MXK8000S

Installation manual

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1. Normal Specification

Main power supply

Input Power	AC 110V or 220V/50~60Hz (Optional)
Output Power	24V/10A, 5V/4A(Default)

Battery

Capacity	**24V/18Ah** (Combined battery)

UI Specification

Size	17- inch TFT LCD Panel
Resolution	1280×1024
Touch	Resistance method

Housing type

Basic	stand-alone 600×600×2000
Option	19- inch standard RACK
	Metal plate

Capacity

Panel	32 connections between panels
Transponder	32 MXK1000T connections per panel
Roof	2 Roofs per Loop Card
RELAYER	250 per MXK Loop 127 per MXK-NU Loop
Circuit	4 times per MXK44 2 times per MXK22
Maximum number of circuits	32 panels x 32-98ban x 4 loops x 250 address x 4 times = 4,096,000 circuit
Minimum number of circuits	1 panel x 1/2 x 2 loop x 250 address x 4 circuit = 2000 circuit

Printer

Basic	Small serial printer Serial printer (RS-232C) 40colums(English), 20colums(Korean)

Key & LED (OCSM)

System Control Key	5
Facility Control Programmable Key	16
System LED	15
Facility status Programmable LED	16

Configuration tool

MXK Consys	All configurations of the MXK Consys system can be programmed with this tool

BMS protocol

Emergency broadcasting, BMS etc.	External using RS-485 communication port Connection with the auxiliary emergency broadcasting system

Workstation.

MuxGraphics	Connected using an Ethernet port

Communication port

No	Method	Purpose
1	Ethernet	LAN1(J2): SFC800, Hub Workstation
2	RS-232C	Port2 (CON4): Serial Printer
3	RS-485	Port1 (CON12): Rack Communications, Normal. Back & Emergency Broadcast of Transponder, Normal & Back of Network
4	RS-422	Port1 (CON13): Parallel
5	SATA	Port1(J4): recording Hard disk
6	USB	USBPort1~4(CON2A~D): Map Download Upload, Firmware Upgrade

Call points & Telephone response.

Call points, Telephone	Connecting a solid line to the panel MTIB board

2. Product Configuration

MXK8000S Panel

MXK W/S (Workstation)

TRANSPONDER

Repeator

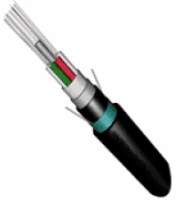
ROH(Optical converter)

RCM(Back Loop Configurator)

Switch hub (purchased separately)

LAN Cable(Separate Purchase)

Optical Jumper cord (Separate Purchase)



Optical cables for pulling (Separate Purchase)

Note: Components marked "(separate purchase)" must be purchased on the market.

3. Panel Installation

The MXK8000 system is sent to a site after finishing all basic tests.

You can use the system after setting and customizing the keys, In/Output map, and network based on the functions of CPU and the site.

All settings can be set up in consultation with Johnson Controls International Korea's Product Technical Team, considering the conditions of the site and the manager's opinion.

✓ Panel Location

Panels are protected by packing boxes and protective vinyl.

Remove the packaging of the product after moving the panel to a place where you want to install the system (a fire control room, a security room, other control rooms, etc.).

The environment in which the panel is installed shall be maintained at temperature of 0℃ to 40 ℃ and humidity of 85 % or less.

If there is serious indoor contamination with dust, etc. due to a construction, keep the product without removing the packaging. Then, clean the contamination by air ventilation, and remove the packaging of the product before using it.

There are no restrictions on the location of the panel installation in the management room, so choose a location that is convenient for the administrator to manage the panel. However, you should choose a suitable place where wire connection is easy because the panel must be connected to transponders and I/O modules through external wires.

✓ Power Supply

Caution before Power Supply

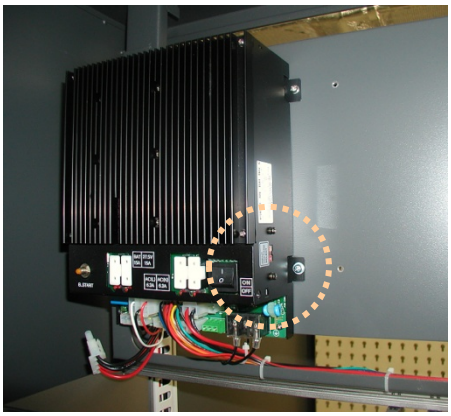
Do a visual inspection of the product before the power is supplied.

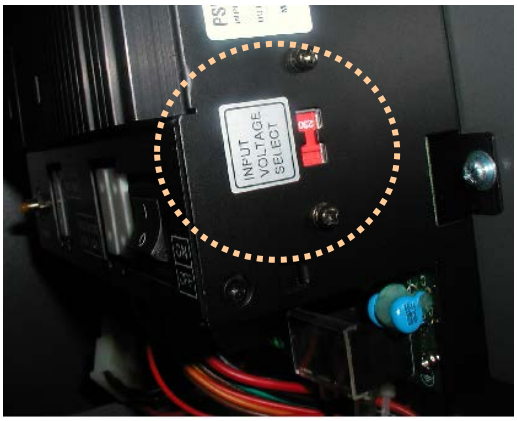
Long-term shipping and the consequent vibration may cause the assembly to become loose.

Applying power to an abnormal assembly causes physical damage to the product. Before turning on the product, do a visual inspection for connectors or connections to check that they are OK, and then apply AC power.

If visual inspection shows that the connectors are missing or abnormal, check the AC connection and please call the A/S center.

The MXK8000 panel is for use with both 110V/220V. The product is the 220 V state by default. If you are using 110 V, turn the “Input voltage select” switch to AC 110 V.





Connecting Power Lines

When connecting the power line to the panel, work with the power supply cut off. Working unblocked can lead to the risk of life loss. It can also cause product failure. The AC power line at the site is connected to the AC terminal through the routing path below the panel enclosure.

You can check the AC connecting terminal at the bottom of the panel by opening the panel door

Panel status check

If the AC power line is connected, turn on the main power switch on the panel and check the panel status.

Make sure that Power LED on the front panel is illuminated as normal.

Make sure that the CPU RUN LED flashes normally.

Make sure the panel screen is booting.

In normal circumstances, the screen will display a default image used when the product is shipped.

During the manufacturing, an In/Output map is used for testing. Therefore, with I/O modules disconnected, the panel may show many troubles.

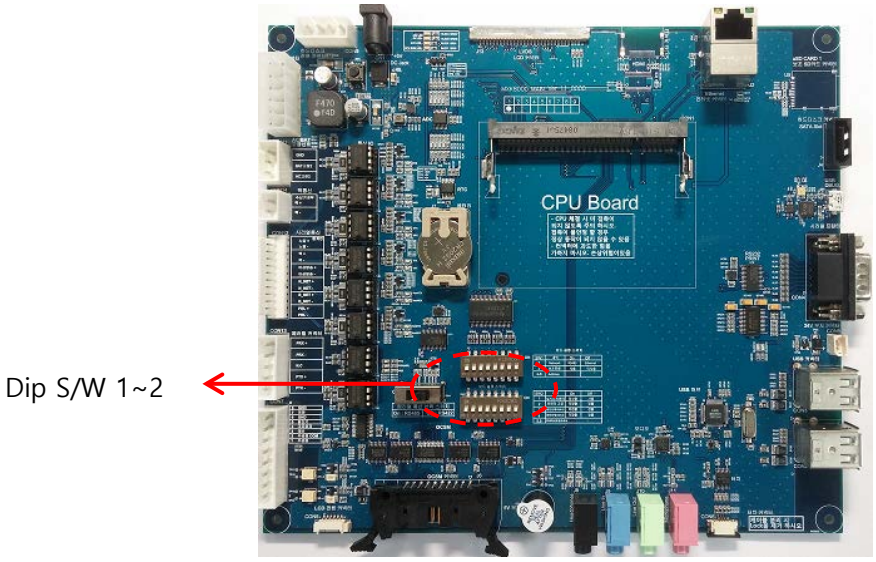
✓ Panel Settings

DIP Switches

Once the panel has been installed, the panel must be set up for the site.

First, set the DIP switch on the panel.

The panel has two DIP switches.



< Figure 3-1>

SW1

Pin Number	Description	ON	OFF
1	Debug	Use	Unused
2	Reserved		
3	Battery	Use	Unused
4 ~ 8	Panel address	See next page	

<Table 3-1> 1 DIP Switch Setting

SW2

Pin Number	Description	ON	OFF
1	Real-time printer	Unused	Use
2	Printer Trouble Detection	Undetected	Detection
3	SFC800 FX1 Open Circuit Detection	Undetected	Detection
4	SFC800 FX2 Open Circuit Detection	Undetected	Detection
5, 6	Panel Action	< Table 3-3 > Reference	
7	Reserved		
8	Reserved		

<Table 3-2> 2 DIP Switch Setting

Switch	State	Description
5	ON	**In the occurrence of fire, the main buzzer is activated to sound**
	OFF	**In the occurrence of fire, the main alarm is activated to sound.**
6	ON	**In case of equipment activation, the main buzzer isn't activated to sound.**
	OFF	**In case of equipment, the main buzzer is activated.**

<Table 3-3> Action Description (2 DIP Switch 5~6)

Use SW1 numbers from 4 to 8 to set the panel number.

Please, note that the number is set in descending order from switch 8.

< Figure 3-2 >

Map Settings

All setup files required for panel setting, such as input/output maps, panel equipment keys & LEDs, and network IPs, are managed all together by Johnson Controls International Korea Product Technology Team.

You can request the product technology team the customized files (maps) for each site. Before making a request of a map file to Product Technical Team, you should discuss with your manager how to operate the system in the field including network links, location of keys, and full view of the system. Then, request it to Product Technical Team.

You can download the map file you received from the product technical team to the panel. For instructions on how to download the map, see the following article, "Map Download & Upload".

4. Map Download & Upload

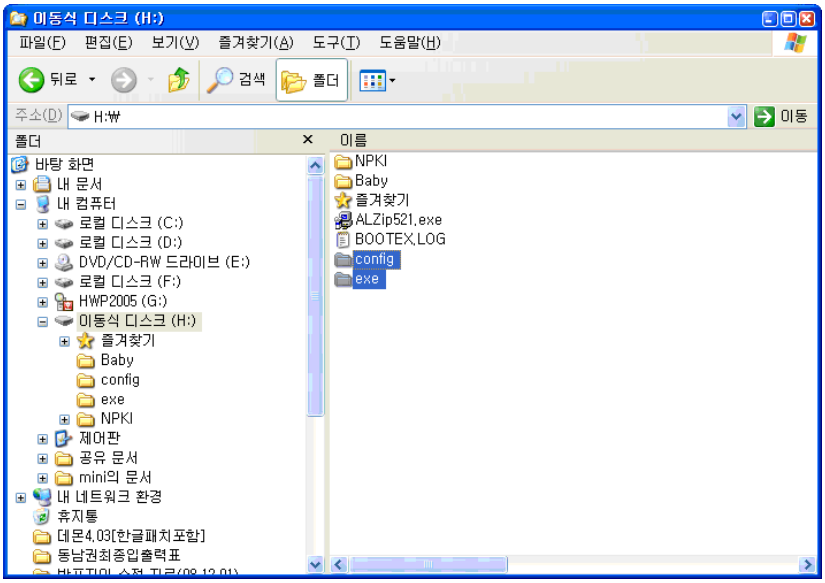
✓ Types of map files

Map Type	Function
adio_in_cfg.dat	Setting of I/O module, analog detector input
adio_out_cfg.dat	Setting of I/O module, analog detector output
set_panel_ip_cfg.dat	Setting of Panel IP number, net mask
prl_out_cfg.dat	Setting of Parallel Output (Broadcast or Graphic Panel)
panel_cfg.dat	Setting of Panel Usage, Network Control, and Data Sharing
Transponder_cfg.dat	Selecting the type of transponder
net_out_cfg.dat	Setting of network output
matrix_cfg_00.dat ~ matrix_cfg_31.dat	In/Output links (point map)
logic_cfg_00.dat ~ matrix_cfg_31.dat	In/Output links (AND map)
system_cfg.ini	Setting equipment keys& LEDs and field names
home_pic.png	The image on Home screen

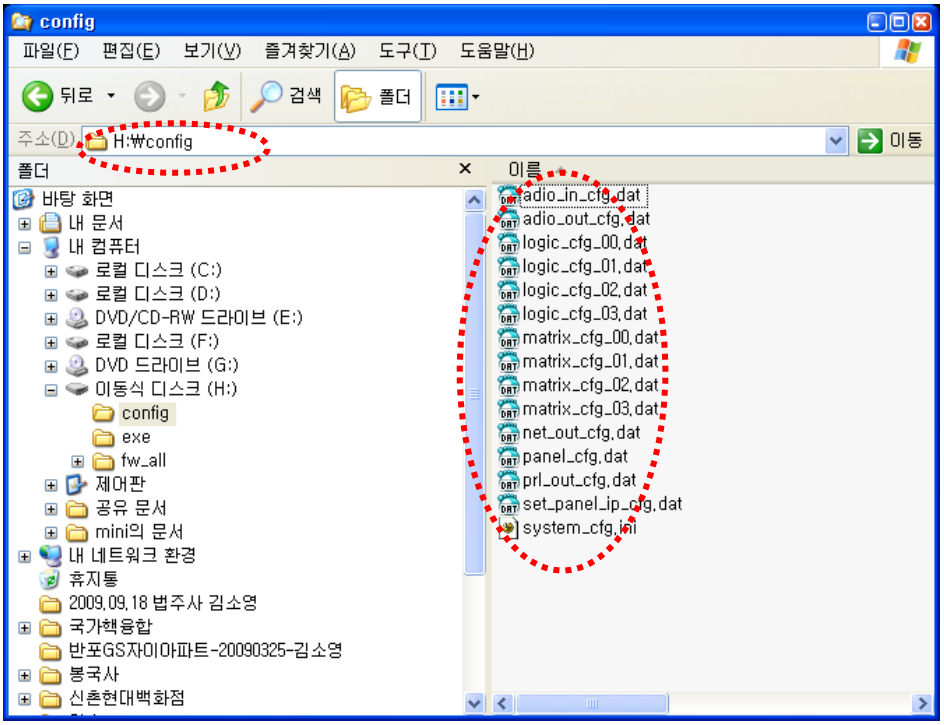
✓ Map Download & Upload

To download a map to the panel, use a USB portable disk.

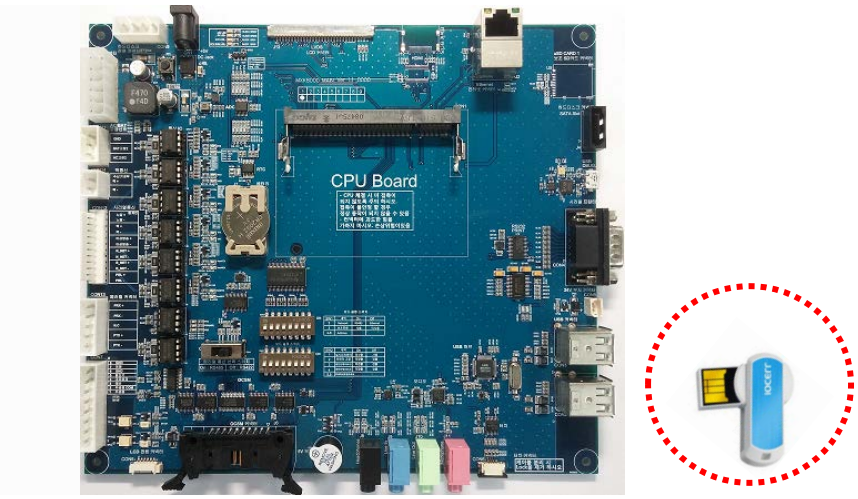
First, create the folder "**config**" on the USB disk.



Insert the map you want to download into the "config" folder.

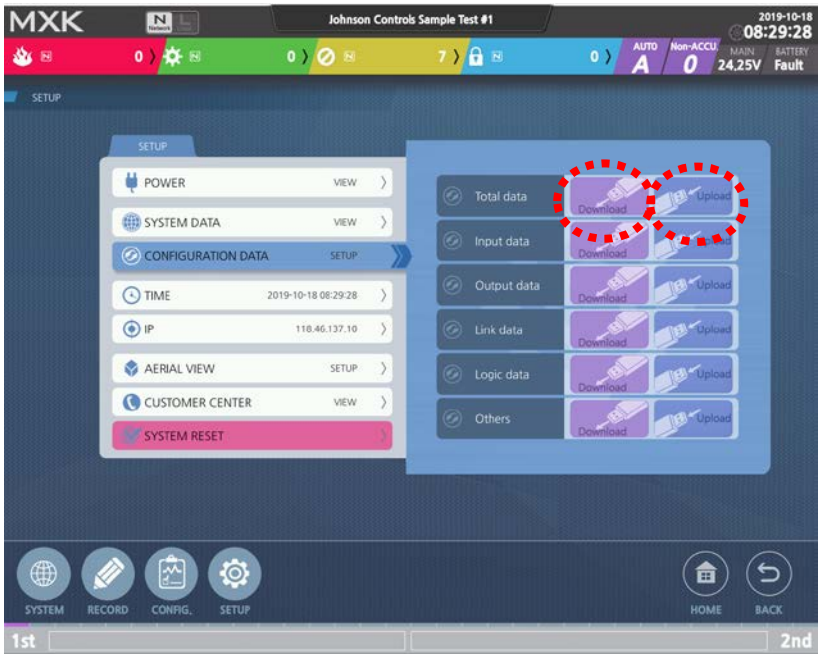


You can download maps by inserting selected files, or all of them. If you put the map into the "config" folder of the USB memory, plug it into the USB port on the MCM module of the panel. Any one of the four ports is O.K to plug.



