Italy	Europe
Latvia	Europe
Lithuania	Europe
Luxembourg	Europe
Malta	Europe
Mexico	North America
Netherlands	Europe
Poland	Europe
Portugal	Europe
Romania	Europe
Slovakia	Europe
Slovenia	Europe
Spain	Europe
Sweden	Europe
United Arab Emirates	United Arab Emirates
United Kingdom	Europe
United States	North America

5.8.2 I/O Tab

The I/O tab is used for optional settings such as anti-tamper, external relays, and I'm alive signal.

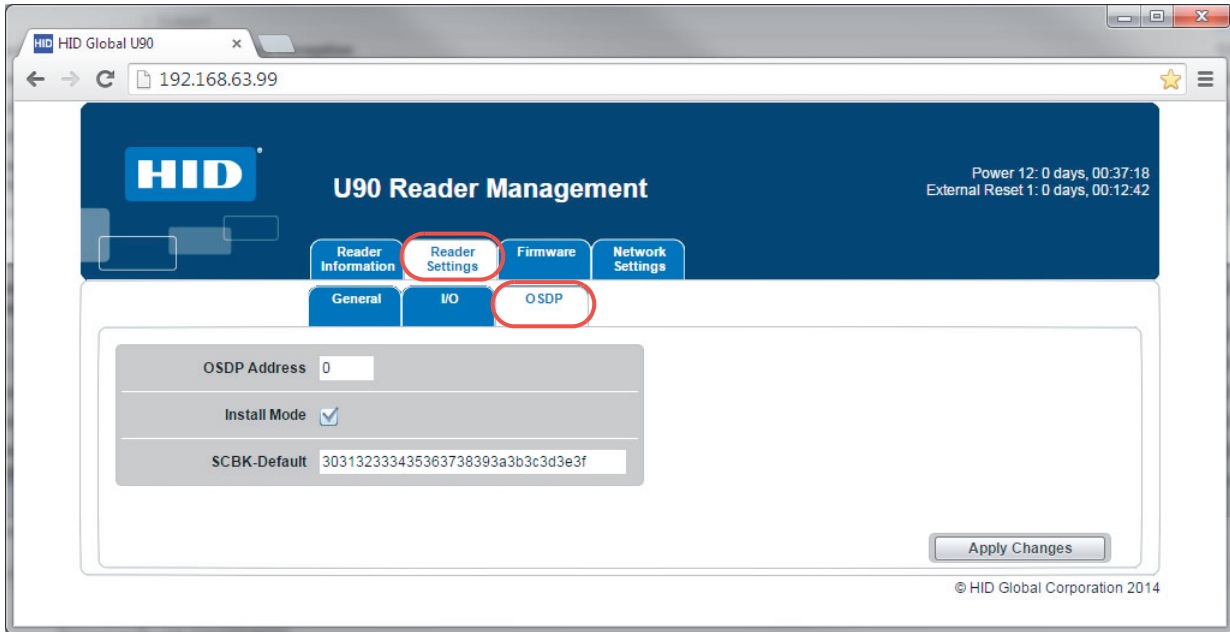


Field	Description
Hold Input	<p>The reader allows for a hold feature to be used. When hold is active, the reader will not report data.</p> <ul style="list-style-type: none"> • No Hold - Reader will continuously poll and report data per the Grant Access settings. • Parking Hold (Default) - Reader will not poll and therefore not report tag data unless the hold line is high (Released). • Wiegand Hold - Reader will continuously poll, but only report tag data over the communication lines when the hold line is high (Released).
Anti-Tamper	<p>The selection of the following option, depends on how this device is used.</p> <ul style="list-style-type: none"> • No Tamper • Open Collector (Default) • OSDP Message • Invert "I'm Alive"

