



Operation Manual

AR-401 PLC

Programmable Logic Controller

" The perfect partner for creating energy-efficient smart buildings and high-efficiency automation control. "

AR-401-PLC-1616R

AR-401-PLC-0808R

AR-727-CM-PLC-0804R



Panel PLC - DIN35



Mini PLC - DIN35

- The built-in HTTP Server enables direct programming via a browser, eliminating the need for a human-machine interface.
- Added unique intelligent building logic scheduling functionality, greatly simplifying automatic management configuration for complex IO control buildings.
- Standard with MODBUS-TCP to RTU Gateway and RS-485 IO expansion Port



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Table of Contents

1	<u>Features</u>	01
2	<u>Hardware Features</u>	01
3	<u>Logic Programming Features</u>	01
4	<u>Logic Command Table</u>	
	4-1 <u>Output Mode</u>	02
	4-1-1 Output Time Unit	
	4-2 <u>Counter/Timer Condition</u>	03
	4-3 <u>Holiday/Time-related Condition</u>	03
	4-4 <u>Input Condition</u>	05
5	<u>WEB Interface Overview</u>	
	5-1 <u>IO Expend Nodes</u>	07
	5-2 <u>IO Schedule</u>	11
	5-3 <u>Schedule Setting</u>	12
	5-4 <u>Clock</u>	22
	5-5 <u>Holiday</u>	23
6	<u>Product architecture</u>	
	6-1 <u>Access Control & WEB PLC Integration Configuration</u>	25
	6-2 <u>Introduction & Applications of Virtual Output</u>	27

6-3	WEB PLC & 701ServerSQL Communication Setting	35
6-4	Introduction of PLC Series & The functions of CH1/CH2 Ports	37
6-5	Cross-IP / Cross-PLC Cloud-Based Logic Control	38

7 [Case Study](#)

7-1	Definition of DI/DO in SOYAL PLC Ladder Diagram	44
7-2	Introduction & Applications of Edge Triggering	45
	7-2-1 Self-holding – Without Using Edge Triggering	
	7-2-2 Self-holding – Using Edge Triggering	
	7-2-3 Chart Introduction of Level & Edge Triggering	

A. Basic Applications

A-1	One-on-one Level Triggering	49
	Method 1. DI Level Triggering	
	Method 2. DO Level Triggering	
A-2	One-on-one Edge Triggering	53
	Method 1. DI Edge Triggering	
	Method 2. DO Edge Triggering	
A-3	Daily / Hourly Scheduled Triggering	57
A-4	Weekday / Holiday Scheduled triggering	59
A-5	ON/OFF Indicator Light of Traffic Lane with Infrared Sensors	62
A-6	Electric Lock Latch ON/OFF with Momentary Button	64
A-7	Trigger Motor for 2 Minutes on Every Hour	65
A-8	Motor Self-holding of Level Triggering	66
A-9	Motor Self-holding of Edge Triggering	67

B. Intermediate Applications

B-1	<u>Alarm Output with Dual Infrared Sensors</u>	69
B-2	<u>LED Scheduled Output on Weekdays</u>	71
B-3	<u>ON/OFF Flashing LED with Two Momentary Buttons</u>	73
B-4	<u>Latch & Pulse Output of LED Lights with One Button</u>	75
B-5	<u>Pulse Output for 10 Seconds Every Minute</u>	77
B-6	<u>Multiple Functions of Sequentially LED Light Outputs</u>	79
	Method 1: Application of TIMER	
	Method 2: Application of Pulse Output	
	Method 3: Application of DO Edge Trigger	
B-7	<u>Scheduled Alarm of Security Card Condition</u>	87
B-8	<u>Delay Alarm with Single Button</u>	88
B-9	<u>Dual Motors Alternating Operation</u>	90
B-10	<u>Multiple Motors Alternating Operation</u>	92

C. Advanced Application Scenarios

C-1	<u>Door Open Timeout Alarm</u>	95
C-2	<u>DI/DO One-on-one Triggering (Graphic Animation Integration)</u>	98
C-3	<u>Scrolling / Marquee Output</u>	101
C-4	<u>Four Doors Interlock</u>	104
C-5	<u>Queue Output (Pipe Output)</u>	107
C-6	<u>Calculate Motor Usage Count and Notify for Maintenance</u>	109
C-7	<u>Create a 24-hour Clock by Timer & Counter</u>	111
C-8	<u>Direction Recognition of Traffic Lane</u>	115

8 Appendix

8-1	<u>Firmware Update</u>	121
8-2	<u>Logic Schedule Export</u>	123
8-3	<u>Logic Schedule Import</u>	124
8-4	<u>FAQs</u>	125
8-5	<u>The List of WEB PLC & IO Expansion Board</u> ..	129

1. Features

The AR-401-PLC Series is a specialized programmable logic controller (PLC) designed for smart buildings.

It allows for Cloud-based Programming directly through a WEB browser and compatible with standard Modbus-TCP protocol. It's particularly suitable for integrating central monitoring, access control, and property management, especially in applications involving SCADA or SOYAL 701ClientSQL graphical animation control system.

- Built-in HTTP Server allows programming on browser directly, no need for any human-machine interface.
- Added unique intelligent building logic scheduling functionality, simplifying automatic management configuration for smart buildings.
- Digital input events can proactively notify the cloud system via TCP and automatically execute offline emergency processes.
- Built-in Calendar, Holiday, Counter, Timer and multiple DI/DO logic conditions.
- A multi-integration configuration suitable for Automatic Machines, Access Control System, Equipment Maintenance, and Graphical Control System Integration.

2. Hardware Features

- MODBUS-TCP to RTU Gateway X 1 which can be used for RTU devices and analog interfaces
- RS-485 I/O Expansion Communication Port X 1, allowing for the expansion of I/O points up to 256 points.
- Built-in Relay Outputs and 16 Optical Isolation Inputs. It can be expanded to a maximum of 256 Digital Inputs and 256 Digital Outputs

3. Logic Programming Features

- Support for Calendar and Holiday Conditions, setting via browser or 701ClientSQL Interface.
- **Logic Schedules:** Supports a web-based interface for 64 Logic Schedules.
- **Logic Conditions:** Hourly / Daily / Weekly / Calendar / Holiday / Timer / Counter / AND / OR / Edge Trigger Conditions.
- **Output Modes:** ON/OFF / One Shot / Continue Pulse / Counter / Timer
- Support for 256 DOs, including Actual Digital Outputs(up to 64) and Virtual Outputs.
- **Timer :** Support for 32 Timers, with the option to select for 0.1 / 1.0 second unit. The maximum value for a single timer is 65535. The Timer can be connected with series of Counters, enabling a time duration for more than 3000 years.
- **Counter :** Support for 32 Counters, with a maximum value of 65535 for each individual count. The counter can be linked to other counters for usage, allowing for a maximum count exceed 100 million times.

4. Instruction Table

4-1 Output Mode

Output	Explanation	Level Triggering	Edge Triggering
On	Closed circuit the assigned DO.	V	V
Off	Open circuit the assigned DO.	V	V
※Pulse	Closed circuit the assigned DO for specific seconds.	▲	V
Cycle	Closed circuit and open circuit the assigned DO continuously automatically.	X	V
Toggle	Closed circuit and open circuit the assigned DO intermittently when condition fulfilled.	X	V
※Timer(TMR)	Start counting assigned TMR when condition fulfilled. Reset to zero when condition not met.	V	▲
Counter(CNT)	Increase/Decrease assigned CNT by 1 when condition fulfilled.	X	V
※CNT RST	Reset the assigned CNT.	▲	V
Pipe	Queue output, refer case C-5 for more details.	X	V

- ※1. Pulse : Recommended to use Edge Triggering for Pulse Output, because the output time will start as condition fulfilled; if using the Level Triggering, the output will be closed circuit by condition fulfilled, but start counting when condition not met.
- ※2. Timer(TMR) : In actually, Timer support for Level Triggering only, but if you want to compare with the Edge Triggering, it is available to make a Virtual Output be ON Status, and let this Virtual Output to be the condition of assigned TMR, then it would be the “DO Level Triggering”.
- ※3. CNT RST: Recommended to use Edge Triggering for CNT RST, because the PLC will execute the reset command continuously when condition fulfilled, therefore, the PLC will reset the CNT repeatedly until the condition not met when for Level Triggering condition.

4-1-1 Output Time Unit

	Description
Fast Click <input type="checkbox"/>	Time unit of 1.0 second
Fast Click <input checked="" type="checkbox"/>	Time unit of 0.1 second

4. Instruction Table

4-2 Counter/Timer Condition

Output	Condition	Example	Explanation
Counting	LESS	Join 1 <input type="text" value="CNT :#0"/> Join 2 <input type="text" value="LESS :#1"/>	CNT 000 < CNT 001
	EQUA	Join 1 <input type="text" value="CNT :#0"/> Join 2 <input type="text" value="EQUA :#1"/>	CNT 000 = CNT 001
	MORE	Join 1 <input type="text" value="CNT :#0"/> Join 2 <input type="text" value="MORE :#1"/>	CNT 000 > CNT 001
Timing	LESS	Join 1 <input type="text" value="TMR :#0"/> Join 2 <input type="text" value="LESS :#1"/>	TMR 000 < TMR 001
	EQUA	Join 1 <input type="text" value="TMR :#0"/> Join 2 <input type="text" value="EQUA :#1"/>	TMR 000 = TMR 001
	MORE	Join 1 <input type="text" value="TMR :#0"/> Join 2 <input type="text" value="MORE :#1"/>	TMR 000 > TMR 001

※ The input field of Counter (CNT) and Timer (TMR) are fixed, Join 1 & Join 2 is the first condition group : Join 3 & Join 4 is the second condition group. Join 1 / Join 3 must be the CNT / TMR output mode, and Join 2 / Join 4 must be the LESS / EQUA / MORE conditions.

4-3 Holiday/Time-related Condition

Function	Condition	Content	Remark
Time-related Condition	Time not related	In default value, the action time is 24:00, means the logic is not related to the time condition.	Action Time <input type="text" value="24:00"/>
	Real Time Clock Triggering (TMR 32)	When you required the logic to be triggered in specific period, then it can be set with TMR 32.	For example, you need an infrared sensor condition to work from 09:00-17:00 only. Join 1 <input type="text" value="TMR :#32"/> Join 2 <input type="text" value="MORE :#0900"/> Join 3 <input type="text" value="TMR :#32"/> Join 4 <input type="text" value="LESS :#1700"/>
	Hourly Triggering	When you required the logic to be triggered in each hour, it could set the action time from 24:01-24:59.	For example, the sprinkler should work for one minute at the 25th minute of every hour. Action Time <input type="text" value="24:25"/> Mode <input type="text" value="3:Pulse"/> Out # <input type="text" value="5"/> Clicks <input type="text" value="60"/> (※ Y5 output for pulse 60 seconds.)

4. Instruction Table

Function	Condition	Content	Remark
Time-related Condition	Daily Triggering	When you required the logic to be triggered at specific time on every day, it could set the action time from 00:00-23:59.	For example, the sprinkler should start working on 12:00 every day, and triggered for 3600 seconds. Action Time <input type="text" value="12:00"/> Mode <input type="text" value="3:Pulse"/> Out # <input type="text" value="5"/> Clicks <input type="text" value="3600"/> (※ Different to Real Time Clock (TMR 32), Daily Triggering belongs to Edge Triggering, if you power-on the PLC at 12:03 or force-closed the output manually, then Daily Triggering will not work for this logic condition.)
	Weekday & Holiday Related Condition	Weekday Triggering The Logic will work on weekdays only. Holiday Triggering The Logic will work on holidays only.	1. Below has four example of weekday and holiday logic, kindly refer to it firstly. 2. Holiday can be set on WEB or 701ClientSQL. 3. The default value of each day is weekday; when the day is not being clicked as holiday, then it is weekday.

Schedule-related Conditional Time Settings:

Action Time	<input type="text" value="24:00"/>
Holiday	<input checked="" type="checkbox"/>
Sun	<input type="checkbox"/>
Mon	<input type="checkbox"/>
Tue	<input type="checkbox"/>
Wed	<input type="checkbox"/>
Thu	<input type="checkbox"/>
Fri	<input type="checkbox"/>
Sat	<input type="checkbox"/>

The logic condition operates on all of the holidays.

Action Time	<input type="text" value="24:00"/>
Holiday	<input type="checkbox"/>
Sun	<input type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input type="checkbox"/>

The logic condition operates only on weekdays. However, if Monday, Wednesday, or Friday is a holiday, the logic will not activate.

Action Time	<input type="text" value="24:00"/>
Holiday	<input checked="" type="checkbox"/>
Sun	<input type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input type="checkbox"/>

The logic condition operates on Monday, Wednesday and Friday, no matter it is weekday or holiday.

Action Time	<input type="text" value="24:00"/>
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>

The logic condition operates every day of the year. (Default)

4-4 Trigger-Related Condition Table

Conditional Type	Condition	Input/output	WEB configuration value	Explanation of Conditions
Logic	AND	DI	&Di	Close this input point
		DO	&Do	Close this output point
	AND NOT	DI	& DiN	Open this input point
		DO	&DoN	Open this output point
	OR	DI	Di	Close this input point
		DO	DO	Close this output point
	OR NOT	DI	DiN	Open this input point
		DO	DoN	Open this output point
	DI Rising	DI	^Dx	Input Point - Rising Edge Trigger
	DI Falling	DI	^.Dx	Input Point - Falling Edge Trigger
DO Rising	DO	^Dx	Output Point - Rising Edge Trigger	
DO Falling	DO	^.Dx	Output Point - Falling Edge Trigger	

DI Rising Edge Triggering & Falling Edge Triggering and DO Rising Edge Triggering & Falling Edge Triggering, both using the condition $\wedge Dx$ and $\wedge .Dx$ for parameter setting.

Therefore, each mode is differentiated by the value:

When the value is between 0 and 255, it represents the Edge Triggering for DI; when the value is between 512 and 767, it represents Edge Triggering for DO. Related examples are as follows:

4. Instruction Table

A. DI0 (X₀) Rising Edge Trigger: When the condition is met, it triggers DO5 (Y₅) ON.

Values between 0~255 represent input point edge trigger conditions; 0 = X₀.

Item	Value
Schedule	<< 0 Go to >>
Mode	2:ON/Pulse Pipe ▾
Out #	5
Clicks	0
Join 1	--- :# 0
Join 2	--- :# 0
Join 3	--- :# 0
Join 4	^Dx :# 0
	Update

B. DO1 (Y₁) Falling Edge Trigger: When the condition is met, it triggers DO5 (Y₅) ON.

Values between 512~767 represent output point edge trigger conditions; 513 = Y₁.

Item	Value
Schedule	<< 0 Go to >>
Mode	2:ON/Pulse Pipe ▾
Out #	5
Clicks	0
Join 1	--- :# 0
Join 2	--- :# 0
Join 3	--- :# 0
Join 4	^.Dx :# 513
	Update

C. Appendix [Table 4-2-1]

Values between 0~255 represent input point edge trigger conditions; 0 = X₀.

^Dx(^.Dx)	Input Point	^Dx(^.Dx)	Output Point
0	X ₀	512	Y ₀
1	X ₁	513	Y ₁
2	X ₂	514	Y ₂
...
...
...
254	X ₂₅₄	766	Y ₂₅₄
255	X ₂₅₅	767	Y ₂₅₅

5-1 IO Expend Nodes

When AR-401-IO/AR-403-IO boards are connected to the CH2 of PLC, they will be the IO expansion boards, and the Node ID of each IO expansion board defines the DI/DO range, below is the example value of IO expansion board from Node 01 to Node 15.

RCU Node		Addressing	Input	Output	Virtual
PLC Onboard		000~016	000~007	000~007	008~015 (AR401-0808R)
Node 01	<input type="checkbox"/>	016~031	016~031	016~023	023~031 (AR401-1608R)
Node 02	<input type="checkbox"/>	032~047	032~047	032~047	- - - - - (AR401-1616R)
Node 03	<input type="checkbox"/>	048~063	048~051	048~051	052~063 (AR403-0404M)
Node 04	<input type="checkbox"/>	064~079	064~079	064~071	072~079 (AR401-1608R)
Node 05	<input type="checkbox"/>	080~095	080~095	080~087	088~095 (AR401-1608R)
Node 06	<input type="checkbox"/>	096~111	096~111	096~103	104~111 (AR401-1608R)
Node 07	<input type="checkbox"/>	112~127	112~127	112~119	120~127 (AR401-1608R)
Node 08	<input type="checkbox"/>	128~143	128~143	128~135	136~143 (AR401-1608R)
Node 09	<input type="checkbox"/>	144~159	144~159	144~151	152~159 (AR401-1608R)
Node 10	<input type="checkbox"/>	160~175	160~175	160~167	168~175 (AR401-1608R)
Node 11	<input type="checkbox"/>	176~191	176~191	176~183	184~191 (AR401-1608R)
Node 12	<input type="checkbox"/>	192~207	192~207	192~199	200~207 (AR401-1608R)
Node 13	<input type="checkbox"/>	208~223	208~223	208~215	216~223 (AR401-1608R)
Node 14	<input type="checkbox"/>	224~239	224~239	224~231	232~239 (AR401-1608R)
Node 15	<input type="checkbox"/>	240~255	240~255	240~247	248~255 (AR401-1608R)

Update

- ※ The PLC Series can be paired with all of the AR-401-IO/AR-403-IO expansion boards, but please notice the DI/DO range follows the Node ID of IO expansion boards.
- ※ For instance, Node 01 AR-403-IO-0404P connect to PLC, the DI is 000~003, the Actual Output is 000~004, the Virtual Output is 005~015.
- ※ For instance, Node 02 AR-401-IO-1608R connect to PLC, the DI is 016~031, the Actual Output is 016~023, the Virtual Output is 024~031.
- ※ For instance, Node 03 AR-401-IO-0016R connect to PLC, there has no any DI, the Actual Output is 016~023, the Virtual Output is 024~031.
- ※ When designing a PLC configuration, it is recommended to place multiple independent PLCs for each area, do not connect too many IO expansion boards to one PLC unit, this offers several advantages:

1. Improved Operation Speed

Since IO expansion boards communicate with the PLC via RS485, excessive distance or too many IO expansion boards may reduce communication performance. Independent PLCs avoid this issue, ensuring faster logic operations.

2. Enhanced System Reliability

With multiple independent PLCs, a failure in one PLC will not cause the entire system to stop operating. This increases the system robustness and minimizes the downtime.

5. Interface Overview

	1	2	3	4	5	6
RCU Node		Addressing	Input	Output	Virtual	
8 PLC Onboard		000~016	000~007	000~007	008~015 (AR401-0808R)	
Node 01 <input type="checkbox"/>		016~031	016~031	016~023	023~031 (AR401-1608R)	
Node 02 <input type="checkbox"/>		032~047	032~047	032~047	--- ~ --- (AR401-1616R)	
Node 03 <input type="checkbox"/>		048~063	048~051	048~051	052~063 (AR403-0404M)	
Node 04 <input type="checkbox"/>		064~079	064~079	064~071	072~079 (AR401-1608R)	
Node 05 <input type="checkbox"/>		080~095	080~095	080~087	088~095 (AR401-1608R)	
Node 06 <input type="checkbox"/>		096~111	096~111	096~103	104~111 (AR401-1608R)	
Node 07 <input type="checkbox"/>		112~127	112~127	112~119	120~127 (AR401-1608R)	
Node 08 <input type="checkbox"/>		128~143	128~143	128~135	136~143 (AR401-1608R)	
Node 09 <input type="checkbox"/>		144~159	144~159	144~151	152~159 (AR401-1608R)	
Node 10 <input type="checkbox"/>		160~175	160~175	160~167	168~175 (AR401-1608R)	
Node 11 <input type="checkbox"/>		176~191	176~191	176~183	184~191 (AR401-1608R)	
Node 12 <input type="checkbox"/>		192~207	192~207	192~199	200~207 (AR401-1608R)	
Node 13 <input type="checkbox"/>		208~223	208~223	208~215	216~223 (AR401-1608R)	
Node 14 <input type="checkbox"/>		224~239	224~239	224~231	232~239 (AR401-1608R)	
Node 15 <input type="checkbox"/>		240~255	240~255	240~247	248~255 (AR401-1608R)	

1 RCU Node : Select Node ID

2 Enable the extension board while relevant Node ID is checked.

3 Addressing : Addressing range

4 Input : Actual Input (DI)

5 Output : Actual Output (DO)

6 Virtual : Virtual Output (DO)

※ Note: The product model behind the virtual output point is for reference only.
Please refer to the actual device connection status for the actual points.

7 Update: Press the "Update" button to update the settings.

8 This field represents the actual number of connected IO expansion board points.

5. Interface Overview

[Table 5-1-1] 256DO Configuration Table :

DO points not connected to an extension I/O board can be used as virtual output points, with statuses mirroring those of actual DO points:

■ DO Actual Output Points ■ Virtual Output Points

Device		Point Code	Assigned Points	Points															
				0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
PLC	PLC-0808R	0~15	DO:8	Y ₀	Y ₁	Y ₂	Y ₃	Y ₄	Y ₅	Y ₆	Y ₇	M ₈	M ₉	M ₁₀	M ₁₁	M ₁₂	M ₁₃	M ₁₄	M ₁₅
	PLC-1616R		DO:16	Y ₀	Y ₁	Y ₂	Y ₃	Y ₄	Y ₅	Y ₆	Y ₇	Y ₈	Y ₉	Y ₁₀	Y ₁₁	Y ₁₂	Y ₁₃	Y ₁₄	Y ₁₅
Node1	IO-1608R	16~31	DO:8	Y ₁₆	Y ₁₇	Y ₁₈	Y ₁₉	Y ₂₀	Y ₂₁	Y ₂₂	Y ₂₃	M ₂₄	M ₂₅	M ₂₆	M ₂₇	M ₂₈	M ₂₉	M ₃₀	M ₃₁
Node2	IO-1616R	32~47	DO:16	Y ₃₂	Y ₃₃	Y ₃₄	Y ₃₅	Y ₃₆	Y ₃₇	Y ₃₈	Y ₃₉	Y ₄₀	Y ₄₁	Y ₄₂	Y ₄₃	Y ₄₄	Y ₄₅	Y ₄₆	Y ₄₇
Node3	IO-0404P	48~63	DO:4	Y ₄₈	Y ₄₉	Y ₅₀	Y ₅₁	M ₅₂	M ₅₃	M ₅₄	M ₅₅	M ₅₆	M ₅₇	M ₅₈	M ₅₉	M ₆₀	M ₆₁	M ₆₂	M ₆₃
---	---	---	---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Node15	IO-0016R	240~255	DO:16	Y ₂₄₀	Y ₂₄₁	Y ₂₄₂	Y ₂₄₃	Y ₂₄₄	Y ₂₄₅	Y ₂₄₆	Y ₂₄₇	Y ₂₄₈	Y ₂₄₉	Y ₂₅₀	Y ₂₅₁	Y ₂₅₂	Y ₂₅₃	Y ₂₅₄	Y ₂₅₅

5. Interface Overview

[Table 5-1-2] :

- The WEB PLC mainboard connects to three I/O expansion boards: AR-401-IO-1608 (Station No. 001), AR-403-IO-0404 (Station No. 002), and AR-401-IO-0016 (Station No. 003).
- The WEB PLC does not have an actual station number. When connecting with 701ServerSQL, simply select an available station number slot, check it, and enter the IP of the WEB PLC.
- The station numbers for I/O expansion boards range from 001 to 015, with a maximum of 15 I/O expansion boards. The station numbers of the expansion boards should be adjusted according to their manuals. For example, AR-401-IO-1608 uses the dip switches on the panel; AR-403-IO-0404 uses Commview to modify the station number.

※Point Code = I/O Expansion Board Station Number*16 + (N - 1), where N = the relay number or the input point number on the board.

**Blue: Actual Input Points (Xn) / Black: Invalid Input Points (Non-existent) /
Green: Actual Output Points (Yn) / Red: Virtual Output Points (Mn)**

	WEB PLC Mainboard		I/O Expansion Board		I/O Expansion Board		I/O Expansion Board	
Node ID	000		001		002		003	
Name	AR-401-PLC-0808R		AR-401-IO-1608R		AR-403-IO-0404P		AR-401-IO-0016R	
Item	DI	DO	DI	DO	DI	DO	DI	DO
0	X ₀	Y ₀	X ₁₆	Y ₁₆	X ₃₂	Y ₃₂	N/A	Y ₄₈
1	X ₁	Y ₁	X ₁₇	Y ₁₇	X ₃₃	Y ₃₃	N/A	Y ₄₉
2	X ₂	Y ₂	X ₁₈	Y ₁₈	X ₃₄	Y ₃₄	N/A	Y ₅₀
3	X ₃	Y ₃	X ₁₉	Y ₁₉	X ₃₅	Y ₃₅	N/A	Y ₅₁
4	X ₄	Y ₄	X ₂₀	Y ₂₀	N/A	M ₃₆	N/A	Y ₅₂
5	X ₅	Y ₅	X ₂₁	Y ₂₁	N/A	M ₃₇	N/A	Y ₅₃
6	X ₆	Y ₆	X ₂₂	Y ₂₂	N/A	M ₃₈	N/A	Y ₅₄
7	X ₇	Y ₇	X ₂₃	Y ₂₃	N/A	M ₃₉	N/A	Y ₅₅
8	N/A	M ₈	X ₂₄	M ₂₄	N/A	M ₄₀	N/A	Y ₅₆
9	N/A	M ₉	X ₂₅	M ₂₅	N/A	M ₄₁	N/A	Y ₅₇
10	N/A	M ₁₀	X ₂₆	M ₂₆	N/A	M ₄₂	N/A	Y ₅₈
11	N/A	M ₁₁	X ₂₇	M ₂₇	N/A	M ₄₃	N/A	Y ₅₉
12	N/A	M ₁₂	X ₂₈	M ₂₈	N/A	M ₄₄	N/A	Y ₆₀
13	N/A	M ₁₃	X ₂₉	M ₂₉	N/A	M ₄₅	N/A	Y ₆₁
14	N/A	M ₁₄	X ₃₀	M ₃₀	N/A	M ₄₆	N/A	Y ₆₂
15	N/A	M ₁₅	X ₃₁	M ₃₁	N/A	M ₄₇	N/A	Y ₆₃

5-2 IO Schedule

You can review the programmed list that has been configured.

