

iFDC

iEDC

8 DOOR ACCESS CONTROL SYSTEM

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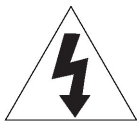
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# Safety Information

# 1



**CAUTION:** TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK) NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



This symbol indicates that dangerous voltage consisting a risk of electric shock is present within this unit.



This exclamation point symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

## WARNING

To reduce the risk of fire or electric shock, do not expose this appliance to rain or moisture.

## WARNING

1. Be sure to use only the standard adapter that is specified in the specification sheet. Using any other adapter could cause fire, electrical shock, or damage to the product.
2. Incorrectly connecting the power supply or replacing battery may cause explosion, fire, electric shock, or damage to the product.

3. Do not connect multiple controllers to a single adapter. Exceeding the capacity may cause abnormal heat generation or fire.
4. Securely plug the power cord into the power receptacle. Insecure connection may cause fire.
5. When installing the controller, fasten it securely and firmly. The fall of controller may cause personal injury.
6. Do not place conductive objects (e.g. screwdrivers, coins, metal parts, etc.) or containers filled with water on top of the controller. Doing so may cause personal injury due to fire, electric shock, or falling objects.
7. Do not install the unit in humid, dusty, or sooty locations. Doing so may cause fire or electric shock.
8. If any unusual smells or smoke come from the unit, stop using the product. In such case, immediately disconnect the power source and contact the service center. Continued use in such a condition may cause fire or electric shock.
9. If this product fails to operate normally, contact the nearest service center. Never disassemble or modify this product in any way. (SAMSUNG is not liable for problems caused by unauthorized modifications or attempted repair.)
10. When cleaning, do not spray water directly onto parts of the product. Doing so may cause fire or electric shock.

## CAUTION

1. Do not drop objects on the product or apply strong blows to it. Keep away from a location subject to excessive vibration or magnetic interference.
2. Do not install in a location subject to high temperature (over 50°C), low temperature (below -30°C), or high humidity. Doing so may cause fire or electric shock.
3. If you want to relocate the already installed product, be sure to turn off the power and then move or reinstall it.
4. Remove the power plug from the outlet when there is a lightning storm. Neglecting to do so may cause fire or damage to the product.
5. Keep out of direct sunlight and heat radiation sources. It may cause fire.
6. Install it in a place with good ventilation.
7. Avoid aiming the controller directly towards extremely bright objects such as sun.
8. Apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.
9. The Mains plug is used as a disconnect device and shall stay readily operable at any time.

# 1 IMPORTANT SAFETY INSTRUCTIONS

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1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus.
13. Unplug this apparatus when a card is used. Use caution when moving the cart/ apparatus combination to avoid injury from tip-over.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



iEDC is a combined product of iFDC and ERIO, the extension board.

## 1 Characteristics of iEDC

---

### Intelligent multi door access control system

*iEDC* is an intelligent multi door access control system and created to manage sites, from small to large scale, by controlling maximum 8 doors with *ERIO*. *iEDC* registers maximum 100,000 user cards and saves 100,000 events of access and alarm.

Various types of readers can be connected to *iEDC* reader ports. *iEDC* supports various operation modes such as RF card only and RF card + password. Security can be enhanced by connecting various input devices such as exit buttons, door sensor, human body sensor, and broken window sensor to input ports of *iEDC*. Also you can install *iEDC* inside your security area and protect the *iEDC* from breaking.

When you use *iFDC* alone, you can control 4 doors. In the case that you install *ERIO*, which is an extension board, you can control 8 doors. *iEDC* supports serial and ethernet communication.

*iEDC* can set up features such as user card registration, input output operation mode, input output settings, and time schedules by using *STARWATCH ENTERPRISE* software. With *STARWATCH ENTERPRISE*, you can monitor real-time access & alarm status of cardholders.

## Anti-Passback

iEDC provides Anti-Passback to manage access history of cardholders precisely and enhance security of an area by setting up to force going in and going out. For example, install card readers on both sides of a door, in and out, and then a cardholder cannot go out in the case that the cardholder had not presented his/her card to in-reader when going in.

If a cardholder had not presented a card when he went in by following a person who had gone in in front of the card reader, the door would not open when the cardholder goes out by presenting the card and an Anti-Passback error would occur.



**There are 3 levels of Anti-Passback for your convenience.**

**-Hard Anti-Passback:** A cardholder cannot access when an Anti-Passback occurs. iEDC generates Anti-Passback error output and creates the event.

**-Soft Anti-Passback:** A cardholder can access even though an Anti-Passback error occurs. iEDC creates an Anti-Passback event.

**-Timed Anti-Passback:** When an Anti-Passback error occurs, iEDC removes the error and lets the cardholder access.

## Setting up a reader to terminate the validity of a cardholder

When a card is presented to the reader to which this feature is enabled, the validity of the card expires. From that time on, even if the card is presented to a reader which is connected to the iEDC, the doors would not open, and iEDC generates the event.

## Handling Wiegand and 4/8bit Burst input

iEDC recognizes standard Wiegand automatically. In the case that a reader supports 26 bit or 34 bit Wiegand, you can use the reader without separate setting.

## Setting up ARM/DISARM

This feature lets a cardholder who has authority to set up ARM/DISARM set up ARM/DISARM to a reader. The reader which is set to ARM cannot read cards and the keypad of the reader is disabled.



**There are 4 levels of ARM/DISARM for your convenience.**

**-ARM/DISARM:** Once ARM/DISARM is set, the ARM/DISARM is applied to all of the iEDC

- Timed ARM:** ARM is set after the certain time that a cardholder predefined.
- Free ARM/DISARM:** Let the cardholder use Free ARM/DISARM card to set ARM/DISARM without using the keypad.
- Group ARM/DISARM:** When a cardholder set ARM/DISARM to a reader of a group, ARM/DISARM of all reader of the group are automatically set together.

## Programmable inputs and outputs

*iEDC* can connect with input or output devices that a user want to use: exit buttons, door sensors, and sensors.

## Setting up Various Time Schedule

Time Schedule make *iEDC* operate or stop during the predefined time. You can apply time schedule by your intention, reader, input and output devices. You can make maximum 255 time schedule codes, and you can divide a day into maximum 24 sections to set time schedules.



**There are 5 time schedules for your convenience.**

-**Card time schedule:** This lets *iEDC* allow or deny access of cardholders by the predefined time. When registering cards, card time schedule can be set by readers. During a predefined time of a time schedule, *iEDC* allows access. When it is not the predefined time, *iEDC* deny access and save time schedule errors.

-**Reader time schedule:** When reader mode is RF + PW, during a predefined time of a time schedule, *iEDC* operates as if it is RF mode. When it is not the predefined time, *iEDC* operates as RF + PW.

-**Input time schedule:** Input time schedules to use for each input port. During the predefined time, input signal is generated automatically.

-**Output time schedule:** Input time schedules to use for each output port. During the predefined time, output ports automatically generate signal.

-**Manual output time schedule:** This make an output times schedule work when a certain card is authenticated during the predefined time.

## Setting up holidays

Maximum 255 holiday codes can be defined except Sunday, such as legal holidays and biweekly holidays. One holiday code can contains maximum 64 days.

Maximum 3 holiday time schedules can be allocated to one cardholder, therefore maximum

192 (64×3) holidays for one card holder can be defined. (In time schedule menu, you can set to allow access only during the predefined time on the designated date). Each holiday code can be set to each time schedule code.

### **Door open alarm, forced door open alarm**

*iEDC* generate door open alarm event if a door remains open after a predefined standby time. Also, if a cardholder opens a door by force without authentication process, *iEDC* generates forced door alarm event immediately. You can set to sound an alarm when door open alarm events or forced door open alarm events occur.

### **2 men operation mode**

2 men operation mode is designed to control special areas which require high security level. When 2 men operation mode is enabled, authentications of 2 authorized cardholder are required when accessing a door. When registering cards for 2 men operation mode, two cards are required which are registered by visitor and manager authorization codes

### **Duress**

Duress is used to let other people know that a cardholder is being threatened, for example, the cardholder is forced to open a door by a robber.

If a cardholder input 2 ~ 4 digits duress alarm password and <ENT> key before presenting a card or inputting the card number, door opens as if normal, but *iEDC* generates duress event and user-defined output.

### **Handling events by priority**

*iEDC* saves every event that occurs. Using these events, *iEDC* manager can get information of cardholders' access; time, location, and identity.

The manager can check events by time of event occurrence. If the manager wants to check specific type of events first, the manager can define event priority and check events of high priority first.

### **Registering lost / stolen ID**

When a cardholder loses a card or a card is stolen, *iEDC* manager can register the card as lost / stolen card. If the lost / stolen card is used by other person, *iEDC* saves lost / stolen events. Using these information *iEDC* manager can check when and where the lost / stolen card is used.

## Maintaining data

When a power failure occurs, *iEDC* saves card data (personal information) and access & alarm data to flash memory and preserve data perpetually.

## Defining the term of validity of cards

Defines the term of validity of a cardholder's card usage and allow access during the term. An expired card can be re-registered to use it again.

## Setting up various inputs and outputs

*iEDC* provides maximum 16 input ports and 16 output ports.



- Defining input port type(NO, NC):** You can define whether an input port is NO (Normal Open) or NC (Normal Close)
- Defining input type:** You can define input types such as exit button and door sensor
- Defining output type:** Output type is relay output, and you can set output time that you want.

## Support various readers

*iEDC* supports various reader operation modes



- RF Card Only:** Recognizes user RF card only.
- PIN only:** Recognizes both Keypad Data and RF Card
- RF Card + Password:** Recognizes RF Card and password.

## Uploading / Downloading user data and events

*iEDC* uploads user data, events information, and other setting values to or downloads from Host PC by using operating software.

## Setting up output operation time

*iEDC* has maximum 16 outputs. *iEDC* sets up unit of operation time of all outputs by the 1 second or the 0.1 second unit.

## Setting up by doors

*iEDC* can control maximum 8 doors because *iEDC* offers interface for 8 RF readers. In this case, exit buttons must be used for exit. In the case of setting up in / out readers for all doors,

iEDC can control maximum 4 doors. If you want to use Anti-Passback feature, in / out readers for all doors are required.

iEDC provides maximum 16 relay output and input ports. Locking devices of each door are controlled by relays, and devices such as exit button and door contact sensor are controlled by input.

iEDC allows to set up exit button input and door contact sensor for each door and sound door open alarm and forced door open alarm by using door contact sensors.

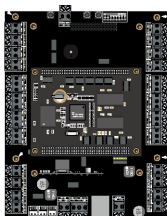
### Guard tour

Guard tour feature maintains history of guard tour by using guard card. When a guard card is authenticated, relay outputs are not generated and the event is recorded. Therefore you can manage working status of guards and at the same time restrict access of guards.

