

Intelligent Extension unit

1.0 Overview

1.1 Introduction

The EW Extension Unit is designed for modular expansion of an O2LA installation via the RS485 communication bus. Each EW unit supports two Wiegand-26 bit readers. It has 2 outputs and 2-exit button inputs for controlling 2-doors. Since it supports Wiegand-26 readers, it provides installers with total flexibility in planning installations. Three additional outputs can be utilised for applications such as siren, auto dialler, etc. Access can be given for up to 10 codes/cards in emergencies such as disrupted RS485 functioning or system failure.

1.2 Features

- Metal housing.
- RS485 connection to O2LA.
- 5 inputs (2 Request-to-exit, 2 Door-monitoring contacts, 1 free input).
- 5 outputs: 2 Relays 10A & 1 Relay 2A (Contact Voltage: 24V DC/120V AC).
2 transistors (0.25A, Open collector).
- Sirens, dialer, flasher, etc can be connected.
- Tamper protection against removal of cover or the entire unit.

1.3 Electrical Specifications

Input Voltage : 12 15 V DC(Regulated)
 Current Consumption : 60mA (Standby)
 150mA (Maximum)
 Inputs : 2 request-to-exit (NO)
 2 door-monitoring contacts (NC)
 1 Free input (Opto isolated)

Note : (NC-Normally Closed, NO-Normally Open)

Outputs :

Ouput1	RELAY	10A
Ouput2	RELAY	10A
Ouput3	RELAY	2A
Ouput4	TRANSISTOR	250mA, Open Collector
Ouput5	TRANSISTOR	250mA, Open Collector

Fuse : 500mA Cartridge Fuse
 Indicators : Red LED indicates Power "ON".
 Green LED indicates status of Relays 1&2.
 Yellow LED flicker indicates proper RS485 bus connection

1.4 Mechanical Specifications

Dimension (mm) : 180 (L) x 129 (W) x 53 (H)
 Housing : White Painted metal
 IP Factor : IP31

1.5 General information

Door monitoring contact: The two Inputs door contact 1(DP1) and door contact 2 (DP2) are to be connected to magnetic door contact sensors, to detect " forced door" and "door opened too long" conditions.

Request-to-Exit button: Two Inputs PB1 and PB2 to be connected to 2 Push buttons. When either button is pressed, the corresponding door is opened. PB1 → Relay1, PB2 → Relay 2.

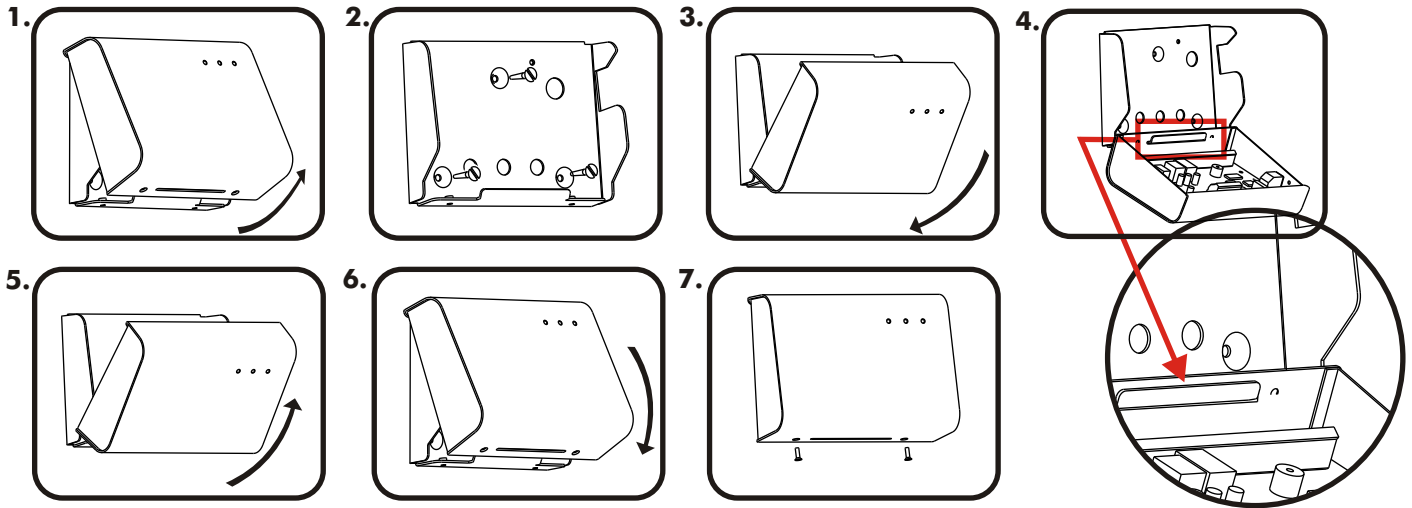
Tamper: If an attempt is made to sabotage the EW unit, a tamper switch triggers the Output 4 (Transistor T4, 250mA). Siren, Alarm, Dialer, etc. can be connected to be triggered by this output.

