impro technologies®

MDR-SE

Multi-Discipline Readers with HID SEOS™

USER GUIDE

SPECIFICATIONS

CSN Read Capability..... Slim Tags, Omega Tags, Philips HITAG™ 1, Philips HITAG™ 2, HID Tags (H10301, H10302 and H10304), ISO 15693-2 iClass Tags and ISO 14443A MIFARE® Tags.

HRW910 ..... Wiegand connections
HRW911 ..... OSDP connections

NOTE: HID and MIFARE® are registered trademarks of HID Global Corporation (an ASSA ABLOY Group Brand and Koninklijke Phillips Electronics N.V. respectively.

Working Environment Designed to work in an indoor or outdoor environment similar to IP54. These models are, therefore, sealed (conformal coated) against water.

Installation Please consult the instructions under Installation Information, on page 3.

Input Voltage Rating ..... 8 V DC to 14 V DC, polarity sensitive.

NOTE: If the Multi-discipline Reader's Input Voltage rises or falls outside that specified above; the Reader emits a continuous beep sound. The beep sound consists of a 1-second beep followed by a 1-second interbeep pause.

Power Requirements	**Current (mA)**	**Power (W)**
Supply Voltage 12 V DC all Indicators on	145	1.74

Wiegand Bus

Electrical Interface	'0' and '1' Data streams.
Data Format	Tag information: 26-bit or 44-bit – or PACS dependent

Inputs

Quantity	4.
Type	Dry Contact.
Function	Operation of the Buzzer, LED (Red/Green) and Scanner Inhibit.
Protection Range	+15 V Continuous.

Buzzer ..... 4 kHz piezo-electric single volume, single tone.

Status Indicators

Status LED	Tri-coloured Red, Green or Amber (Default) (externally visible).

Optical Anti-tamper
(Labelled "AT")

Open Collector Output on Purple Line.
GND reference on Grey Line.

NOTE: In OEM applications, connect the Purple and Grey wires to a Dry Contact Input. In Access Portal Systems (connecting to a Wiegand Reader Module clustered with a Cluster Controller Module), and Impro iTRT) it is unnecessary to connect these lines as the Software handles the Anti-tamper.

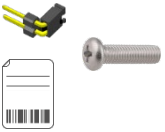
INSTALLATION INFORMATION

Accessories

Find the following when unpacking the MDR-SE Reader:

- Either an MDR-SE Wiegand (HRW910-5-8-GB-XX) or an MDR-SE OSDP (HRW911-5-8-GB-XX) multi-discipline reader housed in ABS plastic. The reader consists of a front cover assembly and a backing plate.

- One 2-Way Programming plug.
- M3 x 8 mm Philips screw.
- An extra serial number label.



*A special tool for the "Snake Eye" screw is available from Impro Technologies (item number **EQM-00608**).*

General

Remember the following when installing the MDR-SE Readers:

Maximum Data Communications Distance

HRW910 (Wiegand)

Install the Reader no further than 150 m (164 yd) from the Host unit. The cable individual conductor may be AWG 20 to AWG 22 cross-sectional area should not be less than 0.644 mm^2 (0.0253 in^2).

HRW911 (OSDP)

Install the Reader no further than 1.22 Km (1 335 yd) using four (4) conductor shielded twisted pair that is TIA-485 compliant.

NOTE: You can expect a drop in read range on 13.56 MHz Tags if noise exists on the Reader's input supply. The following good wiring practices lessen noise introduction:

Use a well shielded cable with a drain wire, ensure connection of the drain wire to a clean Earth point. Also, install cables away from high voltage cabling and other noise (that is wireless equipment, machinery and so on) sources.