Field	Description
RS485 Baud Rate	Set this field based on the panel requirements. <ul style="list-style-type: none"> • 9600 (Default) • 19200 • 38400 • 57600 • 115200
Relay Mode	There are three (3) relays used for visual and audible indicators. <ul style="list-style-type: none"> • Reader Controlled - The relays will trigger based on the readers output. • Host Controlled - The relays will trigger based on the input lines from the PACS. The relays can perform any function related to audio or visual indicators. The terminal and drop-down labels represent typical use cases. Important: The relays must not be used for access control.
Relay (1, 2 and 3)	Sets the LED indicators for each of the relays. Customer will set as needed. <ul style="list-style-type: none"> • None - Relay will not trigger. • Green LED - The relay will either trigger on an input on the GRN terminal pin (Host Controlled), or when the diagnostic LED is green (Reader Controlled), indicating an SIO has been read. • Red LED - The relay will either trigger on an input on the RED terminal pin (Host Controlled), or when the diagnostic LED is red (Reader Controlled). • Blue LED - The relay will trigger when the diagnostic LED is blue (Reader Controlled), indicating an EPC has been read. • Sounder - The relay will trigger on an input on the BEEP terminal (Host Controlled).
I'm Alive Message	Select this option to enable I'm alive messaging.
I'm Alive Byte	Default: aa.
I'm Alive Interval	I'm Alive interval in units of 100ms. Range: 0 - 65535. Default: 10.
Apply Changes	The Apply Changes button will apply any of the changes that have been made to the configuration (fields will be green) and save them to the configuration. Once saved the green fields should turn back to black.

5.8.3 OSDP

The OSDP tab allows the configuration of Open Supervised Device Protocol. See the SIA OSDP Specification, V2.1.6 for detailed information on OSDP.

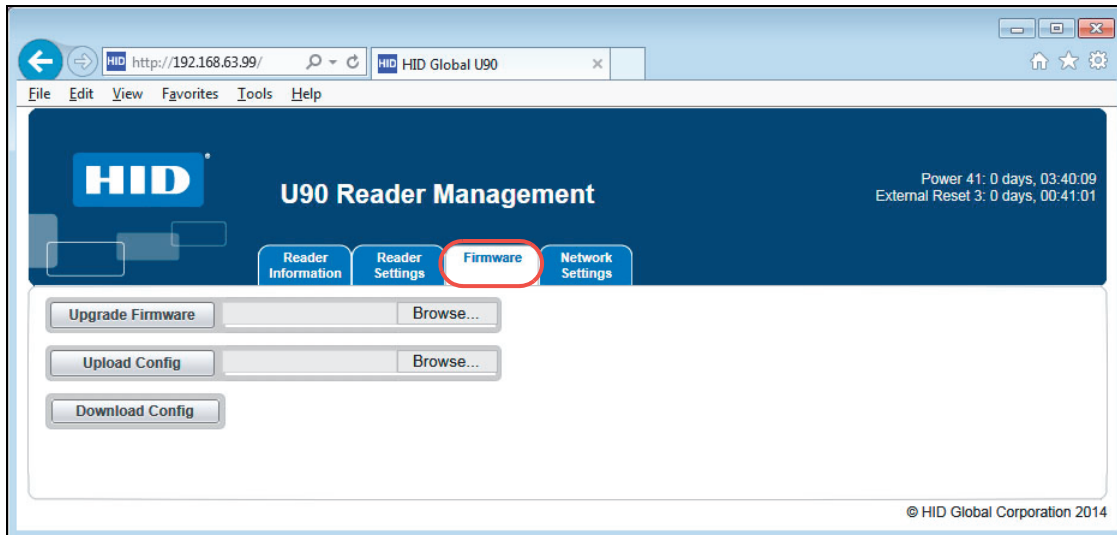


Note: The OSDP baud rate can be set using the baud rate field in the I/O tab. The baud rate can also be changed via an OSDP command.

Field	Description
OSDP Address	Sets the OSDP address. Range: 0 - 126. Default: 0. Note: This can also be changed via an OSDP command.
Install Mode	Enables and disables the Install Mode. Default: enabled (checked). When enabled the SCBK-Default option is available.
SCBK-Default	Secure Channel Base Key-Default. See SIA OSDP Specification, Appendix D. This field requires the Install Mode to be enabled. The SCBK-D can be used as a key to initiate a Secure Channel Session. Once a successful OSDP KEYSET command has been executed, the reader will disable the Install Mode , and the SCBK-D can no longer be used to initiate a Secure Channel Session. Note: Apart from manually enabling Install Mode again via the checkbox.
Apply Changes	The Apply Changes button will apply any of the changes that have been made to the configuration (fields will be green) and save them to the configuration. Once saved the green fields should turn back to black.