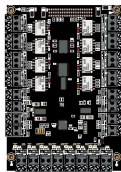
## 2 What's in the Box

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### 2.1 iEDC comes with followings



iFDC  
1 ea



ERIO  
1 ea



Quick Installation Guide  
1 ea

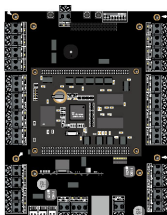


Manual CD  
1 ea



Diode  
8 ea

### 2.2 iFDC comes with followings



iFDC  
1 ea



Quick Installation Guide  
1 ea



Manual CD  
1 ea

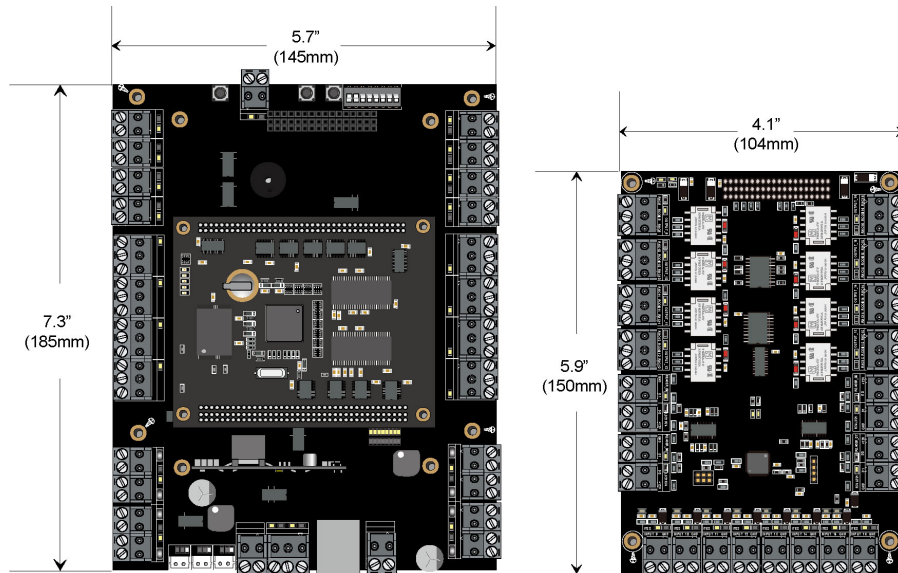


Diode  
4 ea

### 3 iFDC, ERIO size

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Figure 2-1 iFDC, ERIO size



### 4 iFDC board configuration

---

- 4 reader ports
- 8 input ports
- 8 output ports (Relay output)

Figure 2-2 iFDC board configuration

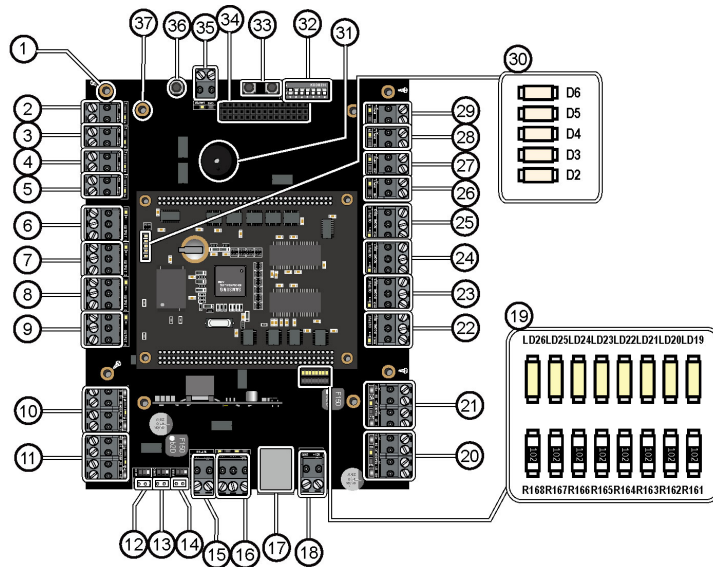


Table 2-1 iFDC board configuration description (figure: see Figure 2-2 iFDC board configuration)

| No. | Name                   | Function                                    |
|-----|------------------------|---------------------------------------------|
| 1   | Nema case fixing hole  | Fixes nema case using screws.               |
| 2   | Input no.1 port        | Receives inputs through connected cable.    |
| 3   | Input no.2 port        |                                             |
| 4   | Input no.3 port        |                                             |
| 5   | Input no.4 port        |                                             |
| 6   | Relay output no.1 port | Provides FORM-C(COM, NO, NC) relay outputs. |
| 7   | Relay output no.2 port |                                             |
| 8   | Relay output no.3 port |                                             |
| 9   | Relay output no.4 port |                                             |
| 10  | Reader no.1 port       | Handles Wiegand reader inputs.              |
| 11  | Reader no.2 port       | Handles Wiegand reader inputs.              |

| No. | Name                               | Function                                                                                                                                                                    |
|-----|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | port                               |                                                                                                                                                                             |
| 12  | Link status LED connector          | Connects nemacase LED using cable. Indicates ethernet communication status by using ??? LED.                                                                                |
| 13  | Communication status LED connector | Connects nemacase LED using cable. Indicates ethernet communication status by using yellow LED                                                                              |
| 14  | Power status LED connector         | Connects nemacase LED using cable. Red LED means that power is being supplied normally.                                                                                     |
| 15  | RS485 communication                | This port is used when <i>iEDC</i> connects PC in a long distance and uses RS 485 communication. You can connect more than 2 <i>iEDC</i> in multi-drop way and communicate. |
| 16  | RS232 communication                | This port is used when <i>iEDC</i> connects PC 1 by 1 in a short distance and uses RS232 communication.                                                                     |
| 17  | RJ 45                              | This is a RJ-45 connector that connects ethernet cable.                                                                                                                     |
| 18  | Power +12V                         | <i>iEDC</i> uses +12V DC power and its maximum operating current is 700mA. (Assuming that no other connections exist such as lock, alarm, sensor, and reader.)              |
| 19  | Firmware operation status LED      | Shows operations. For more information, please see ' <a href="#">Firmware operation status LED operating status description table</a> '.                                    |
| 20  | Reader no.3 port                   | Handles Wiegand reader inputs.                                                                                                                                              |
| 21  | Reader no.4 port                   | Handles Wiegand reader inputs.                                                                                                                                              |
| 22  | Relay output no.5 port             | Provides FORM-C(COM, NO, NC) relay outputs.                                                                                                                                 |
| 23  | Relay output no.6 port             |                                                                                                                                                                             |
| 24  | Relay output no.7 port             |                                                                                                                                                                             |
| 25  | Relay output no.8 port             |                                                                                                                                                                             |
| 26  | Input no.5 port                    | Receives inputs through connected cable.                                                                                                                                    |
| 27  | Input no.6 port                    |                                                                                                                                                                             |
| 28  | Input no.7 port                    |                                                                                                                                                                             |

| No. | Name                                | Function                                                                                                                                 |
|-----|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| 29  | Input no.8 port                     |                                                                                                                                          |
| 30  | Firmware operation status LED       | Shows operations. For more information, please see ' <a href="#">Firmware operation status LED operating status description table</a> '. |
| 31  | Buzzer                              | Sounds buzzer.                                                                                                                           |
| 32  | Communication ID setting DIP Switch | Sets up communication ID.                                                                                                                |
| 33  | Initialization switch               | Initializes all the values of <i>iEDC</i> to factory default and resets <i>iEDC</i> .                                                    |
| 34  | ERIO BOARD connecting connector     | Connects ERIO, the expansion board.                                                                                                      |
| 35  | Tamper Switch                       |                                                                                                                                          |
| 36  | Reset Switch                        | Reboots <i>iEDC</i> . Setting values remains after the reboot.                                                                           |
| 37  | ERIO BOARD Fixing hole              | Fixes ERIO using screws.                                                                                                                 |

Figure 2-3 iFDC board LED configuration

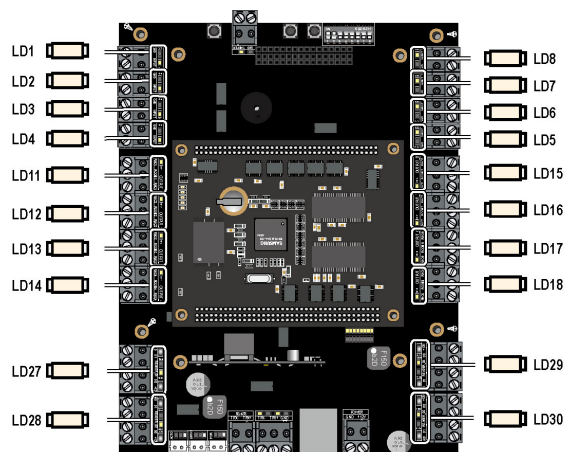


Table 2-2 Firmware operation status description (Figure: see [Figure 2-3 iFDC board LED configuration](#))

| LED  | Name                           | Normal Status | Function                                                                                                    |
|------|--------------------------------|---------------|-------------------------------------------------------------------------------------------------------------|
| LD19 | LED for ethernet communication | Blinking      | Indicates ethernet communication status between <i>iEDC</i> and PC. When ethernet communication begins, the |

| LED         | Name                                                    | Normal Status | Function                                                                                                     |
|-------------|---------------------------------------------------------|---------------|--------------------------------------------------------------------------------------------------------------|
|             | tus between iEDC and PC                                 |               |                                                                                                              |
| LD20        | LED for serial communication status between iEDC and PC | Blinking      | Indicates serial communication status between iEDC and PC. When serial communication begins, the LED blinks. |
| LD21        | Reader data process status LED                          | Blinking      | Indicates handling process of data which are received from ERIO.                                             |
| LD22        | Input, relay output status LED                          | Blinking      | Indicates handling process of input, relay output.                                                           |
| LD23        | Peer to Peer communication status LED                   | Blinking      | Indicates status of peer to peer communication between iEDCs.                                                |
| LD24        | Event LED                                               | Blinking      | Indicates status of events that occurred from iEDC.                                                          |
| LD25        | LED for status of saving events                         | Blinking      | Indicates status of saving events that occurred from iEDC.                                                   |
| LD26        | iEDC operation status LED                               | Blinking      | Indicates iEDC functions operation status.                                                                   |
| LD11 ~ LD18 | Output port status LED                                  |               | When an output occurred, output LED of the corresponding output blinks for output time.                      |
| LD1~LD8     | Input port status LED                                   |               | When a normal input is received, the LED of the corresponding input blinks for a moment.                     |
| LD27~LD30   | LED for signal of normal Wiegand on reader port         |               | When a normal Wiegand signal is received for the corresponding reader, the LED blinks for a moment.          |