Schedule << 0 Renew >>

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	ON	000	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	TMR:000	LESS:005
001	ON	001	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	TMR:000	MORE:003	TMR:000	LESS:030
002	ON	002	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	TMR:000	MORE:015	TMR:000	LESS:025
003	ON	003	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	TMR:000	MORE:025	TMR:000	LESS:035
004	ON	017	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	TMR:000	MORE:008	TMR:000	LESS:017
005	ON	018	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	TMR:000	MORE:013	TMR:000	LESS:022
006	Cycle	005	002:025	Y	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:000
007	Cycle	007	015:001	Y	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:000
008	OFF	007	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:001
009	ON	016	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	TMR:000	LESS:012	Do:031	---:000
010	ON	019	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	TMR:000	MORE:018	TMR:000	LESS:027
011	Timer	000	33	Y	Y	Y	Y	Y	Y	Y	Y	Y	24:00	TMR:000	LESS:050	---:000	---:000



5. Interface Overview

5-3 Schedule Setting

Item	Value	Rule	Descriptions
Schedule	<< 0 >> Go to	Clear	Empty All IO Rules
Mode	2:ON		Pulse(Pipe Queue)/Cycle/Toggle accept Timed/Edge triggering only. Pipe switch is M255
Out #	0		IO#(0~255) TMR/CNT #(0~31)

[Schedule] : There are a total of 64 sets of IO Schedules available for using, from 0 to 63.

Item	Value	Rule	Descriptions
Schedule	<< 0 >> Go to	Clear	Empty All IO Rules
Mode	2:ON		Pulse(Pipe Queue)/Cycle/Toggle accept Timed/Edge triggering only. Pipe switch is M255
Out #	0		IO#(0~255) TMR/CNT #(0~31)

[Clear] : Clicking this button will clear all settings for this schedule. Remember to use the "Update" button to update the new logic setting.

Schedule	<< 0 >> Go to	Clear	Empty All IO Rules
Mode	2:ON/Pulse Pipe		Pulse(Pipe Queue)/Cycle/Toggle accept Timed/Edge triggering only. Pipe switch is M255
Out #	0:None		IO#(0~255), TMR/CNT #(0~31)
Clicks	1:OFF		Pulse(1~65535) or Cycle(1~255:1~255)
Fast Click	2:ON/Pulse Pipe		0.1 or 1.0 Second
Action	3:Pulse		Whole day(24:00),per Hour(24:01~24:59),Otherwise is Time Edge event
Time	4:Cycle		None
Holiday	5:Toggle		&Di (&DiN)
Sun	6:TIMER		&Do (&DoN)
Mon	7:CNT Inc		Idi (IdiN)
Tue	8:CNT RST		
	9:CNT Dec		

[Mode] : There are several different output modes available to select.

- **OFF** : Let the specified DO to an open-circuit state.
 - **ON/Pulse Pipe** : There has two modes in current:
 - a. ON Mode(Standard):**
Let the specified DO to an closed-circuit state.
 - b. Pipe Mode(Unique):**
Activate the pipe output mode, when DO255 (M255) virtual output is ON.
- ※For detailed operations, please refer to section [C-5 Queue Output \(Pipe Output\)](#).

- **Pulse** : Let the DO be closed circuit for specific seconds.
 ※Enter the duration time in “Clicks” field, the range of value is from 1 to 65535.
- **Cycle** : Let the DO continuously alternate between closed circuit and open circuit with assigned time. (Only applicable for Edge Triggering)

Mode	4:Cycle
Out #	5
Clicks	003:002

※Enter the duration time in “Clicks” field, the front value represents the closed circuit time, and the back value represents the open circuit time, the range of value is from 1 to 65535.

- **Toggle** : Let the DO alternate between closed circuit and open circuit when triggered.
- **TIMER** : here are total of 32 Timers available to use, from Timer 0 to Timer 31. The Timer will start running when the logic condition is fulfilled; stop running and return to default value when the logic condition is unfulfilled.
 ※Timer has count range from 0-65535, can pair to the Counter logic to achieve more count requirement, kindly refer to [C-7 Create a 24-hour Clock by Timer & Counter](#).
 ※There has a special function for Timer 32, the Real Time Clock function, when you required the logic to be triggered in specific period, then it can be set with TMR 32.

For example, you need an infrared sensor condition to work from 09:00-17:00 only, it is available to set the condition of 09:00 < Timer 32 < 17:00 as below.

- Time 00:28 will be value 28 or 0028
- Time 07:50 will be value 750 or 0750
- Time 13:52 will be value 1352 directly

Join 1	TMR	:# 32
Join 2	MORE	:# 0900
Join 3	TMR	:# 32
Join 4	LESS	:# 1700

5. Interface Overview

※Timer can be forward counting or reverse counting (countdown). The Timer will count forward when input 0 as default value; The Timer will count reverse when input positive integer as default value.

Mode	6:TIMER
Out #	1
Clicks	0

Mode	6:TIMER
Out #	1
Clicks	300

- **CNT Inc / CNT Dec / CNT RST:** The PLC has a total of 32 Counters, from Counter 0 to Counter 31. When the logical condition is fulfilled, the Counter will increase / decrease the value by one.

※Counter has the maximum value of 65535, can pair to the other Counter logic to achieve more count value requirement, kindly refer to C-7 Create a 24-hour Clock by Timer & Counter.

※Counter can be forward counting or reverse counting. “CNT Inc” for forward counting and “CNT Dec” for reverse counting

※The default value is set with “CNT RST” , for example, if we want the Counter 1 to count forward by zero, then the setting is as below,

Schedule	<< 0 Go to >>
Mode	7:CNT Inc
Out #	1

Schedule	<< 1 Go to >>
Mode	8:CNT RST
Out #	1
Clicks	0

5. Interface Overview

If we want the Counter 2 to count reverse by one hundred, then the setting is as below,

Schedule	<< 0 Go to >>
Mode	9:CNT Dec
Out #	2

Schedule	<< 1 Go to >>
Mode	8:CNT RST
Out #	2
Clicks	100

Item	Value	Rule	Descriptions
Schedule	<< 0 Go to >>	Clear	Empty All IO Rules
Mode	2:ON		Pulse(Pipe Queue)/Cycle/Toggle accept Timed/triggering only. Pipe switch is M255
Out #	0		IO#(0~255), TMR/CNT #(0~31)
Clicks	0		

[Out #] :The “Out #” field is available to input the value for Digital Output(DO) from 0~255, Timer from 0~31, Counter from 0~31.

※Output value from 0~255 has included the Actual Output & Virtual Output, including the Output from Main Board PLC to IO Expansion Boards. It is available to refer to [5-1 IO Expand Board for more details.](#)

Item	Value	Rule	Descriptions
Schedule	<< 0 Go to >>	Clear	Empty All IO Rules
Mode	2:ON		Pulse(Pipe Queue)/Cycle/Toggle accept Timed/triggering only. Pipe switch is M255
Out #	0		IO#(0~255), TMR/CNT #(0~31)
Clicks	0		Pulse(1~65535) or Cycle(1~255:1~255)
Fast Click	<input type="checkbox"/>		

[Clicks] : The “Clicks” field is available to input the value for seconds and times, when select “Pulse”, “Cycle” and “Timer” output, the number means the seconds, the details please refer to the [7.Case Study](#) or “Pulse” / “Cycle” relevant examples. When select “Counter” output in “CNT RST” , the number means the default value of specific “Counter” .

5. Interface Overview

Item	Value	Rule	Descriptions
Schedule	<< 0 Go to >>	Clear	Empty All IO Rules
Mode	2:ON		Pulse(Pipe Queue)/Cycle/Toggle accept Timed/triggering only. Pipe switch is M255
Out #	0		IO#(0~255), TMR/CNT #(0~31)
Clicks	0		Pulse(1~65535) or Cycle(1~255:1~255)
Fast Click	<input type="checkbox"/>		0.1 or 1.0 Second
Action	24:00		

[Fast Click] : When checked, the Clicks will be in units of 0.1 seconds. If unchecked, the Clicks will remain in units of 1 second.

Item	Value	Rule	Descriptions
Schedule	<< 0 Go to >>	Clear	Empty All IO Rules
Mode	2:ON/Pulse Pipe		Pulse(Pipe Queue)/Cycle/Toggle accept Timed/Edge triggering only. Pipe switch is M255
Out #	7		IO#(0~255), TMR/CNT #(0~31)
Clicks	0		Pulse(1~65535) or Cycle(1~255:1~255)
Fast Click	<input type="checkbox"/>		0.1 or 1.0 Second
Action Time	24:00		Whole day(24:00),per Hour(24:01~24:59),Otherwise is Time Edge event

[Action Time] : Divided into three settings

- a. When filled in with 00:00-23:59, it represents triggering this schedule at a fixed time point every day.
- b. When filled in with 24:00 (default value), it means that the IO trigger of this schedule is not related to time
- c. When filled in with a time point between 24:01 and 24:59, it will activate at a fixed time every hour. For example, filling in 24:15 means the output will be triggered every hour at 15th minute.

5. Interface Overview

Action Time	<input type="text" value="24:00"/>	Whole day(24:00),per Hour(24:01~24:59),Other is Time Edge event
Holiday	<input checked="" type="checkbox"/>	None
Sun	<input checked="" type="checkbox"/>	&Di (&DiN) AND Di(Not)
Mon	<input checked="" type="checkbox"/>	&Do (&DoN) AND Do(Not)
Tue	<input checked="" type="checkbox"/>	Di (DiN) OR Di(Not)
Wed	<input checked="" type="checkbox"/>	Do (DoN) OR Do(Not)
Thu	<input checked="" type="checkbox"/>	^^Dx (^Dx) Di(0~255),Do(0~255=512~767). Rising(Falling)
Fri	<input checked="" type="checkbox"/>	TMR / CNT Timer or Counter
Sat	<input checked="" type="checkbox"/>	LESS / EQUA / MORE vs. C/T Value
Join 1	<input type="text" value="---"/> :# <input type="text" value="0"/>	IO#(0~255),CT#(0-31) CT#200~231 for CNT/TMR vs CNT/TMR (0~31)

[Holiday/Weekday] : The PLC includes a holiday editing page that allows you to define specific dates as holidays.

[\[IO Expend Nodes \]](#) [\[IO Schedule \]](#) [\[Schedule Setting \]](#) [\[Clock \]](#) **[\[Holiday \]](#)**

After completing the Holiday Setting, we can define the logic condition is available to operate on weekday only / holiday only / weekday or holiday / every day.

Schedule-related Conditional Time Settings:

Action Time	<input type="text" value="24:00"/>
Holiday	<input checked="" type="checkbox"/>
Sun	<input type="checkbox"/>
Mon	<input type="checkbox"/>
Tue	<input type="checkbox"/>
Wed	<input type="checkbox"/>
Thu	<input type="checkbox"/>
Fri	<input type="checkbox"/>
Sat	<input type="checkbox"/>

The logic condition operates on all of the holidays.

Action Time	<input type="text" value="24:00"/>
Holiday	<input type="checkbox"/>
Sun	<input type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input type="checkbox"/>

The logic condition operates only on weekdays. However, if Monday, Wednesday, or Friday is a holiday, the logic will not activate.

Action Time	<input type="text" value="24:00"/>
Holiday	<input checked="" type="checkbox"/>
Sun	<input type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input type="checkbox"/>

The logic condition operates on Monday, Wednesday and Friday, no matter it is weekday or holiday.

Action Time	<input type="text" value="24:00"/>
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>

The logic condition operates every day of the year. (Default)

5. Interface Overview

Thu	<input checked="" type="checkbox"/>	^Di (^Di)	DI Rising(Falling)
Fri	<input checked="" type="checkbox"/>	TMR / CNT	Timer or Counter
Sat	<input checked="" type="checkbox"/>	LESS / EQUA / MORE	vs. C/T Value
Join 1	<input type="text" value="---"/> :#0	(0~255)	CT#200~231 for CNT/TMR vs CNT/TMR (0~31)
Join 2	<input type="text" value="---"/> :#0	(0~255)	CT Value or CT#
Join 3	TMR:#0	(0~255)	CT#200~231 for CNT/TMR vs CNT/TMR (0~31)
Join 4	LESS:#5	(0~255),*Edge Here	CT Value or CT#
<input type="button" value="Update"/>			

[Join 1-4] :Join 1- Join 4 is the condition field, here provides the rules and example for each condition

1. When having multiple conditions in one schedule, there has the logic priority required to be followed, the sequence is Timer/Counter > OR > AND.

※Edge Triggering has the priority same to Timer/Counter, but it is fixed to be set in Join 4, so the PLC will automatically arrange the logic priority, no need to consider by yourself, below is an easy example,

Wrong example		Correct example	
Item	Value	Item	Value
Schedule	<< 0 Go to >>	Schedule	<< 0 Go to >>
Mode	2:ON/Pulse Pipe	Mode	2:ON/Pulse Pipe
Out #	1	Out #	1
Clicks	0	Clicks	0
Fast Click	<input type="checkbox"/>	Fast Click	<input type="checkbox"/>
Action Time	24:00	Action Time	24:00
Holiday	<input checked="" type="checkbox"/>	Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>	Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>	Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>
Join 1	&Do:#3	Join 1	TMR:#0
Join 2	TMR:#0	Join 2	MORE:#30
Join 3	MORE:#30	Join 3	&Do:#3
Join 4	^^Dx:#0	Join 4	^^Dx:#0

5. Interface Overview

From the picture above, we can guess the programmer want to trigger DO1, and the conditions are DO3 is ON, Timer 0 is more than 30 seconds and DI0 get the Edge Triggering.

But the error content is

- &Do should be placed in final condition, but there has Edge Triggering is the condition, occupied the Join 4, so &Do should be placed in Join 3.
- Timer (TMR) is fixed to be set in Join 1 & Join 2 or Join 3 & Join 4.

Hint:

In actually, PLC support 64 Schedules, most of cases will not use all of them, therefore, it is available to utilize more Schedules to simplify the priority of setting logic with Virtual Outputs.

When using the PLC AR-401-PLC-0808R, the DO8-DO15 are Virtual Outputs, which can be utilize directly.

Step1. Separate the conditions and make them to be the Virtual Outputs.

Item	Value
Schedule	<< 0 Go to >>
Mode	2:ON/Pulse Pipe v
Out #	8
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	TMR :# 0
Join 2	MORE :# 30
Join 3	--- :# 0
Join 4	--- :# 0

Item	Value
Schedule	<< 1 Go to >>
Mode	2:ON/Pulse Pipe v
Out #	9
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	&Do :# 3
Join 2	--- :# 0
Join 3	--- :# 0
Join 4	--- :# 0

Item	Value
Schedule	<< 2 Go to >>
Mode	2:ON/Pulse Pipe v
Out #	10
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	--- :# 0
Join 2	--- :# 0
Join 3	--- :# 0
Join 4	^^Dx :# 0

5. Interface Overview

Step2. Combine the conditions of Virtual Outputs.

Item	Value
Schedule	<< 3 Go to >>
Mode	2:ON/Pulse Pipe v
Out #	1
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	&Do :#8
Join 2	&Do :#9
Join 3	&Do :#10
Join 4	--- :#0

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	ON (Pipe)	008	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	TMR:000	MORE:030	---:000	---:000
001	ON (Pipe)	009	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Do:003	---:000	---:000	---:000
002	ON (Pipe)	010	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Dx:000
003	ON (Pipe)	001	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Do:008	&Do:009	&Do:010	---:000

More details of Virtual Output can refer to [6-2 Introduction & Applications of Virtual Output](#)

2. Timer and Counter should be filled in Join 1/Join 3, while specified conditions are written in Join 2/Join 4.

Join 1	TMR :#0
Join 2	EQUA :#60
Join 3	CNT :#1
Join 4	MORE :#2

5. Interface Overview

3. Edge trigger conditions are fixed in Join 4.

Join 1	&Do	:#0
Join 2	&Do	:#1
Join 3	---	:#0
Join 4	^^Di	:#1

Join 1	&Do	:#0
Join 2	&Do	:#1
Join 3	---	:#0
Join 4	^.Di	:#1

4. When comparing the size of Timer and Counter as conditions, add 200 to the original CNT, and the system will automatically recognize it as a Timer/Counter comparison condition.

Example: Writing the condition "Counter 000 is less than Counter 001"
 (can also be interpreted as "Counter 001 is greater than or equal to Counter 000")

Join 1	CNT	:#200
Join 2	LESS	:#1
Join 3	---	:#0
Join 4	---	:#0

Example: Writing the condition "Counter 000 is equal to Counter 001":

Join 1	CNT	:#200
Join 2	EQUA	:#1
Join 3	---	:#0
Join 4	---	:#0

Example: Writing the condition "Counter 001 is greater than Counter 000"
 (can also be interpreted as "Counter 000 is less than or equal to Counter 001")

Join 1	CNT	:#201
Join 2	MORE	:#0
Join 3	---	:#0
Join 4	---	:#0

5. Interface Overview

5-4 Clock

WEB PLC supports the following clock setting modes:

Item	
Year	<input type="text" value="24"/>
Month	<input type="text" value="4"/>
Day	<input type="text" value="1"/>
Hour	<input type="text" value="10"/>
Min	<input type="text" value="33"/>
Second	<input type="text" value="50"/>
	<input type="button" value="Update"/>

A. Setting Clock via the WEB interface

- Select [Clock] at the bottom of the WEB interface → Manually update the current time and select [Update]

B. Automatic Clock Adjustment by 701ServerSQL/701ClientSQL

- Use the auto time synchronization function in 701ServerSQL to keep controllers synced :

- 1 Connect to 701ServerSQL, select [TCP_IO] under LAN, and enter [1601] as the port.

Area	IP Address	Port	Net-Point Name
000 327E/3xxE/7xxE/8xxE/716Ev5	0 . 0 . 0 . 0	0	
001 TCP_IO	192 . 168 . 1 . 179	1601	Reception

- 2 Enable 701ServerSQL Auto Time Synchronization Feature: [Setting] → [Time Attendance] → Click [Update time clock to controller at program start!]

- 3 Input two of [Auto Update Controller Clock]

- To manually sync the time, use the Download function in 701ClientSQL :

We can also use 701ClientSQL to update the clock manually.

- 1 Press "F.Download"
- 2 Press "Clock" to update the time to PLC directly.

5-5 Holiday

WEB PLC supports the following holiday setting modes:

A. Setting Holidays via the WEB interface

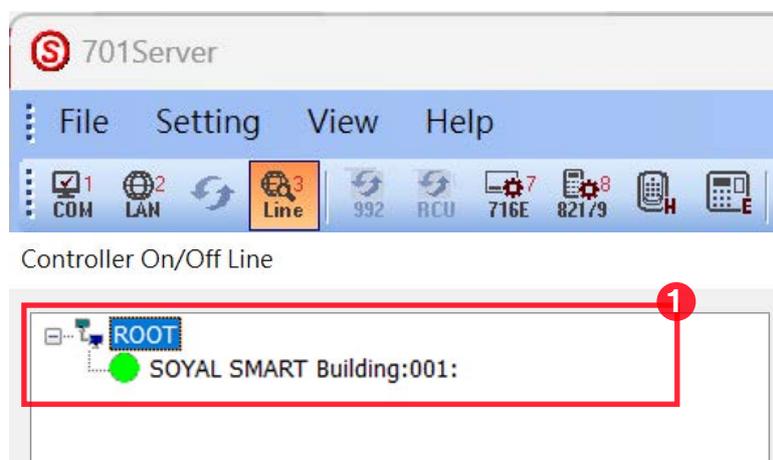
- Select [Holiday], enter the page to start editing holidays, manually enter the dates to add/delete as holidays, then click [ADD] / [DEL], [Empty all Holiday] is to clear all holidays.



B. Download Holidays via 701ClientSQL

701ServerSQL:

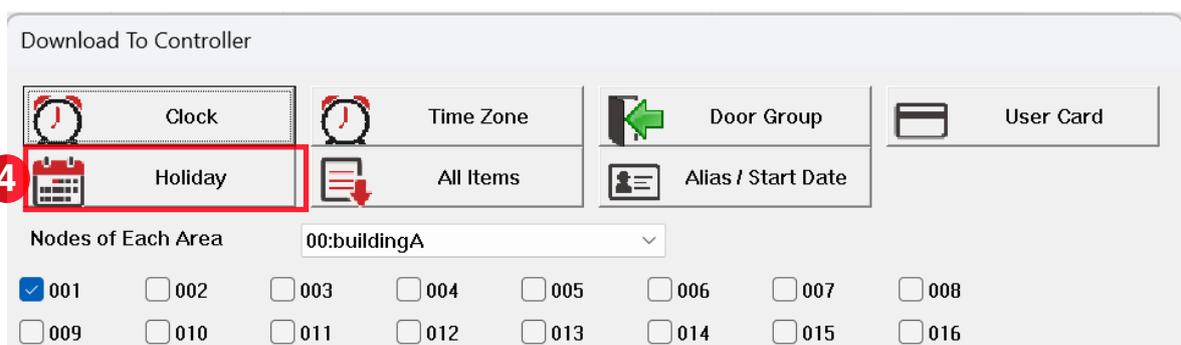
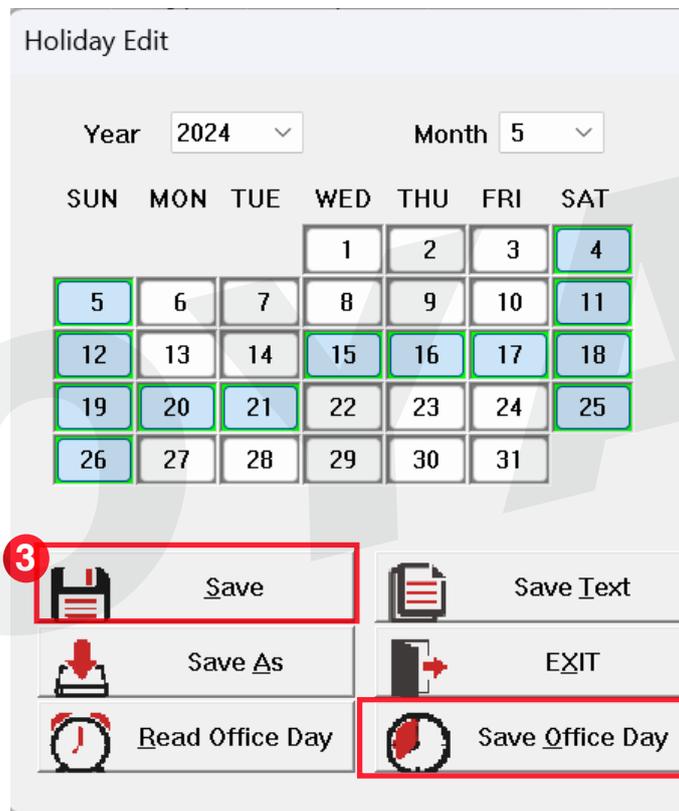
- 1 This method is similar to the process of downloading holidays using a card machine. First, ensure that the WEB PLC is connected to 701ServerSQL.



5. Interface Overview

701ClientSQL:

- 2 Click on  or select holiday editing from the settings menu, which will bring up the holiday editing window.
- 3 Click on the date to be set as a holiday, select [Save], [Save as attendance holiday file].
- 4 Click on  to download, select the WEB PLC station number, then click [5] Holiday, to download the holidays to WEB PLC.

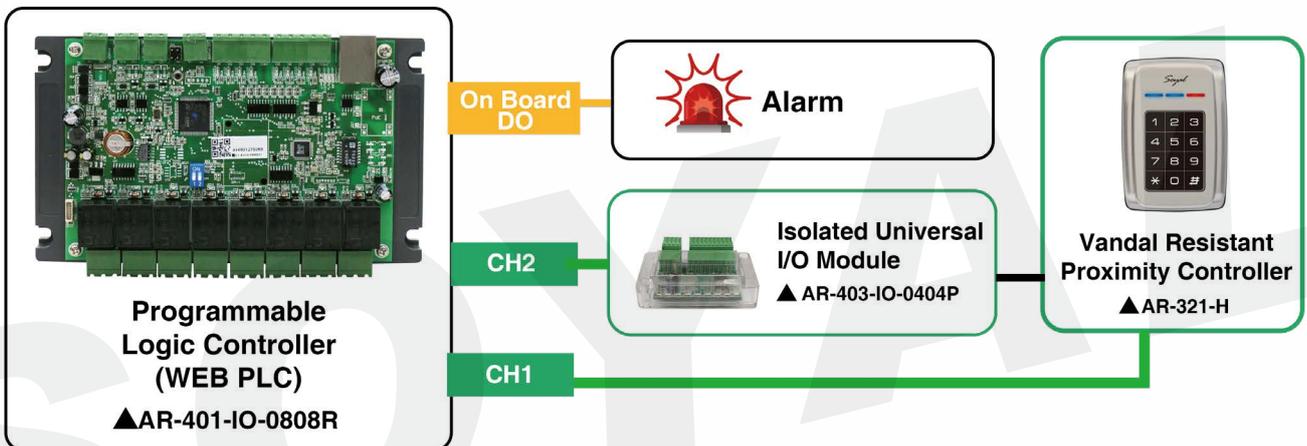


6-1 Access Control & WEB PLC Integration Configuration

1. Basic Application

This example is suitable for various access control configurations, such as the hotel lobby, office building and etc. The relay output of the card reader will be connected to the DI of WEB PLC, allowing programmers to assign the condition of DO.

For example, upon receiving a signal from DI0, DO0 can output to unlock an electronic lock for 10 seconds, DO1 can output to illuminate a light for 60 seconds, and DO2 can output to a management center panel, significantly enhancing the value of the card reader access control system.



