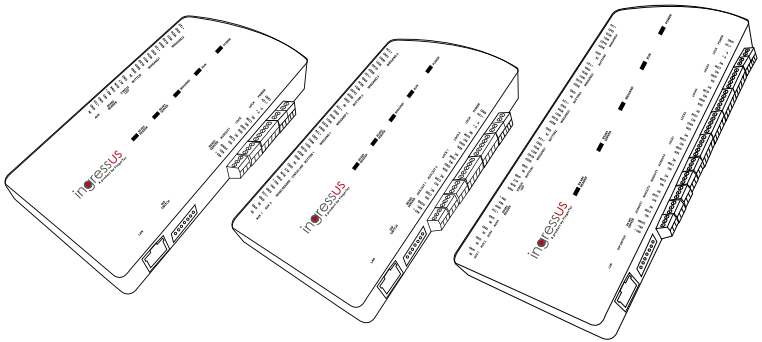


FINGERTEC



ingressUS Controllers
Centralization of Access Control Devices Made Easy

Installer Guide

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1 • INTRODUCTION

The FingerTec Ingressus door access controller comes in 3 versions, Ingressus 1 (1 door version), Ingressus II (2 door version) and Ingressus IV (4 door version). Ingressus provides a computerized central control access control system to secure the environment. Ingressus can store fingerprints, password and card ID of every user. It justifies accessibilities of every user according to the data/settings configured in it.

The Ingressus connects with slave readers to build a complete access control system to guard entry-exit of a premise. The slave readers can be either RS485 readers (reader to capture fingerprints and card ID from users) or Wiegand readers (reader to capture card ID and password from users). RS485 reader connects to Ingressus via RS485 network (multi-drop), for example R2c. Ingressus I supports 2 units of RS485 Reader, while the Ingressus II can support 4 units. The RS485 network of RS485 Reader shall link to the RS485 port of the Ingressus. Ingressus I supports 2 units of Wiegand Reader while Ingressus II supports up to 4 units. Each Wiegand Reader, for example i-Kadex and k-Kadex, connects to the Wiegand port of Ingressus (max 4 ports, Wiegand 1, 2, 3 and 4).

DIAGRAM I

Slave Reader	Credentials	Sample Model	Connection to Ingressus
RS 485	Fingerprint, card ID	R2c	RS 485 port
Wiegand	Card ID, password	i-Kadex, k-Kadex	Wiegand port

Ingressus I supports up to 2 sets of door locks (1 door); Ingressus II supports up to 4 sets of door locks (2 doors) and Ingressus IV supports up to 8 sets of door locks (4 doors).

DIAGRAM II

Controller	Door Lock Qty
Ingressus I	2 sets for 1 door
Ingressus II	4 sets for 2 door
Ingressus IV	8 sets for 4 door

Ingressus can support 2 types of door lock output, either wet contact or dry contact. For wet contact, Ingressus can output power to the door lock system. You can supply additional power supply this is suitable with the door lock system to Ingressus the maximum is 12VDC 3A. For dry contact, Ingressus outputs relay signal to door lock system. You must install an independent power supply to the door lock system. Ingressus will only output relay signal to the door lock system to unlock/lock it. Dry contact is a more secure installation because door lock systems have their own power supply, it remains working even though Ingressus is powered down.

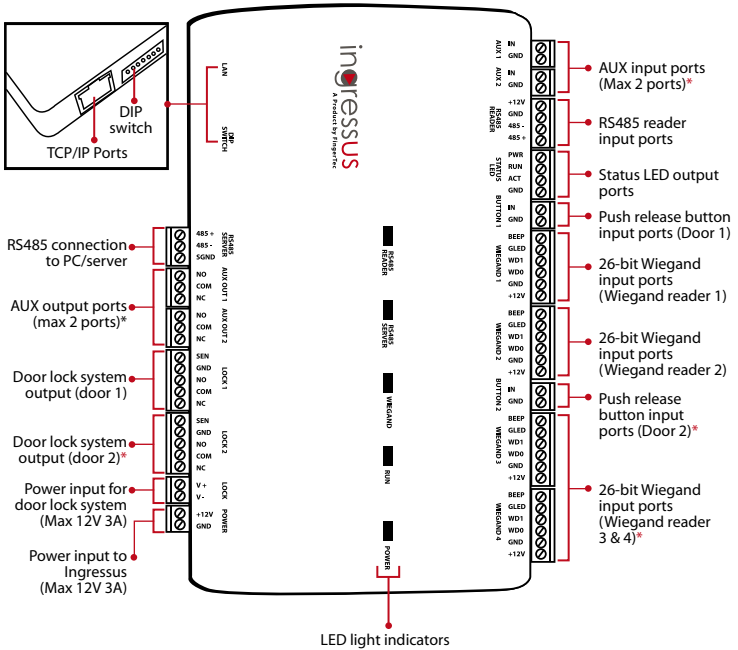
Ingressus II and IV can support AUX input and output. You can install sensors/detectors for example smoke detector as AUX input and alarm as AUX output. When the smoke sensor triggers, Ingressus will trigger the alarm to alert all users. You can configure in Ingress software to unlock all doors in case of fire or smoke detected. See the technical specifications to learn the kinds of AUX input/output available.

