



WIEGAND READERS

Wiegand 125 kHz Passive Proximity Readers INSTALLATION MANUAL

SPECIFICATIONS

Read Capability..... Slim Tags, Omega Tags
and HID 125 kHz Tags.

*NOTE: HID is a registered trademark of
HID Global Corporation (an ASSA
ABLOY Group Brand).*

Working Environment

WPR900 and WPK900 Designed to work in indoor or outdoor
environments similar to IP53.

WKM900 Designed to work in an indoor or protected
outdoor environment similar to IP42.

WDP900 The IP rating for this Wiegand Reader is
dependant on the user supplied housing. The
rating of the Reader on its own is similar to
IP35.

*NOTE: Certain plastic Readers (WPR900,
WPK900, WKM900 and WDP900)
are RoHS compliant and do not
contain any UV stabilizer.*

WMR900 / HRN920 and
WMK900 / HRK920 Designed to work in harsh (industrial) indoor or
outdoor environments similar to IP53.

WJB900 Designed to work in an indoor or protected
outdoor environment similar to IP54.

Input Voltage Rating..... 5 V DC to 16 V DC, polarity sensitive.

Power Requirements

	Current (mA)	Power (W)
Supply Voltage 5 V DC all Indicators on.....	50	0.25
Supply Voltage 12 V DC all Indicators on.....	50	0.60

Wiegand Bus

Electrical Interface.....	'0' and '1' Data streams.
Data Format.....	Tag information: 44-bit or 26-bit Wiegand. Key information: 26-bit Wiegand only.

Inputs

Quantity.....	4.
Type.....	Dry Contact.
Function.....	Operation of the Buzzer, LED and Scanner Inhibit.

Optical Anti-tamper (WJB900 Only)

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. On Impro Systems, it is unnecessary to connect these lines as the Software handles the Anti-tamper.

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

Status Indicators

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

WPK900, WMK900 /HRK920 and WKM900 models only

Keypad

WPK900 and
WMK900/ HRK920 12 Alphanumeric keys.

WKM900 12 Numeric keys and 1 Bell Button.

PIN-codes 5 Digit codes in the range 00000 to 65535.
4 Digit codes in the range 0000# to 9999#.

Blank Space

INSTALLATION INFORMATION

Accessories

Find the following when unpacking the Wiegand Reader:

WPR900 and WPK900

- Either a Wiegand Plastic Non-keypad Reader (WPR900-1-0-GB-XX) housed in a dark grey, ABS plastic housing. The Wiegand Reader consists of a Front Cover and a Backing Plate (the Backing Plate is attached with a Self-tapping Screw (M3 x 8 mm)).
- Or a Wiegand Plastic Keypad Reader (WPK900-1-0-GB-XX) housed in a dark grey, ABS plastic housing. The Wiegand Reader consists of a Front Cover and a Backing Plate (the Backing Plate is attached with a Self-tapping Screw (M3 x 8 mm)).
- One 2-Way Programming Pin.
- An extra Serial Number Label.

WMR900 / HRN920 and WMK900 / HRK920

- Either A Wiegand Metal Non-Keypad Reader (WMR900-1-0-GB-XX / HRN920-1-0-GB-XX) housed in a Zinc alloy die-cast housing. The Wiegand Reader consists of a Front Cover and a Backing Plate (the Backing Plate is attached with an M8 x 8 mm screw).
- Or a Wiegand Metal Keypad Reader (WMK900-1-0-GB-XX / HRK920-1-0-GB-XX) housed in a Zinc alloy die-cast housing. The Wiegand Reader consists of a Front Cover and a Backing Plate (the Backing Plate is attached with an M8 x 8 mm screw).
- One extra an M8 x 8 mm screw.
- One 2-Way Programming Pin.
- An extra Serial Number Label.

WDP900

- A Wiegand Door Entry Panel (WDP900-1-0-GB-XX) housed in a Black, ABS Plastic housing.
- One 2-way Programming Pin.
- An extra Serial Number Label.

WKM900

- A Wiegand Keypad Mullion Reader (WKM900-1-GB-XX) housed in a Black, ABS Plastic housing. The Wiegand Reader consists of a Front Cover and a Mounting Bracket (the Mounting Bracket is attached with a Self-tapping Screw (M2 x 6 mm)).
- A 1 m (3.28 ft) Wiegand Connector Cable.
- One 2-Way Programming Pin.
- Two Counter-sunk Self-tapping Screws (M2 x 6 mm).
- An extra Serial Number Label.