5.9 Firmware Tab

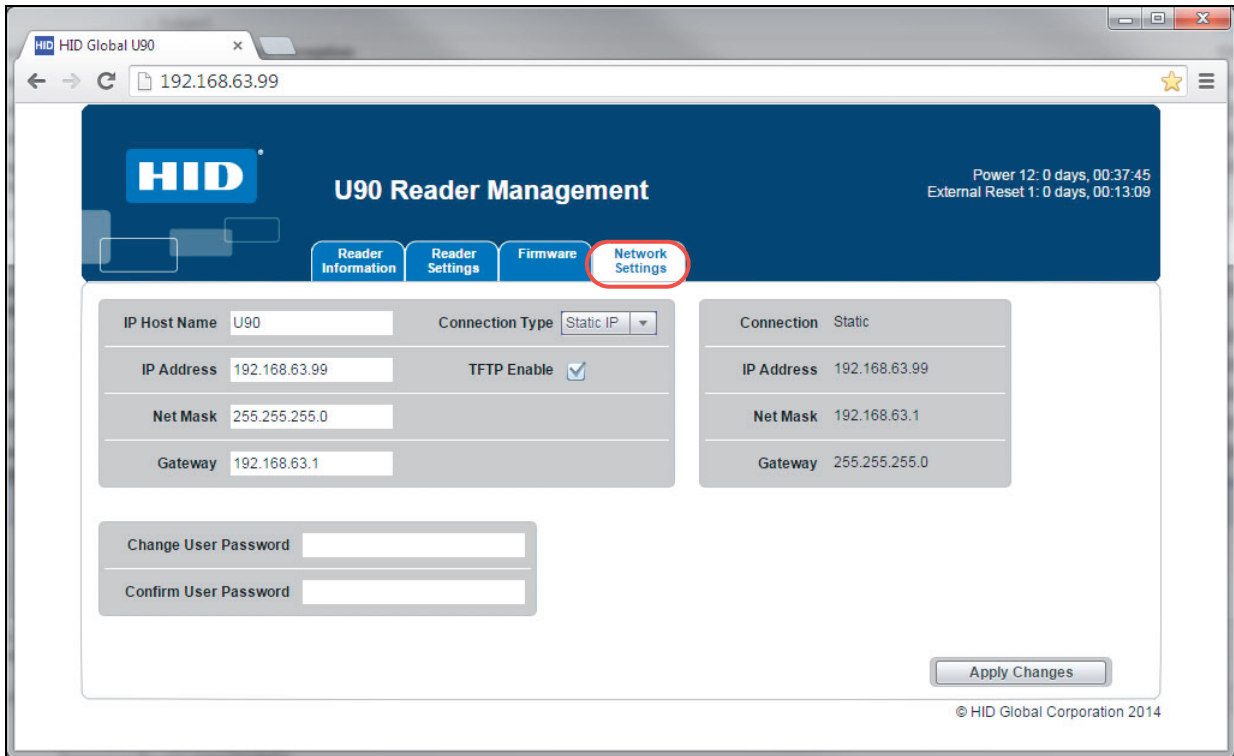
The Firmware tab provides the ability to update firmware and download or upload configuration files.



Field	Description
Upgrade Firmware	Click Browse to locate the upgrade firmware file. Click Upgrade Firmware to begin the upgrade process. See <i>Section 5.3: General Information</i> for detailed update information.
Upload Config	Click Browse to locate the upgrade config file. Click Upload Config to begin the upgrade process.
Download Config	Click Download Config to save the configuration file for this reader.

5.10 Network Settings Tab

The Network Settings tab provides the ability to adjust network settings for a specific installation.



The screenshot shows the HID U90 Reader Management web interface. The 'Network Settings' tab is selected and highlighted with a red circle. The interface displays the following configuration:

- IP Host Name:** U90
- Connection Type:** Static IP (dropdown menu)
- IP Address:** 192.168.63.99
- Net Mask:** 255.255.255.0
- Gateway:** 192.168.63.1
- TFTP Enable:** ☒
- Connection:** Static
- IP Address:** 192.168.63.99
- Net Mask:** 192.168.63.1
- Gateway:** 255.255.255.0
- Change User Password:** [Input field]
- Confirm User Password:** [Input field]
- Apply Changes:** [Button]

Additional information displayed includes: Power 12: 0 days, 00:37:45 and External Reset 1: 0 days, 00:13:09. The footer indicates © HID Global Corporation 2014.

Field	Description
IP Host Name	Host name for use with multicast DNS (local) and DHCP Client. Default U90.
Connection Type	Enable the DHCP Client to receive an IP address from an external DHCP Server for the U90, or manually set the Static IP.
IP Address	IP address of the reader, used if DHCP is not enabled.
TFTP Enabled	Enables/disables the TFTP server for firmware and configuration.
IP Address	Displays the current IP address.
Net Mask	Net Mask of the reader, used if DHCP is not enabled.
Gateway	Default Gateway for the reader, used if the DHCP is not enabled.
Connection	Displays the current connection type.
IP Address	IP address of the reader, used if DHCP is not enabled.
Net Mask	Displays the current Net Mask.
Gateway	Displays the current Gateway address.
Change User Password	Enter new password for the device.