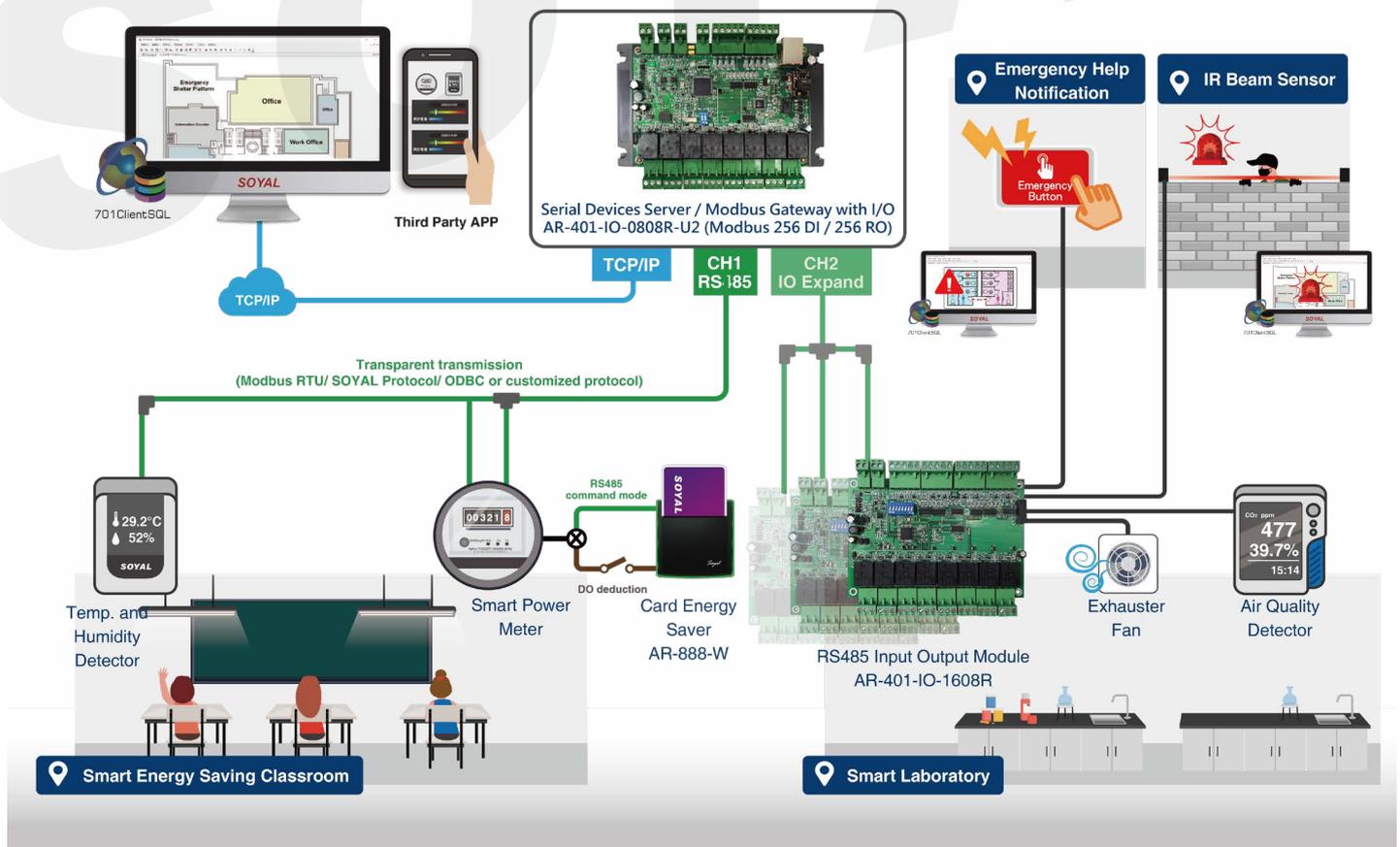
2. Advanced Application

Firstly, CH1 of the WEB PLC serves as an RS-485 to TCP transparent transmission function, serve as the converter between RS-485 devices and computers. This function not only can be used to connect SOYAL H/E Series Controllers, but also can be used to connect devices such as smart meters, energy-saving devices, and smart temperature and humidity sensors, enabling real-time monitoring of temperature, humidity, and electricity consumption data.

Based on this data, available to adjust air conditioning, lighting, and other equipment can be made in real-time to achieve smart energy savings.

CH2 is connected to the IO expansion boards, which can be connected to various boards such as AR-401-IO-1616/AR-401-IO-1608/AR-401-IO-0016 to meet the demand for more digital inputs & outputs. This part can expand up to 256DI/256DO, connecting devices such as infrared electronic fences, emergency call buttons, air quality monitors, and exhaust fans for real-time IO monitoring.

Furthermore, the graphical animation function of 701ClientSQL can simultaneously monitor the WEB PLC, remotely control the status of DO outputs, and manage the activation of on-site equipment.



6-2 Introduction & Applications of Virtual Output

Firstly, we know that the WEB PLC can connect up to 15 sets of IO expansion boards, controlling a maximum of 256 DI / 256 DO.

Each IO board, including PLC itself and IO expansion board, have 16 DI/16 DO independently in the memory of PLC.

In other words, if we connected an AR-IO-403-0404P to one PLC, it still has 16 sets of inputs and 16 sets of outputs in the memory of PLC, therefore, the input we can use is its' DI0-DI3 and DO0-DO16, DO0-DO3 are the Digital Outputs with real relay, DO4-D15 are Virtual Outputs.

Q1. What is the purpose of using a Virtual Output?

Ans 1 : No physical output required

There are two purposes of using a Virtual Output, one is Logic Condition Integration, another one is letting the output to be a manually adjustable state condition on Graphic Animation of 701ClientSQL.

Here we explain with Graphic Animation part firstly, because it is more easy to understand.

A. 701ClientSQL Graphic Control:

In Graphic Animation of 701ClientSQL, we can directly control the ON/OFF status of the PLC's Outputs, including Actual Outputs and Virtual Outputs.

But the Input are always be Actual Input, since the PLC input is monitored for real-time status, the value is 1 when the input is closed, the value is 0 when the input is open for PLC.

In Graphic Animation of 701ClientSQL, we can directly control the ON/OFF status of the PLC's Outputs, including Actual Outputs and Virtual Outputs.

But the Input are always be Actual Input, since the PLC input is monitored for real-time status, the value is 1 when the input is closed, the value is 0 when the input is open for PLC.

If there is a requirement to manually control whether the infrared sensor will execute the action by the security, you can achieve it with the integration of Actual Input, Actual Outputs and Virtual Outputs.

For example:

If the security need to cancel the alarm output function, regardless of whether the infrared is triggered or not, this can be achieved by controlled a Virtual Output manually.

PLC Model: AR-401-PLC-0808R

DI0 (X_0) is infrared sensor inputs

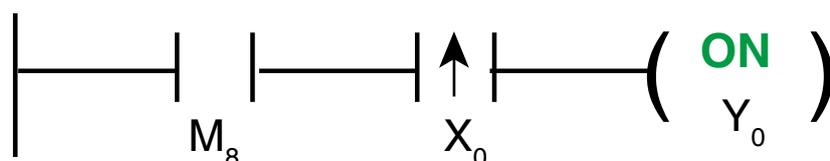
DO0 (Y_0) is alarm outputs

DO8 (M_8) is Virtual Output (manual control output) on Graphic Animation.

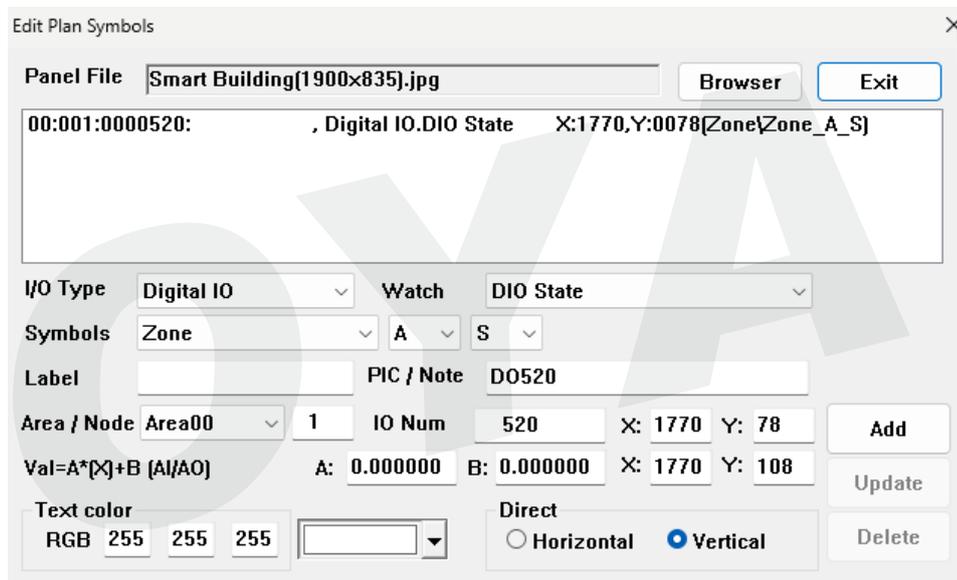
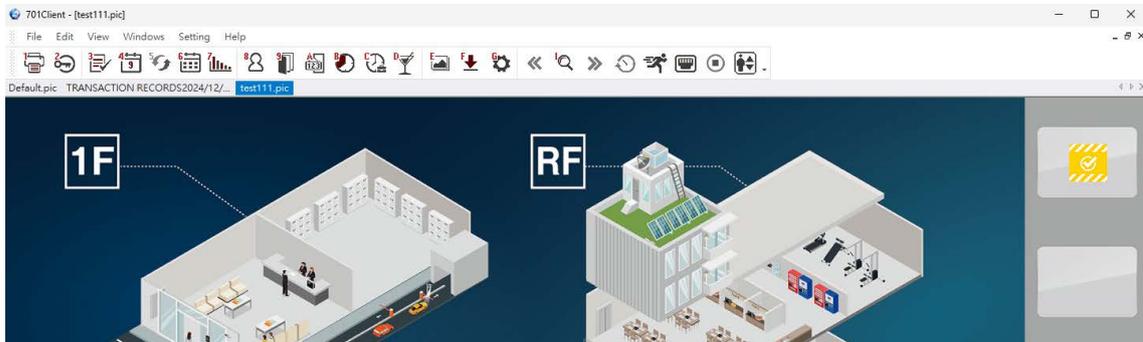
Step1. Determine the logic of alarm triggering

Here we want the alarm output Y_0 will only be X_0 Edge Triggering, with the condition that M_8 is ON status.

If M_8 is OFF status, X_0 will never trigger the alarm Y_0 .



Step2. Connect PLC to 701ServerSQL, and edit the Graphic Animation in 701ClientSQL.



※The IO Num 520 is represent the M8 Virtual Output, when the security needs to cancel/enable the alarm output function, he can manually change the status of M8 directly. The graphic will work with animation to let us know whether it is being triggered.

Related resources :

- [Connect PLC to 701ServerSQL → Refer to Paragraph 6-3 WEB PLC & 701ServerSQL Communication Setting.](#)
- [PLC and Graphic Animation Integration Example](#)

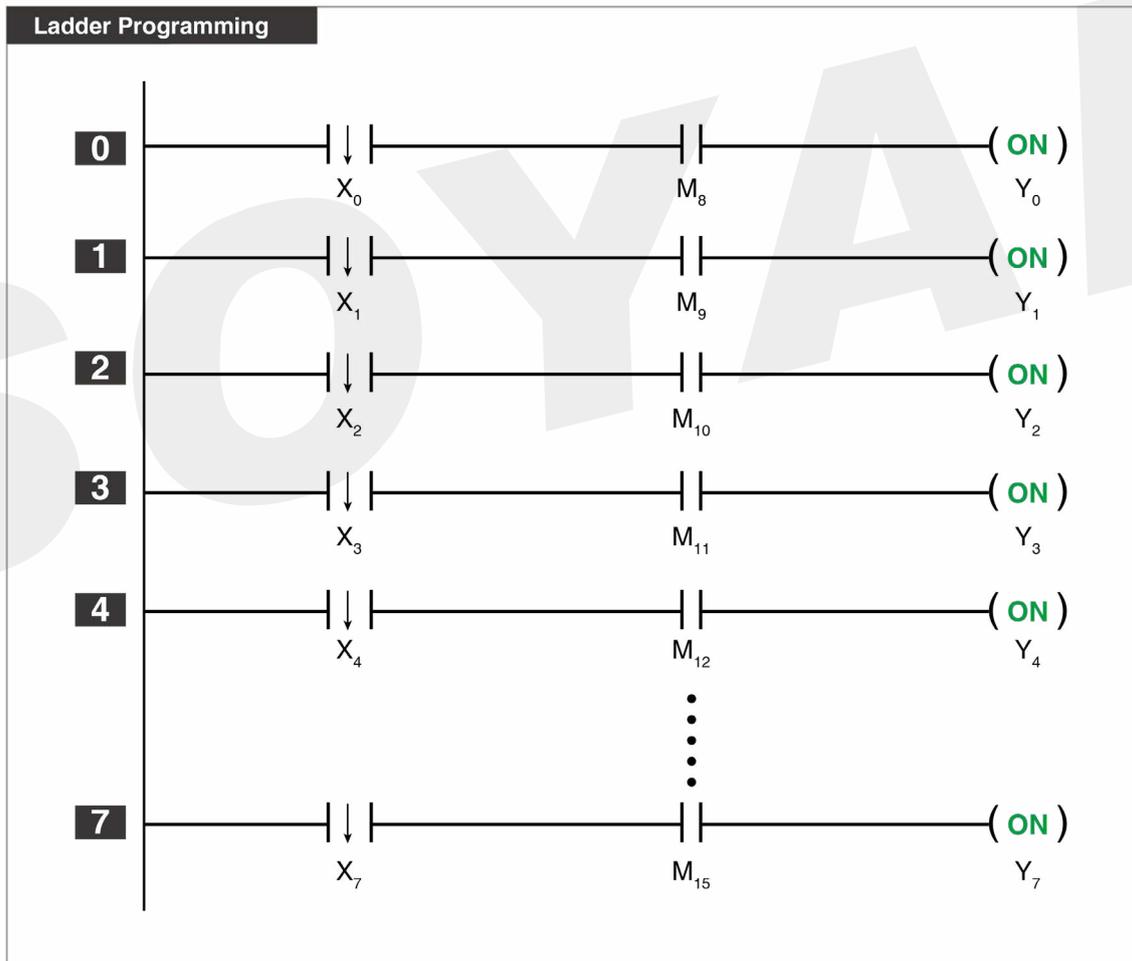
B. Logic Condition Integration

When we are programming the Logic for PLC, Virtual Output can simplify many conditions, and increase the total conditions of one Actual Output.

Example1 :

In Four-door Interlock Configuration, the condition for unlocking/locking door is pretty complex, involving the status of Door Sensor and the Lock Status of other three doors, relay output times, and etc.

Moreover, we know one schedule is only available to add with 4 conditions, the condition quantity will not enough for editing, therefore, multiple conditions can be summarized into Virtual Outputs of two or three layers, making logic programming easier.



Reference for Daily Scheduled Trigger Settings:

- [A-3 Daily / hourly scheduled triggering](#)

Example 2 :

Some of conditions have the priority issue and logic conflict in one schedule.

Join 1- Join 4 is the condition field, here provides the rules and example for each condition.

1. When having multiple conditions in one schedule, there has the logic priority required to be followed, the sequence is Timer/Counter > OR > AND.

※Edge Triggering has the priority same to Timer/Counter, but it is fixed to be set in Join 4, so the PLC will automatically arrange the logic priority, no need to consider by yourself, below is an easy example,

Wrong example		Correct example	
Item	Value	Item	Value
Schedule	<< 0 Go to >>	Schedule	<< 0 Go to >>
Mode	2:ON/Pulse Pipe ▾	Mode	2:ON/Pulse Pipe ▾
Out #	1	Out #	1
Clicks	0	Clicks	0
Fast Click	<input type="checkbox"/>	Fast Click	<input type="checkbox"/>
Action Time	24:00	Action Time	24:00
Holiday	<input checked="" type="checkbox"/>	Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>	Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>	Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>
Join 1	&Do :# 3	Join 1	TMR :# 0
Join 2	TMR :# 0	Join 2	MORE :# 30
Join 3	MORE :# 30	Join 3	&Do :# 3
Join 4	^^Dx :# 0	Join 4	^^Dx :# 0

6. Product architecture

From the picture above, we can guess the programmer want to trigger DO1, and the conditions are DO3 is ON, Timer 0 is more than 30 seconds and DI0 get the Edge Triggering.

But the error content is

- a. &Do should be placed in final condition, but there has Edge Triggering is the condition, occupied the Join 4, so &Do should be placed in Join 3.
- b. Timer (TMR) is fixed to be set in Join 1 & Join 2 or Join 3 & Join 4.

Hint:

In actually, PLC support 64 Schedules, most of cases will not use all of them, therefore, it is available to utilize more Schedules to simplify the priority of setting logic with Virtual Outputs.

When using the PLC AR-401-PLC-0808R, the DO8-DO15 are Virtual Outputs, which can be utilize directly.

Step1. Separate the conditions and make them to be the Virtual Outputs.

Item	Value	Item	Value	Item	Value
Schedule	<< 0 Go to >>	Schedule	<< 1 Go to >>	Schedule	<< 2 Go to >>
Mode	2:ON/Pulse Pipe ▾	Mode	2:ON/Pulse Pipe ▾	Mode	2:ON/Pulse Pipe ▾
Out #	8	Out #	9	Out #	10
Clicks	0	Clicks	0	Clicks	0
Fast Click	<input type="checkbox"/>	Fast Click	<input type="checkbox"/>	Fast Click	<input type="checkbox"/>
Action Time	24:00	Action Time	24:00	Action Time	24:00
Holiday	<input checked="" type="checkbox"/>	Holiday	<input checked="" type="checkbox"/>	Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>	Sun	<input checked="" type="checkbox"/>	Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>	Mon	<input checked="" type="checkbox"/>	Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>
Join 1	TMR :# 0	Join 1	&Do :# 3	Join 1	--- :# 0
Join 2	MORE :# 30	Join 2	--- :# 0	Join 2	--- :# 0
Join 3	--- :# 0	Join 3	--- :# 0	Join 3	--- :# 0
Join 4	--- :# 0	Join 4	--- :# 0	Join 4	^^Dx :# 0

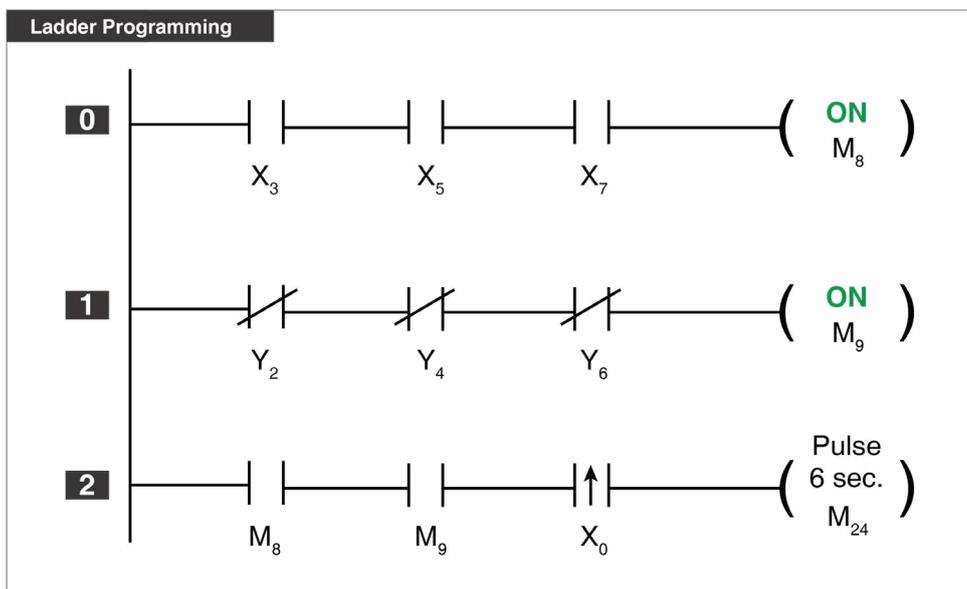
Step2. Combine the conditions of Virtual Outputs.

Item	Value
Schedule	<< 3 Go to >>
Mode	2:ON/Pulse Pipe v
Out #	1
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	&Do :# 8
Join 2	&Do :# 9
Join 3	&Do :# 10
Join 4	--- :# 0

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	ON (Pipe)	008	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	TMR:000	MORE:030	---:000	---:000
001	ON (Pipe)	009	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Do:003	---:000	---:000	---:000
002	ON (Pipe)	010	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Dx:000
003	ON (Pipe)	001	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Do:008	&Do:009	&Do:010	---:000

Ans 2 : Logical concatenation

Example: Taking the example of four-door interlocking, the condition for locking door A is complex, involving the door positions of the other three doors, lock output states, relay output times, etc. At this point, multiple conditions can be summarized into virtual points of two or three layers, making management easier.



Q2. How to calculate the address of Virtual Outputs?

Ans :

In the WEB page of the PLC, you can click on [IO Expand Nodes] at the bottom.

When IO expansion boards are connected, the Node ID of them should be selected on this page, and the table has shown with the input and output range as example, below has more information and explanation of Virtual Output Calculation.

Refer to the 256DO Point Configuration Table :

- [Table 5-1-1](#)
- [Table 5-1-2](#)

RCU Node	Addressing	Input	Output	Virtual
PLC Onboard	000~016	000~007	000~007	008~015 (AR401-0808R)
Node 01 <input checked="" type="checkbox"/>	016~031	016~031	016~023	023~031 (AR401-1608R)
Node 02 <input checked="" type="checkbox"/>	032~047	032~047	032~047	- - - ~ - - - (AR401-1616R)
Node 03 <input checked="" type="checkbox"/>	048~063	048~051	048~051	052~063 (AR403-0404M)
Node 04 <input type="checkbox"/>	064~079	064~079	064~071	072~079 (AR401-1608R)
Node 05 <input type="checkbox"/>	080~095	080~095	080~087	088~095 (AR401-1608R)
Node 06 <input type="checkbox"/>	096~111	096~111	096~103	104~111 (AR401-1608R)
Node 07 <input type="checkbox"/>	112~127	112~127	112~119	120~127 (AR401-1608R)
Node 08 <input type="checkbox"/>	128~143	128~143	128~135	136~143 (AR401-1608R)
Node 09 <input type="checkbox"/>	144~159	144~159	144~151	152~159 (AR401-1608R)
Node 10 <input type="checkbox"/>	160~175	160~175	160~167	168~175 (AR401-1608R)
Node 11 <input type="checkbox"/>	176~191	176~191	176~183	184~191 (AR401-1608R)
Node 12 <input type="checkbox"/>	192~207	192~207	192~199	200~207 (AR401-1608R)
Node 13 <input type="checkbox"/>	208~223	208~223	208~215	216~223 (AR401-1608R)
Node 14 <input type="checkbox"/>	224~239	224~239	224~231	232~239 (AR401-1608R)
Node 15 <input type="checkbox"/>	240~255	240~255	240~247	248~255 (AR401-1608R)

[\[IO Expand Nodes\]](#) [\[IO Schedule\]](#) [\[Schedule Setting\]](#) [\[Clock\]](#) [\[Holiday\]](#)

6-3 WEB PLC & 701ServerSQL Communication Setting

STEP 1 : Choose “TCP/IP Only” in COM

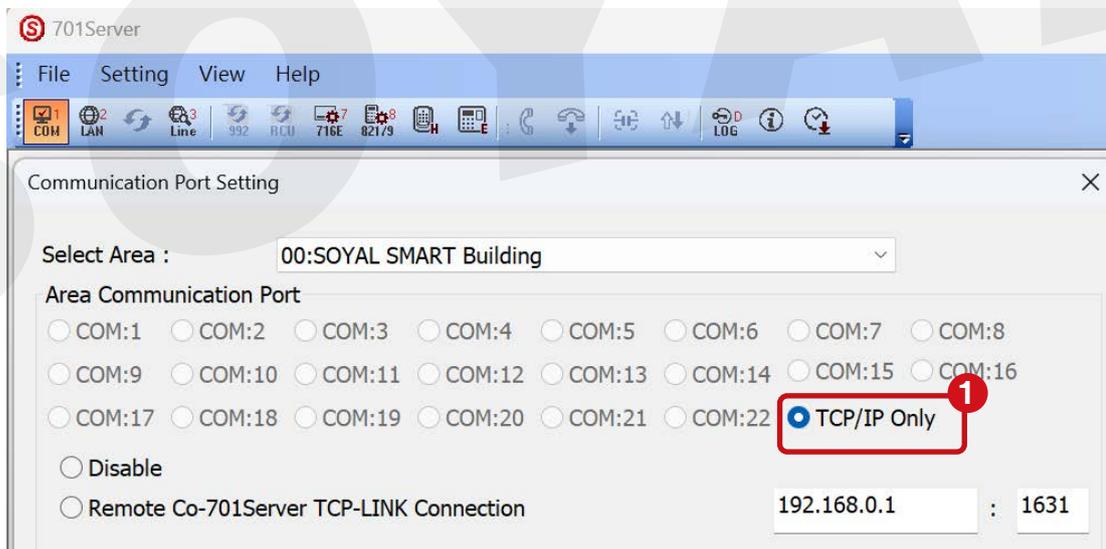
STEP 2 : Choose LAN, select an available Node ID for PLC, then select the “TCP_IO” .

STEP 3 : Check IP, enter the IP and Port of the WEB PLC.

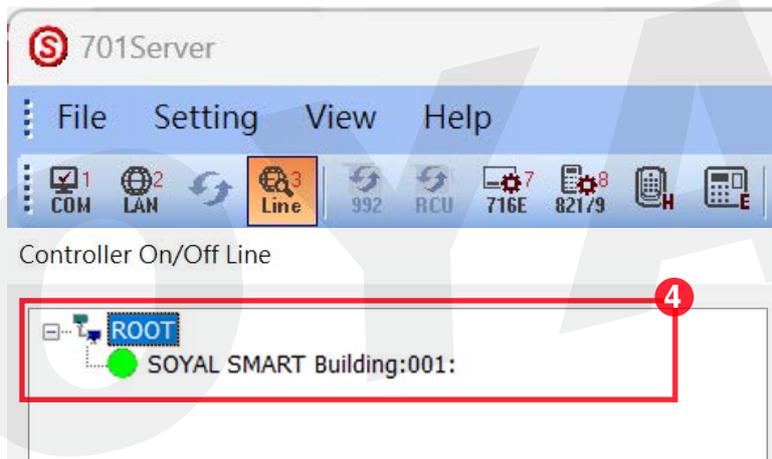
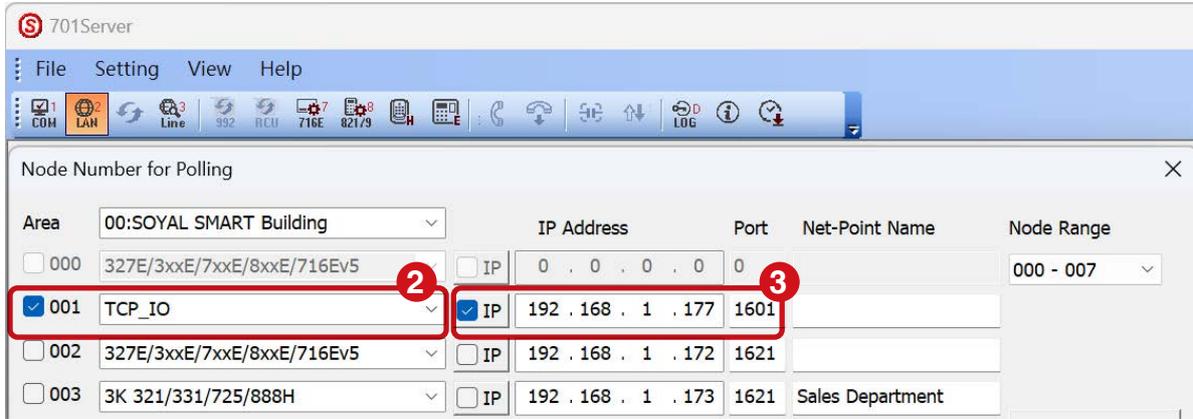
※The default Port of WEB PLC is 502 or 1601, if you want to connect to 701ServerSQL, it and both IP and Port can be modified in the WEB interface.

