



Incedo™

EAC-M50
Installation Guide

ASSA ABLOY
Opening Solutions

Experience a safer
and more open world

1 Introduction

Product Description

Incedo™ Business is ASSA ABLOY's new access control system, optimised for small to medium-sized businesses yet easily upgraded to meet the demands of a large, multi-site organisation. Designed around three core hardware components and three software options, Incedo Business will meet your customer's requirements no matter how complex.

This powerful access control solution has features which punch well above its weight. An Incedo Business system is easy to install, configure and manage, thanks to its design and use of plug-and-play hardware with simple in-field configuration. The system offers many enterprise features without the associated costs.

Incedo Business Lite is an embedded application included with every Cluster Controller. With no need for a dedicated PC or complicated software to install, you simply browse to the controller on your client's network and begin to manage the system instantly. The interface is easy to use, with auto ID of hardware, simple configuration menus, and multiple means of adding credentials to the system. Incedo Business Lite is quick to set up and ready to go.

For applications where multi-site and advanced access control functionality are a requirement, we developed Incedo Business Plus. This solution can manage hundreds of sites, thousands of doors and tens of thousands of key holders from multiple workstations. Integrations with third-party CCTV and elevator systems, plus visitor management capability, make Incedo Business Plus ideal for multiple, connected applications.

Finally Incedo Business Cloud hosted within ASSA ABLOY's ultra-secure environment, offers additional features over Incedo Business Plus, as well as giving the owner and an installation partner access to the system 24/7. No longer must you be on-site to amend configuration or access vital information to run reports. Simply connect to your network from a PC or tablet with internet access to take true, real-time control of your Incedo Business system.

Reliable and backed by a strong warranty, ASSA ABLOY puts access control from a trusted industry leader within reach.

2 System Specifications

Note:

- Additional EAC-DM5 Door Reader Modules are required
- See System Architecture – Best Practices on page 4 for more details

Hardware capabilities (per EAC-M50 enclosure)

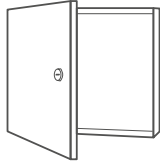
Feature	Specification
Max People	1000 Lite 125000 Plus version 1000 Cloud (per instance)
Max Cards	3 Cards per Person
Max Logs	100 000
#of Doors	Upto 8 in readers or upto 4 in and out readers

Our range of Wireless Aperio® door locks can be simply integrated with the EAC-M50 via a communication hub to connect to Incedo Business, offering increased online access control possibilities.

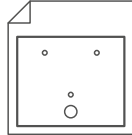
For 32 doors, there can be any combination of both wired and wireless Aperio locks or readers.

3 What's in the packaging?

EAC-M50 Contents



EAC - M50



Drilling
template



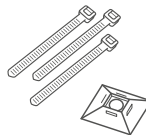
Quick Install
Guide



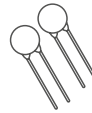
More
Documentation



Duplicate
Labels



Cable ties
& anchor



Metal-Oxide
Variators (MOVs)



Spare
fuses

4 Installation preparation

***Note**
Installation of Aperio units requires Aperio AH30 communication hubs, commissioning software and USB dongle

System requirements

- Compatible PC Browser
- Access to an Ethernet Network point or a router/switch that will allow network connectivity
- In the absence of any network, Incedo Business Lite can be set up and administered by connecting a desktop/laptop PC directly to the Controller Module with an (uncrossed) network cable
- Mains power with 3A fused spur

Suggested Tools

- Electric drill
- Drill bits (Masonry / steel – to suit the site wall materials)
- Screwdriver, small, flat
- Wire strippers
- Side cutters
- Site plan (to lay out door and reader locations)

Additional Hardware

- ASSA ABLOY wired readers
- Aperio Door Locks*
- Electric strike locks and/or magnetic locks
- Power supply with sufficient capacity to power the locks
- Push buttons for Request-to-Exit (REX)
- Door Position Sensor (DPS)
- Mains power cable
- Cable for Door Module readers, sufficient for the site (measure the site)
- Cable for Door Position Sensor and Request-to-Exit, sufficient for the site (measure the site)
- Two 1K resistors for each sense line

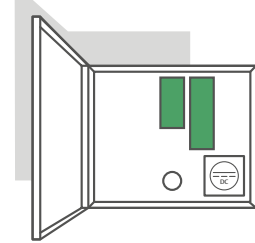
5 System Architecture. Best Practices

Aperio Hubs need to be connected to the RS485 on the Master Cluster Controller:

- Any combination of single-readers and two reader doors is permissible
- Readers may be independently allocated to any door. Whatever the combination, upto 4 entry and exit readers or 8 entry readers per enclosure

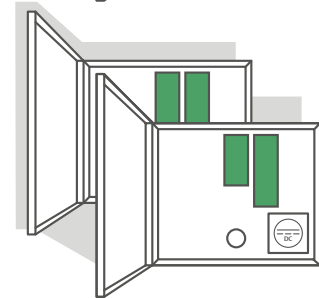
ONE EAC-M50 enclosure

- Is sufficient for upto a maximum of 2 wired doors or maximum 32 wireless doors or a combination of both



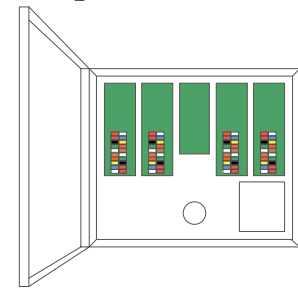
TWO+ EAC-M50 enclosures are needed:

- For 9 to 32 wired readers
- The enclosures are linked with an RS485 cable, saving on long, multiple-reader cable runs (Remember that the total wired door count still cannot exceed the 8-door limit per enclosure.)