Next, go to the screen on the panel to download it.

HOME → Setup → I/O Program Map Data



If a progress bar appears during the download and the progress bar is 100% completed and it disappears, the download is completed.

Reboot the panel to make sure the map is properly applied to the system before using it.

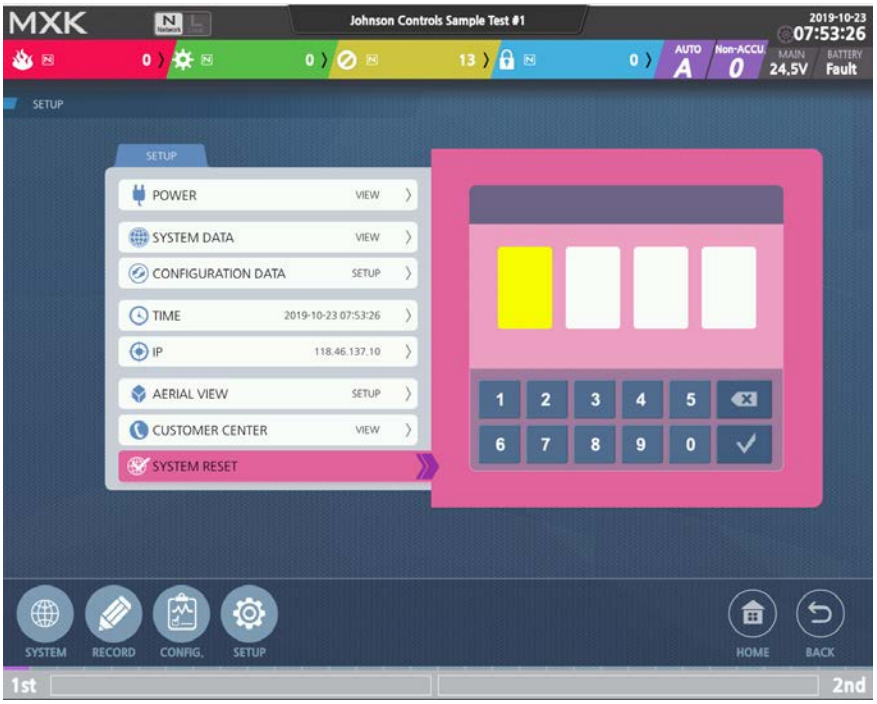
On the contrary, if you upload a map from the panel.

You should empty out the 'usb:/config' folder, plug the USB into the panel, and click the Data Upload button.

✓ System Reset (Reboot and shutdown)

In order to update a firmware due to a system error or to reboot the system after downloading the map, you must safely shut down the system to continue.

HOME → Set Up → System Reset



Type	Password
Reboot	4 9 3 5
End	1 2 3 4

* If you want to shut down the system, select shut-down, and turn off the power in 5 seconds. (Safety Shut-down)

During system operation, if you forcedly cut off the power supply to the MCM board, the system may break down. Be sure to use the system reset function before turning off power supply.

However, only in unavoidable circumstances like screen stop, touch screen problems), forcedly turn the power off.

5. Firmware Upgrade

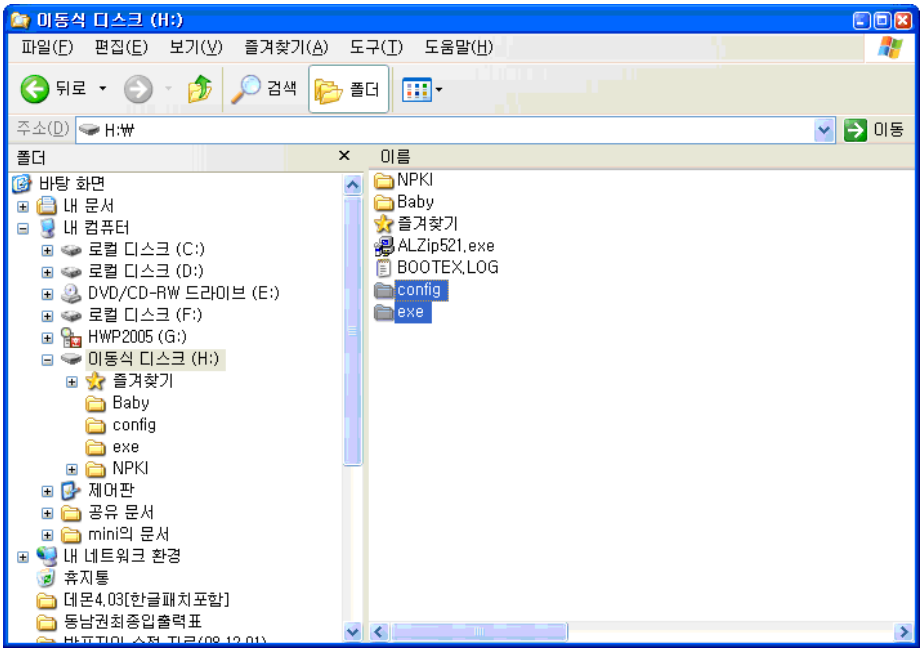
✓ Program type

Firmware type	Function
p_bms, p_config, p_start, p_maria p_desk, p_event, p_Transponder, p_init, p_io, p_logic, p_main, p_mc, p_mmi, p_network, p_network_485, p_print, p_prl	Panel Application The operation programs of the panel. Application of Event process, In/Output links, screen process, communication, record processing, printing process, etc
dev-fuart.ko, dev-record.ko, dev_n2mux_adc.ko, dev_n2mux_etc.ko, dev_n2mux_io.ko, drv-net485.ko, dev_n2mux_key_led.ko, dev_n2mux_nvram.ko, drv-realeth-ax88796b-r.ko	Device drivers to operate hardware (MCM_CPU, MCM_MAIN) of the panel

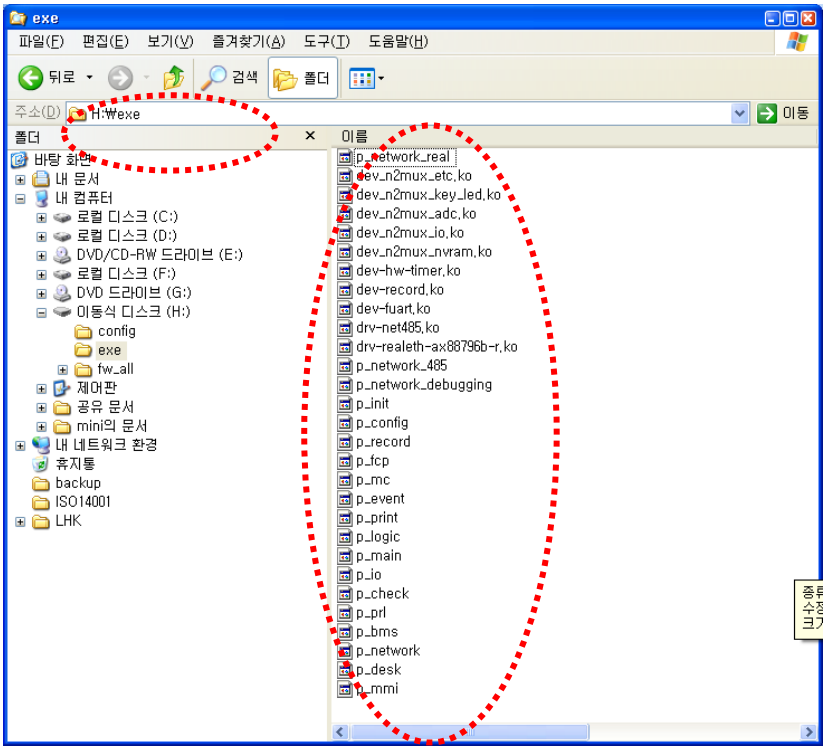
✓ How to upgrade the firmware

Upgrading the panel firmware also uses a USB portable disk.

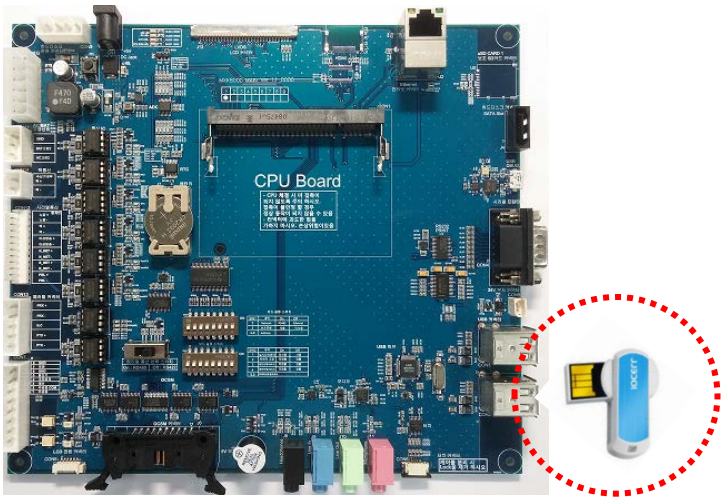
First, create an "exe" folder on the USB disk.



Insert the upgraded firmwate program files into the USE “exe” folder.



If you have inserted the firmware program files into the USB "exe" folder, plug the USB disk into the USB terminal on the MCM module of the panel. Any one of the four ports is O.K to plug.

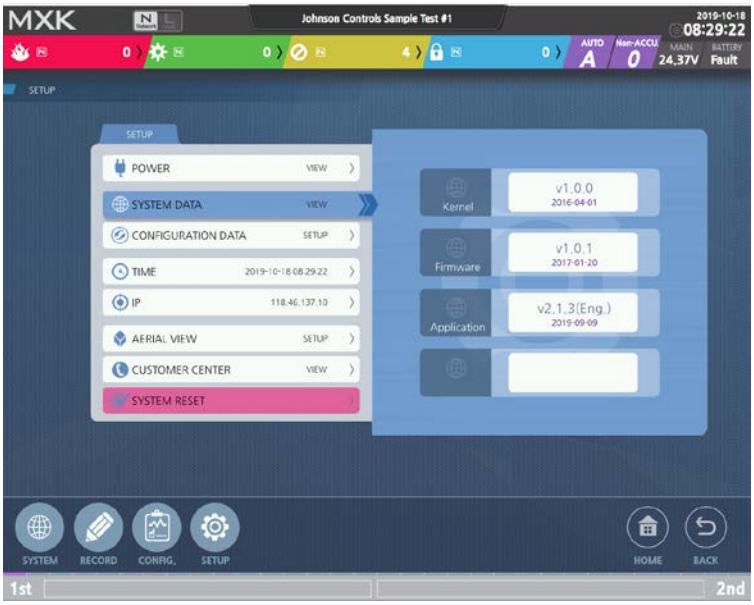


Check whether the USB is plugged in properly.

If you reboot the panel with a USB disk with firmware plugged in, the panel will be automatically upgraded with the new firmware. Applying the new firmware to the panel will take more time to boot, so please wait.

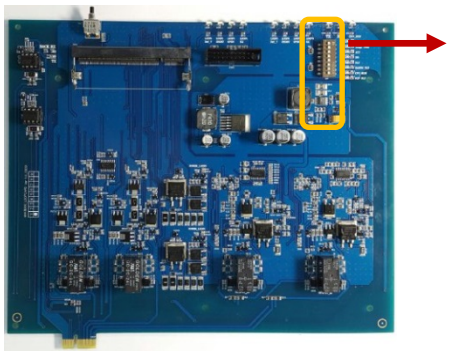
When booting is completed, pleases go to the set-up menu and check the version to see whether the new firmware has been applied or not.

HOME -> Set-up-> System Data



6. Loopcard Set up and verification

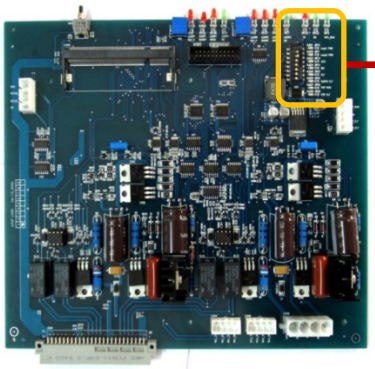
✓ MXK Loop Dip SW Setting



Pin	Description	ON	OFF
1~6	Transponder Address Number	1~64	
7	Reserved		
8	Mode	Fast	Normal

※ During system installation, the Fast mode is used for faster trouble shooting. After the completion of installation, the system should use Normal mode.

✓ MXK-NU Loop Dip SW Setting



Pin	Description	ON	OFF
1~4	Transponder Address Number	1~16	
5	Main Control Module type	NMUX	NMUXII, U
6	Loop0 I/O module type	HIMUX	NMUX
7	Loop1 I/O module type	HIMUX	NMUX
8	Mode	Fast	Normal

※ During system installation, the Fast mode is used for faster trouble shooting. After the completion of installation, the system should use Normal mode.

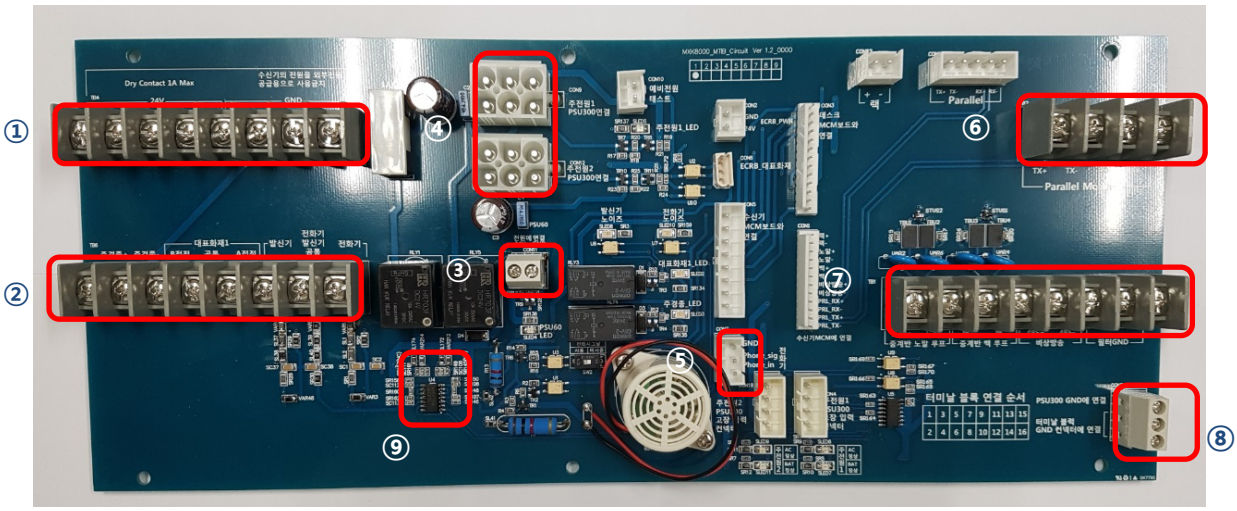
✓ Check and level adjustment of Transponder LEDs

Name	ON	OFF
CPU_RUN	Flashes at 1 second cycle in normal conditions	
RX	Flashes in response in normal conditions	
TX	Flashes on receipt of data in normal conditions	
LOOP0 RX	Flashes in response to I/O module connected to LOOP0	
LOOP0 OPEN	I/O module is not connected	I/O module is connected
LOOP0 SHORT	Loop Short	Normal
LOOP0 REF_V	Reserved	Reserved
LOOP0 가변 저항	Reserved	
LOOP1 RX	Flashes in response to I/O module connected to LOOP0	
LOOP1 OPEN	I/O module is not connected	I/O module is connected
LOOP1 SHORT	Loop Short	Normal
LOOP1 REF_V	Reserved	Reserved
LOOP1 Variavle resistance	Reserved	
RESET	Press on rebooting	

※ Unlike existing (NMUX U) loop card, variable resistors don't need any adjustment, and the status view for Ref is reserved.

