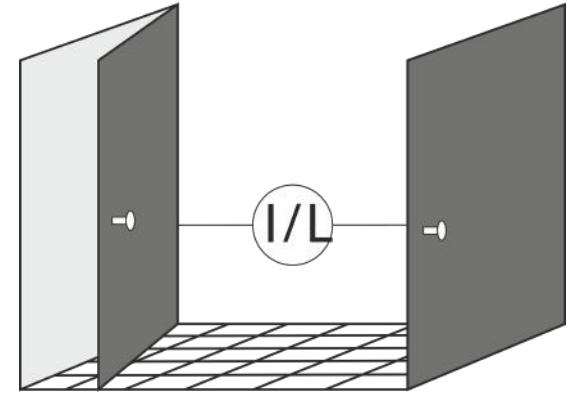




# Door Interlock System



- The Door Interlock System comprises of Door Controller, Door Stations, Electromagnetic Locks, Door Position Sensors and Power Supply unit.
- The Door Controller monitors the status of the Doors and controls the locking and release sequence of the Doors.
- The Electromagnetic Locks are used to Normally hold the Doors Locked.
- The user can Request for Release of the Door by presenting hand in front of sensor on the Door Controller / Door Station.
- The Door is released only if the interlocked Doors are in locked condition.
- The Door Emergency Station is provided to override the Interlock logic and release all the doors and allow free passage during an Emergency event.

**Door Interlock system is used to prevent the simultaneous opening of Airlock/Change room doors. The system thus aids in minimizing the microbial, particulate contamination and also the disturbance of area conditions.**



# Door Controller Model: Dor-2100 series

The Dor-2100 Controller is one of the key integrated components for Door Interlock Systems. It is an intelligent controller incorporating an 32 bit Micro-controller. The Dor-2100 is built to control one Door in Stand Alone Mode and can interlock up to 16 Doors when 16 Controllers are connected in Network on OSDP bus. The Dor-2100 controller logic ensures that the Doors are normally closed and are locked. Unlocking any door causes the interlocked door to be incapable of being unlocked and hence prevents simultaneous operation of doors. Multi-Level Logic allows configuring the system to interlock the Door with any number of Doors within the Door interlock group. This logic allows simultaneous use of the Change rooms and reduces hindrance to Man Movement.

- Compact design and elegant PC snap fit bezel.
- Contact Less operation.
- Easy Installation, minimum civil work and interconnecting cables.
- Mounting: directly on Door Frame.
- Integration facility with Access Control System to Restrict Man movement.
- Number of Doors Controlled: One.
- Built in Capacitive sensor for Door Release Request operation.
- Configurable as Master or Slave.



**• Inputs:**

- Emergency Release: One
- Lock Feedback Input (LFB): One.
- Door Position Sensor Input (DPS): One.
- Configurable Auxiliary Input: One (for Integration with Fire alarm / other systems)
- Door Lock Outputs: Controls one 600 Lbs Electromagnet lock, 500 mA load max.

**• Indications:**

|                                 |        |                             |
|---------------------------------|--------|-----------------------------|
| Red LED Steady                  | -----> | Door Locked                 |
| Red LED Blink                   | -----> | Access Denied / Interlocked |
| Green LED Steady                | -----> | Door Released               |
| Orange LED Blinking             | -----> | Door is not Locked          |
| Red LED Blink & Green Led Blink | -----> | Emergency                   |

**• Communication:**

- Port 1: RS-485 port, OSDP
- Port 2: Mini USB Port, for configuration of controller.

# Door Controller Model: Dor-2100 series

## Alarms:

**Propped Door Alarm:** The Sounder activates when the door is unlocked/ open for more than 20 seconds. : Intermittent Beeps.

**Forced Door Alarm:** The Sounder activates when the door is forced open, without the operation of Door Release Button. Continuous Beep.

**Emergency Alarm:** The sounder activates when Emergency situation is initiated. Intermittent Beeps with indications.

**Door not locked alarm:** The sounder activates when the door is not properly locked.

## Door Operation Modes:

- **Access Denied local** - Door is permanently locked when auxiliary input is momentarily activated and remains in lock condition until reset with second momentary signal.
- **Access Denied global** - All Door in the system are permanently locked when auxiliary input is momentarily activated and remains in lock condition until reset with second momentary signal.
- **Free Access local** - Door is unlocked when auxiliary input is activated and resets only after auxiliary input is deactivated.
- **Free Access global** - All doors in system are unlocked when auxiliary input is activated and resets only after auxiliary input is deactivated.
- **Emergency** - All doors in system are unlocked and audio-visual alarm is activated.

