Mullion Reader VR20 VR50

Installation Manual

VR50M-MF   **VR20M-MF**
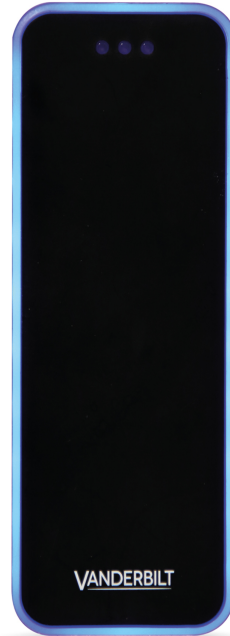
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• Directive 2014/30/EU (Electromagnetic Compatibility Directive)
• Directive 2014/53/EU (Radio Equipment Directive)
• Directive 2011/65/EU (Restriction of the use of certain hazardous substances Directive)
The full text of the EU declaration of conformity is available at: http://van.fyi?Link=DoC

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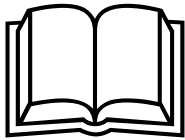
http://van.fyi?Link=Mullion_Reader

Table of Contents

1 Introduction

The VR20M-MFand VR50M-MF are mullion-mount card readers with modern anti-hacking security over OSDP and support for the traditional Wiegand protocol. When installed as part of a secure system over OSDP, the communication from the reader or the controller they are connected to cannot be compromised. The readers are made of hard wearing materials and will endure most weather conditions. The readers are easy to mount and can be mounted on a flat surface. The readers can be cleaned with most kinds of domestic detergents. All readers have a multicolour light frame. The VR50M-MF has a keypad for PIN code.

2 Technical data

	VR20M-MF	VR50M-MF
Protocol	OSDP or Wiegand	OSDP or Wiegand
Interface to controller	RS485 or Wiegand	RS485 or Wiegand
Operating voltage (Rated voltage 12-24 VDC)	8.5 – 30.0VDC	8.5 – 30.0VDC
Power consumption	DC 12V 43mA Peak 168mA DC 24V 26mA Peak 100mA	DC 12V 60mA Peak 220mA DC 24V 40mA Peak 125mA
Tamper protection	Yes	Yes
Card technology	MIFARE^{TM}	MIFARE
Card compatibility	MIFARE Classic MIFARE Plus MIFARE DESFire EV1/ EV2	MIFARE Classic MIFARE Plus MIFARE DESFire EV1/ EV2
Reading distance	MIFARE Classic-up to 6 cm MIFARE Plus-up to 6 cm MIFARE DESfire EV1/ EV2-the card must be held to the reader	MIFARE Classic-up to 6 cm MIFARE Plus-up to 6 cm MIFARE DESfire EV1/ EV2-the card must be held to the reader
Indicators	3 x LED (red/yellow/green) 1 x Buzzer Multicolour light frame	3 x LED (red/yellow/green) 1 x Buzzer Multicolour light frame
Keypad	No	Yes
Operating temperature	- 40°C to + 70°C	- 40°C to + 70°C
IP rating	IP54-IP66 *Mounting and connecting* on page 12	
IK class	08	08
Housing	Zinc cast metal bezel with polycarbonate plastic front	Zinc cast metal bezel with polycarbonate plastic front
Color	Black, matt chrome	Black, matt chrome
Dimensions (WxHxD) mm	Surface mounted: 48 x 129 x 22	Surface mounted: 48 x 129 x 24
Weight	219g	225g
Serviceable parts	None	None
Standards	EN50131-3:2009, Grade 3, Class III SSF1014:5, Grade 3, Class III	EN50131-3:2009, Grade 3, Class III SSF1014:5, Grade 3, Class III

Cable length guide

Mode	Max. Cable Length	Cable
OSDP	1 km.	Screened twisted pair (For example; Belden 9501)
Wiegand	30m	Screened multicore (For example; Belden 9538)

2 Compliance

2.1 IEC/EN60839-11 compliance

This product complies with IEC/EN60839-11, Grade 4, Class IV.

2.2 UL compliance

This device complies with UL 294.

Operation is subject to the following conditions:

- The reader shall be connected to a compatible UL 294 listed control unit. The readers have been UL evaluated with the AC5102 control unit.
- This device must be powered from power limited/class 2 supply.

Warning

Changes or modifications not expressly approved by the party responsible for compliance could void the User`s authority to operate the equipment.

Performance levels per UL294 are

- Destructive attack – Level I
- Line Security – Level I
- Endurance – Level IV
- Standby – Level I

2.3 FCC statement

Model No.	FCC ID
VR20M-MF	2AHDLMULL
VR50M-MF	2AHDLMULL

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.

Warning: Changes or modifications not expressly approved by the party responsible for compliance could void the User`s authority to operate the equipment.

3 Safety regulations

General

- Follow all warnings and instructions marked on the device.
- Keep this document for reference purposes.
- Please consider any additional country-specific, local laws, safety standards, or regulations concerning installation, operation, and disposal of the product.

Liability claim

- Do not make any changes or modifications to the device.
- Use only spare parts and accessories that have been approved by the manufacturer.

4 Reader components and package contents

The following diagrams identify the reader components and the items that come packaged with the reader.

4.1 Reader components
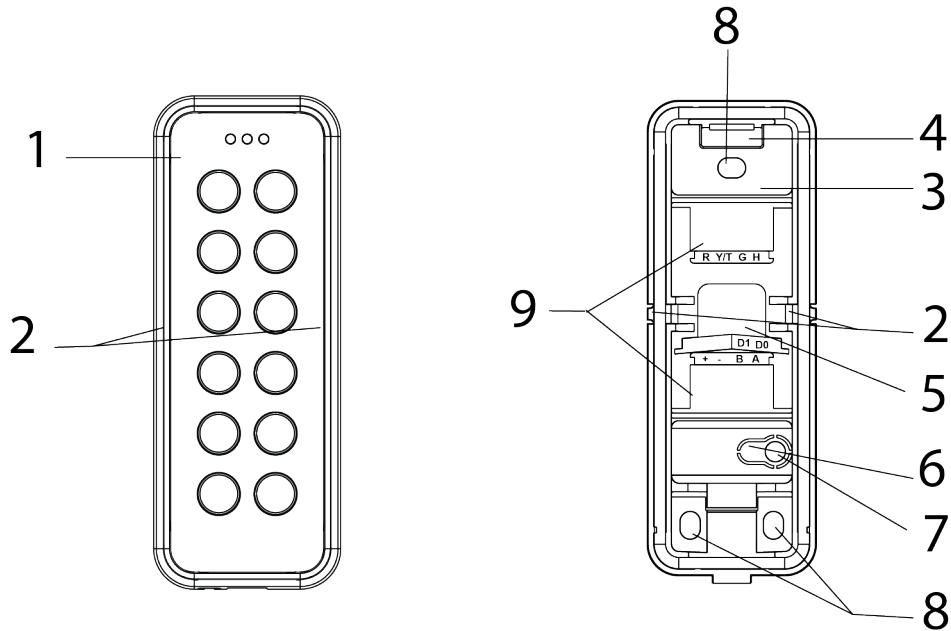
1	Front	6	Tamper base
2	Knockouts x 2	7	Screw for tamper protection
3	Base	8	Mounting holes
4	Hook	19	Upper and lower terminal block locations
5	Location where cables can come through the back		

4.2 Reader Components

Package contents
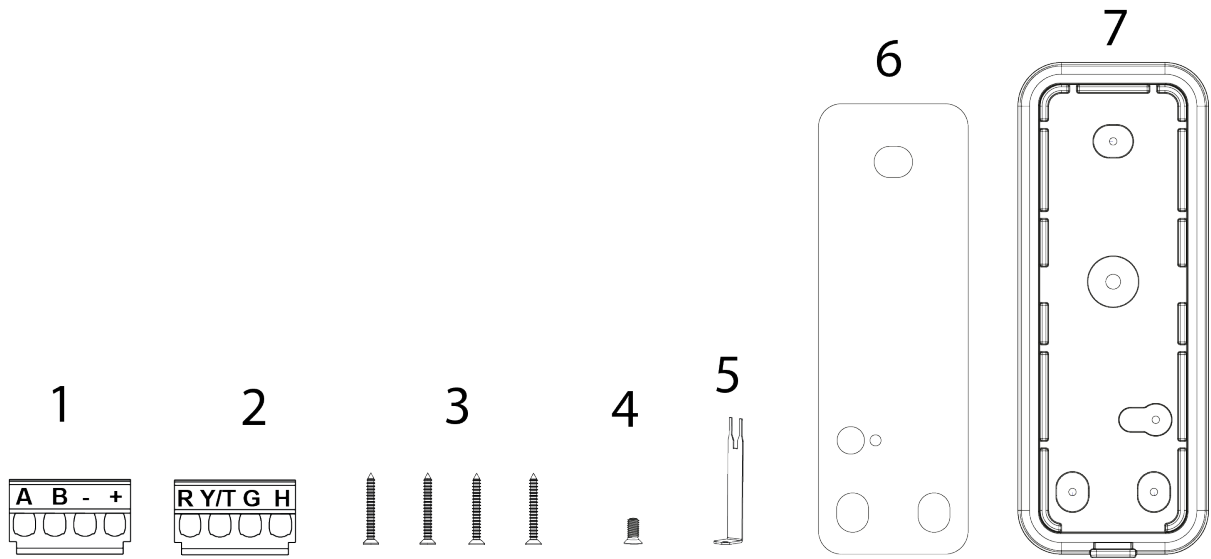
1	**A B - +** terminal block for OSDP and Wiegand (lower terminal block)
2	**R Y/T G H** terminal block for Wiegand (upper terminal block)
3	Mounting/Tamper screws
4	Cover screw
5	Opening tool
6	IP 55 Foam backing for outdoor installation
7	IP 66 Gasket for outdoor installation

5 Mounting and connecting

The mullion readers are surface-mounted readers. The readers can be mounted with cables fed through the back of the unit or fed in from either side through knockout gaps.

