SEHAN ELECTOOLS
SHC Series
Serial Driver

Supported version	TOP Design Studio	V1.4.9.12 or higher

CONTENTS

We want to thank our customers who use the Touch Operation Panel.

1. System configuration

The system configuration of TOP and "Sehan Electric Power - SHC Series" is as follows:

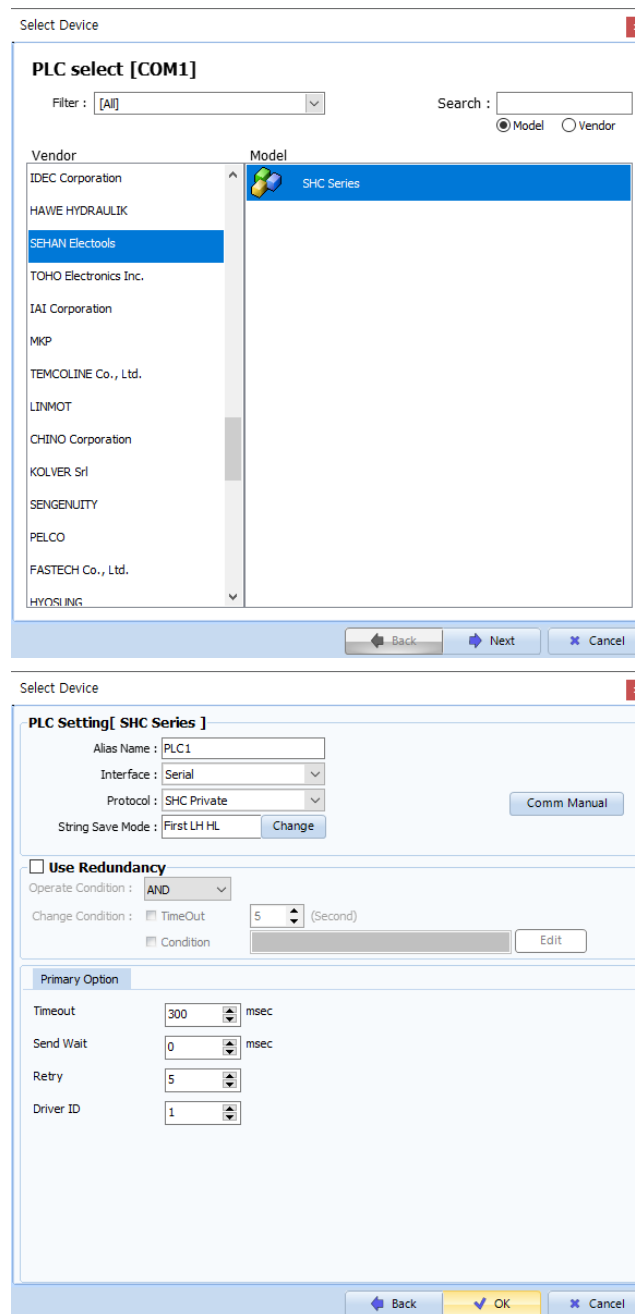| Series	Model	Port	Communication method	System setting	Cable
SHC	SHC-□□□	Comm 0A Comm 0B	RS-232C RS-485	3. TOP communication setting	5. Cable table

■ Connectable configuration

・1 : 1 (RS-232C/485)

・1 : N (RS-485)
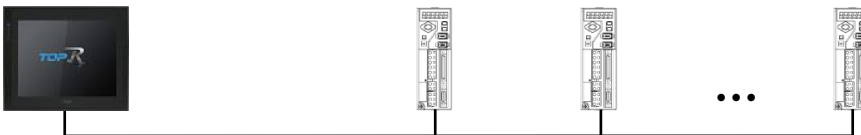
2. External device selection

■ Select a TOP model and a port, and then select an external device.

Settings		Contents
TOP	Model	Check the display and process of TOP to select the touch model.
External device	Vendor	Select the vendor of the external device to be connected to TOP. Select "SEHAN Electools".
	PLC	Select an external device to connect to TOP-R.

