

# ACTpro MIFARE Readers

## Installation Guide



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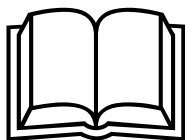
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# Table of Contents

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<b>1 Overview</b>	<b>4</b>
1.1 Product description	4
1.2 Technical specification	4
1.3 Reader connections	5
1.3.1 MF1040e/MF1050e	5
1.3.2 MF1030e	6
1.3.3 CAT5/6 colour code	6
1.4 Wiring for ACTpro and ACT365	7
1.4.1 Attaching the ferrite bead	7
1.4.2 Clock & Data entry reader	7
1.4.3 Clock & Data exit reader	8
1.4.4 Wiegand entry reader	8
1.4.5 Wiegand exit reader	9
1.5 Reader configuration	9
1.5.1 Operation: MF1030PM / MF1040e / MF1050e	9
1.5.2 Operation: MF1030e	9
1.5.3 Sector reader	9
1.5.4 Serial and Reverse Serial reader	10
1.6 Reader re-programming	10
1.6.1 Backlight operation – MF1050e	10
1.6.2 Buzzer operation	10
1.6.3 Power On beep codes	10
<b>2 Mounting instructions</b>	<b>12</b>
2.1 MF1030PM	12
2.1.1 Panel mount reader connections to the ACTpro door controllers and door stations	13
2.1.2 LED control	13
2.1.3 Wiring for Clock & Data / Wiegand reader	13
2.2 MF1040e/MF1050e	14
2.2.1 Surface mount	14
2.2.2 Flush mount	14
2.2.3 Flush mount to UK pattress box	15
2.3 MF1030e	16

# 1 Overview

This guide describes the following products:

- MF1030e ACTpro MIFARE Mullion Reader
- MF1030PM ACTpro MIFARE Reader panel mount
- MF1040e ACTpro MIFARE Reader
- MF1050e ACTpro MIFARE Reader with keypad

## 1.1 Product description

ACTpro MIFARE Classic® readers support all Vanderbilt MIFARE cards and fobs. They can be configured to read serial, reverse serial or sector data from any third party MIFARE Classic card.

- Compatible with Vanderbilt MIFARE cards and fobs
- Configured to read Vanderbilt sector data, serial number or reverse serial number
- Configured to read sector data from any MIFARE Classic card (read key required)
- Configured for Wiegand or Clock & Data output
- Configurable backlight (MF1050e only)

## 1.2 Technical specification

	MF1030e	MF1030PM	MF1040e	MF1050e
<b>Connections</b>	Pigtail	Terminal Block	Terminal Block	Terminal Block
<b>Dimensions W x H x D</b>	37 x 120 x 15mm	63 x 58 x 23mm	95 x 128 x 19mm	95 x 128 x 21mm
<b>Mounting</b>	Mullion	Panel	Flush or Surface	Flush or Surface
<b>Weight</b>	150g	65g	142g	155g
<b>Power Supply</b>	12V DC – 24V DC	12V DC – 24V DC	12V DC – 24V DC	12V DC – 24V DC
<b>Selectable sector, serial &amp; reverse serial</b>	Yes	Yes	Yes	Yes
<b>Current Consumption (Typical)</b>	30mA	30mA	70mA	70mA
<b>Current Consumption (Peak)</b>	130mA	70mA	140mA	140mA
<b>Operating Temperature</b>	-40°C to +50°C	-40°C to +50°C	-40°C to +50°C	-40°C to +50°C
<b>Transmit Frequency</b>	13.56MHz	13.56MHz	13.56MHz	13.56MHz
<b>Keypad</b>	No	No	No	Yes
<b>Environmental Rating</b>	IP67	IP67	IP67	IP67
<b>Cable Distance</b>	100m	100m	100m	100m