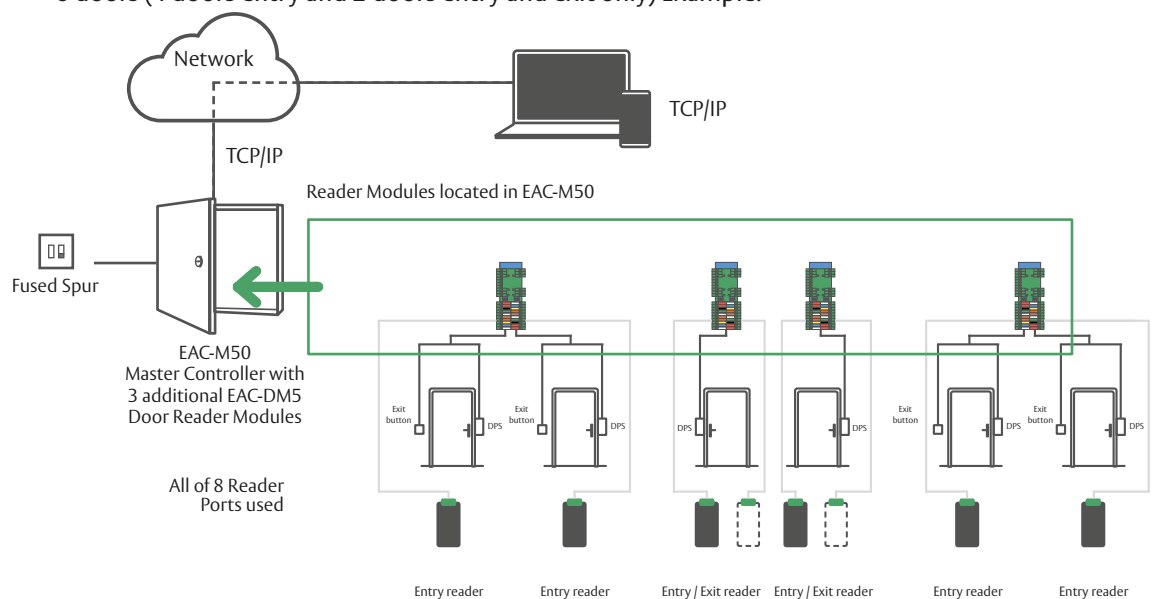


How many EAC-DM5 Door Reader Modules are needed?

- One EAC-DM5 Module is needed for each door that has both entry and exit readers
- One EAC-DM5 Module is needed for every two doors that only require entry readers
- In each EAC-M50 enclosure there is space to fit a further 3 x EAC-DM5 to total 4 x EAC-DM5



Wiring set up for Metal Enclosure Cluster Controller EAC-M50 - 6 doors (4 doors entry and 2 doors entry and exit only) Example.



Please refer to reader manufactures documentation for cable specification

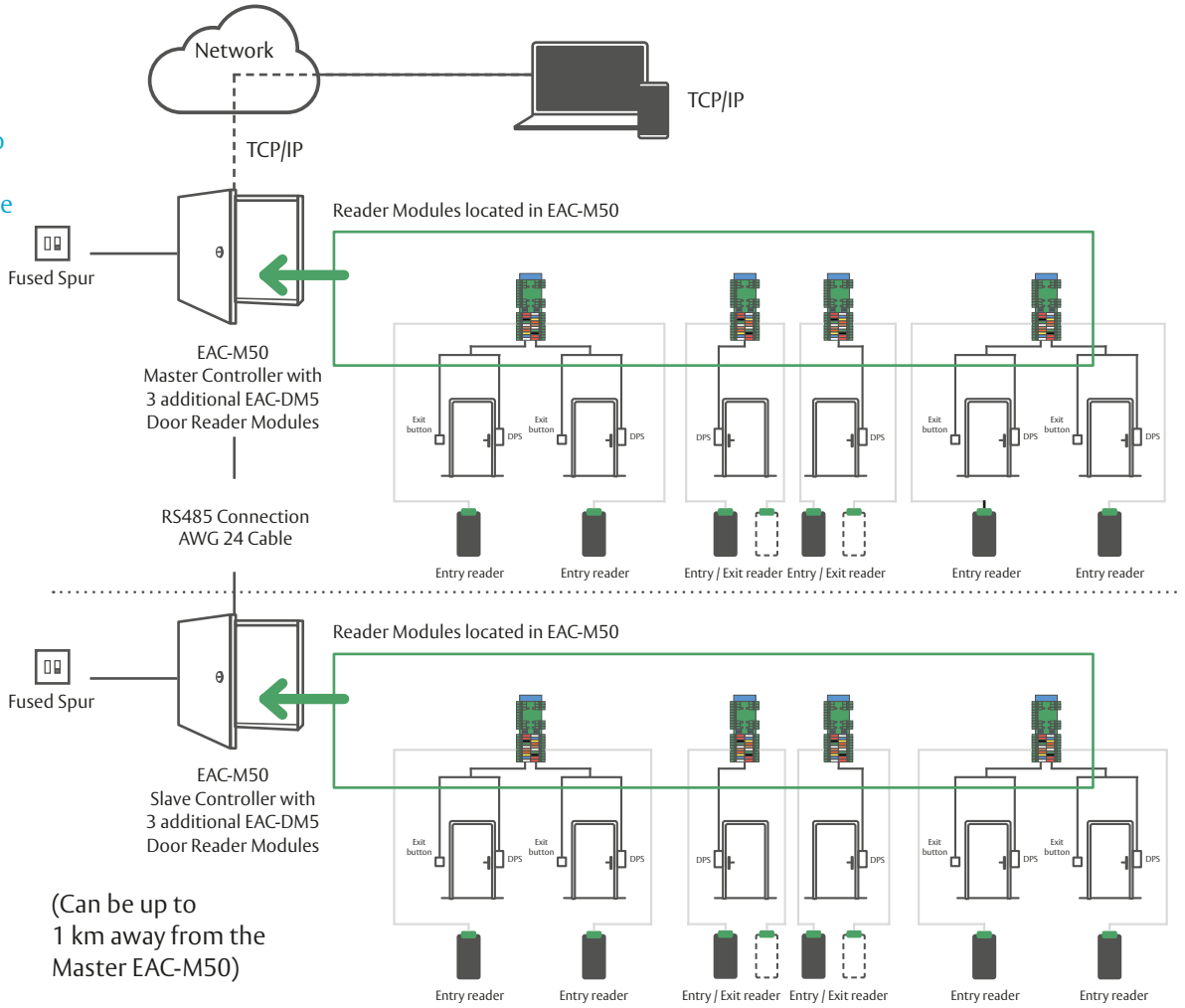
- Any combination of single-reader or entry+exit-reader doors is possible
- Lite version is connected by local network

- Cloud version is connected via the Internet
- Plus version needs to be installed onto a server PC on the customers network

Wiring set up for Metal Enclosure Cluster Controller EAC-M50 - 12 doors (8 doors entry and 4 doors entry and exit only) Example.