7. External wiring connection – Transponder, loops, call points, phones

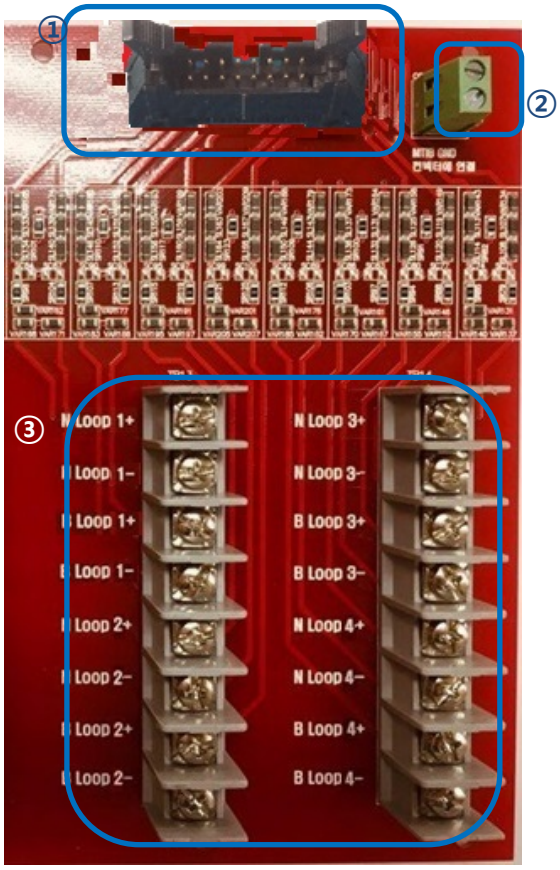
✓ MTIB Circuit Board



The Circuit board plays the role of the terminal board that connects the external and internal wires and some simple functions. You can check with each number as follows.

- **1. Power Supply Function: 24V 1A (Fuse 1A)**
- **2. Terminals of Main alarm, Fire Signal (Dry contact), Call point and Telephone: Special attention to neutral wires of Call point, and telephone.**
- **3. Terminals to separate power for Call point and Phone: 24V external power connection (ex.PSU60, LDPS)**
- **4. Main, Auxiliary Power Battery Test Terminal**
- **5. Auxiliary power trouble monitoring terminal**
- **6. Parallel Module (RS-422) connections**
- **7. Normal, Back of external Transponder, Emergency Broadcast (RS485) connection, filter GND terminal**
- **8. Filter Common Terminals: Loop filter and CS filter Connect to common terminals**
- **9. Call point/phone trouble LED : LED On means trouble**

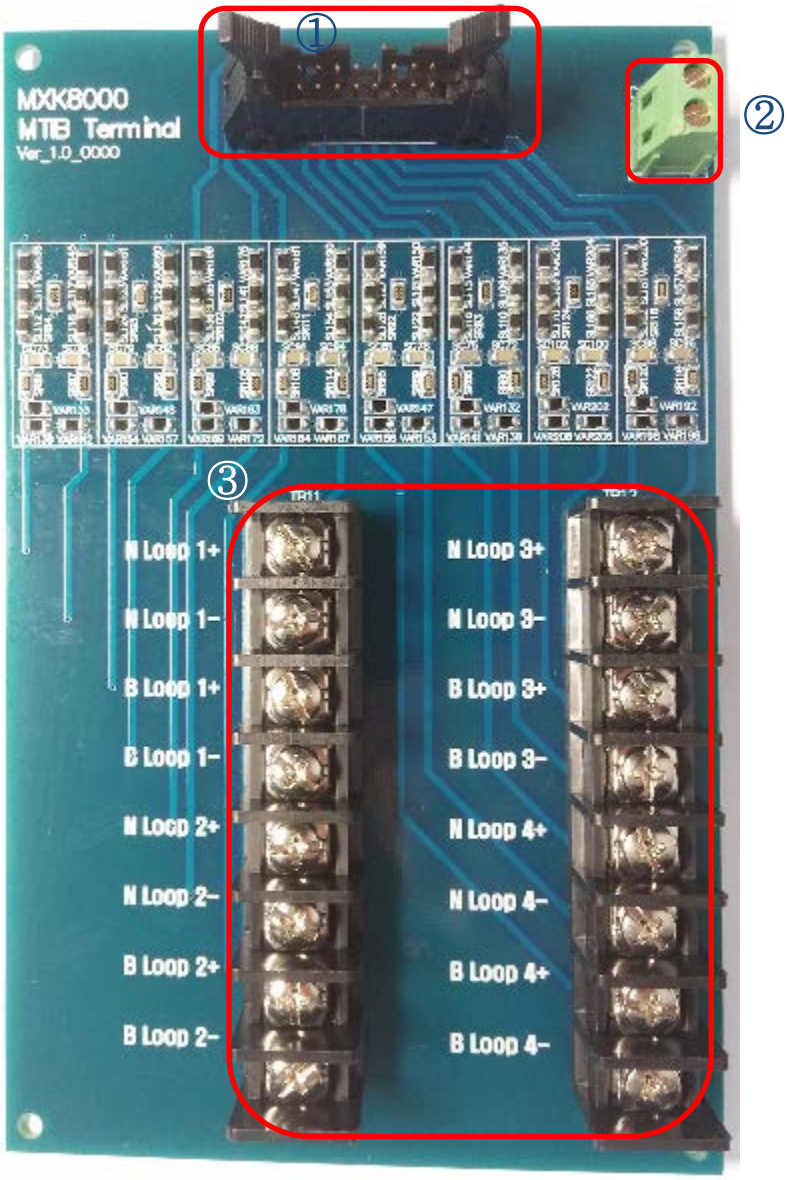
✓ MTIB MXK Terminal Board



The MXK Terminal Board is a board that is used to connect loop wires for the internal MXK loop transponder rack.

- **1. Normal, Back Loop Connection Terminal**
- **2. Filter Common Terminals: Connecting to Common Terminals of Circuit**
- **3. Loop Normal, Back Connection Terminal**

✓ MTIB NU Terminal Board



The NU Terminal Board is used by connecting the loop wires for the use of the internal NU Loop transponder rack.

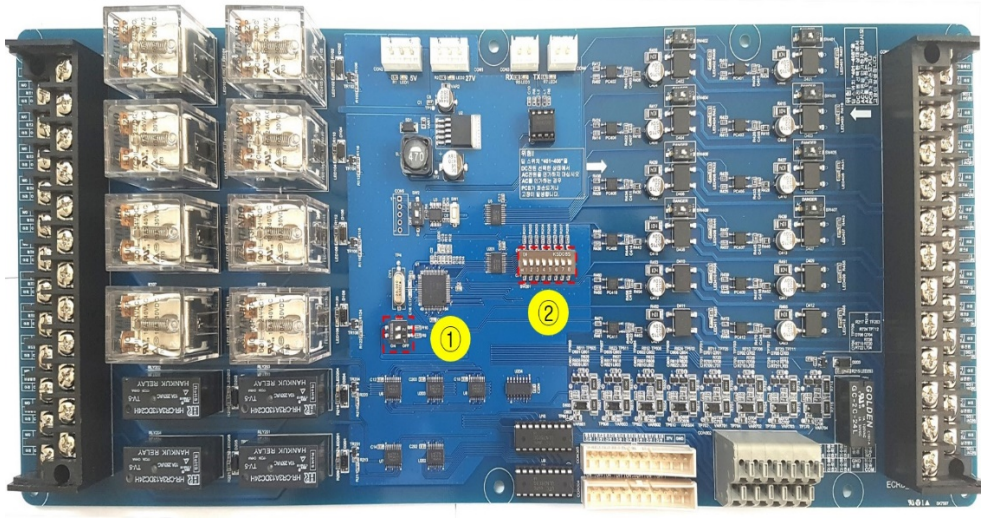
- **1. Normal, Back Loop Connection Terminal**
- **2. Filter Common Terminals: Connecting to Common Terminals of Circuit**
- **3. Loop Normal, Back Connection Terminal**

8. FIM(FUMP, FAN)

✓ ECRB_Pump8

1. Dip Switch

1.1. Location



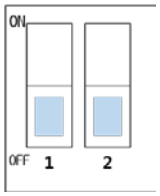
1.2. Function Description

Location	Part	Function
①	SW3	Address-setting dip switch
②	SW201	Latched Mode - setting dip switch

1.3. Setting method

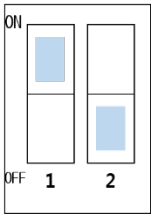
① **SW3: Address-Setting Switch**

※ **ECRB_Pump8 does not use address 0 (address 1, 2, and 3 only)**



Example) If you set an address (the switch must be "On" in order to set to "1")

- Setting No. 1 is to turn "No. 1" dip-switch to On.

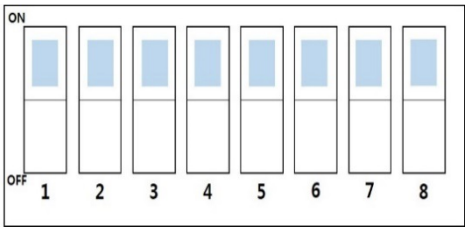


② **SW201: Self-Maintenance Setup Switch**

- Only one input signal of equipment makes pump output status latched.

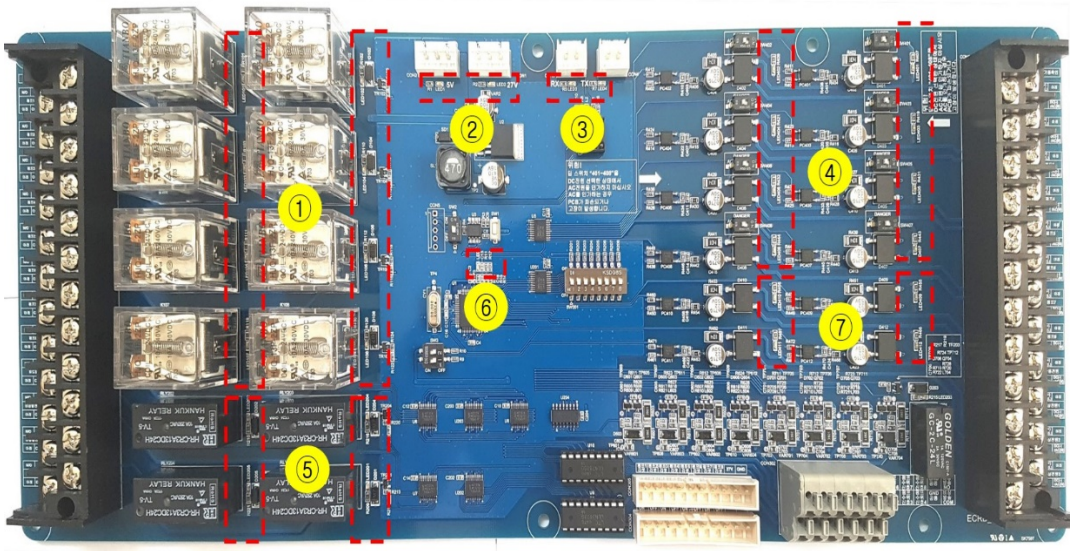
Example) **The switch must be "on" in order to set to latched mode.**

- If all of switches from 1 to 8 should have pump output set to latched state, all from 1 to 8 switches are turned to On**.**



2. LED

2.1. Location



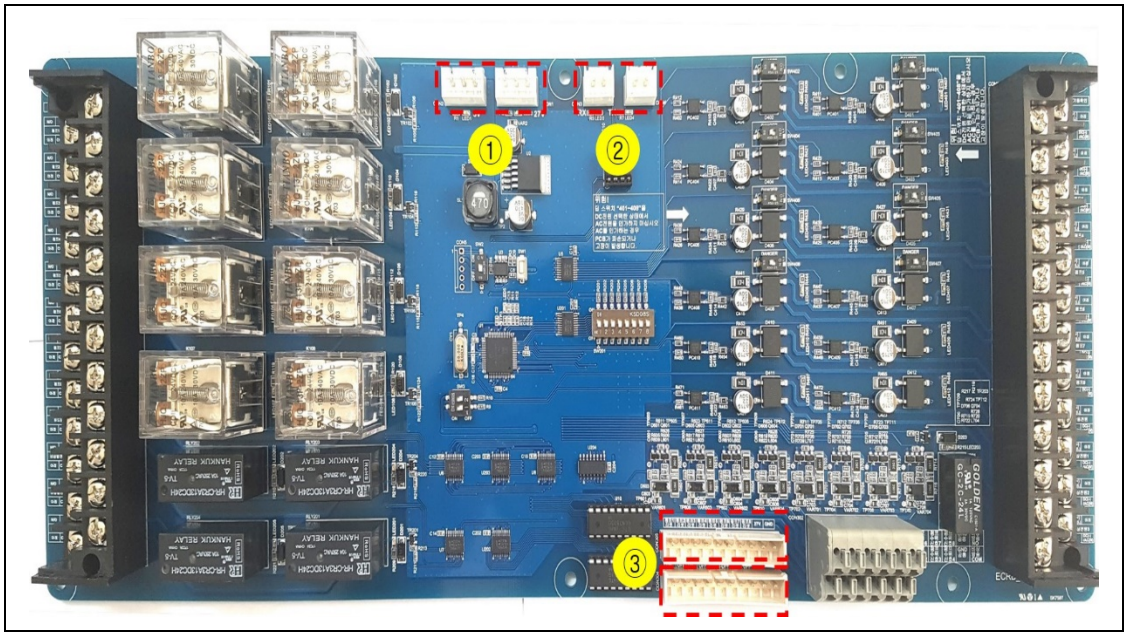
2.2. Function Description

Location	Part	Color	Function
①	LED101~108	Red	LED is on : Relay operation is normal
②	LED1	Green	LED is on : Internal power's circuit output (5 V DC) is normal
	LED2	Green	LED is on : Power (27 VDC) input is normal
③	LED3	Green	LED flashes: RS485 communication connection (Rx)
	LED4	Red	LED flashes: RS485 communication connection (Tx)
④	LED401~408	Red	LED is on : Activation acknowledging voltage input (220 VAC/24 VDC) is normal
⑤	LED204	Red	LED is on: Exit sign shows a normal operation
	LED201,205,202	Red	LED is on: Emergency generator 1,2,and 3 show normal

			operation
⑥	LED5	Green	LED is on: Error in address setting
			LED flashes (Period 0.25sec) : Communication is lost
			LED flashes (Period 1sec): CPU is normal
⑦	LED409	Red	LED is on : Commercial power is input
	LED410~412	Red	LED is on: Emergency power 1,2,and 3 are input

3. Connector

3.1. Location

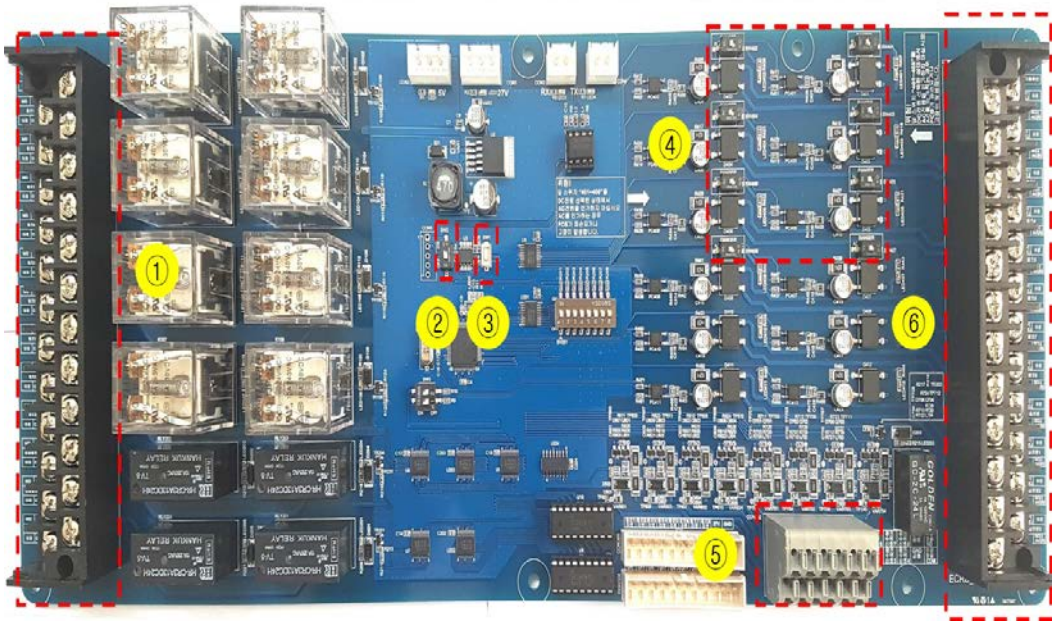


3.2. Function Description

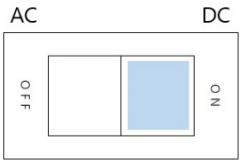
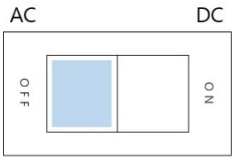
Location	Part	Function
①	Con1~2	Power connector(Connected to other ECSB·ECRB using the daisy chain method)
②	Con3~4	Communication connector (Connected to other ECSB·ECRB using the daisy chain method)
③	Con304~5	Pump Reset, On/Off control switch signal connection connector (connected to ECRB_DCM)

