MXK500W

벽부형_설치 메뉴얼

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1.General Speicifcation

Main power supply

A.C.	AC 220V/50~60Hz
D.C.	27V/7A, 5V/3A(Default)

Battery

Capacity	24V/7Ah (연축전지)

GUI Specification

Size	17 inch TFT LCD Panel
Resolution	1280×1024

Touch Panel

Size	17 inch

Housing type

Basic Standalone	W530×D190×H750(mm)

회로수용 능력

Node	Panel 32s (+ W/S 32s)
Transponder	32s per panel
Loop	2 Loops per Loop card
I/Os	250 I/Os per Loop
Circuit	Up to 4 Points per I/O
Maximum number of circuits	32 Panels × 32 Transponders × 4 Loops × 250 Addresses × 4 Points = 4,096,000 circuits
Minimum number of circuits	250 addresses × 4 points ×2 Loops ×1 Transponder = 2000 circuits

Key & LED (OCSM)

System Control Key	5
Equipment Control Programmable Key	16
System LED	15
Equipment Status Programmable LED	16

Configuration tool (U-Consys tool) All configurations can be programmed with this tool.

Emergency acknowledge by protocol RS-485 communication port is used for external emergency broadcasting.

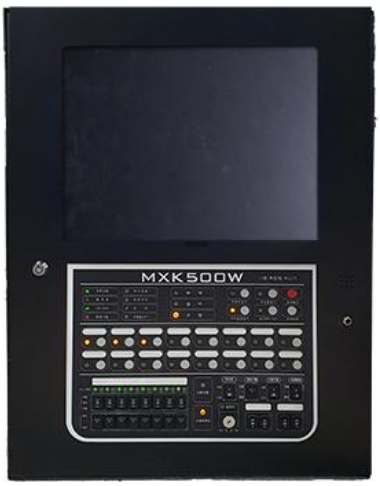
Workstation port (supporting Ethernet port) 32 Workstations can be connected.

Communication port

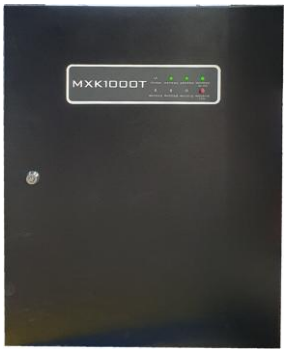
No	Method	Purpose
1	Ethernet	LAN1(J2): SFC800, Hub Workstation
2	RS-485	Port1(CON12): Loop Communication FCP Normal/Back Communication, Emergency Broadcasting
3	USB	USBPort1~4(CON2A~D): Mp download/upload, Firmware Upgrade

Call points & Telephone response

2. Production Configuration



MXK500W Panel



Transponder

I/O module

ROH(Optical converter)

RCM(Back Loop Configurator)

Switch hub (separate purchase)

LAN Cable(Separate Purchase)

Optical Jumper cord (Separate Purchase)

Optical cables for pulling (Separate Purchase)

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

3. Panel Installation

MXK500 System is shipped to the site after completing all basic tests. You can begin using the system after configuring and customizing the keys, Input/Output map, and network according to the CPU functions and site-specific requirements.

All settings should be configured in consultation with **Johnson Controls International Korea's Product Technical Team**, taking into account site conditions and the preferences of the site manager.

✓ Panel Location

Panels are delivered in protective packing boxes and vinyl.

After transporting the panel to the desired installation location (eg. Fire control room, security room, or other control rooms), remove the packaging.

Installation environment maintain a temperature of 0℃ to 40℃ and humidity levels of 85% or less. If the site is heavily contaminated with dust or other debris due to ongoing construction, keep the packaging intact. After ensuring the area is clean through air ventilation, remove the packaging.

While there are no specific restrictions for the management room location, choose a place that is convenient for the administrator to manage the panel. Note: The panel must connect to transponders and I/O modules via external wires, the place should allow easy wiring connections.

✓ Power Supply

Caution Before Supplying Power

Before supplying power to the product, perform a visual inspection. Long-hours of shipping and subsequent vibrations may cause components to loosen. Applying power to an improperly assembled product may result in physical damage.

Before turning on the product, check all connectors and connections to ensure they are secure and undamaged. If any connectors are missing or damaged, **do not connect** the AC power. Instead, contact the A/S center for assistance.

Note: The MXK500W operates on **220V power**.

Connecting Power Lines

Ensure the power supply is turned off before connecting the power line to the panel. Working on a power supply poses a serious risk to life and can cause product damage. The AC power line on-site should be connected to the AC terminal through the designated routing path located below the panel enclosure

Note: Open the door and inspect the AC terminal located below, behind the panel.

Panel Status Check

Once the AC power line is connected, turn on the main power switch on the panel. Then, perform the following checks:

- Verify that the **Power LED** on the front panel is illuminated normally.
- Ensure the **CPU RUN LED** is flashing as expected.
- Confirm that the panel screen is booting properly

Under normal conditions, the screen will display the default image configured during product shipment.

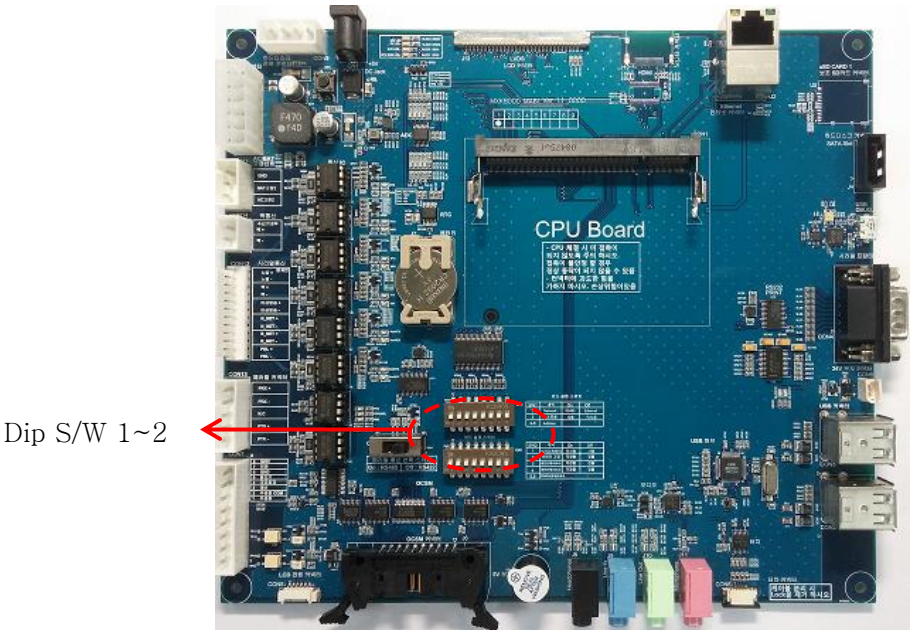
During manufacturing, an Input/Output (I/O) map is used for testing purposes. If the I/O modules are disconnected, the panel may display multiple errors.

✓ Panel Settings

DIP Switches

Once the panel has been installed, it must be configured for the site.

Begin by setting the **DIP switch** on the panel. The panel is equipped with two DIP switches.



< 그림 3-1>

SW1

Pin Number	Description	ON	OFF
1	Debug	Used	Unused
2	ECSB Mode Selection	MXK500	MXK8000
3	Battery	Use	Unused
4 ~ 8	Panel address	Refer to the next page	

< Table 3-1> #1 DIP Switch

SW2

Pin Number	Description	ON	OFF
1	Real-time printer	Unused	Used
2	Printer Trouble Detection	Undetected	Detected
3	Open Circuit Detection(ch1)	Undetected	Detected
4	Open Circuit Detection (ch2)	Undetected	Detected

5, 6	Panel Activities	Refer to < Table 3-3 >	
7	Ethernet Network	Used	Unused
8	Reserved		

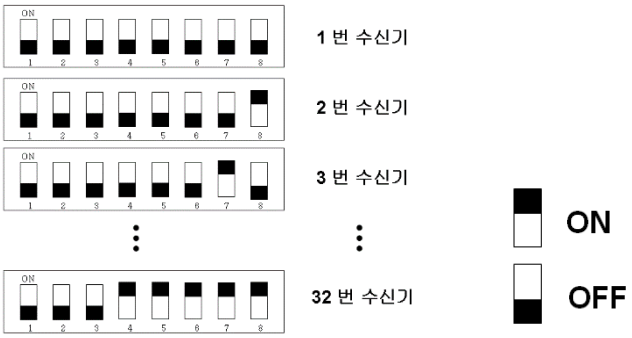
< Table 3-2># 2 DIP Switch Setting

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> Activity Settings (2 DIP Switches 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



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Map Settings

All setup files required for panel configuration—such as input/output maps, panel equipment keys and LEDs, and network IP settings—are managed by the **Johnson Controls International Korea Product Technology Team**.

You can request customized map files for each site from the Product Technology Team. Before requesting a map file, discuss with your manager how the system will be operated in the field, including Network links, Location of keys, and Full system overview.

After receiving the map file from the Product Technology Team, you can download it to the panel.

For detailed instructions on downloading and uploading maps, refer to the article titled 4. **"Map Download & Upload"**

4. Map Download & Upload

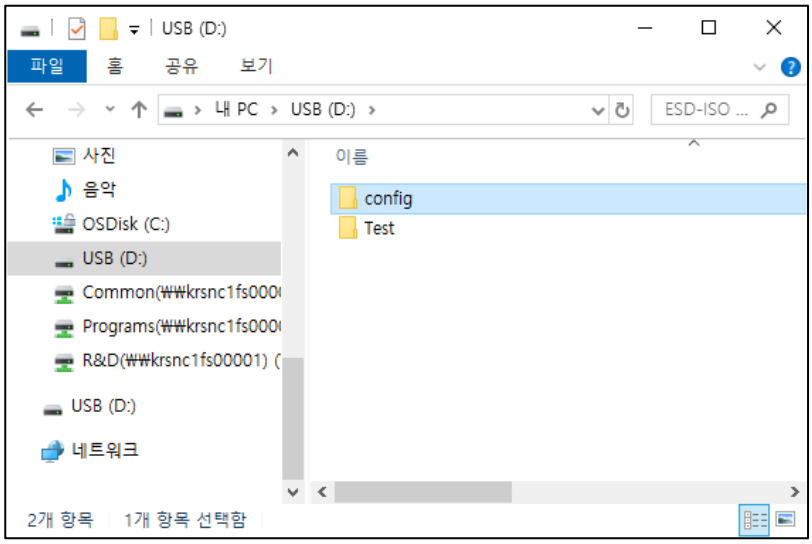
✓ Types of map files

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
fcp_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
mxkecsb-data	Setting the switch name of FIM module
home_pic.png	The image on Home screen