The Ingressus comes with its management software, Ingress. Ingress stores a copy of user information and entry-exit records in PC/server. An administrator can always update user information and restriction of access to every Ingressus. An administrator can preview and print useful reports to check entry-exit of each user. Ingress also works as a monitoring station for all connected Ingressus to enhance security levels of the environment.

Ingressus provides 2 types of communications to Ingress. You can link up multiple units of Ingressus by using RS485 network or using TCP/IP (LAN) to a single Ingress. With Ingress, you can now have all entry-exit control of all users on a server for easy management.

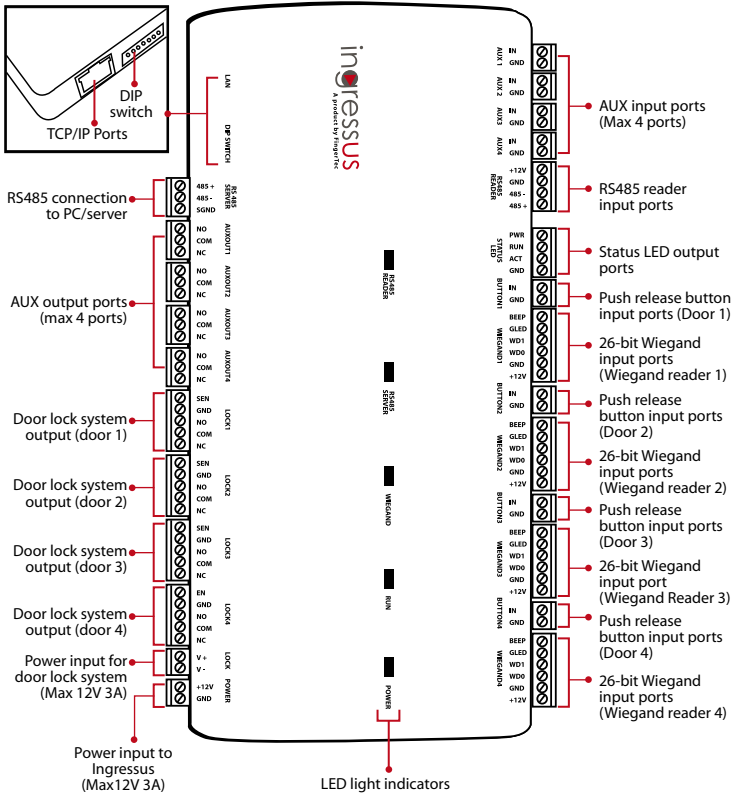
THE OVERVIEW OF HARDWARE

• Ingressus I & II



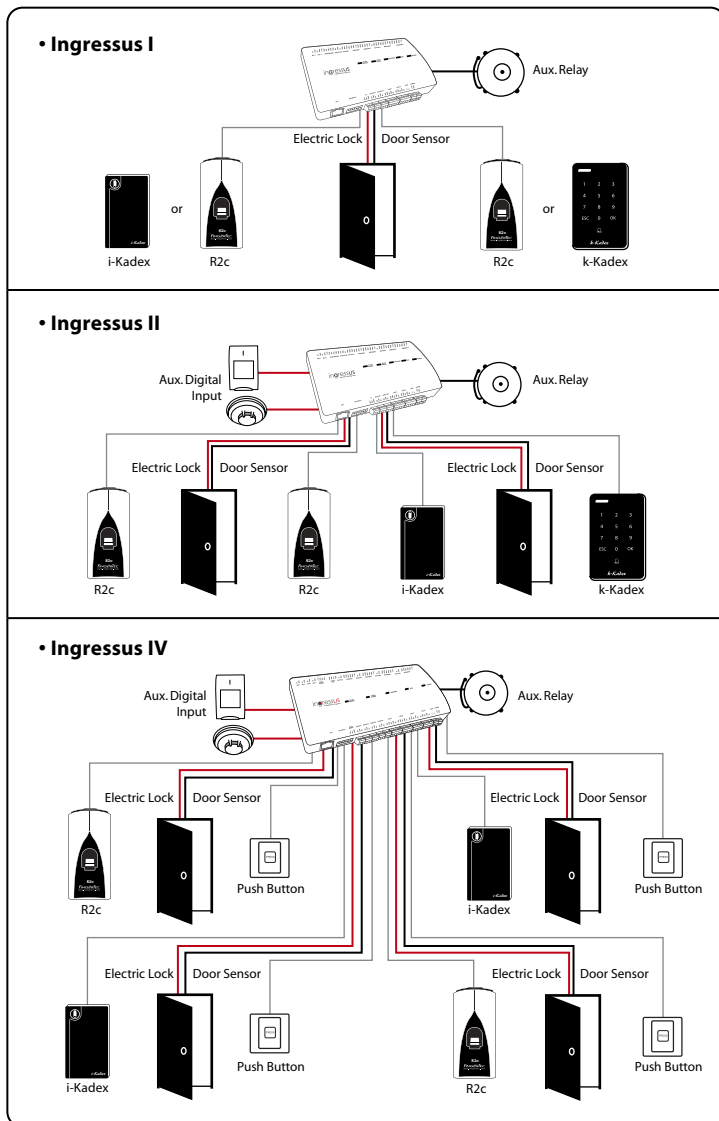
* These ports are available in Ingressus II.