Model	Interface	Protocol
SHC Series	Serial	SHC Private

Please check the system configuration in Chapter 1 to see if the external device you want to connect is a model whose system can be configured.
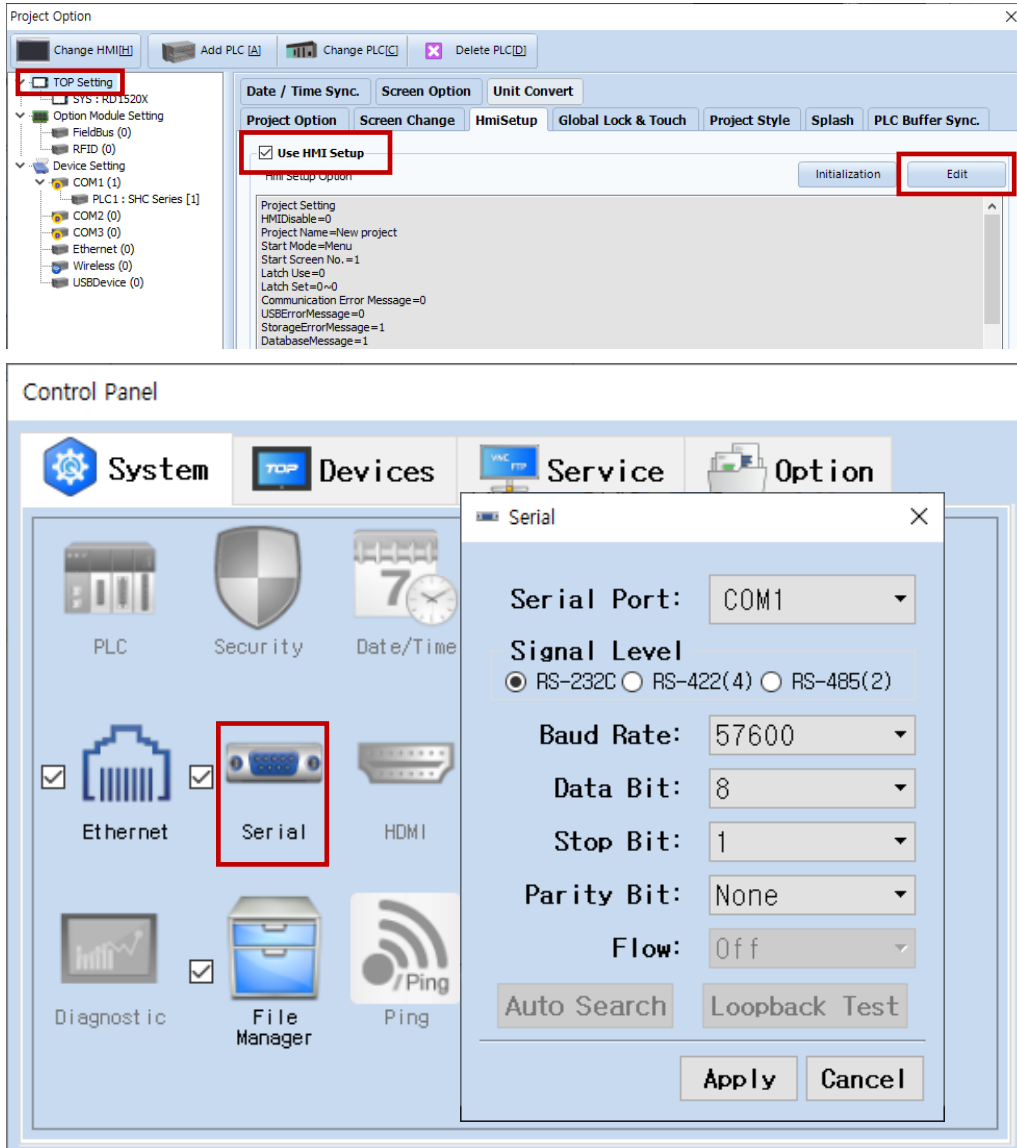
3. TOP communication setting

The communication can be set in TOP Design Studio or TOP main menu. The communication should be set in the same way as that of the external device.

3.1 Communication setting in TOP Design Studio

(1) Communication interface setting

■ [Project] → [Property] → [TOP Setting] → [HMI Setup] → [Use HMI Setup Check] → [Edit] → [Serial]

– Set the TOP communication interface in TOP Design Studio.

Items	TOP	External device	Remarks
Signal Level (port)	RS-232C / RS-485		
Baud Rate	57600		
Data Bit	8		
Stop Bit	1		
Parity Bit	None.		