Incedo Business will only accomodate upto 8 wired doors in total per EAC-M50 enclosure

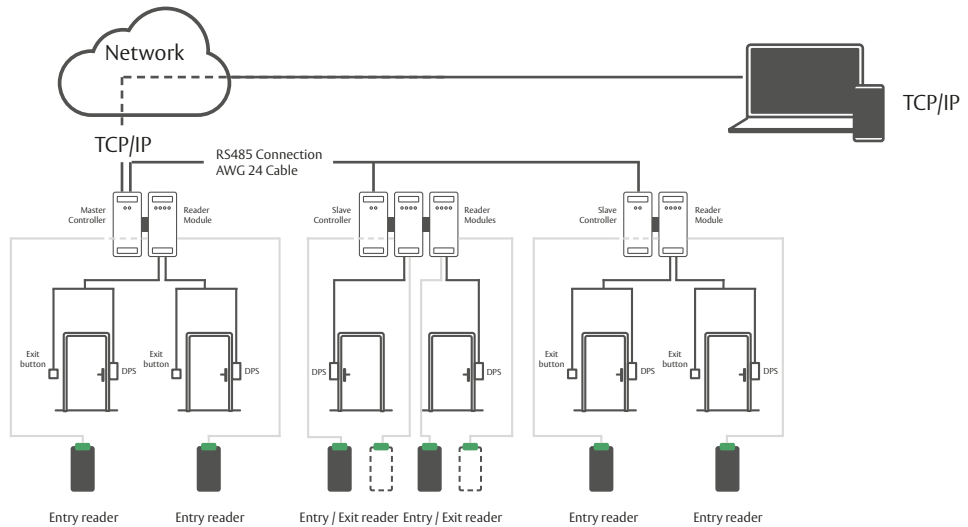
Please refer to reader manufacturers documentation for cable specification



- Lite version is connected by local network
- Cloud version is connected via the Internet
- Plus version needs to be installed onto a server PC on the customers network

Wiring set up for Plastic Housing Cluster Controller EAC-CP5 - 6 doors (4 doors entry and 2 doors entry and exit only) Example.

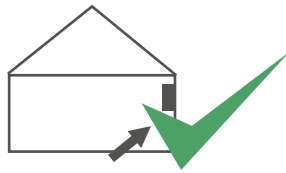
Please refer to reader manufacturers documentation for cable specification



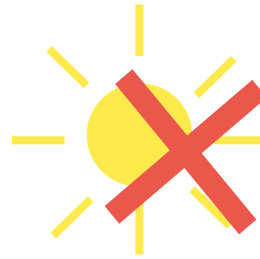
- Any combination of single-reader or entry+exit-reader doors is possible
- Lite version is connected by local network
- Cloud version is connected via the Internet
- Plus version needs to be installed onto a server PC on the customers network

6 Mounting the EAC-M50

Mounting Location Considerations Shelter and Security



Secure Indoor location

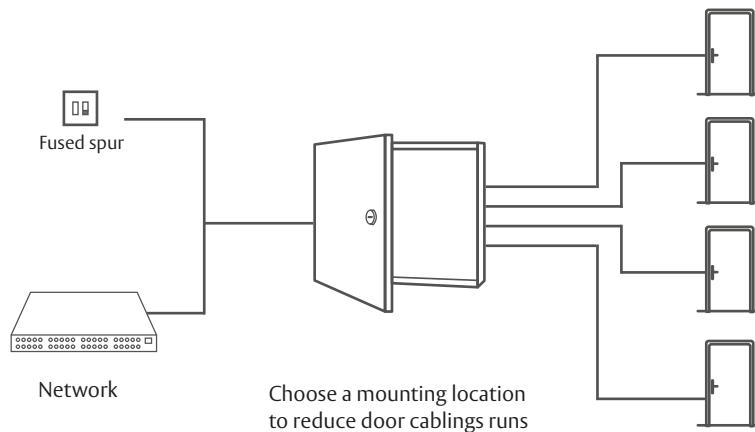


Away from weather

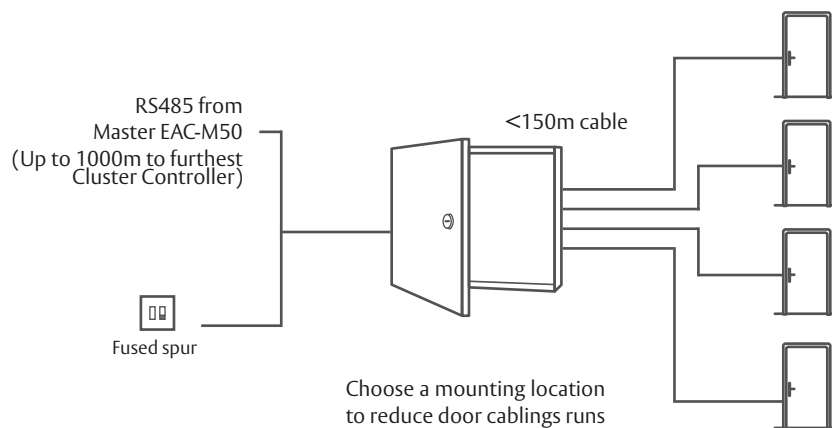
Note that the Slave EAC-M50:

- Does NOT connect to the network
- MUST connect via RS485 to the Master EAC-M50
- Is able to continue reading cards and controlling its doors in the event of an RS485 cable break