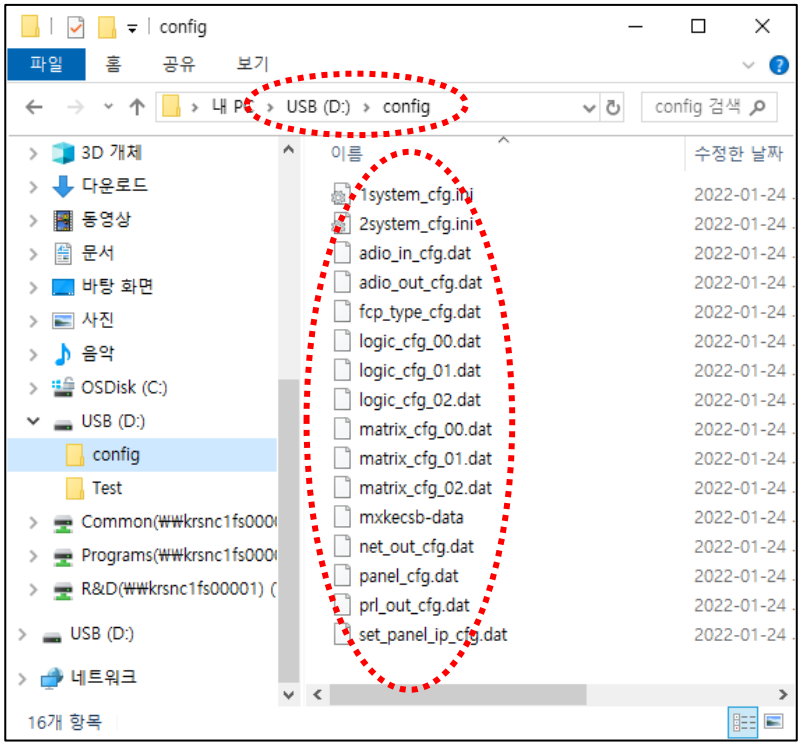
✓ Map Download & Upload

Use a USB portable disk to download the map to the panel.

Create a folder named **"config"** on the USB disk.

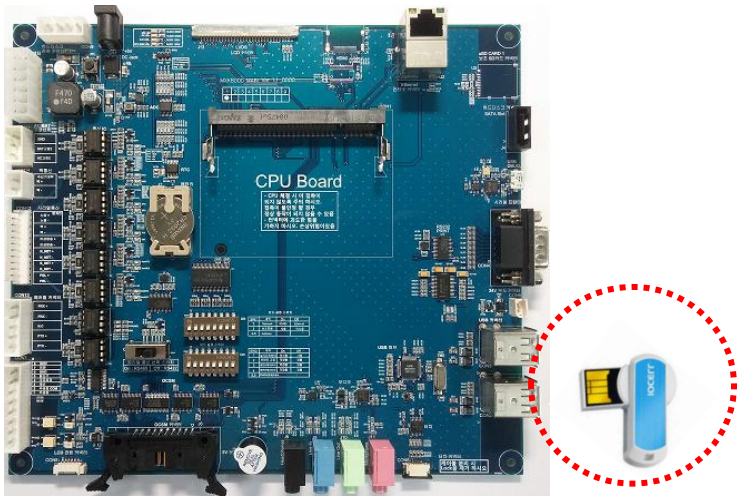


Place the desired map file(s) into the **"config"** folder.



You can choose to include specific files or all available maps.

Insert the USB disk into the USB port on the **MCM module** of the panel. Any of the four USB ports on the module can be used for this purpose.



Downloading a Map via the Panel Screen

On the panel screen, navigate to:

HOME -> Setup -> I/O Program Map Data

A progress bar will appear during the download process and when the progress bar reaches **100%** and disappears, the download is complete.

After the download is complete, reboot the panel to ensure the map is properly applied to the system before use.

Uploading a Map from the Panel

Empty the contents of the **'usb:/config'** folder on the USB disk and insert the USB into

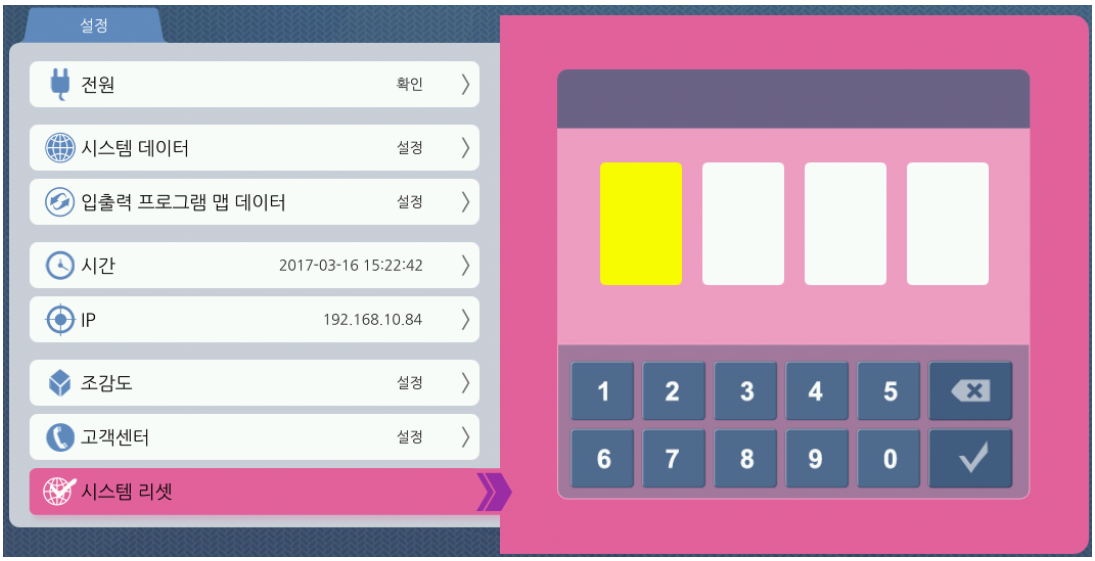
the panel's USB port.

Click the **Data Upload** button on the panel screen to begin the upload process.

✓ System Reset (Reboot and shutdown)

To update the firmware due to a system error or to reboot the system after downloading a map, you must safely shut down the system before proceeding.

Navigate to: **HOME > Setup -> System Reset**.



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

* To shut down the system: Select **Shut-down and t**urn off the power within **5 seconds** of initiating the shut-down. (**Safety Shut-down**)

Do **not** forcefully cut off the power supply to the **MCM board** while the system is in operation. Doing so may cause serious system damage.

Always use the **System Reset** function before turning off the power supply.

In unavoidable situations (e.g., screen freezes, touch screen malfunctions), you may need to forcibly turn off the power.

5. Firmware Upgrade

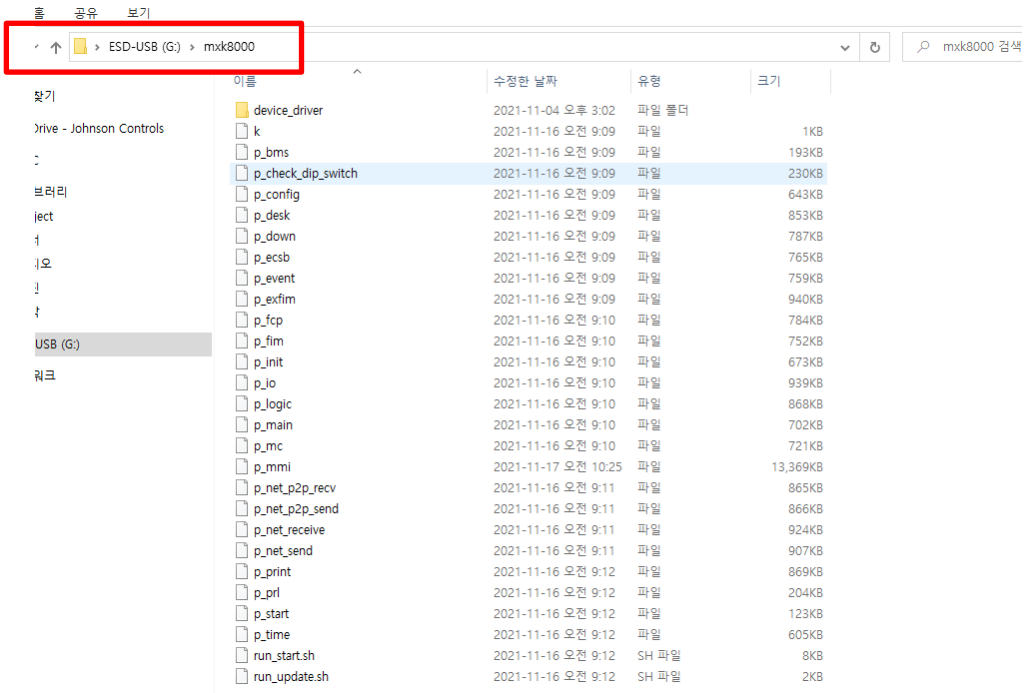
✓ Program Type

Firmware type	Function
p_bms, p_check_dip_switch, p_config, p_desk, p_down, p_ecsb, p_event, p_exfim, p_fcp, p_fim, p_init, p_io, p_logic, p_main, p_mc, p_mmi, p_net_p2p_recv, p_net_p2p_send, p_net_receive, p_net_send, p_print, p_prl, p_start, p_time, run_start.sh, run_update.sh, k	Panel Application The operation programs of the panel. Applications of Event process, In/Output links, screen process, communication, record processing, printing process, etc
mxk1000_ocsm_keypad.ko, mxk8000_ocsm_keypad.ko, dev_mxk_etc.ko	Device drivers to operate hardware (MCM_CPU, MCM_MAIN) of the panel

✓ How to upgrade the firmware

Use a USB portable disk to upgrade the panel firmware.

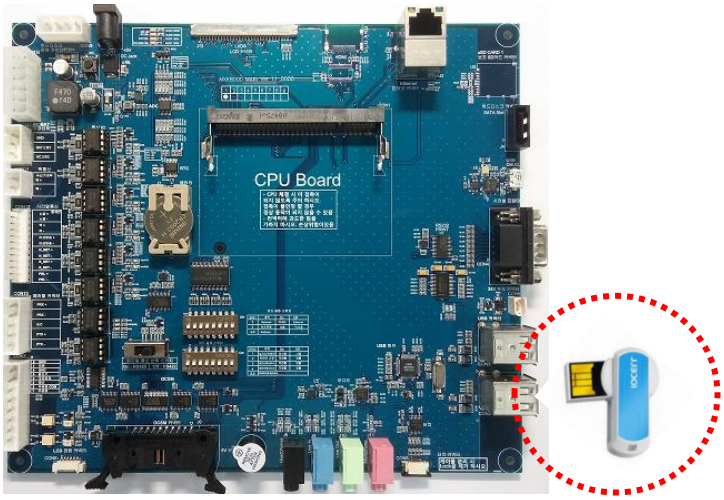
Create an **"mxk8000"** folder on the USB disk.