Free Input: EW has provision for an additional input utilized for connecting to other security systems outputs which can trigger the 3rd output (2A Relay). For example, smoke detectors can be connected to this input and an auto-dialer to the corresponding output.

Reset: If EW system hangs for whatever reasons (i.e not sensing the Readers, Push buttons etc), remove the front housing and press the Reset button on the PCB to reset the micro controller. **(See Figure in Section 4.1)**

2.0 Mounting Installation

1. Identify a suitable flat surface for wall mounting.
2. Remove the front cover.
3. Using the base as a template, mark the mounting screw hole positions and drill 3 holes using a 6 mm bit.
4. Fix the base housing to the wall using 6 mm diameter wall plugs and 3 wall-fixing screws (4 x 30 CSK Philips) provided.
5. Route the cables through the hole in the base housing.
6. To aid hands-free wiring to the PCB terminals hook the angled bend of the front cover to the base.
7. Ensure that the wiring of the EW PCB is carried out as per wiring instructions given in Section 3
8. Unhook the top-cover and align correctly to the housing.
9. Close and fix the top-cover with the 2 M3x8 mm security screws using the security screwdriver provided.



3.0 View of Terminal Blocks

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27						
NC	C	NO	NC	C	NO	NC	C	NO	+12V	0V	Orange, Green	Grey	Grey	Blue	Blue	White	Yellow	Red	Black	Yellow	White	PB1	PB2	G	DP1	DP2						
Relay 2			Relay 1			Relay 3			IN		Reader 2														Exit 1		Exit 2		Contact 1		Contact 2	
Outputs									Power		Reader 1														Exits		Doors					

EW

28	29	30	31	32	33	34
Free Input	Output 5	Output 4	GND	B	A	
RS485						

CE
ISO 9001-2000
UKAS
DG/WS/0007 IS 01

Note: A cover has been placed over the PCB so that, when flipped open, it reveals the, reset button and jumpers. Wires-connected to the terminal blocks (28-34) should be of sufficient length (approx 200 mm) so that the wires can be moved out of the way when the PCB cover is required to be opened.

4.0 Network Setup

EW is to be connected to O2LA via the RS485 bus; the Yellow LED in EW will flicker to indicate proper bus communication.

1. Ensure that the wiring is properly done and the unit is connected to the RS485 bus.
2. Open the Unit and assign the peripheral number or address to the EW via the dipswitch (refer Section 5)
3. Power up the EW unit.
4. Once the O2LA identifies the EW unit, yellow LED starts to flicker indicating proper communication.
5. If the Yellow LED does not flicker within 60 seconds, re-check the wiring.
6. Close the housing.

Caution: If two EW's are given the same address, then O2LA is likely to malfunction.

4.1 Jumper Settings

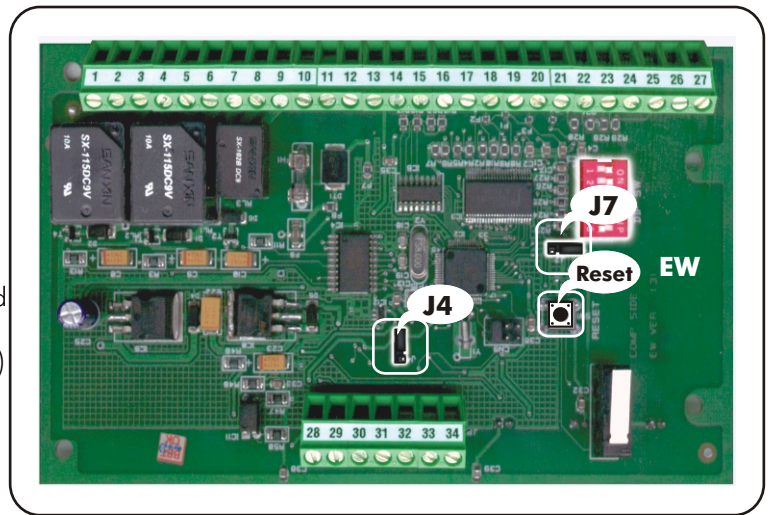
EW has two jumpers that need to be set for customization and basic communication.