## Timers :

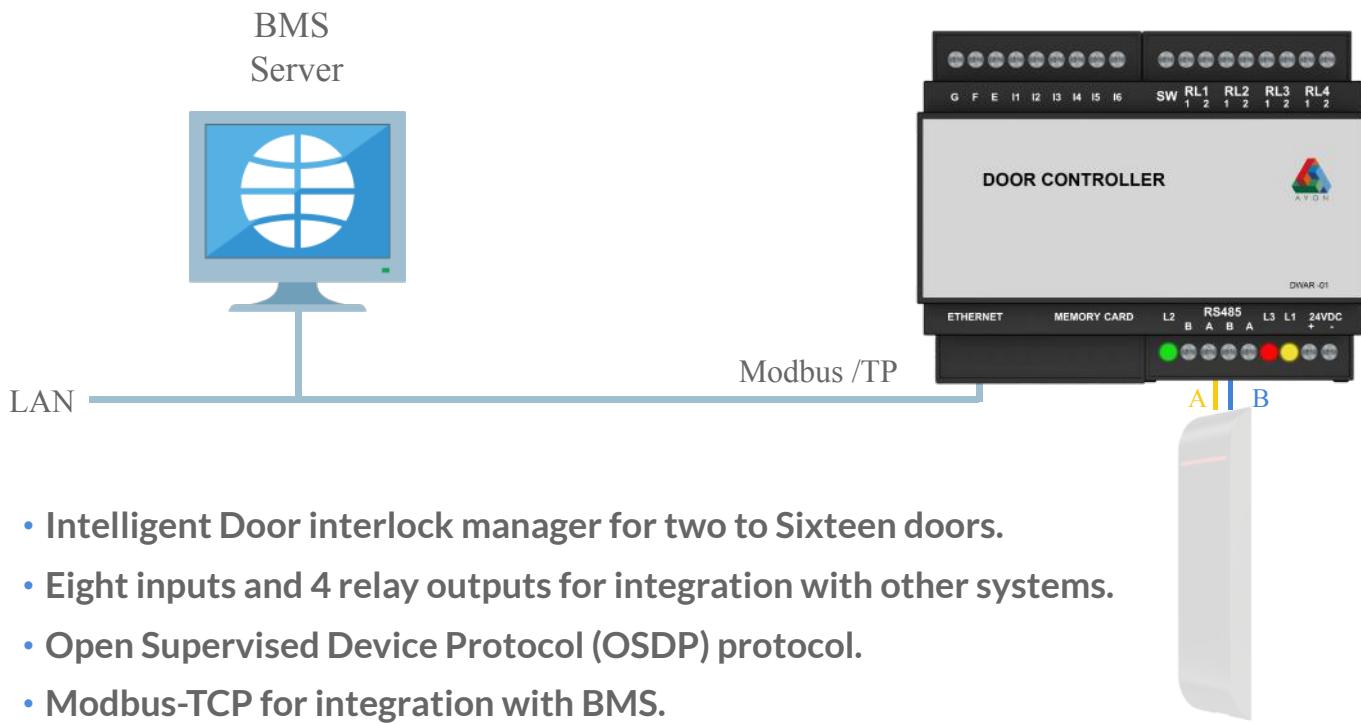
- **Door Release Timer (DRT)** : The time for which the door to be in release condition when a valid external request (Door Release) or internal command (Cap sense Proximity is detected) is available. Default time is 5 seconds and can be configured using configuration utility.
- **Egress Time Delay (ETD)** : The time delay duration between the request to release door command and releasing of the door. Default time is 0 seconds and can be configured using configuration utility.
- **Interlock Time Delay (ITD)** : The time delay duration between the next release of the door after the previous release of the interlocked doors. Default time is 0 seconds and can be configured using configuration utility.
- **Lock Time Delay (LTD)** : The time delay duration between Doors return to close condition and Lock energizing. Default time is 0 seconds and can be configured using configuration utility.

## Electrical & Mechanical :

Operating voltage: 12-24V DC.

Size: 36mm (w) x 145 mm (h) x 14mm (d)

# Door Controller : DWAR - 01



- Intelligent Door interlock manager for two to Sixteen doors.
- Eight inputs and 4 relay outputs for integration with other systems.
- Open Supervised Device Protocol (OSDP) protocol.
- Modbus-TCP for integration with BMS.

DWAR-01 Door Server is an advanced Door Interlock System Controller with extended applications. The Server can be used to build a 16 Door Interlock System or multiple groups of interlock as per site requirement.

DWAR-01 is powered with Open Supervised Device Protocol (OSDP) protocol for reader connectivity to connect to all the Door Controllers in the system.

DWAR-01 also shares various status information with Building Management Software on Modbus/TCP and accepts limited Door Control Commands from BMS.

The intuitive configuration software of DWAR-01 allows for setting up of Interlock logics and many other special functions.

| Modbus Details            |   |              |        |
|---------------------------|---|--------------|--------|
| Individual Door State     | Open / Closed / Locked /Released                              | Read         | 1 byte |
| Individual Door Alarm     | Propped Door / Door Not Locked / Forced Door                  | Read         | 1 byte |
| Group State               | Normal / Interlocked / Emergency/ Free Access / Access Denied | Read         | 1 byte |
| Set Door Controller state | Normal / Door Released Free Access / Deny Access              | Read / write | 1 byte |

*Open Supervised Device Protocol (OSDP) is an access control communications standard (IEC 60839-11-5) developed by the Security Industry Association (SIA) to improve interoperability among access control and security products.*

**Technical Specifications:**

| Parameter                             | Description  |
|---------------------------------------|--|
| Operating Voltage                     | 12-24 V DC   |
| Max. Avg. Operating Current: @24 V DC | 500mA  |
| Connection Type, Power                | Screw Connection with tension sleeve   |
| Digital Inputs                        | 6  |
| Relay Output                          | 4 , 250mA @ 24V DC.  |
| Communication Port 1                  | RS-485 port, 2-wire, OSDP, Supports maximum of 16 Dor-2100 Door Controllers as slaves. |
| Communication Port 2                  | RJ-45 Ethernet. 10/100 Mbps.   |
| Protocol Support                      | TCP/IP, Modbus/TCP, OSDP   |
| Cable Cross-Section                   | 0.75-2.5mm <sup>2</sup>  |
| Operation temperature                 | -5°C ... +45°C   |
| Storage temperature                   | -20°C ... +70°C  |
| Degree of protection                  | IP20   |
| Installation                          | DIN-rail   |
| Housing material                      | ABS  |
| Enclosure dimension (l x w x h)       | 106 x 90 x 58 mm   |

# Door Interlock System: Accessories

## Door Station: Dor - 27

The user interacts with the system through the Door Stations. The Door Stations on request from the user, sends a Door release signal to the Door Controller. The Door Station is provided with multiple status indications.

- Compact design and elegant snap fit Polycarbonate bezel.
- Contact Less operation.
- Mounting: directly on Door Frame.
- Built in Capacitive sensor for Door Release Request operation.
- Indications:3, Red-locked, Green-released, Orange-alarms.
- Buzzer: One.
- Operating Voltage: 24V DC.
- Dimensions (w x h x d mm): 36 X 145 X 14.