Copy the upgraded firmware program files into the **"mxk8000"** folder.

(*.ko file should be into device_driver" folder created in "mxk8000". Even when the file is not provided, it's O.K.)

Insert the USB disk into any of the four USB ports on the **MCM module** of the panel.



Reboot the panel with the USB disk containing the firmware plugged in. The panel will automatically upgrade to the new firmware.

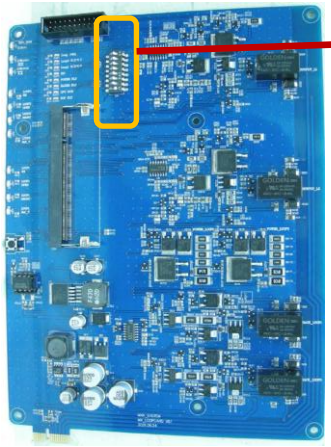
Note: Applying the new firmware will take additional time during the boot process, so please wait patiently.

Once booting is complete, check whether the new firmware has been applied:

Navigate to: **HOME -> Setup -> System Data**

6. Loopcard Setup and Verification

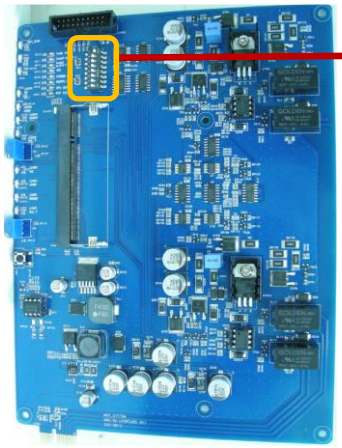
✓ MXK-MX Loop Dip switch settings



Pin No.	Description	ON	OFF
1~6	Transponder Address Number	1~64	
7	850EMT Tool Remote Mode	Used	Unused
8	Mode Selection	Install	NORMAL

※ During system installation, **Fast Mode** is utilized for faster troubleshooting processes. Once installation is complete, switch the system to **Normal Mode** for regular operation.

✓ MXK-NU Loop Dip switch settings



Pin No.	Description	ON	OFF
1~6	Transponder Address Number	1~64	
7	Protocol Setting	HI-MUX	N-MUX
8	Mode Selection	Normal	Install

※ During system installation, **Fast Mode** is utilized for faster troubleshooting processes. Once installation is complete, switch the system to **Normal Mode** for regular operation.

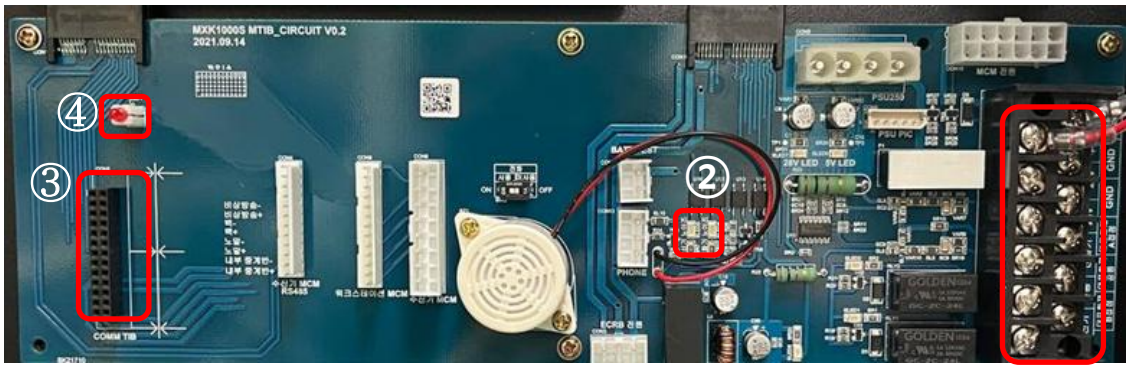
✓ Checking and Adjusting the Level of Transponder LEDs

Description	ON	OFF
CPU_RUN	Flashes at a 1-second cycle under normal conditions	
RX	Flashes in response to normal operation	
TX	Flashes upon receipt of data	
LOOP0 RX	Flashes when an I/O module is connected to LOOP 0	
LOOP0 OPEN	I/O module is not connected	I/O module is connected
LOOP0 SHORT	Loop Short	Normal
LOOP0 REF_V	Reserved	Reserved
LOOP0 variable resistor	Reserved	
LOOP1 RX	Flashes when an I/O module is connected to LOOP 1	
LOOP1 OPEN	I/O module is not connected	I/O module is not connected
LOOP1 SHORT	Loop Short	Loop Short
LOOP1 REF_V	Reserved	Reserved
LOOP1 variable resistance	Reserved	
RESET	Press on rebooting	

7. External Wiring – Transponder, Loops, Callpoints, Phones

✓ MTIB (MTIB Circuit, Comm TIB)

✓ MTIB Circuit Board



The circuit board functions as a terminal board, connecting external and internal wires and performing some simple functions. You can check each component based on the numbered labels as follows:

1. Con1

- Power Supply Function : 27V 1A(Fuse 1A)

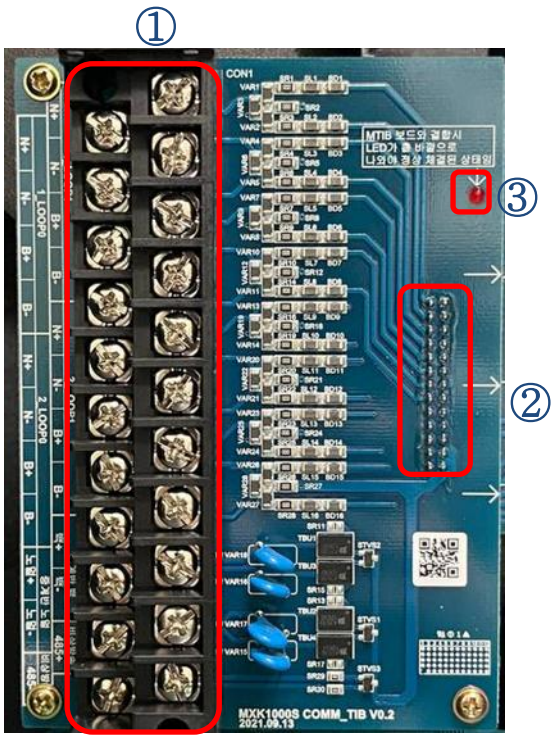
- Main alarm, Fire Signal (Dry contact), Call point and Telephone

(Pay special attention to sharing wires of Call point, and telephone)

2. LEDs to indicate abnormal call points and phones : corresponding LED lights on

3. A connector for Comm TIB

4. Connection Status LEDs for Comm TIB



1. Con1

- Connecting Terminal for Loop Normal & Back

- External transponder's Normal & Back

- Emergency broadcasting (RS485)

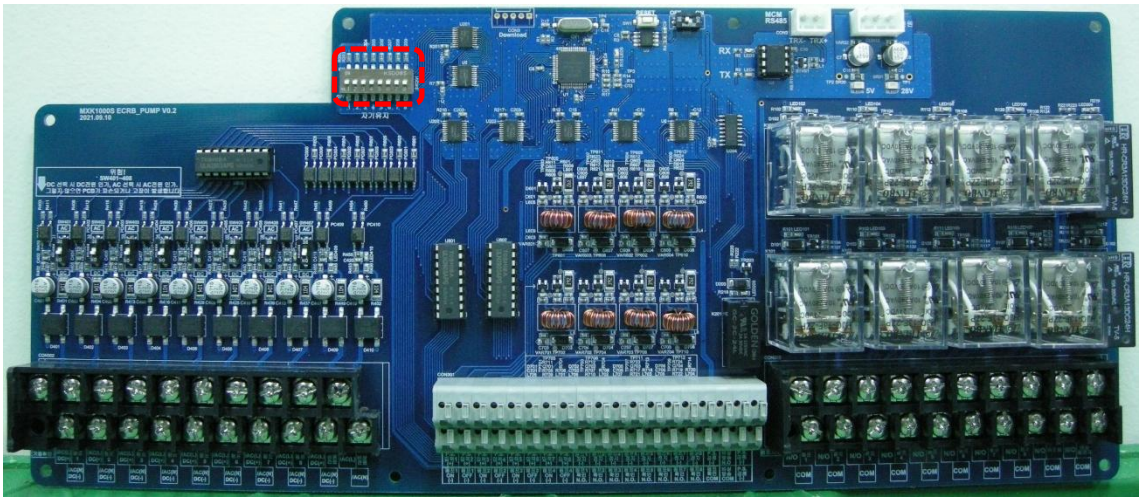
2. MTIB connecting connector

3. Connection Status LED for MTIB (The MTIB's LED must be protruding).

8. ECSB

1. Dip Switch

1.1. Location



1.2. Function Description

Location	Part	Function
①	SW201	Latched Mode - setting dip switch

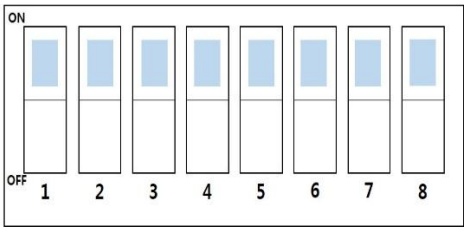
1.3. 설정방법

①SW201: Latched-mode Setting Switch

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

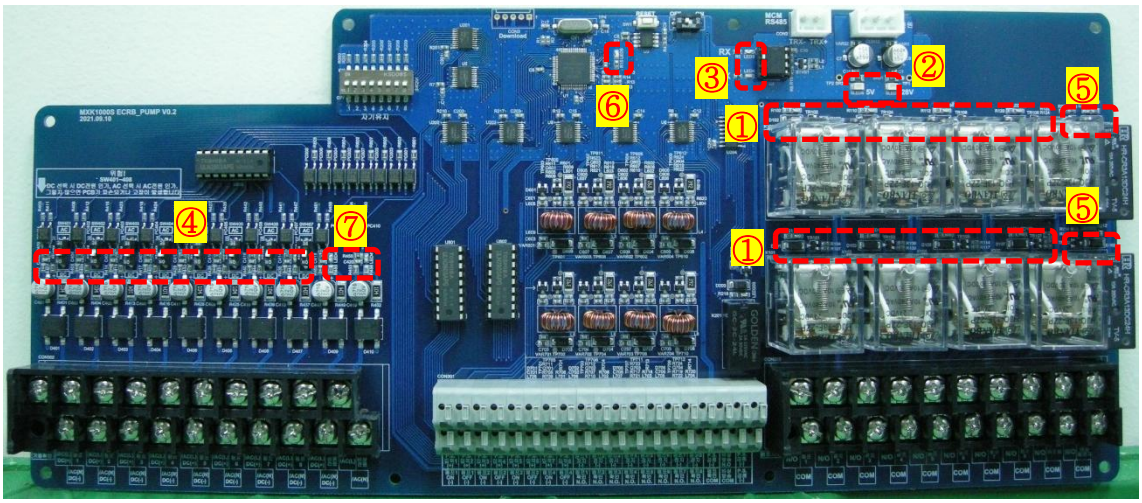
Example) **The switch must be "on" in order to set to latched mode.**