4. Others

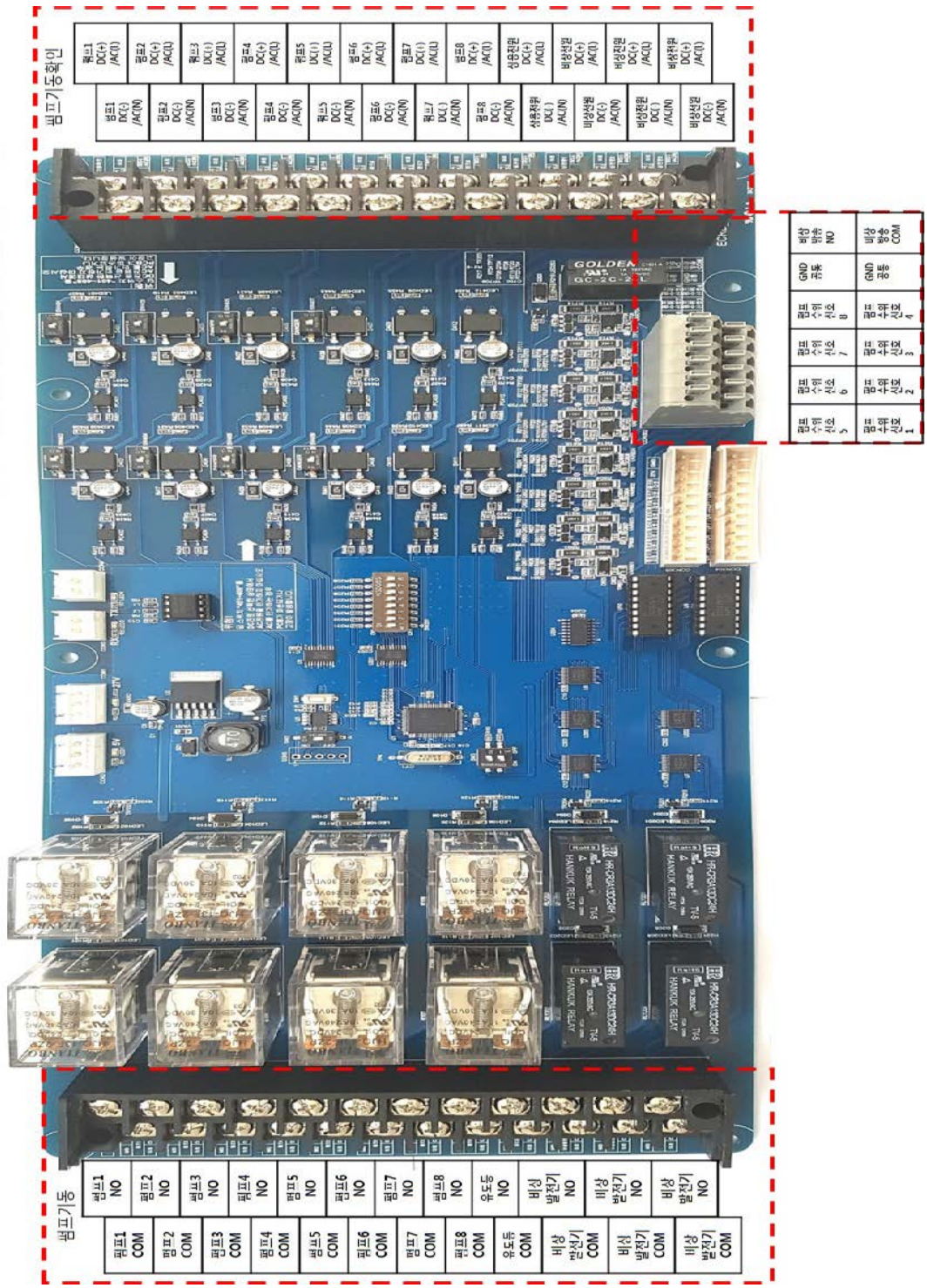
4.1. Location



4.2. Function Description

Location	Part	Function
①	Con301	Pump activation, emergency generator, exit sign signal output connector
②	SW2	Boot mode setting switch (default state is on)
③	SW1	Reset switch
④	SW401~408	Setting the level of pump activation acknowledging input signal (On:24 V DC, Off:220V AC)  DC  AC ※ Do not change it when the power supply is input. ※ Do not apply power other than the designed power.
⑤	CON302	Pump level signal (PS) input, emergency broadcasting in/output connector
⑥	CON303	Pump activation acknowledgement, pump activation, main power, emergency power, signal input connector

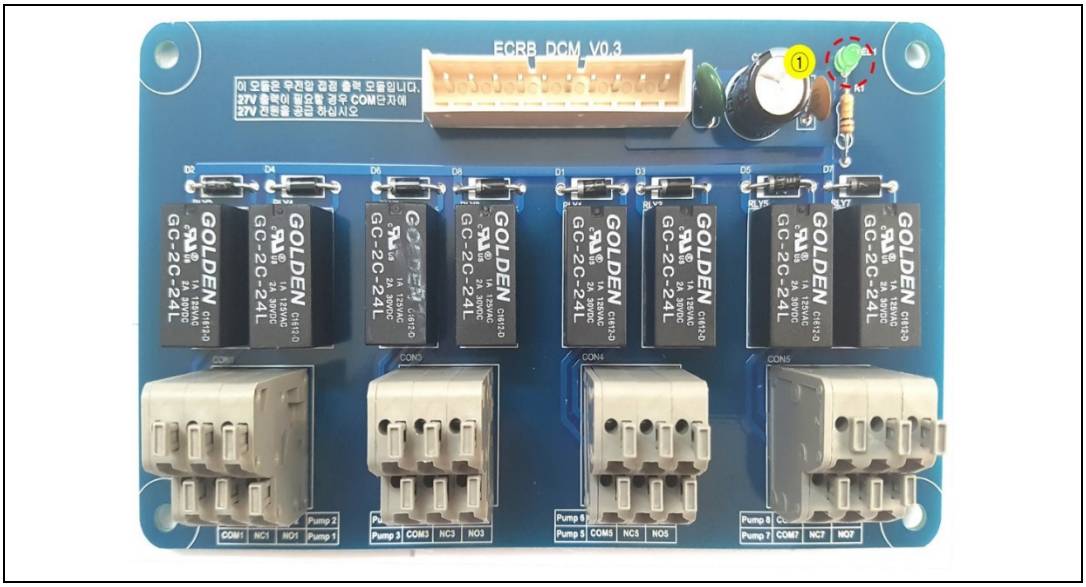
4.3. Terminal Description

Silk


✓ DCM

1. LED

1.1. Site

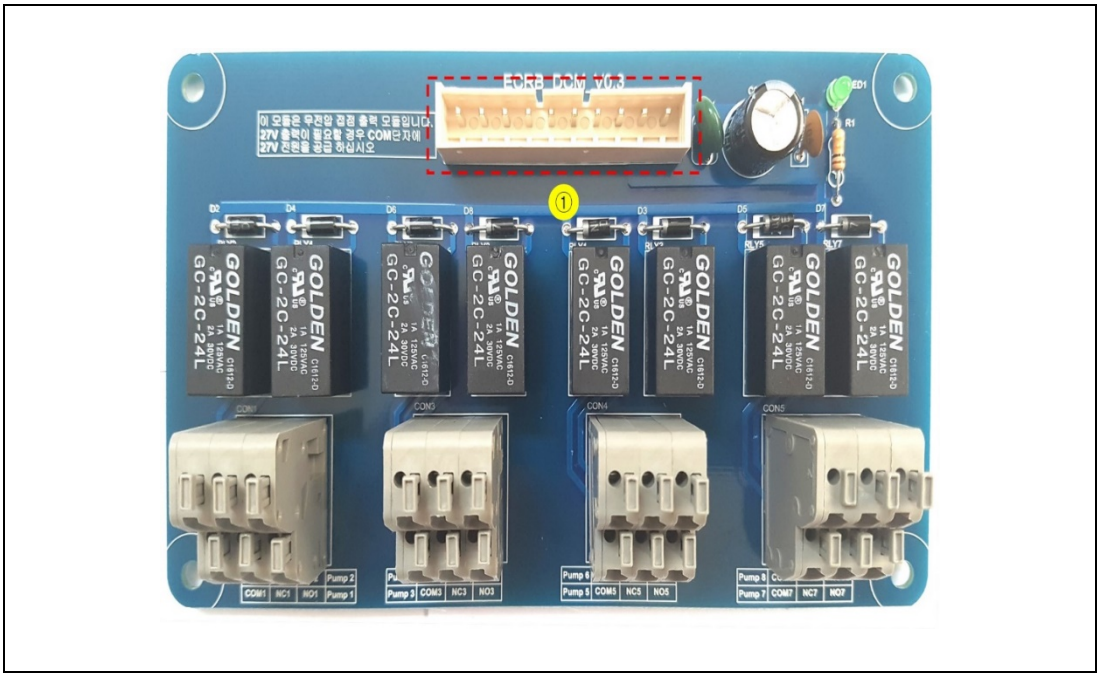


1.2. Function Description

Site	Part	Color	Function
①	LED1	Green	LED On: Power output(27VDC) is normal

2. Connector

2.1. Location

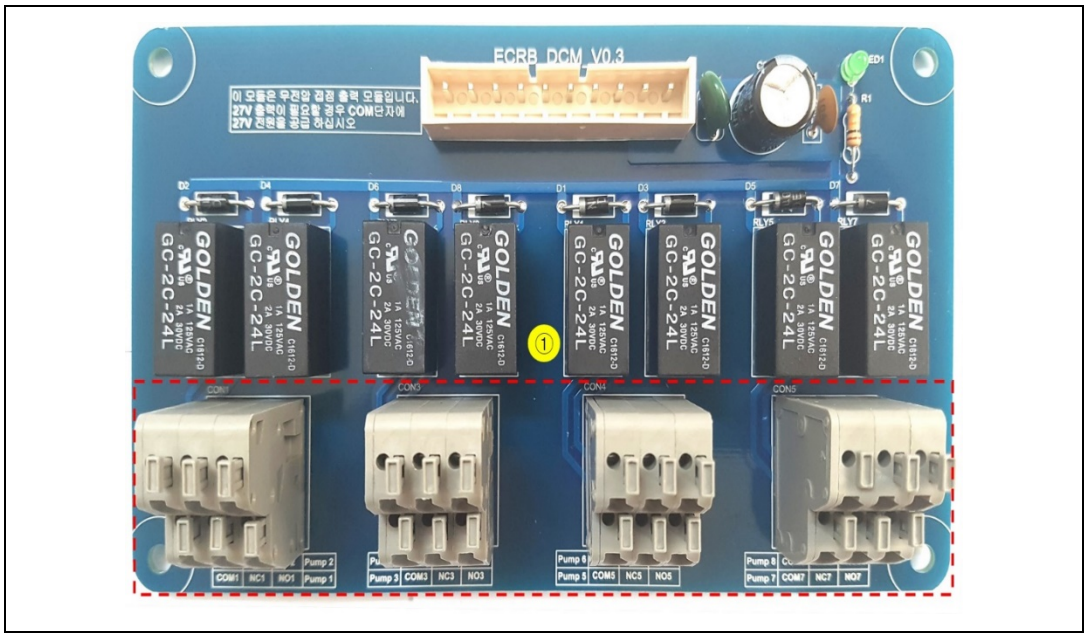


2.2. Function Description

Location	Part	Function
①	CON1	Pump Reset, On/Off control switch, 27 V DC signal connector (connected to ECRB_Pump8)

3. Others

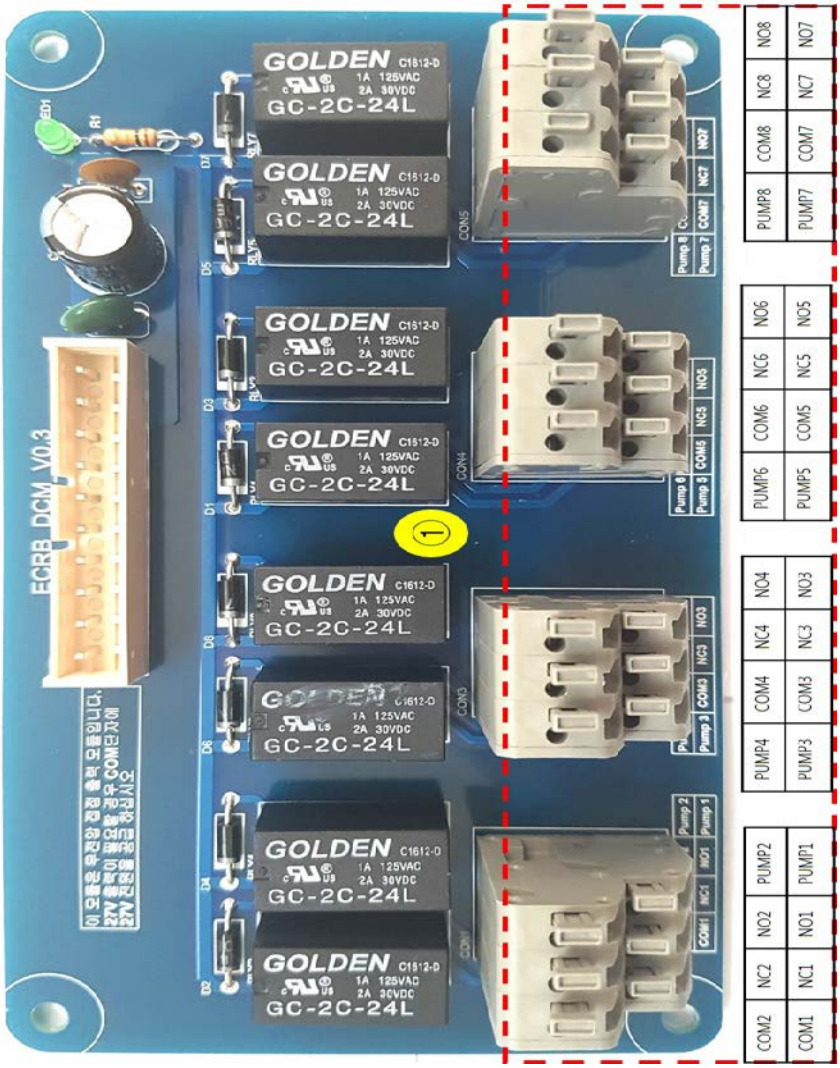
3.1. Location



3.2. Function Description

Location	Part	Function
①	CON1,3,4,5	Non-voltage contactor output

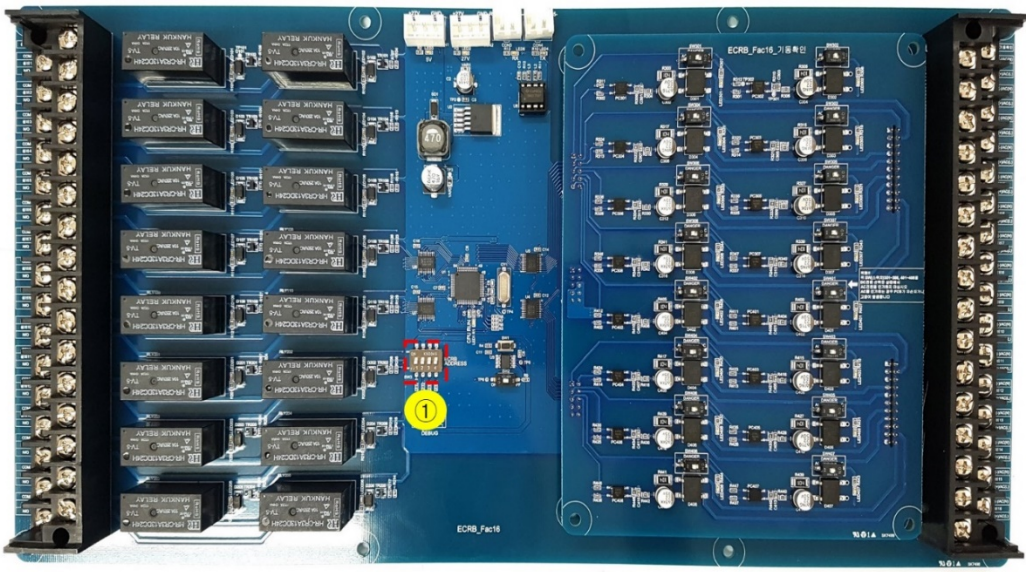
3.3. Terminal Description

Silk


✓ ECRB_Fac16

1. Dip Switch

1.1. Location



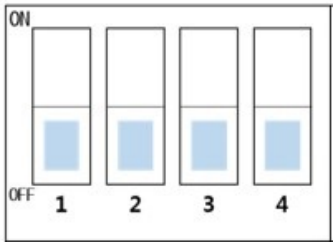
1.2. Terminal Description

Site	Part	Function
①	SW3	Address-setting dip switch

1.3. Setting method

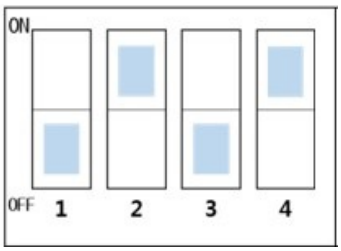
① **SW3: Address-Setting Switch**

※ **ECRB_Fac16 does not use address 0,14,15 (address 1~13 only)**



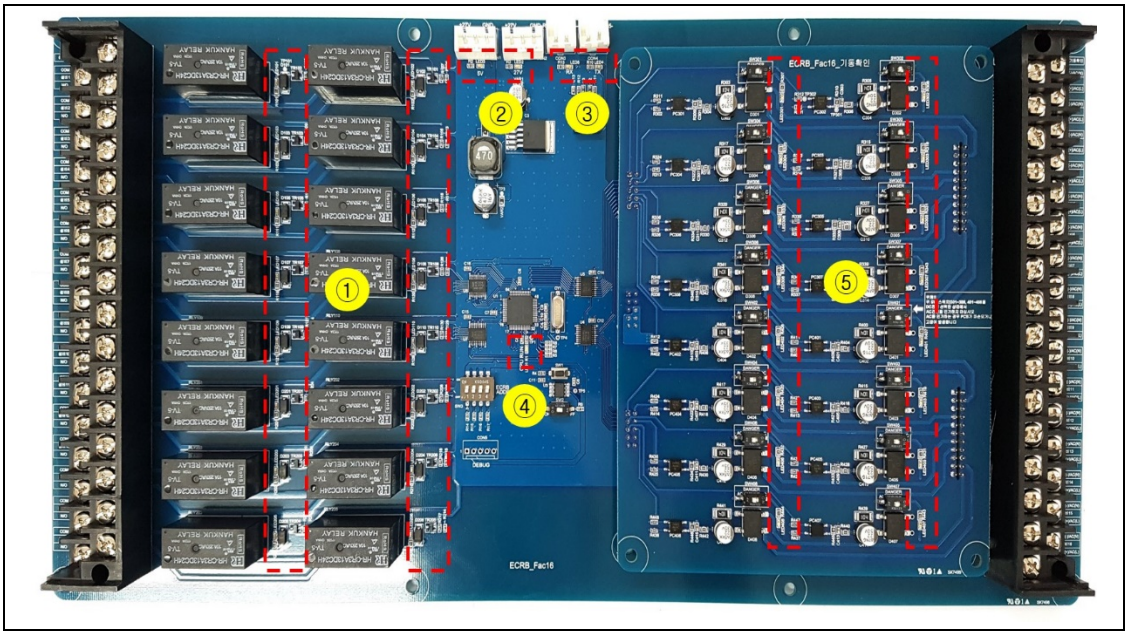
Example) If you set address 10,(the switch must be "On" in order to set to "1")