• Ingressus IV

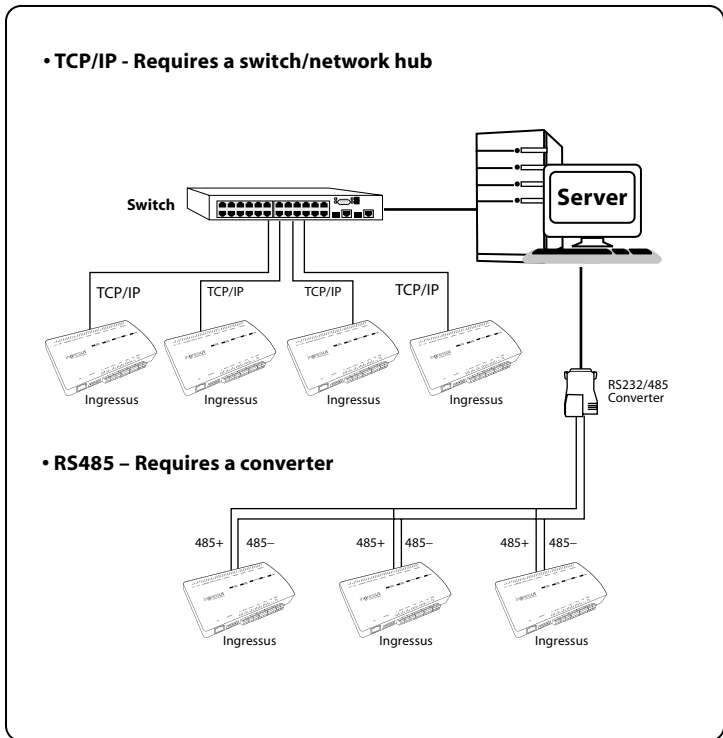


THE OVERVIEW OF INSTALLATION & COMMUNICATIONS

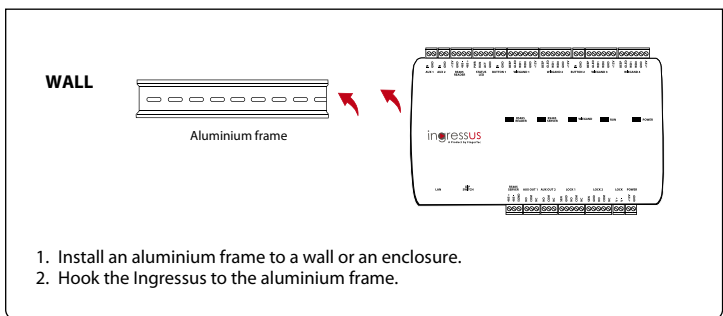
The installations with door lock system



The connection with PC/Server



To install Ingressus



2 • TECHNICAL SPECIFICATIONS

MODEL	Ingressus I	Ingressus II	Ingressus IV
BASIC			
• Dimension (L X W X H), mm	186 x 106 x 36		226 x 106 x 36
• Power input	12V DC		
• Operating temperature (°C)	0 - 55		
• Operating humidity (%)	10 - 80		
• CPU	32-bit, 400MHz		
• Flash memory (MB)	128		
• SDRAM (MB)	32		
• Polarity protection	Yes		
STORAGE			
• Fingerprints	3000		
• Cards	30000		
• Passwords	30000		
• Transactions	100000		
COMMUNICATIONS			
• Communications with server	TCP/IP, RS485		
• Quantity of terminal	2	4	4
• Communication with terminals	2 x 26-bit Wiegand input. Each for 1 slave terminal (1 x RS485 input to support RS485 network) (max 2 units)	4 x 26-bit Wiegand input. Each for 1 slave terminal (1 x RS485 input to support RS 485 network) (max 4 units)	4 x 26-bit Wiegand input. Each for 1 slave terminal (1 x RS485 input to support RS 485 network) (max 8 units)
INPUT			
• Push release button	1	2	4
• Door sensor	1	2	4
• AUX	1	2	4
• Types of AUX input supported	Motion detector, passive DIR detector, curtain passive infrared detector, pet immunity PIR detector, two beam digital active infrared detector, heat detector		
OUTPUT			
• Door lock (12VDC 10A form C relay)	1	2	4
• AUX output (30VDC 2A form C relay)	1	2	4
• Types of AUX output supported	Gas detector and compatible sensors, Piezo strobe siren, electronic siren		
ACCESS CONTROL FEATURES			
• Main Features	Door opening time (0-999s), Inter-locking (Ingressus II & IV only), Anti-pass back (Local only), Multi card unlocking, First card unlocking, Time zone (50), Holiday time zone, Permanent door release/lock time zone, Day light saving time zone, Continuous verification of users		
• Security Features	Door force open alarm, Door open time out alarm, Fire linkage, Duress alarm, Door status and event (51 types)		
SOFTWARE			
• Ingress	Bundled		

3 • BEFORE INSTALLATION

THE POWER SUPPLY

Ingressus must be powered up by 12VDC 3A independently. DO NOT share the power supply with any other devices, slave terminals or door lock systems. **Sharing power supplies might cause insufficient power to Ingressus.** The Ingressus DOES NOT support POE. Link up your Ingressus with backup power supply, for example UPS or rechargeable backup battery, to keep the system working even during power failure.