## 5 ERIO board configuration

ERIO (Extension Reader/Input/Output Module) board configuration:

- 4 reader ports
- 8 input ports
- 8 output ports (relay output)

Figure 2-4 ERIO board configuration

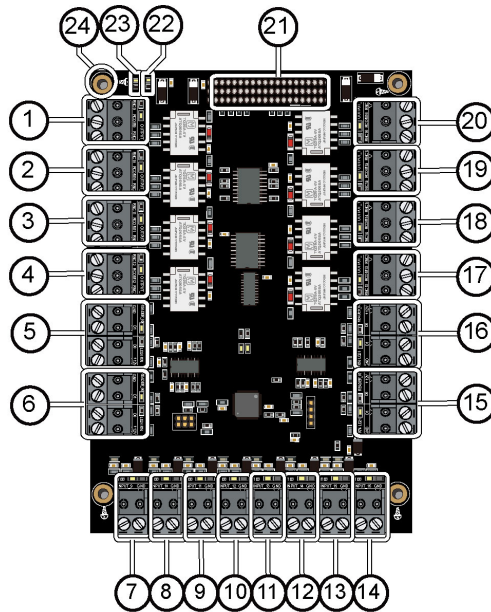


Table 2-3 ERIO board configuration (Figure: see [Figure 2-4 ERIO board configuration](#))

| No. | Name                    | Description                                 |
|-----|-------------------------|---------------------------------------------|
| 1   | Relay output no.9 port  | Provides FORM-C(COM, NO, NC) relay outputs. |
| 2   | Relay output no.10 port |                                             |
| 3   | Relay output no.11 port |                                             |
| 4   | Relay output no.12 port |                                             |
| 5   | Reader no.5 port        | Handles Wiegand reader inputs.              |
| 6   | Reader no.6 port        |                                             |
| 7   | Input no.9 port         | Receives inputs through connected cable.    |
| 8   | Input no.10 port        |                                             |
| 9   | Input no.11 port        |                                             |
| 10  | Input no.12 port        |                                             |
| 11  | Input no.13 port        |                                             |
| 12  | Input no.14 port        |                                             |
| 13  | Input no.15 port        |                                             |
| 14  | Input no.16 port        |                                             |
| 15  | Reader no.7 port        | Handles Wiegand reader inputs.              |
| 16  | Reader no.8 port        |                                             |

| No. | Name                     | Description                                                    |
|-----|--------------------------|----------------------------------------------------------------|
| 17  | Relay output no.13 port  | Provides FORM-C(COM, NO, NC) relay outputs.                    |
| 18  | Relay output no.14 port  |                                                                |
| 19  | Relay output no.15 port  |                                                                |
| 20  | Relay output no.16 port  |                                                                |
| 21  | iFDC connector pin       | It is a connector pin for iFDC board connection.               |
| 22  | INPUT circuit status LED | Blinking LED means normal status of INPUT circuit.             |
| 23  | Power status LED         | Turned on red LED means that power is being supplied normally. |
| 24  | Fixing hole              | Connects iEDC MAIN by using screws.                            |

Figure 2-5 ERIO board LED configuration

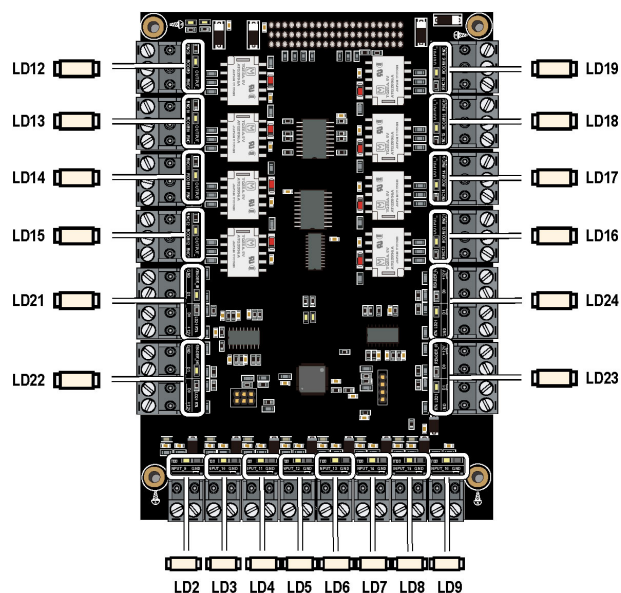


Table 2-4 ERIO status LED description (Figure: see Figure 2-5 ERIO board LED configuration)

| LED       | Name                   | Normal Status | Function                                                                        |
|-----------|------------------------|---------------|---------------------------------------------------------------------------------|
| LD11~LD18 | Output port status LED |               | When an output occurs, the corresponding output LED blinks for the output time. |
| LD1~LD8   | Input port status LED  |               | When a normal input is received, the corresponding                              |

| LED       | Name                                         | Normal Status | Function                                                                             |
|-----------|----------------------------------------------|---------------|--------------------------------------------------------------------------------------|
|           |                                              |               | g input LED blinks for a moment.                                                     |
| LD27~LD30 | LED for normal Wiegand signal on reader port |               | When a normal Wiegand signal is received, the corresponding LED blinks for a moment. |

To make sure of stable operation of this device, check following installation diagram and maximum cable length.

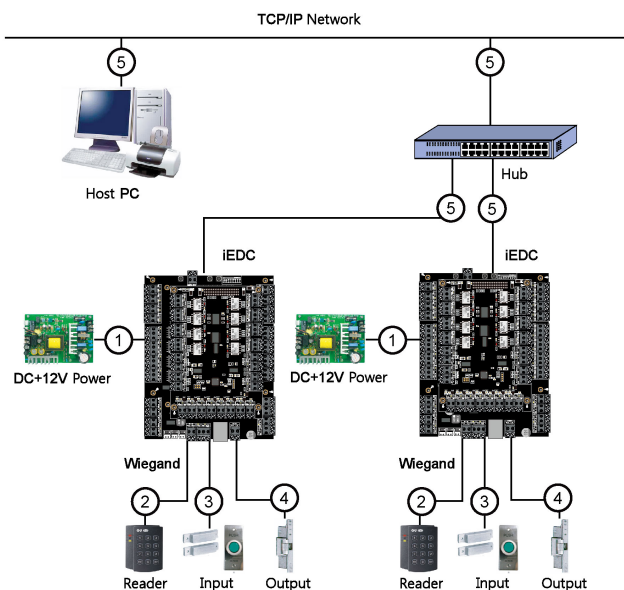


iEDC is a combined product of iFDC and ERIO, the extension board.

## 1 Installation diagram

Configuration of the device installation is as follows.

Figure 3-1 iEDC installation diagram



## 2 Recommended cables and maximum allowable length of cables

| No.            | Description                                                        | Cable Type                                                                                     | Maximum allowable length of the cable |
|----------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------|
| 1              | DC +12V Power → iEDC                                               | Belden #9409, 18 AWG<br>2 conductor, unshielded                                                | 3m                                    |
| 2 <sup>1</sup> | Reader (Power and Data)<br>Reader → iFDC & ERIO                    | Belden #9512, 22 AWG<br>4 conductor, shielded<br>Belden #9514, 22 AWG<br>8 conductor, shielded | 150m                                  |
| 3              | Door Contact<br>Exit Button<br>Sensor Input<br>Input → iFDC & ERIO | Belden #9512, 22 AWG<br>4 conductor, shielded<br>Belden #9514, 22 AWG<br>8 conductor, shielded | 300m                                  |
| 4              | Door Lock, Alarm Device<br>Lock (Alarm) → iFDC & ERIO              | Belden #9409, 18AWG<br>2 conductor, unshielded                                                 | 300m                                  |
| 5              | iFDC Cable<br>iFDC ↔ Host P.C                                      | 1. UTP Cable CAT5 (Category 5)<br>2. Serial Cable                                              | 1. Under 100m<br>2. Under 150m        |

## 3 Things to check before installation

<sup>1</sup> Consider maximum consuming current when you select cable thickness.

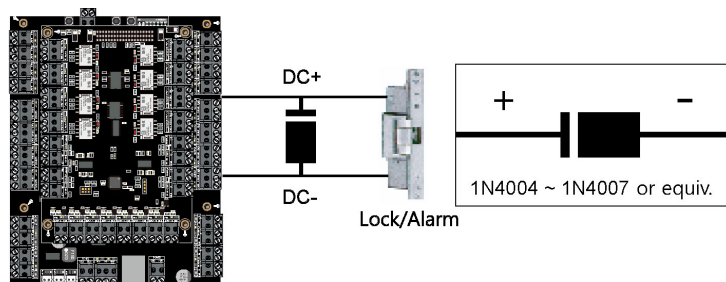
### 3.1 Connect anti-reverse current diode when installing locking device

If an output relay is connected to a device which has coils, errors may occur or *iEDC* may be damaged due to high electrical surge which is induced during turning on or off *iEDC*. Connect anti-reverse current diode as following figure.



Connecting anti-reverse current diode is recommended to prevent damage of electrical devices of *iEDC*. 1N4004 ~ 1N4007 or equivalent diode is included in the gift box.

Figure 3-2 Connecting anti-reverse current diode



## 1 Board ID(BOARD ID) settings

---

Because a board ID is an essential information for communication, you must set it up.

Board ID setting switch is located on the top of iFDC. 8 switches has their own value and board ID is the sum of values of switches which are set up 'ON'. See examples below and set a board ID. Default board ID is 0.



Must set board ID before you supply power.

If you install more than 1 *iEDC*, each board ID must be unique, because a board ID is an original address of a device.