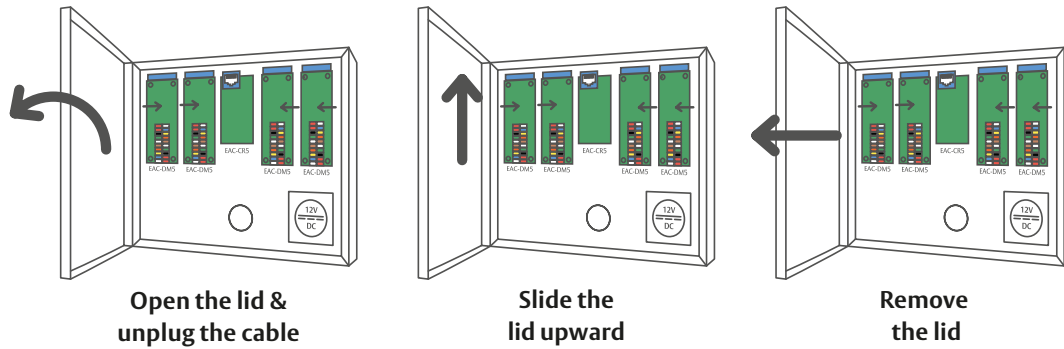
Single EAC-M50 cable run considerations



Slave EAC-M50 cable run considerations



Removal / Fitting the Lid



Mark up the mounting holes using the drilling template

1. Select fasteners that are appropriate for the mounting surface (masonry/wood/ dry wall)
2. Select the drill size appropriate for the fasteners
3. Fix the Drilling Template against the chosen vertical surface making sure that the top edge is horizontal. (Remember to allow 30 mm clearance on the left of the EAC-M50 enclosure to allow the door to hinge fully open)
4. Centre punch the two mounting hole locations
5. Drill holes of a diameter that is suitable for the fasteners
6. Remove the lid from the enclosure (as per instructions above)
7. Mount the enclosure to the surface
8. Replace the lid (and plug the lid cable back in) after the system wiring is complete, making sure to re-attach the earth strap to the lid
9. Place the EAC-CR5 and EAC-DM5 Module labels in the correct positions provided on the back page of the EAC-M50 Quick Install Guide. The information on the labels will be used during the door configuration process via Incedo Business Management software

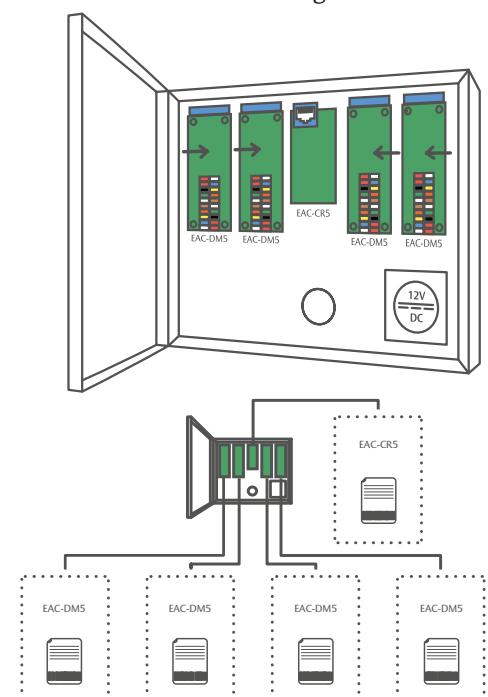
Note:
EAC-DM5 Modules may be added or removed without powering down the system

Expanding the controller with more Door Reader Modules

The EAC-M50 comes assembled with one EAC-DM5 Module, and can support another three EAC-DM5 Modules.

Additional EAC-DM5 Modules are plugged into the sides of the existing Modules, and then fastened in place with the four mounting screws that are included with each EAC-DM5 Module.

Remember to place the additional EAC-DM5 Module labels on the back page of the EAC-M50 Quick Install Guide for easy reference to which door they support (see diagram to right).



7 Wiring the System

EAC-DM5 Reader Module

EAC-DM5 Module Cable Specifications

*Depends upon voltage of door lock

Application	Conductors (#of Wires)	Cross Sectional Area	AWG	Max Cable Length
Door Locking Device (12V and higher)	2	0.75 mm ²	18	150 m*
Card Reader	5+	0.32 mm ²	20	150 m
Door Contact	2	0.32 mm ²	20	150 m
Request-to-Exit	2	0.32 mm ²	20	150 m

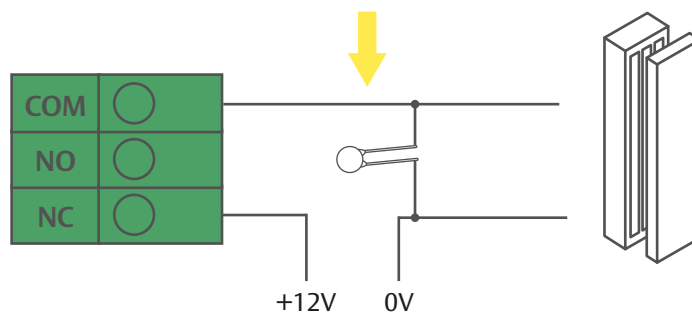
Metal Oxide Variators (MOV's) included in the packaging

*Replacement MOV's are available on Amazon or other good retailers

MOV Rating	25V RMS 500A 77V Max Clamping*
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Where to use the supplied MOV's

The MOV's must be connected across the cable supply for the Locking device, at the device, not at the controller, to prevent sparking at the relay contacts.

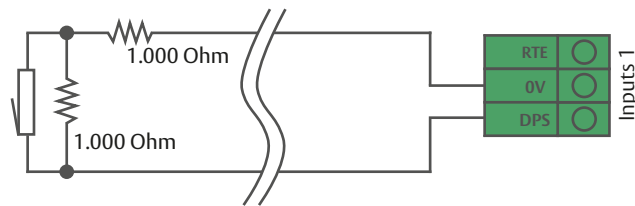


The Supplied MOV's are only for 12V applications and are MANDATORY.

Supervised Inputs (Optional)

Incedo Business Lite can monitor the Door Position Sensor (DPS) circuits for tampering when resistors are installed.