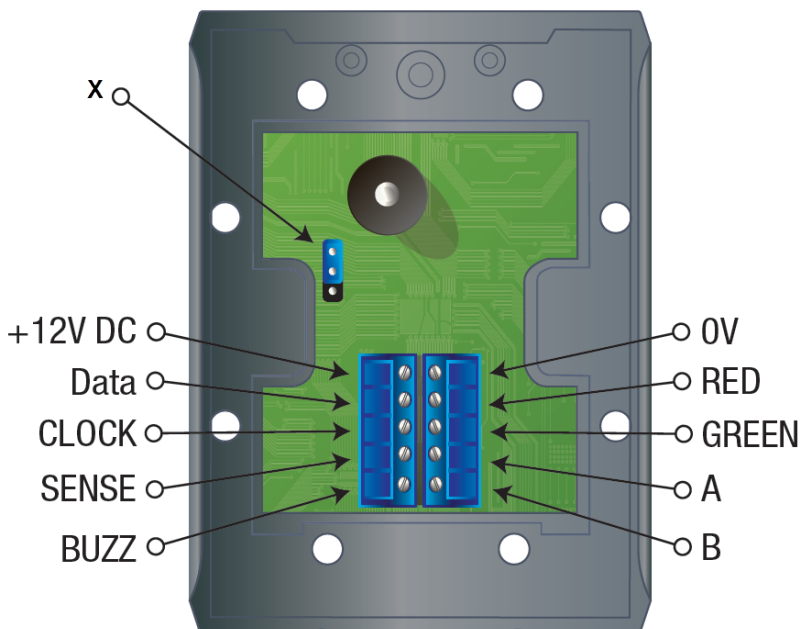
	MF1030e	MF1030PM	MF1040e	MF1050e
<b>Output Formats</b>	Wiegand or Clock & Data	Wiegand or Clock & Data	Wiegand or Clock & Data	Wiegand or Clock & Data
<b>Indoor &amp; Outdoor</b>	Yes	Yes	Yes	Yes
<b>Card &amp; PIN</b>	Card only	Card only	Card only	Card & PIN



ACTpro MIFARE readers must be powered from a fused AC/DC PSU (12–24V, 1A maximum). If the reader is used in a manner not specified in this document, the protection provided by the reader may be impaired.

### 1.3 Reader connections

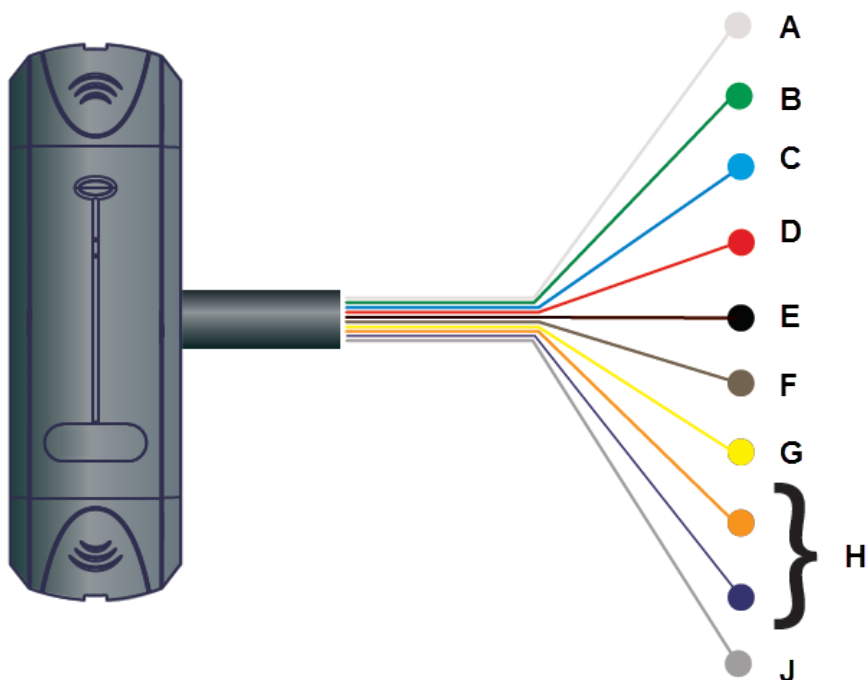
#### 1.3.1 MF1040e/MF1050e



<b>X</b>	Sector/Serial operation jumper
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### 1.3.2 MF1030e

MF1030e is supplied with 3m pigtail cable.



<b>A</b>	SENSE (White)	<b>F</b>	RED LED (Brown)
<b>B</b>	CLOCK/D1 (Green)	<b>G</b>	GREEN LED (Yellow)
<b>C</b>	DATA/D0 (Blue)	<b>H</b>	(Orange and Purple) – Programming Sector/Serial
<b>D</b>	+12V (Red)	<b>J</b>	ISP (Grey) – Unused
<b>E</b>	0V/GND (Black)		

### 1.3.3 CAT5/6 colour code

The following is the suggested colour coding if using CAT5 or CAT6 cabling.