- 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

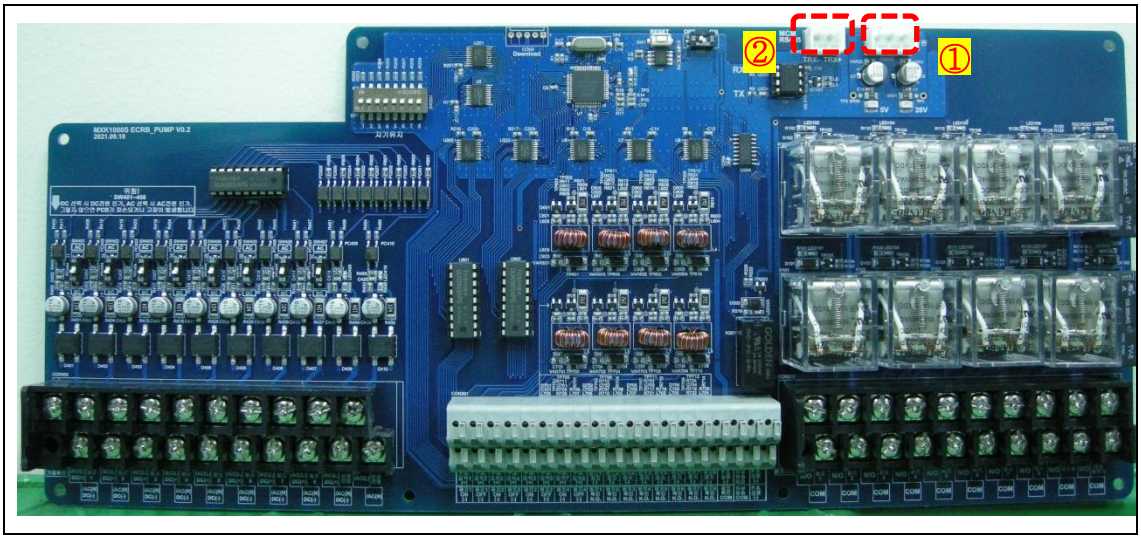


2.2. Function Description

Location	Part	Color	Function
①	LED101~108	Red	LED is on : Relay operation is normal
②	SLED5	Green	LED is on : Power (5 VDC) input is normal
	SLED6	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: Emergency generator is normal
	LED202	Red	LED is on: Exit sign shows a normal operation
⑥	LED5	Green	LED is on: Error in address setting
			LED flashes (0.25- sec cycle) : Communication is lost
			LED flashes (1-sec cycle): CPU is normal
⑦	LED409	Red	LED is on : Commercial power is input
	LED410	Red	LED is on : Commercial power is input

3. Connector

3.1. Location

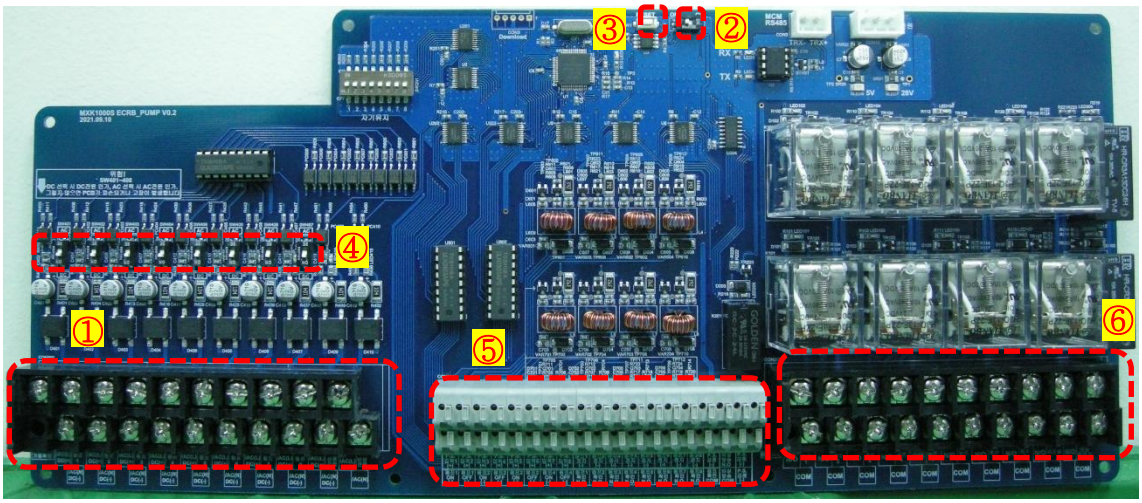


3.2. Function Description

Location	Part	Function
①	Con13	Power Connector
②	Con2	Communication Connector

4. Others

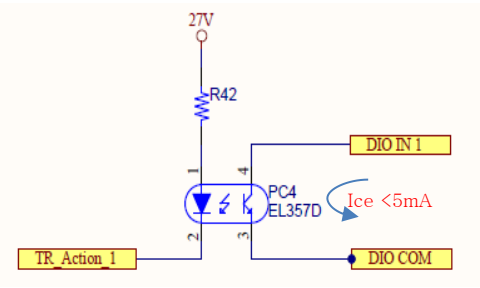
4.1. Location



4.2. Function Description

Location	Part	Function
①	Con302	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:27VDC, OFF : 220VAC) DC AC ※ Do not change it when the power supply is input. ※ Do not apply power other than the designed power
⑤	CON301	Pump level signal (PS) input, pump reset/ON/OFF input/output, DIO input, emergency power input/output connector
⑥	CON303	Signal input connector of Pump activation acknowledgement, main power/ emergency power acknowledgement

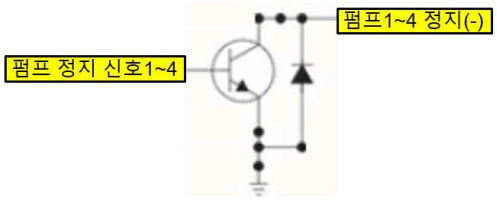
* Pump activation acknowledgement circuit (Pump1 ~ 4 ack.)



Pump1 N.O ~ Pump 4 N.O terminals are designed to have 5mA and less flow

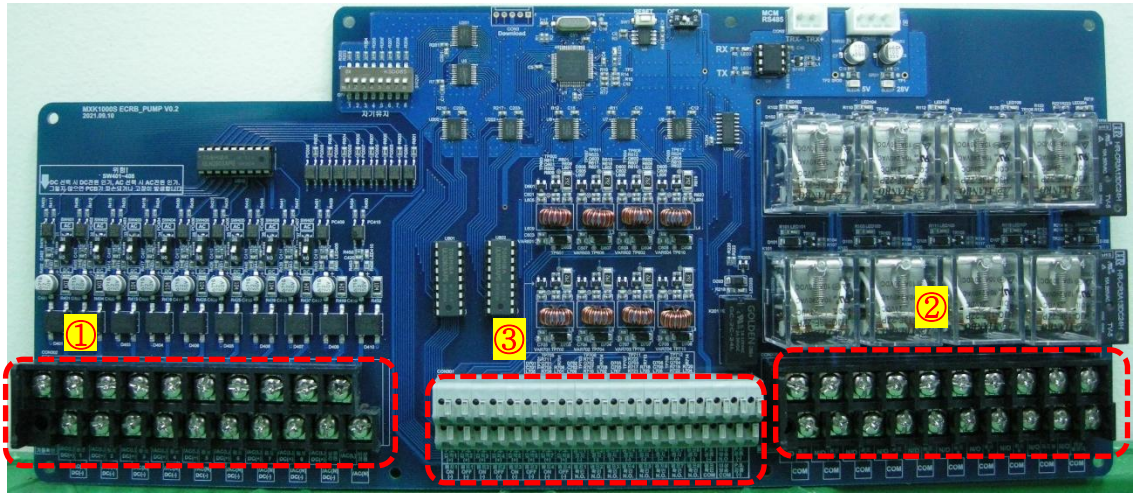
DIO COM is connected to "Pump ACK. COM" terminal

* **Pump Stop circuit** (Pump 1 ~4 Stop)

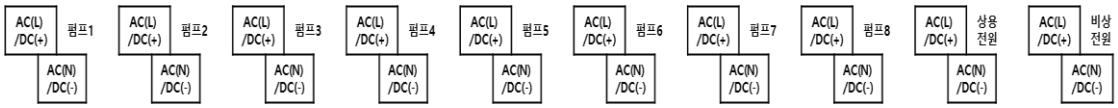


They are designed to have 300mA and less current flow and ground is connected to power supply.