## Door Emergency Station: Dor - 26

In case of emergency, it is desirable to override the Door Interlock System Operating conditions for fast evacuation.

The Door Interlock System releases all the doors when the user operates emergency button on the Door Emergency Station.

This facility will allow free passage of the users through the interlocked doors.

- Compact design and elegant snap fit Polycarbonate bezel.
- Soft Touch Membrane keypad.
- Mounting: directly on Door Frame.
- Dimensions (w x h x d mm): 34 X 100 X 11.



## Privacy Station: Dor-28

Entry/Exit Standard Operating Procedure in select facilities expect de-gowning and gowning to a level where the user has to be provided with privacy.

Privacy Station when activated the Door of the Change Room will get permanently locked preventing any other user from entering the room. The system is normalized when the user passes through any of the door.



# Door Interlock System: Accessories

## Electromagnetic Lock (EML):

The doors of the change room/ Airlock are held locked using Electromagnetic lock. The Electro-magnetic lock consists of Electromagnet Mounted on to the Door Frame and a striker plate mounted on the door shutter. The EML is installed on the Door with minimum damage to the door frame and door .The installation involves only 12 drills and no cutting of slots in the door frame or door shutter. The door is strongly locked when the magnet is energized with striker plate bonded to it. The Door is released when EM Lock is De-energized. This locking mechanism is with no moving parts and is low in maintenance. The magnetic lock is provided with a hall effect sensor to sense if the strike plate is bonded to electro magnet (Door is locked). The sensor signal which is termed as lock feedback (LFB) signal is used by door controller to decide if the door is 100% closed and locked.

This inbuilt bonding sensor feature is very essential for reliable Door Interlock system and to qualify stringent requirement of validation.

## Specifications:

Operating Voltage: 24 VDC

Current Draw: 24V/250mA ( $\pm 5\%$ )

Holding Force: Up to 600 lbs (272 kg)

Lock Feedback: Hall Effect, Contact: SPDT rated 2A at 24 VDC

Anti-Rust Surface Treatment: Blue Zinc Plating

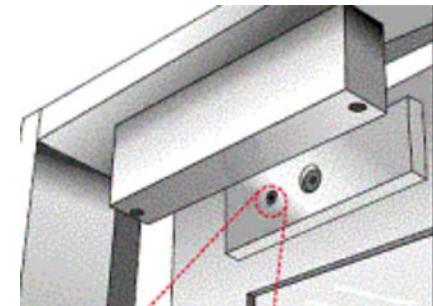
Operating Temperature: 0~55° C (32~131° F)

Operating Humidity: 0~95% (non-condensing)

Weight (Magnet): 1.1 kg ( $\pm 1\%$ )

Dimensions (l x w x h mm): Magnet – 250 x 42 x 25 mm

Armature – 180 x 38 x 11 mm



## Magnetic Contact (Door Positioning Sensor):

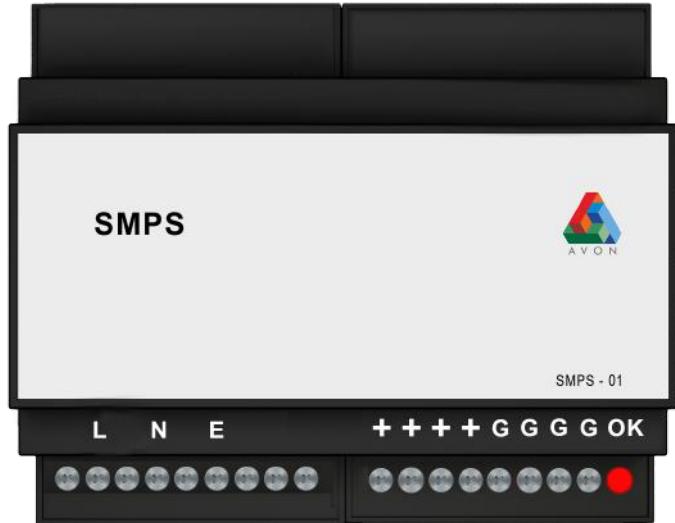
Magnetic contact is used as Door Position Sensor to monitor the position of the door. The magnetic contact consists of a reed contact on Door Frame and a permanent magnet on Door Shutter. When the door is opened, the reed contact is opened as the magnet is taken away. This reed contact status is used by the Door Controller to decided if the Door is in closed position or open position.

DPS is used only when Door position monitoring is included in Door Interlock system design.