Distance between readers

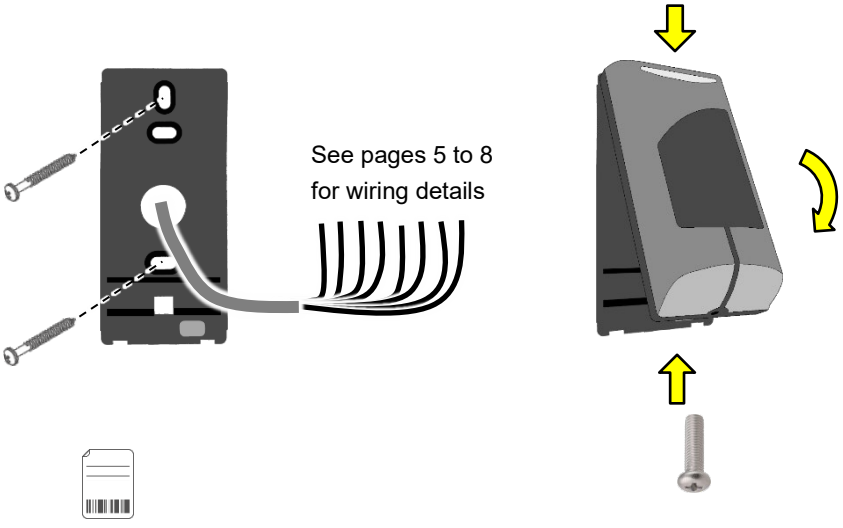
To avoid mutual interference, install the readers no closer than 500 mm (20 in) apart. Expect a drop in Tag read range where you install readers back-to-back (that is on either side of a wall).

Mounting the Readers

CAUTION: Make certain that you mount the Readers on a vibration-free surface.

CAUTION: You may install Readers in an open environment. To do this, apply a slanted bead of general-purpose, black, silicone-based sealant between the mounting surface and the Backing Plate, above the cable entry point. An open environment refers to any environment affected by elements like rain or water.

1. Select the mounting position of the Readers, considering accessibility, routing of wires and visibility of the externally visible LED.
2. Secure the plastic mounting plate to the mounting surface, using suitable screws and wall plugs, nuts and bolts or rivets.
3. Pass the reader cable through the hole in the centre of the backing plate and wire up the terminal block as per the applicable diagram (pages 5 to 8).
4. After wiring the MDR-SE reader terminals, hook the reader housing onto the top of the plastic mounting plate, lower the reader onto the plate and secure in in place with one of the two screws provided.



5. Remember to apply the spare serial number label to the site map, or the Quick Start Guide, as the reader's type, address and location will be needed when configuring the access control software.

WIRING THE MDR-SE READERS

Wiring the HRW911 (OSDP) to the Impro OSDP Reader Module

The two reader terminal channels on the OSDP module may be independently configured for different readers.

For the HRW911, set the DIP Switches to 000010 – as shown below.

Wire pin for pin, as the terminals are labelled. (AT is not used).

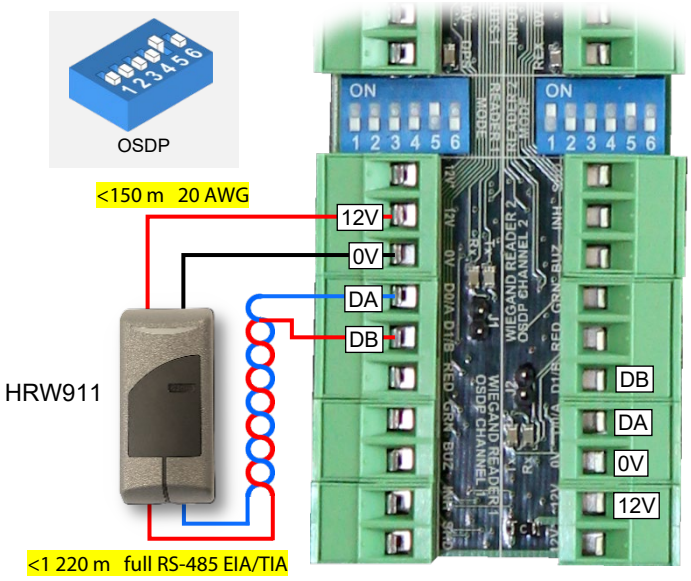


Figure 1: Connecting an HWR911 to the Impro OSDP Reader Module

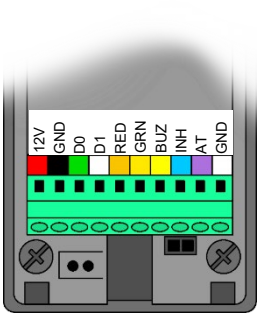
All the reader's functions are communicated via OSDP to the Impro OSDP Reader module – no additional wiring is necessary.