For wiring details please refer to:

- *Connecting the cables* on page 17.

5.1 Mounting a reader

5.2 Mounting a reader indoors (IP54)

To ensure a close fit, mount the reader on a flat surface (mounting surface should not have depths or deviations of > 1mm).

To attach the base to a surface:

1. Attach the base to the wall with three screws: one in the middle at the top of the base, and one in each of the corners at the bottom of the base.

1	Cable entry through base gasket
2	Tamper screw
3	Tamper base

2. If additional wall removal tamper protection is required, fix the screw (item 2) into the tamper base (item 3). Do not over-tighten the screw as this can damage the tamper base.

3. Continue to follow the instructions detailed in *Connecting the cables* on page 17.

ℹ️ The reader is automatically tamper protected when removing the front of the reader from the reader base with the help of the opening tool. The wall removal tamper is an additional protection against physical attacks.

5.3 Mounting a reader outdoors (IP55)

To ensure a close fit, mount the reader on a flat surface (mounting surface should not have depths or deviations of > 1mm).

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i	Seal the cable entry through the base with silicon to avoid ingress of dust, water, and draft. Endure that there is no silicon between the wall and the base, remove residue sealant if necessary.

To attach the base to a surface:

1. Peel the backing paper from the foam.

2. Stick the foam firmly to the back of the base.

3. Make a small hole in the backing of the base (item 1 in the diagram below). Use this hole to feed the cable through the base and into the reader base.

4. Remove any fabric around the cable entry point on the back of the reader to avoid water channeling to the inside of the reader.

5. Attach the base to the wall with three screws: one in the middle at the top of the base, and one in each of the corners at the bottom of the base.

1	Cable entry through base
2	Tamper screw
3	Tamper base
4	Self-adhesive foam base

6. If additional wall removal tamper protection is required, fix the screw (item 2) into the tamper base (item 3). Do not over-tighten the screw as this can damage the tamper base.

7. Continue to follow the instructions detailed in *Connecting the cables* on page 17.

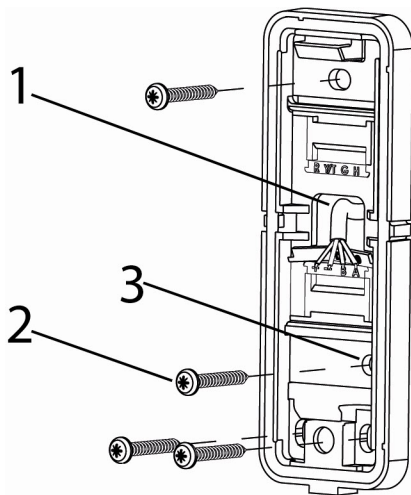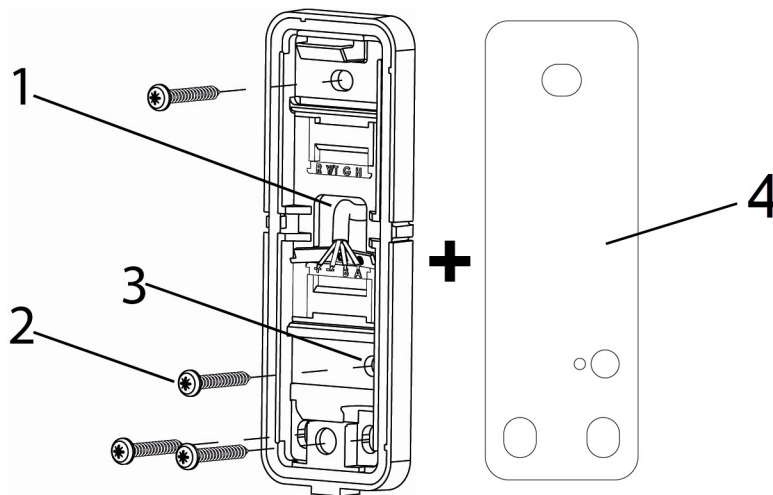| i	The reader is automatically tamper protected when removing the front of the reader from the reader base with the help of the opening tool. The wall removal tamper is an additional protection against physical attacks.

5.4 Mounting a reader outdoors (IP66)

To ensure a close fit, mount the reader on a flat surface (mounting surface should not have depths or deviations of > 1mm).

To attach the base to an exterior surface to IP 66:

1. Press the base firmly into the rubber gasket.

2. Feed the cable through the hole in the back of the rubber gasket and into the reader base. Do not enlarge the hole. The rubber will stretch over the cable.

3. Attach the base and gasket together to the wall with three screws: one in the middle at the top of the base, and one in each of the corners at the bottom of the base.

1	Cable entry through base
2	Tamper screw
3	Tamper base
4	IP 66 rubber gasket

4. If additional wall removal tamper protection is required, fix the screw (item 2) into the tamper base (item 3). Do not over-tighten the screw as this can damage the tamper base.

5. Continue to follow the instructions detailed in *Connecting the cables* on page 17.

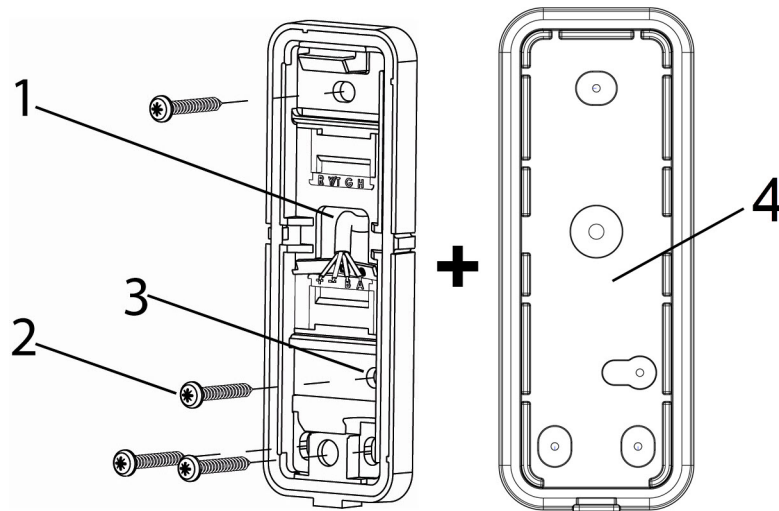> **i** The reader is automatically tamper protected when removing the front of the reader from the reader base with the help of the opening tool. The wall removal tamper is an additional protection against physical attacks.

5.5 Mounting a reader with cables fed from the side

Warning

Mounting the unit with the cable led in from either side through knockout gaps does not comply with the folowing standards:

UL 294, IP55, IP66

If the cables are fed from the side:

1. Remove the gasket from the base.
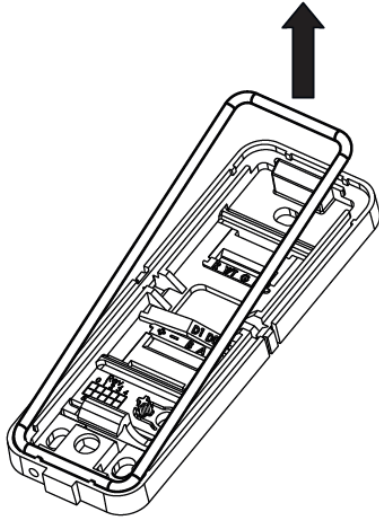
2. Identify which of the knockouts the cables should be fed through.