# Switch Mode Power Supply - SMPS

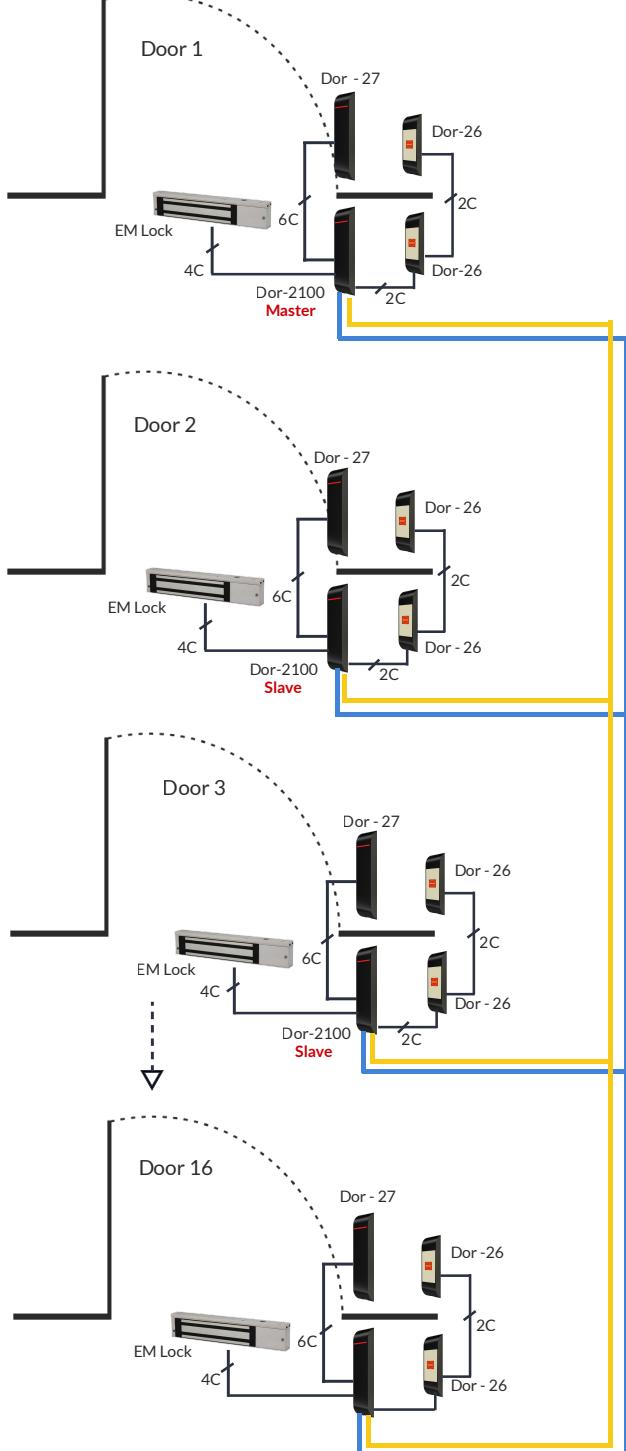
Switch Mode Power Supply, 100 Watts, Input 160 to 290 VAC, output 24V DC, constant voltage constant current o/p characteristic suitable for any type of industrial load.



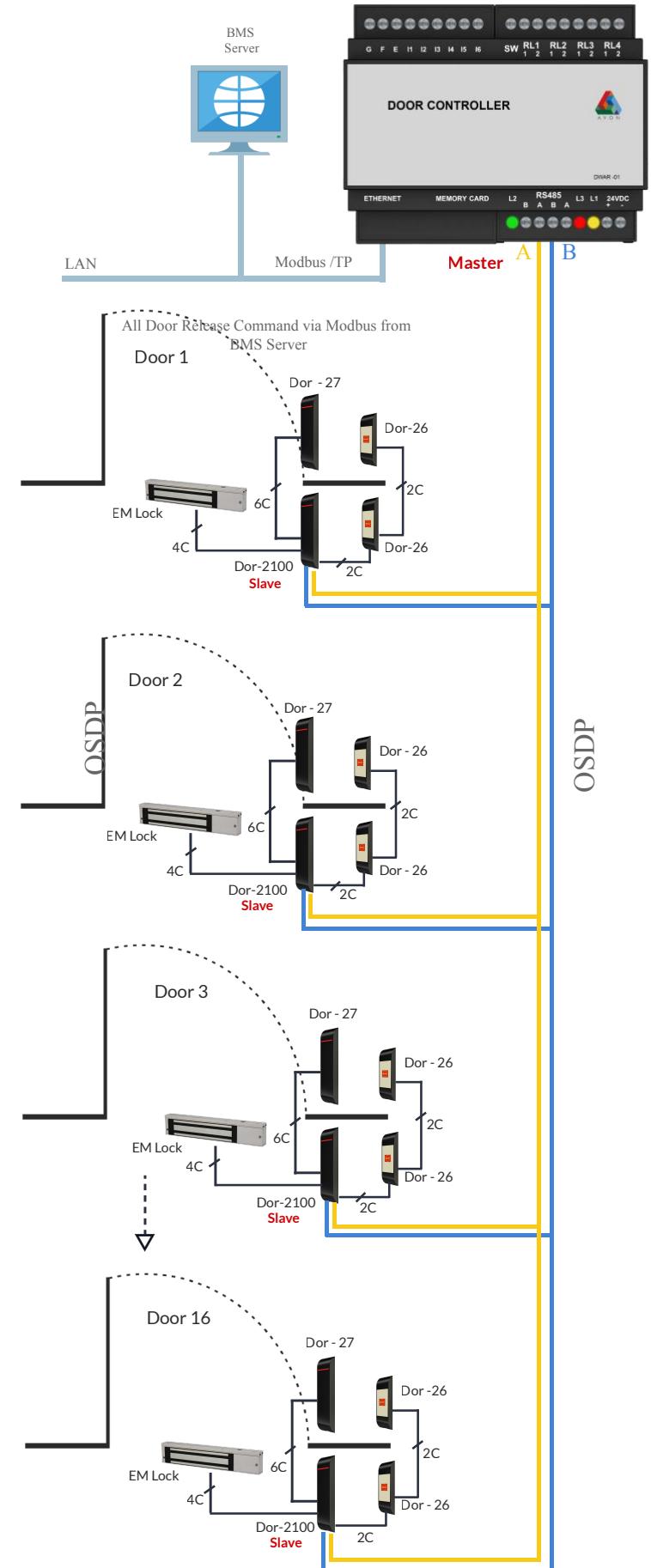
| Parameter                               | Description  |
|---|--|
| Input Voltage Range AC                  | 160-290 VAC  |
| Input Frequency                         | 40-60HZ  |
| Output voltage adjustment               | + -10%   |
| Inrush Current                          | 30 Amps  |
| Efficiency @ full load & 230 V AC Input | > 85%  |
| Hold-up Time                            | 20 msec  |
| Operating Temperature                   | 0 TO 50 DEG C  |
| Leakage current                         | <2 mA at 230 vac   |
| Line Regulation                         | <1%  |
| Load Regulation                         | <1%  |
| Ripple and noise                        | 100 mv p-p   |
| Protections                             | Input under /over voltage<br>Output overload / short circuit (cvcc type)<br>Output over voltage<br>Thermal overload/over temperature |
| Isolation between: Input & Output       | 3000V AC   |
| Input & Earth                           | 1500V AC   |
| Output & Earth                          | 1500V AC   |
| Cable Cross-Section                     | 0.75-2.5mm <sup>2</sup>  |
| Operation temperature                   | -5°C ... +45°C   |
| Storage temperature                     | -20°C ... +70°C  |
| Degree of protection                    | IP20   |
| Installation                            | DIN-rail   |
| Housing material                        | ABS  |
| Enclosure dimension (l x w x h)         | 106 x 90 x 58 mm   |