Figure 4-1 Location of board ID setting switches and its magnification

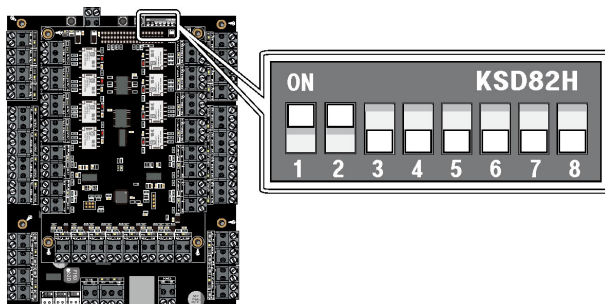


Table 4-1 Examples of setting DIP switches for board ID

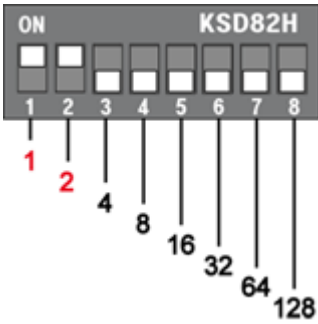
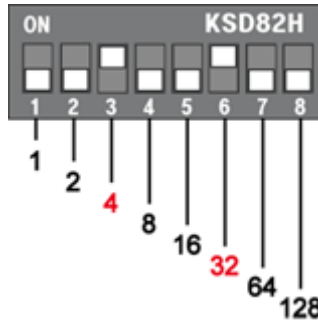
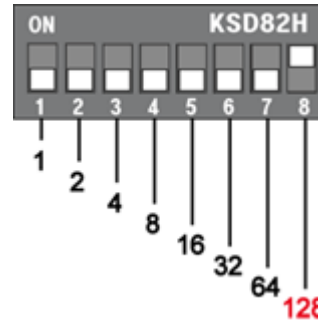
| Example 1                                                                                                       | Example 2                                                                                                          | Example 3                                                                                                          |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
|  <p>1 + 2 = 3 (board ID=3)</p> |  <p>4 + 32 = 36 (board ID=36)</p> |  <p>128 = 128 (board ID=128)</p> |

Table 4-2 Board ID switch setting and communication address detail

| Switch no.    | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | board ID |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|----------|
| Switch status | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | 0        |
|               | ON  | OFF | OFF | OFF | OFF | OFF | OFF | OFF | 1        |
|               | OFF | ON  | OFF | OFF | OFF | OFF | OFF | OFF | 2        |
|               | ON  | ON  | OFF | OFF | OFF | OFF | OFF | OFF | 3        |
|               | OFF | OFF | ON  | ON  | ON  | ON  | ON  | ON  | 253      |
|               | OFF | ON  | ON  | ON  | ON  | ON  | ON  | ON  | 254      |
|               | ON  | ON  | ON  | ON  | ON  | ON  | ON  | ON  | 255      |

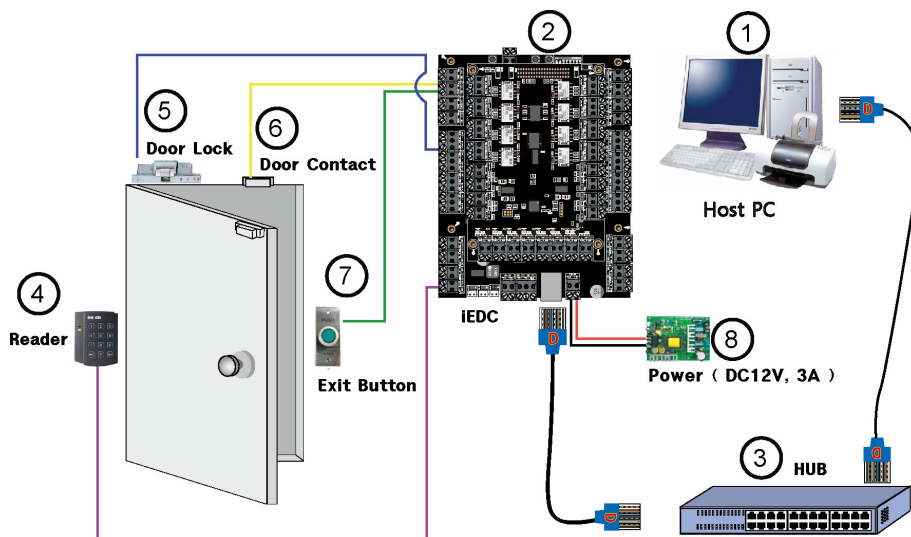


When you do wiring, make sure that the power is not being supplied. If the power is being supplied when you do wiring, you may receive an electric shock and *iEDC* may be damaged.

## 1 Wiring diagram

The figure below is a wiring diagram of *iEDC*. Do wiring following the diagram below.

Figure 5-1 *iEDC* wiring diagram

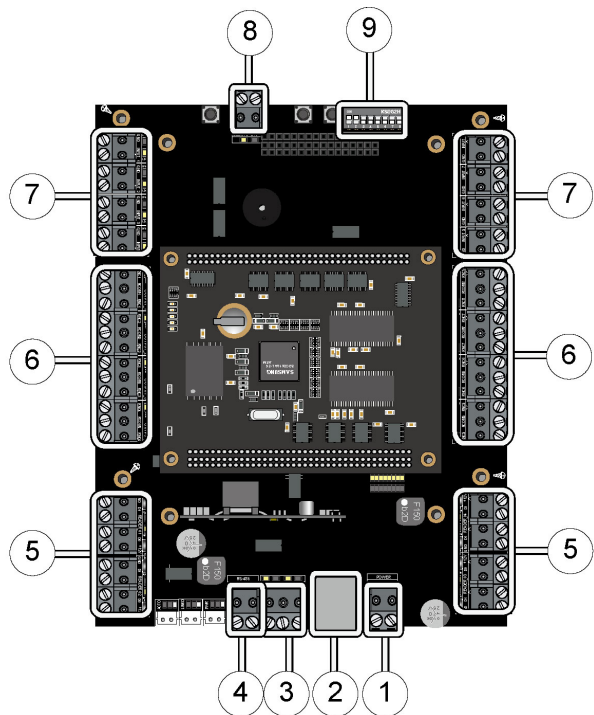


| No. | Name                        |
|-----|-----------------------------|
| 1   | PC for software installaion |
| 2   | iEDC                        |
| 3   | HUB                         |
| 4   | Leader                      |
| 5   | Door Lock                   |
| 6   | Door Contact                |
| 7   | Exit Button                 |
| 8   | Power                       |

## 2 Description of names required for wiring

### 2.1 iFDC

Figure 5-2 Description of names required for wiring - iFDC

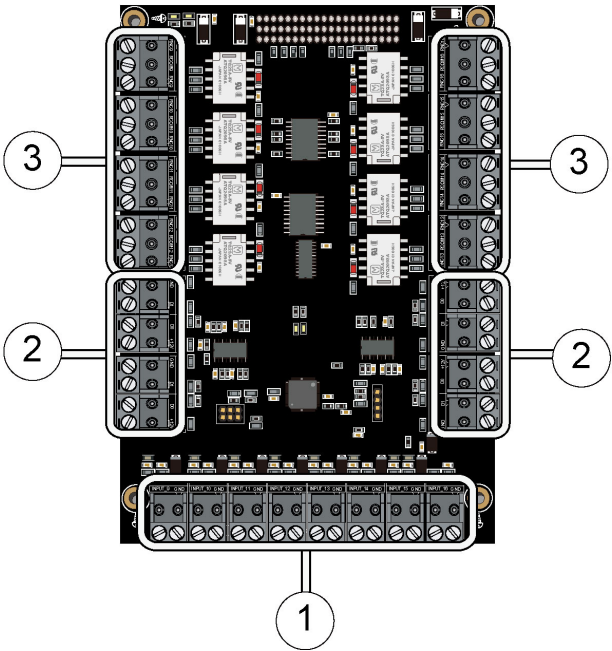


| No. | Name                 |
|-----|----------------------|
| 1   | Power terminal block |
| 2   | RJ45 ethernet port   |

| No. | Name                             |
|-----|----------------------------------|
| 3   | RS232 serial port                |
| 4   | RS 485 serial port               |
| 5   | Reader port terminal block       |
| 6   | Output port terminal block       |
| 7   | Input port Terminal Block        |
| 8   | Tamper input port terminal block |
| 9   | Board ID setting switch          |

## 2.2 ERIO

Figure 5-3 Description of names required for wiring - ERIO



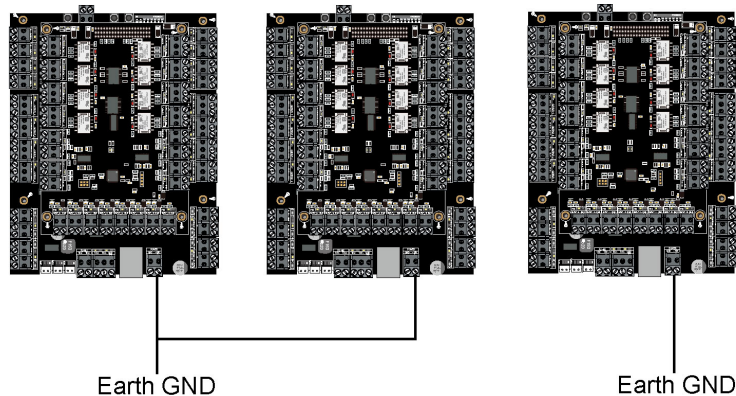
| No. | Name                       |
|-----|----------------------------|
| 1   | Input port terminal block  |
| 2   | Output port terminal block |
| 3   | Output port terminal block |

### 3 GND connection between *iEDCs*

---

When installing several *iEDCs*, GND of power terminal block of each *iEDC* must be connected to earth GND. GND removes potential difference and prevents errors when lightning or surge occurs.

Figure 5-4 *iEDC* GND connection

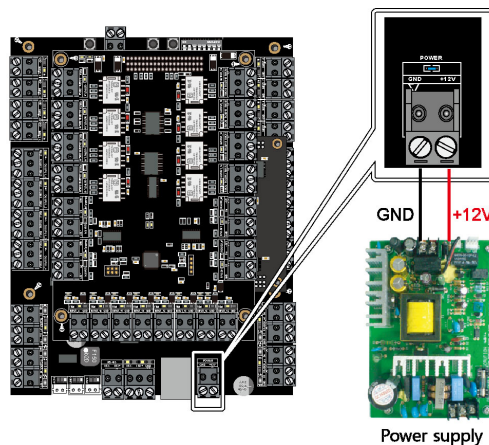


### 4 *iEDC* power connection

---

- Connect +12V wire (red wire) of DC 12V power supply to +12V of power terminal block of *iEDC*.
- Connect GND wire (black wire) of DC 12V power supply to GND of power terminal block of *iEDC*.

Figure 5-5 *iEDC* power connection

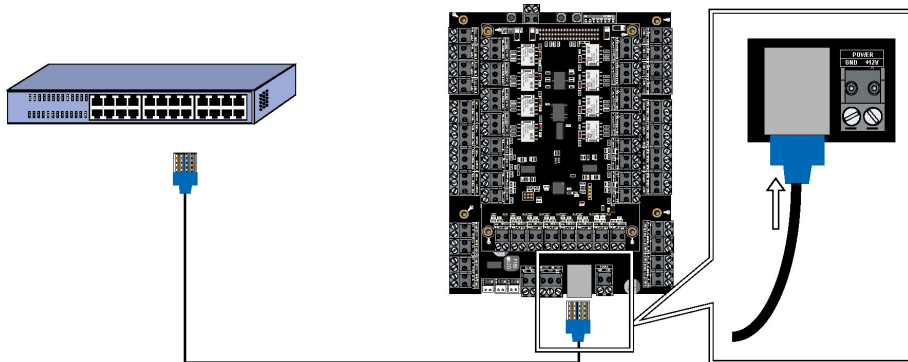


## 5 Network cable connection

---

Connect ethernet cable to RJ 45 ethernet port of *iEDC* as the following figure.