WJB900

- A Wiegand Junction Box Reader (WJB900-1-0-GB-XX) housed in a Black, ABS Plastic housing. The Wiegand Reader consists of a Front Cover and a Backing Plate Assembly (the Front Cover is attached with a Combi Screw (6 mm x 2.2 mm)). The Backing Plate Assembly includes 1 m (3.28 ft) of 10-core, 6.2 mm cable.
- One 2-way Programming Pin.
- An extra Serial Number Label.

General

Remember the following when installing the Wiegand Readers:

Maximum Data Communications Distance

CAUTION: When implementing the 150 m cable distances with the Wiegand Readers use the 12 V power input option.

NOTE: When implementing long cable distances with the Wiegand Readers, reduce electrical noise by connecting the shield wire.

Install the Wiegand Readers no further than 150 m (164 yd) from the Host unit. The cable individual conductor cross-sectional area should not be less than 0.2 mm^2 (0.0003 in^2). Recommended cables include West Penn 3272 or Belden 9505.

Distance between Wiegand Readers

To avoid mutual interference, install the Wiegand Readers no closer than 500 mm (20 in) apart.

Mounting the Wiegand Readers

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

Select the mounting position of the Wiegand Readers, considering accessibility, routing of wires and visibility of the externally visible LED.

NOTE: If flush-mounting the WJB900 reader on a drywall surface, ensure that the reader cable hole through the mounting surface is at least 12 mm diameter. This is to accommodate the grommet on the rear of the reader.

Secure the Wiegand Readers to the mounting surface, using four suitable screws and wall plugs, nuts and bolts or rivets.

NOTE: The Wiegand Door Entry Panel is designed for mounting in a user supplied enclosure. The Reader has 4 mounting holes, drilled to 4 mm in diameter. The mounting holes accommodate M3 bolts and nuts.

ELECTRICAL CONNECTIONS

Connecting the Wiegand Reader

Figure 1 to Figure 6 show typical connections for the Wiegand Reader.

NOTE: Connection details remain the same for all Wiegand models.

NOTE: When connecting the Wiegand Keypad Mullion Reader (WKM900) or the Wiegand Junction Box Reader (WJB900), use the cable colours displayed in brackets.

NOTE: The ideal cable distance between the IXP20 Controller and its Wiegand Reader **MUST NOT** exceed 150 m (164 yd).