J4: Is normally open. When closed, an on-board resistor of value 120 ohm will be connected across the RS485 Bus as a Termination Resistor

(Refer Section 4.3).

J7: Is to be closed when 2 readers are connected to the same door as IN (Reader 1) and OUT (Reader 2) during Anti-Pass back. In this case, Door Sensor 2 (Dp2) input must be shorted and Door Sensor 1 (DP1) only is to be used for door monitoring

(See also caution given below).



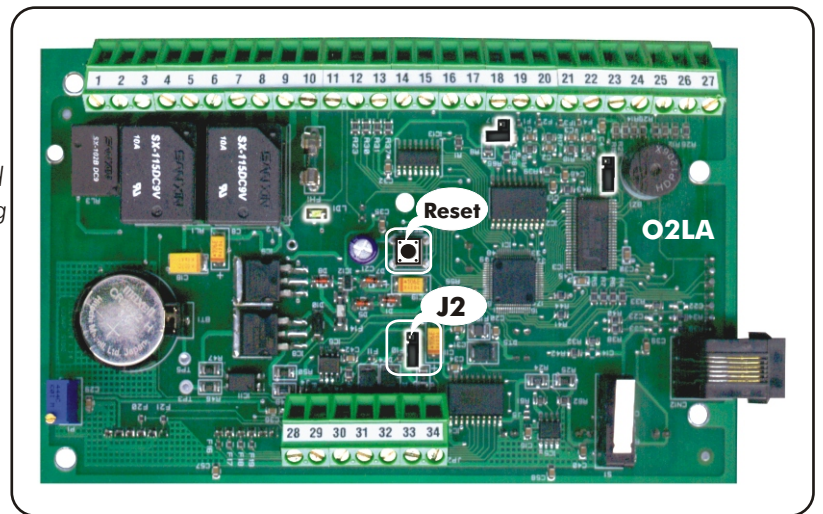
It may be noted that one Jumper is required to be set in the O2LA controller.

J2: Is normally open. When closed, an on-board resistor of value 120 ohm will be connected across the RS485 Bus as a Termination Resistor **(Refer Section 4.3).**

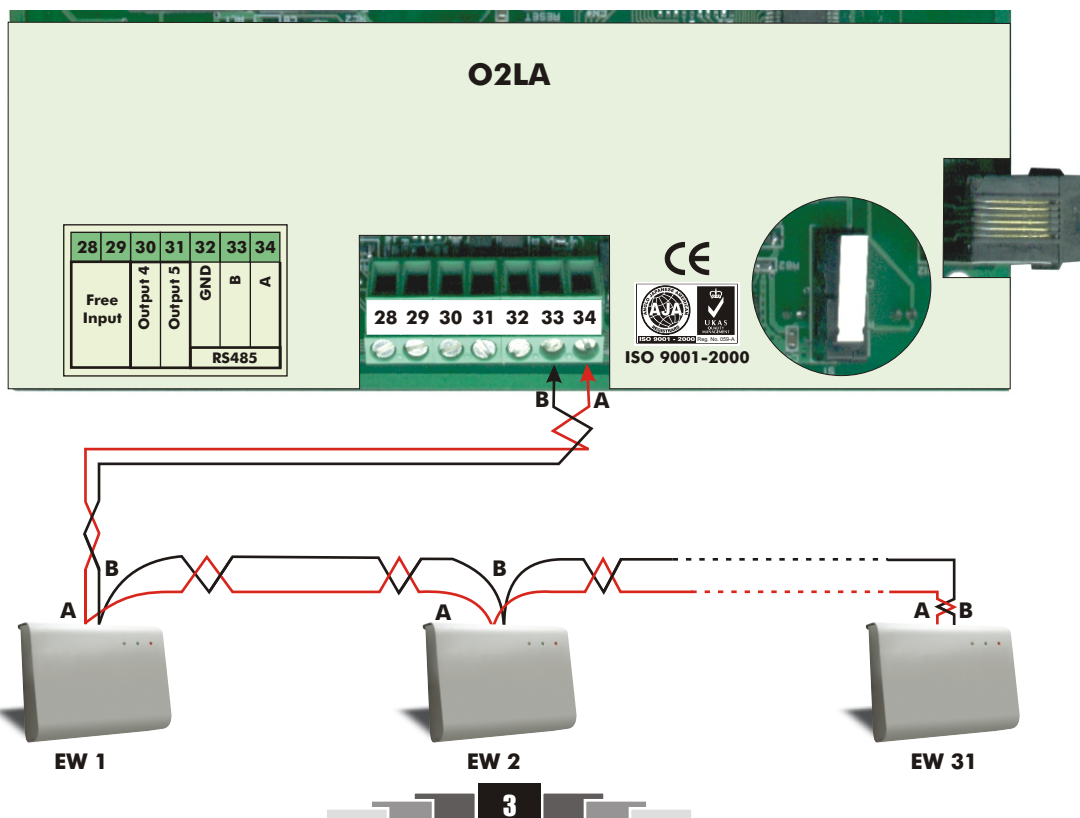
Caution: 1. In most applications, the EW is used to independently operate 2 doors (each having its own door sensor), with 2 separate readers. In Anti-Passback mode, two readers are used to operate the same door. This requires that the second door sensor be de-activated. This is done by shorting Jumper J7, which shorts DP2 to ground.