3. Use a pliers to pull the knockout away from the base.
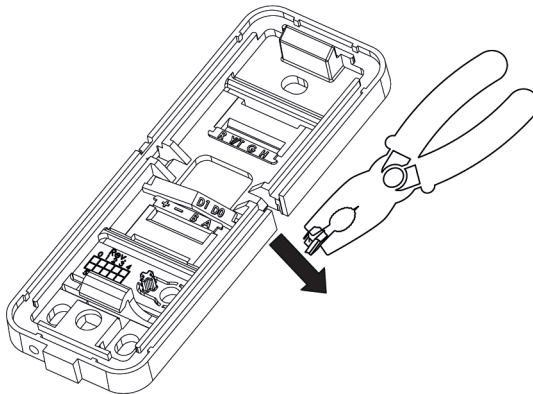
4. Remove the corresponding knockout on the cover.
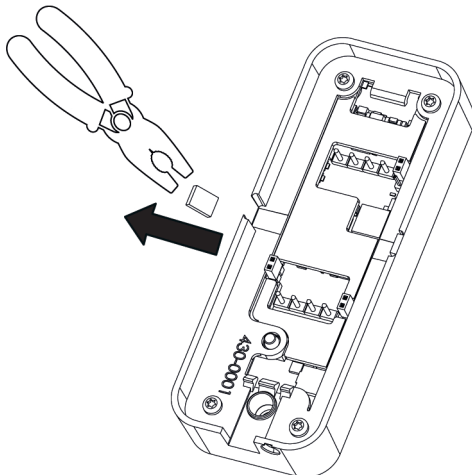
5. Attach the base to the wall with three screws: one in the middle at the top of the base and one in each of the corners at the bottom of the base.
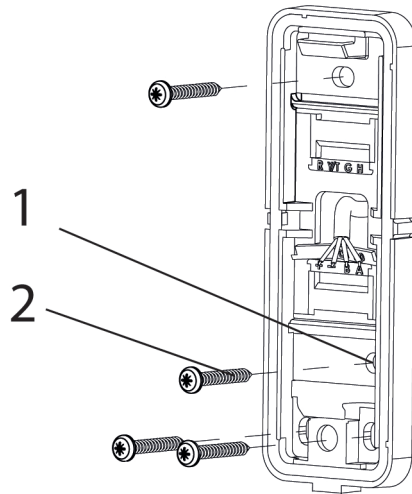
1	Tamper base
2	Tamper screw

6. If additional wall removal tamper protection is required, fix the screw (item 2) into the tamper base (item 3). Do not over-tighten the screw as this can damage the tamper base.

> **i**   The reader is automatically tamper protected when removing the front of the reader from the reader base with the help of the opening tool. The wall removal tamper is an additional protection against physical attacks.

7. Feed the cables through the opening and reinsert the gasket. Follow the instructions for *Connecting the cables* on the next page.

> **i**   Vanderbilt recommend sealing the gap that the knockout creates with a silicon sealant. Do this after you have closed the reader.

5.6 Connecting the cables

5.6.1 Connecting the reader in OSDP mode

Use the terminal block marked AB-+ (see item 1 in *Reader Components* on page 10) and a twisted screened cable with min. 2 pairs to connect the cables in OSDP mode.

1. Attach the cables according to the respective indicators on the second, AB-+ terminal block (lower terminal block) and the base:

Reader	Controller
+	+12V
-	0V
B	B
A	A

2. Insert the ridge on the end of the terminal block marked AB-+ into the slot marked AB-+.
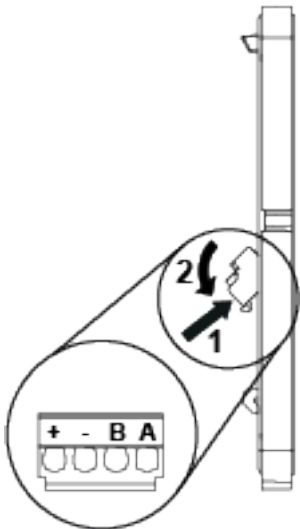
3. Gently push the terminal block towards the base until it clicks.

4. Push the cables back.

> Please note that you must set the Jumpers to configure your application.
>
> For more information on setting the Jumpers in OSDP mode see *Setting the Jumpers for OSDP* on page 20.
>
> For more information on setting the Jumpers in Wiegand mode see *Setting the Jumpers for Wiegand* on page 21.

> On the reverse of the front plate, Jumper 3 is used to determine EOL (see the diagram in *Connecting the cables* above). By default EOL is ON and the reader acts as the last reader on the bus. However, if the reader is an intermediate reader on the bus, Jumper 3 must be removed.

5.6.2 Connecting the reader in Wiegand mode

Use the terminal blocks marked AB-+ and RY/TGH (see item 1, item 2 in *Reader Components* on page 10) and a twisted screened multicore cable (4 pairs + screen) such as Belden 9538 to connect the reader in

Wiegand mode.

1. Attach the cables according to the respective indicators on the communication and power terminal block (AB-+ terminal block (lower terminal block)):

Reader	Controller
+	+12V
-	0V
B	Wiegand D1
A	Wiegand D0

2. Attach the cables on the LED, tamper, and horn terminal block (RY/TGH terminal block (upper terminal block)):

Reader	Controller (Generic)	Controller (SPC)	Controller (ACT)
R	Red LED	VO1	Red
Y/T*	Tamper input	Zone Input (tamper)[1]	Tamper input[1]
G	Green LED	VA1	Green
H	Buzzer output	System Output[1]	Buzzer output[1]
*The Tamper output (default setting) connection may alternatively be configured to provide a Yellow input to the reader. The Tamper output/ Yellow input options are mutually exclusive.			
[1]This connection is optional.			

When the tamper output option is configured there is no yellow indication input. In this instance, you can turn on the yellow indication LED by setting both the red and green indication inputs low. Both the red and green indication LEDs are turned off at this time.

The buzzer is activated by setting the horn input low. The buzzer is deactivated by setting the horn input high.

3. Insert the ridge on the end of the upper or lower terminal block into the corresponding slot.
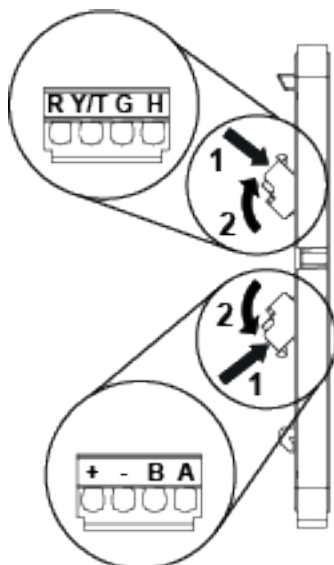
4. Gently push the terminal block towards the base until it clicks.

5. Remove the Jumper 3 (see the diagram in *Connecting the cables* on page 17). Jumper 3 is used to determine EOL. By default the reader has EOL ON. EOL is always off in Wiegand mode.

Please note that you must set the Jumpers to configure your application. For more information on setting the Jumpers in Wiegand mode see *Setting the Jumpers for Wiegand* on page 21.

5.7 Setting the Jumpers

There are three jumpers inside the front of the reader. Use the jumpers to set the reader to OSDP or Wiegand mode, to set OSDP Addressing or Wiegand format, and to set the End Of Line (EOL) status for the reader.
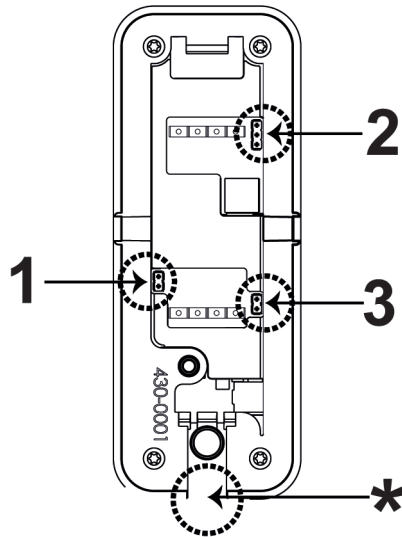
1	Set reader to OSDP or Wiegand mode
2	Set OSDP addressing or Wiegand formats
3	Set End Of Line (EOL) status for the reader
*****	This indicates the bottom of the reader

5.8 Setting the Jumpers for OSDP

The diagrams below show how to position the Jumpers to get the desired functions from the terminal blocks. Note that the EOL is ON for a sole reader or for the last reader on the RS485 bus.

Jumper 1
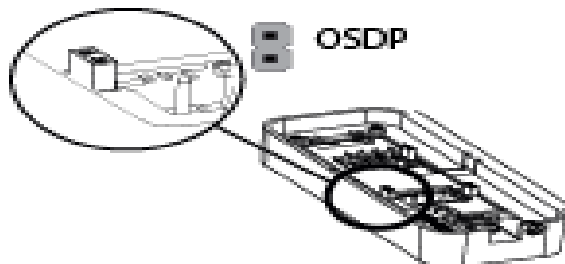
Jumper 1 is ON to select OSDP.