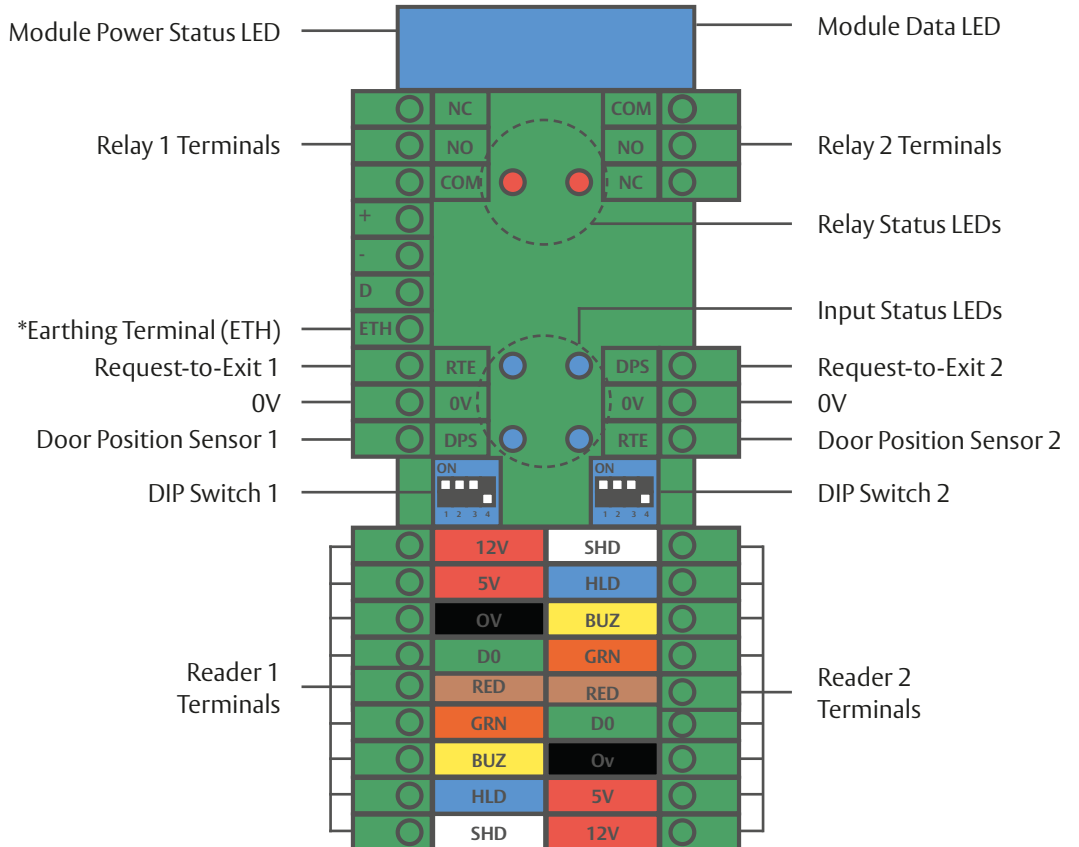
Two 1k Ω resistors are required for every sense line. These should be installed in a location where they cannot be accessed without opening the door in question:

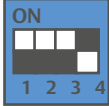


This feature must be activated in Incedo Business Management software via the door configuration process.

EAC-DM5 Key Components Diagram

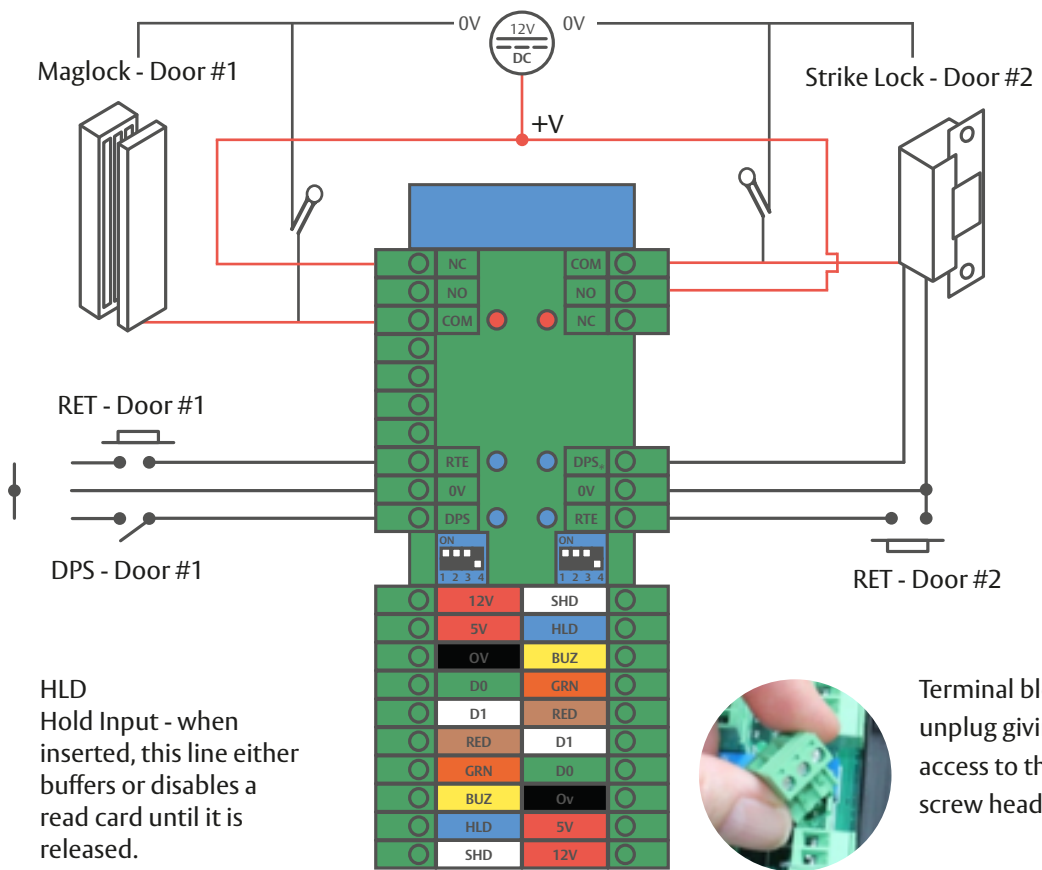
*EAC-DM5 Reader Modules have spare Earthing Terminals – see page 12 for details



DIP Switch position	Function
 1110	(Factory Set DIP Switch Position) 26-bit, 44-bit, 40-bit, 37-bit and card + PIN-code Mode.