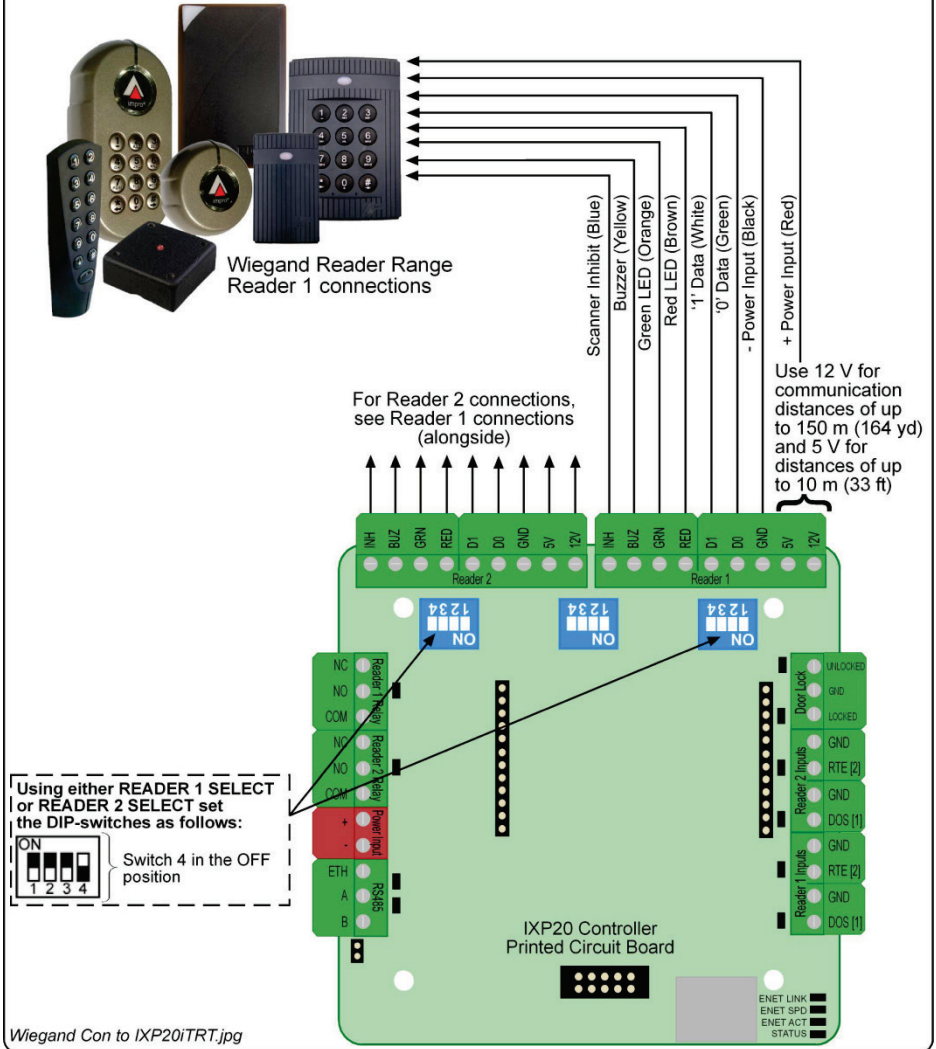


Figure 1: Wiegand Reader Connected to the IXP20 Controller

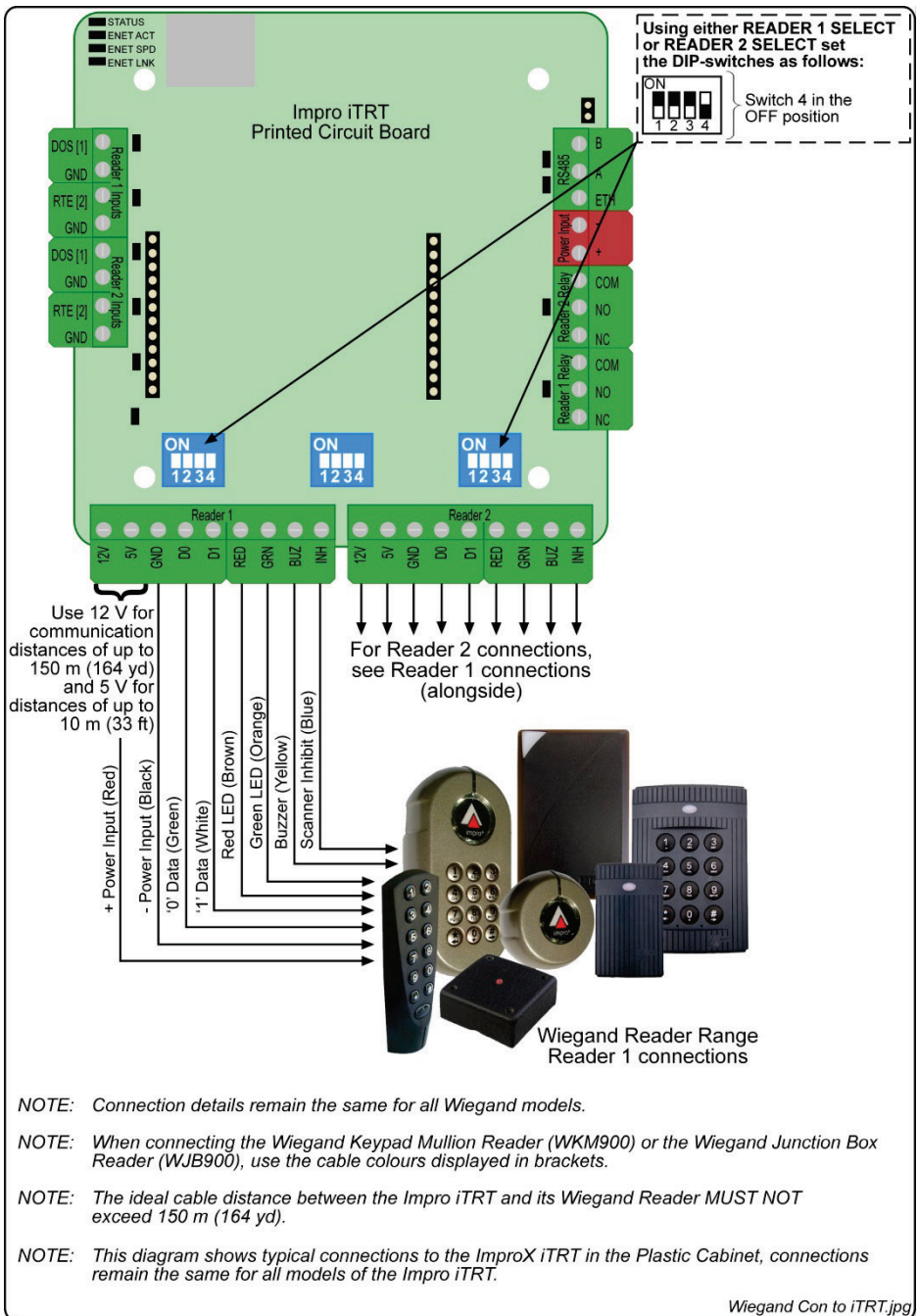