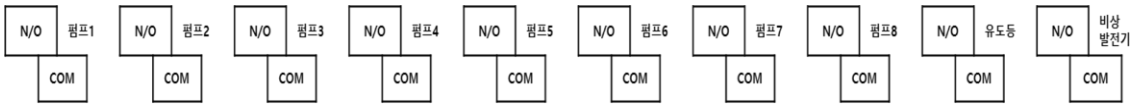
4.3. Terminal



1. Pump Activation Acknowledgement



2. Pump Activation



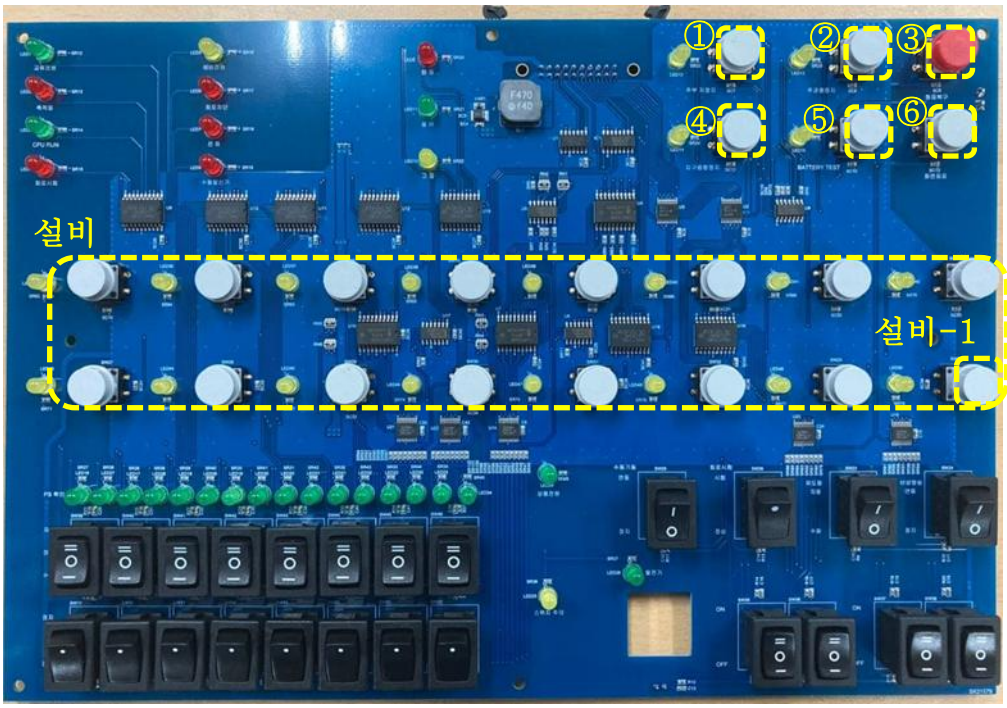
3. Power Supply, Pump, Emergency Broadcasting

P.S. 입력1 (+)	P.S. 입력2 (+)	P.S. 입력3 (+)	P.S. 입력4 (+)	P.S. 입력5 (+)	P.S. 입력6 (+)	P.S. 입력7 (+)	P.S. 입력8 (+)	펌프1 정지 (-)	펌프2 정지 (-)	펌프3 정지 (-)	펌프4 정지 (-)	펌프5 정지 (-)	펌프6 정지 (-)	펌프7 정지 (-)	펌프8 정지 (-)	P.S. 공통 (-)	비상 방송 N.O.	P.S. 공통 (-)
펌프1 ON (-)	펌프2 ON (-)	펌프3 ON (-)	펌프4 ON (-)	펌프5 ON (-)	펌프6 ON (-)	펌프7 ON (-)	펌프8 ON (-)	펌프1 확인 N.O.	펌프2 확인 N.O.	펌프3 확인 N.O.	펌프4 확인 N.O.	펌프5 확인 N.O.	펌프6 확인 N.O.	펌프7 확인 N.O.	펌프8 확인 N.O.	펌프 확인 COM	비상 방송 COM	P.S. 공통 (-)

✓ OCSM_ECSB

1. OCSM Keys

1.1. Location

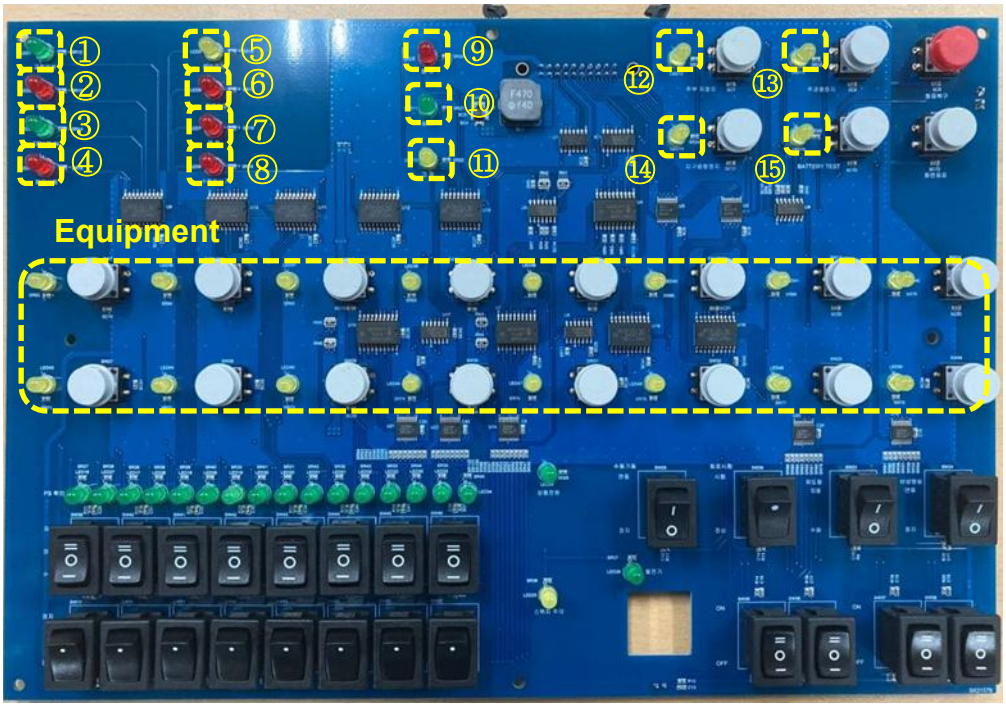


1.2 Function Description

Location	Part	Function
①	SW1	Main Buzzer Stop (Operation Stop, Clear)
②	SW2	Main Alarm Stop (Operation Stop, Clear)
③	SW3	Restoration from fire (Operation Stop, Clear)
④	SW5	Local Alarm Operation (Operation Stop, Clear)
⑤	SW4	Battery Test (Operation Stop, Clear)
⑥	SW6	Touch screen coordination (Operation Stop, Clear)
설비-①	SW7~SW33	Designate equipment 1~15 on Map, Set key controls to stop or clear
설비-②	SW34	Set to abort the extinguishing agent release, Press the key to stop, and release the key to clear

2. OCSM LED

2.1. Location



2.2 Function Description

Location	Part	Function
①	LED1	AC power status (AC fail:OFF, AC normal : ON)
②	LED2	Accumulation event occurrence (Event :ON, Clear :OFF)
③	LED3	CPU operation status (Normal : Flash, Failure :ON or OFF)
④	LED4	Circuit test indication (Test :ON, Clear :OFF)
⑤	LED5	Battery connection (Normal: OFF, Disconnected : ON)
⑥	LED6	Circuit Isolation (Isolated: ON, Clear: OFF)
⑦	LED7	Phone input (Input: ON, Clear: OFF)
⑧	LED8	Manual call point input (Input : ON, Clear : OFF)
⑨	LED9	Fire signal from I/Os, Detectors (Fire : ON, Clear: OFF)
⑩	LED11	Equipment Input (Input: ON, Clear: OFF)
⑪	LED10	Panel Failure (Failure : ON, Normal : OFF)
⑫	LED12	Main buzzer stop key status (Stop : Flash, Clear : OFF)
⑬	LED14	Main alarm stop key status (Stop : Flash, Clear : OFF)
⑭	LED15	Local alarm stop key status (Stop : Flash, Clear : OFF))
⑮	LED13	Battery test (test :ON, No test :OFF)

Equipment	LED35~50	Stop keys for equipment 1~16 (Stop : Flash, Clear: OFF)

3. Connectors

3.1. Location

3.2. Function Description

Location	Part	Function
①	J1	Power & Communication
②	Con2	Emergency power generator Switch

4. ECSB LED

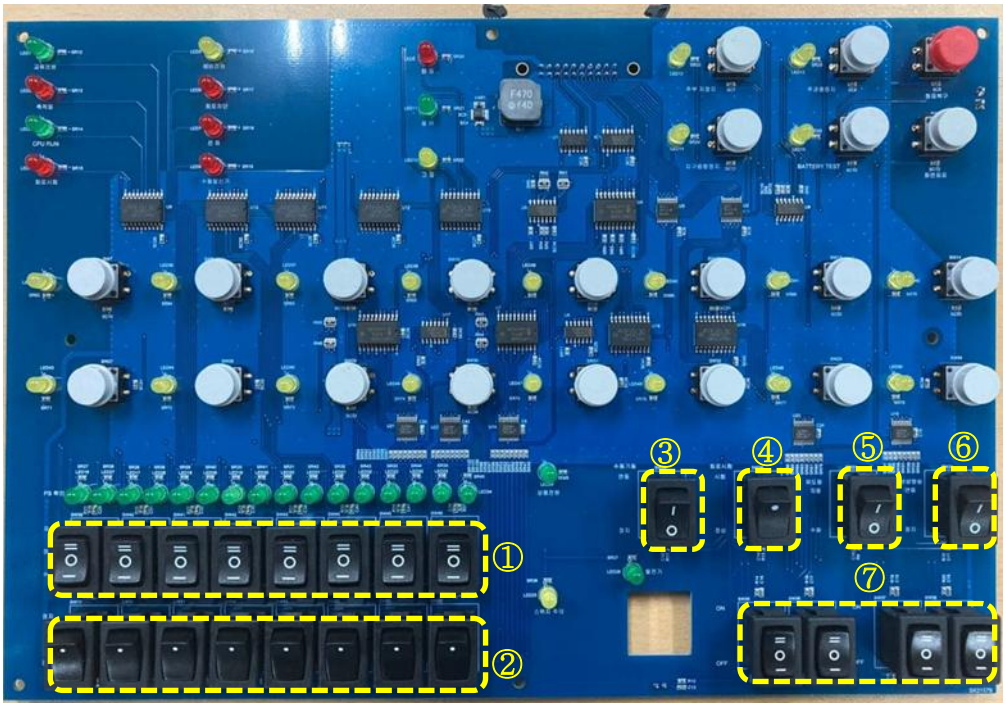
4.1. Location

4.2. Function Description

Location	Part No.	Color	Function
①	LED16~23	Green	Power supply status for Pump 1~8 (Input :ON, Clear : OFF)
②	LED27~34	Green	Pump activation acknowledgement signal (Input:ON, Clear:OFF)
③	LED24	Green	Commercial Power input (Input :ON, Clear :OFF)
④	LED25	Green	Caution of Pump control switch (Pump Control Switch to Stop :Flash, Auto or Manual : OFF)
⑤	LED26	Green	Power generator (Input :ON, Clear :OFF)

5. ECSB KEY

5.1. Location



5.2. Function Description

Location	Part	Function
①	SW39~46	Operation of Pump 1~8, Auto (When power is supplied, the pump is released), Stop, Manual (Pump Release)
②	SW15~22	Reset signal for Pump 1~8 (Restored from notifying status, Normal)
③	SW25	Manual operation (Linked, Stop)
④	SW26	Circuit Test
⑤	SW23	Notifies Exit sign (Auto, Manual)
⑥	SW24	Dry Contact output of emergency broadcasting (Linked, Stop)
⑦	SW35~38	Pump Pressure (ON, OFF)

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 supports a network configuration of up to 32 panels, with an additional 32 workstations connected. Using UTP LAN cables, the distance between panels can reach up to 100 meters, while optical cables extend the range to 25 kilometers.