Address 10 is to set "No. 2 and 4" dip-switches to On. (2 + 8 = 10)



2. LEDs

2.1. Location

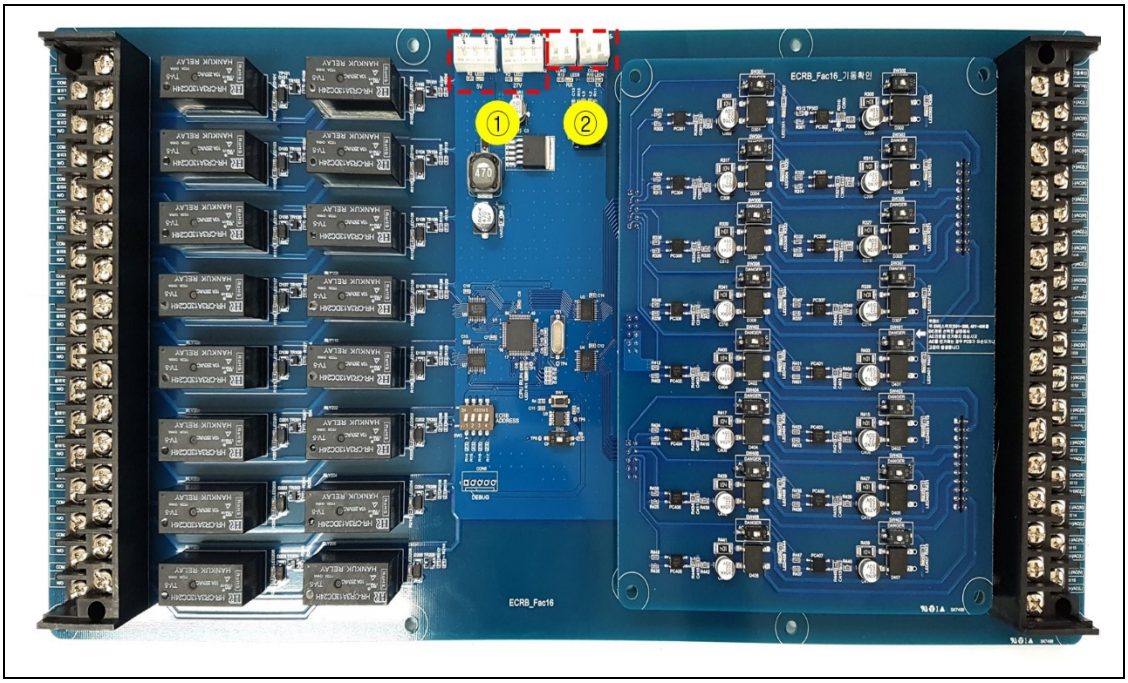


2.2. Function Description

Location	Part	Color	Function
①	LED101~110 LED201~206	Red	LED On : Equipment operates normally
②	LED3	Green	LED is On : Input power (27 V DC) is normal
	LED2	Green	LED is On : Input power (5 V DC) is normal
③	LED5	Green	LED flashes: RS485 communication connection (Rx)
	LED4	Red	LED flashes: RS485 communication connection (Tx)
④	LED1	Green	LED is On: Error in address setting
			LED flashes (Period 0.25sec) : Communication is lost
			LED flashes (Period 1sec): CPU is normal
⑤	LED301~308 LED401~408	Red	LED On : Confirmation of Equipment activation is normal

3. Connector

3.1. Location

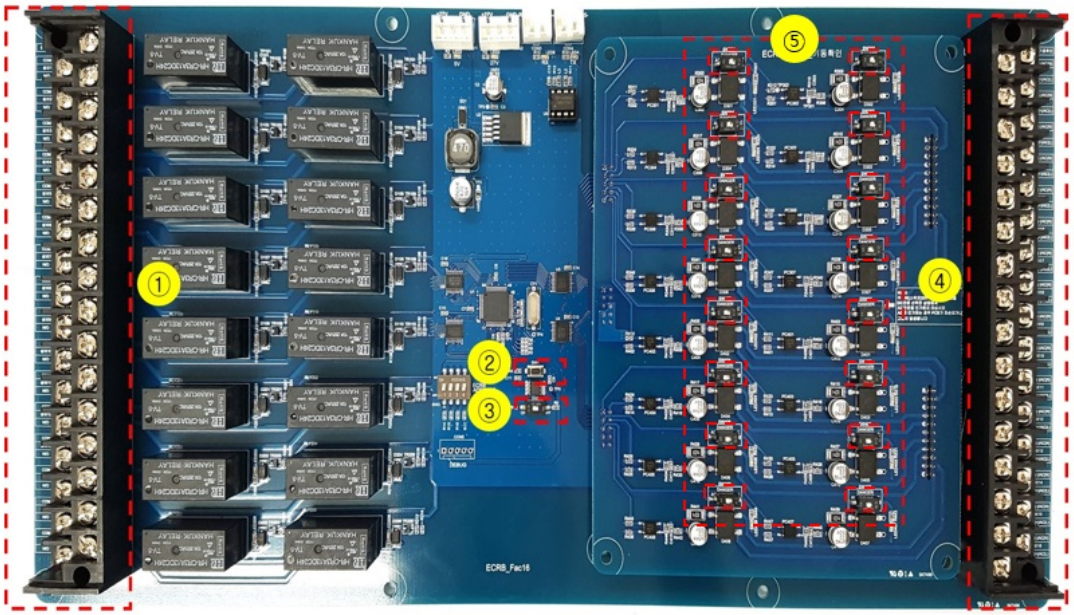


3.2. Function Description

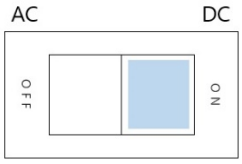
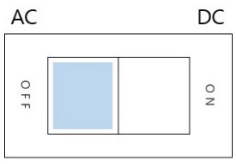
Location	Part	Function
①	CON1~2	Power connector (Connected to other ECSB·ECRB using the daisy chain method)
②	CON3~4	Communication connector (Connected to other ECSB·ECRB using the daisy chain method)

4. Others

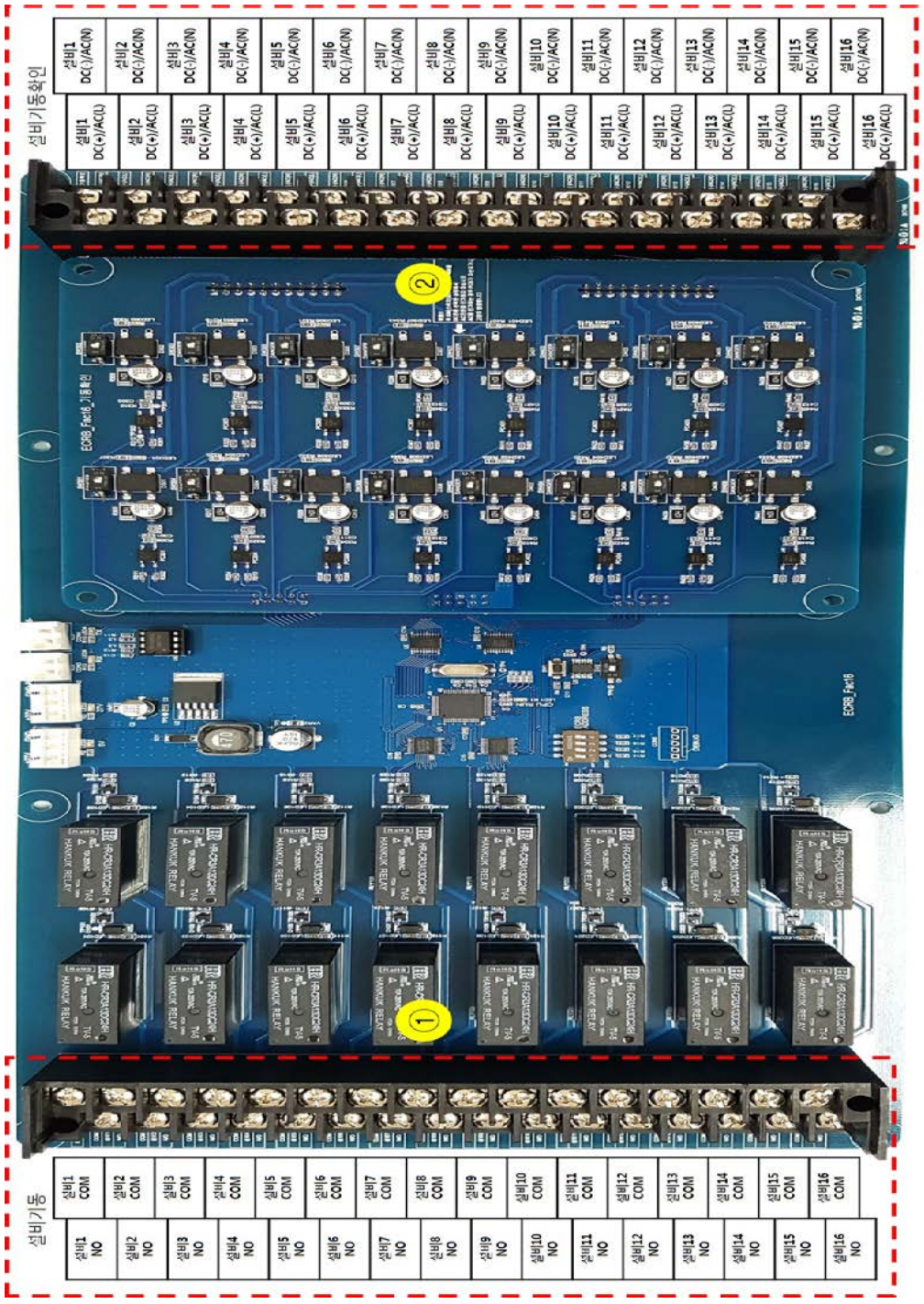
4.1. Location



4.2. Function Description

Location	Part	Function
①	CON504	Equipment Activation Output Connector
③	SW1	Reset switch
④	SW2	Boot mode-setting switch (default state is ON)
④	CON501	Equipment Activation Acknowledging connector
⑤	SW301~308 SW401~408	Equipment Activation Acknowledging signal level (ON: 24 VDC, OFF: 220 VAC)  DC Settings  AC Settings ※ **Do not change the level when the power is applied.** ※ **Do not apply power other than the designated power source.**

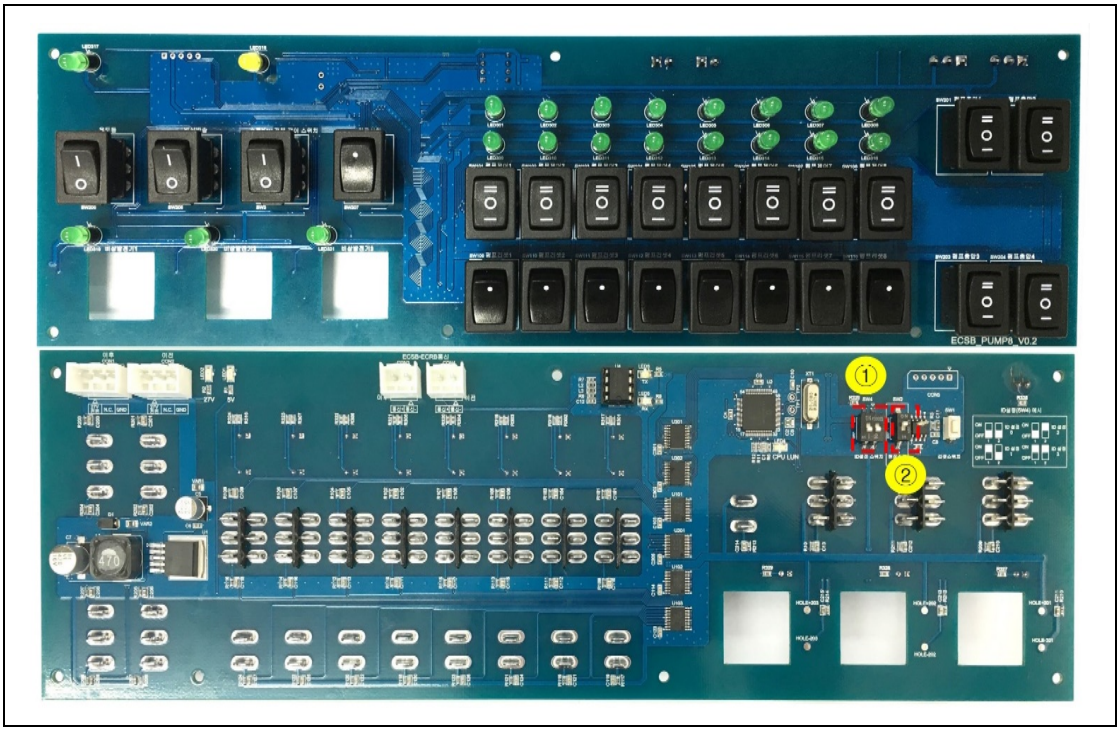
4.3. Terminal Description

Silk


✓ ECSB_Pump8

1. Dip Switch

1.1. Location



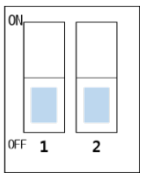
1.2. Function Description

Location	Part	Function
①	SW4	Address-setting dip switch
②	SW2	Boot mode setting switch (default state is ON)

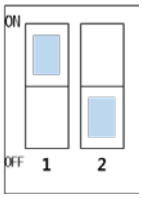
1.3. Setting method

① **SW4: Address setting switch**

※ **ECSB_Pump8 does not use address 0 (address 1, 2, and 3 only)**

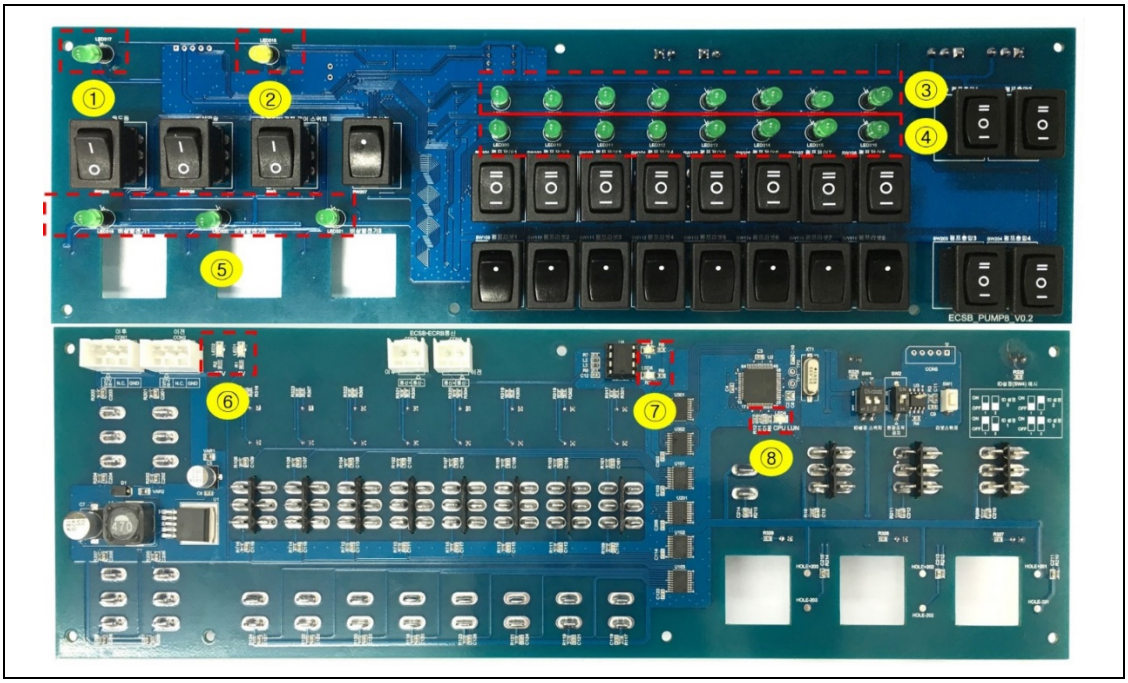


- **Example)** If you want to set ECSB's address to address 1 (The switch must be turned to "On" in order to set to 1).
- - Setting address 1 is to turn "No. 1" dip-switch to On.