Jumper 2
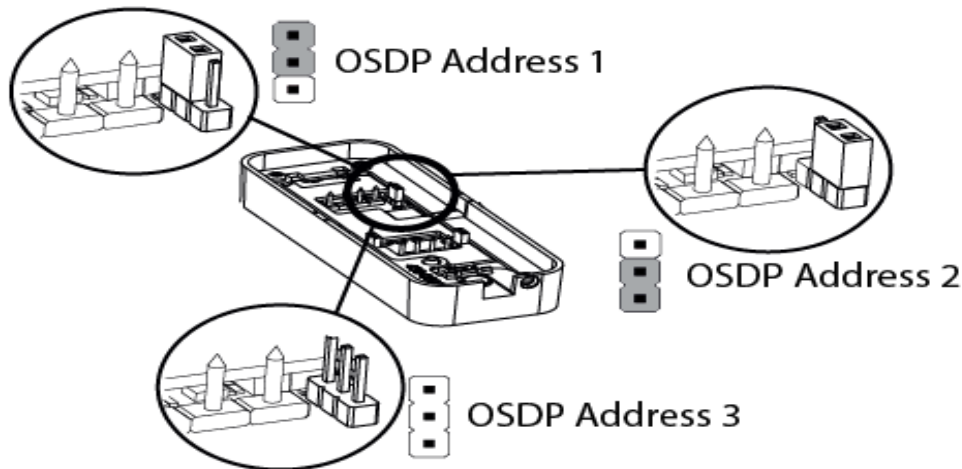
- Jumper 2 is ON the first two pins for OSDP Address 1.
- Jumper 2 is ON the bottom two pins for OSDP Address 2.
- Jumper 2 is OFF for OSDP Programmable Address.

Jumper 3
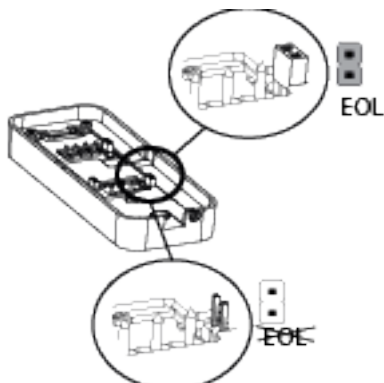
- Jumper 3 is ON to enable EOL.
- Jumper 3 is OFF to disable EOL.

5.9 Setting the Jumpers for Wiegand

By default, the VR20 and VR50 Mullion readers are configured to transmit standard mode 32 Bit Wiegand, 37 Bit Wiegand, or 56 Bit Wiegand.

Some installations may require transmission in Reverse Mode for 26 Bit Wiegand, 32 Bit Wiegand or 56 Bit Wiegand.

If you are adding this reader to an existing Reverse Mode installation, you must follow the procedure to program the reader to Reverse Mode Wiegand.

For more information, please refer to:

- *Reverse mode Wiegand* on page 23.

If the existing installation uses 26 Bit Wiegand, you must follow the additional procedure to program the reader to transmit in Reverse Mode 26 Bit Wiegand.

For more information, please refer to:

- *Reverse mode Wiegand* on the next page.

Only one of the two modes may be configured at a time.

Wiegand - Standard mode transmission

Wiegand	Standard transmission	Re-program necessary
56 Bit	Yes	No
37 Bit	Yes	No
32 Bit	Yes	No
26 Bit	No	

Wiegand - Reverse mode transmission

| Wiegand	Standard transmission	Re-program necessary	Procedure	Mandatory additional procedure
56 Bit	Yes	Yes	**Yes**	*Programming a reader for reverse mode transmission* on page 24
37 Bit	Yes	No		
32 Bit	Yes	Yes	**Yes**	*Programming a reader for reverse mode transmission* on page 24
26 Bit	Yes	Yes	***Programming a reader for reverse mode transmission on page 24***	*Programming a Reverse mode transmission reader for 26 Bit Wiegand* on page 24

The diagrams below show how to position the Jumpers to get the desired functions from the terminal blocks. Note that in Wiegand mode EOL is not fitted. Wiegand can be set at 32 bit, 37 bit, or 56 bit.

Jumper 1
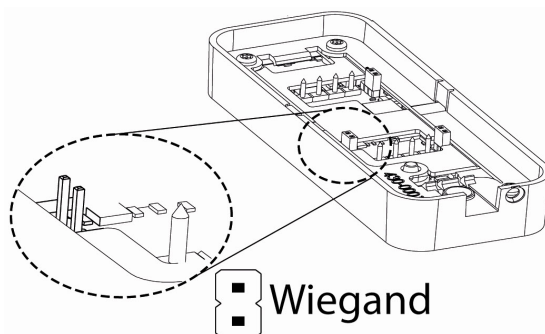
Jumper 1 is OFF to select Wiegand.
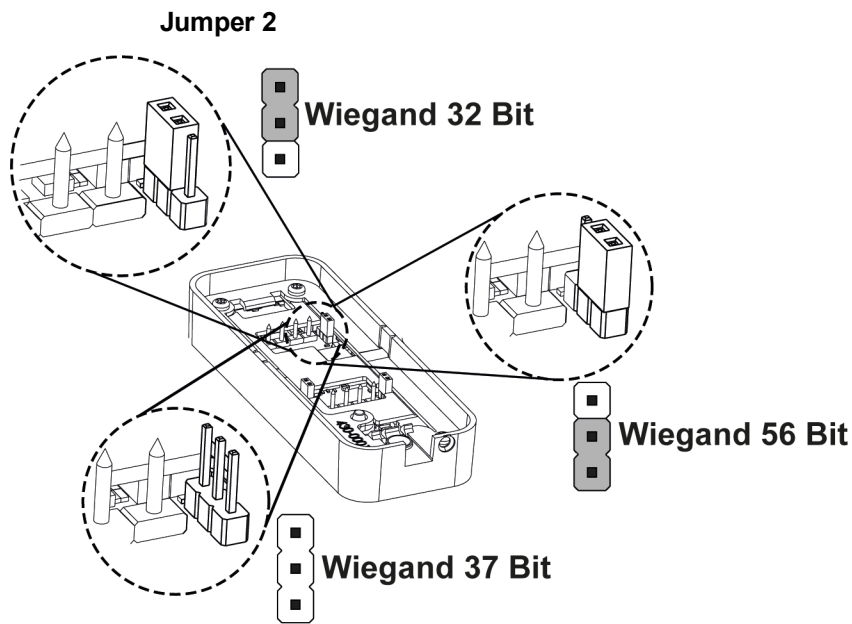
Jumper 2

- Jumper 2 is ON the first two pins for Wiegand 32 bit.
- Jumper 2 is ON the bottom two pins for Wiegand 56 bit.
- Jumper 2 is OFF for Wiegand 37 bit.

Jumper 3
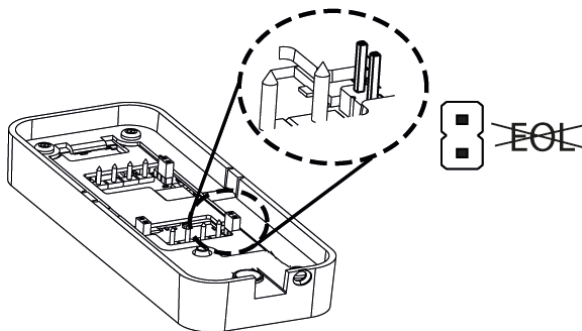
- Jumper 3 is OFF to disable EOL.
- Jumper 3 is always OFF in Wiegand mode.

5.10 Reverse mode Wiegand

Some installations may require transmission in Reverse Mode for 26 Bit Wiegand, 32 Bit Wiegand or 56 Bit Wiegand.

To add a reader to an existing Reverse Mode installation, you must follow the procedure to program the reader to Reverse Mode Wiegand. For more information, see *Programming a reader for reverse mode transmission* on the facing page.

If the existing installation uses 26 Bit Wiegand, you must follow an additional procedure to program the reader to transmit in Reverse Mode 26 Bit Wiegand. For more information, see *Programming a Reverse mode transmission reader for 26 Bit Wiegand* on the facing page.

Only one of the two modes may be configured at a time.

5.11 Programming a reader for reverse mode transmission

To provide backwards compatibility to V1.08, V1.09, and V1.12 Mullion readers, you can program the reader for Reverse mode transmission.

1. Remove the Base of the reader from the Front of the reader.

2. Power down the reader if connected.

3. Connect the Green to the Tamper connection.

4. Place Jumper 2 in the lower position.

5. Remove Jumper 1.

6. Power up the reader.
   The reader beeps the affirmation tone and the green indication LED flashes. The reader is now in VR firmware 1.X Wiegand compatible mode.

7. Power down the reader.

8. Disconnect the Green from the Tamper connection.

9. Place Jumper 2 in the appropriate position for the number of Weigand bits.
   For 32 Bit Wiegand, place Jumper 2 in the upper position.
   For 56 Bit Wiegand, place Jumper 2 in the lower position.
   For 26 Bit Wiegand you must re-progamme the reader into 26 Bit mode.

10. Continue with the installation.

5.11.1 Reverting to standard mode Wiegand

To return the reader to the standard data sequence for Wiegand, follow the steps below:

1. Remove the Base of the reader from the Front of the reader.

2. Power down the reader if connected.

3. Connect the Green to the Tamper connection.

4. Remove Jumper 1 and Jumper 2.

5. Power up the reader.
   The reader beeps the affirmation tone and the green indication LED flashes. The reader is now in standard mode.