Ingressus can work as an intermediary to supply power to a door lock system. You must supply additional power to Ingressus at the LOCK V+ and V- ports. The input power is for supplying power to the door lock system. Check the technical specifications of your door lock system, for example 12VDC, 500mA. Calculate the total current consumption before you determine the power supply to LOCK V+ and V-. For example: 4 sets of 12VDC, 500mA door lock to install with Ingressus.

Total current consumption = $4 \times 500\text{mA} = 2000\text{mA}$ (2A)

You must supply at least 12VDC 2A power into the LOCK V+ and V- ports of Ingressus.

The maximum input is 12VDC 3A, and limited to DC power only.

You can ignore the LOCK V+ and V- ports if you are installing door system with individual power supply. Ingressus does not power up the door lock system in this situation, but only outputs relay signals to control the door lock system.

THE DOOR LOCK SYSTEM

There are 2 methods to link up Ingressus with door lock system, either power output (wet-contact) or relay output (dry contact).

To use wet contact, you must provide additional power supply to Ingressus with specifications suitable for the door lock system. This is very crucial to ensure sufficient current to be supplied to the door lock system. Ingressus receives the input power and supplies it to the door lock system. During operation, Ingressus will control the power output to the door lock system to unlock/lock the door. You can input a maximum of 12VDC 3A to Ingressus to support up to 4 sets of door lock systems.

However we do not recommend using power output from Ingressus. In case of power failure in this link-up, all door locks will lose power from Ingressus. The doors will unlock immediately. Make sure you secure the power supply and backup power to Ingressus to ensure zero downtime while maintaining the door lock system.

There are 2 types of wet contact, NO (normally open) and NC (normally close). Check the type of your door lock before you choose to use either contact.

	NC Type (Fail safe)	NO Type (Fail secure)
Idle/fail verifications	Ingressus outputs constant at 12VDC. NC type door lock system activated.	Ingressus does not output any power. NO type door lock system activated.
Success verification	Ingressus stops to output any power for a few seconds (configurable in software). NC type door lock system deactivated.	Ingressus outputs constant at 12VDC for a few seconds (configurable in software). NO type door lock system deactivated.
Power supply cut off	NC type door lock system unlocks.	NO type door lock system remains locking status.

If you are installing door lock systems with independent power supply and backup power, you must choose to use dry contact with Ingressus. Ingressus outputs a 12V relay signal to door lock system to unlock after successful verification. Door lock system with independent power source can work perfectly even if the Ingressus is down or malfunctions. This is the better and more secure installation method.

There are 2 types of dry contact, NO (normally open) and NC (normally close). Check the type of your door lock before you choose to use either contact.

	NC Type (Fail safe)	NO Type (Fail secure)
Idle/fail verifications	Ingressus outputs constant at 12VDC relay signal to the door lock circuit. Door lock system activated.	Ingressus does not output any relay signal to the door lock circuit. Door lock system activated.
Success verification	Ingressus stops to output relay signal for a few seconds (configurable in software) to the door lock circuit. Door lock system deactivated.	Ingressus outputs 12VDC relay signal to door lock circuit for a few seconds (configurable in software). Door lock system deactivated.
Power supply cut off	Door lock system unlocks.	Door lock system remains locked.

Refer to [Wiring Diagram](#) for more details about the installation of Wet/Dry contact, NO/NC output.

CAUTIONS WHEN HANDLING DOOR LOCK SYSTEM INSTALLATION:

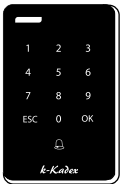
1. DO NOT power up Ingressus, door lock system, or any devices before installation process is completed.
2. PROTECT all wires/cables by using PVC casing pipe or metal lining.
3. SOLDER all joining points of wires/cables and cover them by using insulation tape to achieve better contact.
4. INSTALL diode to the door lock circuit to prevent short circuit.
5. DO NOT install and use the door lock system with AC power. The dry contact from Ingressus (12VDC 10A) is sufficient for door lock system with DC power. If AC power door lock is a must, please contact us at support@fingertec.com
6. If installing Ingressus with door lock system via wet contact, please use 4-strand wire with standard RVV 4*0.75mm² [2 for door lock (NO-COM / NC-COM), 2 for door sensor (SEN-GND)].
7. Use 2-strand wires with standard RVV 2*0.5mm m² for push release button.

THE SLAVE TERMINALS

Ingressus connects to slave terminals via 2 types of connection, which are RS485 network and 26-bit Wiegand input.

Wiegand Reader

The terminals must come with 26-bit Wiegand output. The Wiegand terminals only read and send card ID, user ID or password to Ingressus. These terminals do not have any memory or storage to keep user ID, password or card ID. They do not have the ability to verify password or card ID for users. All storage and verification happen in Ingressus. Ingressus replies to the slave terminals for the result of verification. Slave terminals notify users by LED lights and buzzer.



k-Kadex



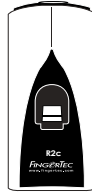
i-Kadex

k-Kadex: capture card ID (default is RFID, Mifare upon request), user ID and password

i-Kadex: capture card ID (default is RFID, Mifare upon request) only

The maximum length of each Wiegand reader and Ingressus shall not exceed 100 meters.