* The above settings are examples recommended by the company.

Items	Description
Signal Level	Select the serial communication method between the TOP and an external device.
Baud Rate	Select the serial communication speed between the TOP and an external device.
Data Bit	Select the serial communication data bit between the TOP and an external device.
Stop Bit	Select the serial communication stop bit between the TOP and an external device.
Parity Bit	Select the serial communication parity bit check method between the TOP and an external device.

(2) Communication option setting

■ [Project] > [Project Property] > [PLC Settings > COM > "PLC1 : SHC Series"]

    – Set the options of the SHC Series communication driver in TOP Design Studio.

Items	Settings	Remarks
Interface	Select Serial.	Refer to "2. External device selection".
Protocol	Select the serial communication protocol between the TOP and an external device.	
TimeOut (ms)	Set the time to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device and sending the next request.	
Driver ID	Enter ID for external device.	

3.2. Communication setting in TOP

* This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.

■ Touch the top of the TOP screen and <u>drag</u> it down. Touch "EXIT" in the pop-up window to go to the main screen.

(1) Communication interface setting

■ [Control Panel] → [Serial]

Items	TOP	External device	Remarks
Signal Level (port)	RS-232C / RS-485		
Baud Rate	57600		
Data Bit	8		
Stop Bit	1		
Parity Bit	None.		

  * The above settings are <u>examples</u> recommended by the company.

Items	Description
Signal Level	Select the serial communication method between the TOP and an external device.
Baud Rate	Select the serial communication speed between the TOP and an external device.
Data Bit	Select the serial communication data bit between the TOP and an external device.
Stop Bit	Select the serial communication stop bit between the TOP and an external device.
Parity Bit	Select the serial communication parity bit check method between the TOP and an external device.