2. If the second door sensor is not de-activated, then, in Anti-Pass back mode, when Door 2 is used (OUT operation) Door 1 sensor will "see" a forced door and raise an alarm.

3. Poor communication over the Rs485 cable can manifest itself as a system malfunction, e.g. the need to present cards more than once for doors to open; events not registering in buffer Memory, etc.



4.2 RS 485 Network



4.3 Termination Resistor

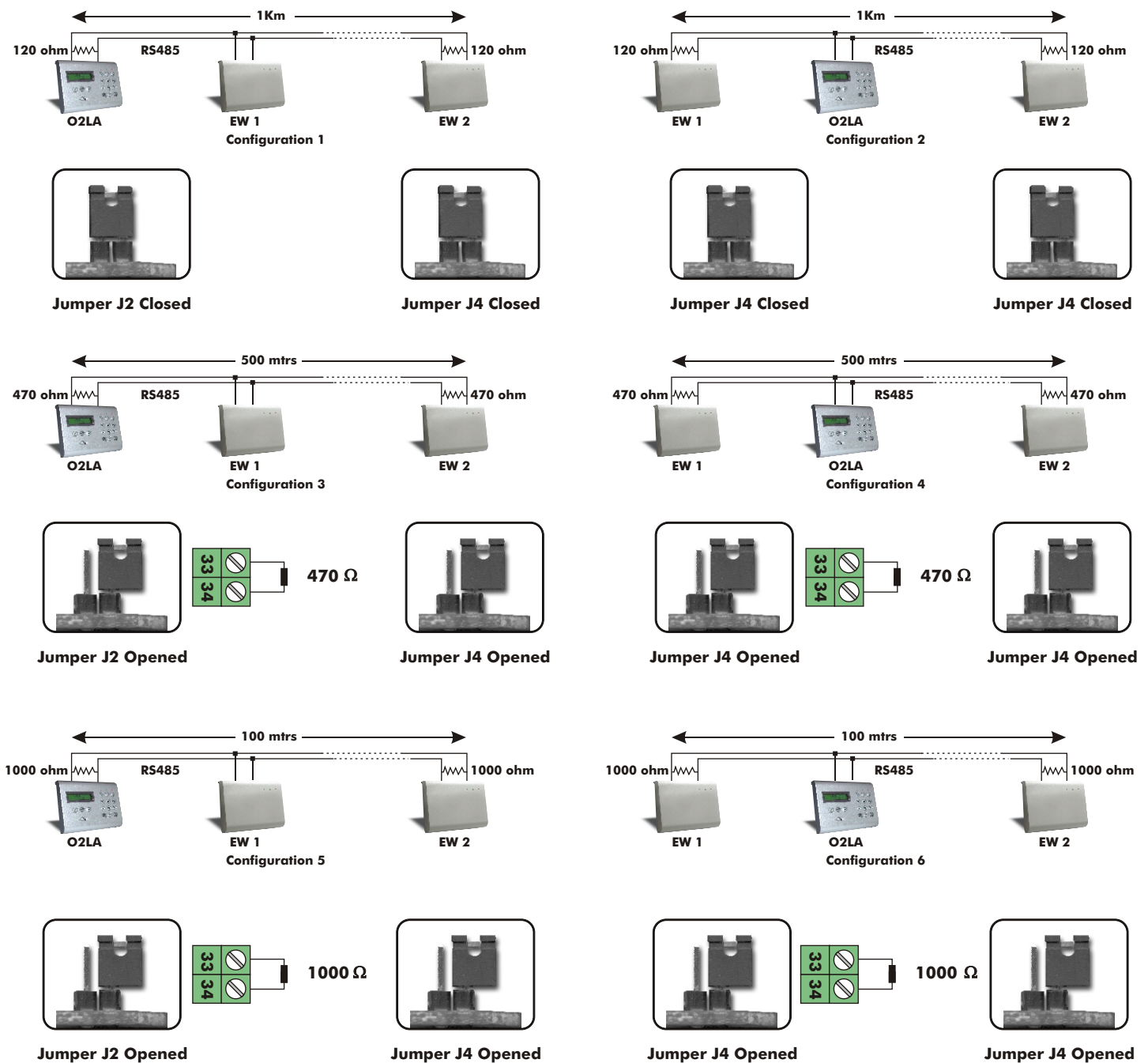
To maintain optimal performance of the RS485 communication bus it must be ensured that signals do not reflect back from the ends of the cable. To achieve this, resistors of the correct value have to be connected to the ends of the RS485 line. The length and other parameters of the RS485 line determine the value of the resistor to be used. O2LA and EW have on-board resistors as well as provision for attaching external resistors.