2. LEDs

2.1. Location

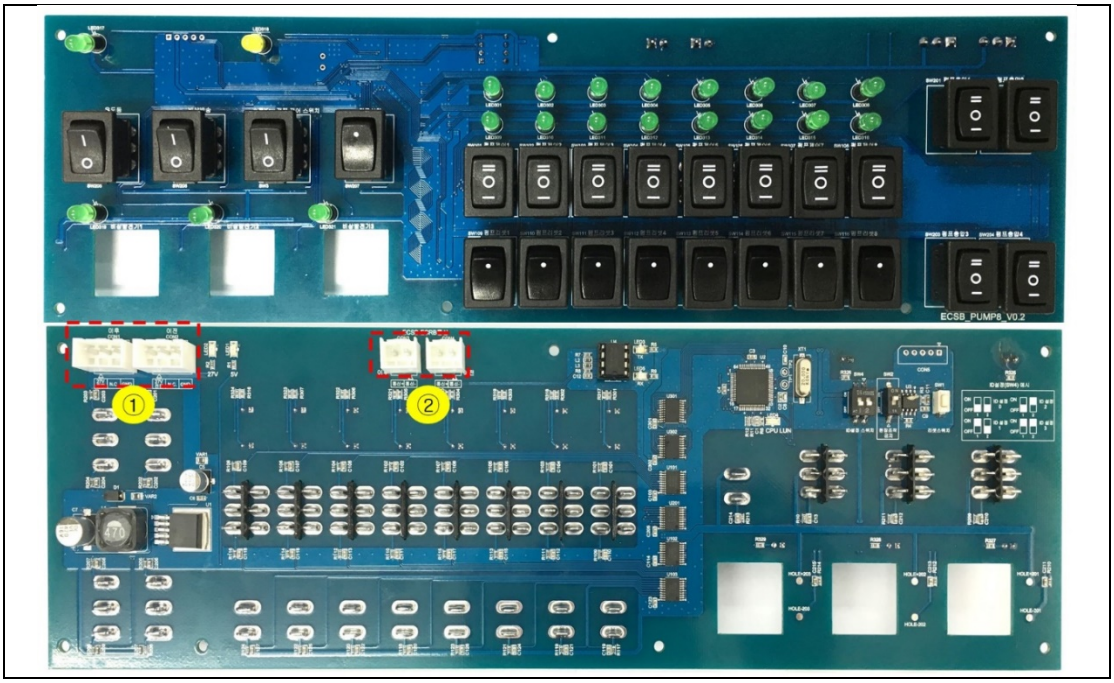


2.2. Function Description

Location	Part	Color	Function
①	LED317	Red	LED is On: Main power is normal
②	LED318	Yellow	LED flashes: Switch Caution
③	LED301~308	Green	LED is On : PS Input LED flashes : end-of-terminal failure (Period 1sec) LED is Off : Normal state
④	LED309~316	Green	LED is On : Pump activation acknowledging voltage input is normal
⑤	LED319~321	Green	LED is On: Normal emergency generator
⑥	LED1	Green	LED is On : Input power (27 V DC) is normal
	LED2	Green	LED is On : Input power (5 V DC) is normal
⑦	LED3	Green	LED flashes: RS485 communication connection (Rx)
	LED5	Red	LED flashes: RS485 communication connection (Tx)
⑧	LED4	Green	LED is On: Error in address setting
			LED flashes (Period 0.25sec) : Communication is lost
			LED flashes (Period 1sec): CPU is normal

3. Connectors

3.1. Location

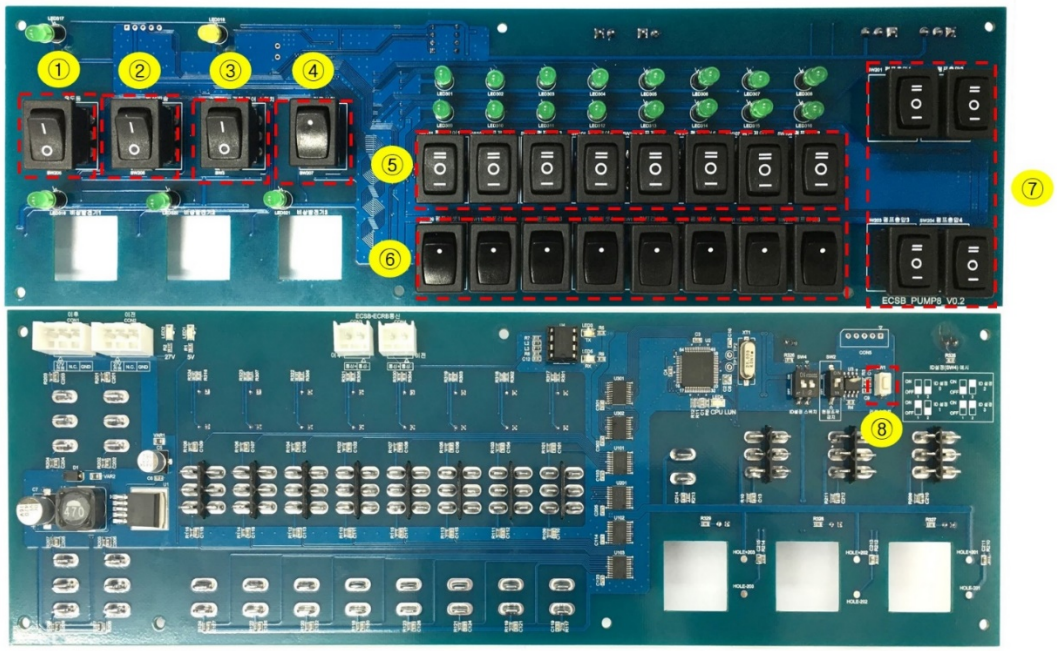


3.2. Function Description

Location	Part	Function
①	Con1~2	Con1~2 Power Connector (Connected to other ECSB·ECRB using the daisy chain method)
②	Con3~4	Con3-4 Communication Connector (Connected to other ECSB·ECRB using the daisy chain method)

4. Others

4.1. Location



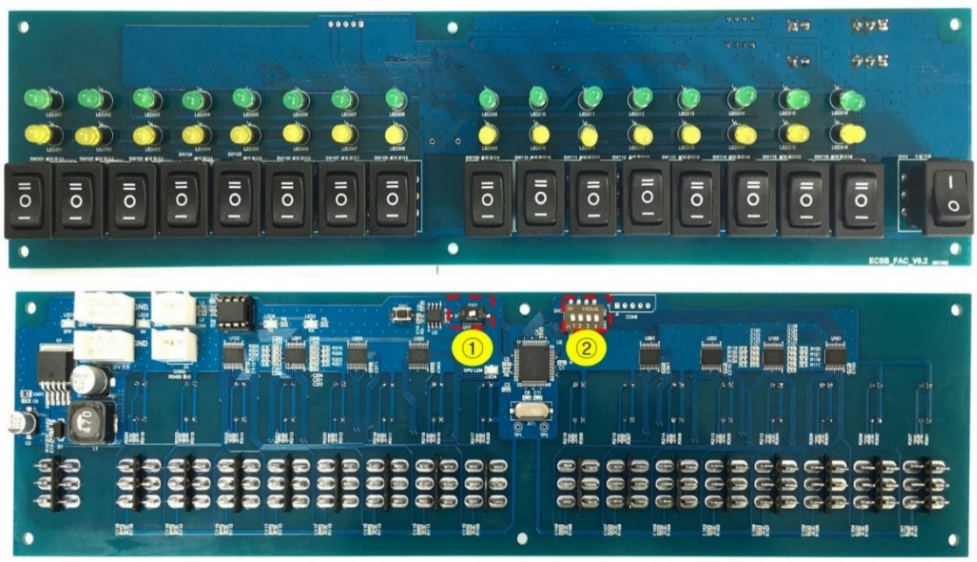
4.2. Function Description

Location	Part	Function
①	SW205	Up : Key to link exit sign Down : Key to stop linking exit sign
②	SW206	Up : : Key to link emergency broadcasting Down : Key to stop linking emergency broadcasting
③	SW207	Up : Output Protection Key
④	SW208	Up : Key to link circuit test
⑤	SW101~108	Up : Key to control pump automatically Mid : Key to stop pump control Down: Key to control pump manually
⑥	SW109~116	Up : Key to link pump reset
⑦	SW201~204	Up : On Key to pump pressure is enough Down: Off Key to pump pressure is not enough
⑧	SW1	Reset switch

✓ ECSB_Fac16

1. Dip Switch

1.1. Location



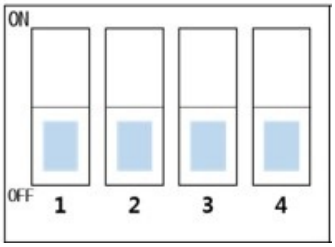
1.2. Function Description

Site	Part	Function
①	SW4	Address-setting dip switch
②	SW2	Boot mode setting switch (default state is ON)

1.3. Setting method

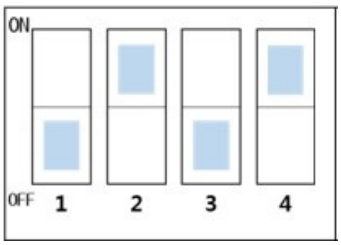
① SW4: Address setting switch

※ **ECSB_Fac16 does not use addresses 0,14,15 (address 1 to 13 only)**



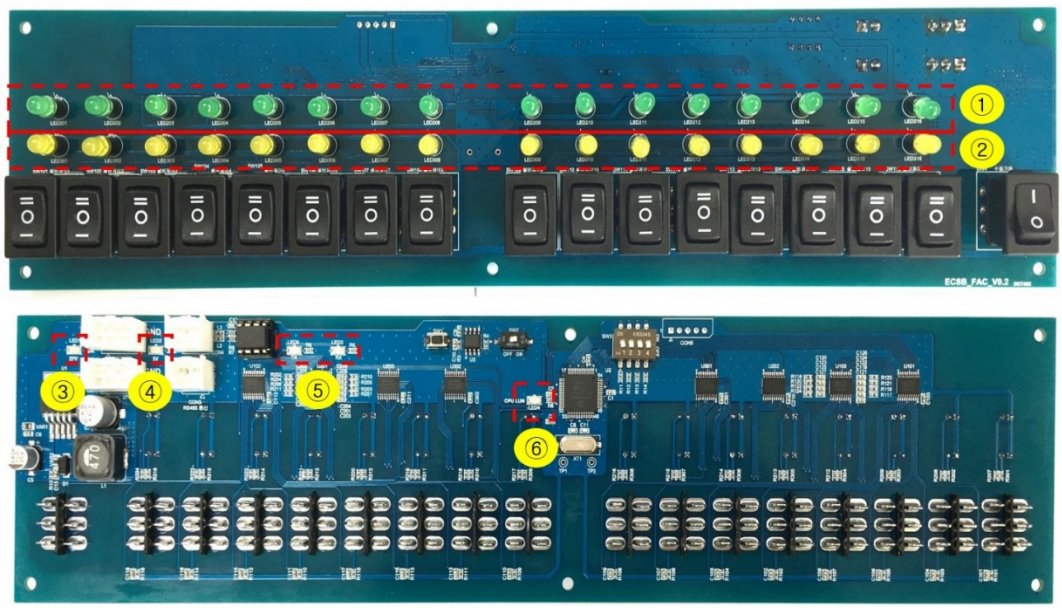
Example) If you want to set address 10. (The switch must be turned to "on" in order to set to "1")

Address 10 is to set "No. 2 and 4" dip-switches to On. (2 + 8 = 10)



2. LEDs

2.1. Location

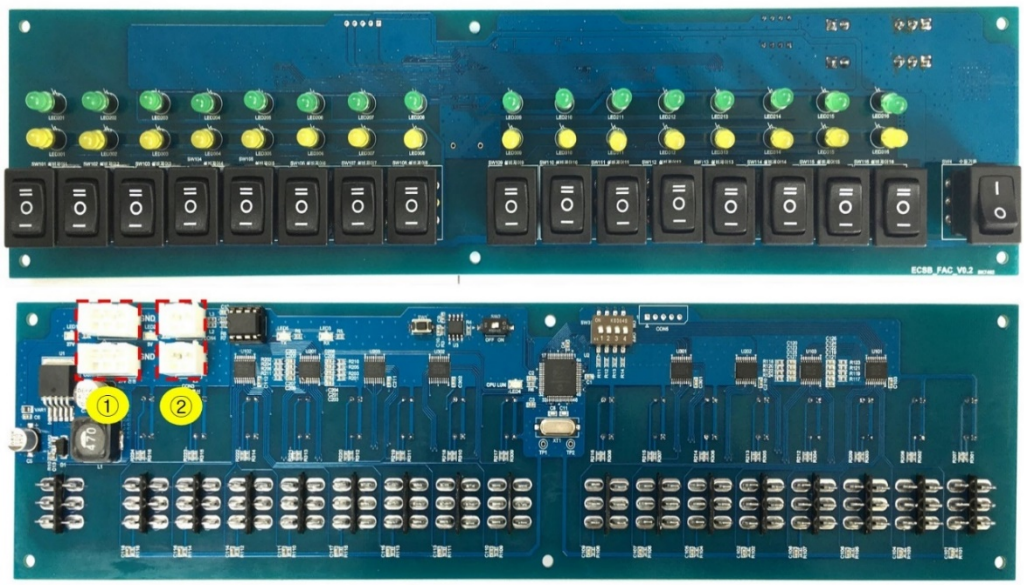


2.2. Function Description

Location	Part	Color	Function
①	LED201~216	Green	LED is On : Activation acknowledging voltage input is normal
②	LED301~316	Yellow	LED is On: Switch caution
③	LED1	Green	LED is On : Input power (27 V DC) is normal
④	LED2	Green	LED is On : Input power (5 V DC) is normal
⑤	LED5	Red	LED flashes: RS485 communication connection (Rx)
	LED3	Green	LED flashes: RS485 communication connection (Tx)
⑥	LED4	Green	LED is On: Error in address setting
			LED flashes (Period 0.25sec) : Communication is lost
			LED flashes (Period 1sec): CPU is normal

3. Connectors

3.1. Location

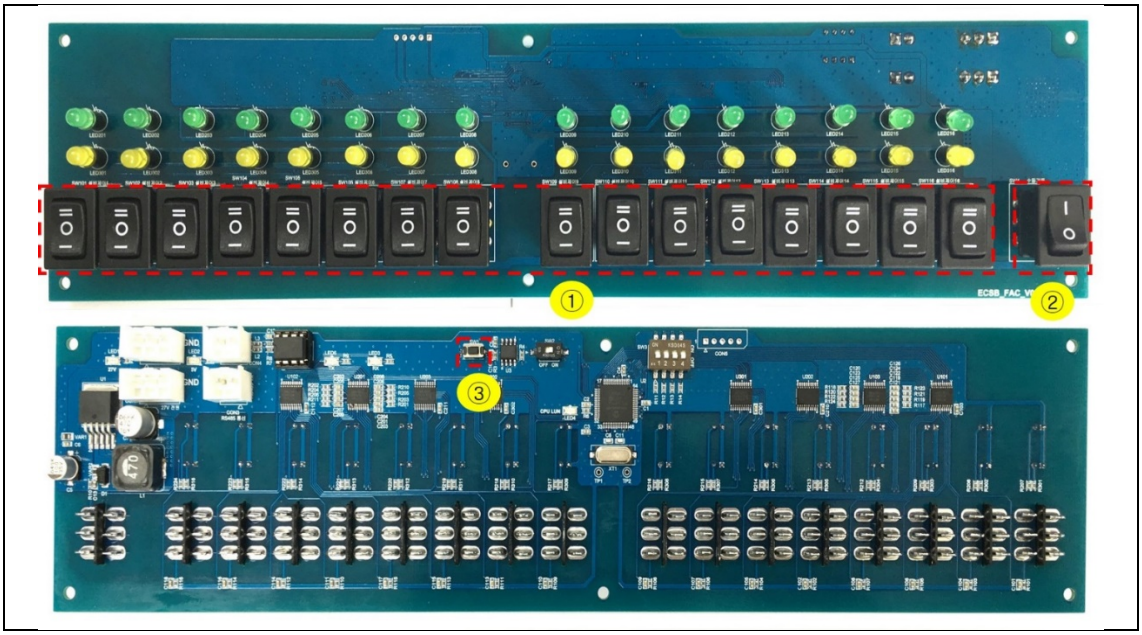


3.2. Function Description

Location	Part	Function
①	Con1~2	Power connector (Connected to other ECSB·ECRB using the daisy chain method)
②	Con3~4	Communication connector (Connected to other ECSB·ECRB using the daisy chain method)

4. Others

4.1. Location



4.2. Function Description

Location	Part	Function
①	SW101~116	Up : Key to control equipment automatically Mid : Key to stop equipment control Down : Key to control equipment manually
②	SW4	Output protection key (formerly manual activation)
③	SW207	Reset switch

9. Network - Ethernet

✓ Network Specification

Max Number of Nodes	-	32 panels + 32 workstations
Max communication Distance	-	LAN Cable Enabled - Up to 100 m
		Using the Optical cable - 25Km
Communication	-	LAN configuration using Ethernet
Available Topology	-	BUS, Star, Ring all available

The MXK8000 panel can configure a network with up to 32 panels. Additionally, up to 32 additional workstations can be connected. If a network uses UTP LAN cable, the distance between panels can be up to 100 m, and if optical cables are used, the distance can be up to 25 km.