※ PLC do not have the Node ID in actually, but we still need to select a virtual Node ID for it when connecting the 701ServerSQL, the software will connect PLC by IP & Port, virtual Node ID will be utilize in Graphic Animation setting of 701ClientSQL if need.

STEP 4 : Confirm the connection status.



6. Product architecture



6-4 Introduction of PLC Series & The functions of CH1/CH2 Ports

1. The relationship of AR-727-CM Series and IO PLC Series

SOYAL has provided RS-485 to TCP/IP solutions using AR-727-CM series for a long time. It has CH1/CH2 for transparent transmission.

AR-727-CM-PLC-0804R and AR-401-PLC-0808R are upgraded products, both can be upgraded with WEB PLC firmware, achieving IO Logic Control while also having transparent transmission capabilities on CH1.

In practical cases, CH1 can connect devices such as smart electricity meters, energy savers, humidity sensors and etc. items to monitor real-time data. Based on this data, adjustments can be made to control devices such as air conditioning and lighting, achieving smart energy saving.

CH2 can expand up to 256DI/256DO, using IO expansion boards, to connect devices such as infrared fences, emergency buttons, air monitors for real-time control.

Furthermore, the graphic control system of 701ClientSQL can simultaneously monitor all DI/DO of the WEB PLC, remotely control the status of DO outputs, and control the on-site equipment.

2. The CH1/CH2 Function of WEB PLC

CH1: Transparent transmission, RS-485 to TCP

CH2: Connect to IO expansion boards, to control 256DI/256DO

6-5 Cross-IP / Cross-PLC Cloud-Based Logic Control

Configuration:

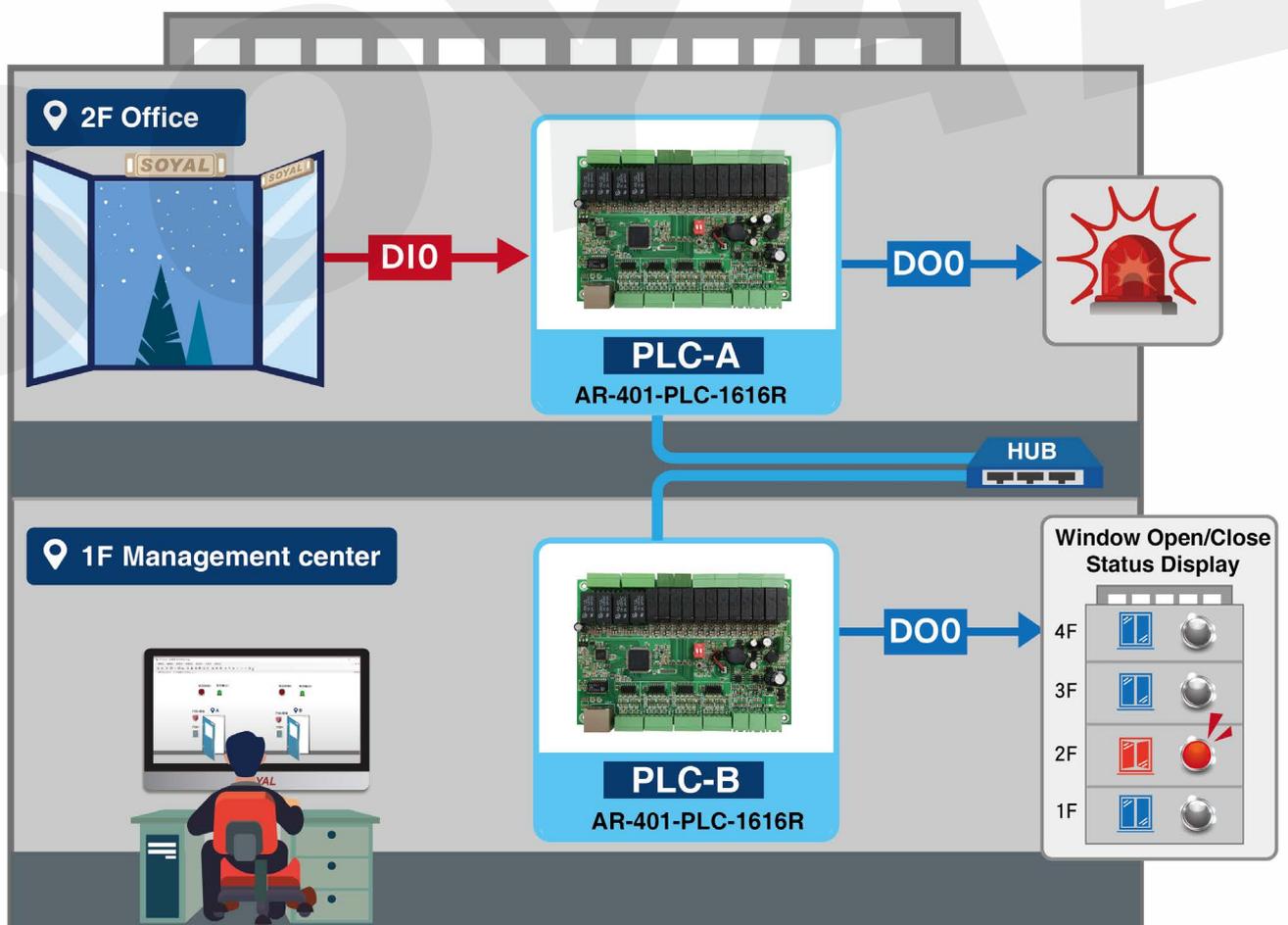
In the same network, Dual-PLC remote control can be achieved, it is good for the integration of On-site IO Controlling & Remote-site Monitoring with LED Alarm Monitor Panel.

This configuration is restricted to one-direction triggering. In other words, PLC-A will be the main PLC responsible for executing the logical operation, to get the DI status and to trigger the on-site alarm DO, while PLC-B will be installed in the remote-site control room, synchronizing the DO status of PLC-A.

Case Study:

In the office building, each floor has been installed with a PLC to monitor the window status, and in the control room, will has same pieces of PLCs be installed, to mimic the DO status of each PLC that had been installed in each floor.

The security on each floor can quickly check the window status by LED panel in real-time, and the manager in the control room can easily monitor all of the window status with LED light simultaneously.



Cross-PLC I/O Remote Trigger Configuration Method:

STEP 1 : Device IP/Port Mapping Table

	Local PLC	→ Direction →	Remote PLC
IP	192.168.1.177		192.168.1.145
TCP I/O Control Port	1601		1601

※Both PLCs must update to the special firmware: APX727i3__V0505n 240916
 1616 PLC DOx_RDOx_TRIGER UDP 遠端 DOx 同步本地 DOx.STM

STEP 2 : Set the PLC's IP/Port

Local PLC

Network Setting

After you have changed the IP address, the device will **restart** (hardware reset). You need to change the **host IP** with new IP Address in Internet Browser to **re-connect** the target. Set Control Port from 1601 to 502 will enable Onboard IO MODBUS_TCP support and enable MODBUS-TCP to RTU on Ch1/2 with Port 1621/1623.

Item	Setting
Device Name	S2E-Device
LAN IP Address	192.168.1.177
LAN Net Mask	255.255.255.0
Default Gateway	192.168.1.254
Primary DNS Server	168.95.1.1
Secondary DNS Server	168.95.192.1
MAC Address	00-13-57-06-6B-EB
HTTP Server Port	80 (80-65530)
TCP I/O Control Port	1601 Set to 502:Enable Modbus-TCP IO and Modbus-TCP to RTU on CH1/2 port 1621/1623
DHCP Client	<input type="checkbox"/>

Remote PLC

AR-727CM webPLC 1616 240916 DOx to Remote DOx

Network Setting

After you have changed the IP address, the device will **restart** (hardware reset). You need to change the **host IP** with new IP Address in Internet Browser to **re-connect** the target. Set Control Port from 1601 to 502 will enable Onboard IO MODBUS_TCP support and enable MODBUS-TCP to RTU on Ch1/2 with Port 1621/1623.

Item	Setting
Device Name	S2E-Device
LAN IP Address	192.168.1.145
LAN Net Mask	255.255.255.0
Default Gateway	192.168.1.254
Primary DNS Server	168.95.1.1
Secondary DNS Server	168.95.192.1
MAC Address	00-13-57-06-B2-6B
HTTP Server Port	80 (80~65530)
TCP I/O Control Port	1601 Set to 502:Enable Modbus-TCP IO and Modbus-TCP to RTU on CH1/2 port 1621/1623
DHCP Client	<input type="checkbox"/>

Update

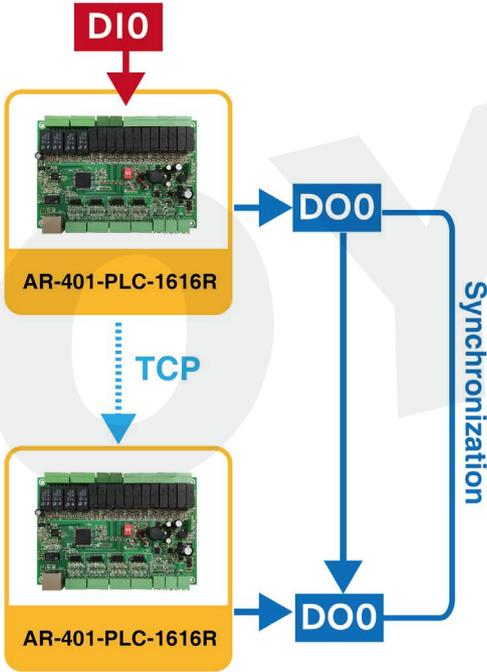
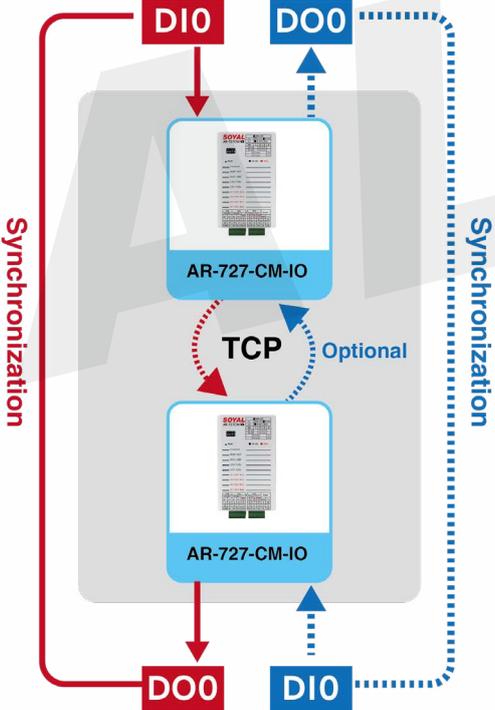
STEP 3 : IP Direction Settings

AR-727CM webPLC 1616 240916 DOx to Remote DOx

Channel-1	Setting
Protocol	TCP
Operation Mode	Server
Local Port	1621 (1024~65535)
Remote Port	1601 (1024~65535)
Remote IP	192.168.1.145
Baud Rate	9600
Data+Parity Bits	8
Parity	None
Stop Bits	1
UART <> NET delay time	10 (10~1000)ms
UART to NET minimum bytes	1024 (16~1024)
Socket Timeout	120 (0~600)sec. (TCP Client Keep Alive:0)

Update

Remote I/O Control Trigger - One-way/Two-way Trigger Architecture Comparison Table:

One-way/ Two-way Trigger	One-way Trigger	Two-way Trigger
Trigger Method	DO Triggering DO	DI Triggering DO
Applicable Products	AR-401-IO-PLC Series	AR-727-CM-IO/ AR-401-IO Series
PLC Logic Control	Yes	No
Configuration Method	WEB PLC Manual 6-5 Cross-PLC I/O Linking	AR-727-CM HTTP Server Manual 3-3 / TCP/IP Remote I/O Control Setting
Architecture	 <p>The diagram shows two AR-401-PLC-1616R units. The top unit has a red 'DIO' input and a blue 'DOO' output. The bottom unit has a blue 'DOO' input and a red 'DIO' output. A dashed blue arrow labeled 'TCP' connects the two units. A solid blue arrow labeled 'Synchronization' points from the top unit's DOO to the bottom unit's DOO.</p>	 <p>The diagram shows two AR-727-CM-IO units. The top unit has a red 'DIO' input and a blue 'DOO' output. The bottom unit has a blue 'DOO' input and a red 'DIO' output. A dashed blue arrow labeled 'TCP' connects the two units, with 'Optional' written next to it. Solid red arrows labeled 'Synchronization' point from the top unit's DOO to the bottom unit's DOO, and from the bottom unit's DIO to the top unit's DIO.</p>
Firmware Update Instructions	In this architecture, both PLCs need to update the remote trigger special firmware	The DI trigger side needs to update the special firmware, and the DO output side uses the standard firmware (※For two-way triggering, both sides need to update the special firmware)
Firmware Version	APX727i3__VXXXXXX 1616 PLC DOx_RDOx_TRIGER UDP 遠端 DOx 同步本地 DOx.STM	APX727i3__VXXXXXX 8i4o DIx_ Trigger_Remote_Dox.STM



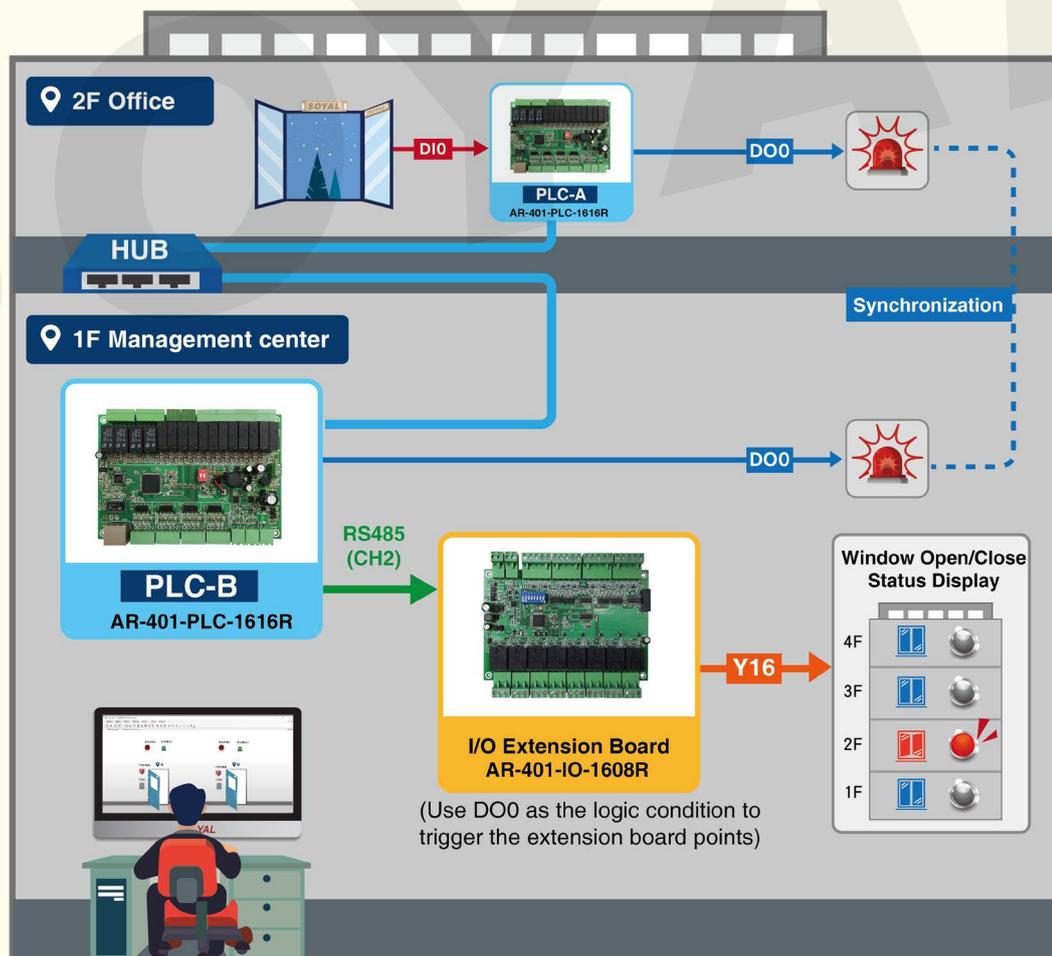
Note 1 :

The remote triggering function only work on the DO of PLC main board ($Y_0 \sim Y_{15}$), the DO of expansion IO board ($Y_{16} \sim Y_{255}$) do not have the remote triggering function, which means the DO on expansion IO boards cannot mimic the action of another PLC.

Therefore, the DO on IO expansion boards under PLC-B can still operate with the logic condition, for example that DO1 on main board be triggered by PLC-A, we can program the logic of DO16 should ON when DO1 ON.

However, the DO on PLC-B main board ($Y_0 \sim Y_{15}$), cannot operate with the logic condition, because it must to mimic the action of DO on PLC-A.

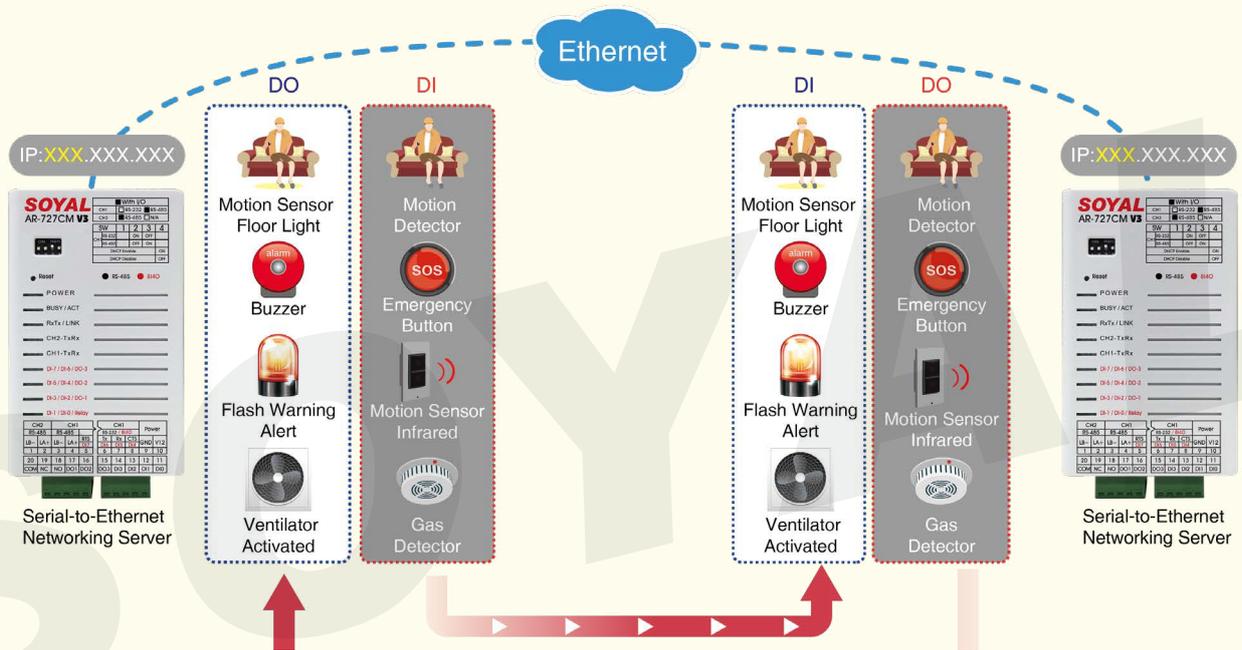
If we program the logic to make the DO2 of PLC-B ON, but the Y_2 of PLC-A is OFF in the meanwhile, it creates a logical conflict. This is why the structure only supports one-direction triggering.



Note 2 :

When AR-727-CM-IO Series with special firmware to do the remote triggering (APX727i3__V0504 231211 8i4o Dlx_Trigger_Remote_Dox.STM), it allows the DI of local AR-727-CM-IO to trigger the DO of remote AR-727-CM-IO.

Therefore, the configuration that two AR-727-CM-IO devices to be assigned to each other is logically available. The reason that the AR-401-IO-PLC series can only control in one-direction can be referenced in [Note 1](#).



7. Case Introduction

7-1 Definition of DI/DO in SOYAL PLC Ladder Diagram

When setting up the logic for PLC, it's essential to learn how to draw a ladder diagram. The ladder diagrams typically represent Digital Input(DI) with “X” and Digital Output(DO) with “Y” .

Below is the introduction of the meaning of DI/DO on SOYAL WEB PLC, and the ladder diagrams in this manual will follow this format.

$X_0 / X_1 / \dots / X_n$ are Digital Input(DI) of $DI_0(=X_0) / DI_1(=X_1) / \dots / DI_n(=X_n)$

$Y_0 / Y_1 / \dots / Y_n$ are Digital Output(DO) of $DO_0(=Y_0) / DO_1(=Y_1) / \dots / DO_n(=Y_n)$

$M_8 / M_9 / \dots / M_n$ are Virtual Output of $DO_8(=M_8) / DO_9(=M_9) / \dots / DO_n(=M_n)$

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7-2 Introduction & Applications of Edge Triggering

7-2-1 Self-holding – Without Edge Triggering

The Self-holding implies that the specific DO ON status will be its' own condition to closed circuit itself.

For example, when someone presses the emergency push button, the alarm will be triggered by the DO of PLC continuously, and it will not stop even if the hand is removed from the button or the button has stopped triggered the DI of PLC, until another alarm release button is pressed by the control center.

Refer to the following ladder diagram, where X_0 represents the emergency push button input, X_1 represents the alarm release button, and Y_0 represents the alarm output. The triggering process of the alarm output Y_0 can be divided into three steps:

- Press the emergency push button X_0 , at this time, the release button X_1 should be open circuit, and the condition of the X_0 ON & X_1 OFF is met, so the alarm output Y_0 is triggered.
- When the hand is removed from the push button, the X_0 on PLC stopped being triggered by push button, alarm output Y_0 will still be triggered, since the condition of Y_0 ON & X_1 OFF is still met.
- When the security confirm the emergency event is over, he must presses the release button to trigger X_1 , causing neither of the two conditions (X_0 ON & X_1 OFF / Y_0 ON & X_1 OFF) to be met, and then the Y_0 stops.

Schedule Setting

Item	Value
Schedule	<< 0 Go to >>
Mode	2:ON
Out #	0
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	Di :# 0
Join 2	Do :# 0
Join 3	&DiN :# 1
Join 4	--- :# 0

Update

Ladder Programming

```

graph LR
    X0((X0)) --- J1(( ))
    X1[/(X1)] --- J1
    J1 --- Y0((Y0))
    style Y0 fill:#00FF00
    
```

IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	ON	000	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	Di:000	Do:000	&DiN:001	---:000

7. Case Introduction

7-2-2 Self-holding – With Edge Triggering

SOYAL PLC provides Edge Triggering condition, significantly reducing the burden of programming.

The conditions are the same to the example 7-2-1:

X₀ represents the emergency push button input, X₁ represents the alarm release button, and Y₀ represents the alarm output. The triggering process of the alarm output Y₀ can be divided into two steps:

The activation process of the alarm output Y₀ is as follows:

- When X₀ emergency push button be triggered, fulfilling the condition of Rising Edge Triggering, Y₀ will be ON status until other conditions causing Y₀ to be OFF status.
- When the security confirm the emergency event is over, he must presses the release button to trigger X₁, an this moment, it will meet the condition of X₁ Rising Edge Triggering. Let the Y₀ to be OFF status.

For a detailed explanation of edge-triggered actions, please refer to the following:

- [6-2-3 Process of determining actions for level-triggering / rising-edge triggering / falling-edge triggering](#)

Schedule Setting

Item	Value
Schedule	<< 0 Go to >>
Mode	2:ON
Out #	0
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	---:##0
Join 2	---:##0
Join 3	---:##0
Join 4	^^Di:##0
Update	

Ladder Programming

IO Schedule

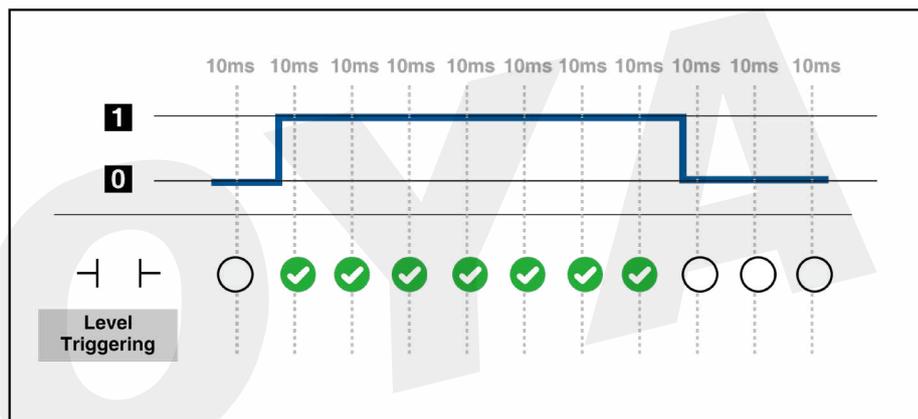
Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	ON	000	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:000
001	OFF	000	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:001

7-2-3 Chart Introduction of Level & Edge Triggering

- **Level Triggering**

Level Triggering means that the schedule continuously judges whether the conditions are met on every 0.1 seconds. If the conditions are met, the schedule executes the output ON / start Timer counting. If the conditions are not met, the schedule executes the output OFF / stop Timer counting.