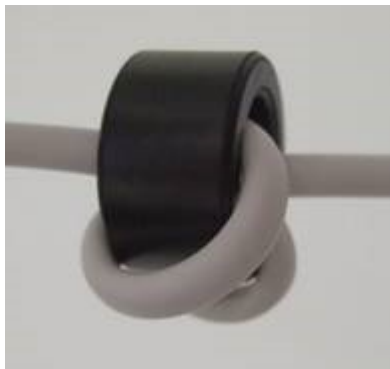
Reader Output	Colour
<b>Sense</b>	White/Green
<b>Clock / D1</b>	Green
<b>Data / D0</b>	Blue
<b>+12V</b>	Orange
<b>(0V) GND</b>	White/Orange
<b>Red LED</b>	Brown
<b>Green LED</b>	White/Brown
<b>Orange &amp; Purple</b>	Programming Sector/Serial
<b>ISP</b>	Grey (Unused)

## 1.4 Wiring for ACTpro and ACT365

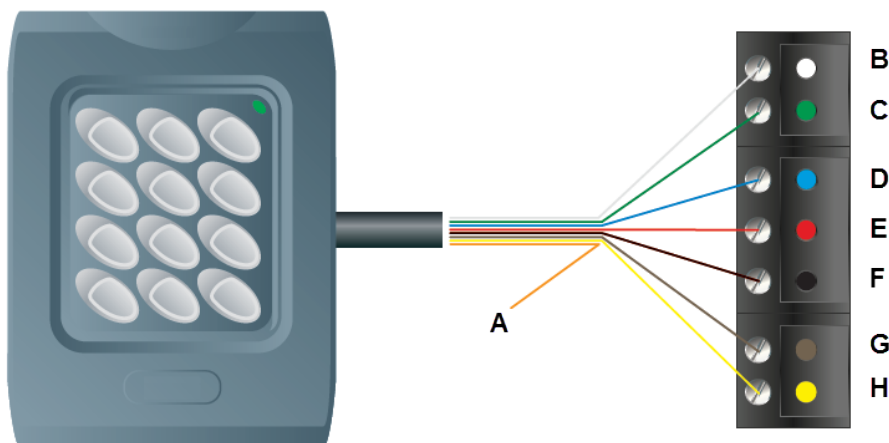
**Note:** Illustrations apply to all ACTpro MIFARE readers.

### 1.4.1 Attaching the ferrite bead

A ferrite bead is supplied with all ACTpro MIFARE MF1040e/MF1050e readers. To comply with the EMC directive, the ferrite bead must be attached to the reader connection cable, as close as possible to the reader terminal block. Wind the reader connection cable around the ferrite bead twice tightly.

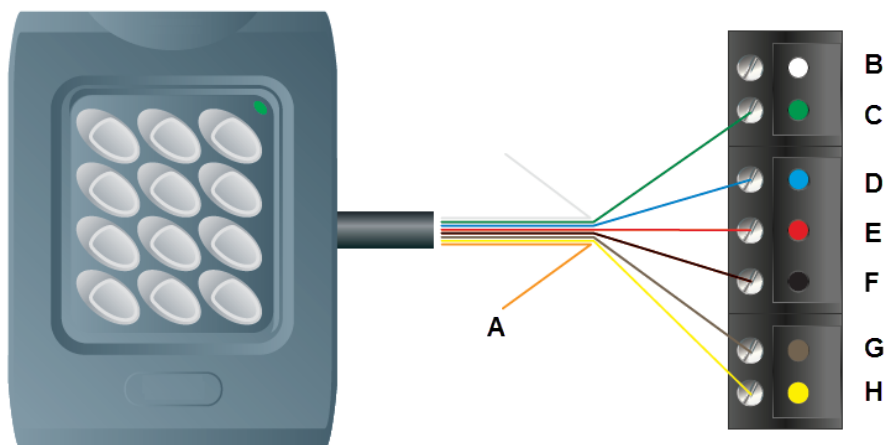


### 1.4.2 Clock & Data entry reader



<b>A</b>	Buzzer input (not available on MF1030e)	<b>E</b>	+12V (Red)
<b>B</b>	SENSE (White)	<b>F</b>	0V / GND (Black)
<b>C</b>	CLOCK / D1 (Green)	<b>G</b>	RED (Brown)
<b>D</b>	DATA / D0 (Blue)	<b>H</b>	GREEN (Yellow)