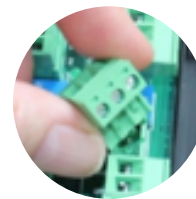
EAC-DM5 Wiring Example

*DPS: Some electric strike locks include Door Position sensor terminals. When they don't, additional sensors should be fitted if door position sensing is required



HLD
 Hold Input - when inserted, this line either buffers or disables a read card until it is released.

SHD
 Cable shield drain



Terminal blocks easily unplug giving simple access to the terminal screw heads.

Caution: Inadequate spark suppression can result in early failure of relay contacts – and will void the warranty on the affected EAC-DM5 Module

Some strike locks and maglocks have built-in arc suppression. Consult the installation information for the locks you are using. It is recommended that the MOV's (supplied with the Door Reader Module) are connected across any inductive local to the load. NB: The supplied MOV's are only suitable for 12V applications.

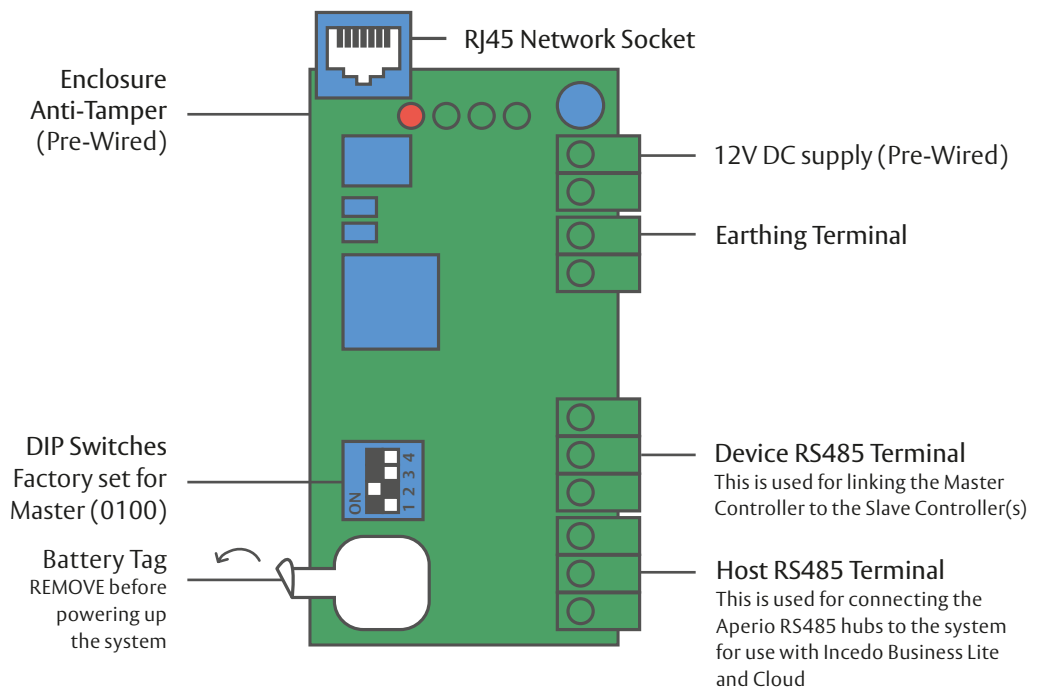
EAC-CR5 Controller Module

Cable Specifications

Application	Conductors	Cross Section	AWG	Max Cable Length
Network	8	$\geq 0,75 \text{ mm}^2$	24	90 m
RS485	Twisted pair, with or without screen	$\geq 0.51 \text{ mm}^2$	22	1 000 m

Key Components and Connections

Note:
Any module that has changes made to its DIP Switch settings while already powered up must be powered down and powered up again. This is because the settings are only read by the module during the power up cycle



*Note:

· **Factory default is an absolute last resort**





Defaulting the Controller Module will erase all Incedo Business Lite data, including any static IP address that has been set up – so this address should be noted somewhere safe for future use

· The most likely reason for choosing to default a Control Module would be when the Incedo Business Lite IP address is accidentally set outside of the mask, and Incedo Business Lite becomes inaccessible

· As long as the IP subnet of the Controller Module is the same as the PC/ Laptop, the Firmware Upgrade Tool may be used to discover the address and allow you to login and set up an appropriate IP address. **The Incedo Business Firmware Upgrade Utility Tool** is available for download from the “More Documentation” link included on page 3

*Note:

The Slave EAC-M50 is NOT connected to the Network
The total door count may not exceed 16 doors when using one master and one slave

DIP-switch Position	Function MODE
 0100	Incedo Business Lite Master Controller
 0101	Incedo Business Cloud Master Controller
 0000	Incedo Business Lite and Cloud Slave Controller
 1000	<p><i>*Special Function – See the note on the next page.</i></p> <p>Factory Default Mode</p> <p>Set DIP Switch 1 to ON, cycle power to the Module, wait for Controller restart (~20 seconds), and return DIP Switch 1 to OFF. (Switches 2, & 4 position do not affect the system)</p>

Earthing Terminal

The Controller and Reader Modules are sensitive to Electrostatic Discharges (ESD). Observe precautions while handling the circuit board assemblies by using proper grounding straps and handling precautions at all times.

To further protect against the harmful effects of EMC and transients, a functional earth connection point is provided as a screw terminal (see silkscreen marking: ETH).

System Backup

Always back up the system data using the Incedo Business Firmware Upgrade Utility Tool. This could save you having to set up the system from scratch again in the event of a system default, as described above. The Access Manager Utility Tool is available for download from the “More Documentation” link included on page 3.