Wiring the HRW910 (Wiegand) to the Impro OSDP Reader Module

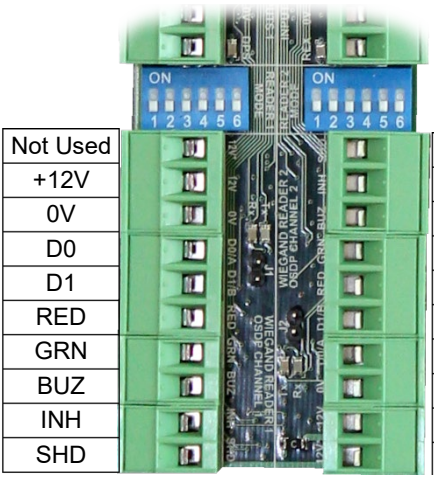
For the HRW910, set the DIP Switches to 000000 – as shown below.

Wiegand Reader cable length may be up to 150 m, cross-sectional area should not be less than 0.644 mm^2.

Wire pin-for pin, as they are labelled, don't use the 12V* or AT terminals



HRW910



Not Used	SHD
+12V	INH
0V	BUZ
D0	GRN
D1	RED
RED	D1
GRN	D0
BUZ	0V
INH	+12V
SHD	Not Used

Use the Impro Wiegand Multi-Discipline Reader Mode
(All switches OFF)

Figure 2: Connecting the HRW910 to the Impro OSDP Reader Module

Connecting to the Impro Wiegand Reader Module

Set the DIP Switches to 0000 – as shown below.

Wiegand Reader cable length may be up to 150 m, cross-sectional area should not be less than 0.644 mm^2.

Wire pin-for pin, as they are labelled, don't use the 5V or the AT terminals.