6. Power down the reader.

7. Disconnect the Green input from the Tamper connection.

8. Place Jumper 2 in the appropriate position for the number of Weigand bits.
   For 32 Bit Wiegand, place Jumper 2 in the upper position.
   For 56 Bit Wiegand, place Jumper 2 in the lower position.
   For 37 Bit Wiegand , remove Jumper 2.

9. Continue with the installation.

5.12 Programming a Reverse mode transmission reader for 26 Bit Wiegand

The reader may programmed into 26 Bit Wiegand mode as follows;

1. Connect Red input to the Tamper

2. Put J2 in the lower position.

3. Activate the Tamperby removing the back plate.

4. Remove OSDP Jumper 1.

5. Power up the reader.
   The reader beeps an affirmation tone and the RED indication led flashes each second.

6. Power down the reader.

7. Disconnect Red input and Tamper connection.

8. Power up the reader.
   The reader now operates in 26 Bit Wiegand mode regardless of the setting of Jumper 2.

5.12.1 Re-programming a reverse mode transmission reader away from 26 Bit Wiegand

To reverse the reader out of 26 Bit Wiegand mode and to use the setting of Jumper 2 to determine Wiegand Bit mode operation, follow the steps below:

1. Connect Red input to the Tamper

2. Remove Jumper 2.

3. Activate the Tamper by removing the back plate.

4. Remove OSDP Jumper 1.

5. Power up the reader.
   The reader beeps an affirmation tone and the RED indication led flashes each second.

6. Power down the reader.

7. Disconnect the Red input and the Tamper connection.

8. Place Jumper 2 in the appropriate position for the number of Weigand bits (upper position for 32 Bit, lower position for 56 Bit, and remove for 37 Bit).

9. Power up the reader.

- The RED indication LED flashes twice if the reader is configured for 26 Bit Wiegand operation.

- The GREEN indication LED flashes twice if it is configured for Reverse transmission mode.

- Both The RED & GREEN indication leds flash twice simultaneously if the reader is configured for Reverse transmission mode and 26 Bit Wiegand operation.

5.13 Default Configuration Card

The Default Configuration card configures the reader for

○ Standard Wiegand transmission mode

○ Wiegand bit mode dependent on Jumper 2

○ ACT MIFARE card printed number on card

○ DESfire UID.

5.13.1 37 Bit Wiegand.

37 Bit Wiegand operation is compatible with ACT MIFARE / DESfire readers.

6 Closing the reader

To close the reader:

1. Holding the front of the reader at an angle, insert the hook on the top of the base into the corresponding slot in the front of the reader and slide down.

2. Gently press in the bottom of the reader front until the snap lock confirms a secure attachment.

3. Screw the cover screw (see number 4 in *Reader Components* on page 10) into the bottom of the reader.
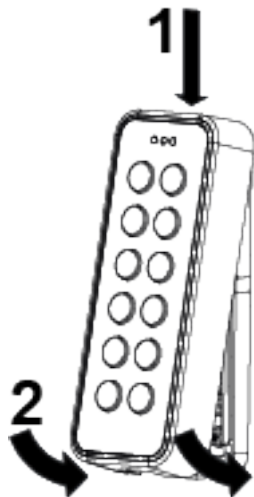
i	If you are using the IP66 gasket, hold the tab at the bottom of the IP66 gasket clear of the reader while closing.
	After closing the reader, press the tab up into the correct sealed position.

7 Disassembling the reader

7.1 To disassemble the reader:

	If you are using the IP66 gasket, pull down the tab at the bottom of the IP66 gasket before inserting the opeining tool.

1. Remove the cover screw.

2. Insert the opening tool in the slot between the base and the front and push gently upwards.
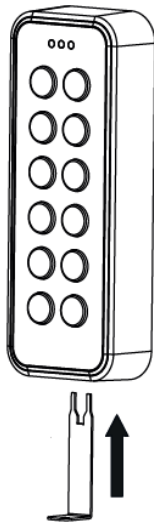
3. Use the opening tool to pull the reader outwards and upwards.
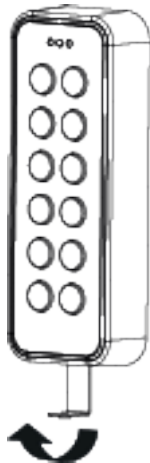
4. When the front of the reader is disconnected from the snap lock, lift the front and slide upwards to disengage from the hook at the top.
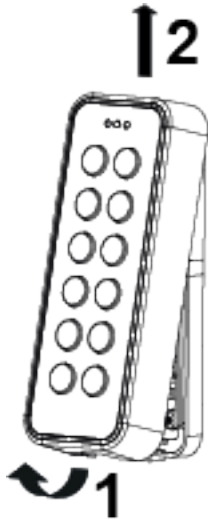
7.2 To remove the terminal block:

1. Push the terminal block gently away from the cable entry hole.
2. Tilt the terminal block away from the base.

8 Default settings

Setting	Default
Reading MIFARE Classic	UID
Reading MIFARE Plus SL1 – SL3	UID
Reading MIFARE DESFire EV1	UID
Communications mode	OSDP (to change to Wiegand mode remove Jumper 1 and Jumper 3)
Backlight	Always on (change with 3CT tool)
Bus address	1 (Up to eight are supported)
Wiegand output	26/32/37/56 Bit
Wiegand key PIN burst	4/8 Bits
Light frame	Follows Red, Green LED inputs in Wiegand mode
Tamper/Yellow Connection	Tamper output (change to yellow LED with 3CT tool)
Wiegand heart beat mode	OFF
Time-out for configuration card (keypad backlight turns off when this timeout expires subsequent to last keypress)	3 seconds
Activation time-out	30 seconds
Hold-off time for card read	100 milliseconds
Reception for card (time before the same card will be detected in the field again)	Inactive
Min background illumination	12
Max background illumination	255
Off-line indication	Yes
Buzzer volume for key press	2
Buzzer volume for card read	2
System sound	10

8.1 3CT Tool

To change the default configuration of the reader, use the 3CT tool. You can purchase the 3CT tool as a separate download. You can use the 3CT tool to configure MIFARE Classic and DESFire EV1 card formats to be configured along with Wiegand options to be used for the card readers. For further information, please contact Vanderbilt International Ltd.. The 3CT tool configures the format in which user cards are interpreted by the card reader. The 3CT tool supports configuration of the following options: Tamper Output / Yellow Input and Heart beat Mode.

Option	Default setting	Information
Yellow input	Disabled	Selects Tamper Output when disabled
Heart beat mode	Disabled	Ensures a comms message is sent every 10 seconds to controller when enabled

For more information on 3CT please see the User manual for Configuration Card Creation Tool which is included when you purchase the 3CT tool.

[i] The readers use FreeRTOS. For further information, please visit www.freetos.org.

8.2 Setting burst mode using the keypad

The default burst mode is 4 bit. This can be changed to 8 bit. To change from 4 bit to 8 bit burst :

1. Power up the reader while holding the X key. The red and green indicators alternately turn on.

2. Press the key sequence 1818 to specify that 8 bit burst is required.

3. Hold down the ✓ key until you hear the two-tone affirmative beep.

4. To change back to 4 bit burst from 8 bit burst, follow the steps above pressing the key sequence1414 instead of 1818.

9 Connecting the reader to SiPass integrated

9.1 Connecting the reader to SiPass integrated in OSDP mode
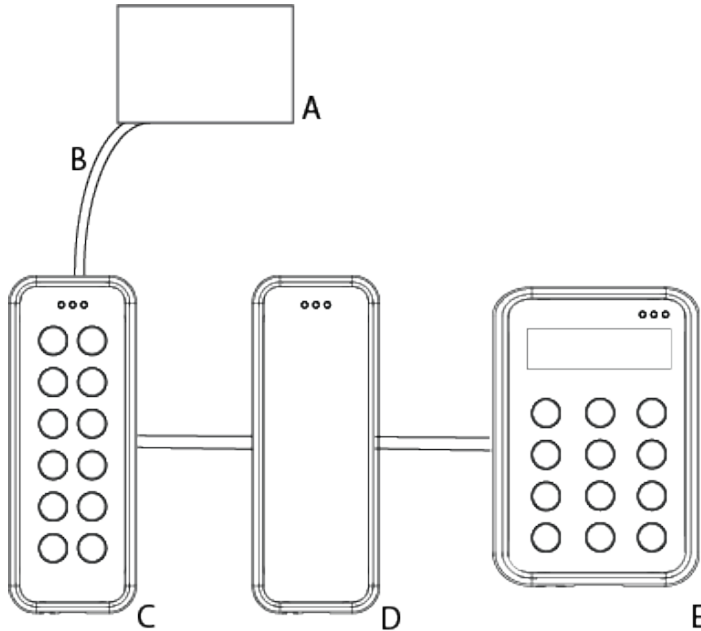
|	
A	SiPass integrated RIM (DRI/ERI)
B	Power and A, B (OSDP)
C	Reader 1 (VR50M-MF Mullion reader with keypad)
D	Reader 2 (VR20M-MF Mullion reader)
E	Reader 3 (VR40S-MF MIFARE Reader with keypad and display)

The connection between a reader and a Reader Interface Module (RIM) is as follows:

RIM (DRI/ERI)	VRxx-MF
12 V	+
0V	-
Tx/+	A
Rx/-	B

SiPass integrated can support both the VR and NGCR readers on the same OSDP bus.