Figure 2: Wiegand Reader Connected to the Impro iTRT

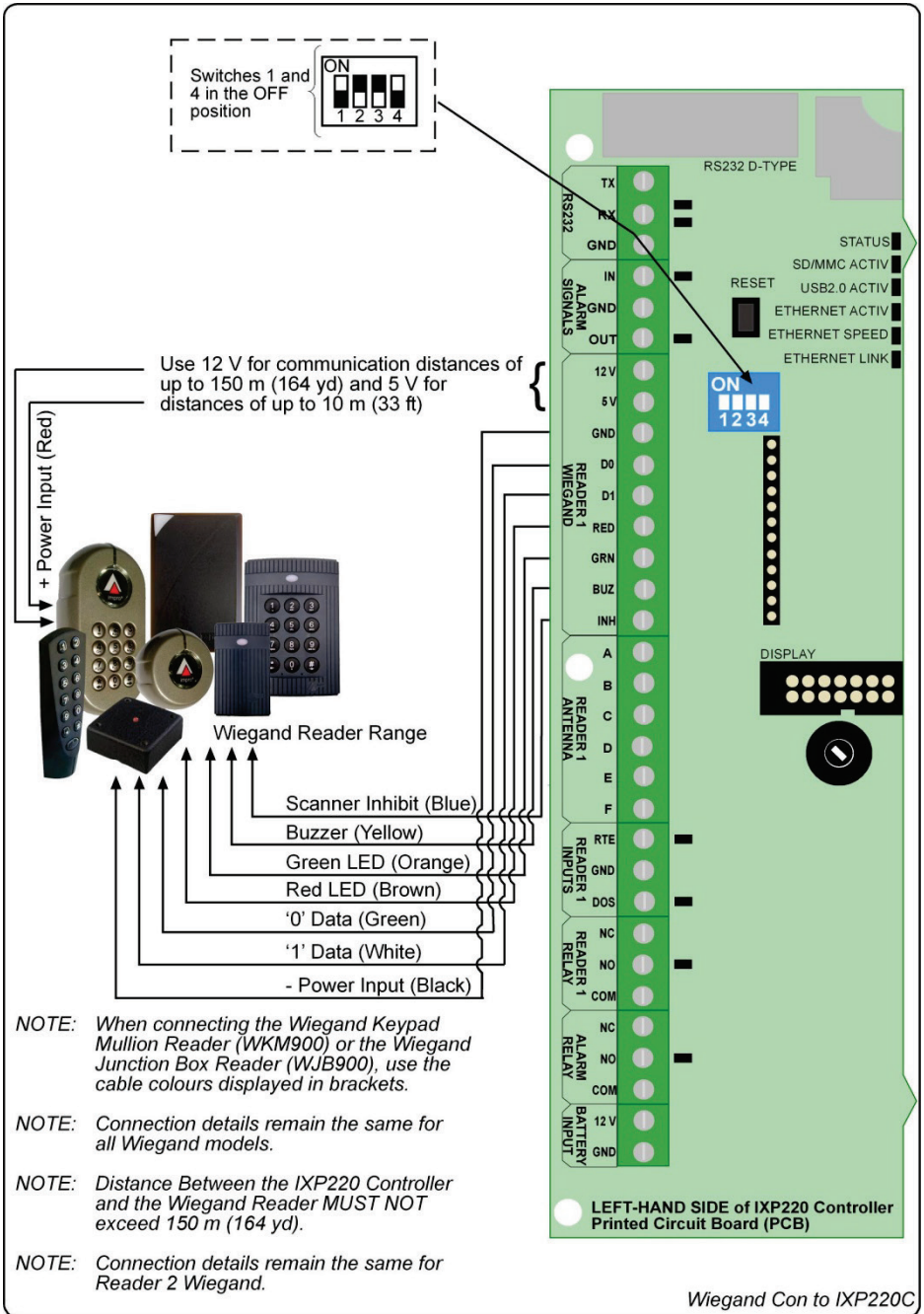


Figure 3: Wiegand Reader Connected to the IXP220 Controller