(2) Communication option setting

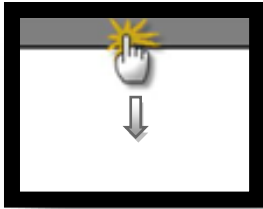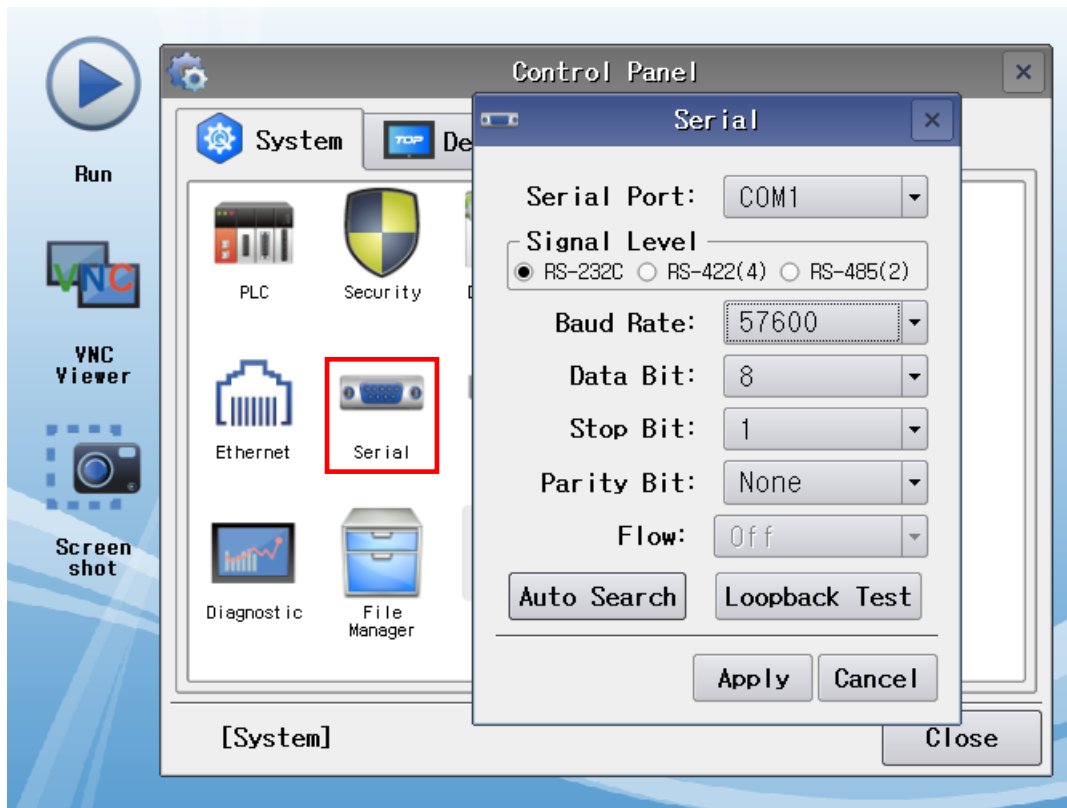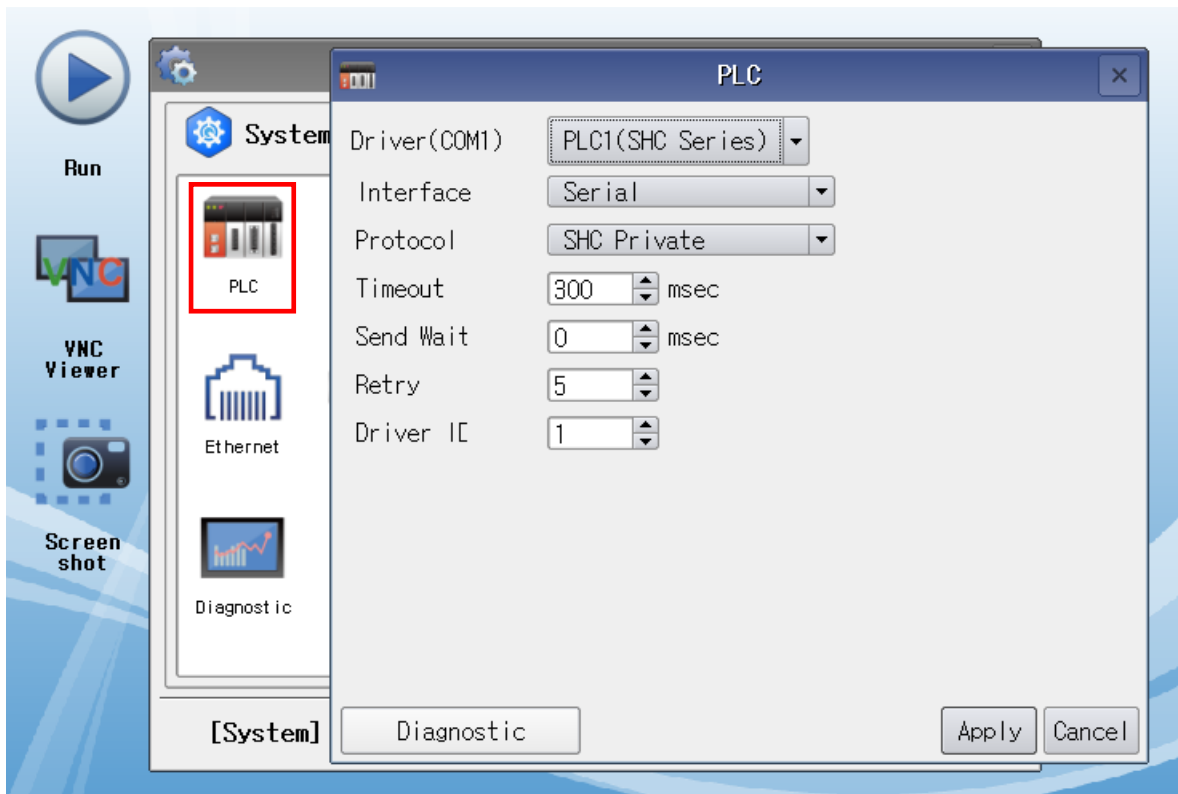■ [Control Panel] → [PLC]

Items	Settings	Remarks
Interface	Select Serial.	Refer to "2. External device selection".
Protocol	Select the serial communication protocol between the TOP and an external device.	
TimeOut (ms)	Set the time to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device and sending the next request.	
Driver ID	Enter ID for external device.	

3.3 Communication diagnostics

■ Check the interface setting status between the TOP and an external device.

- Touch the top of the TOP screen and drag it down. Touch "EXIT" in the pop-up window to go to the main screen.