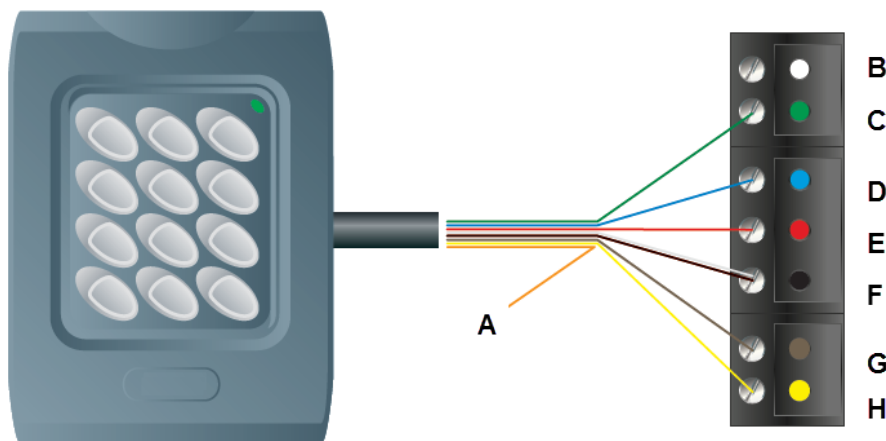
### 1.4.3 Clock & Data exit reader



<b>A</b>	Buzzer input (not available on MF1030e)	<b>E</b>	+12V (Red)
<b>B</b>	SENSE (White) – DO NOT CONNECT SENSE	<b>F</b>	0V / GND (Black)
<b>C</b>	CLOCK / D1 (Green)	<b>G</b>	RED (Brown)
<b>D</b>	DATA / D0 (Blue)	<b>H</b>	GREEN (Yellow)

### 1.4.4 Wiegand entry reader

**IMPORTANT:** To put ACTpro MIFARE readers into Wiegand, mode connect the SENSE on the reader to 0V/GND.

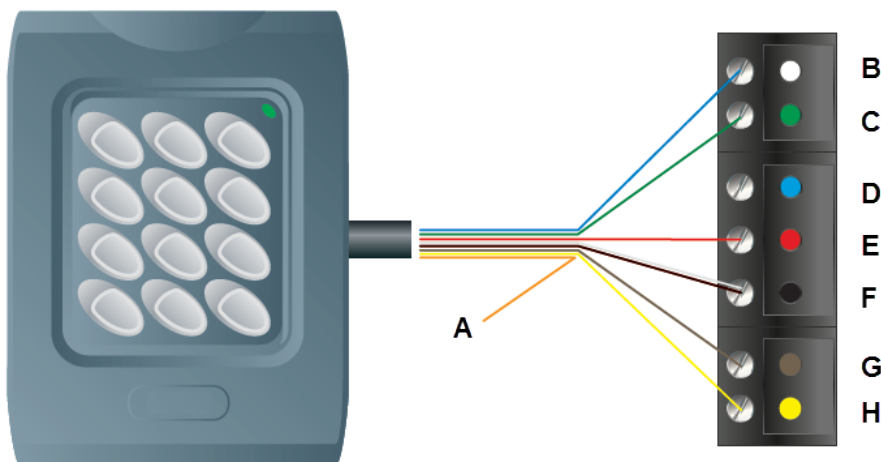


<b>A</b>	Buzzer input (not available on MF1030e)	<b>E</b>	+12V (Red)
<b>B</b>	SENSE	<b>F</b>	0V / GND (Black, White)
<b>C</b>	CLOCK / D1 (Green)	<b>G</b>	RED (Brown)
<b>D</b>	DATA / D0 (Blue)	<b>H</b>	GREEN (Yellow)



### 1.4.5 Wiegand exit reader

**IMPORTANT:** To put ACTpro MIFARE readers into Wiegand mode, connect the SENSE on the reader to 0V/GND PIN and DATA/D0 to the SENSE PIN on the controller.



<b>A</b>	Buzzer input (not available on MF1030e)	<b>E</b>	+12V (Red)
<b>B</b>	SENSE (Blue)	<b>F</b>	0V / GND (Black, White)
<b>C</b>	CLOCK / D1 (Green)	<b>G</b>	RED (Brown)
<b>D</b>	DATA / D0	<b>H</b>	GREEN (Yellow)

## 1.5 Reader configuration

### 1.5.1 Operation: MF1030PM / MF1040e / MF1050e

ACTpro MIFARE readers can operate in sector, serial or reverse serial mode. Mode is selectable via a jumper. To change the operation mode power down the reader, change the jumper for the desired operation and re-apply power.