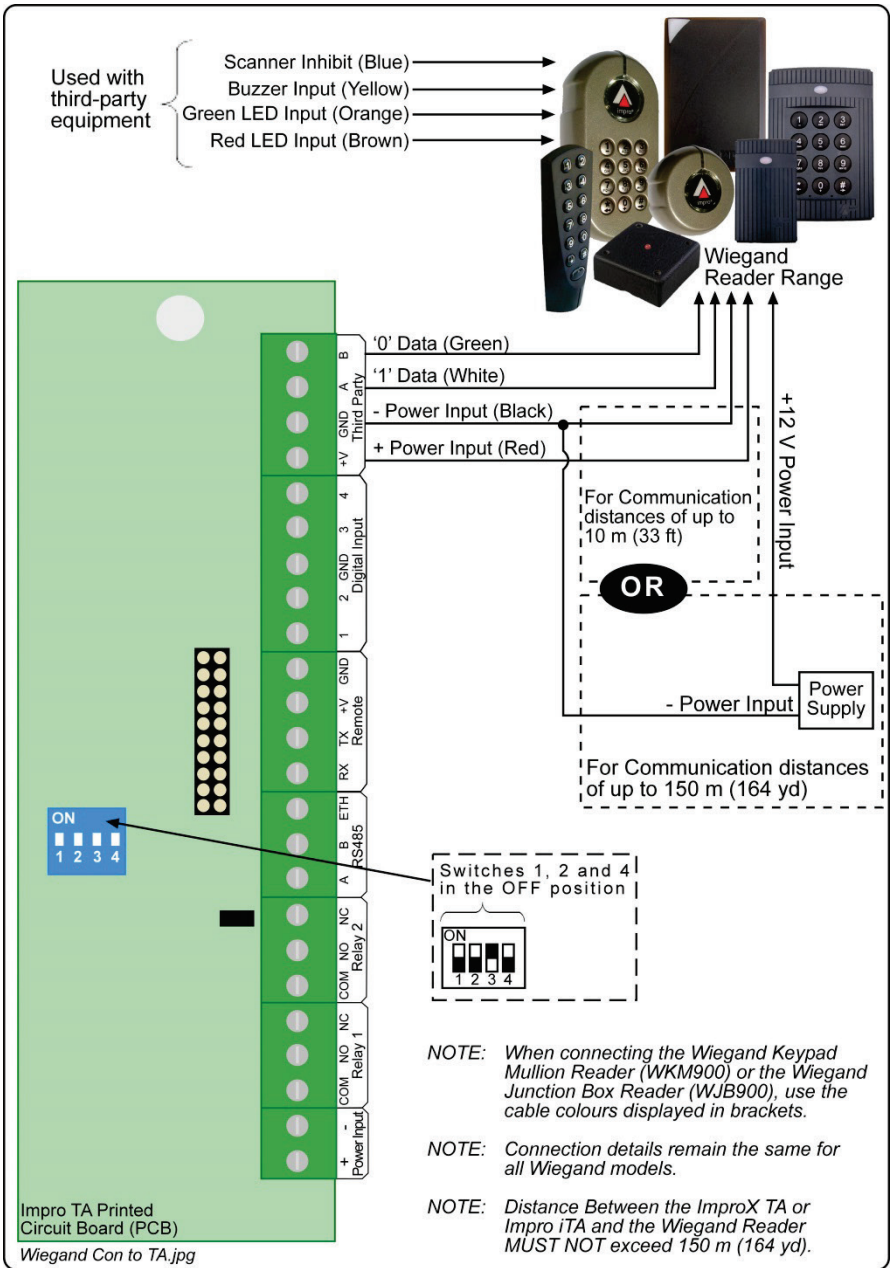


Figure 4: Wiegand Reader Connected to the Impro MfT

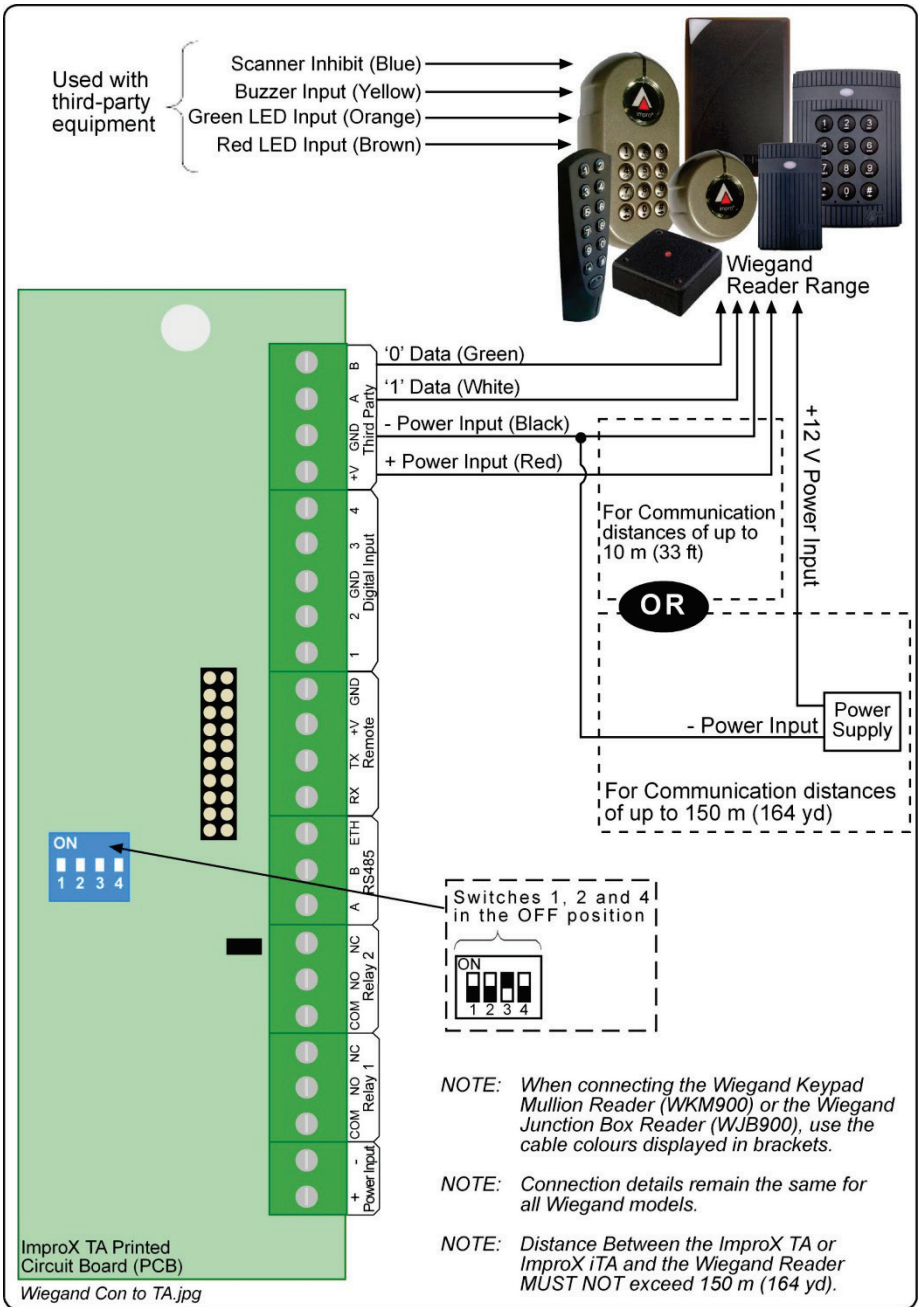