RS485 Reader

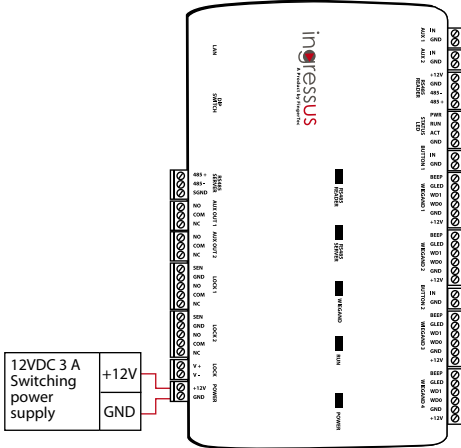


R2c

The terminal can support RS485 network to link up with Ingressus. The terminal captures fingerprint templates and card ID of users, before sending it to Ingressus for verification. This terminal does not have any memory or storage to store user ID, fingerprint templates or card ID. The storage and verification are done in Ingressus. This terminal will capture the credentials and reply to users the result of verification.

4 • INSTALLATION INSTRUCTIONS & DIAGRAMS

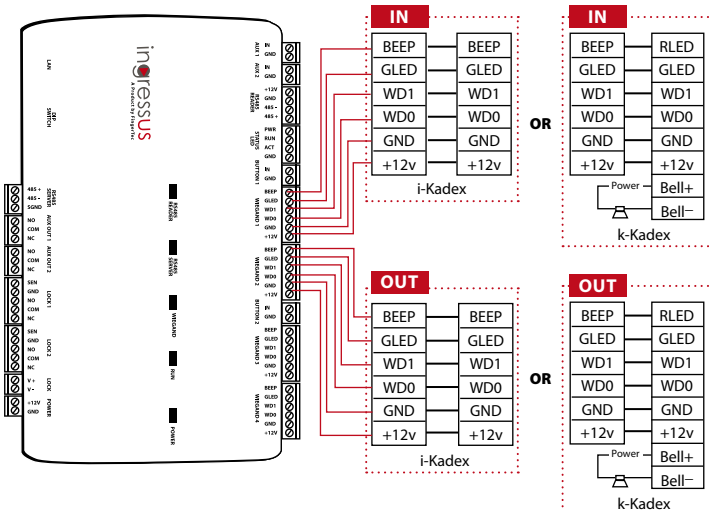
POWER-UP INGRESSUS



Note:

1. Only supply 12VDC 3A to Ingressus. Recommended to use switching power supply with stable 12VDC 3A output.
2. Check to make sure the POWER LED lights up in red color.
3. DO NOT share the switching power with any other Ingressus, door lock systems or other devices.
4. Make sure backup power is available to support Ingressus during power failure.
5. TURN OFF power for Ingressus before you continue to the next step.

CONNECTING TO WIEGAND READER (k-Kadex, i-Kadex)



Note:

1. All Wiegand readers must provide 26-bit Wiegand output.
2. Each Wiegand port only connects to 1 Wiegand reader.
3. Use standard Wiegand wires RVVP 6*0.5mm (2 for D0, 2 for D1, 2 for GND)
4. Relation of Wiegand reader and doors

Ingressus I

	Wiegand 1	Wiegand 2
Install to	Door 1 – Entry	Door 1 – Exit

Ingressus II

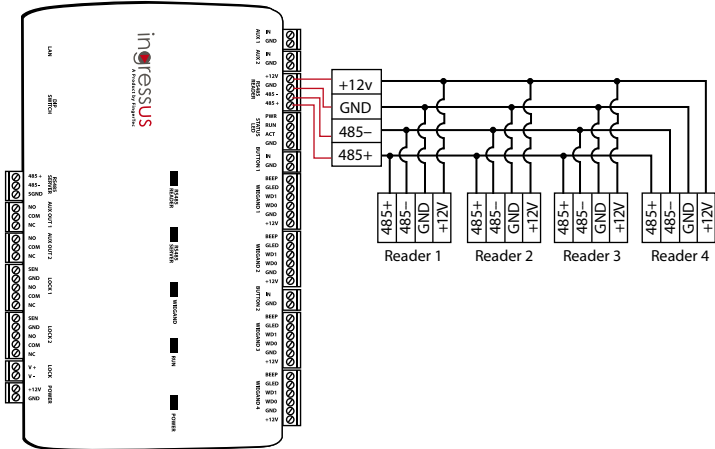
	Wiegand 1	Wiegand 2	Wiegand 3	Wiegand 4
Install to	Door 1 – Entry	Door 1 – Exit	Door 2 – Entry	Door 2 – Exit

Ingressus IV

	Wiegand 1	Wiegand 2	Wiegand 3	Wiegand 4
Install to	Door 1 – Entry	Door 2 – Entry	Door 3 – Entry	Door 4 – Entry

5. Slave terminals receive power from Ingressus directly. DO NOT connect any additional power supply to the slave terminals.