From the diagram below, value 1 means the condition fulfilled; value 0 means the condition not fulfilled. Clicked circle represent the time points that PLC will execute the output "ON"; while hollow circles represent the time points for executing output "OFF"



- **Rising Edge Triggering**

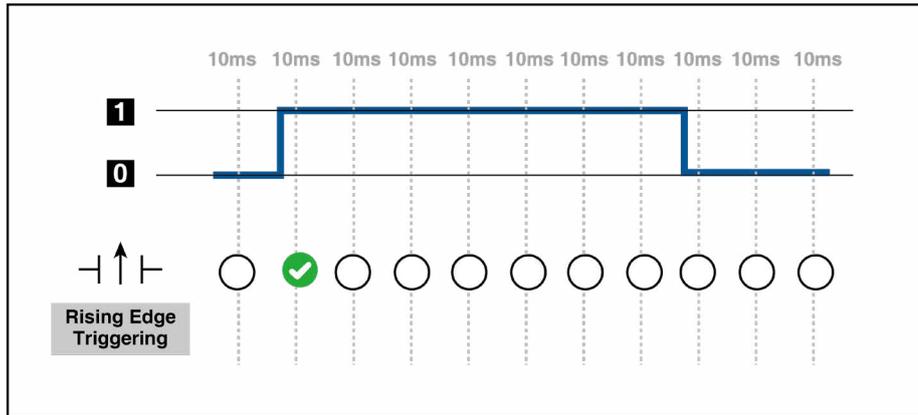
Rising Edge Triggering is one of Edge Triggering function, the condition is met at the moment that the value of DI changed from 0 to 1.

In other words, the condition of the value equal to 0, the value equal to 1 and the value of DI changed from 1 to 0, do not meet to the requirement of Rising Edge Triggering.

The output triggered by Edge Triggering will not stop even if the condition not fulfilled, it needs to wait for other OFF schedule to off it.

Common Applications: Traffic lane direction recognition / Momentary push-button cases

7. Case Introduction



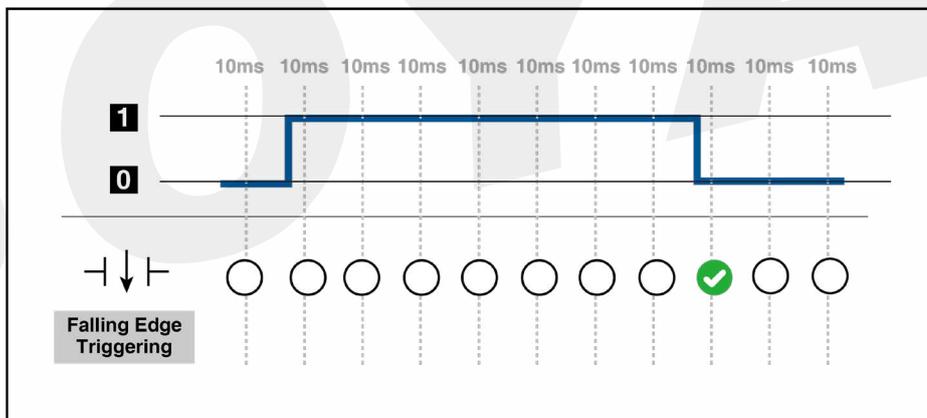
● Falling Edge Triggering

Falling Edge Triggering is one of Edge Triggering function, the condition is met at the moment that the value of DI changed from 1 to 0.

In other words, the condition of the value equal to 0, the value equal to 1 and the value of DI changed from 0 to 1, do not meet to the requirement of Falling Edge Triggering.

The output triggered by Edge Triggering will not stop even if the condition not fulfilled, it needs to wait for other OFF schedule to off it.

Common Applications: Traffic lane direction recognition / Latching button cases



● Comparison Table

Condition	Level Triggering	Edge Triggering
On	Activates "ON" when condition is met	Activates "ON" when condition is met
Off	Turns "OFF" when condition is not met	Turns "OFF" only when the "OFF" condition is met
Acts as a condition	Related to other conditions by "or" or "and"	Related to other conditions by "and"
Acts as a condition	Multiple level triggering conditions can exist within a single logic statement	Only one edge condition is allowed within a single logic statement ※Time triggering also falls under the category of edge triggering.

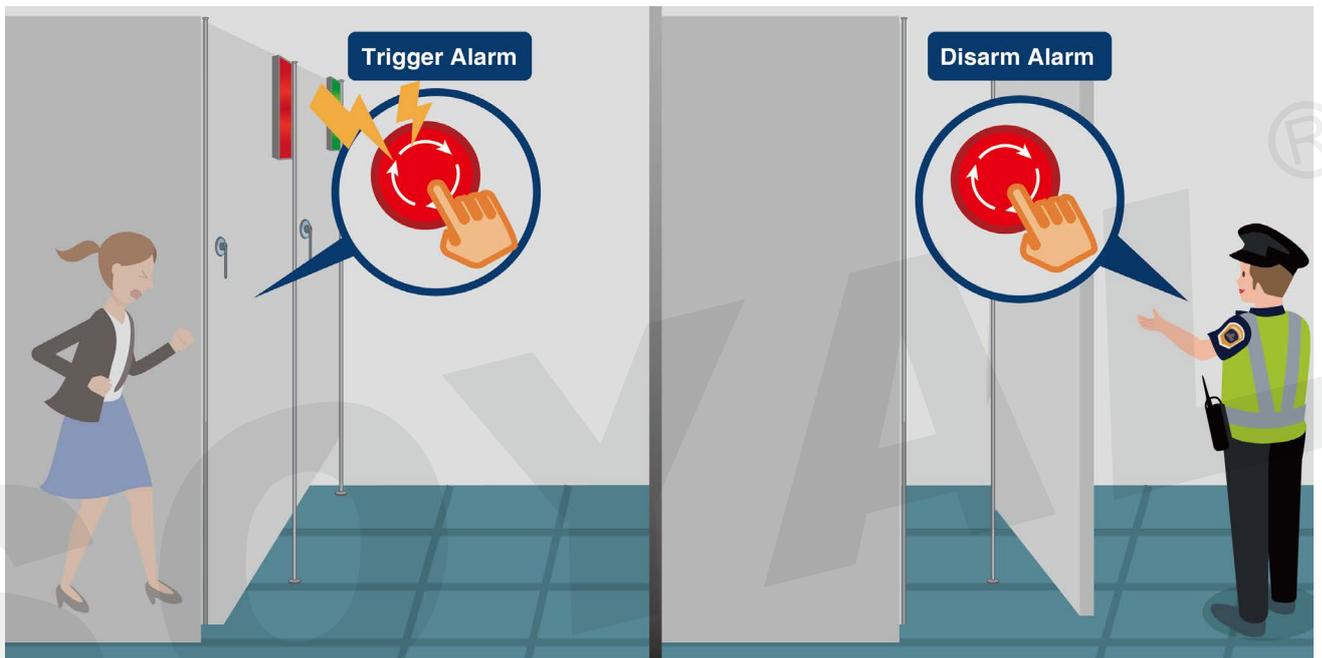
A. Basic application scenarios

A-1 One-on-one Level Triggering

Method 1: DI Level Triggering

Scenario:

The restroom equipped with latching button, which can start / stop the alarm output directly.



Conditions:

The digital input X_n can trigger the corresponding digital output Y_n .

When X_n condition is met, Y_n is triggered. When X_n condition is not met, Y_n is not triggered.

Command:

- Index 000: When X_0 is closed circuit, turn ON Y_0 ; when X_0 is open circuit, turn OFF Y_0 .
- Index 001: When X_1 is closed circuit, turn ON Y_1 ; when X_1 is open circuit, turn OFF Y_1 .
- Index 002: When X_2 is closed circuit, turn ON Y_2 ; when X_2 is open circuit, turn OFF Y_2 .

⋮

- Index 007: When X_7 is closed circuit, turn ON Y_7 ; when X_7 is open circuit, turn OFF Y_7 .

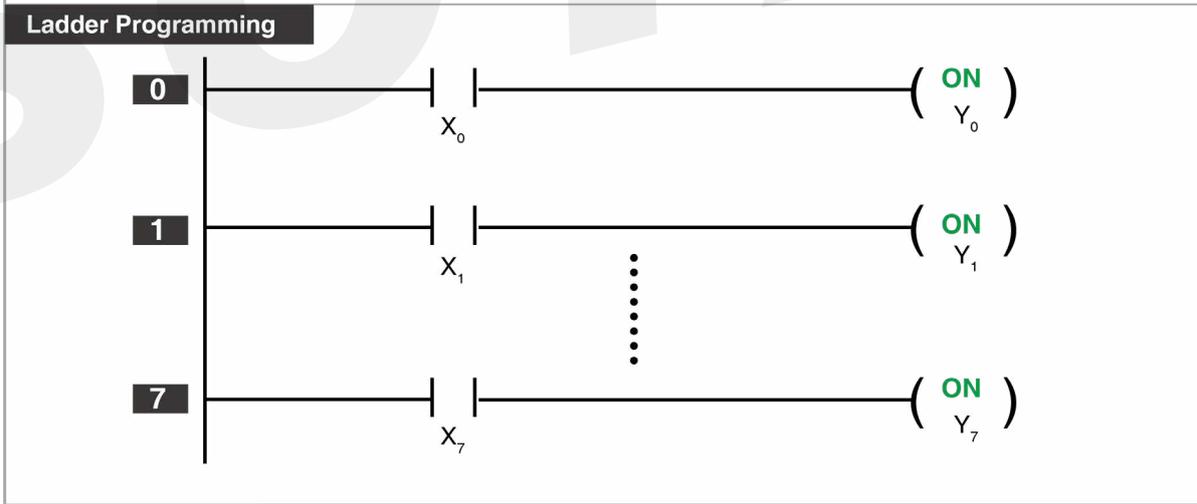
Referenced Command: Level Triggering

7. Case Introduction

Schedule Setting

Item	Value	Item	Value	Item	Value	Item	Value
Schedule	<< 0 Go to >>	Schedule	<< 1 Go to >>	Schedule	<< 2 Go to >>	Schedule	<< 3 Go to >>
Mode	2:ON/Pulse Pipe						
Out #	0	Out #	1	Out #	2	Out #	3
Clicks	0	Clicks	0	Clicks	0	Clicks	0
Fast Click	<input type="checkbox"/>						
Action Time	24:00						
Holiday	<input checked="" type="checkbox"/>						
Sun	<input checked="" type="checkbox"/>						
Mon	<input checked="" type="checkbox"/>						
Tue	<input checked="" type="checkbox"/>						
Wed	<input checked="" type="checkbox"/>						
Thu	<input checked="" type="checkbox"/>						
Fri	<input checked="" type="checkbox"/>						
Sat	<input checked="" type="checkbox"/>						
Join 1	&Di :#0	Join 1	&Di :#1	Join 1	&Di :#2	Join 1	&Di :#3
Join 2	--- :#0						
Join 3	--- :#0						
Join 4	--- :#0						

Item	Value	Item	Value	Item	Value	Item	Value
Schedule	<< 4 Go to >>	Schedule	<< 5 Go to >>	Schedule	<< 6 Go to >>	Schedule	<< 7 Go to >>
Mode	2:ON/Pulse Pipe						
Out #	4	Out #	5	Out #	6	Out #	7
Clicks	0	Clicks	0	Clicks	0	Clicks	0
Fast Click	<input type="checkbox"/>						
Action Time	24:00						
Holiday	<input checked="" type="checkbox"/>						
Sun	<input checked="" type="checkbox"/>						
Mon	<input checked="" type="checkbox"/>						
Tue	<input checked="" type="checkbox"/>						
Wed	<input checked="" type="checkbox"/>						
Thu	<input checked="" type="checkbox"/>						
Fri	<input checked="" type="checkbox"/>						
Sat	<input checked="" type="checkbox"/>						
Join 1	&Di :#4	Join 1	&Di :#5	Join 1	&Di :#6	Join 1	&Di :#7
Join 2	--- :#0						
Join 3	--- :#0						
Join 4	--- :#0						



IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	ON (Pipe)	000	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:000	---:000	---:000	---:000
001	ON (Pipe)	001	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:001	---:000	---:000	---:000
002	ON (Pipe)	002	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:002	---:000	---:000	---:000
003	ON (Pipe)	003	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:003	---:000	---:000	---:000
004	ON (Pipe)	004	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:004	---:000	---:000	---:000
005	ON (Pipe)	005	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:005	---:000	---:000	---:000
006	ON (Pipe)	006	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:006	---:000	---:000	---:000
007	ON (Pipe)	007	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:007	---:000	---:000	---:000

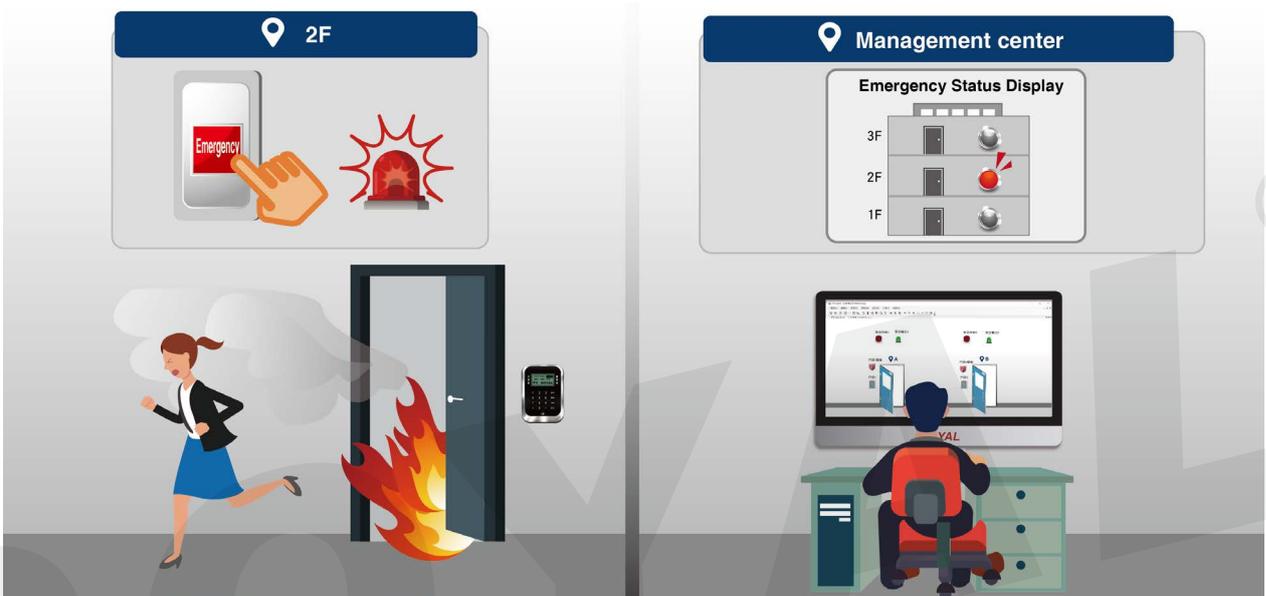
Method 2: DO Level Triggering

Scenario:

Continue to Method 1. DI Level Triggering, not only the DI can be the condition, but DO can be a condition, below steps will show how it works:

When the $Y_n/Y_{n+1}/\dots$ alarm is ON, it will also trigger other alarms $Y_m/Y_{m+1}/\dots$ to be ON status.

When the $Y_n/Y_{n+1}/\dots$ alarm is OFF, $Y_m/Y_{m+1}/\dots$ will be OFF status simultaneously.



Conditions:

The digital output Y_n can trigger the corresponding outputs, $Y_m/Y_{m+1}/\dots$.

When the Y_n ON condition is met, $Y_m/Y_{m+1}/\dots$ will be triggered. When the Y_n ON condition is not met, the output of $Y_m/Y_{m+1}/\dots$ will be OFF status.

Command Explanation:

From Method 1. DI Level Triggering we got

- Index 000: When input point X_0 is shorted, turn ON Y_0 .
- Index 001: When input point X_1 is shorted, turn ON Y_1 .
- Index 002: When input point X_2 is shorted, turn ON Y_2 .
- Index 003: When input point X_3 is shorted, turn ON Y_3 .

-
- Index 004: When output point Y_0 is activated, turn ON Y_4 .
 - Index 005: When output point Y_1 is activated, turn ON Y_5 .
 - Index 006: When output point Y_2 is activated, turn ON Y_6 .
 - Index 007: When output point Y_3 is activated, turn ON Y_7 .

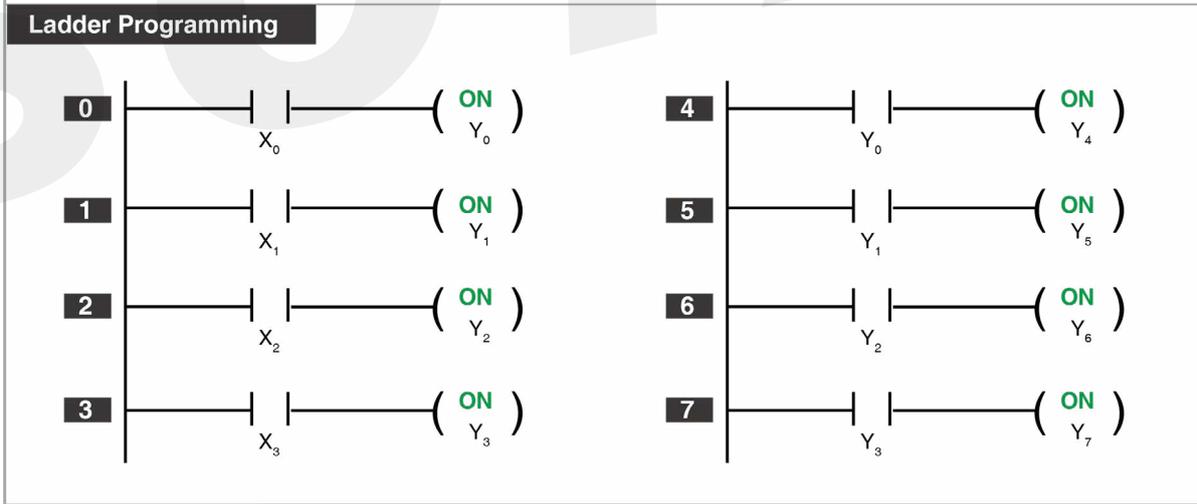
Referenced Command: Level Triggering

7. Case Introduction

Schedule Setting

Item	Value	Item	Value	Item	Value	Item	Value
Schedule	<< 0 Go to >>	Schedule	<< 1 Go to >>	Schedule	<< 2 Go to >>	Schedule	<< 3 Go to >>
Mode	2:ON/Pulse Pipe						
Out #	0	Out #	1	Out #	2	Out #	3
Clicks	0	Clicks	0	Clicks	0	Clicks	0
Fast Click	<input type="checkbox"/>						
Action Time	24:00						
Holiday	<input checked="" type="checkbox"/>						
Sun	<input checked="" type="checkbox"/>						
Mon	<input checked="" type="checkbox"/>						
Tue	<input checked="" type="checkbox"/>						
Wed	<input checked="" type="checkbox"/>						
Thu	<input checked="" type="checkbox"/>						
Fri	<input checked="" type="checkbox"/>						
Sat	<input checked="" type="checkbox"/>						
Join 1	&Di :#0	Join 1	&Di :#1	Join 1	&Di :#2	Join 1	&Di :#3
Join 2	--- :#0						
Join 3	--- :#0						
Join 4	--- :#0						

Item	Value	Item	Value	Item	Value	Item	Value
Schedule	<< 4 Go to >>	Schedule	<< 5 Go to >>	Schedule	<< 6 Go to >>	Schedule	<< 7 Go to >>
Mode	2:ON/Pulse Pipe						
Out #	4	Out #	5	Out #	6	Out #	7
Clicks	0	Clicks	0	Clicks	0	Clicks	0
Fast Click	<input type="checkbox"/>						
Action Time	24:00						
Holiday	<input checked="" type="checkbox"/>						
Sun	<input checked="" type="checkbox"/>						
Mon	<input checked="" type="checkbox"/>						
Tue	<input checked="" type="checkbox"/>						
Wed	<input checked="" type="checkbox"/>						
Thu	<input checked="" type="checkbox"/>						
Fri	<input checked="" type="checkbox"/>						
Sat	<input checked="" type="checkbox"/>						
Join 1	&Do :#0	Join 1	&Do :#1	Join 1	&Do :#2	Join 1	&Do :#3
Join 2	--- :#0						
Join 3	--- :#0						
Join 4	--- :#0						



IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	ON (Pipe)	000	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:000	---:000	---:000	---:000
001	ON (Pipe)	001	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:001	---:000	---:000	---:000
002	ON (Pipe)	002	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:002	---:000	---:000	---:000
003	ON (Pipe)	003	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:003	---:000	---:000	---:000
004	ON (Pipe)	004	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Do:000	---:000	---:000	---:000
005	ON (Pipe)	005	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Do:001	---:000	---:000	---:000
006	ON (Pipe)	006	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Do:002	---:000	---:000	---:000
007	ON (Pipe)	007	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Do:003	---:000	---:000	---:000

A-2 One-on-one Edge Triggering

Method 1: DI Edge Triggering

Scenario:

In high-security places, when the alarm has been triggered, it must be turned off by the administrator, such as pressing the release button in control room. Therefore, we can use Edge Triggering to achieve this issue quickly.

Conditions:

Ex. $X_n/X_{n+1} / \dots$ can trigger the corresponding $Y_n/Y_{n+1} / \dots$

When the X_n condition is met, Y_n will be triggered, and after the X_n condition is not met, Y_n will continue to output.

It needs additional schedule to turn off Y_n , for example, the administrator pressing alarm release button X_m .

Command Explanation:

- Index 000: When the status of X_0 fulfilled the condition of Rising Edge Triggering(from open to closed circuit), turn on Y_0 .
 - Index 001: When the status of X_1 fulfilled the condition of Rising Edge Triggering(from open to closed circuit), turn on Y_1 .
 - Index 002: When the status of X_2 fulfilled the condition of Rising Edge Triggering(from open to closed circuit), turn on Y_2 .
 - Index 003: When the status of X_3 fulfilled the condition of Rising Edge Triggering(from open to closed circuit), turn on Y_3 .
-
- Index 004: When X_4 is fulfilled the condition of Rising Edge Triggering(from open to closed circuit), turn off Y_0 .
 - Index 005: When X_4 is fulfilled the condition of Rising Edge Triggering(from open to closed circuit), turn off Y_1 .
 - Index 006: When X_4 is fulfilled the condition of Rising Edge Triggering(from open to closed circuit), turn off Y_2 .
 - Index 007: When X_4 is fulfilled the condition of Rising Edge Triggering(from open to closed circuit), turn off Y_3 .

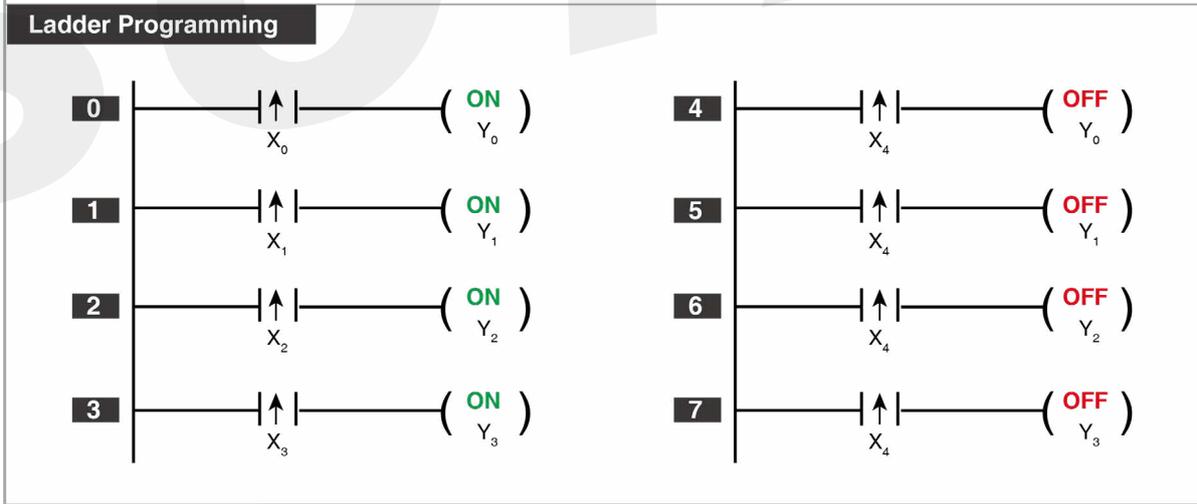
Referenced Command: Edge Triggering

7. Case Introduction

Schedule Setting

Item	Value	Item	Value	Item	Value	Item	Value
Schedule	<< 0 Go to >>	Schedule	<< 1 Go to >>	Schedule	<< 2 Go to >>	Schedule	<< 3 Go to >>
Mode	2:ON/Pulse Pipe						
Out #	0	Out #	1	Out #	2	Out #	3
Clicks	0	Clicks	0	Clicks	0	Clicks	0
Fast Click	<input type="checkbox"/>						
Action Time	24:00						
Holiday	<input checked="" type="checkbox"/>						
Sun	<input checked="" type="checkbox"/>						
Mon	<input checked="" type="checkbox"/>						
Tue	<input checked="" type="checkbox"/>						
Wed	<input checked="" type="checkbox"/>						
Thu	<input checked="" type="checkbox"/>						
Fri	<input checked="" type="checkbox"/>						
Sat	<input checked="" type="checkbox"/>						
Join 1	---:##0						
Join 2	---:##0						
Join 3	---:##0						
Join 4	^^Dx:##0	Join 4	^^Dx:##1	Join 4	^^Dx:##2	Join 4	^^Dx:##3

Item	Value	Item	Value	Item	Value	Item	Value
Schedule	<< 4 Go to >>	Schedule	<< 5 Go to >>	Schedule	<< 6 Go to >>	Schedule	<< 7 Go to >>
Mode	1:OFF	Mode	1:OFF	Mode	1:OFF	Mode	1:OFF
Out #	0	Out #	1	Out #	2	Out #	3
Clicks	0	Clicks	0	Clicks	0	Clicks	0
Fast Click	<input type="checkbox"/>						
Action Time	24:00						
Holiday	<input checked="" type="checkbox"/>						
Sun	<input checked="" type="checkbox"/>						
Mon	<input checked="" type="checkbox"/>						
Tue	<input checked="" type="checkbox"/>						
Wed	<input checked="" type="checkbox"/>						
Thu	<input checked="" type="checkbox"/>						
Fri	<input checked="" type="checkbox"/>						
Sat	<input checked="" type="checkbox"/>						
Join 1	---:##0						
Join 2	---:##0						
Join 3	---:##0						
Join 4	^^Dx:##4						



IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	ON (Pipe)	000	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Dx:000
001	ON (Pipe)	001	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Dx:001
002	ON (Pipe)	002	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Dx:002
003	ON (Pipe)	003	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Dx:003
004	OFF	000	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Dx:004
005	OFF	001	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Dx:004
006	OFF	002	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Dx:004
007	OFF	003	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Dx:004

Method 2: DO Level Triggering

Scenario:

In high-security places, there may have a multi-layer alarm configuration. For example, when the alarm in place A (Y_n) be triggered or the alarm in place B (Y_{n+1}) be triggered, central alarm (Y_m) in control room should be triggered simultaneously.