Connect pins 1 & 2



Connect pins 2 & 3



Do NOT connect jumper

### 1.5.2 Operation: MF1030e

The operation of the MF1030e is selectable via cable configuration. To change the operation power down the reader, change the Orange and Purple cable for the desired operation and re-apply power.

Colour	Sector	Serial	Reverse Serial
<b>Orange</b>	0V	0V	Not Connected
<b>Purple</b>	0V	Not Connected	0V

### 1.5.3 Sector reader

The default sector reader operation reads a number encoded into Sector 1 of the MIFARE cards and fobs. The ACTpro MIFARE readers can be programmed to read any specified sector data. See *Reader re-programming* on the facing page.

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### 1.5.4 Serial and Reverse Serial reader

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When in Serial or Reverse Serial mode, the MIFARE card serial number (CSN) is read by the reader.

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## 1.6 Reader re-programming

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The ACTpro MIFARE readers ship from the factory pre-configured to read Vanderbilt MIFARE cards and fobs. The ACTpro MIFARE reader can also be reconfigured for serial or reverse-serial by repositioning the jumpers. (See *Reader configuration* on the previous page.)

On sites with an existing installation of MIFARE cards, it may be necessary to re-program MIFARE readers so that data on the existing MIFARE cards can be read. The ACTpro MIFARE readers are re-programmed using a programming card.

The programming card can be generated on site using ACTenterprise software and an ACTpro USB reader (**ACTinstall > Advanced Setup > Card Configuration > MIFARE format**). You will require the following information on how the existing cards are encoded before generating the programming card: Data Format, Data Orientation, Start and End Byte Position, and Read/Write Keys.

To re-program an ACTpro MIFARE reader the programming card must be presented to the reader after power up and while the LED is Red. The ACTpro MIFARE reader will acknowledge the re-programming by playing an ascending note tune. (Configuration is held in non-volatile memory.)

Readers that have been re-programmed may be reset to read Vanderbilt-issued MIFARE cards and fobs with a Default Programming Card.

ACTpro MIFARE readers that have been programmed to read third-party MIFARE cards and fobs will play a series of ascending notes after being powered up in addition to the standard beep codes, this is to indicate that it no longer reads the MIFARE cards and fobs issued by Vanderbilt.

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### 1.6.1 Backlight operation – MF1050e

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The MF1050e ACTpro MIFARE Reader has backlight illumination of the keypad. The default operation is for the illumination to be switched on. During installation the back light operation may be switched off or changed to automatic. In automatic mode the keypad is illuminated for 20 seconds on a key press or when a card is presented to the reader.

To change the backlight operation: Power up the reader. The LED on the top right hand side will cycle through green, blue and red, and back to blue. While the LED is red, enter the code below for the required operation. The code must be completely entered while the LED is red.

- Always on (Default): X014000
- Always Off: X014001
- Automatic: X014008

**Note:** The backlight operation for the MF1030PM is controlled by jumpers marked **LED**. See *LED control* on page 13.

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### 1.6.2 Buzzer operation

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The internal buzzer is activated by applying 0V to the Buzz PIN. The buzzer activates 4 seconds after the 0V is applied and sounds continuously until the 0V is removed (external buzzer control is not available on the MF1030e).

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### 1.6.3 Power On beep codes

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The Output Data Format and the Sector/Serial Operation of the reader can be determined by the beeps generated by the reader after power is applied. The reader will generate two sets of beeps, the first indicating the Output Data Format and the second set of beeps indicating Sector or Serial Operation. The first set of beeps will occur while the LED is green, the second set of beeps occur half a second later while the LED is blue.