Figure 5-6 iEDC network cable connection

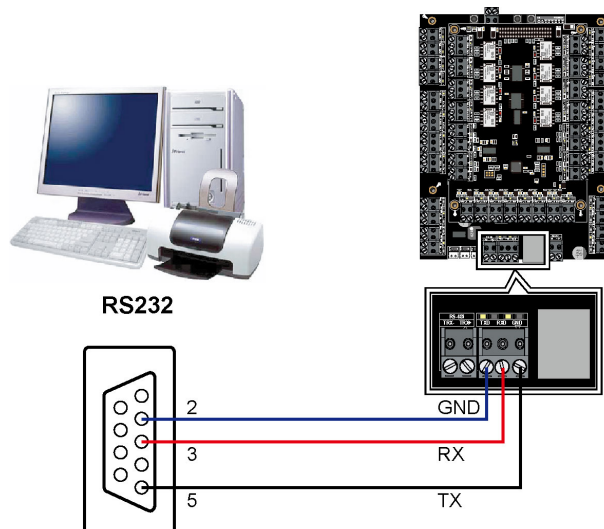


## 6 Serial cable connection

---

Connect RS232 communication cable as the following figure.

Figure 5-7 RS232 communication single connection



## 7 Reader connection

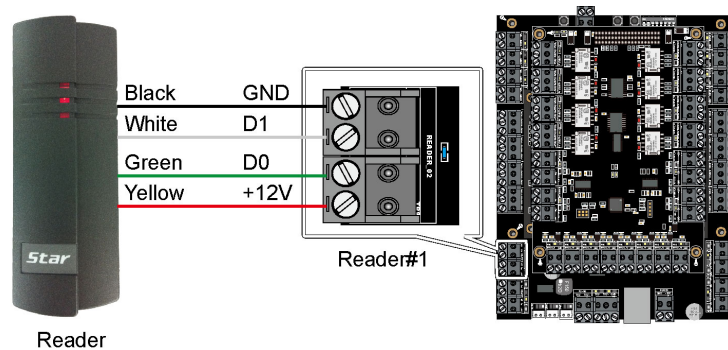
Connect an RF reader to a reader port of iEDC as follows.

Followings are how to connect a RF reader to reader port no.1 (EX\_RD1 port).

When you connect 2 RF reader to reader port no.1 (EX\_RD1 port) and reader port no.2 (EX\_RD2 port), use the same way.

- Connect +12V wire (red wire) of RF reader to +12V of reader port terminal block of *iEDC*.
- Connect GND wire (black wire) of RF reader to GND of reader port terminal of *iEDC*.
- Connect D0 wire (green wire) of RF reader to D0 of reader port terminal of *iEDC*.
- Connect D1 wire (white wire) of RF reader to D1 of reader port terminal of *iEDC*.

Figure 5-8 iEDC reader wiring



You can supply power to reader separately. In this case, GNDs of reader power and iEDC power must be **commonly grounded**. If not, difference of voltage level may cause errors of Wiegand communication.

### 7.1 Applicable reader types

- A reader that generates outputs in 26 bit Wiegand format
- A reader that generates outputs in 26 bit Wiegand + 8 bit (or 4 bit) burst format
- A reader that generates outputs in 34 bit Wiegand format
- A reader that generates outputs in 34 bit Wiegand + 8 bit (or 4 bit) burst format

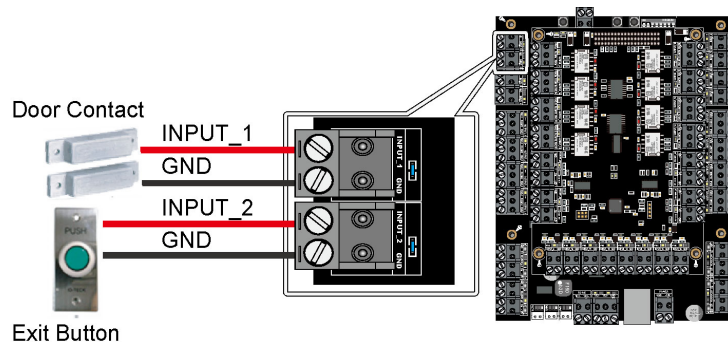
## 8 Input device wiring

---

To input port terminal block (INPUT\_1 ~ INPUT\_8) of iEDC, you can connect input devices such as door contact and exit button. Connect input device following descriptions below.

- Connect exit button to INPUT\_1 of input port terminal block of iEDC as the following figure.
- Connect door contact to INPUT\_2 of input port terminal block of iEDC as the following figure.

Figure 5-9 Input device wiring



## 9 Output device wiring

---

To output port terminal block of iEDC, you can connect output devices such as door lock and alarm. Connect output devices following the description below.

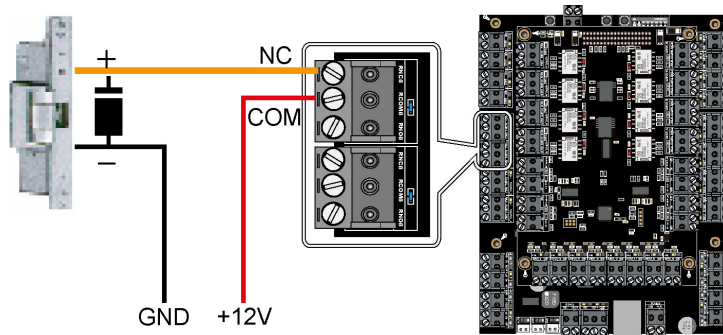
### 9.1 Door lock wiring

When it is POWER FAIL SAFE door lock

---

- Connect +12V wire of DC 12 V power supply to RCOM1 of terminal block of output port.
- Connect + wire of door lock to RNC1 of terminal block of output port.
- Connect - wire of door lock to GND of DC 12 V power supply.
- **Must** connect anti-reverse current diode between + wire and - wire of door lock as the figure below.

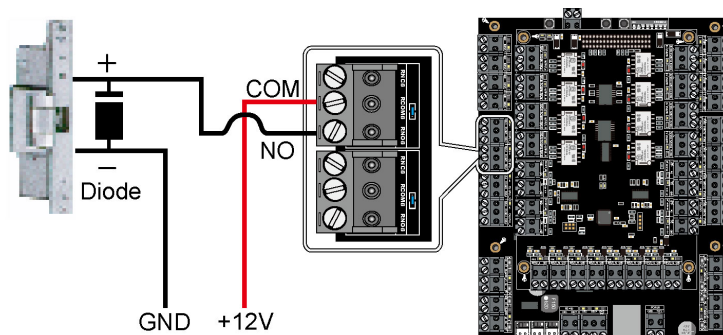
Figure 5-10 Power Fail Safe door lock wiring



### When it is POWER FAIL SECURE door lock

- Connect +12V wire of DC 12 V power supply to RCOM1 of terminal block of output port.
- Connect + wire of door lock to RNO1 of terminal block of output port.
- Connect - wire of door lock to GND of DC 12 V power supply.
- **Must** connect anti-reverse current diode between + wire and - wire of door lock as the figure below.

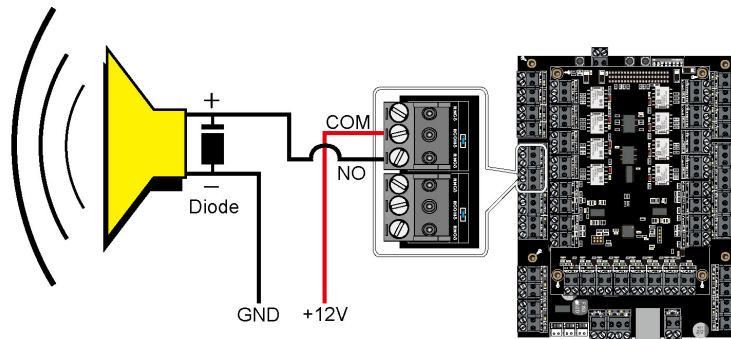
Figure 5-11 Power Fail Secure door lock wiring



## 9.2 Alarm wiring

- Connect +12V wire of DC 12 V power supply to RCOM2 of terminal block of output port.
- Connect + wire of alarm to RNO2 of terminal block of output port.
- Connect - wire of alarm to GND of DC 12 V power supply.
- **Must** connect anti-reverse current diode between + wire and - wire of alarm as the figure below.

Figure 5-12 Alarm wiring



## 9.3 How to control LED / Buzzer of a reader under Power Fail Secure mode

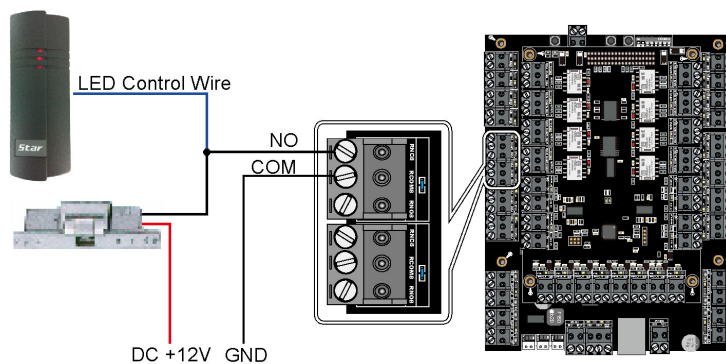
### Power Fail Secure mode

Under this mode, when power shortage or unexpected situation occurs, doors are closed automatically. Because all doors are closed, security level becomes higher. **Be careful** when you install iEDC on doors which should be opened when it is emergency such as emergency exit.

### Wiring method to indicate door open status by LED of a reader under Power Fail Secure mode

LED can display door status while door lock is operating by connecting LED control wire to relay output to which door lock is connected.

Figure 5-13 How to display door open status using LED of a reader. (Power Fail Secure)



### How to control

In the case that connecting Wiegand wire of a reader to reader port #1 as the figure, LED of the reader is inverted (Red → Green) when door lock operates.