✓ Device Configuration for the Network

To configure the network for the panel, the following products are required: Refer to 2. Product Configuration

- **Panel : MXK8000**
- **SFC800 (Optical Converter)**: 1 unit per panel (additional units based on site requirements)
- **Back Loop (RCM)**: One loop is required across the entire network
- **Router**: 100 Mbps wired and wireless router
- **HUB**: 100 Mbps switch hub
- **LAN Cable**: Cross cable or direct cable (UTP CAT5)
- **Optical Cables for Pulling**: Single-mode, 4 Core (or higher)
- **FDF (Optical Terminal Box)**: For terminating optical cables, produced by a specialized vendor
- **Optical Jumper Cord**: SM SP SC/PC – SC/PC Cable

Note: HUBs, LAN cables, optical cables, optical terminal boxes, and optical jumper cords are sold on the market and must be purchased or manufactured separately. Refer to this information when sourcing or manufacturing them. For guidance on device usage and connections, refer to the sections below before purchasing.

✓ IP Settings

Configure the panel's IP settings based on the provided map, which is generated by the product technical team. Once the number of connected panels is determined, request the map from the technical team. The map can then be downloaded to the panel.

IP Ranges : 192.168.10.2 ~ 192.168.10.253
Default Mask : 255.255.255.0

MXK8000 System IP Range (Recommended):
192.168.10.80 ~ 192.168.10.111
MXK8000 W/S IP Range (Recommended):
192.168.10.151 ~ 192.168.10.182

The IP addresses are assigned as follows:

Panel 1: 192.168.10.80
Panel 2: 192.168.10.81
Up to 32 panels are sequentially assigned IPs.

Similarly, Workstation IPs start at 192.168.10.151 and increase sequentially to 192.168.10.182, allowing up to 32 W/S connections.

Workstation devices are pre-configured with IP settings on-site, so no additional setup is required.

✓ Network Connection using LAN Cable

For installations with two or more panels, if the distance is less than 100 meters within a building, the network can be configured using a wired/wireless router, switch hub, and UTP LAN cables.

Types and Selection of Routers

A router, also referred to as an access point (AP), acts as the network's gateway and hub, enabling multiple devices to share one connection for simultaneous communication. If no gateway is set, the router can function as a switch hub.

Router requirements for the MXK500W network:

Must support 100 Mbps or higher
Use direct cables for connection
Set the internal network gateway to 192.168.10.1

Only one router should be configured per network

The router used in MXK500W is as follows:

10/100Mbps and more supported

Recommended Model 1:: Anygate RG5200R2)

(Recommended Model 2: EFM Networks iptime A604)

(Recommended Model 3: Bless Information Communication ZIO-2509N)

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

Types and choice of Hubs

Hubs must work in conjunction with a router to connect each node in the network. LAN cables enable communication among multiple nodes.

Types of Hubs

1. **Dummy Hub:**
    - Communication speed decreases as more lines are connected.
    - Rarely used in recent years due to performance limitations.
2. **Switch Hub:**
    - Maintains communication speed even as more lines are connected.
    - Predominantly used and readily available in the market.

Hub Requirements for MXK8000 Network

- The hub should support a minimum speed of **100 Mbps**.
- **Switch hubs** are recommended to ensure stable communication speed.

LAN Cable Connection Guidelines

- Use **cross-LAN cables** to connect one hub to another.
- Use **direct cables** to connect a panel to a hub.

Even if a switch hub includes an **Auto Uplink** feature (which automatically detects and classifies direct and cross-LAN cables), abnormal network communication may occur if the appropriate cables are not used separately.

Recommended Hub for MXK8000 as follows.

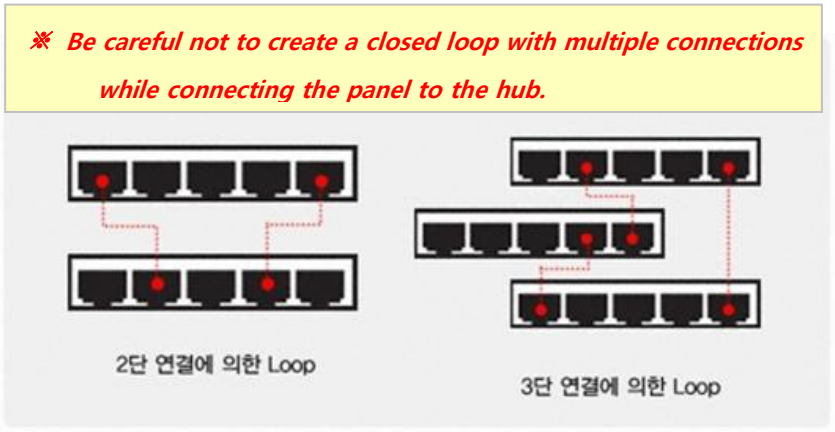
10/100Mbps and more supported, Switch Hub

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

LEDs show status of LAN ports, indicating cables are connected. Data transmission makes them flickering.

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

When connecting hubs and LAN cables in a network, it is crucial to avoid creating a closed loop, as this can disrupt normal data communication as illustrated in the following image. This issue not only stops from proper data transmission but also leads to a data surge to shut down the system.

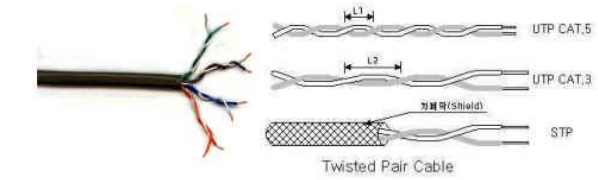


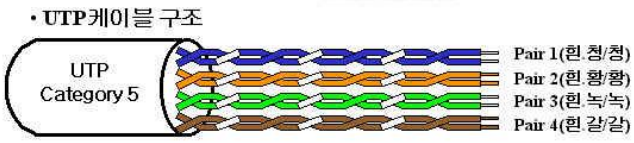
< Figure 6-3: Example of an invalid LAN cable wiring in a closed loop >

Types and choices of LAN Cables

Shielded twisted pair (STP) cables are equipped with shielding for noise protection within the cable, making them suitable for special use cases due to their high performance but elevated cost. On the other hand, unshielded twisted pair (UTP) cables are more commonly used as LAN cables since they lack shielding and are more affordable. UTP cables are categorized based on performance, with CAT3 supporting speeds of up to 10 Mbps and CAT5 supporting up to 100 Mbps. For the MXK8000 system, the

recommended cable is the **UTP CAT5 LAN cable**, ensuring reliable performance at the required speed.





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)

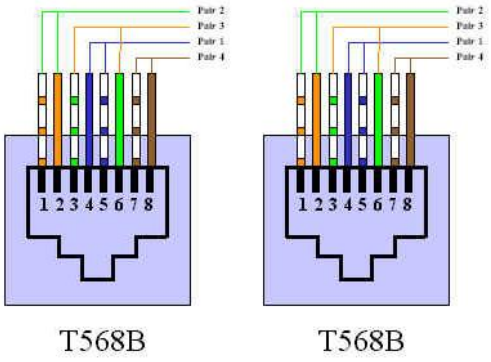
.

< Figure 6-4: UTP Cable Category >

Direct LAN Cable, Cross LAN Cable

LAN Cables are divided into direct and cross LAN cables depending on the connections.

- Direct LAN Cable: Both ends of the cable are connected in the same pin order to the other connectors.

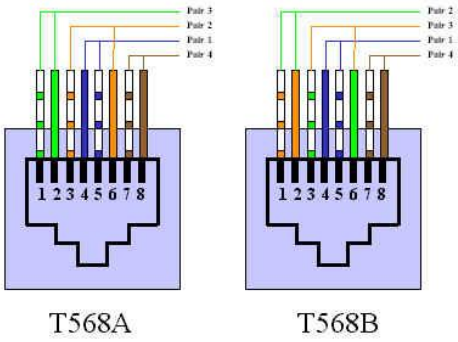


< Figure 6-5: Direct LAN Cable >

Ex. Panel -SFC800, Panel -HUB, W/S-SFC800

- Cross Cable: Its pin configuration typically has the transmit (TX) pins on one end connected to the receive (RX) pins on the other end, meaning that pin 1 on one connector connects to pin 3 on the other connector, and pin 2 connects to pin 6 One end of the cable has the pin order 1,2,3,4,5,6,7,8 and 3,6,1,4,5,2,7,8, essentially "crossing" the transmit and receive pairs, allowing direct communication between two

devices like computers without a switch or router.



< Figure 6-6: Cross LAN Cable >

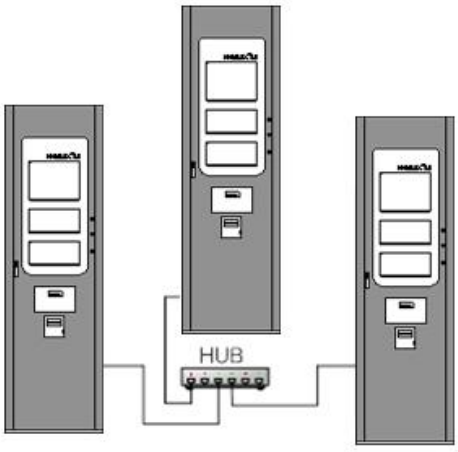
Example used in Panel-Panel, Panel-W/S, Hub-Hub, etc.

< Figure 6-6: Cross LAN Cable >

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

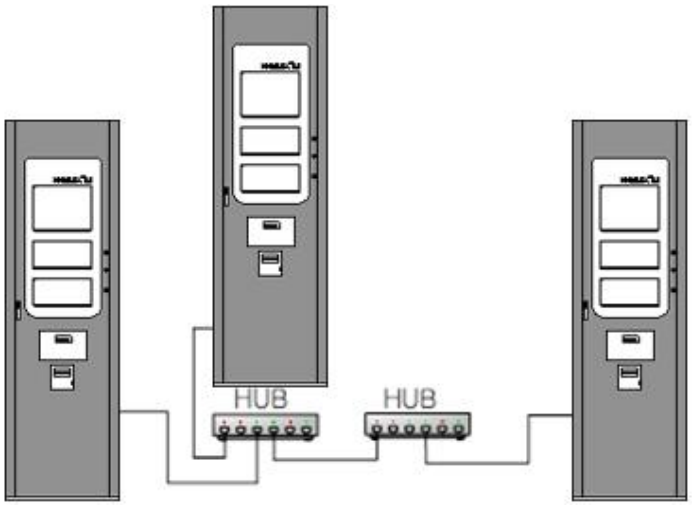
Connection Scheme

When configuring the panel network using LAN Cable and Hub, connect the panel directly to the hub as shown below. Figure 6-7 below shows that three panels are connected directly to one hub. If all the panels are in close proximity to each other, you can use one hub to connect them all.