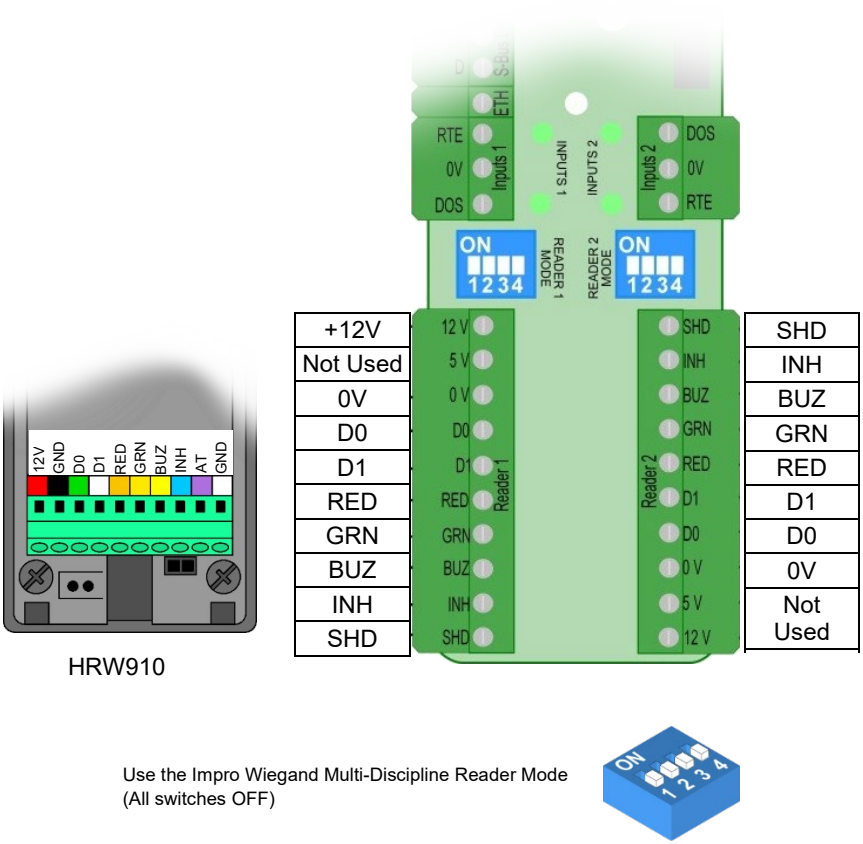


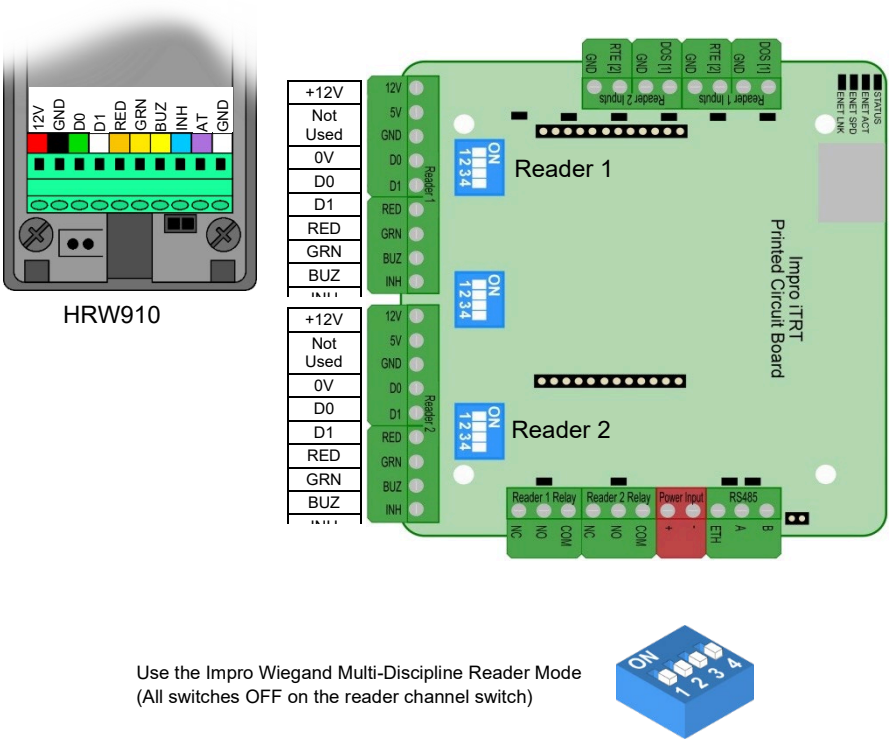
Figure 3: Connecting the HRW910 to the Impro Wiegand Reader Module

Connecting to the Impro iTRT

Set the DIP Switches to 0000 – as shown below.

Wiegand Reader cable length may be up to 150 m, cross-sectional area should not be less than 0.644 mm^2.

Wire pin-for pin, as they are labelled, don't use the 5V or AT terminals.



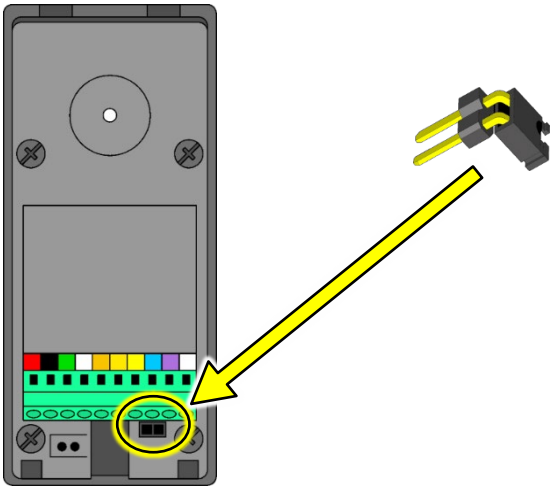
Use the Impro Wiegand Multi-Discipline Reader Mode
(All switches OFF on the reader channel switch)

Figure 4: Connecting the HRW910 to the Impro iTRT

SETTING THE OUTPUT MODE (OEM USE ONLY)

The Multi-discipline Readers offer different Output Mode Combinations. Select the Output Mode by doing the following:

1. With the power disconnected, locate, and bridge the pair of sockets on the back of the reader using the included 2-Way Programming Jumper.



2. For the HRW910, power up the unit with the programming jumper plugged in and listen for the beeps, the number of beeps indicates the selected Output Mode. Remove the Programming Jumper as soon as the required mode is indicated:

- 1 Beep, Mode 1: Reserved
- 2 Beeps, Mode 2: 44-bit, HID Normal (Default Mode).
- 3 Beeps, Mode 3: 26-bit
- 4 Beeps, Mode 4: Reserved
- 5 Beeps, Mode 5: LF Tags Only
- 6 Beeps, Mode 6: HF Tags Only
- 7 Beeps, Mode 7: LF & HF Tags
- 8 Beeps, Mode 8: Reserved
- 9 Beeps, Mode 9: Reserved
- 10 Beeps, Mode 10: Restore Factory Defaults

NOTE: *The 26-bit and the 44-bit refer to the output format of EMM Tags. HID Tags output in either normal or 45-bit raw mode.*

If you remove the programming jumper after the beeps for a reserved mode, the reader mode will remain unchanged.