9.2 Setting OSDP address for the reader

You can set the reader address to 1 (default setting), 2 , or programmed with a value from 1 to 8 using the Jumper. Place the Jumper in one of the three positions shown in the diagram below to achieve the desired address. Additional addresses are automatically assigned by the controller from 3 to 8 following the order in which the readers are powered up.
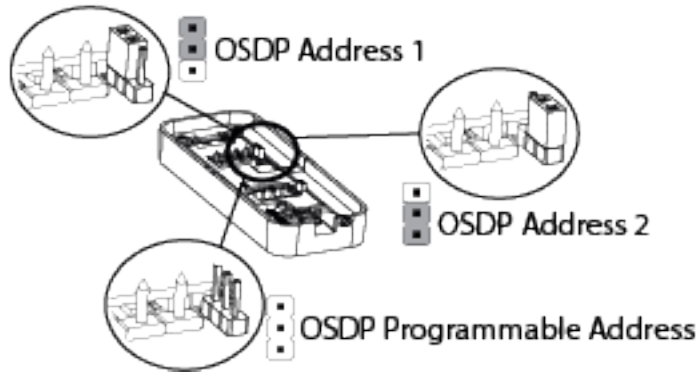
When the reader is first powered up, the yellow LED flashes. The flashing lights stop when it is correctly configured to SiPass integrated. This can be tested by holding a card next to the reader. A correctly configured reader acknowledges the card according to the SiPass integrated settings.

Please note that a new reader will always get the next free bus address. For example, if a reader with bus address 5 is removed and a new reader is installed, the new reader gets address 5.

9.3 Connecting the reader to SiPass integrated in Wiegand mode

For more detail on connecting the reader to SiPass integrated via Wiegand see *Connecting the reader in Wiegand mode* on page 17.

10 Connecting VR20/VR50 readers to ACT

This section covers the following topics:

Connecting VR20/VR50 readers to ACT in OSDP mode

- *Connecting a single reader to ACT in OSDP mode* below
- *Connecting multiple readers to ACT in OSDP mode* on the next page
- *Setting the OSDP address for the reader* on page 35
- *Setting the jumpers for OSDP mode* on page 35

Connecting VR20/VR50 readers to ACT in Wiegand mode

- *Connecting an entry reader to ACT in Wiegand mode* on page 36
- *Connecting an Entry and an Exit reader to ACT in Wiegand mode* on page 37
- *Setting the Jumpers for Wiegand mode* on page 1

10.1 Connecting a single reader to ACT in OSDP mode

An ACTpro 1520 controller can support all VR series readers on the same OSDP bus.
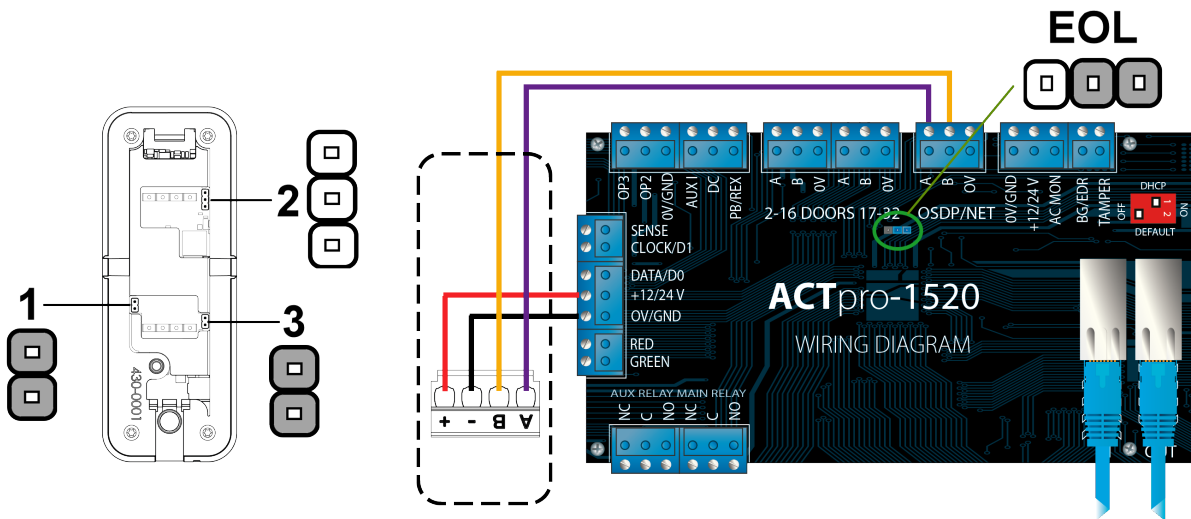
- For OSDP mode, set the jumpers on the VR series reader as shown in 1,2, 3 in the diagram.
- Set the End Of Line (EOL) jumper on the ACT pro controller as shown.

Wire the connections between a VR series reader and an ACTpro 1520 controller as follows:

| VRxx-MF - AB-+ Terminal block	ACTpro 1520
+	+12/24 V
-	0V/GND
A	A (OSDP/NET block)
B	B (OSDP/NET block)

For more information on how to correctly locate and fit the terminal blocks, see *Connecting the cables* on page 17.

Cable length guide

Mode	Max. Cable length	Cable
OSDP	1 km.	Screened twisted pair (For example; Belden 9501)

10.2 Connecting multiple readers to ACT in OSDP mode

An ACTpro 1520 controller can support multiple VR series readers on the same OSDP bus.
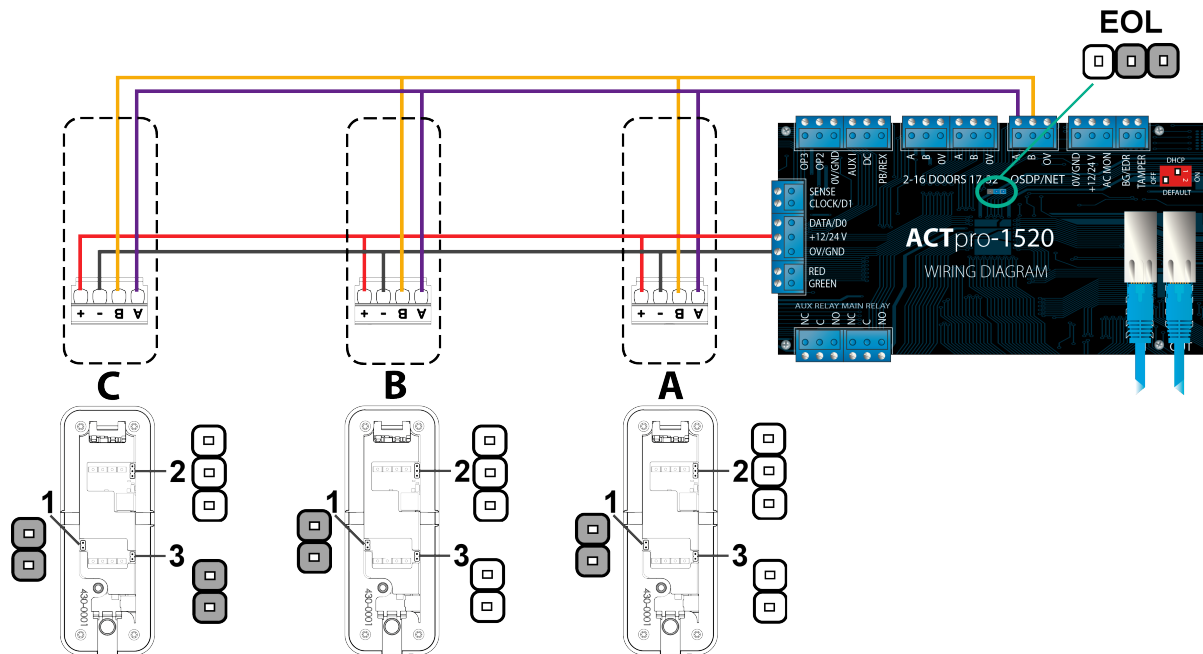
A	B	C
Address 1	Address 2	Address 3 (**End Of Line**)
Jumper 1 **ON**	Jumper 1 **ON**	Jumper 1 **ON**
Jumper 2 **OFF** top 2 links	Jumper 2 **OFF** top 2 links	Jumper 2 **OFF** top 2 links
Jumper 3 **OFF**	Jumper 3 **OFF**	Jumper 3 **ON**

- Set the End Of Line (EOL) jumper on the ACT pro controller as shown.