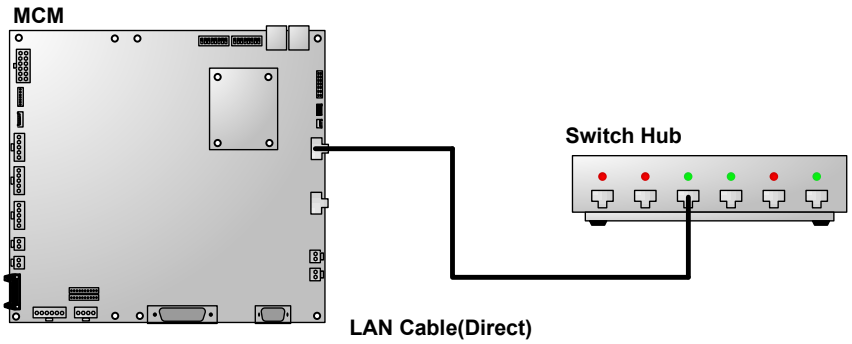
< Figure 6-7: Three panels connected to one hub. >

In a difficult situation to connect all systems to a single hub, additional hubs can be added to connect. <Figure 6-8> 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. LAN port #1 should be connected with LAN cable shown in <Fig. 6-8>



< Figure 6-9: Connecting MCM and HUB >

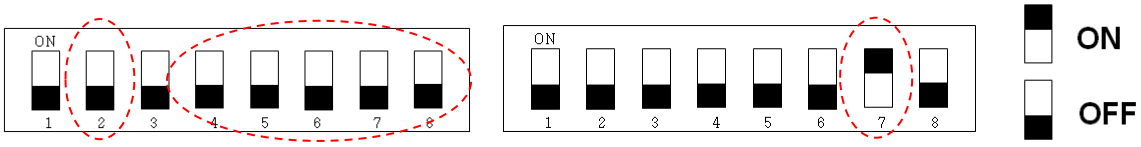
As described in the previous section, switch hubs should be used, and the LAN cables must be **UTP CAT5**. **Direct LAN cables** should be used to connect the panel to the hub, while **cross LAN cables** should be used to connect a hub to another hub or to directly connect panels, as shown in **Figure 6-8**.

Dip Dip Switch Settings

Once all connections are complete, the **Dip Switches** need to be set up. Switches 4 to 8 of **SW1** can be configured for the panel number. For detailed information, refer to the Dip Switch setup instructions in the previous section.

For Ethernet networks, SW1-2 **should be set to "OFF," and** SW2-7 **should be set to "ON" to enable the required functions.**

SW1 SW2



Important!

Always use a switch hub.

Even if the model supports **Auto Uplink**, LAN cables should be used separately.

After installing the panel, check the **Dip Switch** settings of the **MCM module**.

Incorrect Dip Switch settings will prevent network communication.

✓ **Network Connection Using Optical Cable**

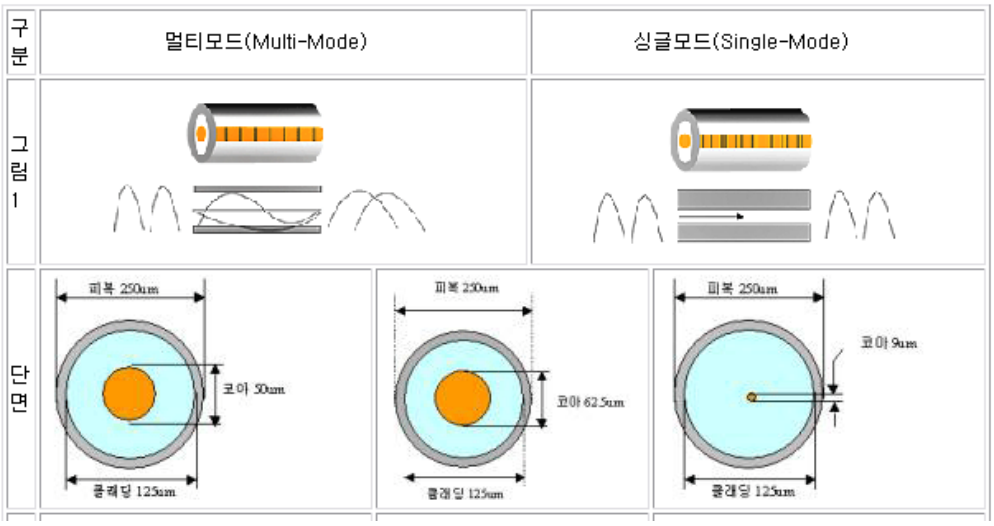
If the distance between panels exceeds 100 meters, the network connection should be made using optical cables. To connect the panels using optical cables, optical cable pulling must first be completed. The pulled optical cables must then be terminated in the **Fiber Distribution Frame (FDF)** by optical cable specialists.

Types and Choice of Optical Cables

Optical cables are classified into two main types: **Single-Mode** and **Multi-Mode** cables.

Single-Mode cable has a core diameter of 9um. Its smaller core diameter allows light to travel longer distances, making it suitable for communication up to 25km.

Multi-mode Cable has core diameters of 50um, and 62.5um.The large core diameter results in higher light loss due to irregular reflection, limiting the communication distance up to2 kilometers.



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

For MXK8000 network, only **Single-Mode** optical cables should be used.

The **SFC800 (Optical Converter)** module is designed for Single-Mode optical cables, so all optical cables—including those for pulling and optical jumper cords—should be Single-Mode.

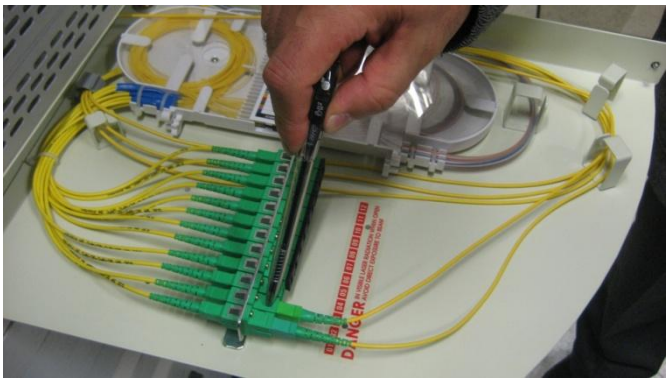
Optical Fiber Cable Pulling

Optical cables for pulling must be Single-Mode cables. The number of cores in the optical

cables varies, typically ranging from **4-core** to **12-core** cables, with increasing diameter and core counts. Generally, **4-core cables** are sufficient and cost-effective unless a special case requires more cores. For specific installation guidance, consult optical cable companies for more details.

FDF BOX (Fiber Distribution Frame)

After the optical cable pulling is completed, the cables must be terminated in the **Fiber Distribution Frame (FDF)**, which requires the expertise of optical cable specialists. The specialists will terminate the cables according to the number of cores, ensuring that spare ports are available for future use, even if they are not currently utilized.



< Figure 6-11: FDF BOX>

SFC800 (Optical Converter)

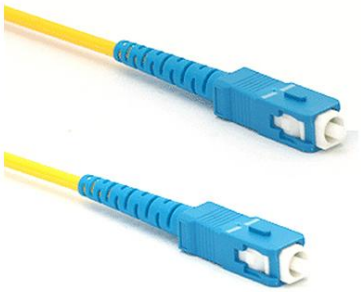
The **SFC800** module enables Ethernet-based communication for the MXK500W network. It is used to convert electrical signals transmitted through the LAN cables into light signals for optical cables, which connect distant panels. The SFC800 module also monitors the connection status of the optical cable.

< Figure 6-12: SFC800 >

It operates with a **DC 5V** voltage, and a **5V output adapter** for **AC220V** is included.

Optical Jumper Cord

The **optical jumper cord** connects the **FDF** box to the **SFC800**. It must be a **Single-Mode** optical cable with **SC-type** connectors on both ends. One side connects to the **SFC800**, and the other side connects to the **FDF**, ensuring compatibility between the optical jumper cord and the FDF optical terminal.



- 싱글모드 SC - SC타입 -

< 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

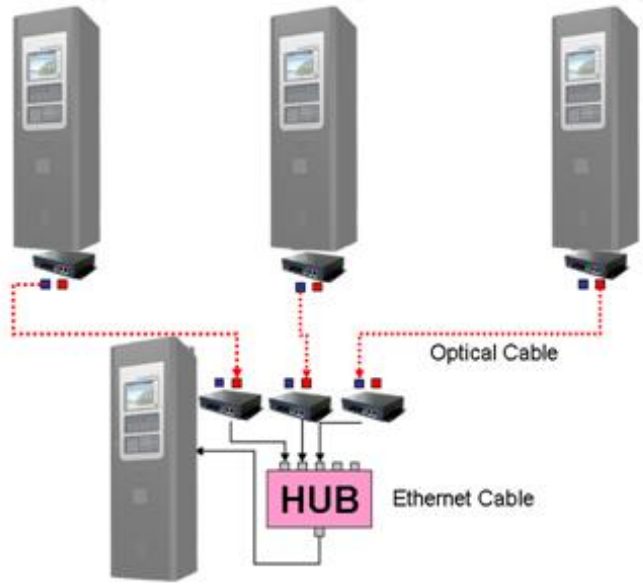
When connecting two panels using optical cables, the setup follows these steps:

Panel to SFC800:
Each panel connects to its corresponding **SFC800** using a **direct LAN cable**. The SFC800 has **eight LAN ports**, and any of these ports can be used.

SFC800 to FDF:
The **SFC800** is then connected to the **FDF box** using **optical jumper cords**. Each SFC800 has two optical terminals for these connections.

Alternating Terminals:
When connecting two panels, their SFC800 modules must use alternate optical terminals:
For **Panel 1**, connect one of the optical terminals on the SFC800 to **FX2** (Tx or Rx).
For **Panel 2**, connect the corresponding SFC800 to the **FX1** (Tx or Rx) terminal.
Both panels should use **SC-type optical jumper cords** for the connection.

When connecting multiple panels, the same process applies. The connection can utilize a **Star topology**, as shown in <Figure 6-14>, using optical cables. In this setup:.