Field	Description
Confirm User Password	Confirm the new password for the device.
Apply Changes	The Apply Changes button will apply any of the changes that have been made to the configuration (fields will be green) and save them to the configuration. Once saved the green fields should turn back to black.

5.10.1 To Change the Password

1. Select the **Network Settings** tab.
2. Enter a new password in the **Change User Password** field.
3. Re-enter the new password in the **Confirm User Password** field.
4. Click **Apply Changes**.
5. Test the new password, by clicking the **Reboot System**. Log into the reader with the new password.

Note: If the password has been lost, see *Section 6: Restore Default Settings* for instructions to reset the password to the default setting.

6 Restore Default Settings

The following two procedures are the same, except for placing the jumpers on different pins. The graphic below shows the pins for resetting the user name and password for the U90 Reader Management GUI.

To restore the network setting to default:

1. Remove power from the reader.
2. Place the jumper between pins P1-5 (**OC/TMPR**) and P1-2 (**GRN**).
3. Restore power to reader.
4. Remove jumper.

To reset the password for access to the U90 Reader Management GUI:

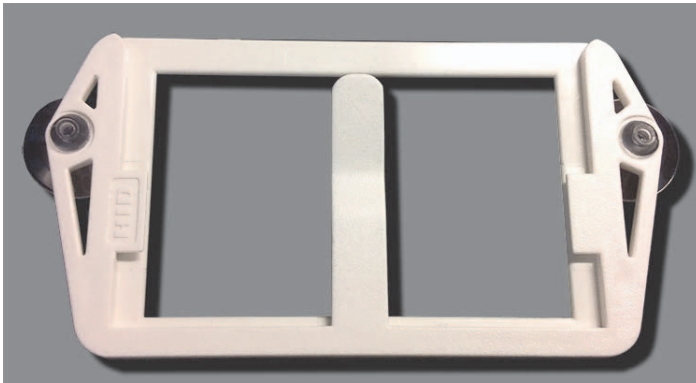
1. Remove power from the reader.
2. Place the jumper between pins P1-5 (**OC/TMPR**) and P1-6 (**RED**).
3. Restore power to reader.
4. Remove jumper.



7 Credential Location

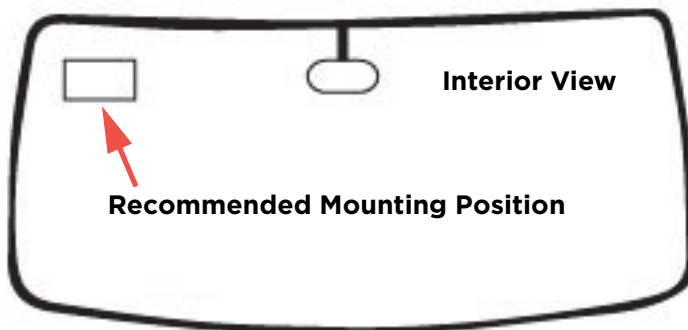
The Windshield Card Mount is a simple card carrier designed to attach on the inside of a vehicle windshield and hold a UHF card in a fixed position, that can be easily read by a UHF reader at a vehicle gate.

The following information covers the installation of a card mount.



7.1 Installation

1. Select a location on the windshield.
Note: Place the Mount in the windshield location as seen in the graphic below, with a minimum of 2 inches from the edge of the windshield.



2. Clean and dry the windshield before installation.
3. Press the suction cups firmly against the windshield so a vacuum seal is formed.
4. Slide the card into the mount.

Special Note:

Tinted Windshields: Some vehicles have a conductive tinted area across the top of the windshield that may interfere with reading the access card. If your windshield has this tint, you must install the credential holder at least 2 inches below the tinted area. Nonconductive tint does not affect performance.

See the vehicle Owner's Manual for guidelines for label and sticker placement on the windshield.

Sun Screens: A reflective windshield sun shade, should not be used when the credential is in the card holder. The heat generated between the sun shade and the window can damage the credential.