CONNECTING TO RS485 READER (R2c)

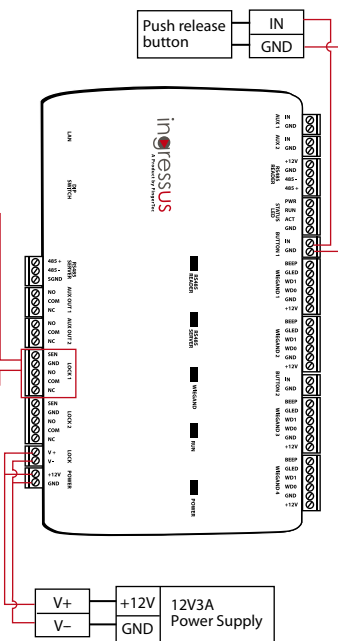
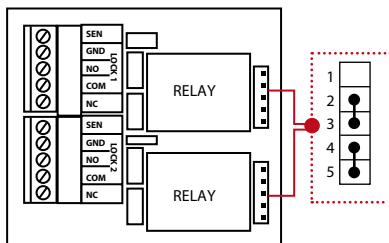
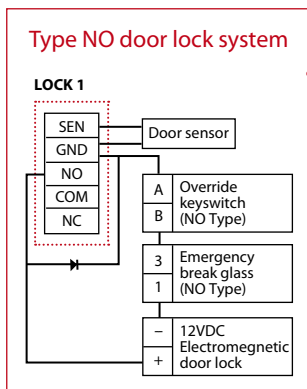
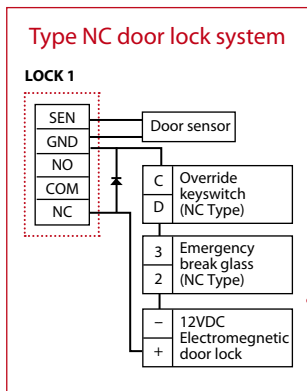


Note:

1. Make sure you can configure the DIP switch of each slave terminal to set its device number (range 1 to 4), for Ingressus II & IV, range 1 to 2 for Ingressus I). None of the terminals can have the same device number.
2. Use standard belden shielded twisted pairs RS485 cables, RVVP 6*0.5mm (2 for RS485+, 2 for RS485- and 2 for GND).
3. DO NOT use multi drop, star-shape or ring-shape wiring to connect RS485 reader to Ingressus.
4. A maximum of 8 x R2c can be used with Ingressus IV.

CONNECTING TO DOOR LOCK SYSTEM VIA WET CONTACT

Set jumper inside Ingressus to wet contact mode.

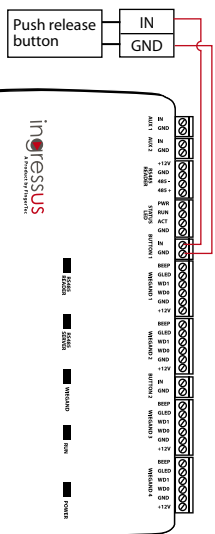
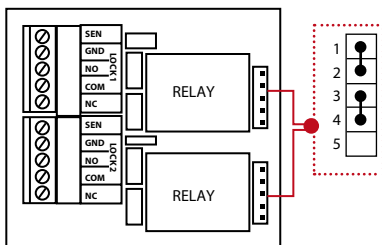
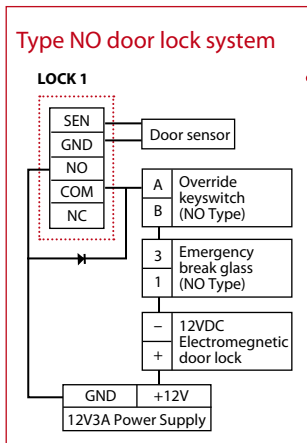
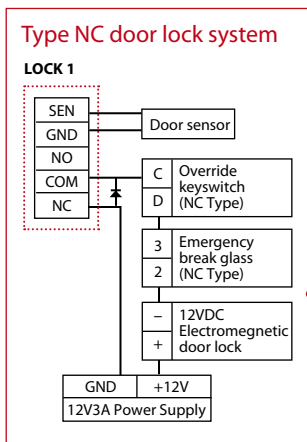


Note:

1. Use 4-strand wire with standard RVV 4*0.75mm² [2 for door lock (NO-COM / NC-COM), 2 for door sensor (SEN-GND)].
2. Use 2-strand wires with standard RVV 2*0.5mm² for push release button.
3. DO NOT power up Ingressus during wiring process.
4. For Ingressus IV, duplicate the connection of Ingressus II.