This function can simplified the integration of multi-layer triggering configuration. If we do not use with the DO Edge Triggering, then we have to rewrite all of the conditions for ($Y_n + Y_{n+1}$) to trigger central alarm Y_m .

Conditions:

Ex. $Y_n/Y_{n+1} / \dots$ can trigger the corresponding $Y_m/Y_{m+1} / \dots$

When the Y_n condition is met, Y_m will be triggered, and after the X_n condition is not met, **Y_n will continue to output.**

It needs additional schedule to turn off Y_m , for example, the administrator pressing alarm release button X_m .

Command:

- Index 000: When the status of X_0 fulfilled the condition of Rising Edge Triggering(from open to closed circuit), turn on Y_0 .
- Index 001: When the status of Y_0 fulfilled the condition of Rising Edge Triggering(from open to closed circuit), turn on Y_1 .
- Index 002: When the status of X_1 fulfilled the condition of Rising Edge Triggering(from open to closed circuit), turn off Y_0 .
- Index 003: When the status of X_1 fulfilled the condition of Rising Edge Triggering(from open to closed circuit), turn off Y_1 .

Referenced Command: Edge Triggering

7. Case Introduction

Schedule Setting

Item	Value	Item	Value	Item	Value	Item	Value
Schedule	<< 0 Go to >>	Schedule	<< 1 Go to >>	Schedule	<< 2 Go to >>	Schedule	<< 3 Go to >>
Mode	2:ON/Pulse Pipe	Mode	2:ON/Pulse Pipe	Mode	1:OFF	Mode	1:OFF
Out #	0	Out #	1	Out #	0	Out #	1
Clicks	0	Clicks	0	Clicks	0	Clicks	0
Fast Click	<input type="checkbox"/>						
Action Time	24:00						
Holiday	<input checked="" type="checkbox"/>						
Sun	<input checked="" type="checkbox"/>						
Mon	<input checked="" type="checkbox"/>						
Tue	<input checked="" type="checkbox"/>						
Wed	<input checked="" type="checkbox"/>						
Thu	<input checked="" type="checkbox"/>						
Fri	<input checked="" type="checkbox"/>						
Sat	<input checked="" type="checkbox"/>						
Join 1	---:##0						
Join 2	---:##0						
Join 3	---:##0						
Join 4	^^Dx:##0	Join 4	^^Dx:##512	Join 4	^^Dx:##1	Join 4	^^Dx:##1

Ladder Programming

```

graph TD
    R0[0] --- X0((X0))
    X0 --- Y0c((Y0))
    Y0c --- Y0o[ON]
    
    R1[1] --- Y0n((Y0))
    Y0n --- Y1c((Y1))
    Y1c --- Y1o[ON]
    
    R2[2] --- X1n((X1))
    X1n --- Y0o[OFF]
    
    R3[3] --- X1n2((X1))
    X1n2 --- Y1o2[OFF]
    
```


IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	ON (Pipe)	000	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Dx:000
001	ON (Pipe)	001	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Dx:512
002	OFF	000	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Dx:001
003	OFF	001	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Dx:001

A-3 Daily / Hourly Scheduled Triggering

WEB PLC supports three operation modes by different value fill in the “Action Time” field:

1. Time-independent Schedule (default value):

Fill in 24:00, which means this schedule is independent of time.

Example: If you fill in 24:00 and set the trigger condition as &DI3, then this schedule trigger only depends on X3, ignoring the time.

2. Daily Fixed-time Triggering

Fill in the time point in range 00:00-23:59.

This represents the schedule will be triggered at a fixed time point every day.

※Please notice that the Time Triggering belongs to Edge Triggering, therefore, the output will not stop if you choose the “ON” mode, until another schedule of “OFF” mode to stop the output.

※Time Triggering is available to use with “Pulse” mode for simpler programming, because it can stop within specific minutes/seconds.

Example1 : If you fill in 12:15 with ON schedule, it will be triggered daily at 12:15, meeting

the requirement for turning on the lighting at a fixed time every day. Conversely, you need to set an OFF schedule to stop the output.

Example2 : If you fill in 12:30 with Pulse schedule, it will be triggered daily for 600 seconds at 12:15, and stop output automatically.

3. Hourly fixed trigger

Fill in the time points within 24:01 to 24:59, triggering at a fixed minute every hour.

Example: If you fill in 24:12, it means the output will be triggered at 12 minutes past every hour, achieving the function of triggering the sprinkler system at fixed intervals every hour. Set the output condition to Pulse, with a duration of 600 seconds each hour.

7. Case Introduction

<p>1. Time-independent scheduling conditions</p>	
<p>2. Daily fixed-time trigger</p>	
<p>3. Hourly fixed trigger</p>	

7. Case Introduction

2. Weekdays trigger only

In the Week/Holiday condition, selecting only Monday to Sunday without selecting holidays means that this schedule will trigger only on weekdays.

Example: On weekdays (non-holidays), turn on the lobby lights at 8:00 in the morning and turn them off at 5:00 in the afternoon.

Schedule Setting

Item	Value
Schedule	<< 0 Go to >>
Mode	2:ON ▾
Out #	0
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	08:00
Holiday	<input type="checkbox"/>
Sun	<input type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input type="checkbox"/>
Join 1	--- :# 0
Join 2	--- :# 0
Join 3	--- :# 0
Join 4	--- :# 0
<input type="button" value="Update"/>	

Item	Value
Schedule	<< 1 Go to >>
Mode	1:OFF ▾
Out #	0
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	17:00
Holiday	<input type="checkbox"/>
Sun	<input type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input type="checkbox"/>
Join 1	--- :# 0
Join 2	--- :# 0
Join 3	--- :# 0
Join 4	--- :# 0
<input type="button" value="Update"/>	

Holiday

Month 1 :Day 27

Month 1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1 Jan	1																														

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60

3. Holiday & Specific Weekdays trigger

In the Week/Holiday condition, selecting both Monday to Sunday and holidays means that this schedule will trigger on specified weekdays or holidays.

Example: Whenever it's Wednesday or a holiday, turn on the driveway lights at 6:00 in the evening and turn them off at 10:00 at night.

Schedule Setting	
Item	Value
Schedule	<< 0 Go to >>
Mode	2:ON/Pulse Pipe ▾
Out #	0
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	18:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input type="checkbox"/>
Mon	<input type="checkbox"/>
Tue	<input type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input type="checkbox"/>
Fri	<input type="checkbox"/>
Sat	<input type="checkbox"/>
Join 1	--- :#0
Join 2	--- :#0
Join 3	--- :#0
Join 4	--- :#0
	Update

Item	Value
Schedule	<< 1 Go to >>
Mode	1:OFF ▾
Out #	0
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	22:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input type="checkbox"/>
Mon	<input type="checkbox"/>
Tue	<input type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input type="checkbox"/>
Fri	<input type="checkbox"/>
Sat	<input type="checkbox"/>
Join 1	--- :#0
Join 2	--- :#0
Join 3	--- :#0
Join 4	--- :#0
	Update

7. Case Introduction

A-5 ON/OFF Indicator Light of Traffic Lane with Infrared Sensors

Conditions:

1. At the entrance of the driveway, when the infrared sensor X_0 is triggered, it activates the opposite exit signal light Y_0 .
2. The signal light operates in a cycle of ON for 0.3 seconds > OFF for 0.3 seconds > ON for 0.3 seconds > OFF for 0.3 seconds, and so on.
3. At the end of the driveway entrance, there's another set of infrared sensors (X_1). The signal light Y_0 stops outputting only after a vehicle triggers X_1 and leaves.
4. The above operation sequence is triggered only on holidays, defined here as Fridays, Saturdays, and Sundays (excluding public holidays).
5. For holiday settings, refer to section [5-5: Holiday Editing](#). You can manually select holidays in the [Holiday] section or edit and download them in 701ClientSQL.

Commands:

- Index 000: Output Y_0 operates in a cycle mode, with a time unit of ON for 0.3 seconds and OFF for 0.3 seconds, repeating. It triggers only on holidays (requires setting holidays throughout the year firstly), with the trigger condition being the Rising Edge Triggering of X_0 .
- Index 001: Turns off Y_0 , triggered by holidays or the Falling Edge Triggering of X_1 .

Referenced Command:

Cycle / Holiday / Rising Edge Triggering / Falling Edge Triggering

7. Case Introduction

Schedule Setting

Item	Value	Item	Value
Schedule	<< 0 Go to >>	Schedule	<< 1 Go to >>
Mode	4:Cycle	Mode	1:OFF
Out #	0	Out #	0
Clicks	003:003	Clicks	0
Fast Click	<input type="checkbox"/>	Fast Click	<input type="checkbox"/>
Action Time	24:00	Action Time	24:00
Holiday	<input checked="" type="checkbox"/>	Holiday	<input checked="" type="checkbox"/>
Sun	<input type="checkbox"/>	Sun	<input type="checkbox"/>
Mon	<input type="checkbox"/>	Mon	<input type="checkbox"/>
Tue	<input type="checkbox"/>	Tue	<input type="checkbox"/>
Wed	<input type="checkbox"/>	Wed	<input type="checkbox"/>
Thu	<input type="checkbox"/>	Thu	<input type="checkbox"/>
Fri	<input type="checkbox"/>	Fri	<input type="checkbox"/>
Sat	<input type="checkbox"/>	Sat	<input type="checkbox"/>
Join 1	---:##0	Join 1	---:##0
Join 2	---:##0	Join 2	---:##0
Join 3	---:##0	Join 3	---:##0
Join 4	^^Di:##0	Join 4	^.Di:##1
Update		Update	

Ladder Programming

Cycle: ON 0.3 sec. >
 OFF 0.3 sec. > ON 0.3
 sec. > ...

IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	Cycle	000	003:003	-	-	-	-	-	-	-	-	Y	24:00	---:000	---:000	---:000	^^Di:000
001	OFF	000	---	-	-	-	-	-	-	-	-	Y	24:00	---:000	---:000	---:000	^.Di:001

7. Case Introduction

A-6 Electric Lock Latch ON/OFF with Momentary Button

Conditions:

The table is equipped with a momentary button, which needs to trigger the lock output with ON/OFF/ON/OFF/.. status each time when we trigger single momentary button.

Command Explanation:

Index 000: Y₀ operates in Toggle mode, triggered by the Rising Edge of X₀.

Referenced Command:

Toggle / Edge Triggering

Schedule Setting

Item	Value
Schedule	<< 0 Go to >>
Mode	5:Toggle
Out #	0
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	--- :# 0
Join 2	--- :# 0
Join 3	--- :# 0
Join 4	^^Di :# 0

Update

Ladder Programming

```

graph LR
    R0[0] --- X0((X0))
    X0 --- Toggle((Toggle))
    Toggle --- Y0[Y0]
    Y0 --- ONOFF[ON/OFF]
    
```

A-7 Trigger Motor for 2 Minutes on Every Hour

Conditions:

At the 01 minute of each hour, Motor (Y2) will start for 120 seconds and automatically stop when the time is up.

Commands:

This configuration uses Pulse output for 120 seconds, triggered only by the time condition.

The Action Time is set for 24:01 to 24:59, which will trigger every hour. For detailed differences, refer to [Action Time](#).

Referenced Command:

Pulse Output / Action Time

Schedule Setting

Item	Value
Schedule	<< 0 Go to >>
Mode	3:Pulse
Out #	2
Clicks	120
Fast Click	<input type="checkbox"/>
Action Time	24:01
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	---:##0
Join 2	---:##0
Join 3	---:##0
Join 4	---:##0

Update

Ladder Programming

IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	Pulse	002	120	-	Y	Y	Y	Y	Y	Y	Y	Y	24:01	---:000	---:000	---:000	---:000

7. Case Introduction

A-8 Motor Self-holding of Level Triggering

Conditions:

From [A-6 Electric Lock Latch ON/OFF with Momentary Button](#), we could understand how to change the output with ON/OFF/ON/OFF/.. status by each time when we trigger single momentary button.

Case A-8 will teach you how to use two momentary buttons to achieve the same output of ON/OFF/ON/OFF/.. status, pressing button A to latch ON motor and then pressing button B to OFF it.

Commands :

Index 000: When X0 be triggered and X1 is open circuit status at the same time, Y0 will be ON. As Y0 is ON, it will trigger Y0 ON when X1 is open circuit status at the same time. When X1 is closed circuit status, Y0 will never be ON status.

Referenced Command: Level Triggering

Schedule Setting

Item	Value
Schedule	<< 0 Go to >>
Mode	2:ON
Out #	0
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	Di :# 0
Join 2	Do :# 0
Join 3	&DiN :# 1
Join 4	--- :# 0

Ladder Programming

```

graph LR
    X0((X0)) --- X1[/(X1)]
    X0 --- Y0((Y0))
    Y0 --- X1
    Y0 --- Y0_coil((ON Y0))
    
```

Motor

IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	ON	000	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	Di:000	Do:000	&DiN:001	---:000

A-9 Motor Self-holding of Edge Triggering

PLC supports Edge Triggering as the condition, allowing for the simple design of self-holding with the same operation as [A-8 Motor Self-holding of Level Triggering](#).

Commands :

- Index000: When the X_0 fulfill the Rising Edge Triggering condition, the value of X_0 got from 0 to 1, then Y_0 will be triggered as ON status, and the ON status will not stop until another schedule to “off” it.
- Index001: When the X_1 fulfill the Rising Edge Triggering condition, the value of X_1 got from 0 to 1, then Y_0 will be triggered as OFF status, and the OFF status will not stop until another schedule to “on” it.

※Edge Trigger conditions must be set in Join4.

Referenced Command: Edge Trigger / ON / OFF

Schedule Setting

0

Item	Value
Schedule	<< 0 Go to >>
Mode	2:ON
Out #	0
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	---:#0
Join 2	---:#0
Join 3	---:#0
Join 4	^^Di:#0

1

Item	Value
Schedule	<< 1 Go to >>
Mode	1:OFF
Out #	0
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	---:#0
Join 2	---:#0
Join 3	---:#0
Join 4	^^Di:#1

Ladder Programming

0

1

Motor

IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	ON	000	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:000
001	OFF	001	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:001

B. Intermediate Applications

B-1 Alarm Output with Dual Infrared Sensors

Conditions:

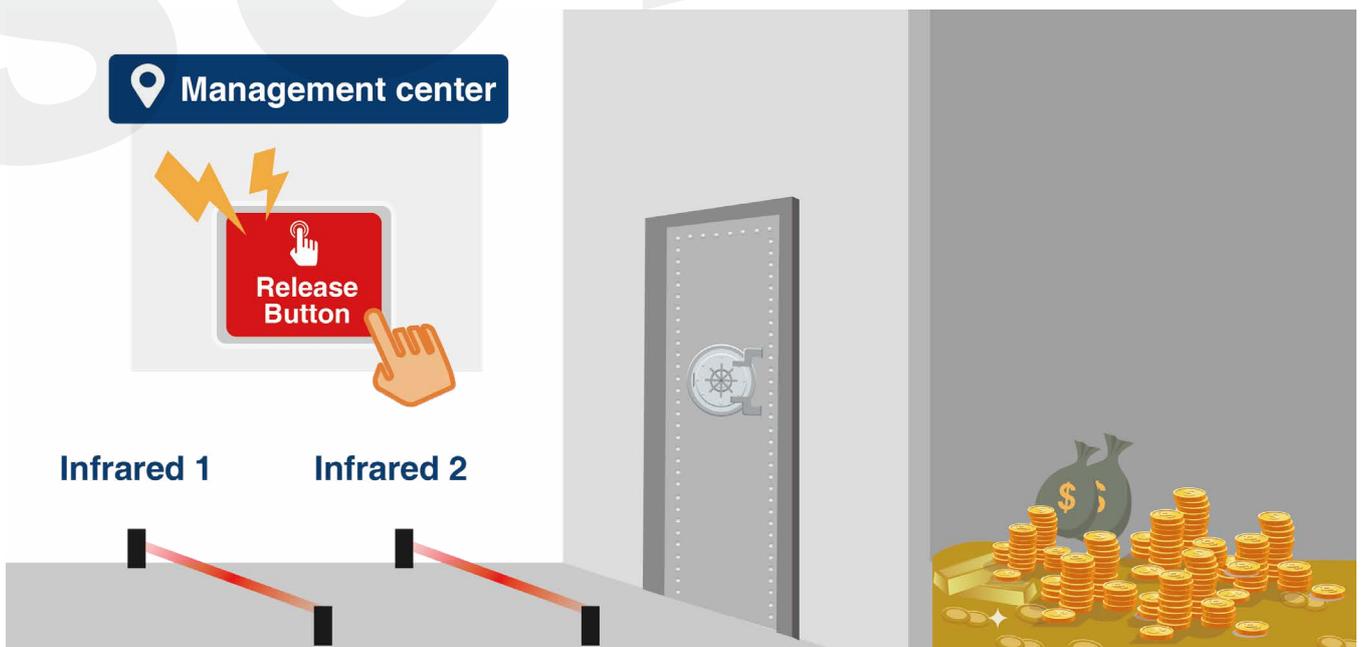
There is a dual-infrared sensor alarm system (with Infrared A / Infrared B), when Infrared A is triggered, one Timer will count from 0 to 30 seconds. If Infrared B is also been triggered within this 30 seconds, the alarm system will be activated.

The alarm needs to be stopped by pressing the release button.

Commands :

- Index 000: Infrared A (X_0) triggers M_8 by Rising Edge Triggering condition.
- Index 001: When M_8 is ON status, TIMER 000 will count from 0 to 65535 seconds.
- Index 002: When TIMER 000 count and equal to 30, M_8 turns off.
- Index 003: While M_8 is ON, Infrared B (X_1) has been triggered by Rising Edge Triggering condition, Y_0 alarm will be activated.
- Index 004: Control room can press the release button (X_2) by Rising Edge Triggering condition, closing alarm Y_0 .

Referenced Command: Rising Edge trigger / TIMER / ON / OFF



7. Case Introduction

Schedule Setting

Item	Value	Item	Value	Item	Value
Schedule	<< 0 Go to >>	Schedule	<< 1 Go to >>	Schedule	<< 2 Go to >>
Mode	2:ON/Pulse Pipe	Mode	6:TIMER	Mode	1:OFF
Out #	8	Out #	0	Out #	8
Clicks	0	Clicks	0	Clicks	0
Fast Click	<input type="checkbox"/>	Fast Click	<input type="checkbox"/>	Fast Click	<input type="checkbox"/>
Action Time	24:00	Action Time	24:00	Action Time	24:00
Holiday	<input checked="" type="checkbox"/>	Holiday	<input checked="" type="checkbox"/>	Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>	Sun	<input checked="" type="checkbox"/>	Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>	Mon	<input checked="" type="checkbox"/>	Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>
Join 1	--- :#0	Join 1	&Do :#8	Join 1	TMR :#0
Join 2	--- :#0	Join 2	--- :#0	Join 2	EQUA :#30
Join 3	--- :#0	Join 3	--- :#0	Join 3	--- :#0
Join 4	^^Di :#0	Join 4	--- :#0	Join 4	--- :#0

Item	Value	Item	Value
Schedule	<< 3 Go to >>	Schedule	<< 4 Go to >>
Mode	2:ON/Pulse Pipe	Mode	1:OFF
Out #	0	Out #	0
Clicks	0	Clicks	0
Fast Click	<input type="checkbox"/>	Fast Click	<input type="checkbox"/>
Action Time	24:00	Action Time	24:00
Holiday	<input checked="" type="checkbox"/>	Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>	Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>	Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>
Join 1	&Do :#8	Join 1	--- :#0
Join 2	--- :#0	Join 2	--- :#0
Join 3	--- :#0	Join 3	--- :#0
Join 4	^^Di :#1	Join 4	^^Di :#2

Ladder Programming

```

graph TD
    subgraph Rung_0 [0]
        X0((X0)) --> M8coil((M8))
        style M8coil fill:#00FF00
    end
    subgraph Rung_1 [1]
        M8nc[| M8 |] --> TMRcoil((TMR 000))
    end
    subgraph Rung_2 [2]
        TMRtimer[TMR 000 = 30] --> M8offcoil((M8))
        style M8offcoil fill:#FF0000
    end
    subgraph Rung_3 [3]
        M8on[X M8] --> X1on[X X1] --> Y0oncoil((Y0))
        style Y0oncoil fill:#00FF00
    end
    subgraph Rung_4 [4]
        X2on[X X2] --> Y0offcoil((Y0))
        style Y0offcoil fill:#FF0000
    end
  
```

B-2 LED Scheduled Output on Weekdays

Conditions:

1. LED flash on weekdays, from Monday to Friday, activating for 90 minutes each time.
This Schedule will not work on Saturdays, Sundays and holidays.
2. This schedule activate on a fixed time 8:30 AM.
3. The flashing function is ON for 0.5 seconds > OFF for 0.2 seconds > ON for 0.5 seconds > OFF for 0.2 seconds, and so on.

Commands:

- Index 000: The Cycle Output condition, there are four conditions as below:
 1. Activate Y₇ when all conditions fulfilled; the output function is ON 0.5 > OFF 0.2 > ON 0.5 > OFF 0.2 seconds, and so on.
 2. Fast Click has been click, the schedule will run with the time unit 0.1 seconds.
 3. Action time is 08:30.
 4. Action date is Monday, Tuesday, Wednesday, Thursday, Friday, not including Saturday, Sunday and Holiday.
※The schedule will not work when Monday to Friday is holiday. Relevant conditions can refer to the [4-3 Holiday/Time-related Condition](#).
- Index 001: OFF Y₇ when the time is 09:59.

Referenced Command:

Holiday / Time Triggering / Fast Click / Cycle Output

7. Case Introduction

Schedule Setting

0

Item	Value
Schedule	<< 0 Go to >>
Mode	4:Cycle
Out #	7
Clicks	005:002
Fast Click	<input checked="" type="checkbox"/>
Action Time	08:30
Holiday	<input type="checkbox"/>
Sun	<input type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input type="checkbox"/>
Join 1	---:#0
Join 2	---:#0
Join 3	---:#0
Join 4	---:#0
<input type="button" value="Update"/>	

1

Item	Value
Schedule	<< 1 Go to >>
Mode	1:OFF
Out #	7
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	09:59
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	---:#0
Join 2	---:#0
Join 3	---:#0
Join 4	---:#0
<input type="button" value="Update"/>	

Ladder Programming

0

RTC ——— (Cycle)
Y₇

① Monday ~ Friday
② 8:30

1

RTC ——— (OFF)
Y₇

① 9:59

(Unit :0.1 Sec)

IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	Cycle	007	005:002	Y	-	Y	Y	Y	Y	Y	-	-	08:30	---:000	---:000	---:000	---:000
001	OFF	007	---	-	Y	Y	Y	Y	Y	Y	Y	Y	09:59	---:000	---:000	---:000	---:000

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72

B-3 ON/OFF Flashing LED with Two Momentary Buttons

Similar to the case of [B-2 LED Scheduled Output on Weekdays](#), but in this case, it required to use two momentary buttons for triggering LED ON/OFF separately, the output mode is the same.

Conditions:

1. LED flashing for 90 minutes each time, without weekday & holiday restriction.
2. This schedule activate by button A, stop by button B.
3. The flashing function is ON for 0.5 seconds > OFF for 0.2 seconds > ON for 0.5 seconds > OFF for 0.2 seconds, and so on.

Commands:

- Index 000: The Cycle Output condition, there are two conditions as below:
 1. Activate Y_3 when X_7 fulfills Rising Edge Triggering condition.
 2. The output function is ON 0.5 > OFF 0.2 > ON 0.5 > OFF 0.2 seconds, and so on.

※Edge Triggering Condition must be set in Join4.

Referenced Command:

Cycle Output / Rising Edge Triggering

7. Case Introduction

Schedule Setting

0

Item	Value
Schedule	<< 0 Go to >>
Mode	4:Cycle ▾
Out #	3
Clicks	005:002
Fast Click	<input checked="" type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	---:# 0
Join 2	---:# 0
Join 3	---:# 0
Join 4	^^Di :# 7

1

Item	Value
Schedule	<< 1 Go to >>
Mode	1:OFF ▾
Out #	3
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	---:# 0
Join 2	---:# 0
Join 3	---:# 0
Join 4	^^Di :# 6

Ladder Programming

0

1

Action Mode: 0.1-second unit; Cycle 0.5 on/0.2 off /0.5 on seconds, and so on.

(Unit :0.1 Sec)

IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	Cycle	003	005:002	Y	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:007
001	OFF	003	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:006

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74

B-4 Latch & Pulse Output of LED Lights with One Button

This case is going to teach you the conditions is possible to be the same and triggering different outputs in the meanwhile.

Conditions:

Press the button to trigger two different outputs:

- (1) Bulb A lights up for 1.5 seconds.
- (2) Bulb B is activated with Toggle Mode, changing between ON/OFF status when the condition fulfilled at each time.

Commands:

- Index 000: Y_2 outputs for 1.5 seconds (Fast Click), when X_6 fulfilled the Rising Edge Triggering condition.
- Index 001: Y_3 outputs with Toggle Mode, turning to ON status when the first time X_6 been triggered with Rising Edge Triggering, turning to OFF status when second time X_6 been triggered with Rising Edge Triggering, and so on.

※Edge Triggering Condition must be set in Join4.

Referenced Command: Pulse / Toggle / Rising Edge Triggering

7. Case Introduction

Schedule Setting

0 Item Value

Schedule << 0 Go to >>

Mode 3:Pulse ▾

Out # 2

Clicks 15

Fast Click

Action Time 24:00

Holiday

Sun

Mon

Tue

Wed

Thu

Fri

Sat

Join 1 --- :# 0

Join 2 --- :# 0

Join 3 --- :# 0

Join 4 ^^Di :# 6

Update

1 Item Value

Schedule << 1 Go to >>

Mode 5:Toggle ▾

Out # 3

Clicks 0

Fast Click

Action Time 24:00

Holiday

Sun

Mon

Tue

Wed

Thu

Fri

Sat

Join 1 --- :# 0

Join 2 --- :# 0

Join 3 --- :# 0

Join 4 ^^Di :# 6

Update

Ladder Programming

0

X₆

(Pulse)
Y₂

Action Mode: On 1.5 Sec

1

X₆

(Toggle)
Y₃

Action Mode: Trigger ON once, then OFF once.

IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	Pulse	002	15	Y	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:006
001	Toggle	003	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:006

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76

B-5 Pulse Output for 10 Seconds Every Minute

This case is going to teach you how to create a cyclic Timer and assign the specific interval of timer as a condition.

Conditions:

There is a light signal that needs to be activated for 10 seconds every minute.

Commands:

- Index 000: Condition Timer 000 < 60, which means this Timer will continuously cycle between 0 and 60 seconds.
- Index 001: Triggering Pulse output for 10 seconds, when each time the Timer = 0 (Timer 000).

※When the condition is set as that the specific timer less to specific seconds (ex. Timer 000 < 600), then the consequence is the timer will run between 0~600 seconds continuously. For this function, we can easily create a cyclic Timer with random seconds/minutes/hours/days, and so on, just the unit of time is in second.

※The condition of triggering a output on each hour is available to refer to [A-3 Daily / Hourly Scheduled Triggering.](#)

7. Case Introduction

Schedule Setting

Item	Value
Schedule	<< 0 Go to >>
Mode	6:TIMER
Out #	0
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	TMR :# 0
Join 2	LESS :# 60
Join 3	--- :# 0
Join 4	--- :# 0
Update	

Ladder Programming

Pulse output for 10 Sec.

IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	Timer	000	6	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	TMR:000	LESS:060	---:000	---:000
001	Pulse	007	10	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	TMR:000	EQUA:000	---:000	---:000

B-6 Multiple Functions of Sequentially LED Light Outputs

Condition:

This case will teach you with three methods to achieve the sequential output triggering, which means the DO1 will be activated when the DO0 OFF, DO2 will be activated when the DO1 OFF, DO3 will be activated when the DO2 OFF, and so on.

There is a traffic signal on-site, and after the condition fulfilled, the green light will turn on for 20 seconds. After the green light got off, the yellow light turns on for 5 seconds, and after the yellow light got off, the red light turns on for 20 seconds.

Method 1: Application of TIMER

Command:

This method can directly specify which lights (green/yellow/red) to turn on at different time intervals, it is good for programming plenty of different time intervals, because you can create a table to list the activated time for each output, and then arrange the time interval sequentially, finally programming on WEB PLC.

- Index 000: X_0 triggers M_{100} , with the condition of Rising Edge Triggering, it may be triggered by the RF sensor onsite.
- Index 001: When M_{100} is ON, start counting the TIMER 000.
- Index 002: When the value of TIMER 000 is between 1-20 seconds, turn ON Y_0 (green light).

※If the green light should be ON status when standby, the condition could be $TIMER\ 000 < 21$, which means the green light will be turned on when TIMER 000 is in the interval of 0-20 seconds.

- Index 003: When TIMER 000 is between 21-25 seconds, turn ON Y_1 (yellow light).
- Index 004: When TIMER 000 is between 26-45 seconds, turn ON Y_2 (red light).

※If the red light should be ON status when standby, then we should set an additional virtual output to integrate with the Y_2 output.

- Index 005: When TIMER 000 equals 46, turn off M_{100} , ending TIMER 000 and resetting it to its default value.

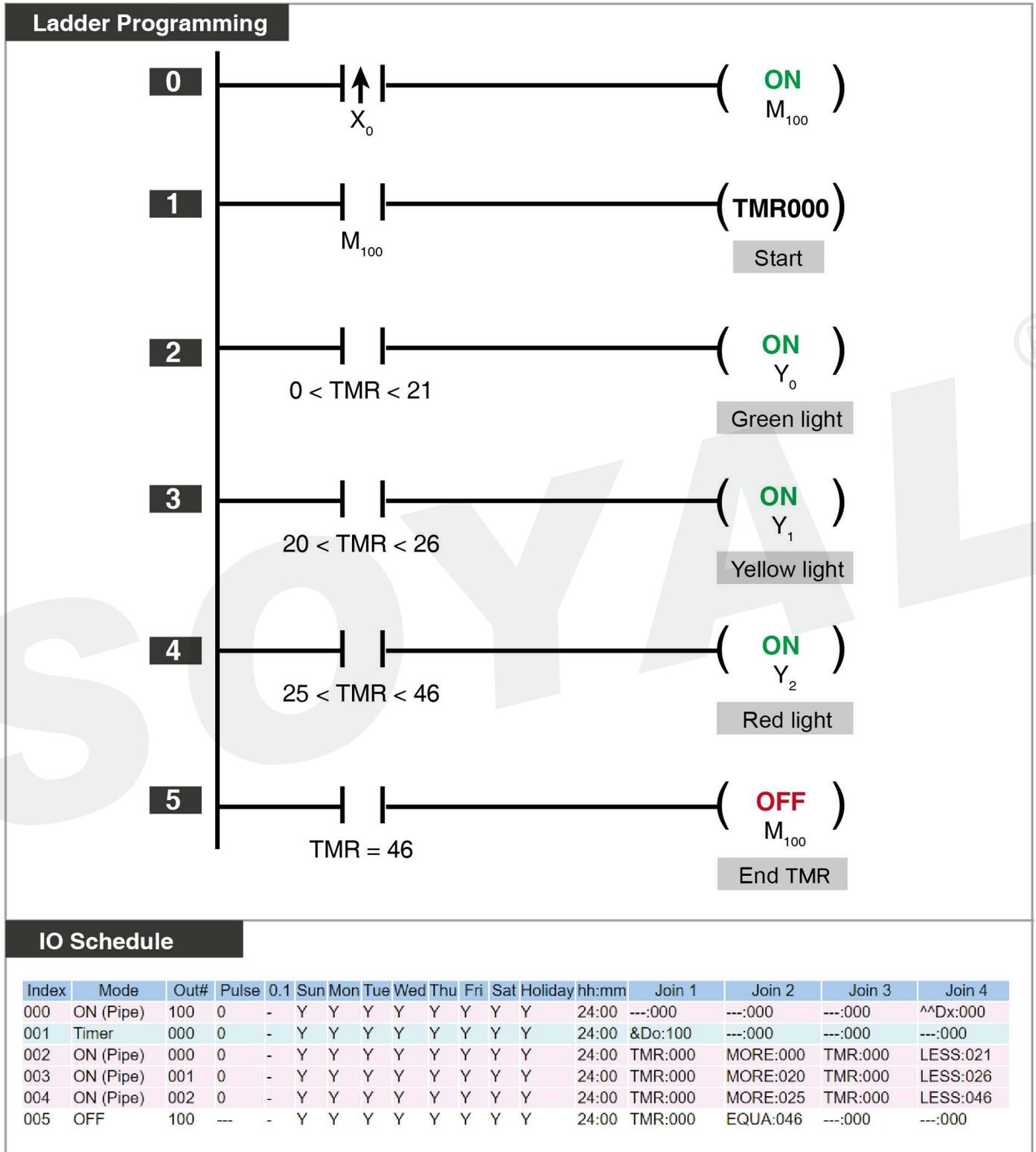
Referenced Commands:

Rising edge trigger / Timer application

7. Case Introduction

Schedule Setting					
Item	Value	Item	Value	Item	Value
Schedule	<< 0 Go to >>	Schedule	<< 1 Go to >>	Schedule	<< 2 Go to >>
Mode	2:ON/Pulse Pipe	Mode	6:TIMER	Mode	2:ON/Pulse Pipe
Out #	100	Out #	0	Out #	0
Clicks	0	Clicks	0	Clicks	0
Fast Click	<input type="checkbox"/>	Fast Click	<input type="checkbox"/>	Fast Click	<input type="checkbox"/>
Action Time	24:00	Action Time	24:00	Action Time	24:00
Holiday	<input checked="" type="checkbox"/>	Holiday	<input checked="" type="checkbox"/>	Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>	Sun	<input checked="" type="checkbox"/>	Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>	Mon	<input checked="" type="checkbox"/>	Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>
Join 1	---:#0	Join 1	&Do:#100	Join 1	TMR:#0
Join 2	---:#0	Join 2	---:#0	Join 2	MORE:#0
Join 3	---:#0	Join 3	---:#0	Join 3	TMR:#0
Join 4	^^Dx:#0	Join 4	---:#0	Join 4	LESS:#21
Schedule	<< 3 Go to >>	Schedule	<< 4 Go to >>	Schedule	<< 5 Go to >>
Mode	2:ON/Pulse Pipe	Mode	2:ON/Pulse Pipe	Mode	1:OFF
Out #	1	Out #	2	Out #	100
Clicks	0	Clicks	0	Clicks	0
Fast Click	<input type="checkbox"/>	Fast Click	<input type="checkbox"/>	Fast Click	<input type="checkbox"/>
Action Time	24:00	Action Time	24:00	Action Time	24:00
Holiday	<input checked="" type="checkbox"/>	Holiday	<input checked="" type="checkbox"/>	Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>	Sun	<input checked="" type="checkbox"/>	Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>	Mon	<input checked="" type="checkbox"/>	Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>
Join 1	TMR:#0	Join 1	TMR:#0	Join 1	TMR:#0
Join 2	MORE:#20	Join 2	MORE:#25	Join 2	EQUA:#46
Join 3	TMR:#0	Join 3	TMR:#0	Join 3	---:#0
Join 4	LESS:#26	Join 4	LESS:#46	Join 4	---:#0

7. Case Introduction



7. Case Introduction

Method 2: Application of Pulse Output

Command:

This method uses the Pulse output to achieve the requirement, in actually method 1/3 is more efficient than method 2, as in this method, one output requires two schedules to be set up, so it is just an interesting function for reference.

- Index 000: The Digital Output for the green light, triggers Y_0 for 20 seconds with the Rising Edge Triggering of X_0 .
- Index 001: The Virtual Output Condition for the yellow light, triggers M_8 for 25 seconds with the Rising Edge Triggering of X_0 , will use the second difference of M_8 and Y_0 ($25-20=5$) to trigger the yellow light output, pairing to Index 003.
- Index 002: The Virtual Output Condition for the red light, triggers M_9 for 45 seconds with the Rising Edge Triggering of X_0 , will use the second difference of M_9 and M_8 ($45-25=20$) to trigger the red light output, pairing to Index 004.
- Index 003: The Digital Output for the yellow light, lights up the yellow light for a total of 5 seconds when Y_0 is OFF and M_8 is ON.
- Index 004: The Digital Output for the red light, lights up the red light for a total of 20 seconds when M_8 is OFF and M_9 is ON.

Referenced Command: Pulse / Rising Edge Trigger

7. Case Introduction

Schedule Setting

Item	Value
Schedule	<< 0 Go to >>
Mode	3:Pulse
Out #	0
Clicks	20
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	--- :# 0
Join 2	--- :# 0
Join 3	--- :# 0
Join 4	^^Di :# 0
<input type="button" value="Update"/>	

Item	Value
Schedule	<< 1 Go to >>
Mode	3:Pulse
Out #	8
Clicks	25
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	--- :# 0
Join 2	--- :# 0
Join 3	--- :# 0
Join 4	^^Di :# 0
<input type="button" value="Update"/>	

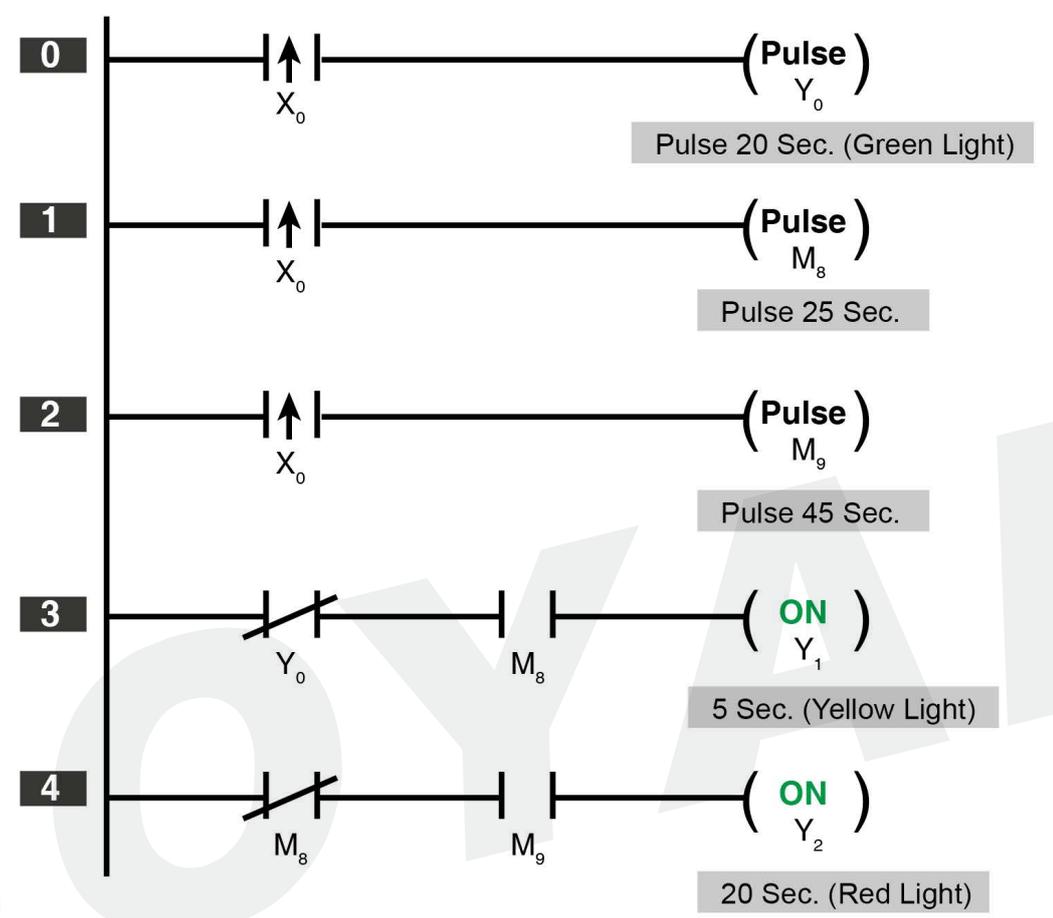
Item	Value
Schedule	<< 2 Go to >>
Mode	3:Pulse
Out #	9
Clicks	45
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	--- :# 0
Join 2	--- :# 0
Join 3	--- :# 0
Join 4	^^Di :# 0
<input type="button" value="Update"/>	

Item	Value
Schedule	<< 3 Go to >>
Mode	2:ON/Pulse Pipe
Out #	1
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	&DoN :# 0
Join 2	&Do :# 8
Join 3	--- :# 0
Join 4	--- :# 0
<input type="button" value="Update"/>	

Item	Value
Schedule	<< 4 Go to >>
Mode	2:ON/Pulse Pipe
Out #	2
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	&DoN :# 8
Join 2	&Do :# 9
Join 3	--- :# 0
Join 4	--- :# 0
<input type="button" value="Update"/>	

7. Case Introduction

Ladder Programming



IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	Pulse	000	20	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:000
001	Pulse	008	25	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:000
002	Pulse	009	45	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:000
003	ON	001	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&DoN:000	&Do:008	---:000	---:000
004	ON	002	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&DoN:008	&Do:009	---:000	---:000

Method 3: Application of DO Edge Trigger

This method utilizes the Falling Edge Triggering of the DO to activate the next output. In other words, the action of the end of green light will be the condition for activating yellow light; and the action of the end of yellow light will be the condition for activating red light.

✘ This method is the simplest one in these three methods, it only requires understanding the logic and programming function of Rising / Falling Edge Triggering, suitable for continuous one-to-one triggering.

Command Explanation:

- Index 000: X_0 Rising Edge Triggering ($\wedge D_x:000 = X_0$), when the condition is met, triggering Y_0 (green light) Pulse output for 20 seconds.
- Index 001: Y_0 Falling Edge Triggering ($\wedge D_x:512 = Y_1$), when the condition is met, triggering Y_1 (yellow light) Pulse output for 5 seconds.
- Index 002: Y_1 Falling Edge Triggering ($\wedge D_x:513 = Y_2$), when the condition is met, triggering Y_2 (red light) Pulse output for 20 seconds.

Referenced Command:

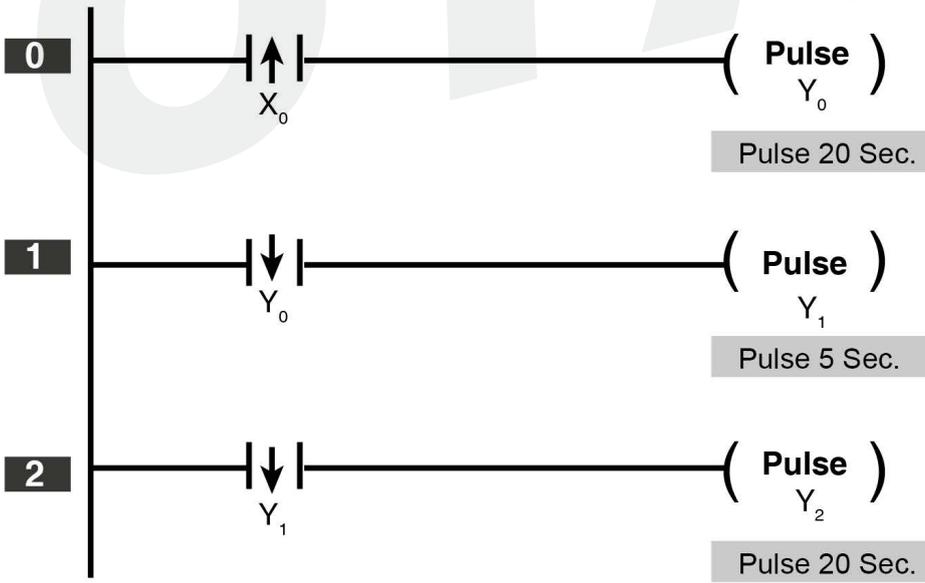
DI Edge Triggering / DO Edge Triggering / Rising Edge Triggering / Falling Edge Triggering / Pulse Output

7. Case Introduction

Schedule Setting

Item	Value	Item	Value	Item	Value
Schedule	<< 0 Go to >>	Schedule	<< 1 Go to >>	Schedule	<< 2 Go to >>
Mode	3:Pulse	Mode	3:Pulse	Mode	3:Pulse
Out #	0	Out #	1	Out #	2
Clicks	20	Clicks	5	Clicks	20
Fast Click	<input type="checkbox"/>	Fast Click	<input type="checkbox"/>	Fast Click	<input type="checkbox"/>
Action Time	24:00	Action Time	24:00	Action Time	24:00
Holiday	<input checked="" type="checkbox"/>	Holiday	<input checked="" type="checkbox"/>	Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>	Sun	<input checked="" type="checkbox"/>	Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>	Mon	<input checked="" type="checkbox"/>	Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>
Join 1	---:#0	Join 1	---:#0	Join 1	---:#0
Join 2	---:#0	Join 2	---:#0	Join 2	---:#0
Join 3	---:#0	Join 3	---:#0	Join 3	---:#0
Join 4	^^Dx:#0	Join 4	^Dx:#512	Join 4	^Dx:#513

Ladder Programming



IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	Pulse	000	20	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Dx:000
001	Pulse	001	5	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Dx:512
002	Pulse	002	20	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Dx:513

B-7 Scheduled Alarm of Security Card Condition

Conditions:

Card readers are installed in each building of the community and are used as security checkpoint, the security has fixed time points that needs to do the patrol, and when the security swipe the card on reader, the reader will record the event to the software, in the meanwhile, the relay of reader will trigger the DI of PLC, when the PLC do not get the signal of reader in fixed time interval, the DO will trigger the alarm in control center.

In this case, the reader needs to be swiped by valid card within ten minutes at four different time points each day: 00:00, 06:00, 12:00, and 18:00. Otherwise, it will trigger the alarm to notify the control center.

Command :

- Index 000: Regardless of weekdays or holidays, at 00:00 every day, execute ON M₈
- Index 001: Once M₈ is activated, TIMER 000 starts counting.
- Index 002: When TIMER 000 exceeds 600 seconds, execute ON Y₀
- Index 003: After the patrol personnel swipe the card, the card reader relay triggers X₀, executing OFF M₈

Referenced Commands: Scheduled trigger / TIMER / Edge trigger

Ladder Programming

IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	ON (Pipe)	008	0	-	Y	Y	Y	Y	Y	Y	Y	Y	00:00	---:000	---:000	---:000	---:000
001	Timer	000	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	Do:008	---:000	---:000	---:000
002	ON (Pipe)	000	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	TMR:000	MORE:600	---:000	---:000
003	OFF	008	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:000

7. Case Introduction

B-8 Delay Alarm with Single Button

Explanation:

A monetary button is installed, if the button is triggered only once within 10 seconds, a 1-second alarm output will be sent to the central alarm system. If the button is triggered twice within 10 seconds, the alarm output will be canceled, 1-second alarm output will not be triggered.

This feature might be used at jewelry store counters. When counter staff perceive a potential danger, they can preemptively trigger a timer. If the emergency situation is resolved, the timer can be canceled within the time limit, to let the PLC do not trigger the central alarm system.

Conditions :

A monetary button has been installed on-site. This button has two possible actions:

1. Pressing button X_0 and not triggering it for the second time within 10 seconds, then the PLC will trigger a 1-second output Y_0 .
2. Pressing button X_0 and triggering it for the second time within 10 seconds, then the PLC will not trigger the 1-second output Y_0 .

Command:

- Index 000: When X_0 is triggered by Rising Edge Triggering condition, M_{10} ON (Toggle Mode, if M_{10} is ON status and triggered by Rising Edge Triggering condition again, then the M_{10} will be OFF).
- Index 001: When M_{10} is ON, Timer 000 starts counting.
- Index 002: When Timer 000 equals 10, triggering Y_0 Output for one second.
- Index 003: When Timer 000 equals 10, M_{10} turns OFF, and the Timer 000 will be stopped simultaneously.

Referenced Command:

Toggle / Edge Triggering / TIMER / Pulse

Schedule Setting

Item	Value	Item	Value	Item	Value	Item	Value
Schedule	<< 0 Go to >>	Schedule	<< 1 Go to >>	Schedule	<< 2 Go to >>	Schedule	<< 3 Go to >>
Mode	5:Toggle	Mode	6:TIMER	Mode	3:Pulse	Mode	1:OFF
Out #	10	Out #	0	Out #	0	Out #	10
Clicks	0	Clicks	0	Clicks	1	Clicks	0
Fast Click	<input type="checkbox"/>						
Action Time	24:00						
Holiday	<input checked="" type="checkbox"/>						
Sun	<input checked="" type="checkbox"/>						
Mon	<input checked="" type="checkbox"/>						
Tue	<input checked="" type="checkbox"/>						
Wed	<input checked="" type="checkbox"/>						
Thu	<input checked="" type="checkbox"/>						
Fri	<input checked="" type="checkbox"/>						
Sat	<input checked="" type="checkbox"/>						
Join 1	---:#0	Join 1	&Do:#10	Join 1	TMR:#0	Join 1	TMR:#0
Join 2	---:#0	Join 2	---:#0	Join 2	EQUA:#10	Join 2	EQUA:#10
Join 3	---:#0						
Join 4	^^Di:#0	Join 4	---:#0	Join 4	---:#0	Join 4	---:#0
	<input type="button" value="Update"/>						

Ladder Programming

IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	Toggle	010	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:000
001	Timer	000	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Do:010	---:000	---:000	---:000
002	Pulse	000	1	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	TMR:000	EQUA:010	---:000	---:000
003	OFF	010	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	TMR:000	EQUA:010	---:000	---:000

7. Case Introduction

B-9 Dual Motors Alternating Operation

This configuration is suitable for two devices alternate operation, such as dual motors or dual signals. PLC will trigger two different devices alternately.

Conditions :

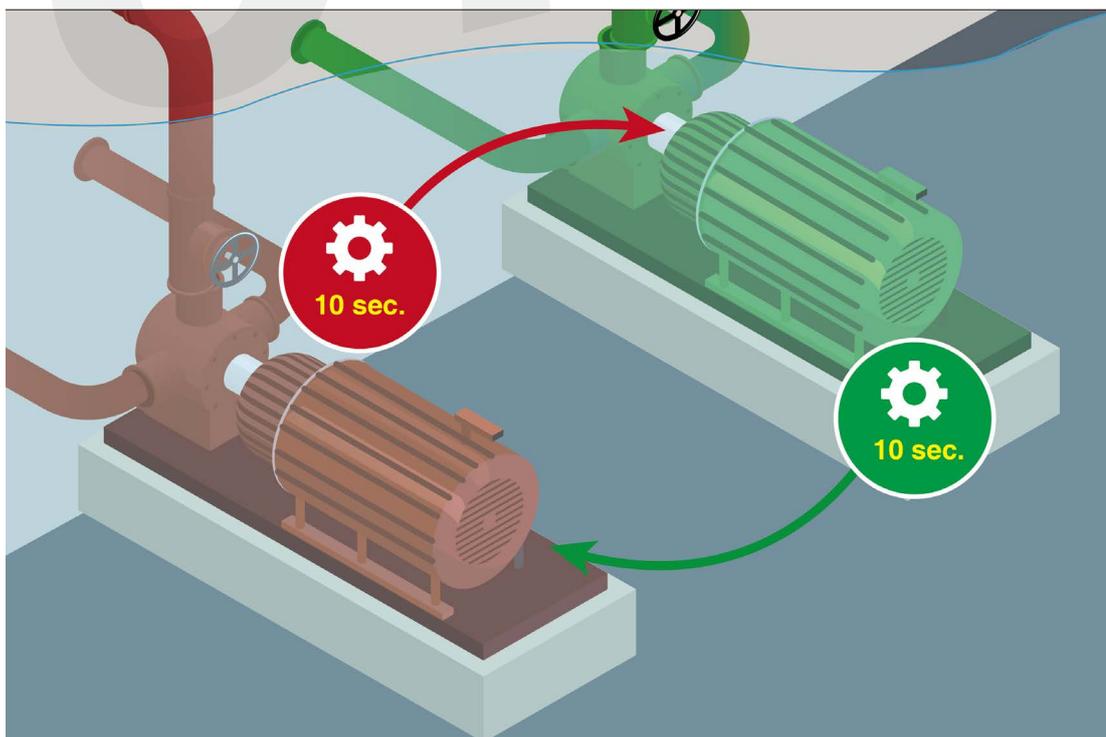
A monetary button can trigger X_0 , and each time we trigger X_0 , the PLC will activate the alternate outputs Y_0 and Y_1 . Y_0 and Y_1 use pulse output to trigger for 10 seconds at a time, and two outputs can be triggered at the same time.