Wire the connections between the VR series readers and an ACTpro 1520 controller as follows:

VRxx-MF - AB-+ Terminal block	ACTpro 1520
+	+12/24 V
-	0V/GND

VRxx-MF - AB-+ Terminal block	ACTpro 1520
A	A (OSDP/NET block)
B	B (OSDP/NET block)

> ⚠️ For more information on how to correctly locate and fit the terminal blocks, see *Connecting the cables* on page 17.

Cable length guide

Mode	Max. Cable length	Cable
OSDP	1 km.	Screened twisted pair (For example; Belden 9501)

# 10.3 Setting the jumpers for OSDP mode

For more information on setting the jumpers in a VR20 or VR 50 Mullion reader, see *Setting the Jumpers* on page 20.

> ℹ️ For ACT systems it is possible to select Jumper 2 in the OFF position in OSDP mode, which is automatically selecting the address depending on the number of readers added to the system. Therefore, it is not necessary to select a specific OSDP address for each reader via the Jumper setting.

10.3.1 Setting the OSDP address for the reader
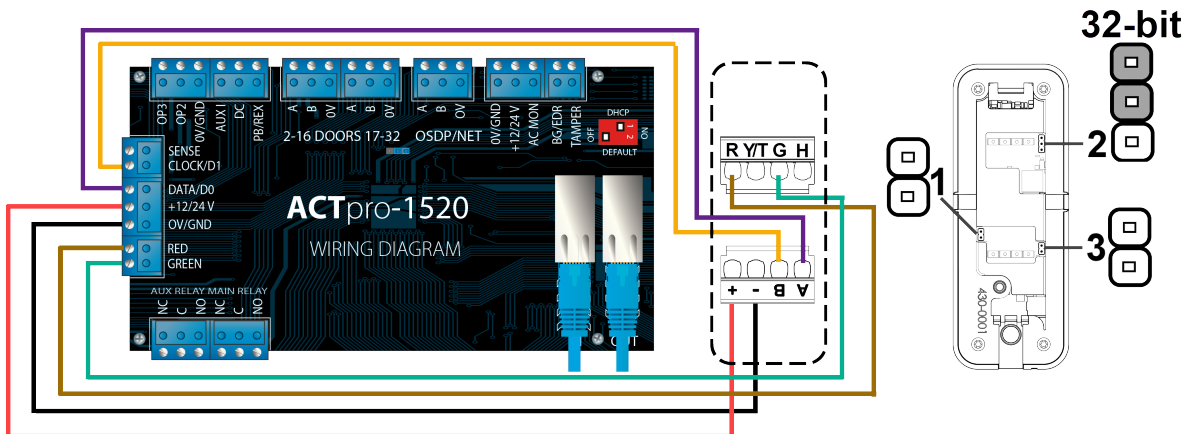
In the OSDP reader section of the ACTPro Software use the auto-discovery function to find the readers.
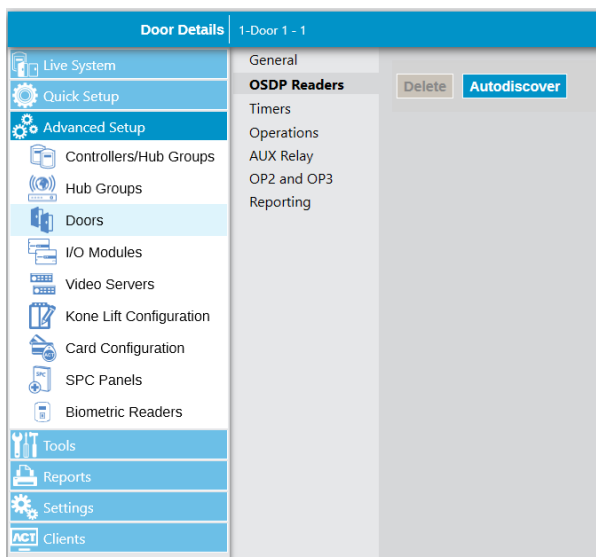
During installation:

- Record the 7 digit serial number.
- Record the door name.
- Record if a reader is an entry or exit reader.

10.4 Connecting an entry reader to ACT in Wiegand mode

For Wiegand (32-bit) mode, set the jumpers on the VR series reader as shown in 1,2, 3 in the diagram.

Wire the connections between a Entry reader and an ACTpro-15xx controller as follows:

AB-+ Terminal block	ACTpro 1520
+	+12/24 V
-	0V/GND
A	DATA/D0
B	CLOCK/D1

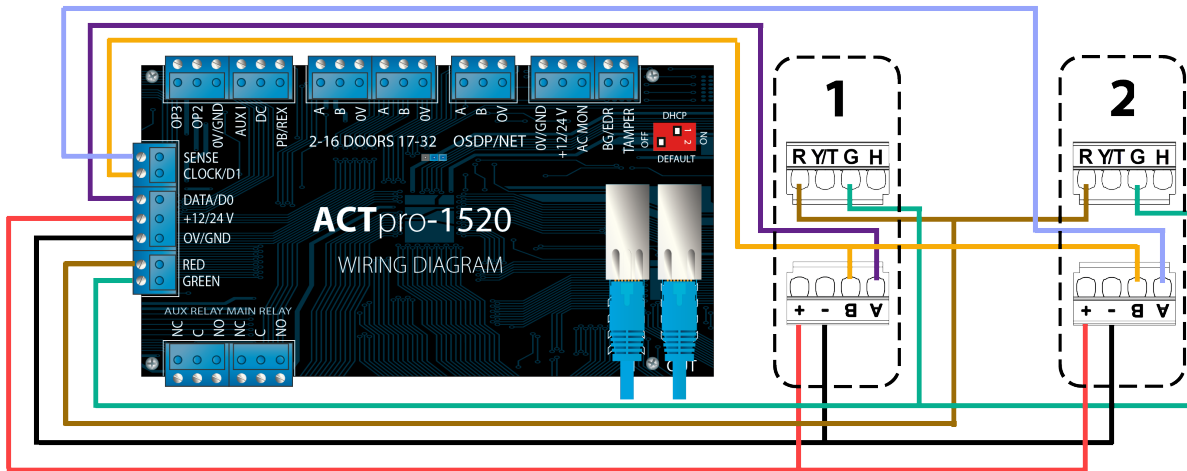| R Y/T G H Terminal block	ACTpro-15xx
R	RED
Y/T	
G	GREEN
H	

⚠️ For more information on how to correctly locate and fit the terminal blocks, see *Connecting the cables* on page 17.

Cable length guide

Mode	Max. Cable length	Cable
OSDP	1 km.	Screened twisted pair (For example; Belden 9501)

10.5 Connecting an Entry and an Exit reader to ACT in Wiegand mode

1. Entry reader
2. Exit reader

Connect Entry reader to ACTpro-15xx controller

Wire the connections between an Entry reader and an ACTpro-15xx controller as follows:

AB-+ Terminal block	ACTpro 1520
A	DATA/D0
B	CLOCK/D1
-	0V/GND
+	+12/24 V

R Y/T G H Terminal block	ACTpro-15xx
R	RED
Y/T	
G	GREEN
H	

Connect Exit reader to ACTpro-15xx controller

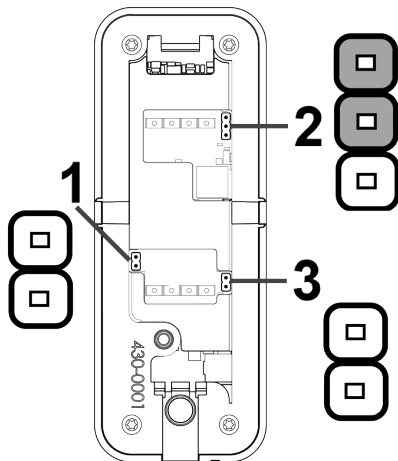Wire the connections between an Exit reader and an ACTpro-15xx controller as follows:

AB-+ Terminal block	ACTpro 1520
A	SENSE
B	CLOCK/D1
-	0V/GND
+	+12/24 V

R Y/T G H Terminal block	ACTpro-15xx
R	RED
Y/T	
G	GREEN
H	

⚠ For more information on how to correctly locate and fit the terminal blocks, see *Connecting the cables* on page 17.