CONNECTING TO DOOR LOCK SYSTEM VIA DRY CONTACT

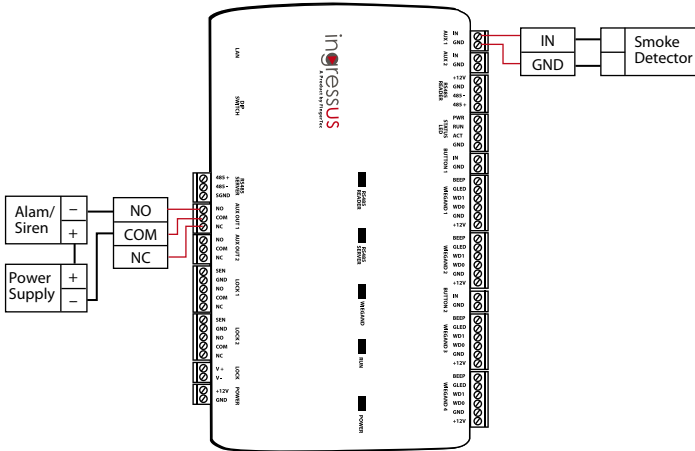
Set jumper inside Ingressus to dry contact mode.



Note:

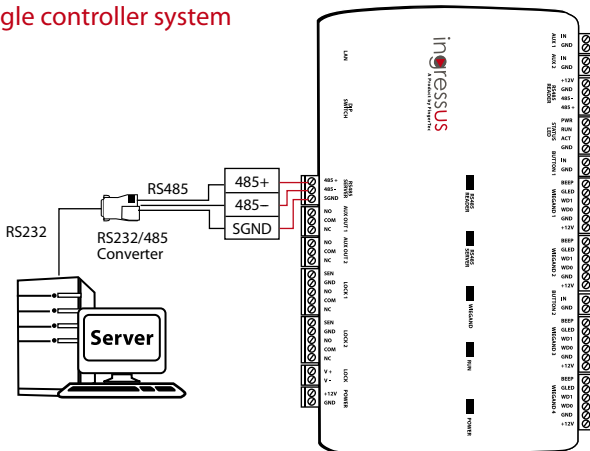
1. DO NOT install with door lock systems connected to AC power.
2. Each door lock system should be installed with independent power supply and backup battery.
3. Use 4-strand wire with standard RVV 4*0.75mm² [2 for door lock (NO-COM / NC-COM), 2 for door sensor (SEN-GND)].
4. Use 2-strand wires with standard RVV 2*0.5mm² for push release button.
5. DO NOT power up Ingressus or lock system during wiring process.
6. For Ingressus IV, duplicate the connection of Ingressus II.

CONNECTING TO AUX COMPONENTS



CONNECTING TO PC VIA RS485

Single controller system



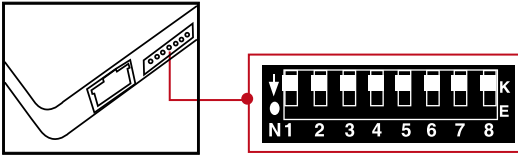
Multiple controller system

Note:

1. ONLY use RS485 connection to link up Ingressus and PC if TCP/IP connection is unavailable.
2. Use standard belden shielded twisted pairs RS485 cables.
3. Make sure you have RS232/485 data converters as the communication interface between RS485 and PC serial port (RS232).
4. Set the DIP switch at Ingressus to define the Device ID of each Ingressus.

CONFIGURATION OF DIP SWITCH

The configuration of DIP switch at Ingressus



Only use switch 1 to 6 to setup Device ID of Ingressus. Each number represents a value, see the table below.

Switch	1	2	3	4	5	6
Value	1	2	4	8	16	32

You can set the Device ID by turning the switch ON (pull down as ON), see sample below:

To set device ID = 35, please turn on switch 1, 2 and 6.

Switch 1 represents value 1

Switch 2 represents value 2

Switch 6 represents value 32

Sum up the value = 1 + 2 + 32 = 35

You can use combination of up to 6 switches to achieve the same value as Device ID. See table below: (the symbol * mean OFF)

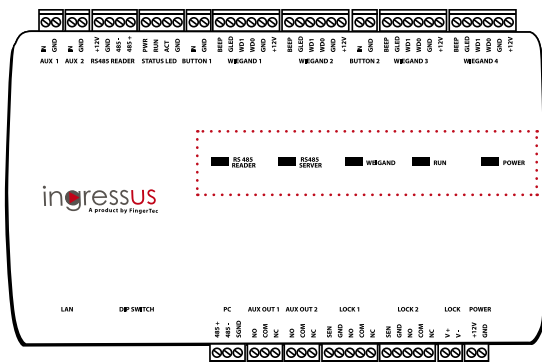
Switch	1	2	3	4	5	6
Device ID	Status of DIP switch					
1	ON	*	*	*	*	*
2	*	ON	*	*	*	*
3	ON	ON	*	*	*	*
4	*	*	ON	*	*	*
5	ON	*	ON	*	*	*
6	*	ON	ON	*	*	*
7	ON	ON	ON	*	*	*
8	*	*	*	ON	*	*
9	ON	*	*	ON	*	*
10	*	ON	*	ON	*	*
11	ON	ON	*	ON	*	*
12	*	*	ON	ON	*	*