# System Architecture

## 2 - 16 Door Interlock System using Dor-2100

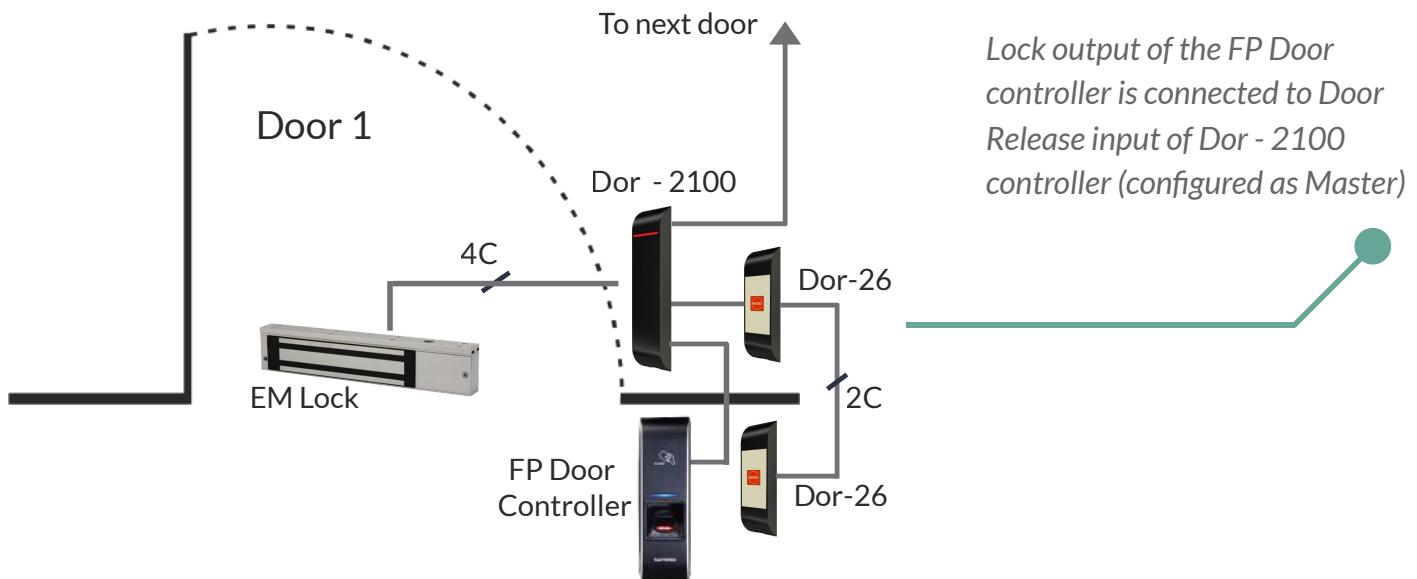


## 2 - 16 Door Interlock System using Dor-2100 & DWAR-01 with BMS Connectivity