3. For the HRW911, power up the unit with the programming jumper plugged in and listen for the beeps, the number of beeps indicates the selected Output Mode. Remove the Programming Jumper as soon as the required mode is indicated:

- 1 Beep, Mode 1: Set OSDP Address = 0
- 2 Beeps, Mode 2: Set OSDP Address = 1
- 3 Beeps, Mode 3: Set BAUD Rate to 9600
- 4 Beeps, Mode 4: Set Baud Rate to 115200
- 5 Beeps, Mode 5: LF Tags Only
- 6 Beeps, Mode 6: HF Tags Only
- 7 Beeps, Mode 7: LF & HF Tags
- 8 Beeps, Mode 8: Reserved
- 9 Beeps, Mode 9: Reserved
- 10 Beeps, Mode 10: Restore Factory Defaults*

*Factory Default settings: Baud Rate = 115200, Address = 0.

NOTE: If you remove the programming jumper after the beeps for a reserved mode, the reader mode will remain unchanged.

4. Clip the Front Cover onto the Backing Plate, secure the reader with the locking screw.

Blank Space

About Wiegand Protocol (OEM info)

Wiegand 44-bit Protocol

Tags are reported using Wiegand 44-bit Protocol. An “EMM” Tag has an 8-bit User Code and a 32-bit Serial Number.

These are reported as follows:

- The 8-bit User Code is reported in bits 1 to 8 of the Protocol.
- The 32-bit Serial Number is reported in bits 9 to 40 of the Protocol.
- Bits 41 to 44 of the Protocol are the exclusive OR of the preceding 40 bits taken 4 at a time.

HID Raw

In this Mode, the entire raw 45-bit HID Tag is output.

Wiegand 26-bit Protocol

Key Codes are reported as a 24-bit code consisting of an 8-bit Facility (or Site) Code, and a 16-bit binary representation of the Key Code.

The following format is used:

- Bit 1 is the even parity over the first 13 bits.
- Bits 2 to 9 are the 8-bit Facility Code for Key Codes.
- Bits 10 to 25 are the 16-bit Key Code.
- Bit 26 is the odd parity over the last 13 bits.

HID Normal

The number of bits to output is determined from the information in the tag and will vary between tags. The 26-bit or 44-bit selection does not impact on HID Tags.

Blank Space

POWER-ON SELF-TEST

The Power-on Self-test tests the RAM and Flash Checksums.

If any parameter in the Self-test fails, the Multi-discipline Reader emits a continuous beep for 2 seconds.

When the Multi-discipline Reader passes the Self-test, it emits two short beeps, each 200 ms in duration, separated by a 200 ms inter-beep pause.

When the Multi-discipline Reader is connected, check that the Status LED is illuminated Red (steady). This will confirm that the connection is correct and working.

Serial Number Label

1. Once the Multi-discipline Reader is installed, sketch a rough site plan – or make use of the spaces provided on the Quick Start Guides for the Reader or terminal/controller – and name the door served by this reader.
2. Attach the Multi-discipline Reader's loose Serial Number Label and the Terminal or Controller's Fixed Address Label, to the sketched site plan in the position of the Multi-discipline Reader.

The Multi-discipline Reader does not have its own Fixed Address. When connected to a Terminal or Controller (like the Impro OSDP Reader Module) the Multi-discipline Reader is assigned one of the available Fixed Addresses.

The Serial Number Label identifies the type of Multi-discipline Reader, and the Fixed Address Label (shipped with the Terminal or Controller) identifies the Fixed Addresses. Both these labels should be attached to the site plan to assist in identifying the hardware once an Auto-ID is performed.

GUARANTEE OR WARRANTY

This product conforms to our Guarantee or Warranty details placed on our Web Site, to read further please go to www.impro.net.

Waste electrical products should not be disposed of with household/office waste. Please recycle where facilities exist. Check with your Local Authority or retailer for recycling advice.

This manual is applicable to the Impro MDR-SE Readers:
HRW910-5-8-GB-XX, HRW911-5-8-GB-XX

(The last two digits of the Impro stock code indicate the issue status of the product.)