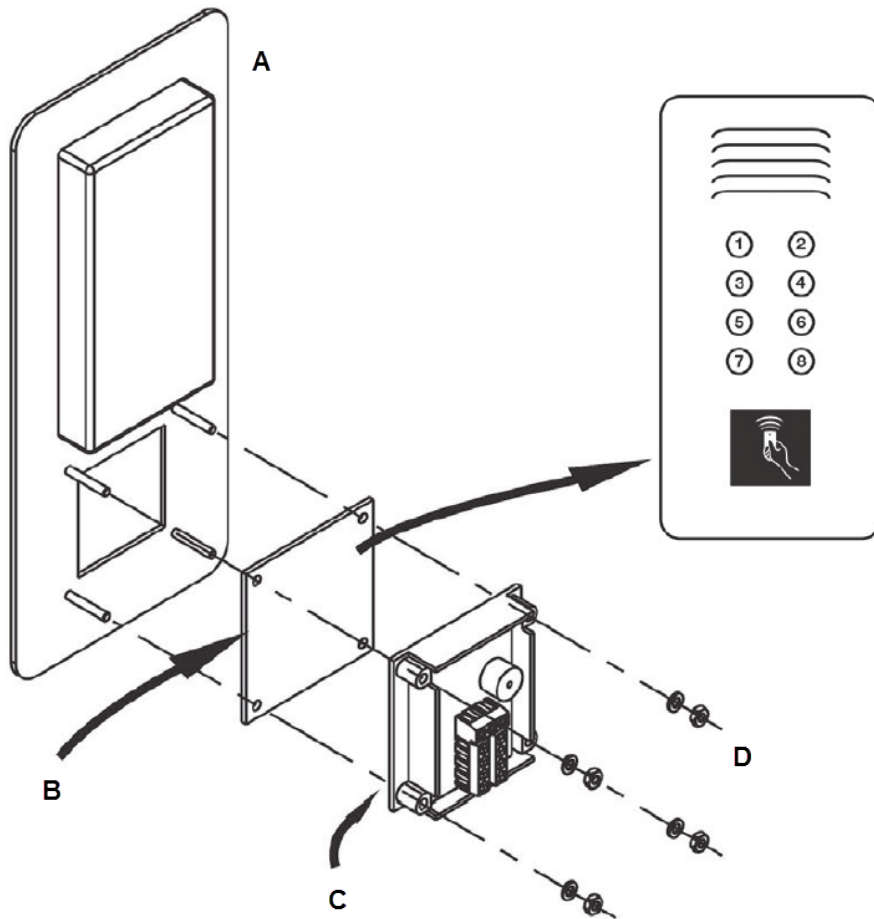
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First beep set	Double beep	Sector reader
	Single beep	Serial reader
	Triple beep	Serial reader (byte reverse)
Second beep set	Double beep	Clock & Data output
	Single beep	Wiegand 37 bit output

**Note:** If the reader has been re-programmed (see *Reader re-programming* on the previous page), then a series of notes is played after the second beep set, this indicates that the default programming to read ACTpro MIFARE cards has been changed.

## 2 Mounting instructions

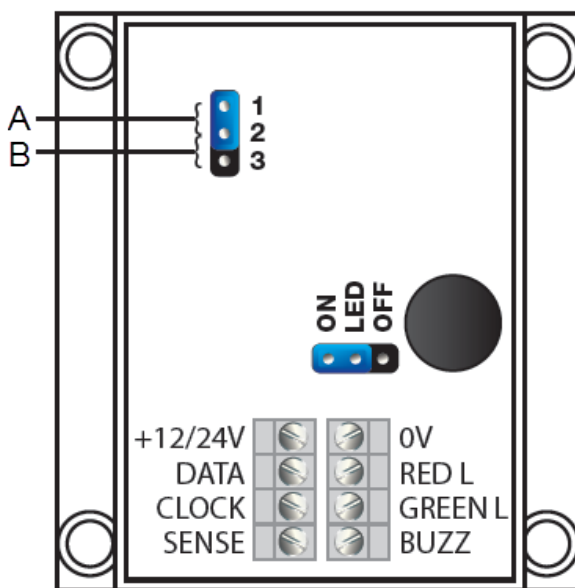
### 2.1 MF1030PM



<b>A</b>	Audio entry panel
<b>B</b>	VR screen printed perspex
<b>C</b>	ACTpro MIFARE panel mount reader
<b>D</b>	M3 washers and nuts

1. Place the VR screen printed perspex over the four studs on the back of the audio entry panel.
2. Place the ACTpro MIFARE panel mount reader over the four studs.
3. Use the four M3 washers and nuts supplied with the product to secure the reader to the audio entry panel.
4. Use the wiring diagram below to connect the reader to the controller.
5. When wiring is complete, place the front cover back onto the audio entry panel.
6. Apply power to the controller and test the reader with a card or fob.

### 2.1.1 Panel mount reader connections to the ACTpro door controllers and door stations



<b>A</b>	Jumper pins 1 and 2	Sector operation
<b>B</b>	Jumper pins 2 and 3	Serial operation
	No jumper	Byte reversed serial operation

### 2.1.2 LED control

The standby LED on the front of the reader can be configured using the jumper. When the jumper is connected between LED and OFF, the blue LED on the front of the reader will remain off while in standby. It will turn green on access granted and red on access denied.

When the jumper is connected between LED and ON, the blue LED on the front of the reader will remain on while in standby. It will turn green on access granted and red on access denied.