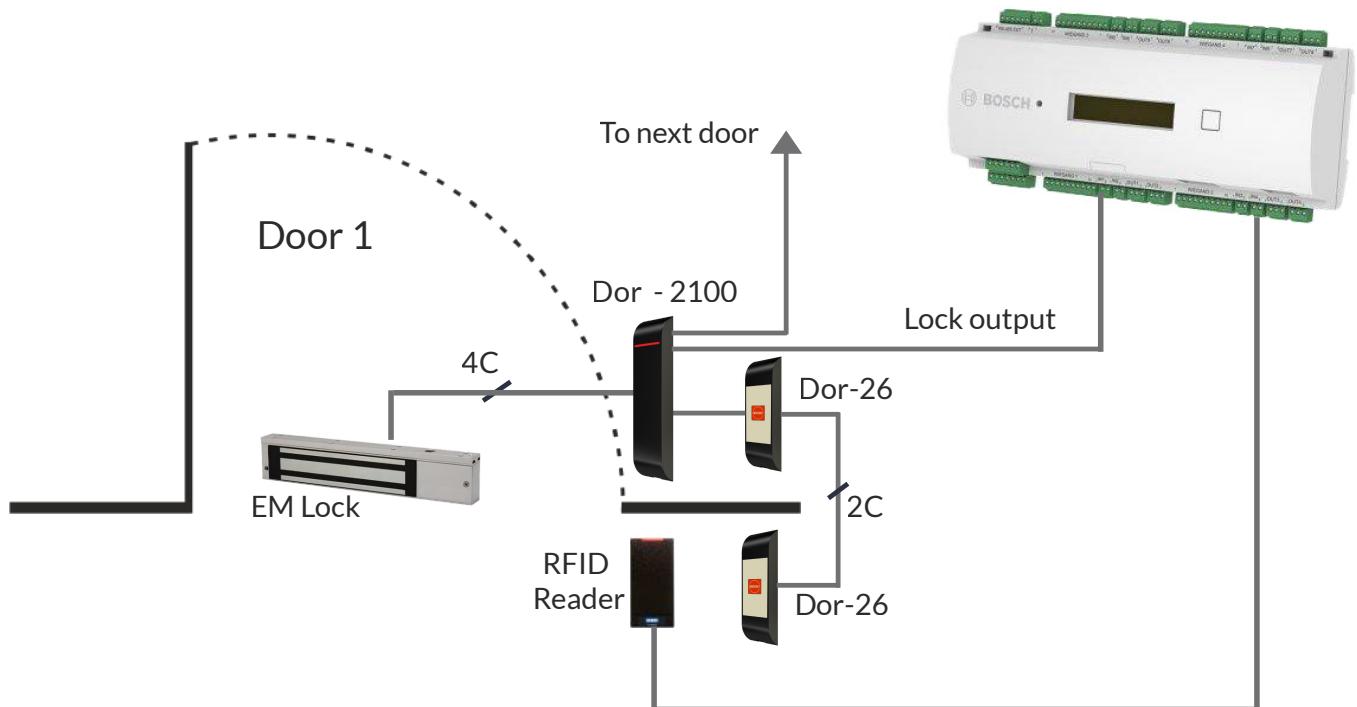


# Integration - Access Control System

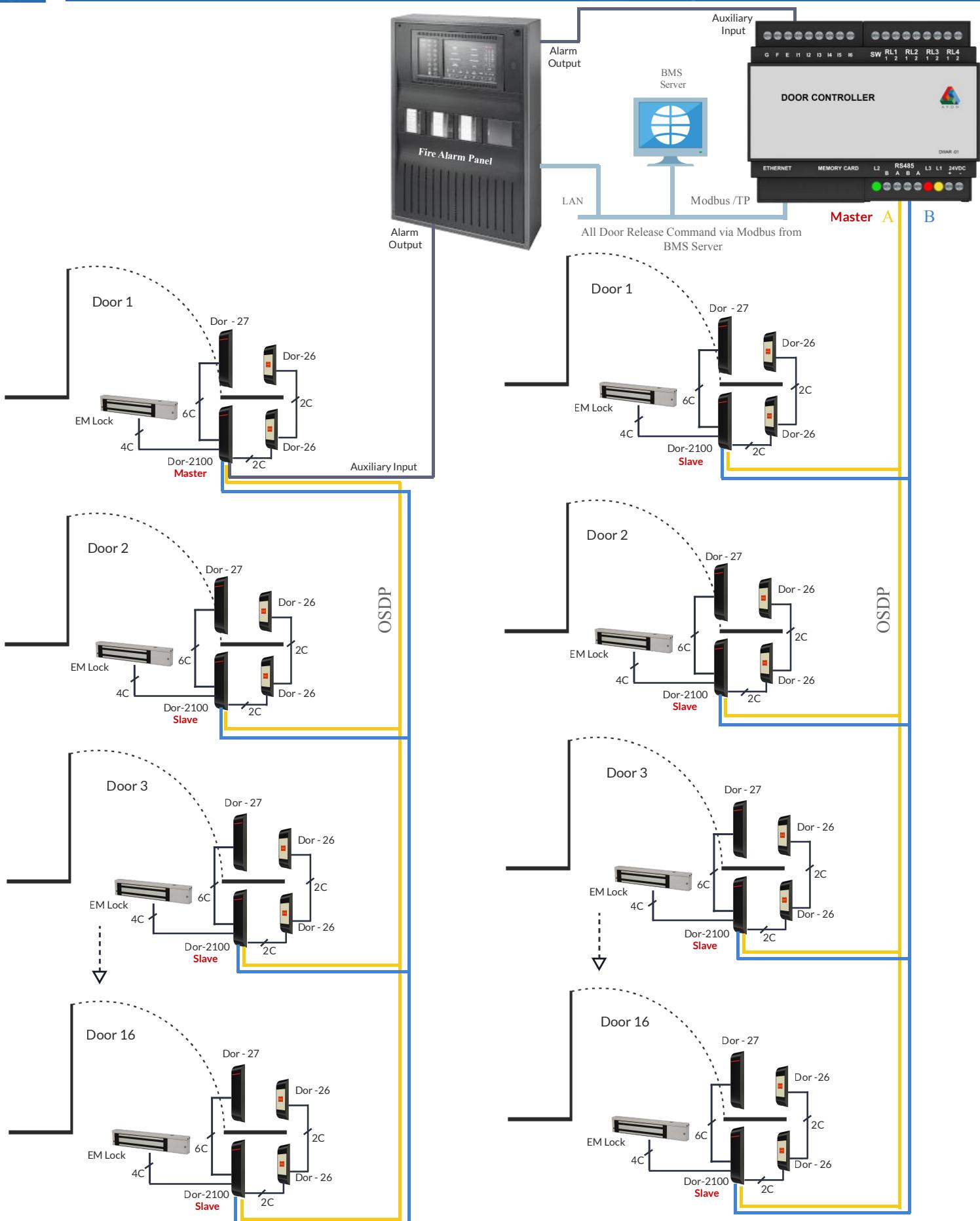
## Integration with Access Control System - Integrated Reader cum Door Controller