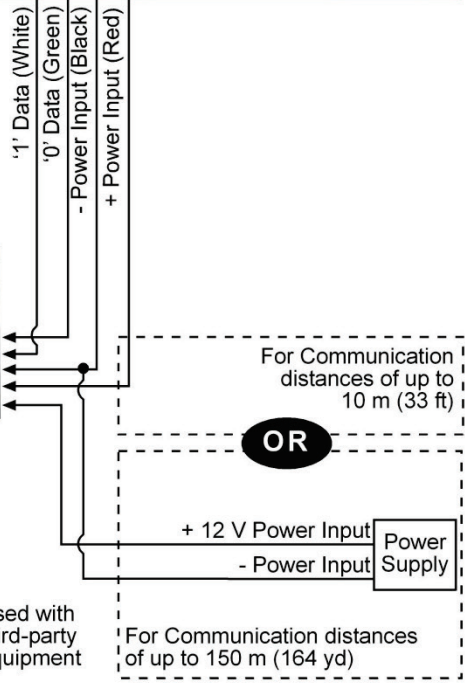
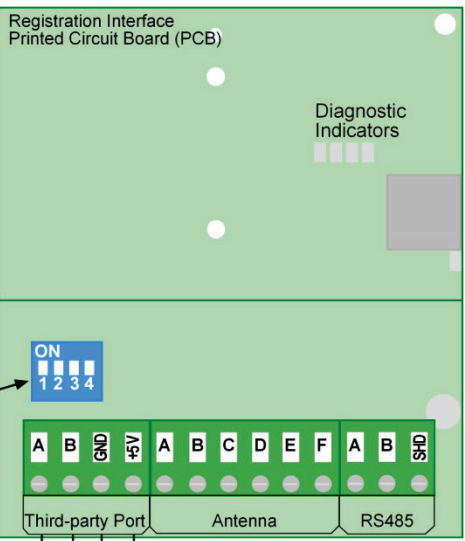
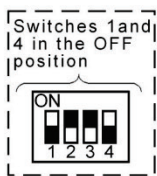