- Check if the COM port settings you want to use in [Control Panel > Serial] are the same as those of the external device.

■ Diagnosis of whether the port communication is normal or not

- Touch "Communication diagnostics" in [Control Panel > PLC].

OK	Communication setting normal
Time Out Error	Communication setting abnormal
	- Check the communication settings of the communication cable, TOP and external device.

■ Communication diagnostics sheet

- If there is a problem with the communication connection with an external terminal, please check the settings in the sheet below.

Items	Contents		Check		Remarks
System configuration	How to connect the system		OK	NG	1. System configuration
	Connection cable name		OK	NG	
TOP	Version information		OK	NG	2. External device selection 3. TOP communication setting
	Port in use		OK	NG	
	Driver name		OK	NG	
	Other detailed settings		OK	NG	
	Relative prefix	Project setting	OK	NG	
		Communication diagnostics	OK	NG	
	Serial Parameter	Transmission Speed	OK	NG	
		Data Bit	OK	NG	
		Stop Bit	OK	NG	
		Parity Bit	OK	NG	
External device	CPU name		OK	NG	4. External device setting
	Communication port name (module name)		OK	NG	
	Protocol (mode)		OK	NG	
	Setup Prefix		OK	NG	
	Other detailed settings		OK	NG	
	Serial Parameter	Transmission Speed	OK	NG	
		Data Bit	OK	NG	
		Stop Bit	OK	NG	
		Parity Bit	OK	NG	
	Check address range		OK	NG	6. Supported addresses

4. External device setting
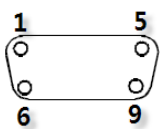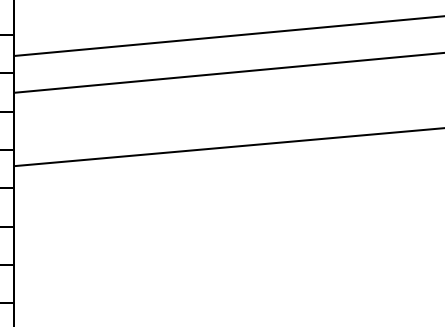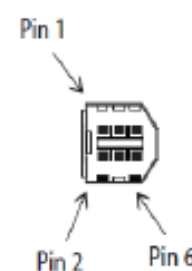
Refer to the manual of the external device and configure the SHC parameters.

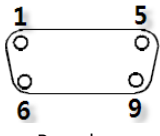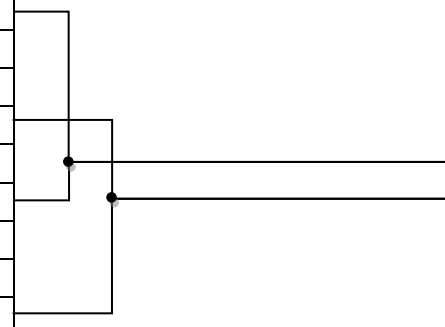| Parameter	Contents	Value	Remarks
P304	Finalize Data Output Mode	1	Fixed
P319	For serial communication, use ETX at the end of the transmission statement	1	Fixed
P501	SHC ID	1	
P502	Serial communication settings	5	

5. Cable table

This is the cable table. The cable table below may vary depending on the SHC model. Please refer to the manual provided by Sehan Electric Power for more information.
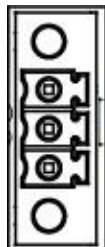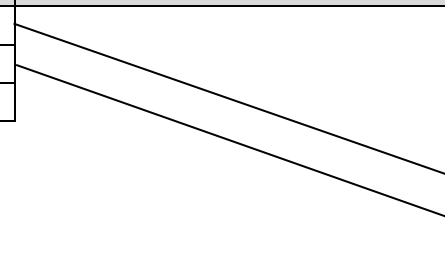
■ RS-232C (1:1 connection)

TOP			Cable connection	External device		
Pin arrangement*Note 1)	Signal name	Pin number		Signal name	Pin number	Pin arrangement*Note 1)
Based on communication cable connector front, D-SUB 9 Pin male (male, convex)		1		TX	1	
	RX	2		RX	2	
	TX	3			3	
		4		GND	4	
	SG	5			5	
		6			6	
		7				
		8				
		9				

*Note 1) The pin arrangement is as seen from the connecting side of the cable connection connector.