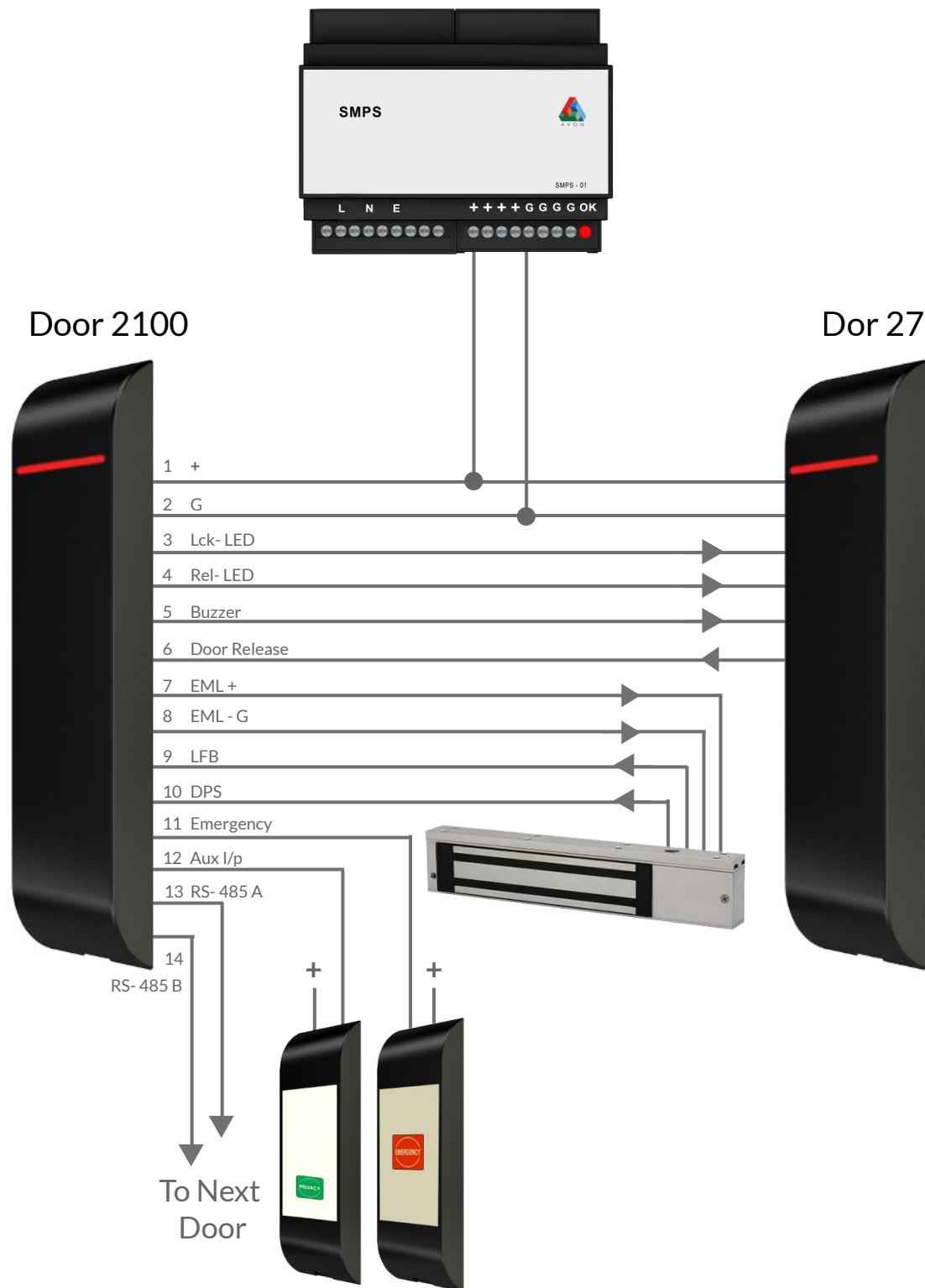
## Integration with Centralized Access Control System