### 2.1.3 Wiring for Clock & Data / Wiegand reader

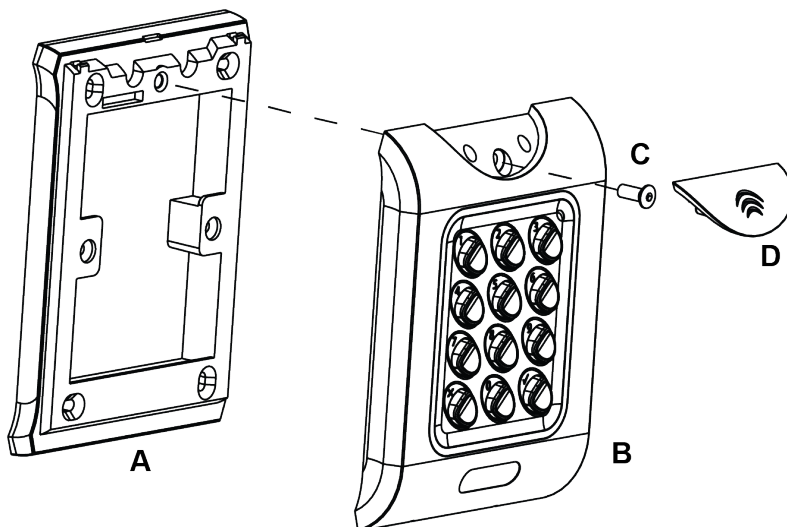
The standard wiring colours for ACTpro MIFARE readers are shown below.

Readers should be a maximum of 100m apart when powered from +12V.

<b>White</b>	SENSE
<b>Green</b>	CLOCK & DATA 1
<b>Blue</b>	DATA / DATA 0
<b>Red</b>	+12V
<b>Black</b>	0V
<b>Brown</b>	RED LED
<b>Yellow</b>	GREEN LED
<b>Orange</b>	BUZZER Ctrl

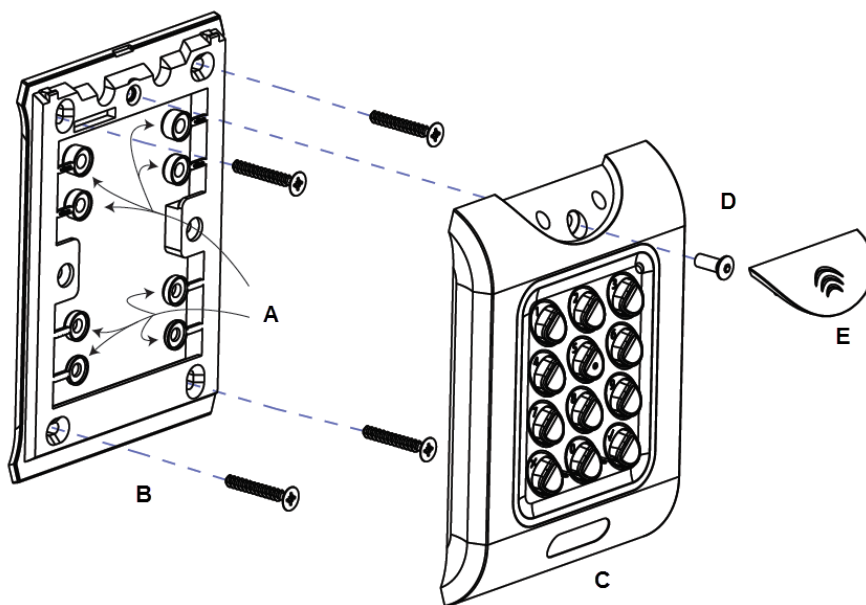
## 2.2 MF1040e/MF1050e

### 2.2.1 Surface mount



- |          |  |
|----------|--|
| <b>A</b> | Mount the surface mount collar on the wall using the fixing kit supplied in the box. |
| <b>B</b> | Place the reader/keypad onto the surface mount collar and clip down into place.      |
| <b>C</b> | Use the security screw supplied to attached the unit to the surface mount collar.    |
| <b>D</b> | Place the cap onto the unit and push firmly in place.                                |