Note: Only O2LA and / or EW Extension Units, at the two extremities of the RS485 line, need to have Termination Resistors.

The on-board resistors, available in the O2LA and EW, have a value of 120 ohms. These on-board resistors can be connected to the line by closing jumper J2 in O2LA and J4 in EW.

In case the on-board 120-ohm resistor does not improve communication, a resistor of a different value can be tried. O2LA and EW Installation packets contain two resistors each of value 1000-ohms and 470-ohms. After making sure that the 120-ohm resistor is not connected to the line (Jumper J2 in O2LA and J4 in EW are open), one of these resistors can be connected across terminals 33 and 34, i.e. terminals A & B of RS485 bus (See Figure below). The 1000 ohms is to be used for cable lengths of around 100 mtrs and the 470 ohms for cable lengths of around 500 mtrs.

Termination Resistors connection in different configurations:



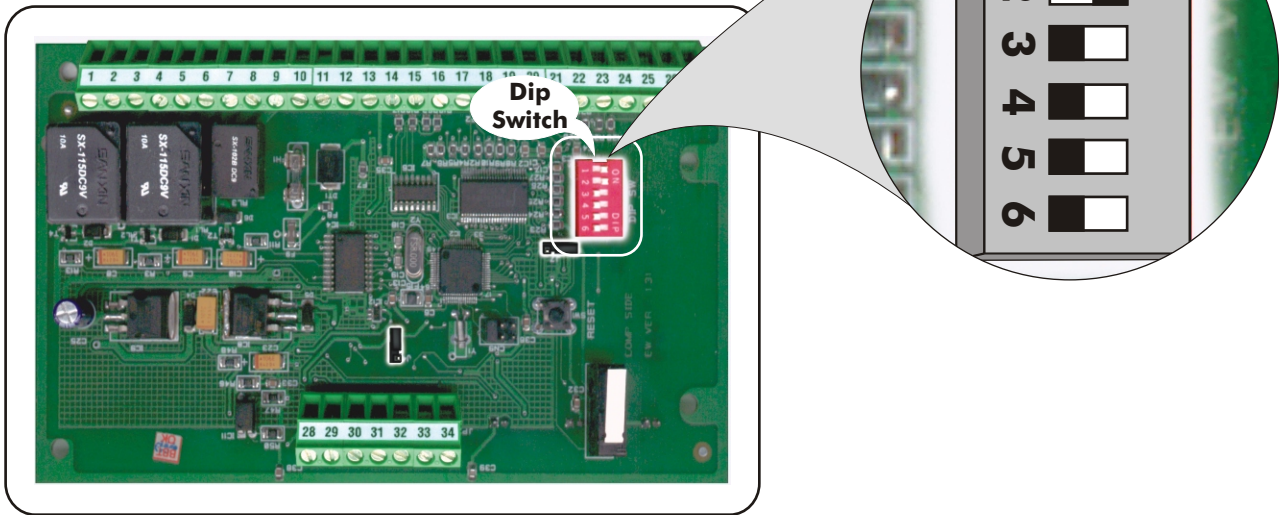
5.0 Assigning Peripheral Numbers or Address