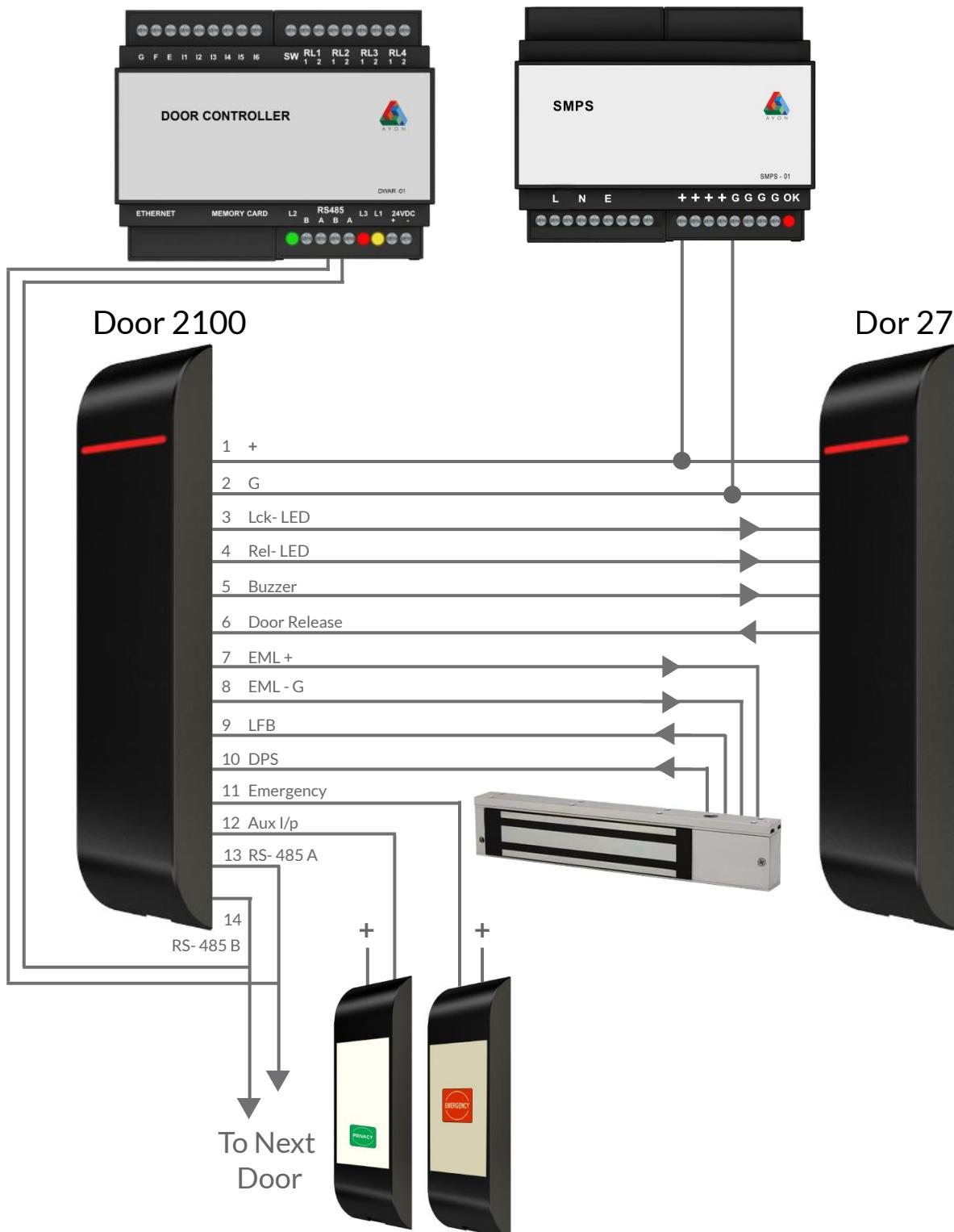
# Integration - Fire Alarm System



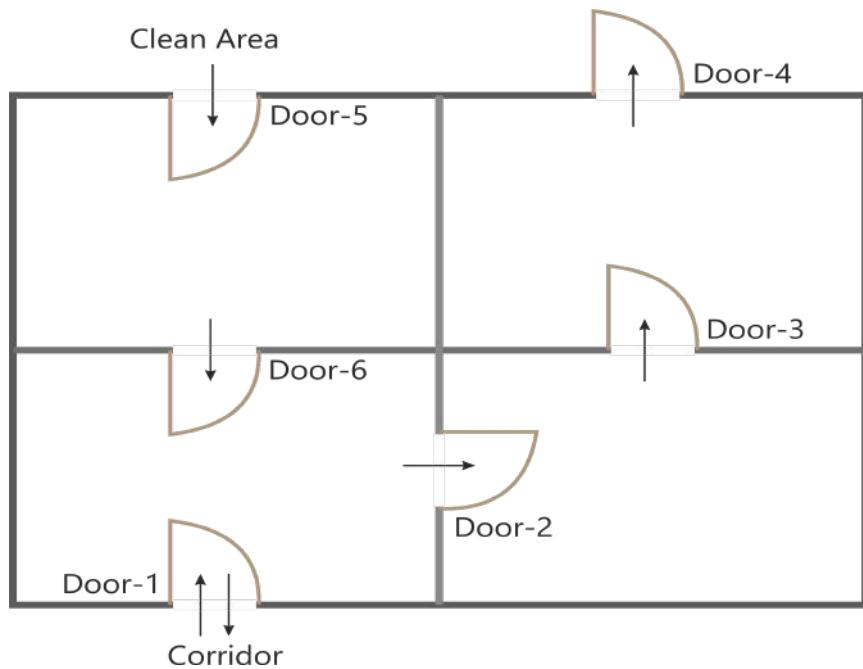
## Connection Details : 2 - 8/16 Door Interlock System using Dor-2100



# Connection Details : 2 - 16 Door Interlock System using Dor-2100 & DWAR- 01 with BMS Connectivity



# Typical Layout



## System Logic

| Action                          | Door-1                            | Door-2                            | Door-3                            | Door-4                            | Door-5                            | Door-6                            |
|---------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Door-1<br>Request to<br>Release | Door<br>Released                  | Access<br>Denied                  | Locked/<br>but can be<br>Released | Locked/<br>but can be<br>Released | Locked/<br>but can be<br>Released | Access<br>Denied                  |
| Door-2<br>Request to<br>Release | Access<br>Denied                  | Door<br>Released                  | Access<br>Denied                  | Locked/<br>but can be<br>Released | Locked/<br>but can be<br>Released | Access<br>Denied                  |
| Door-3<br>Request to<br>Release | Locked/<br>but can be<br>Released | Access<br>Denied                  | Door<br>Released                  | Access<br>Denied                  | Locked/<br>but can be<br>Released | Locked/<br>but can be<br>Released |
| Door-4<br>Request to<br>Release | Locked/<br>but can be<br>Released | Locked/<br>but can be<br>Released | Access<br>Denied                  | Door<br>Released                  | Locked/<br>but can be<br>Released | Locked/<br>but can be<br>Released |
| Door-5<br>Request to<br>Release | Locked/<br>but can be<br>Released | Locked/<br>but can be<br>Released | Locked/<br>but can be<br>Released | Locked/<br>but can be<br>Released | Door<br>Released                  | Access<br>Denied                  |
| Door-6<br>Request to<br>Release | Access<br>Denied                  | Access<br>Denied                  | Locked/<br>but can be<br>Released | Locked/<br>but can be<br>Released | Access<br>Denied                  | Door<br>Released                  |

# Ordering Information

- Door Interlock System One Door Controller, Contact Less operation, OSDP,Max. 16 in one bus.  
Order Ref No. Dor2100
- Contact Less Door Station , Input activated Indicators for Lock and Release, Release Output ,Buzzer  
Order Ref No. Dor27
- Emergency Station with Soft Key. Black  
Order Ref No. Dor26
- Privacy Station  
Order Ref No. Dor28
- Door Server configurable to manage 16 door interlock , BMS connectivity, Ethernet,DIN Mount .  
Order Ref No. DWAR-01
- Electromagnetic Lock With LED Bonding relay, output Holding Force 600 LBS for Single Leaf Door.
- Surface mount Magnetic Contact
- Switch Mode Power Supply , 24V DC 100 Watts , DIN Mount.  
Order Ref No. PSU-01
- Surface Mount enclosure with MCB for Power Supply .  
Order Ref No. Encl01
- Surface Mount enclosure with MCB for Power Supply and Door Server.  
Order Ref No. Encl02