Switch	1	2	3	4	5	6
Device ID	Status of DIP switch					
13	ON	*	ON	ON	*	*
14	*	ON	ON	ON	*	*
15	ON	ON	ON	ON	*	*
16	*	*	*	*	ON	*
17	ON	*	*	*	ON	*
18	*	ON	*	*	ON	*
19	ON	ON	*	*	ON	*
20	*	*	ON	*	ON	*
21	ON	*	ON	*	ON	*
22	*	ON	ON	*	ON	*
23	ON	ON	ON	*	ON	*
24	*	*	*	ON	ON	*
25	ON	*	*	ON	ON	*
26	*	ON	*	ON	ON	*
27	ON	ON	*	ON	ON	*
28	*	*	ON	ON	ON	*
29	ON	*	ON	ON	ON	*
30	*	ON	ON	ON	ON	*
31	ON	ON	ON	ON	ON	*
32	*	*	*	*	*	ON
33	ON	*	*	*	*	ON
34	*	ON	*	*	*	ON
35	ON	ON	*	*	*	ON
36	*	*	ON	*	*	ON
37	ON	*	ON	*	*	ON
38	*	ON	ON	*	*	ON
39	ON	ON	ON	*	*	ON
40	*	*	*	ON	*	ON
41	ON	*	*	ON	*	ON
42	*	ON	*	ON	*	ON
43	ON	ON	*	ON	*	ON
44	*	*	ON	ON	*	ON
45	ON	*	ON	ON	*	ON
46	*	ON	ON	ON	*	ON
47	ON	ON	ON	ON	*	ON
48	*	*	*	*	ON	ON
49	ON	*	*	*	ON	ON
50	*	ON	*	*	ON	ON
51	ON	ON	*	*	ON	ON
52	*	*	ON	*	ON	ON
53	ON	*	ON	*	ON	ON
54	*	ON	ON	*	ON	ON
55	ON	ON	ON	*	ON	ON
56	*	*	*	ON	ON	ON
57	ON	*	*	ON	ON	ON

Switch	1	2	3	4	5	6
Device ID	Status of DIP switch					
58	*	ON	*	ON	ON	ON
59	ON	ON	*	ON	ON	ON
60	*	*	ON	ON	ON	ON
61	ON	*	ON	ON	ON	ON
62	*	ON	ON	ON	ON	ON
63	ON	ON	ON	ON	ON	ON

1. You can connect up to 63 units of Ingressus within the same network. However 32 units of Ingressus is recommended for performance purposes.
2. Switch 7 is the reset button of Ingressus. Turn ON and OFF 3 times within 10 sec to reset Ingressus back to factory default settings. The reset operation erases all data and records stored in Ingressus.
3. Switch 8 is a resistor in between the RS485 + and RS485 – wires to maintain the strength of data signal. In case of installation with RS485 wires longer than 300 meters, turn on switch 8 of the first and last Ingressus. This action is to add a 123ohm resistor to the RS485 wires to maintain the data signal strength.

5 • LED LIGHT INDICATOR



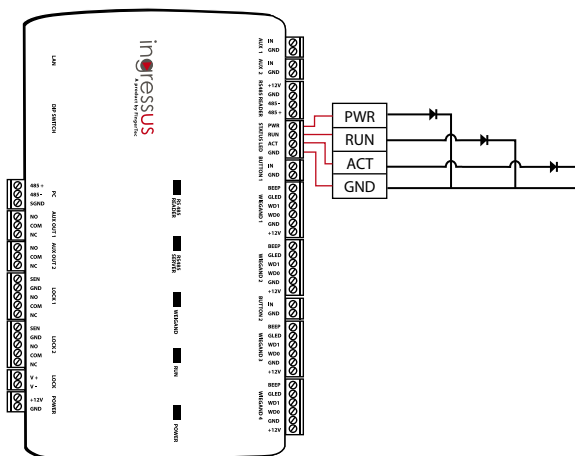
There are a total of 6 LED light indicators on Ingressus. They tell the status of:

- LAN connection to server,
- RS485 connection to server,
- RS485 reader to Ingressus,
- Wiegand reader to Ingressus,
- Operating system of Ingressus, and
- Power input to Ingressus.

Name of LED	Color of LED	Descriptions
RS485 Reader	Yellow & Green	Blinks to indicate <ul style="list-style-type: none"> • RS485 reader captures and sends fingerprints or card ID to Ingressus to verify. • Ingressus replies to RS485 reader with the verification result.
RS485 Server	Yellow & Green	Blinks to indicate data transfer between Ingressus and server via RS485 network.
Wiegand	Yellow	Blinks to indicate <ul style="list-style-type: none"> • Wiegand reader captures and sends card ID or password to Ingressus to verify. • Ingressus replies to Wiegand reader with the verification result.
Run	Green	Blinks to indicate Ingressus is working in good order.
Power	Red	Lights up to indicate Ingressus is receiving sufficient power.
LAN	Yellow	Blinks to indicate data transfer between Ingressus and server via LAN (or TCP/IP) network.

Contact your local resellers or email us at support@fingertec.com if you notice abnormal LED indications at Ingressus.

If you install Ingressus in a solid protective casing, you might not see these LED indicators. However, you can install external LEDs for monitoring purpose. You will need to connect the external LEDs to the STATUS LED port. See wiring diagram as below:



There are 3 outputs to indicate:

Name of LED	Descriptions
Link	Lights up to indicate LAN (or TCP/IP) connection established.
Act	Blinks to indicate data transfer between Ingressus and server via LAN (or TCP/IP) network.
Run	Blinks to indicate Ingressus is working in good order.