Mains supply Connection

Mains Cable Specification

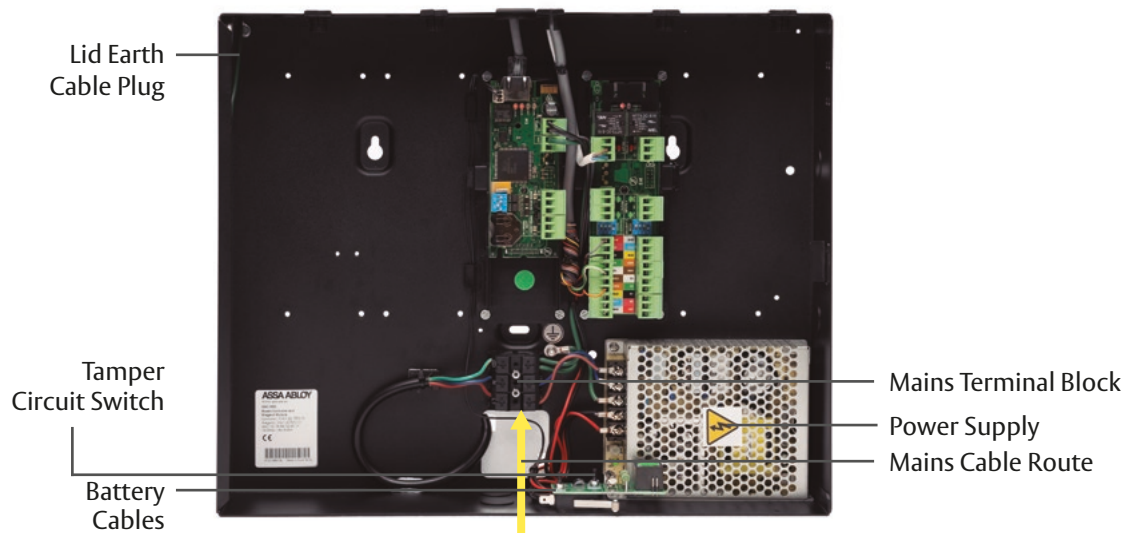
- Connect the power cable to a non switched 3 A fused spur which is local to the panel and clearly identified
- Select a cable that is in accordance to National Wiring code best practices of your local authority

Mains Cable Connection

1. Lay the mains cable from the mains outlet to the EAC-M50 enclosure, ensuring that the supply has been turned off, isolated and padlocked to avoid accidental re-energising
2. Pass the mains cable through a gland in the enclosure wall and follow the route indicated by the yellow arrow. (It should pass behind the battery, if it were installed)
3. Strip the ends mains cable, exposing 10 mm of the conductors
4. Press down on the terminal buttons while threading each stripped wire end into its corresponding terminal
5. Releasing the terminal button will clamp the stripped wire end in place
6. Take some time to thoroughly inspect all the wiring and correct any mistakes before progressing to the next step
7. Pull out the plastic tag from under the Lithium Button Cell on the Controller Module's PCB
8. Turn on the mains supply cable into the outlet socket using a switched fuse spur and power up the installation
9. The STAT (Status) LEDs on the Controller and Reader Modules will flash rapidly for approximately one second
10. After one second the Controller STAT LED will turn off during the booting process. The Reader Modules' STAT LEDs will remain on constantly as long as a suitable supply voltage is present
11. Once satisfied that there are no short circuits, it is now safe to connect the recommended 12V battery (not included) using the EAC-M50's integrated spade terminal plugs

Connecting two EAC-M50 units via RS485

Link the two Controller Modules by connecting their RS485 Device terminals. Remember to set the DIP Switches on the second Controller Module (in the remote EAC-M50) to SLAVE (0000) – and remember to cycle the power to the module in question if you have changed the DIP Switch Settings while it is already in the powered up state.



8 Network Setup

Compatibility

Before commencing network setup, be sure that the operating system and browser are supported. At time of writing, Incedo Business Lite compatibility includes the following full releases (or later):

- Firefox 72.0.1
- Internet Explorer 11 11.356.18362.0
- Chrome 79.0.3945.130

DNS Name function:

- The DNS Name function only works with a PC

First steps:

1. If you have not done so already, remove the plastic tag from under the button cell on the Controller PCB
2. Power up the EAC-M50.
(Allow a minute for it to boot up)

Note:
Only one instance of the interface may be opened at a time. Multiple Client connections are not supported with Incedo Business Lite

Note:
· It is advised to set up a static IP address for future use
· The DNS name function only works on a PC
· If you wish to use DNS features with Mobile devices then you need to set the DNS setting within your router. (DNS setting is router manufacturer dependent.)

How to connect to Incedo Business Lite for the first time

First option:

If you have a Router with an active DHCP server

1. Type the following IP address in to one of the supported browsers:- 192.168.100.1
2. The Incedo Business Lite login dialogue will launch
3. See Logging on, on the next page

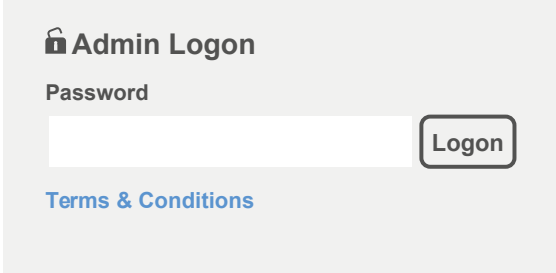
Second option:

Switch or Direct connection

- Connect a PC/Laptop directly to the EAC-M50 network socket using a straight (uncrossed) Ethernet cable – or via a network switch
- The PC needs to have an IP address, which is 192.168.100.1 in the same range as the EAC-M50's default address

1. Click Start>Control Panel
2. Click the “Network and Sharing Centre icon”
3. Select “Local Area Connection”
4. Click the “Properties button”
5. Double-click “Internet Protocol Version 4 (TCP/IPv4)”
6. Set the IP Address to 192.168.100.X (X being any available number between 2 and 254. Ensure that your chosen number is not the same as the EAC-M50
7. Set the Subnet Mask to 255.255.255.0
8. Click the OK button
9. Type the following IP address in to one of the supported browsers:- 192.168.100.1
10. The Incedo Business Lite login dialogue will launch

Logging on



Admin Logon

Password

Logon

[Terms & Conditions](#)

1. Enter the default Admin Password: 12345
2. Click Logon

... Incedo Business Lite will open on the “Live!” Screen:

Date	Time	Location	Name	Event	Card Number
2020-02-06	10:07:00	Controller	Event Code 69	Anti-Tamper Triggered	
2020-02-06	10:06:41	Door 2 (Entry)	Event Code 74	Terminal Online	
2020-02-06	10:06:41	Door 2 (Entry)	Event Code 72	Unit Power Up	

Required Settings

Using the menu-driven interface (paths shown on the next page) complete these steps:

1. Login with default password 12345
2. Set the date and time
3. Update the master password
4. Add/Configure doors and readers using the labels and door names on the back page of the EAC-M50 Quick Install Guide
5. Add/Manage people

For enquiries regarding Incedo Business Cloud installations, please refer to your regional Incedo access control contact.