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

One panel serves as the central hub and requires **three SFC800 modules**. These

SFC800s are connected to the panel via a **switch hub**.
The **Single-Mode optical cables** connect the SFC800 modules alternately:

- From **FX1 (left terminal)** to **FX2 (right terminal)** or vice versa.

While the Star topology is effective, it is not mandatory. The connection method can vary depending on site-specific requirements.
The following illustration depicts a setup with one fewer **SFC800**. It is also possible to connect two **SFC800s** directly using a **LAN cable** without requiring a hub.

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

However, by default, the network configuration for the panel will typically follow the setup shown in **<Figure 6-15>**. In this configuration.

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

Each panel is equipped with **one SFC800**, which connects to the panel using a **LAN cable**.

The **SFC800s** are interconnected by **optical cables**, with connections made from the **right terminal (FX2)** of one SFC800 to the **left terminal (FX1)** of the next.

Dip Switch Setting

Dip Switch setting remains the same as when configuring the network with a hub and LAN cable.

✓ Back Loop Connection

Back Loop

Fire detection systems are critical as they directly impact safety and life. To maintain functionality even during communication line failures, redundant communication lines may be required.

When a communication line fails, the system automatically switches to the redundant communication line. This redundancy is referred to as the **Back Loop function**, which is supported by the MXK8000 system.

Connection Scheme

To implement the **Back Loop**, the network must be configured using a **Ring topology** with optical cables. The connection process is as follows:

The panel connects to an **SFC800** using a **direct LAN cable**. Each **SFC800** is interconnected using an **optical cable** from the **right terminal (FX2)** to the **left terminal (FX1)**.

1. Cautions for Optical Cable Ring Connection

When connecting optical cables in a ring topology, ensure the **master** and **slave** settings are configured for the **SFC800** devices to avoid jamming in optical cable ring connections.

(First, complete all settings for the **master** SFC800, leaving one optical cable unconnected. After the settings are finalized, connect the remaining cable.)

2. Preventing from IP Address Duplication

All **SFC800** devices have the same default IP address (192.168.10.100). To prevent duplication, update the IP addresses on-site to a range between **192.168.10.150 and 192.168.10.199.** Ensure the optical cables connected to the **SFC800** are disconnected during IP configuration. This precaution ensures the changes do not inadvertently impact other **SFC800** devices.

10. Network Verification

✓ ping Test

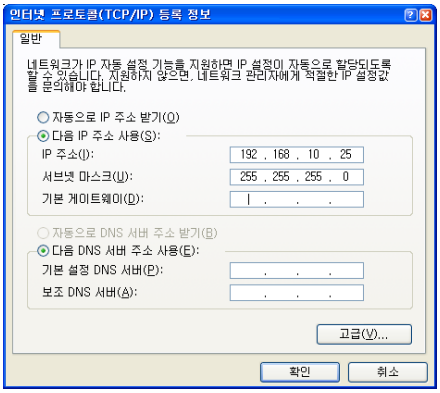
After completing the network configuration and setup, a **ping test** should be conducted to ensure the network lines and settings are functioning correctly.

Ping is a Windows command used to verify the connection status of a LAN cable.

To perform the test:

Set the **IP address** and **net mask** of your laptop to match the same subnet as the panel.

IP: 192.168.10.25　서브넷 Mask: 255.255.255.0

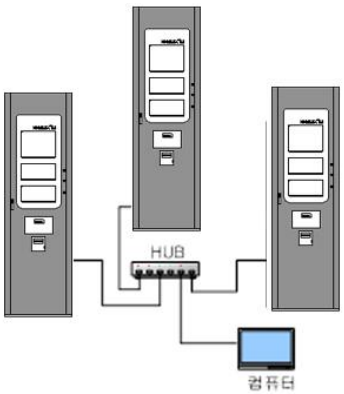


<그림 7-1: Ping 테스트를 위한 노트북 IP설정>

<그림 7-1: Ping 테스트를 위한 노트북 IP설정>

The **IP address** assigned to the laptop is not necessarily a specific number (e.g., 25) but must not duplicate the IP of any panel or workstation on the network.

For sites where a **Workstation (W/S)** is installed, the ping test can be performed directly from the workstation without the need to connect a separate laptop. The workstation will already have its IP address configured, so there is no need to reset its IP.

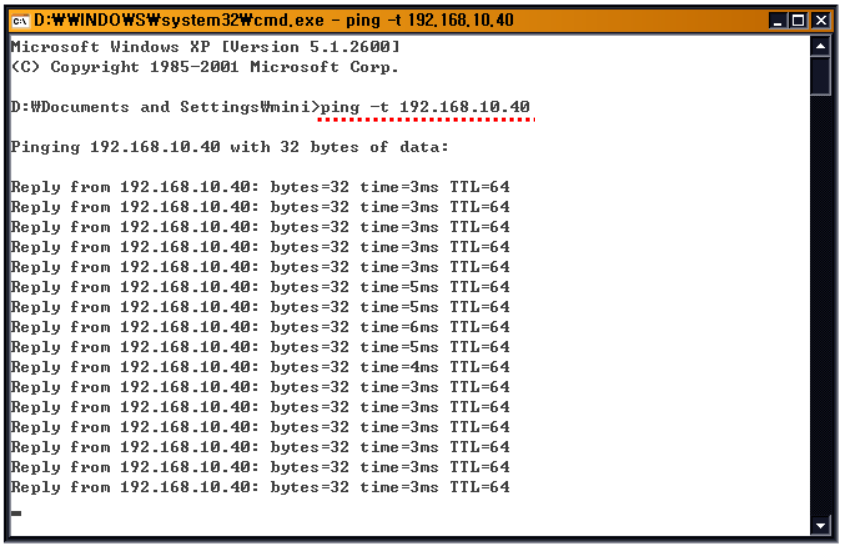


< Figure 7-2: Connecting a computer to a network for ping test >

Click **"Start"** on the Windows menu.

Select **"Run"** and type **"cmd"** to open the command prompt.

Window : Start → Run → "cmd"



< Figure 7-3: cmd command >

In the command prompt window, type the following command to test the connection to the panel or workstation:

ping –t [IP address to check]

If the network connection is normal, you will see a series of replies from the specified IP address, as shown in <Figure 7-5>.

If the connection is faulty, an error message or unusual response will appear. To thoroughly verify network stability, ping all panels and workstations simultaneously by

opening multiple command prompt windows.

Allow the test to run for at least **three minutes** to confirm that no errors or disruptions occur.

✓ Panel Link Check

After confirming that the network line is normal through the ping test, the next step is to verify network communication.

When network communication is functioning properly, the number of events is shared across the network, and all panels display an equal increase in event counts.

Navigate to the **Panel's Status View** screen to verify if data is being transferred between panels.

< Figure 7-6: Panel Network Check >

A more accurate way to confirm the link is by testing the **Main Sound Key** on each panel. Pressing the Main Sound Key generates a message about the key action, which will appear on the **Active List** of all connected panels. This ensures you can identify which panels are properly connected to the network.

11. Q&A

Q: The product does not turn on.

A:

1. **Verify** that AC power is properly supplied to the panel.
2. **Verify** that the AC power is set to the correct voltage (110V/220V - field-specific). **Verify** that power is properly supplied to the MCM_Main Board. Use a tester to check voltages at TP8-11 in the upper left corner of the MCM Main. Operating voltages should be 24V, 5V, and 3.3V within a tolerance of ±5%.

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

A:

1. **Check the Backlight:** The backlight is located at the rear and bottom of the TFT_LCD panel within the MCM_Main Board. If the backlight does not illuminate, the screen will appear black even if the panel is operating.
2. **Check the Mains Power Supply (24V):** The backlight may not turn on if the 24V power supply is not present, the 12V jumper is missing, or the backlight module is defective.
3. **Check the MCM_CPU Operation LED:** If the 3 LEDs on the MCM_CPU are flashing continuously, the MCM Module is defective. Replace the module.

Q: No Network Communication on the Product?

A:

1. **Check LAN Port and SFC800 Terminal LEDs**: .
   - Inspect the LEDs on the **LAN Port**, **SFC800 terminal**, **MCM_Main Board**, and **Hub**

   Yellow LED illuminates if the LAN cable is properly connected to the hub, SFC800, or RCM network module.

   Green LED flashes regularly when data is being transferred between panels. (Some hubs have a single LED. If it turns on, the LAN cable is properly connected. If it flashes, data transfer is occurring.)
   - If the **yellow LED** is off or the **green LED** doesn't flash:

   The LAN cable or optical jumper cord may be faulty or poorly connected.

Replace the cable or cord. If the issue persists, the device might be defective.

2. Verify Panel IP Settings
   - If the port LEDs are functioning but there is no communication, check the panel's IP settings:

   Ensure the **DIP S/W** is correctly configured for the panel number.

   Verify the panel's IP in the **System Inspection Screen**.

   Ensure **SW1-2** and **SW2-7** DIP switches are set appropriately for the network configuration.

   Refer to **Chapter 3: Panel Setting** or **Chapter 6: DIP Switch Setting** for details.

3. IP Map Verification
   - If DIP S/W settings are correct and communication is still unsuccessful

   Check for issues with the IP map that assigns IPs to panels.

   Confirm that all panel IPs are present and testable via a **ping test** (refer to **Chapter 7: Ping Test**).

   Panel IPs typically range sequentially from **192.168.10.40** to **192.168.10.71**, unless specified otherwise (e.g., Panel 5 = 192.168.10.44).

   If a panel cannot be verified during the ping test and its LAN Port LED is functioning, contact the **Product Technical Team** to re-download the IP map to the panel, as the map may contain errors.

Q: Other Panels on the Network Are Not Visible in the Panel's Status View

A:

1. If no panels are visible in the **Status View menu**, this may be due to an incorrect map.

   Reset the map and re-download it to the panel to resolve the issue.

Q: The Link Map Does Not Trigger Outputs

A:

1. Ensure the **Equipment Stop Key** is not activated. If it is, release the key..
2. Use the panel's **Map View** function to verify normal **In/Output connections**.

   Navigate to: **Main Menu → Matrix Map View or Main Menu → Logic Map View**
3. If the map is in place but the link doesn't work, the **In/Output Module** may be defective

   Disconnect the loop line from the I/O module.

   Connect the I/O module directly to the panel and Test it.

   If output works after direct connection, the I/O module might be faulty.

Q:Cannot Download the Map?

A:

1. **Progress Bar Not Displayed**:

   The progress bar does not appear when downloading a **single file.**
   This is normal, and the download is still proceeding.

2. **Progress Bar Freezes or Stops**:
   The map being downloaded may contain two large files of **512 MB each**.
   When downloading these files, the progress bar may appear frozen.
   Wait up to **5 minutes** for the download to complete.