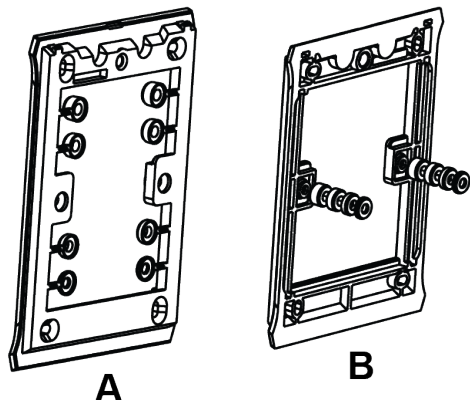
### 2.2.2 Flush mount



- |          |  |
|----------|--|
| <b>A</b> | Remove spacers before mounting.  |
| <b>B</b> | Prepare the mounting surface to receive sub-surface terminals.<br>Mount the flush mount collar on the wall using the fixing kit supplied in the box. |
| <b>C</b> | Place the reader/keypad onto the surface mount collar and clip down into place.  |

- |          |   |
|----------|---|
| <b>D</b> | Use the security screw supplied to attached the unit to the flush mount collar. |
| <b>E</b> | Place the cap onto the unit and push firmly in place.                           |

### 2.2.3 Flush mount to UK pattress box

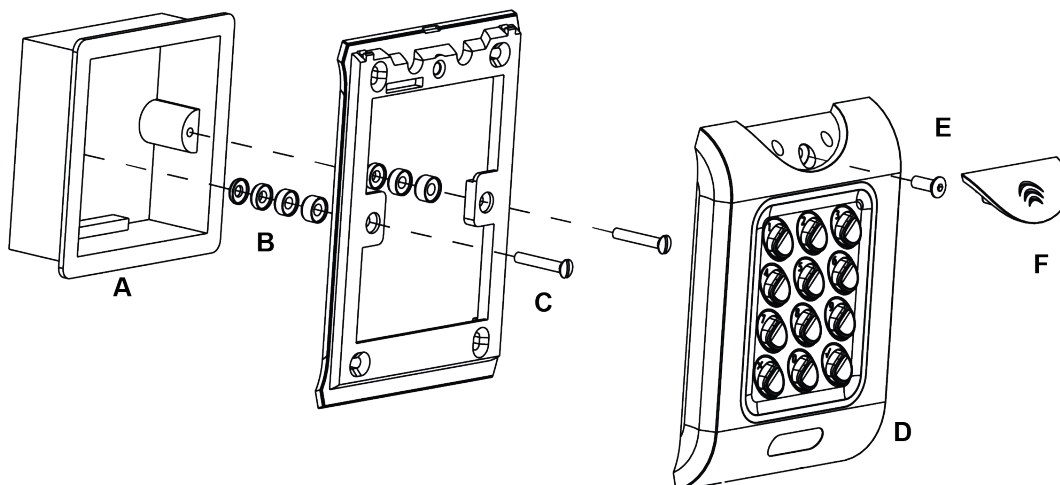


Spacers break away from main component when required by installer for use.

Determine the distance between the pattress box and the mounting plate, using the spacers that are labelled 1mm to 4mm. A spacer of the correct length is assembled by stacking the spacers together.

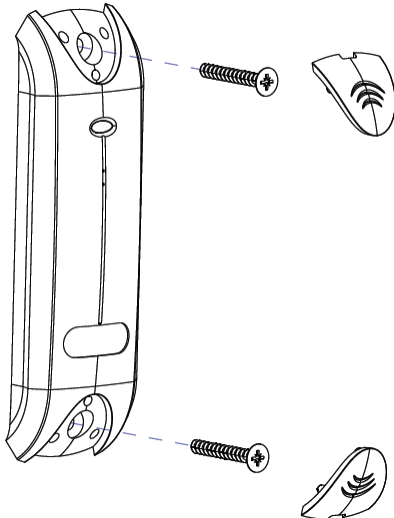
View **A** shows mounting plate before spacers are broken away by installer.

View **B** shows spacer stacking.



- |          |   |
|----------|---|
| <b>A</b> | Standard pattress box.  |
| <b>B</b> | Attach the mounting plate to the pattress using the screws supplied ( <b>C</b> ).   |
| <b>C</b> | Ensure the correct spacers ( <b>B</b> ) have been used to bridge the gap between the mounting plate and the fixing wings of the pattress box to avoid the mounting plate being distorted. |
| <b>D</b> | Place the reader/keypad onto the surface mount collar and clip down into place.   |
| <b>E</b> | Use the security screw supplied to attached the unit to the flush mount collar.   |
| <b>F</b> | Place the cap onto the unit and push firmly in place.   |

### 2.3 MF1030e



Screw unit to the surface. Place caps on to the unit and push firmly into place.





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