## 9.4 How to control LED / Buzzer of a reader under Power Fail Safe mode

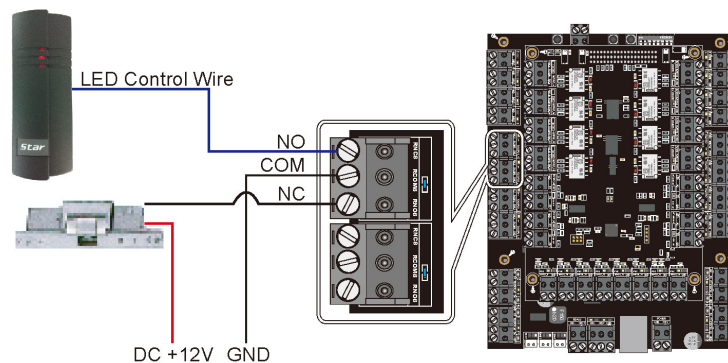
### Power Fail Safe mode

Under this mode, when power shortage or unexpected situation occurs, doors are opened automatically. Because all doors are opened, security level becomes lower. **Be careful** when you install iEDC on doors which should be closed when it is emergency such as a safe of a bank.

### Wiring method to indicate door open status by LED of a reader under Power Fail Safe mode

LED can display door status while door lock is operating by connecting LED control wire to relay output to which door lock is connected.

Figure 5-14 How to indicate door open status using LED of a reader. (Power Fail Safe)



### How to control

In the case that connecting Wiegand wire of a reader to reader port #1 as the figure, LED of the reader is inverted (Green → Red) when door lock operates.



When using separate power supplies for *iEDC* and door lock, it is recommended that GND of each power supply is grounded.

# PoE (Power over Ethernet)

# 6

Using PoE, you can supply power through Ethernet cable without installing an external power (SMPS).

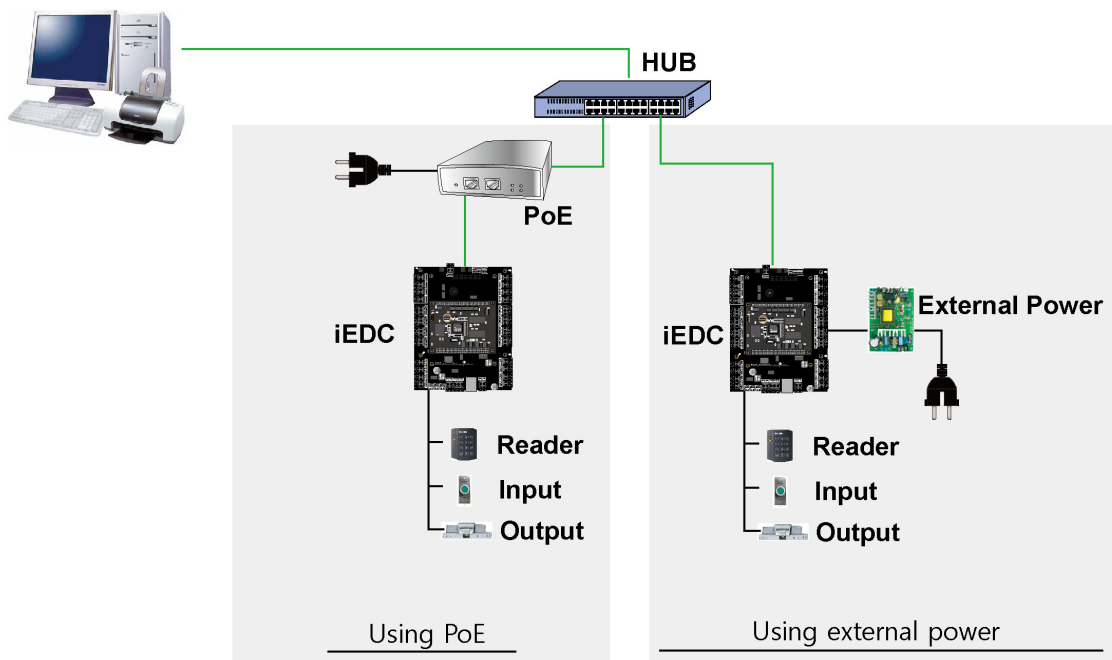


Maximum length of PoE Ethernet Cable is 100m.



See [Table 12-1 iFDC specification](#) for PoE specification.

Figure 6-1 Supplying power using PoE



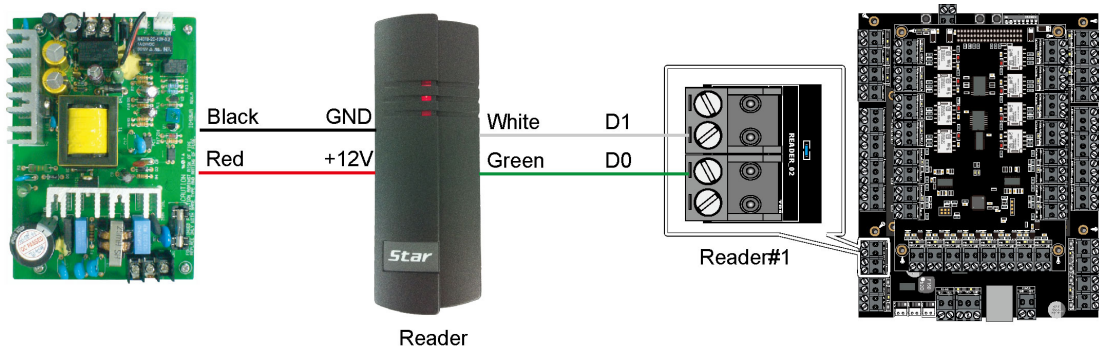


Do **not** use a SMPS and PoE power at the same time.



When using PoE, use an external power supply for external readers.

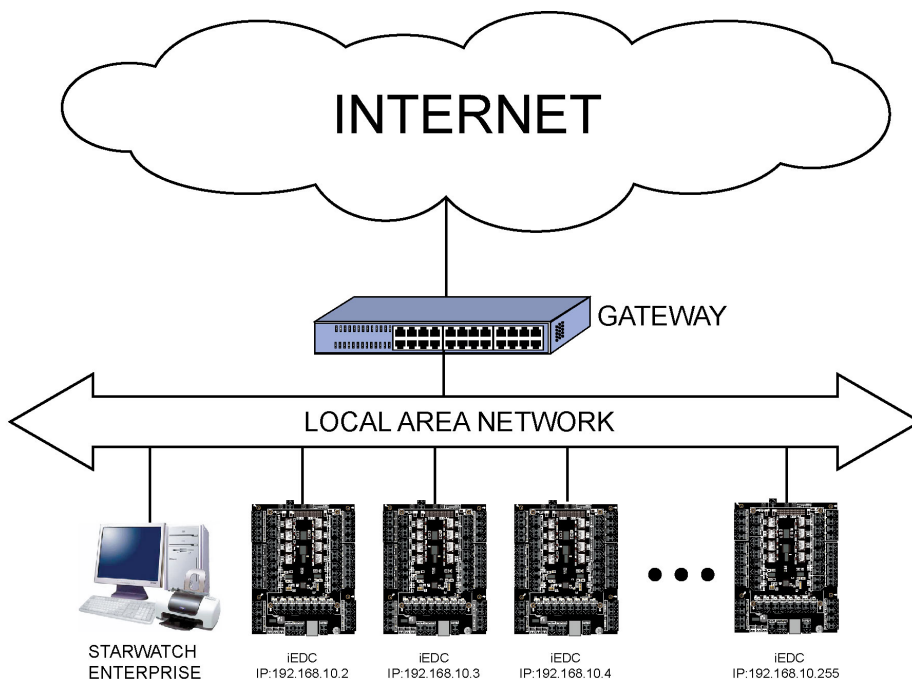
Figure 6-2 Connecting a reader when using PoE



## 1 When using Private IP

---

Figure 7-1 Network configuration when using private IP



The figure above shows network configuration when using private IP. This configuration is a way to construct the most stable network system. When constructing network, constructing an exclusive LAN environment for iEDC only is recommended. Automatic IP search and IP address setting is possible using STARTWATCH ENTERPRISE or iEDC EMULATOR. (See [Network](#)

settings , 'iEDC EMULATOR' for more information)

## 1.1 An example for a correct Private IP setting

Table 7-1 iEDC -MAIN network setting (When using C class)

| NO | iFDC IP address | Subnet Mask   | Gateway      | DNS          | Communication server IP address | Communication server port number |
|----|-----------------|---------------|--------------|--------------|---------------------------------|----------------------------------|
| 1  | 192.168.10.99   | 255.255.255.0 | 192.168.10.1 | 192.168.10.2 | 192.168.10.32                   | 6001                             |

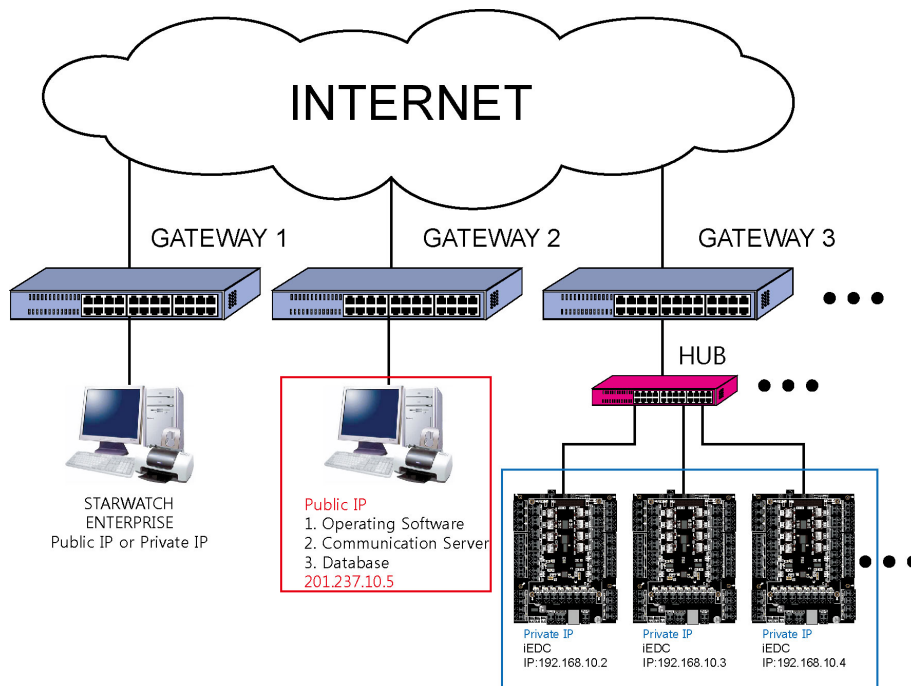
## 1.2 An example for a wrong Private IP setting

When using C class (Subnet mask : 255.255.255.0)

iEDC IP: 192.168.10.10 // Communication server IP: 192.168.11.11

# 2 When using Public IP

Figure 7-2 Network configuration when using public IP



The figure above shows network configuration using public IP.