✓ Device configuration for the network

In order to configure the network of the panel, you need the following products by default. Reference pictures can be found in "Chapter 2 Product Configuration.

- Panel: MXK8000 panel
- SFC800 (Optical Converter): 1 unit per panel (additional pieces on site requirements)
- Back Loop (RCM): One loop is required across the entire network
- Router: 100Mbps wired and wireless router
- HUB: 100 Mbps switch hub**,**
- LAN Cable: Cross cable, direct cable - UTP CAT5
- Optical cables for cable pulling: Single mode, 4 Core (or higher)
- FDF (Optical terminal box): Termination process of optical cables for pulling, produced by a vendor specializing in optical cable.
- Optical jumper cord: SM SP SC/PC – SC/PC Cable

Among these, HUB, LAN Cable, Optical cable for pulling, optical terminal box, and optical jumper cord are sold on the market and must be purchased or manufactured separately. Please, check the information above for purchase or manufacturing them. Also, since the following sections describe how to use devices and how to connect them, please, read and check them before purchase and use them.

✓ IP Settings

Set the IP of the panel based on the map. Maps are generated by the product technology team, so once the number of connected panels on the network is determined, users should request the product technical team for the maps.

Once the map has been created, you can download it to the panel from the product technical team.

IP Zone : 192.168.10.2 ~ 192.168.10.253

Default Mask : 255.255.255.0

MXK8000 System IP Recommended Area: 192.168.10.80 ~ 192.168.10.111

MXK8000 W/S IP Recommended Area: 192.168.10.151 ~ 192.168.10.182

By the product technical team, panel number 1 is set to 192.168.10.80 as shown above, panel number 2 is set to 192.168.10.81, and up to 32 panels are set sequentially.

The W/S IP will also increase sequentially from 192.168.10.151. The MXK8000 system also increases from IP 192.168.10.151 to 182 because it can connect up to 32 W/Ss. W/S is shipped on the site with IP settings, so you don't have to worry about it

✓ Network connection using LAN Cable

When two or more panels are installed, if the distance is less than 100 meters in the building, the network can be configured using a wired and wireless router, switch hub, and UTP LAN cable.

Types and choice of wired and wireless router

Router is also called access point (APs) and is responsible for gateways and hub holes on the network. Multiple devices share one line, enabling simultaneous communication. If the gateway that is not set up is used, router can play the same role as the switch hub. The router performance for MXK8000 network configuration should use hubs that support 100Mbps or higher, and use direct cables. Gateway (internal network) must be set to <192.168.10.1>. And you should set up only one router for one network. The router used in MXK8000 is as follows.

10/100Mbps supporting router

(Recommended Model 1: Anygate RG5200R2)

(Recommended Model 2: EFM Networks iptime A604)

(Recommended Model 2: Bless Information Communication ZIO-2509N)

< Figure 6-1: Recommended Wired and Wireless Router, AP >

Types and choice of Hubs

Hubs must be used in conjunction with a router, and for each node to be connected in the network. LAN cable allows communication among several nodes. Hub has 2 types: Dummy hub and switch hub. In recent years, switch hubs are used mostly with little or no dummy hubs, and switch hubs are sold in the market. The dummy hub makes the communication speed to decrease as more lines are connected, and the switch hub ensures the communication speed even as more lines are connected. The hub for MXK8000 network configuration should support 100Mbps and switch hubs should be used to maintain 100Mbps speed. Also, as explained later in the manual, cross-LAN cables should be used to connect a hub and another hub and direct cables should be used to connect a panel and a hub. Even a switch hub that includes the function of Auto Uplink (automatically classifying Direct cable and Cross LAN cable for communication) may cause abnormal network communication if the direct LAN cable and cross LAN cable are not used separately. Thus, the hub used in the MXK8000 is as follows.

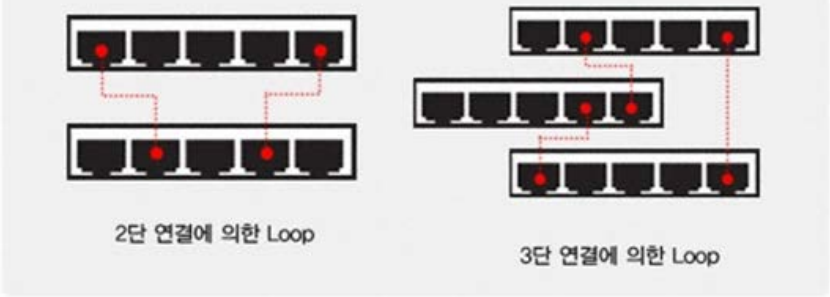
10/100Mbps supporting switch hub

(Recommended Model: 3COM Gigabit Switch 5(3CGSU05))

< Figure 6-2: Recommended HUB, HUB LED >

For connecting hubs and LAN cables, using more than one hub, you should pay attention not to make a closed loop as shown in the following image. When such a closed loop is made, the network is not only unable to communicate data normally, but also it can cause the panel to shut down due to the explosion of data.

※ *Be careful not to create a closed loop with multiple connections when connecting the panel to the hub.*



< Figure 6-3: Example of an invalid LAN cable connection with a closed loop>

Type and choice of LAN cables

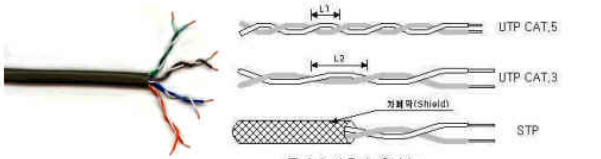
LAN Cable has 2 types : UTP Cable and STP Cable.

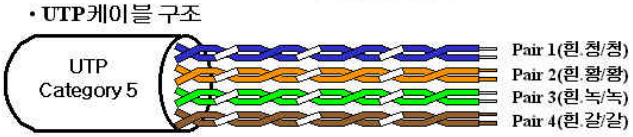
Since the shielded twisted pair (STP) cable is shielded for noise protection inside cable, it is used in special cases due to its good performance but high price.

A Cable (unshielded twisted pair) is a LAN Cable that is not shielded and that we commonly use.

The UTP Cable is classified according to the Category as shown below. CAT3 can be used up to 10Mbps and CAT5 can be up to 100Mbps..

Therefore, the cable to be used for the MXK8000 is the UTP CAT5 LAN Cable.





Type	Use
Category 1	Voice Only (Telephone Wire)
Category 2	Data to 4 Mbps (LocalTalk)
Category 3	Data to 10 Mbps (Ethernet)
Category 4	Data to 20 Mbps (16 Mbps Token Ring)
Category 5	Data to 100 Mbps (Fast Ethernet)

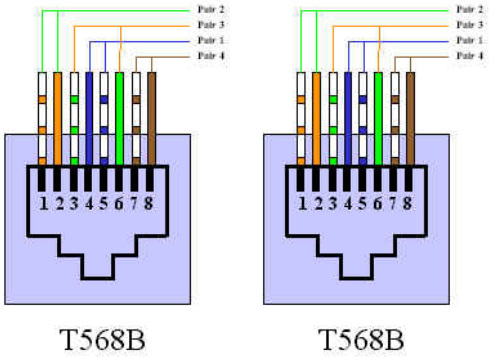
.

< Figure 6-4: UTP Cable Category >

Direct LAN Cable, Cross LAN Cable

LAN cables are divided into direct and cross cables depending on the connection process.

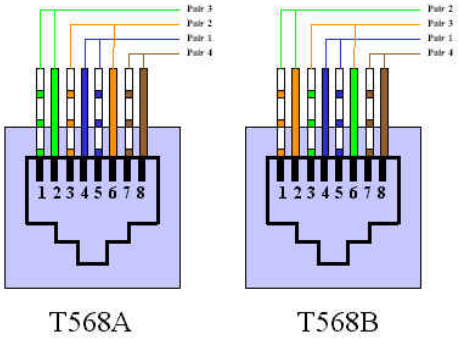
Direct cable: Both ends of the cable are connected in the same order from 1 to 8, as shown in the figure 6-5.



< Figure 6-5: Direct LAN Cable >

Example used in Panel-SFC800, Panel-Hub, W/S-SFC800 etc.

LAN Cable: It uses numbers 1, 2 and 3, 6 to communicate, and one end's number 1 and 2 are connected to 3 and 6 of the other end. One end of the cable is in the order 12345678 and the other end is in the order 36145278.

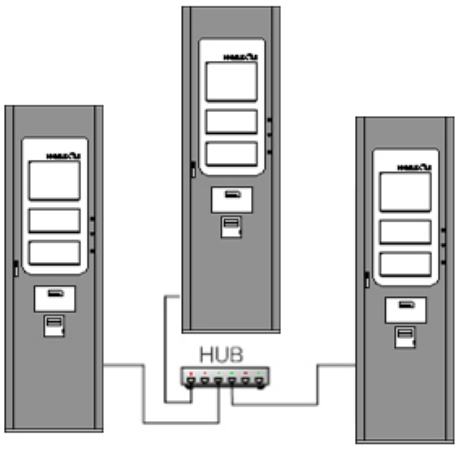


< Figure 6-6: Cross LAN Cable >

Example used in Panel-Panel, Panel-W/S, Hub-Hub, etc.

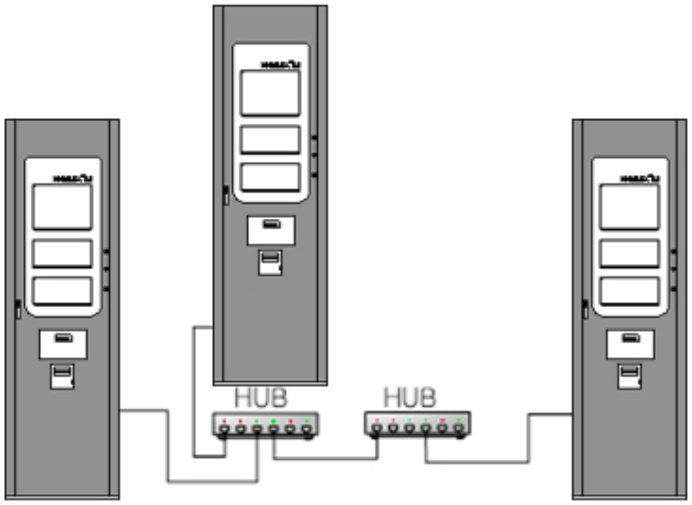
Connection Scheme

When configuring the panel network using LAN Cable and Hub, connect the panel directly to the hub as shown below. Figure 6-6 below shows three panels are connected directly to one hub. If all the panels are in a close distance to each other, you can use one hub to connect them all.



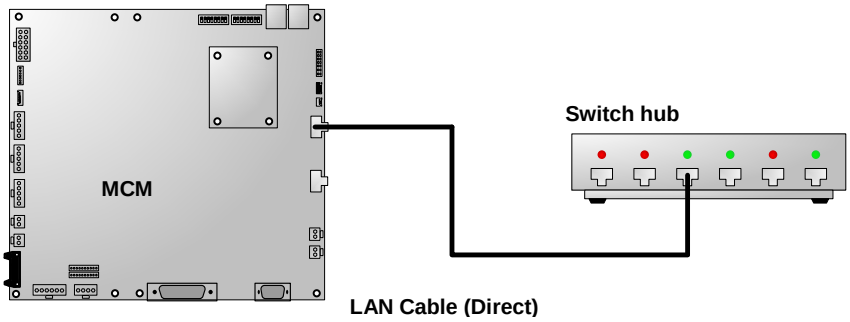
< Figure 6-7: Three panels connected to one hub. >

In a difficult situation to connect all systems to a single hub, additional hubs can be added to connect. <Figure 6-7> is a connection of three panels with two hubs. Connect a hub to another hub using LAN cable and connect panels to each hub.



< Figure 6-8: 3 panels connected to 2 hubs >

When connecting the panel to the hub, the connection port is on the MCM_Main Board inside the panel.



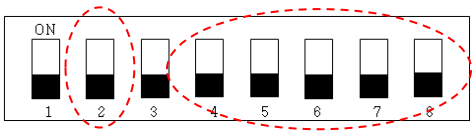
<Figure 6-9: Connection of MCM Module and Hub >

As described in the previous section, hubs should be switch hubs, and LAN cables should be UTP CAT5. 'Direct LAN cable' should be used to connect the panel to the hub, and 'Cross LAN cable' should be used to connect a hub to a hub or connect a panel to a panel directly, as shown in <Figure 6-7>.

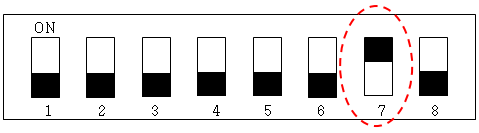
Dip S/W Setting

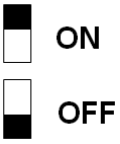
When all connections are completed, the Dip S/W shall be set up. Switches 4 to 8 of SW1 can be set for a panel's number. For more information, refer to the dip switch setup of the panel settings in the previous section. For ethernet networks, SW1-2 should be "OFF" and SW2-7 should be set to "ON" for functions.

SW1



SW2





Important!

Use a switch hub. Also, use the LAN cables separately, even if it is a model supporting Auto Uplink. Please check the Dip Switch settings of the MCM module after installing the panel. Incorrect Dip S/W settings will prevent network communication.

✓ Network connection using optical cable

If the distance is more than 100 m, the network connection between panels shall be made using optical cables.

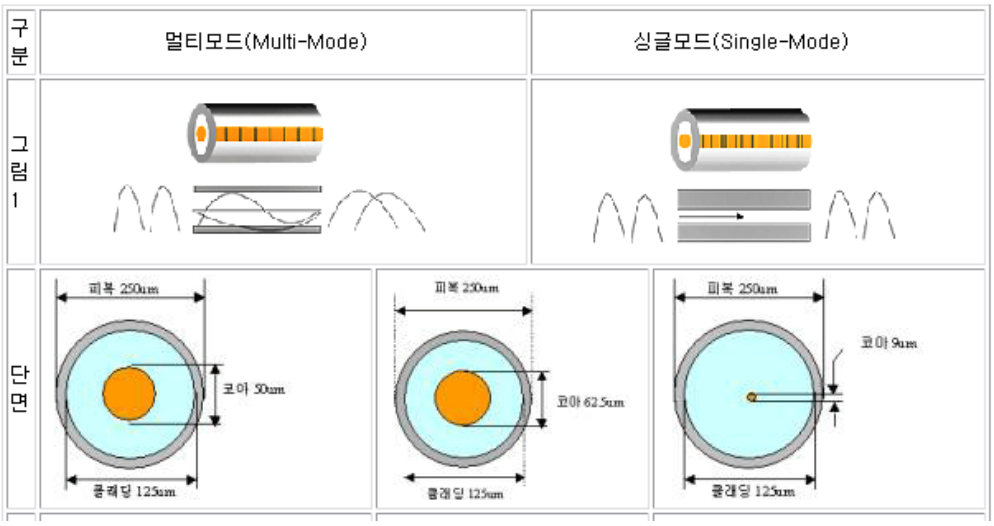
In order to connect them using the optical cable, the optical cable pulling must be made first.