Function Paths

The menu headings are displayed in the menu ribbon – these give you access to the functions:



Live!

- Displays transactions in real time, latest on top

People

- Add people and manage their access rights accounts and their cards

Doors

- Click on Device Discovery to search for connected modules
- Add Door
- Reset APB

Reports

- Access Report
- Status Report
- Audit Report
- Hours Worked Report

Settings



- Network Settings
- Date and Time
- Security (Changing the password)
- Special Days (Add public holidays, etc.)
- Language (*Change language preference*)
- Advanced options:
 - Access Groups
 - UDP output (Destination Address setup)
 - APB Settings
 - Door module settings

About

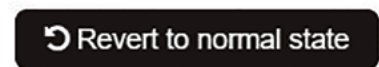
- Browser Application Version
- Web Application Version

System Overrides

- These buttons are always available on screen as long as you are logged in

Button	Function
	All controlled doors are UNLOCKED, allowing everybody to pass.
	All controlled doors are LOCKED – and no cards will open doors.

- Emergency Unlock OR Lockdown will remain active until it is disabled by clicking on “Revert to Normal State” – on the right hand end of the thick red stripe:



9 Electrical Specifications

Power Supply (EAC-PR5)

AC Mains Input	DC Output
90-240 VAC (50/60Hz), 1.3A	12V, 5A

Optional Battery (Strongly recommended)

Not included with the EAC-M50, this battery must be sourced separately.

Note:

- Only connect the battery after all system wiring is complete and tested on the built-in power supply

Battery	Specification
Type	Lead Acid
Voltage	12V
Capacity	7 Ah
Physical Dimensions	65 mm x 101 mm x 151 mm

Battery Protection Fuse	Specification
Length	20 mm, 0.787"
Type	Slow-blow
Rating	6.3 A

Controller Module (EAC-CR5)

Power

Conditions	Current	Power
Supply at 12V DC	140 mA	1.7 W

Inter-Module Communications

Connector	Purpose
10-way connectors: female on the left, male on the right	Power and data lines to other modules

Network

Connector	Purpose
RJ45	Ethernet, 10/100 Base T, half or full duplex

RS485 Ports (Device & Host)

Interface	Baud Rate	Data Format
RS485	38 400	8 data bits, no parity, 1 stop bit

Reader Module (EAC-DM5)

Power (At 12V)

Conditions	Current	Power
Relays idle, No readers connected	37 mA	0.44 W
Both relays activated, maximum reader load	503 mA	6W

Relays

Contact Rating	Configuration	Contacts	Operations
[10A, 28V DC] [5A, 220V AC] [10A, 120V AC]	Double Pole Single Throw	NO, NC, COM	100 000

Inter-Module Communications

Connector	Purpose
10-way connectors: Female on the left, male on the right	Power and data lines to other modules

Reader Port

Connector	Reader Connections
10-way Screw Terminal Plugs	12V, 5V, 0V, D0, D1, LED (Red), LED (Green), Buzzer, Hold, Shield

Battery Charging Circuit

Conditions	Current	Power
Supply at 12V DC, battery flat, max charge current	500 mA	6 W

10 FAQ

Fail Safe versus Fail Secure

Electrically controlled locks fall in to one of two categories:

1. Locks that require power to lock (with loss of power, these are unlocked, allowing EVERYBODY access)
2. Locks that require power to unlock (with loss of power, these are locked, allowing NOBODY access)

The first is considered fail SAFE, as people can still escape the building, and help can get in, should some misfortune occur.

The second is considered fail SECURE, as intruders cannot just walk in when power is lost.

Which lock to use

Mag locks are inherently Fail Safe, as they require power to lock.

Strike locks are available in Fail Safe as well as Fail Secure versions, but are most often Fail Secure.

Caution:

- There is another level that should also be considered.

What relay terminals to use

The relays on the EAC-DM5 Module should be switching power from an independent source, and so a similar principle also applies to your choice of Normally Open (NO) or Normally Closed (NC) relay terminals:

- Use the NC and COM terminals for switching circuits that you wish to keep energised should power to the EAC-DM5 Module be lost
- Use the NO and COM terminals for switching circuits that you wish to be cut off in the event that power to the EAC-DM5 Module is lost

Can Incedo Business Lite handle separated secure areas?

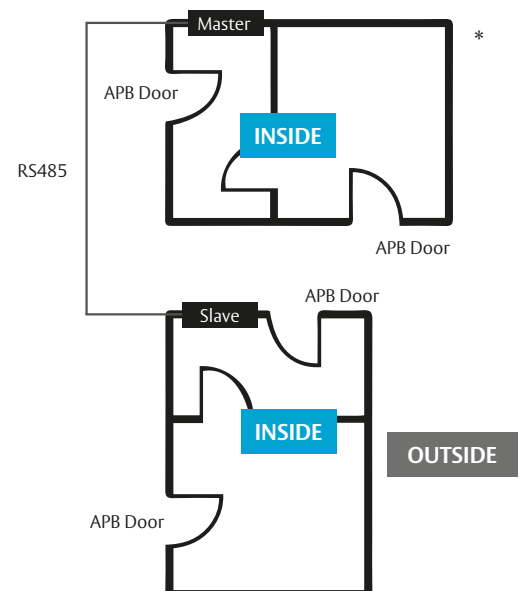
Yes it can:

All access control administration is performed via the EAC-M50 Master.

The EAC-M50 Slave has offline capability (between controllers only).

- This means that access control in the remote area will continue to function normally in the event of a break in the RS485 cable
- The cable break event will be logged on the EAC-M50 Master
- When the RS485 cable is restored, Incedo Business Lite event log will be updated with any events that happened on the slave side while the cable was broken
- Incedo Business Lite system event logs will reveal where a person has been spending their time

*The Slave APB only works when connected to the Master Controller



11 End User Licence Agreement

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Incedo Business LITE
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(Standard Version v.1 – 01.2020)

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