In this configuration, when using the same public IP band, auto search function of STARWATCH ENTERPRISE or iEDC-EMULATOR can find all iEDCs which are connected to the network. (See [Network settings, 8 iEDC EMULATOR](#)) If IP band is different, you need to use manual search function and input IP address of iEDC to find the iEDC.

If a port that iEDC uses is disabled from firewall, you need to change the port into enabled.

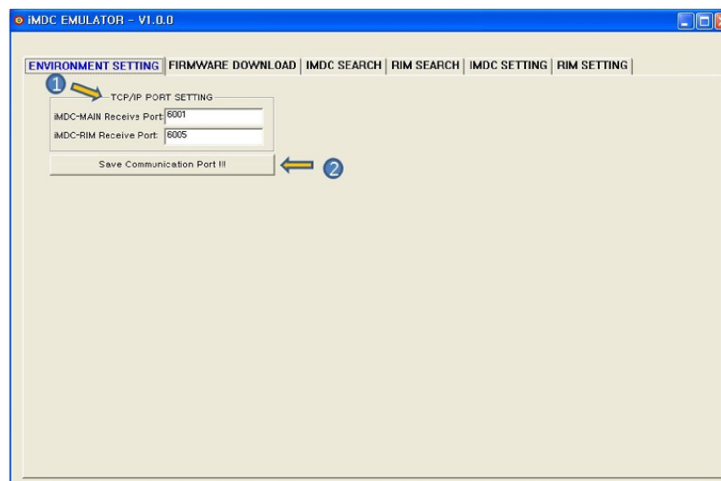
iEDC EMULATOR is a program to set up network of iEDC and test it before installing STARWATCH ENTERPRISE. Set it up referring to descriptions below.



iMDC EMULATOR is used as iEDC EMULATOR also, therefore iMDC EMULATOR is inscribed on the program in the figures belows.

## 1 Setting up environment

Figure 8-1 iEDC Emulator



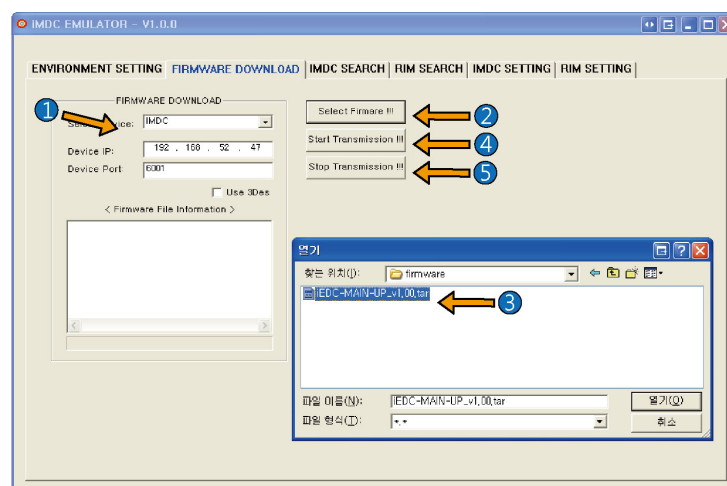
**1 ENVIRONMENT SETTING:** On this tab, set communication port for communication between iEDC and iEDC EMULATOR.

| Name                   | Description                                                                             |
|------------------------|-----------------------------------------------------------------------------------------|
| iMDC-MAIN Receive Port | This port is used for communication between ENTERPRISE and iEDC. Default value is 6001. |
| iMDC-RIM Receive Port  | This is not used for iEDC                                                               |

②[Save Communication Port !!!]: This is used to save changed iEDC Receive Port value. Using the default value is recommended.

## 2 FIRMWARE DOWNLOAD

Figure 8-2 iEDC firmware upgrade



① Select a device to send a firmware. Select iMDC.

After selecting iMDC, input IP and port of the device on Device IP and Device port. (Using the default value is recommended.)

| Name          | Description                                     |
|---------------|-------------------------------------------------|
| Select Device | Select a device to transmit firmware            |
| Device IP     | Input IP of a device to transmit firmware.      |
| Device PORT   | Input IP port of a device to transmit firmware. |

②[Select Firmware !!!]: Opens a window to select a firmware to transmit.

③ Select a firmware to transmit.

④[Start Transmission !!!] : Transmit the firmware to the device (iEDC).

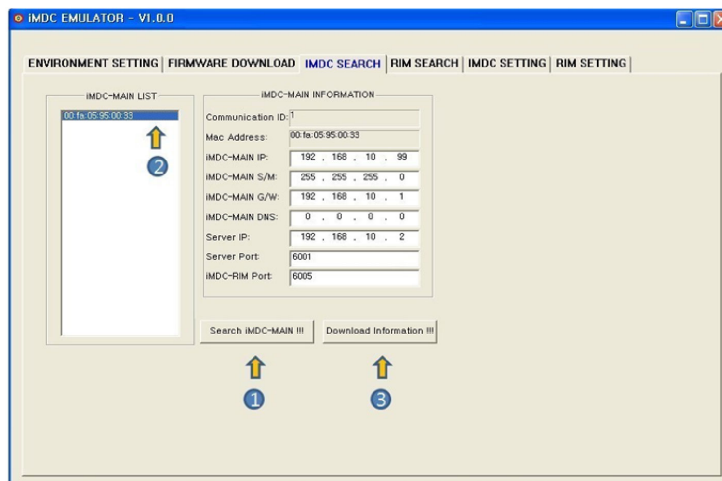


If the transmission is stopped during the firmware is being transmitted, you need to start again from step ②.

⑤ To stop transmitting the firmware, click [Stop Transmission !!!]. Stopping transmission will not cause any problem.

## 3 Finding iEDC

Figure 8-3 iMDC SEARCH tab



①[Search iMDC-MAIN !!!]: Searches network information of all iEDCs/iMDCs of the same network. MAC addresses of found iEDCs/iMDCs are displayed on iMDC-MAIN LIST.

②Double click MAC address to check of change information from the iMDC-MAIN LIST.

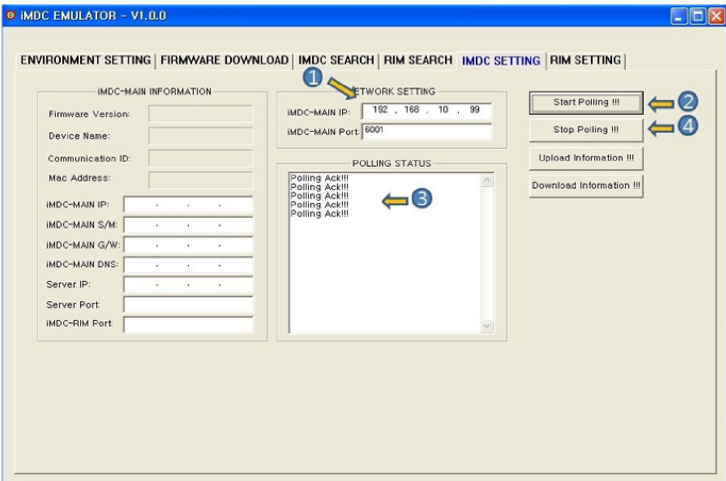
③ [Download Information !!!]: Changes network information of iEDC. Double click MAC address of iEDC to change from iFDC LIST, change relevant information, and then click [Download Information !!!].

# 4 iEDC settings

## 4.1 iEDC polling test

This selects specific iEDC, and tests polling and changes network information.

Figure 8-4 iEDC SETTING tab



1 Input ID address and iEDC port of an iEDC to test polling.

| Name           | Description                                                                                                                       |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------|
| iMDC-MAIN IP   | IP address of iEDC. Default value is 192.168.1.99.                                                                                |
| iMDC-MAIN PORT | A port that is used for communication between ENTERPRISE and iEDC. Default value is 6001. Using the default value is recommended. |

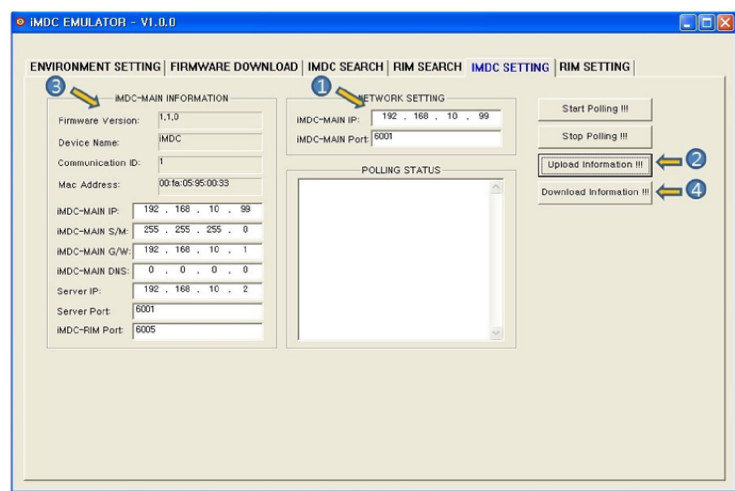
2 Once you click [Start Polling !!!], information of polling status is displayed.

3 Polling ACK!!! shows polling of the iEDC is normal.

4 Once you click [Stop Polling !!!], polling is stopped.

4.2 iEDC network setting

Figure 8-5 iEDC\_Network\_setting



- 1 Input IP and port of an iEDC you want to set.
- 2 Once you click [Upload Information !!!], network information of iEDC is searched for.
- 3 Found network information of iEDC is displayed.

| iEDC INFORMATION | Description                                                                                                      |
|------------------|------------------------------------------------------------------------------------------------------------------|
| Firmware Version | Displays version of the iEDC.                                                                                    |
| Device Name      | Displays name of the found device. iEDC is displayed as iEDC.                                                    |
| Mac Address      | Displays Mac address of the Ethernet card.                                                                       |
| Communication ID | Displays communication address.                                                                                  |
| iMDC-MAIN IP     | Displays IP address of the found iEDC board.                                                                     |
| iMDC MAIN G/W    | Displays gateway address of the found iEDC board.                                                                |
| iMDC MAIN DNS    | Displays DNS address of the found iEDC board.                                                                    |
| Server IP        | Displays IP address of a computer on which a communication server is installed.                                  |
| Server Port      | Displays the port of computer on which a communication server is installed. Default value, 6001, is recommended. |
| iMDC-RIM Port    | This is not used for iEDC.                                                                                       |

- 4 If you want to change iEDC network settings, change iMDC-MAIN INFORMATION and click [Download Information !!!].

## 1 Basic operation

---

### 1.1 Normal status

Normally, when power is being supplied, red LED and board operation status LED turns on.