The pulling optical cables shall be terminated in the Fiber Distribution Frame (FDF) by optical cable specialists.

Types and choice of Optical Cables

Optical cables are divided into two main types, Single-Mode Cable and Multi-Mode Cable. The light passing part of the optical cable is called Core and cables are classified to Single-Mode and Multi-Mode depending on the diameter of the core. The Single-Mode cable is a cable with a small core diameter of 9um, which increases light ray path distance, which can reach longer distances. It can communicate up to 25 kilometers.

Multi-mode Cable has two cores with diameters of 50um and 62.5um. In both cables, the core diameters are wider than that of Single-Mode optical cable, so that when the light is transmitted, the light loss is higher due to the irregular reflection, with the light ray not reaching far. Maximum communication distance can be up to 2 kilometers.



< Figure 6-10: Classification of single mode & multi-mode optical cables >

Optical cables used in MXK8000 networks shall be single-mode one.

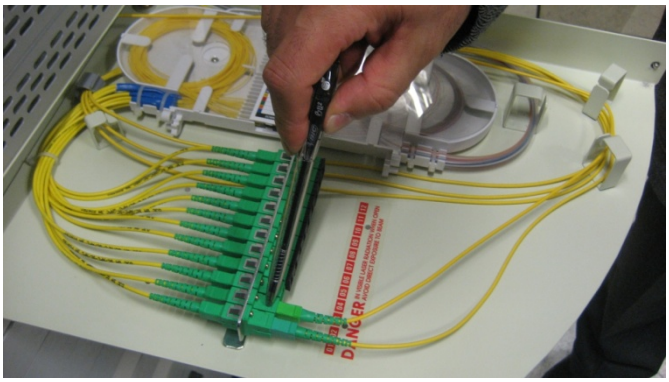
The SFC800 (Optical Converter) module is designed for single-mode optical cables. Therefore, all optical cables, such as optical cables for pulling and optical jumper cords, should be single-mode one.

Optical fiber cable pulling

Optical cables for pulling shall be single-mode optical cables. Cables can be placed according to the conditions of the site. Optical cables for pulling usually come from 4-core to 8-core to 12-core, with increasing cable diameter and core counts. The smaller the number of core, the lower the price. So it is safe to use 4-core cables unless it is a special case. For more information on the optical fiber cable pulling, please contact the optical cable companies.

FDF (Fiber Distribution Frame)

On completion of the optical cable pulling, the optical cables should be terminated to Fiber Distribution Frame (FDF), which requires optical cable specialists. The optical cable specialized company shall terminate all the optical cables pulled as many as the number of cores for optical connection and termination process so that they can be used as a spare port in the future, although they are not currently used.



< Figure 6-11: FDF BOX>

SFC800 (Optical Converter)

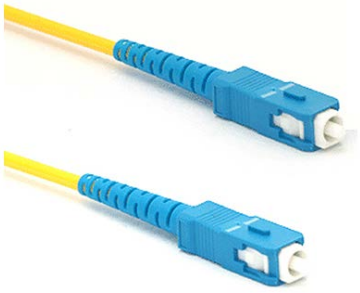
MXK8000 network systems support Ethernet-based communication by default. Optical cables should be used to connect networked panels that are far away from each other. Otherwise, LAN cable can be used to connect panels.

Electrical signals that are transmitted to the LAN Cable are converted into light signals by SFC800. It also includes monitoring the connection status of the optical cable.

< Figure 6-12: SFC800 Equipment > The voltage used is DC 5V and 5V output adapter for AC220V is included.

Optical Jumper cord

Optical jumper cord is an optical cable that is connected from FDF Box to SFC800. It should be a single-mode cable. Connector type is SC type that is connected to SFC800, and the other side is connected to FDF, and it also should be SC-type to work with optical jumper cord and FDF.



< Figure 6-13: Optical Jumper Cord (Optical Patch Cord) >

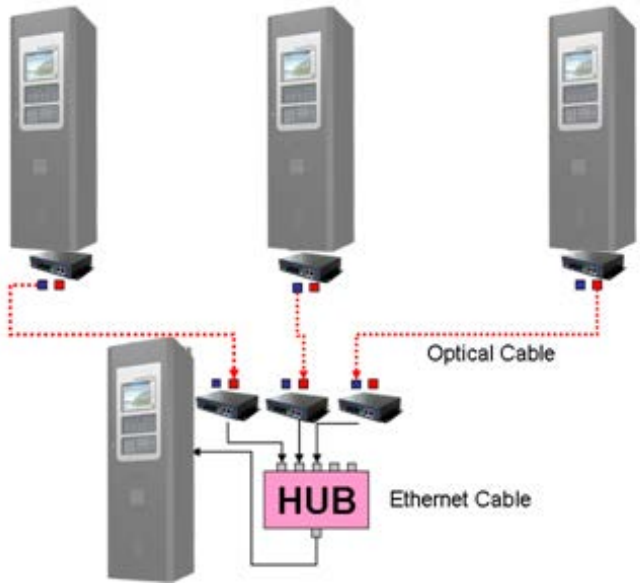
: SM SP SC/PC – SC/PC Cable Use

→ Single mode(SM), Simplex(1C), (PVC/PVC)

Connection scheme

When two panels are connected using optical cables, they are as follows. The panel is connected to the SFC800 using a direct LAN cable. The SFC800 has eight LAN ports, and it doesn't matter to use any of them. It shall then be connected to the FDF box using the optical jumper cords at SFC800. The SFC800 has two terminals for connecting the optical jumper cords. Two panels should not be connected any of the two terminals, and the two panels should be connected alternately to terminals. If a user want to connect Panel 1 and Panel 2 each other, when one of optical terminals on SFC800 is connected to FX2 (Tx or Rx) of panel 1, panel 2 should use the left side terminal, FX1(Tx or Rx) to be connected to its SFC800. They all use the SC type optical jumper cords.

When connecting multiple panels, the same is used. Below <Figure 6-13> shows four panels connected using a Star topology method, using optical cables.



< Figure 6-14: 4 Panel Optical Network Connections (Stat) >

When connected as shown in the figure, one panel has three SFC800s and connects them to the panel through a HUB. The connections from each SFC800 to SFC800 shall be made by means of a Single-Mode optical cable, and from the left side terminal (FX1) to the right (FX2) or from the right (FX2) to the left (FX1).
However, this type of Star topology is not always the answer, and depending on the site, the connection method can be different.

The following illustration shows only two SFC800s. It is also possible to connect the two SFC800s using LAN cable without a hub.

< Figure 6-15: 4 Panels, Optical Network Connections >

By default, however, the panel's network configuration will most often be made as shown in <Figure 6-15>.

< Figure 6-16: 3 Panels, optical network connections (Bus) >

Each panel has one SFC800 and is connected to the panel by LAN Cable. Each SFC800 is connected from the right terminal (FX2) to the left (FX1).

Dip S/W Setting

The Dip S/W setup is the same as how the network is configured using the hub and LAN cable.

✓ Back Loop Connection

What is the Back Loop function?

Fire detection systems are important systems that are directly related to life. Therefore, it is sometimes necessary to construct redundant communication lines because the system cannot function properly due to communication line failures

In the failure of a communication line, the system switches to use the redundant communication line, which is called Back Loop function.

The MXK8000 system supports the Back Loop.

Connection scheme

To implement the Back Loop, connect the network using Ring topology using optical cables. The panel is connected to a SFC800 by a direct LAN cable, and each SFC800 is connected by a optical cable from the right (FX2) to the left (FX1).

1. Caution of jamming in optical cable ring connection

   If the optical cable is connected by the ring without setting master or slave of SFC800, the panel LAN can be down due to jam, so the master and slave settings must be performed before the ring connection (Except one of the optical cables of SFC800 that is to be a master, first finish all settings and then the one optical cable should be connected).

2. Protect against IP address duplication

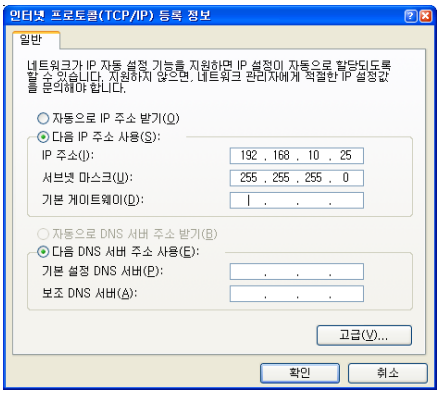
   Since SFC800 has its all of default IPs set to be the same (192.168.10.100), all IPs must be changed on site from 192.168.10.150 to 192.168.10.199 and any IP changes must be made after the removal of the optical cable connected to the SFC800 to ensure that the changes should not affect the other SFC800s.

10. Network Inspection

✓ Ping Test

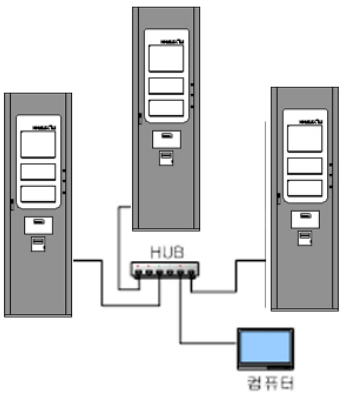
When the network configuration and setup are completed, ping test should be conducted to ensure that there are no problems with the network lines and settings. Ping is a window command that allows you to check the connection status of the LAN cable. First, set your laptop IP and net mask to the same area as the panel.

IP: 192.168.10.25 Subnet Mask: 255.255.255.0



<Figure 7-1: Ping Laptop IP Settings for Testing>

IP is not necessarily number 25, but it should not be duplicated with that of panel and workstation. For the sites where W/S is installed, it is okay to ping from the workstation without connecting the laptop separately. The workstation will have its IP set already, so there is no need to reset the IP. The following picture shows connecting a laptop to a spare port of SFC800 or HUB on a MXK8000 network using a direct LAN cable.

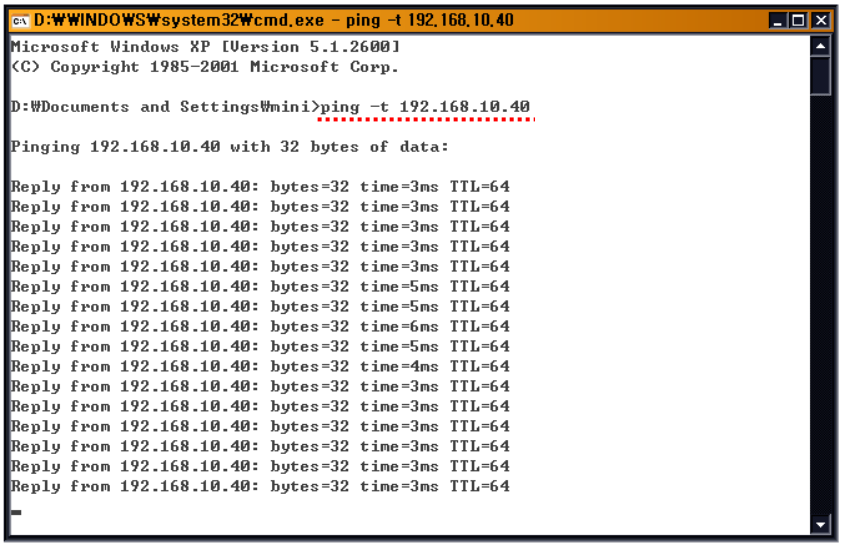


< Figure 7-2: Connecting a computer to a network for ping test>

Click "Run" on the Start menu of the window.

Enter "cmd" to go to the command prompt.

Window : Start → Run → "cmd"



< Figure 7-3: cmd command>

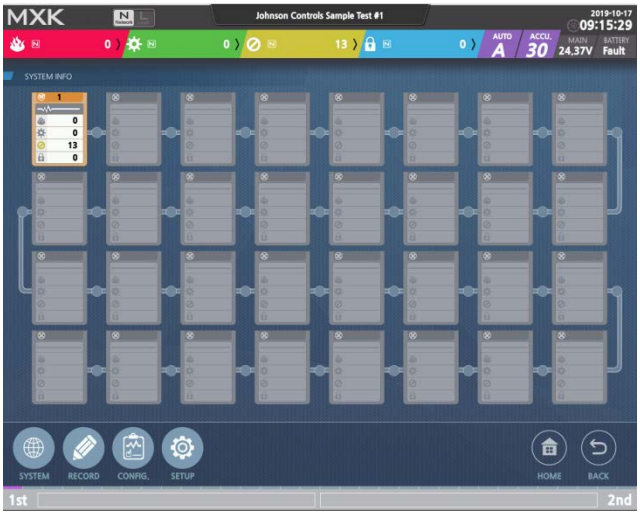
Ping the IP of a panel or workstation you want to check in the Command Prompt window to verify that the network is OK.

"Ping –t [IP to check]" in the command window

As shown in <Figure 7-5>, the network line is in a normal state. If the line is not good, an unusual message will appear. If you ping all the panels and workstation to be verified at once with all windows open, the test shall be kept for at least three minutes to ensure that no errors are detected.

✓ Link Check of the panel

If the ping test confirms that the network line is normal, the network communication should be checked. When communication occurs normally, the number of events is shared on the network. So we can see that the number of events increases equally on the network. You can also go to the Panel's Status View screen to check if each panel's data is transferred.



< Figure 7-6: Panel Network Check>

However, a more accurate method to confirm the link is to press the main sound keys of panels. Pressing the main sound key leaves a message about the key action on the active list of the panel. Since the message of main sound' key is recorded on all the connected panels respectively, it is possible to check which panels are connected to the network.

11. Q&A

The product does not turn on.

1. Ensure that the AC power is normally applied to the panel.
2. Ensure that the AC power is set to 110V/ 220V (field-specific).
3. Make sure that the power is normally applied to MCM_Main Board.
   You can check it with a tester using TP8-11 in the upper left corner of the MCM Main. The operating voltages are 24 V, 5 V, and 3.3 V. Normal range must be within +-5%.

The front key LEDs are operating, but the screen does not turn on.

1. Check Back light.
   Back light is located at the rear and the bottom of the TFT_LCD panel, which appears to be inside the MCM_Main Board. If the Back light does not illuminate, the screen is blacked out even when the panel is operating.
2. Check if the mains power supply (24V) is normal.
   The reason that the back light does not turn on is that the 24V power is not applied or the 12V jumper is missing out, and the back light module will not turn on if it is defective.
3. Check the operation LED of the MCM_CPU
   If the 3 LEDs on the MCM_CPU are flashing continuously, the MCM Module becomes defective. Please replace the module.

There is no network communication on the product?

1. Check the LEDs on the LAN Port and SFC800 terminal of the MCM_Main Board and hub. Each port has two LEDs, yellow and green. The yellow LED will illuminate if the LAN cable is connected well to the hub or SFC800 or RCM network module. In addition, the green LED flashes at regular intervals when data is transferred between panels. (However, the hub is sometimes represented by one LED. If this single LED turns on, it means the LAN cable is connected well. And if it flashes, it means the data is transferred well.) If the yellow LED does not turn on or the green LED does not flash, the LAN cable is in a bad condition or the LAN cable is in a poor connection. Change the cable or optical jumper cord. If the symptoms are the same, suspect the device is defective.

2. If the LED on each port is normal but there is no communication, the panel's IP may be set incorrectly. Make sure that the DIP S/W is set well for the panel number. IP

verification of the panel is possible on the system inspection screen. Also, check that dip switched of SW1-2, SW2-7 are set in the field for the network configuration. Procedure for setting DIP S/W is detailed in chapter 3 " Panel Setting" or chapter 6 "DIP SW Setting" .

3. If the DIP SW setting is correct but communication is not successful, there may be a problem with the map that sets up the IP. Please, verify that all IPs for the panel number are present and testable by the ping test. (Refer to Chapter 7 Ping Test) The panel's IP number increases sequentially from "192.168.10.40" to "192.168.10.71" unless it is special. (Example: 192.168.10.44 is set for Panel 5) If there is a panel that cannot be verified in the ping test and the LAN Port LED of the panel is confirmed normal, please ask Product Technical Team to re-download the IP-related map to the panel since there may be an error in the map.

Other panels on the network are not visible from the panel's status view.

1. If none of panels are visible in the panel's status view menu, please reset the map and download it to the panel as this may be caused by the incorrect map.

The link map does not trigger outputs.

1. Is the equipment stop key not working? Release the equipment stop key.
2. Use the panel's Map view to verify that In/Output connections are normal. The panel has a function to check the In/Output link map. Go to the main menu → Matrix map view or Logic map view.
3. If you have a map in place, but the link doesn't work, you should suspect that the In/Output module has defects. Remove the loop line connected to the In/Output module, and connect the I/O module directly to the panel. Then test it. If output is normal, there is a possibility of I/O module failure.

You cannot download the map.

1. The progress bar of downloading the map is not shown. The progress bar does not appear when you download a single file. The download is normal, so feel safe.
2. Does the progress bar seem to have failed or stopped? The map you are trying to download contains two high-capacity files of 512 Mbytes. When downloading these files, the progress bar seems to freeze. Please wait up to 5 minutes.