Figure 5: Wiegand Reader Connected to the Impro TA or Impro iTA

NOTE: When connecting the Wiegand Keypad Mullion Reader (WKM900) or the Wiegand Junction Box eader (WJB900), use the cable colours displayed in brackets.

NOTE: Connection details remain the same for all Wiegand models.

NOTE: Distance Between the Registration Interface and the Wiegand Reader **MUST NOT** exceed 150 m (164 yd).



Wiegand Connections.jpg

Figure 6: Wiegand Reader Connected to the Registration Interface (Impro RS or Impro RH)

Setting the Wiegand Mode

The Wiegand Readers offer four different Output Mode Combinations. Select the Output Mode by doing the following:

1. Begin by:
 - Removing the Backing Plate from models WPR900, WPK900, WMR900 / HRN920, WMK900 / HRK920 and WKM900.
 - Removing the Front Cover from model WJB900.

NOTE: *Model WDP900 does not have a Backing Plate. The Pins can be found on the reverse of the Reader.*

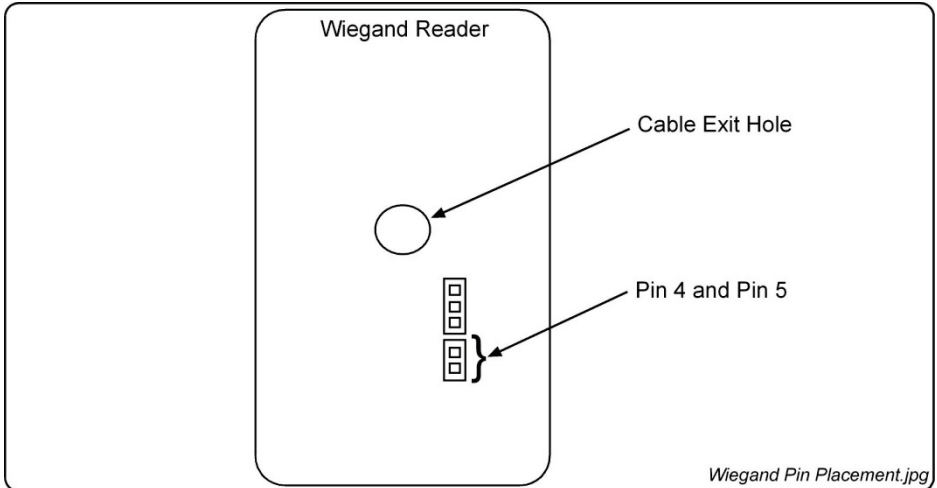


Figure 7: Wiegand Pin Placement

2. Locate and bridge the two stand-alone Pins using the 2-Way Programming Pin supplied.

NOTE: *Pin placement remains the same for all Wiegand models.*

2. Power up the unit, the number of beeps on start-up indicates the Output Mode:
 - Mode 1 (1 Beep): 26-bit, HID Normal.
 - Mode 2 (2 Beeps): 44-bit, HID Normal (Default).
 - Mode 3 (3 Beeps): 26-bit, HID Raw.
 - Mode 4 (4 Beeps): 44-bit, HID Raw.