### 1.2 When a registered card is read

When a registered card is read or ID number is inputted, reader status LED blinks for a second and door (relay #1) is opened for 3 seconds (default value) and at the same time LED which indicates status of the correspondent relay turns on for 3 seconds (default value).

### 1.3 Exit button

To go out from inside, press an exit button or present a registered card to an out reader.

In this case, a door lock relay (Relay #1) operates for 3 seconds (default value) and one can access the door, and LED which indicates status of relay of the door lock turns on for 3 seconds.

### 1.4 Sound an alarm

When an unregistered card is read, reader status LED blinks for a second, alarm relay (Relay #2) operates and at the same time LED which indicates status of the correspondent relay turns on for 3 seconds (default value).

## 2 Default setting values

---

Shows default values of iEDC. Based on the default value, you can change setting values into values which are suitable for your environment. See 10. [11 Appendix](#) for more information.

Before requesting RMA, please check the cases below if your problem is one of them.

1. 1 The device work well with RF Card, but does not work when inputting card number.
2. 2 2 men operation does not work even though cards for 2 men operation (visitor and manager) are registered.
3. 3 When the device have read a card, the device does not response or a different card number appears.

## 1 The device work well with RF Card, but does not work when inputting card number.

---

### 1.1 Please check if Keypad is set to "ENABLE".



The default of the keypad input is "ENABLE".

Set keypad setting to "ENABLE" from a software and transmit it to the device.



If the problem persists, please contact service center.

## 2 2 men operation does not work even though cards for 2 men operation (visitor and manager) are registered.

### 2.1 Not setting 2 men operation mode to the reader may cause this problem.

iEDC sets 2 men operation mode reader by reader.

If 2 men operation mode is not set to the reader, 2 men operation mode does not work.

## 3 When the device have read a card, the device does not response or a different card number appears.

### 3.1 Please check if a reader is good.

1. Check input power of the reader.  
Check if LED blinks when the reader reads a card.
2. Check if the reader is good.  
Disconnect the reader from the system and measure output terminal of the reader using a oscilloscope.

### 3.2 Please check if wiring between a reader and the system.

See [5 Wiring] > [7 Reader connection] of the manual and check wiring between the reader and the device.



If you use a separate power for a reader not connecting to the device, GND of the reader must be connected to GND of the device.

### 3.3 Remove noise.

1. Shield wire and extra wire of cable to GND.
2. Use repeater.
3. See [3 Installation] > [2 Recommended cables and maximum allowable length of cables] and check distance between a reader and the device.

### 3.4 Check distance.

Maximum distance between a reader and iEDC is 150m.



If the problem persists, please contact service center

## 1 Default values of reader/input/output

| Index No | 1          | 2          | 3          | 4          | 5          | 6          | 7          | 8          |
|----------|------------|------------|------------|------------|------------|------------|------------|------------|
| READER   | R1         | R2         | R3         | R4         | R5         | R6         | R7         | R8         |
| INPUT    | DOOR1<br>B | DOOR1<br>D | DOOR2<br>B | DOOR2<br>D | DOOR3<br>B | DOOR3<br>D | DOOR4<br>B | DOOR4<br>D |
| OUTPUT   | DOOR1<br>L | DOOR1<br>A | DOOR2<br>L | DOOR2<br>A | DOOR3<br>L | DOOR3<br>A | DOOR4<br>L | DOOR4<br>A |
| Index No | 9          | 10         | 11         | 12         | 13         | 14         | 15         | 16         |
| INPUT    | DOOR5<br>B | DOOR5<br>D | DOOR6<br>B | DOOR6<br>D | DOOR7<br>B | DOOR7<br>D | DOOR8<br>B | DOOR8<br>D |
| OUTPUT   | DOOR5<br>L | DOOR5<br>A | DOOR6<br>L | DOOR6<br>A | DOOR7<br>L | DOOR7<br>A | DOOR8<br>L | DOOR8<br>A |

### 1.1 Reader

- R: Reader

### 1.2 Input

- B: Exit Button
- D: Door Contact
- S: Sensor

## 1.3 Output

- L: Door Lock
- A: Alarm
- E: etc.

## 2 Output numbers by event (8 Door)

| DOOR | READER | OUTPUT    |       |     |      | INPUT   |        |
|------|--------|-----------|-------|-----|------|---------|--------|
|      |        | DOOR LOCK | ALARM | ETC | EXIT | CONTACT | SENSOR |
| 1    | 1      | 1         | 2     |     | 1    | 2       |        |
| 2    | 2      | 3         | 4     |     | 3    | 4       |        |
| 3    | 3      | 5         | 6     |     | 5    | 6       |        |
| 4    | 4      | 7         | 8     |     | 7    | 8       |        |
| 5    | 5      | 9         | 10    |     | 9    | 10      |        |
| 6    | 6      | 11        | 12    |     | 11   | 12      |        |
| 7    | 7      | 13        | 14    |     | 13   | 14      |        |
| 8    | 8      | 15        | 16    |     | 15   | 16      |        |

- **Default output time is 3 seconds.**
- **DOOR LOCK:** Output number of door lock when one is authenticated.
- **ALARM:** Alarm output number when alarm event occurs.
- **ETC:** Output number for other events.

ex) When no.1 reader authenticated a card, output no.1 is generated. If an error occurs, output is generated on output port no.2 for 3 seconds.

## 3 Applicable reader wiegand input format

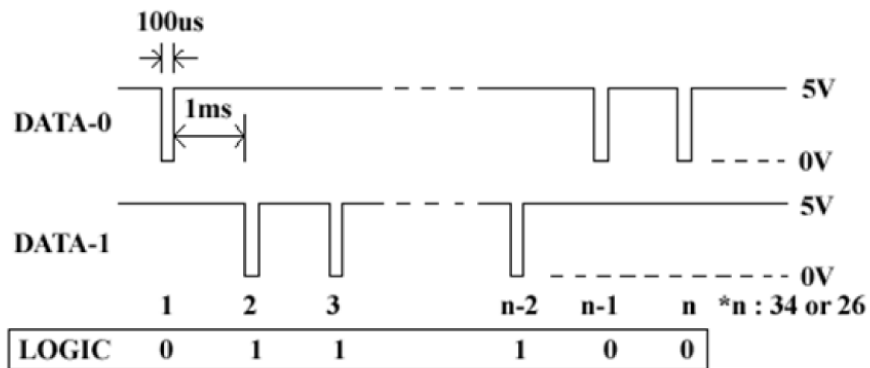
### 3.1 Data format (26-bit /34-bit)

- Bit 1 / Bit 1 : Even parity bit from Bit 2 to Bit 13 / from Bit 2 to Bit 17
- Bit 2 to Bit25 / Bit 2 to Bit33 : 3-byte ID number / 4-byte ID number

- Bit 26 / Bit 34 : Odd parity bit from Bit 14 to Bit 25 / from Bit18 to Bit 33

## 3.2 Timing diagram

Figure 11-1 iEDC\_Reader\_Timing



## 1 iFDC Specification

Table 12-1 iFDC specification

| Device name         |                | iFDC                                                                                 |
|---------------------|----------------|--------------------------------------------------------------------------------------|
| CPU                 |                | 32bit micro processor                                                                |
| Operating system    |                | Embedded Linux                                                                       |
| Memory              | Program memory | 128MByte SDRAM                                                                       |
|                     | Data memory    | 128MByte Flash Memory                                                                |
| User                |                | 50,000                                                                               |
| Event               |                | 100,000                                                                              |
| Power / Current     |                | DC +12V / Max.600mA                                                                  |
| PoE power / current |                | Input 48V DC, Output DC+12V/Max. 600mA                                               |
|                     |                | IEEE802.3af Class 3, Max 7.2W                                                        |
| Communication       |                | Ethernet / Serial                                                                    |
| Ethernet            |                | 10 / 100 Mbps                                                                        |
| Serial              |                | RS485/RS232 (Baudrate: 57600bps)<br>Changeable                                       |
| Interface           |                | Maximum 8 readers                                                                    |
|                     |                | - 26 bit Wiegand, 4/8 bit Burst                                                      |
|                     |                | - 34 bit Wiegand, 4/8 bit Burst                                                      |
|                     |                | Maximum 16 inputs (Changeable input type)                                            |
|                     |                | Maximum 16 outputs (Changeable output type)<br>(iFDC 4 readers, 8 inputs, 8 outputs) |

|                                   |                                               |
|-----------------------------------|-----------------------------------------------|
| Device name                       | iFDC                                          |
|                                   | (ERIO 4 readers, 8 inputs, 8 outputs)         |
| Operating temperature             | 0 ° ~ +65 °C (+32 ° ~ +149°F)                 |
| Operating humidity                | 10 % ~ 90 % relative humidity                 |
| Size (width × height × thickness) | 145 mm × 185 mm × 18 mm (5.7" × 7.3" × 0.75") |
| Weight                            | 283 g (0.623 lbs)                             |
| Ceritification                    | FCC, CE, KC, UL                               |

## 2 ERIO specification

Table 12-2 ERIO specification

| Name                              | ERIO                                                                                 |
|-----------------------------------|--------------------------------------------------------------------------------------|
| Reader                            | 4                                                                                    |
| Input port                        | 8 (Changeable input type)                                                            |
| Output port                       | 8 (2 FORM-C relay output (COM, NO, NC) / DC+12 V ~ +18 V, maximum rated current 2 A) |
| LED indicator                     | Status LED indicator                                                                 |
| Operating temperature             | 0 ° ~ +65 °C (+32 ° ~ +149 °F)                                                       |
| Operating humidity                | 10 % ~ 90 % relative humidity                                                        |
| Size (width × height × thickness) | 110 mm × 150 mm × 29 mm (4.3" × 5.9" × 1.14")                                        |
| Weight                            | 168 g (0.37 lbs)                                                                     |
| Ceritification                    | FCC, CE, KC, UL                                                                      |

## 3 Diode specification

Table 12-3 Diode specification

| Name            | 1N4007                   |
|-----------------|--------------------------|
| Power / Current | 50 ~ 1000 V / Min. 1.0 A |

## FCC Requirements Part 15

***Caution:** Any changes or modifications in construction of this device which are not expressly approved by the responsible for compliance could void the user's authority to operate the equipment.*

***NOTE:** This device complies with **Part 15 of the FCC rules**.*

**Operation is subject to the following two conditions:**

1. This device may not cause harmful interface, and
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a **Class A Digital Device**, pursuant to **Part 15 of the FCC rules**. These limits are designed to this equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on another circuit.
4. Consult the dealer or an experienced radio/TV technician for help.

If you have any questions or problems regarding the RMA services, please contact us using the contact information below. Friendly representatives at IDTECK are always standing by to provide the best after sales services.

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The specifications contained in this manual are subject to change without notice at any time.

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