IN order to be recognized by O2LA, each EW unit has an assigned number or “address”. Peripheral numbers or addresses are assigned using dipswitches on the PCB. There is a set of 6 dipswitches in each EW, and of these, the sixth dipswitch is always in the OFF position.

Each dipswitch can assume one of two positions. In the figure given below, in position one the switch is ON or Logic 1, in the other positions the switch is OFF or Logic 0. By positioning the switches to either ON or OFF each combination will allocate a number between 1 and 31 (31 is the maximum number of EW units that can be connected to one O2LA).

The Logic Table below illustrates how the switches represent the assigned EW peripheral numbers from 1-31.


Switch ON = 1 **Note:** Dip Switch sw6 should always be in OFF position.
Switch OFF = 0



The complete logic table for setting numbers from 1 to 31 is given below:


EW No	Sw1	Sw2	Sw3	Sw4	Sw5	Sw6
01	1	0	0	0	0	0
02	0	1	0	0	0	0
03	1	1	0	0	0	0
04	0	0	1	0	0	0
05	1	0	1	0	0	0
06	0	1	1	0	0	0
07	1	1	1	0	0	0
08	0	0	0	1	0	0
09	1	0	0	1	0	0
10	0	1	0	1	0	0
11	1	1	0	1	0	0
12	0	0	1	1	0	0
13	1	0	1	1	0	0
14	0	1	1	1	0	0
15	1	1	1	1	0	0
16	0	0	0	0	1	0
17	1	0	0	0	1	0
18	0	1	0	0	1	0
19	1	1	0	0	1	0
20	0	0	1	0	1	0
21	1	0	1	0	1	0


22	0	1	1	0	1	0
23	1	1	1	0	1	0
24	0	0	0	1	1	0
25	1	0	0	1	1	0
26	0	1	0	1	1	0
27	1	1	0	1	1	0
28	0	0	1	1	1	0
29	1	0	1	1	1	0
30	0	1	1	1	1	0
31	1	1	1	1	1	0

-  **Note:** 1. For programming the number and location of each EW should be carefully noted down
 2. The O2LA automatically identifies EW units connected to the RS485 network, through their addresses. After an EW unit is detected it will take 2 - 3 minutes for the O2LA to register it in memory

6.0 Electrical Environments

Do not install the unit near electrical generators and motors, power lines or television receivers, etc. or any appliance that emits strong electrical / magnetic fields or radio frequency radiation, all of which can adversely affect system communications.

 **Caution:** Electrical & magnetic disturbances can also affect the functionality of the system through cables installed in direct proximity. The system should be wired (cabled) correctly, observing normal precautions, to avoid such disturbances.

 **Note:** The EW has a 500 mA cartridge fuse on the PCB, which will protect the circuit if a wrong voltage is applied. The fuse will blow immediately if (a) beyond rated voltage (12 - 15 V DC) is connected (b) if an AC voltage is connected

 **Tip:** 2 Spare fuses are provided in the installation hardware kit.

7.0 Extreme case of system usage

Under normal conditions of usage, the time taken for the system to authenticate a card and release the door will be well under 1 second. However, in the extreme case when an O2LA system has 64 doors connected through the RS485 network, and all 64 cards are presented to readers simultaneously, there will be maximum delay of up to 3 seconds. Time taken polling each reader will account for the delay.

Warranty:

XPR warrants its products to be free from defects in material and workmanship for 24 months from the date of shipment. The product is to be installed in accordance with XPR's instructions and the unit should not be modified or tampered with. XPR does not assume any responsibility for damages arising from misuse of the product. XPR's sole responsibility is limited to the repair or replacement when the product is sent to XPR's facility.