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.*

3. Remove the 2-Way Programming Pin once the Mode is selected.
4. Finish by:
 - Replacing the Backing Plate on models WPR900, WPK900, WMR900 / HRN920, WMK900 / HRK920 and WKM900.
 - Replacing the Front Cover on model WJB900.

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.

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.

HID Raw

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

Keypad Model Settings (WPK900, WMK900 / HRK920 and WKM900 only)

The 12-button Keypad is used to enter 5-digit PIN-codes in the range 00000 to 65535. Wiegand protocol constraints disallow PIN-codes from 65536 to 99999. In this case the Status LED turns Red and the Buzzer activates for 2 seconds.

The Reader can accept 1 to 4-digit PIN-codes by pressing the Hash Key (#) after you have entered the PIN-code.

Errors made while entering the PIN-code can be corrected by pressing the Star Key (*) followed by the correct PIN-code.

- PIN code up to 5 digits with programmable facility code, output in 26-bit format.
- Fixed length buffered keys from 1 – 11 output in hexadecimal format with optional parity.

An extra button is included at the bottom of the WKM900 model's keypad; this button offers a doorbell facility.

NOTE: The output of the PIN-code keypad information is in 26-bit Wiegand format.

Blank Space

Fixed Length Key Output Mode

Once the specified number of keys are pressed, all the buffered keys are output in hexadecimal format:

Key	Output
0	0000
1	0001
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001
*	1010
#	1011
Doorbell (WKM900 only)	00111100

Table 1: Fixed Length Key Output Mode

Setting the Fixed Length Mode

The number of keys to be buffered and the parity option in the Fixed Length Mode is set as follows:

1. Press and hold down key '2' for 3 seconds. The Status LED enters a fast flash Mode and emits a long beep.
2. Enter a 3 digit number followed by the Hash Key (#). The first 2 digits specify the key buffer length and must be in the range 00 to 11 (eleven). The third digit must be a '0' where there is no parity and '1' where parity is added.

NOTE: If '00' is entered for the key buffer length then the Key Mode reverts to PIN Mode.

3. On acceptance of the setting the Status LED changes to Green. (If the settings are rejected the Status LED changes to Red).

Blank Space

Single Key 8-bit Burst Mode

To select this Mode, specify the Fixed Length Buffered Mode to be "018". This Mode reports each single key press as 8-bit code. Use Single Key 8-bit Burst Mode when using Wiegand Readers in PAC Mode or TAG+PIN Mode.

Key	Output
0	11110000
1	11100001
2	11010010
3	11000011
4	10110100
5	10100101
6	10010110
7	10000111
8	01111000
9	01101001
*	01011010
#	01001011
Doorbell (WKM900 only)	00111100

Table 2: Single Key 8-bit Burst Mode

Setting Single Key 8-bit Burst Mode

1. Press and hold down key '2' until the Reader beeps continuously.
2. Enter '018' and finish by pressing the Hash Key (#).
3. On acceptance of the change, the Status LED will change to Green. If the change is rejected the Status LED will change to Red.

Entering a Facility Code

A Facility Code only applies when PIN-codes are used. It is reported as part of the Wiegand code and can be used to link a set of Wiegand Readers to a particular Site.

A Facility Code can be entered into the Reader's memory. To set the Facility Code, do the following:

1. Press and hold down key '1' for 3 seconds. The Status LED will enter a fast flash Amber Mode.
2. Enter the Facility Code in the range 0 to 255 and finish by pressing the Hash Key (#).
3. On acceptance of the Facility Code the Status LED will briefly change to Green and the Buzzer sounds. (If the Facility Code is rejected the Status LED will change to Red for a longer period and the Buzzer sounds).

Serial Number Label

1. Once the Wiegand Reader is installed, sketch a rough site plan.
2. Attach the Wiegand 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 Wiegand Reader.

The Wiegand Reader does not have its own Fixed Address. When connected to a Terminal or Controller the Wiegand Reader is assigned one of the available Fixed Addresses.

The Serial Number Label identifies the type of Wiegand 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.

USER NOTES



This manual is applicable to the Wiegand Readers WPR900-1-0-GB-01,
WPR900-1-0-GB-XX, WPK900-1-0-GB-XX,
WMR900-1-0-GB-XX / HRW920-1-0-GB-XX,
WMK900-1-0-GB-XX / HRK920-1-0-GB-XX,
WDP900-1-0-GB-XX, WKM900-1-0-GB-XX and WJB900-1-0-GB-XX.

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

WPR300-0-0-GB-12

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