10.5.1 Set the jumpers for Wiegand mode

ENTRY reader	EXIT reader
Jumper 1 **OFF**	Jumper 1 **OFF**
Jumper 2 **ON** top 2 links (32-bit)	Jumper 2 **ON** top 2 links (32-bit)
Jumper 3 **OFF**	Jumper 3 **OFF**

Cable length guide

Mode	Max. Cable length	Cable
Wiegand	30m.	Screened multicore (For example; Belden 9538)

11 Connecting the VR series reader to SPC

11.1 Connect a single-reader to an SPCA210 door controller through an SE1190 OSDP interface

Using an SE1190 OSDP interface, you can connect a single VR series reader in OSDP mode to an SPCA210 door controller.
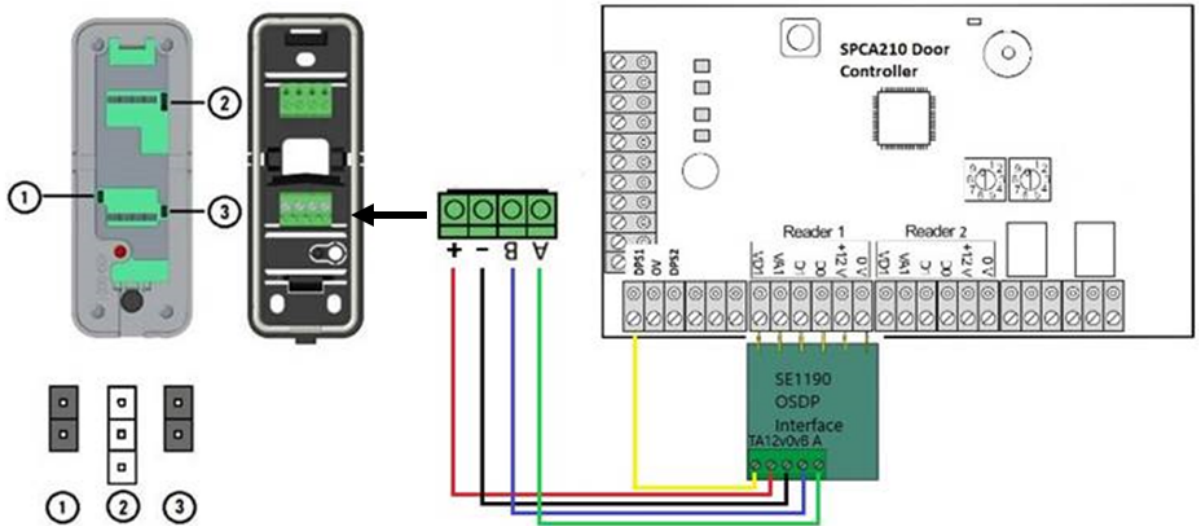
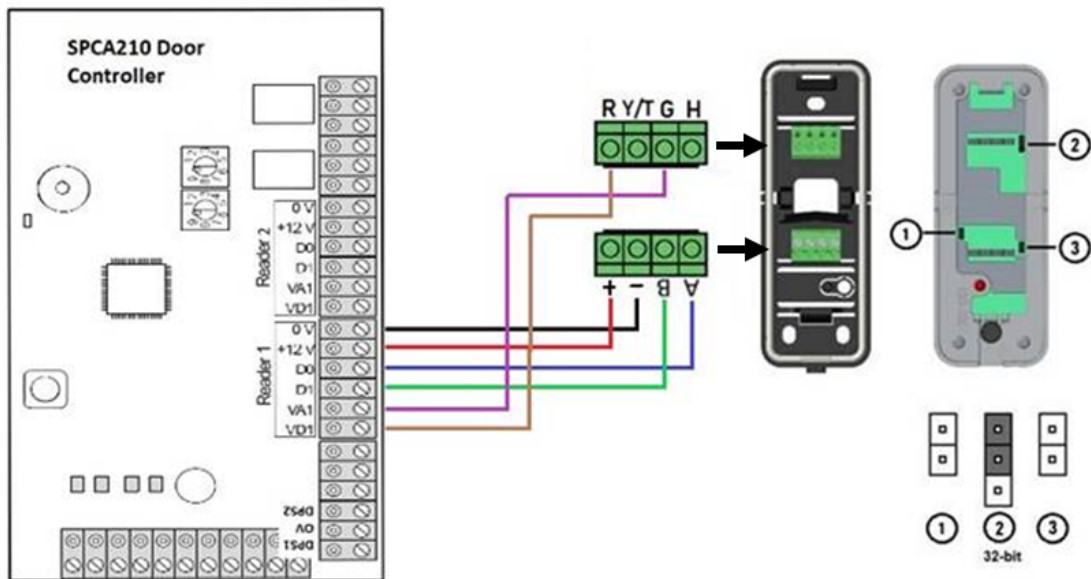| A B - + Terminal block	SPCA210 door controller	SE1190 OSDP interface
A		A
B		B
-		0V
+		12V
	DP51	TA

Reader jumper settings
Jumper 1 ON
Jumper 2 OFF
Jumper 3 ON

Cable length guide

Mode	Max. Cable Length	Cable
OSDP	500m.	Screened twisted pair (For example; Belden 9501)

11.2 Connecting a reader to an SPCA210 in Wiegand mode

You can connect a VR series reader in Wiegand mode directly to an SPCA210 door controller.

Wire the connections between the reader and an ACTpro-15xx controller as follows:

AB-+ Terminal block	SPCA210 door controller Reader 1 block
A	D0
B	D1
-	0V
+	+12V

R Y/T G H Terminal block	SPCA210 door controller Reader 1 block
R	VD1
Y/T	
G	VA1
H	

Reader jumper settings
Jumper 1 OFF
Jumper 2 ON top 2 links
Jumper 3 OFF

Cable length guide

Mode	Max. Cable length	Cable
Wiegand	30m.	Screened multicore (For example; Belden 9538)

11.3 Connect 2 readers in Wiegand mode to an SPCA210 door controller

You can connect 2 VR series reader in Wiegand mode directly to an SPCA210 door controller.
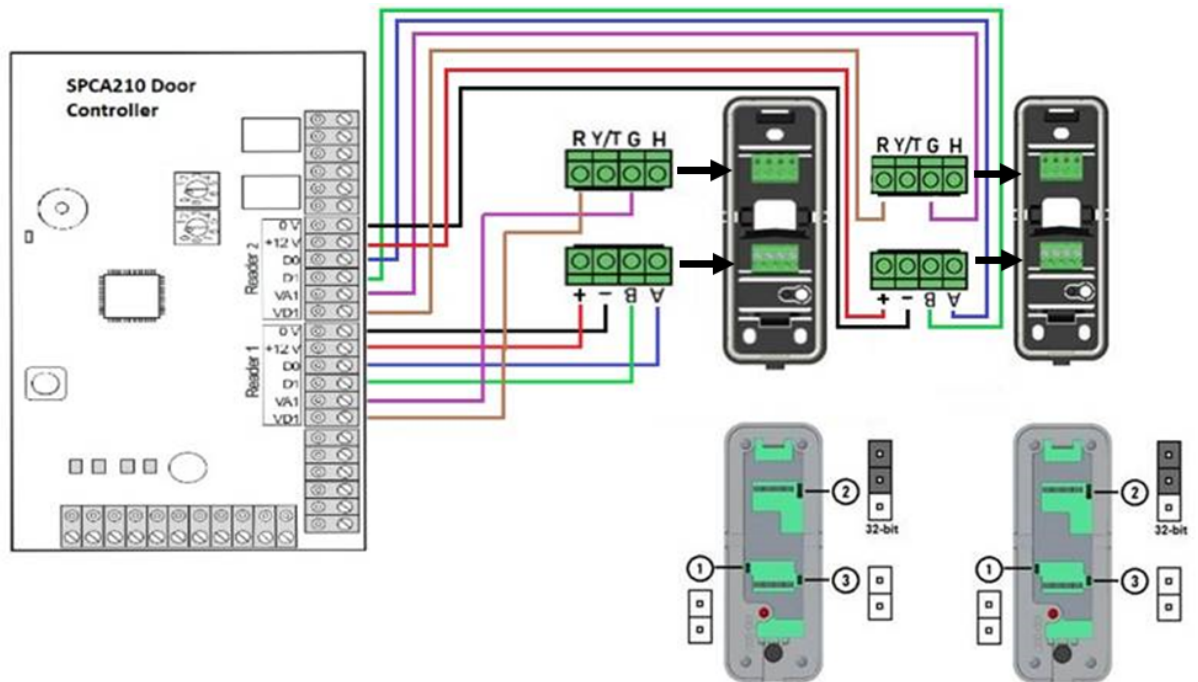
Reader 1 wiring

AB-+ Terminal block	SPCA210 door controller Reader 1 block
A	D0
B	D1
-	0V
+	+12V

R Y/T G H Terminal block	SPCA210 door controller Reader 1 block
R	VD1
Y/T	
G	VA1
H	

Reader 2 wiring

AB-+ Terminal block	SPCA210 door controller Reader 1 block
A	D0
B	D1
-	0V
+	+12V

R Y/T G H Terminal block	SPCA210 door controller Reader 1 block
R	VD1
Y/T	
G	VA1
H	

Reader 1 and Reader 2 jumper settings
Jumper 1 **OFF**
Jumper 2 **ON** top 2 links
Jumper 3 **OFF**

Cable length guide

Mode	Max. Cable length	Cable
Wiegand	30m.	Screened multicore (For example; Belden 9538)

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