■ RS-485 (1:1 connection)

TOP			Cable connection	External device		
Pin arrangement*Note 1)	Signal name	Pin number		Signal name	Pin number	Pin arrangement*Note 1)
Based on communication cable connector front, D-SUB 9 Pin male (male, convex)	RDA(+)	1			1	
		2			2	
		3			3	
	RDB(-)	4		GND	4	
	SG	5		DX+	5	
	SDA(+)	6		DX-	6	
		7				
		8				
	SDB(-)	9				

*Note 1) The pin arrangement is as seen from the connecting side of the cable connection connector.

TOP		Cable connection	External device		
Pin arrangement	Signal name		Signal name	Pin number	Pin arrangement*Note 1)
SG − +	+			1	
	-			2	
	SG			3	
			GND	4	
			DX+	5	
			DX-	6	

■ RS-485 (1:N connection) – Refer to 1:1 connection to connect in the following way.

TOP	Cable connection and signal direction	External device	Cable connection and signal direction	External device
Signal name		Signal name		Signal name
RDA(+)		DX+		DX+
RDB(-)		DX-		DX-
SDA(+)				
SDB(-)				
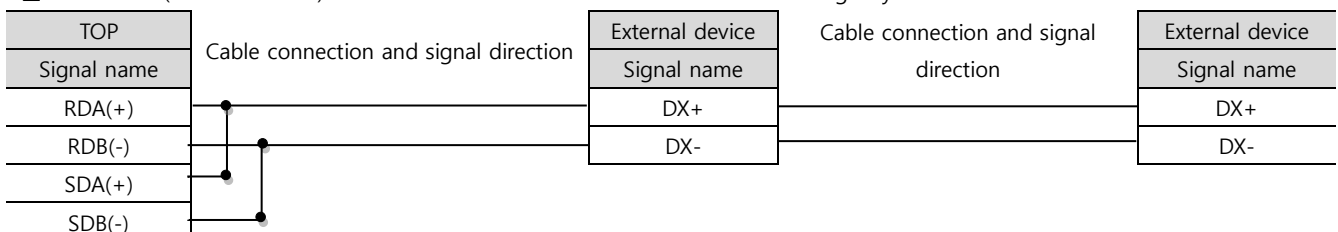
6. Supported addresses

The devices available in TOP are as follows:

The device range (address) may differ depending on the CPU module series/type. The TOP series supports the maximum address range used by the external device series. Please refer to each CPU module user manual and be take caution to not deviate from the address range supported by the device you want to use.

Address	Data	Bit	Word	Size	Read/Write	Remarks
STR	Parameter	STR000.00 ~ STR999.31	STR000 ~ STR999	32 bit	Read/Write	*Note 1)
CHP	Parameter	CHP000.00 ~ CHP999.31	CHP000 ~ CHP999	32 bit	Read/Write	
MOR	Monitoring data	MOR01.00 ~ MOR12.31	MOR01 ~ MOR12	32 bit	Read	*Note 2)
VER	Version	-	VER	32 bit	Read	
RST	Alarm reset	RST	RST		Write	*Note 3)

*Note 1) On write, it is stored in flash memory.

*Note 2) Data depends on number

 MOR 1 : Serial No.

 MOR 2 : Fastening / Loosening time (ms)

 MOR 3 : Preset No.

 MOR 4: Target torque (unit 0.01)

 MOR 5: Target torque (unit 0.01)

 MOR 6 : RPM

 MOR 7 : A1

 MOR 8 : A2

 MOR 9 : Rotation angle (unit 0.01)

 MOR 10: Error (error if larger than 0)

 MOR 11: Fastening / Loosening status (0 for Fastening, 1 for Loosening)

 MOR 12: Complete or Not (Complete if larger than 0)

*Note 3) Command transmission address

Addresses for sending special function performance commands are write-only and can be used by registering the object's action to turn on or off bits of that address, or to enter any value.

E.g.) Click on a switch object to transmit a hold setup command

1. Registers a switch object whose ramp attributes are touched.
2. In [effects and actions] set [condition] to [event > touch down].
3. Set [action] to [Bit > RST Address Input > ON].
   (Set the maximum number of runs to 1, set the cycle, and set the delay to zero.)
4. Press the switch object in TOP to transmit the alarm reset command.