8 Troubleshooting

Item	Symptom	Cause	Solution
Cards	No Card Read	Reader is not able to read the card.	<ul style="list-style-type: none"> • Turn on RF field checkbox • Wrong keys on reader • Power on with sufficient power. Is diagnostic LED on? Does power supply have correct output level? • The card is the incorrect technology
	Dual Card Read	Reader is set to SIO and EPC	Change the configuration to either SIO or EPC.
Diagnostic LED	No RED light	Reader does not have power	Measure voltage on +VDC terminal, must be between 12 and 24VDC
		Firmware has been corrupted	Reader needs to be re-flashed (e.g. with SAMBA)
	Continuous RED light even when card is presented.	RF field is deactivated	Connect to reader through Ethernet port and navigate to the READER SETTINGS tab and then REGION / TUNING subtab. Ensure ENABLE UHF box is checked.
		No region is configured	Connect to reader through Ethernet port and navigate to the READER SETTINGS tab and then REGION / TUNING subtab. Ensure the correct Region is configured.
		Power supply is current-limiting	Make sure the power supply can source at least 2A.
		Reader is not properly tuned	Refer to section
		Card has already been read and is in Anti-Passback	Remove card from RF field for the duration of the Anti-Passback setting and re-present. A card that is in Anti-Passback will be shown in the ACCESS Table on the READER INFORMATION screen after applying the reader's password. The ACCESS TABLE will only display the credentials Public EPC value.
	Diagnostic LED only flashes BLUE when a credential is presented	Reader is configured to only read the EPC	Connect to reader through Ethernet port and navigate to the READER SETTINGS tab and then Comms subtab. Ensure the 'Data Output' box shows that SIO is selected.
		The credential is not a Genuine HID credential with an SIO	Obtain correct credential by contacting HID customer service at 303-404-6700
	The Diagnostic LED only flashes GREEN when a credential is presented	Reader is configured to only read the SIO	Connect to reader through Ethernet port and navigate to the READER SETTINGS tab and then Comms subtab. Ensure the 'Data Output' box shows that EPC is selected.
	Continuous BLUE light	Reader is Autotuning	Wait for Autotune to finish. Typically, this only takes a couple minutes or less, but it may take as long as 20 minutes. Upon completion, the light will turn back to Red.

Item	Symptom	Cause	Solution
Read Range Performance	Read range too low	Credential is in the wrong orientation	
		Approach speed too fast	Slow down approach
		Line of sight is obstructed.	Make sure you don't hold your hand in front of the credential.
		Credential location may need adjustment for different vehicle types	Adjust credential location in the windshield a few centimeters left/right and/or up/down.
		Reader output power too low	Turn up output level
		Reader not properly tuned	Re-run the autotuner. Make sure nothing is near the face of the reader for the duration of the autotune.
		Reader not properly mounted	Re-run the autotuner. Make sure nothing is near the face of the reader for the duration of the autotune.
		Fingers covering credential antenna	If holding credential, hold on edges.
		Environment conditions are adversely affecting performance	Turn up output level
	Read range too high. Reader is reading credential from vehicle not at the gate, including adjacent lanes.	Output level too high	Turn down output level
Graphic User Interface (GUI)	Computer will not connect to reader	Computer has not established a connection with the reader	Allow 60 seconds to pass after reader is powered up and Ethernet cable is connected directly between the PC to the reader.
		IP address is incorrect	For a direct connection, make sure the IP address is 192.168.63.99.
		Computer network and reader are not in the same range.	Ensure computer network adapter IP settings are in the same range as reader (i.e. 192.168.63.xx).
	Changes in the GUI are lost	Changes are not applied prior to disconnecting or resetting the reader	Connect to reader through Ethernet port and navigate to the READER SETTINGS tab and then Comms subtab. elect the ApplyChanges.
	Session is terminated and password must be re-entered	The region for operation has been changed and the reader has reset	This is normal operation, Re-enter Password
		The session has timed out	This is normal operation, Re-enter Password
Communication	Control panel not acknowledging Wiegand data stream	The Wiegand PULSE WIDTH and PULSE SPACE is not appropriate for the panel in use.	Refer to the Panel manufacturer for proper settings and enter correct settings in the GUI.
	Control panel not acknowledging Wiegand data stream or intermittent acknowledgments.	The Wiegand voltage levels at the panel are not correct.	Supply reader power from the panel (not an independent supply) so that the Wiegand lines at the reader and the panel have the same ground reference.
Relays	Not working	Relay Mode configuration incorrect	Make sure Relay Mode is set for Reader Controlled, if desired performance is to map the relay functionality to the Diagnostic LED. Make sure Relay Mode is set for Host Controlled, if desired performance is to control the relays via the input control lines.

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