Command:

- Index 000: Pressing the button to trigger X_0 , M_{10} executes a Toggle output, which means M_{10} turns ON with first press and OFF with the next press.
- Index 001: When M_{10} is ON and X_0 is triggered by Rising Edge Triggering, the Y_0 will be triggered for 10 seconds.
- Index 002: When M_{10} is OFF and X_0 is triggered by Rising Edge Triggering, the Y_1 will be triggered for 10 seconds.

Referenced Commands :

Toggle / Rising Edge Triggering / Pulse



7. Case Introduction

Schedule Setting

Item	Value	Item	Value	Item	Value
Schedule	<< 0 Go to >>	Schedule	<< 1 Go to >>	Schedule	<< 2 Go to >>
Mode	5:Toggle	Mode	3:Pulse	Mode	3:Pulse
Out #	10	Out #	0	Out #	1
Clicks	0	Clicks	10	Clicks	10
Fast Click	<input type="checkbox"/>	Fast Click	<input type="checkbox"/>	Fast Click	<input type="checkbox"/>
Action Time	24:00	Action Time	24:00	Action Time	24:00
Holiday	<input checked="" type="checkbox"/>	Holiday	<input checked="" type="checkbox"/>	Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>	Sun	<input checked="" type="checkbox"/>	Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>	Mon	<input checked="" type="checkbox"/>	Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>
Join 1	---:##0	Join 1	&Do :##10	Join 1	&DoN :##10
Join 2	---:##0	Join 2	---:##0	Join 2	---:##0
Join 3	---:##0	Join 3	---:##0	Join 3	---:##0
Join 4	^^Di :##0	Join 4	^^Di :##0	Join 4	^^Di :##0
<input type="button" value="Update"/>		<input type="button" value="Update"/>		<input type="button" value="Update"/>	

Ladder Programming

IO Schedule

Index	Mode	Out#	Pulse 0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	Toggle	010	---	-	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:000
001	Pulse	000	10	-	Y	Y	Y	Y	Y	Y	Y	24:00	&Do:010	---:000	---:000	^^Di:000
002	Pulse	001	10	-	Y	Y	Y	Y	Y	Y	Y	24:00	&DoN:010	---:000	---:000	^^Di:000

7. Case Introduction

B-10 Multi-Motors Alternating Operation

Similar to the case of [B-9 Dual Motors Alternating Operation](#), but here we want to achieve the controlling of multiple motors, not 2 motors only, the Toggle function only provides two status as the condition(ON/OFF).

In this example, we will use the counter as a condition to create an unlimited number of conditional statements.

Conditions :

One monetary button has been installed, when pressing the button triggers the PLC input X_0 , the PLC will alternately activate 4 different outputs sequentially, and to trigger 4 motors.

Y_0 - Y_4 will have a 3-second pulse output when triggered, and actions on different outputs can occur simultaneously without affecting each other.

Commands:

- Index 000: When $CNT\ 000 = 0$ and X_0 got Edge Triggering, trigger Y_0 Pulse Output for 3 seconds.
- Index 001: When $CNT\ 000 = 1$ and X_0 got Edge Triggering, trigger Y_1 Pulse Output for 3 seconds.
- Index 002: When $CNT\ 000 = 2$ and X_0 got Edge Triggering, trigger Y_2 Pulse Output for 3 seconds.
- Index 003: When $CNT\ 000 = 3$ and X_0 got Edge Triggering, trigger Y_3 Pulse Output for 3 seconds.
- Index 004: When X_0 got Edge Triggering each time, $CNT\ 000$ will increase by 1.
- Index 005: When $CNT\ 000 = 4$, $CNT\ 000$ will reset to 0.

※Note: Condition sequence is crucial in this example because the PLC's operation logic follows the index sequence. Once the logic of Index 000 has run completed, then run Index 001, then run Index 002, and so on.

Therefore, if we programmed the Index 004 & Index 005 as the first & second condition index, the $CNT\ 000$ will increase by 1 at first, and the PLC will execute logic Index 001 rather than logic Index 000.

Referenced Command :

Edge Triggering / Pulse / Counter / CNT Reset

7. Case Introduction

Schedule Setting

Item	Value
Schedule	<< 0 Go to >>
Mode	3:Pulse
Out #	0
Clicks	3
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	CNT :#0
Join 2	EQUA :#0
Join 3	--- :#0
Join 4	^^Di :#0
Update	

Item	Value
Schedule	<< 1 Go to >>
Mode	3:Pulse
Out #	1
Clicks	3
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	CNT :#0
Join 2	EQUA :#1
Join 3	--- :#0
Join 4	^^Di :#0
Update	

Item	Value
Schedule	<< 2 Go to >>
Mode	3:Pulse
Out #	2
Clicks	3
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	CNT :#0
Join 2	EQUA :#2
Join 3	--- :#0
Join 4	^^Di :#0
Update	

Item	Value
Schedule	<< 3 Go to >>
Mode	3:Pulse
Out #	3
Clicks	3
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	CNT :#0
Join 2	EQUA :#3
Join 3	--- :#0
Join 4	^^Di :#0
Update	

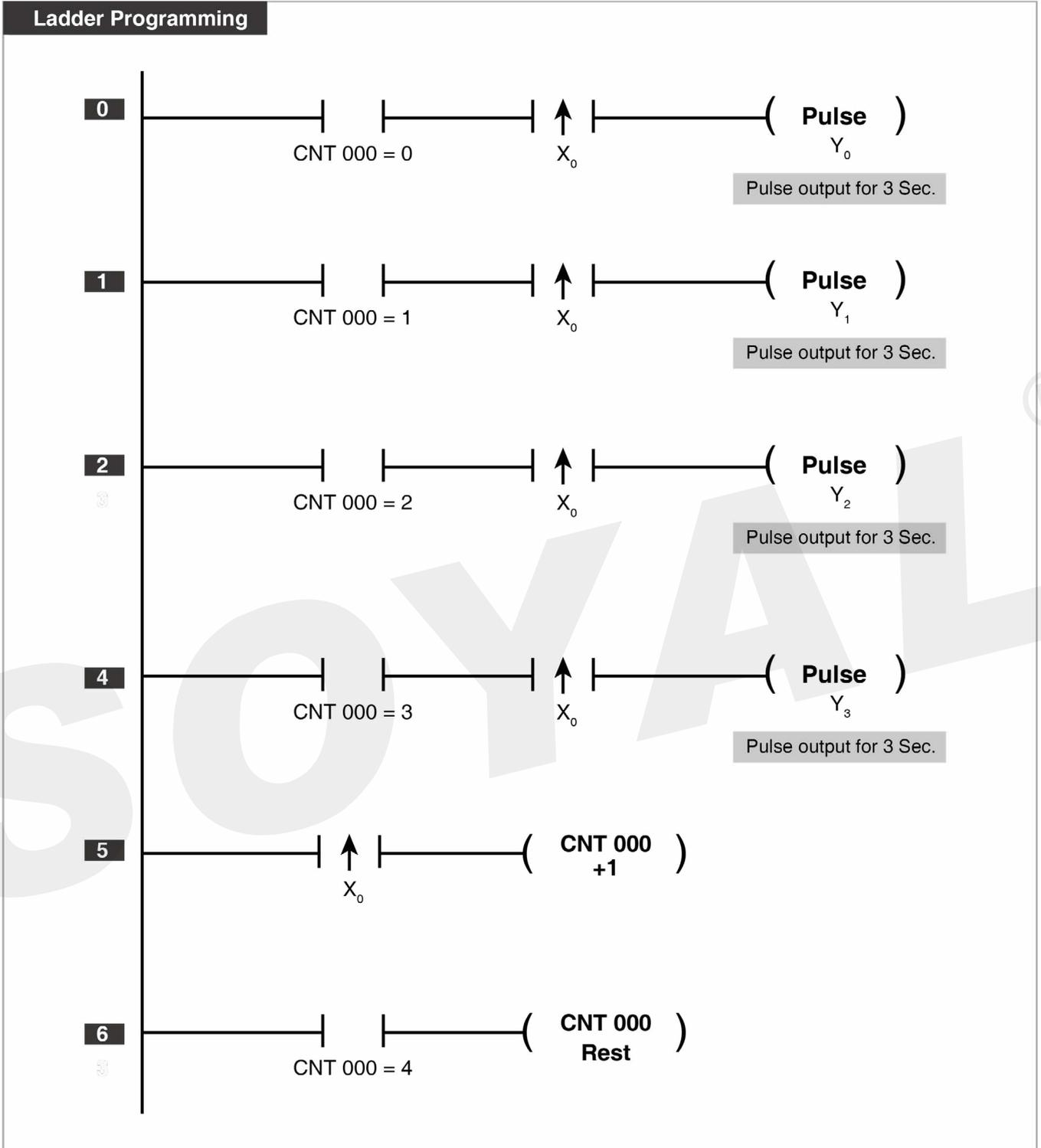
Item	Value
Schedule	<< 4 Go to >>
Mode	7:CNT Inc
Out #	0
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	--- :#0
Join 2	--- :#0
Join 3	--- :#0
Join 4	^^Di :#0
Update	

Item	Value
Schedule	<< 5 Go to >>
Mode	8:CNT RST
Out #	0
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	CNT :#0
Join 2	EQUA :#4
Join 3	--- :#0
Join 4	--- :#0
Update	

IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	Pulse	000	3	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	CNT:000	EQUA:000	---:000	^^Di:000
001	Pulse	001	3	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	CNT:000	EQUA:001	---:000	^^Di:000
002	Pulse	002	3	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	CNT:000	EQUA:002	---:000	^^Di:000
003	Pulse	003	3	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	CNT:000	EQUA:003	---:000	^^Di:000
004	CNT Inc	000	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:000
005	CNT Rst	000	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	CNT:000	EQUA:004	---:000	---:000

7. Case Introduction



C. Advanced application scenarios

C-1 Gate Alert if open more than 10 minutes with Confirm Button

Trigger the Alarm When Door Open more than 10 minutes

Condition:

The main door is equipped with door sensor, serving as the condition for starting the Timer. When the main door is open (door sensor short-circuited) for more than 10 minutes, it will trigger an alarm. The alarm will persist until the main door is closed or until the administrator presses the release button.

Command Explanation:

Index 000: When the Timer000 is equal to 60, Counter Counter000 will increment by 1.

Index 001: When Timer000 is less than 60, it will cyclically count from 0 to 60 seconds.

Additionally, there are required conditions: Y_0 OFF (alarm not triggered yet) and X_0 OFF (door open, door sensor short-circuited).

Index 002: When the Counter000 exceeds 10, it will trigger the virtual output M_{15} (used as the trigger condition for Y_0 alarm output).

Index 003: The trigger conditions for resetting the Counter000 are X_0 (door closed) or X_1 (pressing the release button).

Index 004: Y_0 alarm is self-holding function, with the condition of virtual output M_{15} ON (door open for ten minutes) and X_1 OFF (alarm release button short-circuited).

Referenced Commands:

Timer / Counter / Virtual Output / Self-holding

7. Case Introduction

Schedule Setting

0

Item	Value
Schedule	<< 0 Go to >>
Mode	7:CNT Inc
Out #	0
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	TMR :# 0
Join 2	EQUA :# 60
Join 3	--- :# 0
Join 4	--- :# 0
<input type="button" value="Update"/>	

1

Item	Value
Schedule	<< 1 Go to >>
Mode	6:TIMER
Out #	0
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	TMR :# 0
Join 2	LESS :# 60
Join 3	&DoN :# 0
Join 4	&DiN :# 0
<input type="button" value="Update"/>	

2

Item	Value
Schedule	<< 2 Go to >>
Mode	2:ON
Out #	15
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	CNT :# 0
Join 2	MORE :# 10
Join 3	--- :# 0
Join 4	--- :# 0
<input type="button" value="Update"/>	

3

Item	Value
Schedule	<< 3 Go to >>
Mode	8:CNT RST
Out #	0
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	Di :# 1
Join 2	Di :# 0
Join 3	--- :# 0
Join 4	--- :# 0
<input type="button" value="Update"/>	

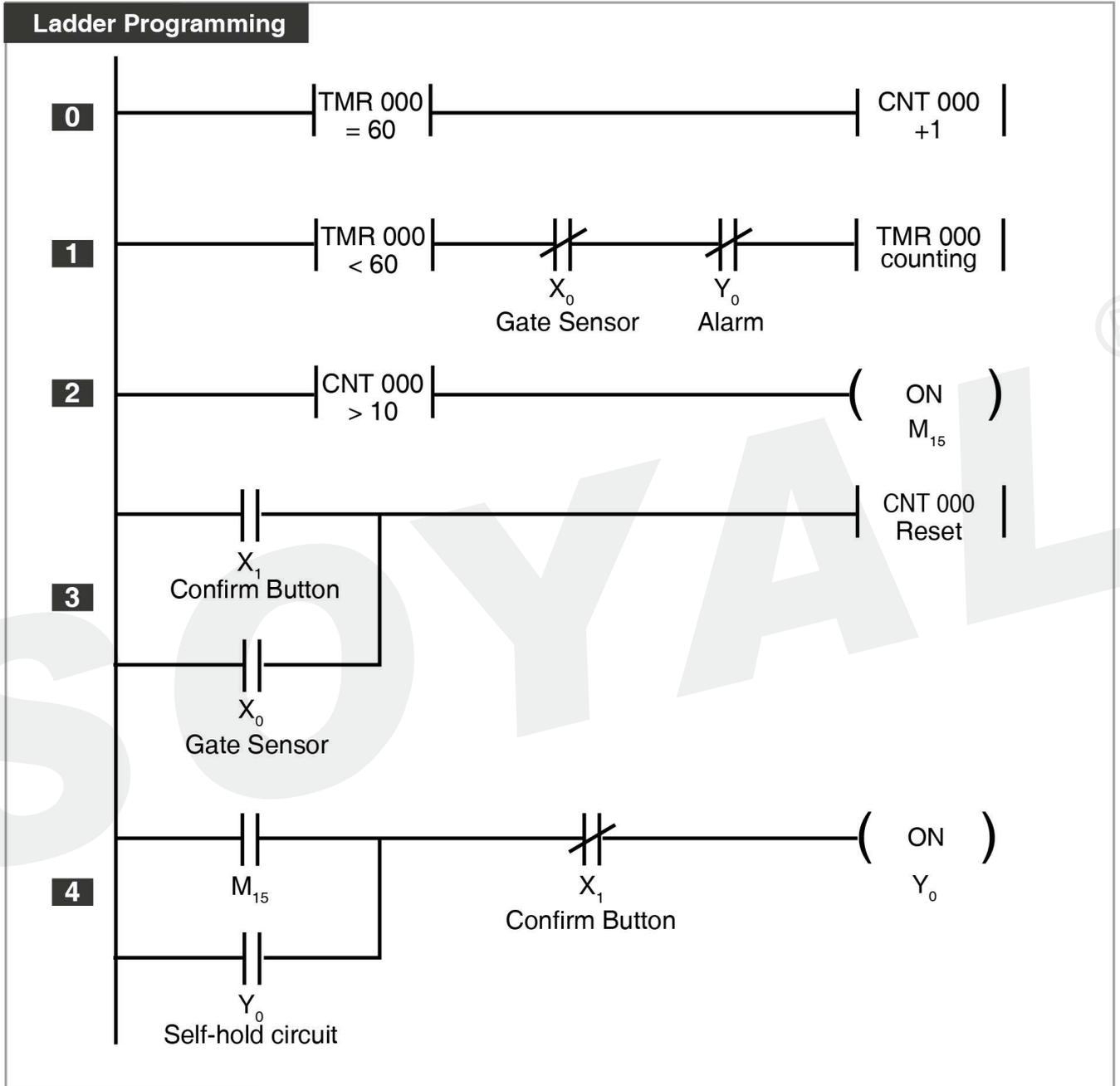
4

Item	Value
Schedule	<< 4 Go to >>
Mode	2:ON
Out #	0
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	24:00
Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>
Join 1	Do :# 15
Join 2	Do :# 0
Join 3	&DiN :# 1
Join 4	--- :# 0
<input type="button" value="Update"/>	

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96

7. Case Introduction



IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	CNT Inc	000	4	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	TMR:000	EQUA:060	---:000	---:000
001	Timer	000	7	Y	Y	Y	Y	Y	Y	Y	Y	Y	24:00	TMR:000	LESS:060	&DoN:000	&DiN:000
002	ON	015	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	CNT:000	MORE:010	---:000	---:000
003	CNT Rst	000	4	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	Di:000	Di:001	---:000	---:000
004	ON	000	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	Do:015	Do:000	&DiN:001	---:000

7. Case Introduction

C-2 DI/DO Corresponding Trigger (Enabled by Administrator for Each DO)

For this example, we have eight infrared devices with edge-triggered Inputs 0-7, and we want to activate corresponding Outputs 0-7 for alarm indicators. Additionally, the manager requires the on-site personnel to have manual control over whether the corresponding alarm indicators should be activated after each infrared device trigger.

Answer: Set the output mode of 0-7 point to ON. When the condition is met for triggering, activate the output alarm indicator. The condition content is edge-triggered (^Di), and the virtual point Y₈ (&Do) must be in “on” state simultaneously to trigger the corresponding alarm indicator.

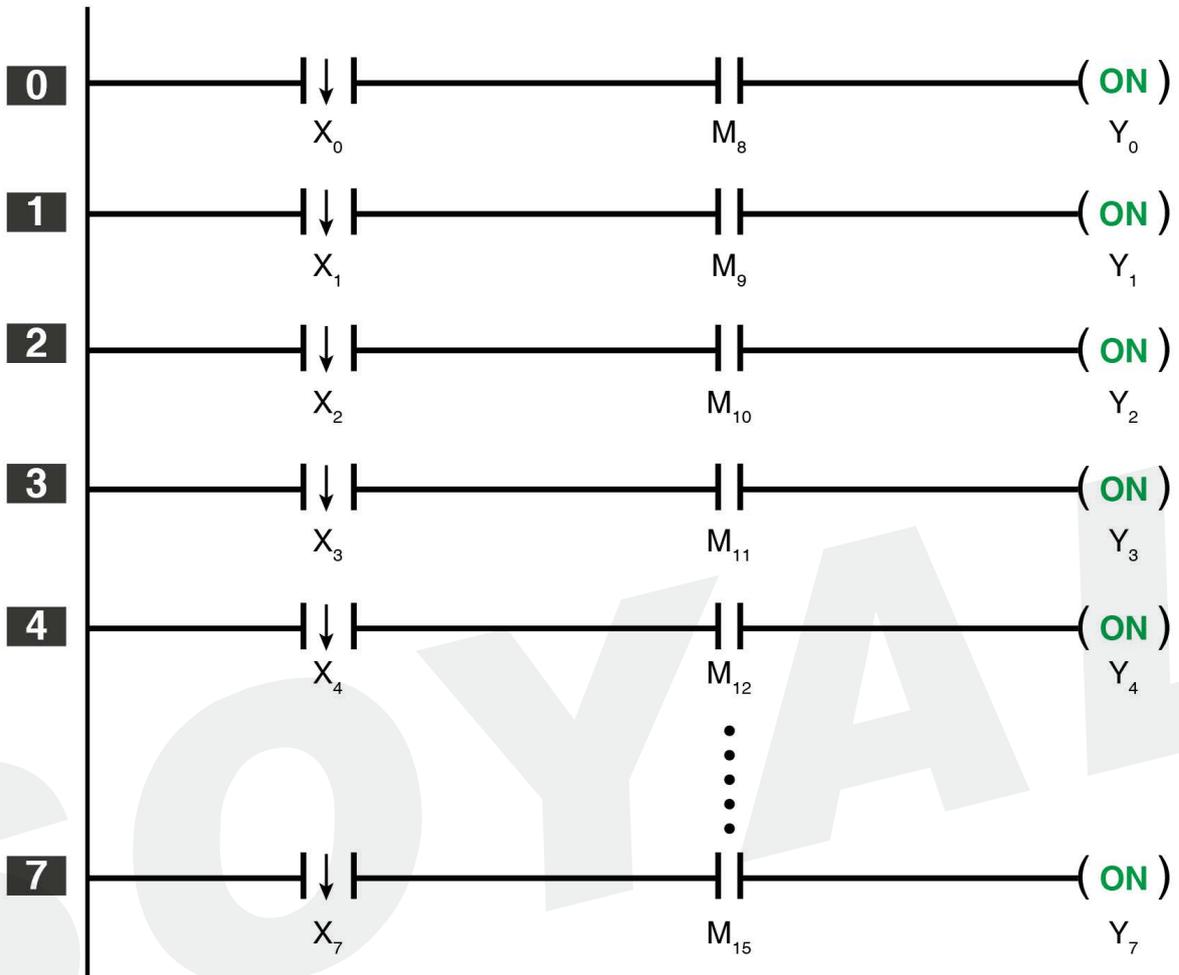
The virtual output M₈₋₁₅ can be triggered through 701Client graphical control or developed using third-party software with Modbus triggering.

Schedule Setting

0	1	2	3																																																																																																																																																																
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Item</th><th>Value</th></tr> <tr><td>Schedule</td><td><< 0 Go to >></td></tr> <tr><td>Mode</td><td>2:ON</td></tr> <tr><td>Out #</td><td>0</td></tr> <tr><td>Clicks</td><td>0</td></tr> <tr><td>Fast Click</td><td><input type="checkbox"/></td></tr> <tr><td>Action Time</td><td>24:00</td></tr> <tr><td>Holiday</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Sun</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Mon</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Tue</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Wed</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Thu</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Fri</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Sat</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Join 1</td><td>&Do :#8</td></tr> <tr><td>Join 2</td><td>--- :#0</td></tr> <tr><td>Join 3</td><td>--- :#0</td></tr> <tr><td>Join 4</td><td>^Di :#0</td></tr> <tr><td colspan="2" style="text-align: right;"><input type="button" value="Update"/></td></tr> </table>	Item	Value	Schedule	<< 0 Go to >>	Mode	2:ON	Out #	0	Clicks	0	Fast Click	<input type="checkbox"/>	Action Time	24:00	Holiday	<input checked="" type="checkbox"/>	Sun	<input checked="" type="checkbox"/>	Mon	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>	Join 1	&Do :#8	Join 2	--- :#0	Join 3	--- :#0	Join 4	^Di :#0	<input type="button" value="Update"/>		<table border="1" style="width: 100%; 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7. Case Introduction

Ladder Programming

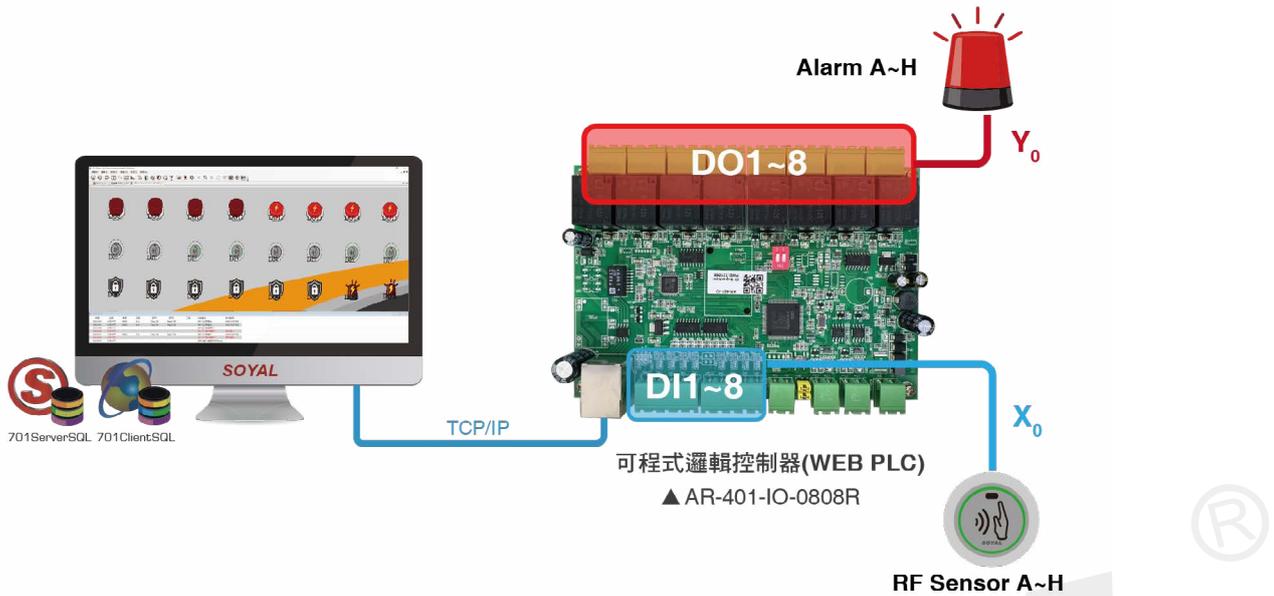


IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
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004	ON	000	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Do:012	---:000	---:000	^.Di:004
005	ON	000	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Do:013	---:000	---:000	^.Di:005
006	ON	000	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Do:014	---:000	---:000	^.Di:006
007	ON	000	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Do:015	---:000	---:000	^.Di:007

7. Case Introduction

Application Architecture :



Graphical Control Configuration example of 701Client:

TOP: Manual control switches for the manager (M₈~M₁₅)

Middle: Infrared inputs (X₀~X₇)

Bottom: Outputs (Y₀~Y₇)

When the manager manually activates virtual output points M₁₂~M₁₅ in 701ClientSQL, infrared inputs X₂ & X₃ & X₆ & X₇ are triggered. This leads to the normal triggering of alarms for corresponding Y₆ & Y₇. However, Y₂ & Y₃ do not trigger any output.



More Detail :

- [701Client Graphical Control Manual](#)

C-3 Marquee Output

Sequentially triggers $Y_0 \sim Y_6$ to create a running lights effect. The activation time is from 13:01 daily to 11:59 the next day, and it stops operating from 12:00 to 13:00 at noon.

Command Explanation:

- Index 000: Daily trigger Y_7 at 13:00.
- Index 001: Daily OFF Y_7 at 12:00.
- Index 002: Set Timer000, starting condition is Y_7 ON; TMR < 11 means this timer will cycle from 0 to 11.
※ In this example, the timer unit is 0.1 seconds, checking Fast Click.
- Index 003~ Index 009: Set the trigger conditions for $Y_0 \sim Y_6$ When the time is within a certain segment of Timer 000, it will perform the ON action.

Referenced Commands:

Action Time / Timer / Fast Click / ON / OFF

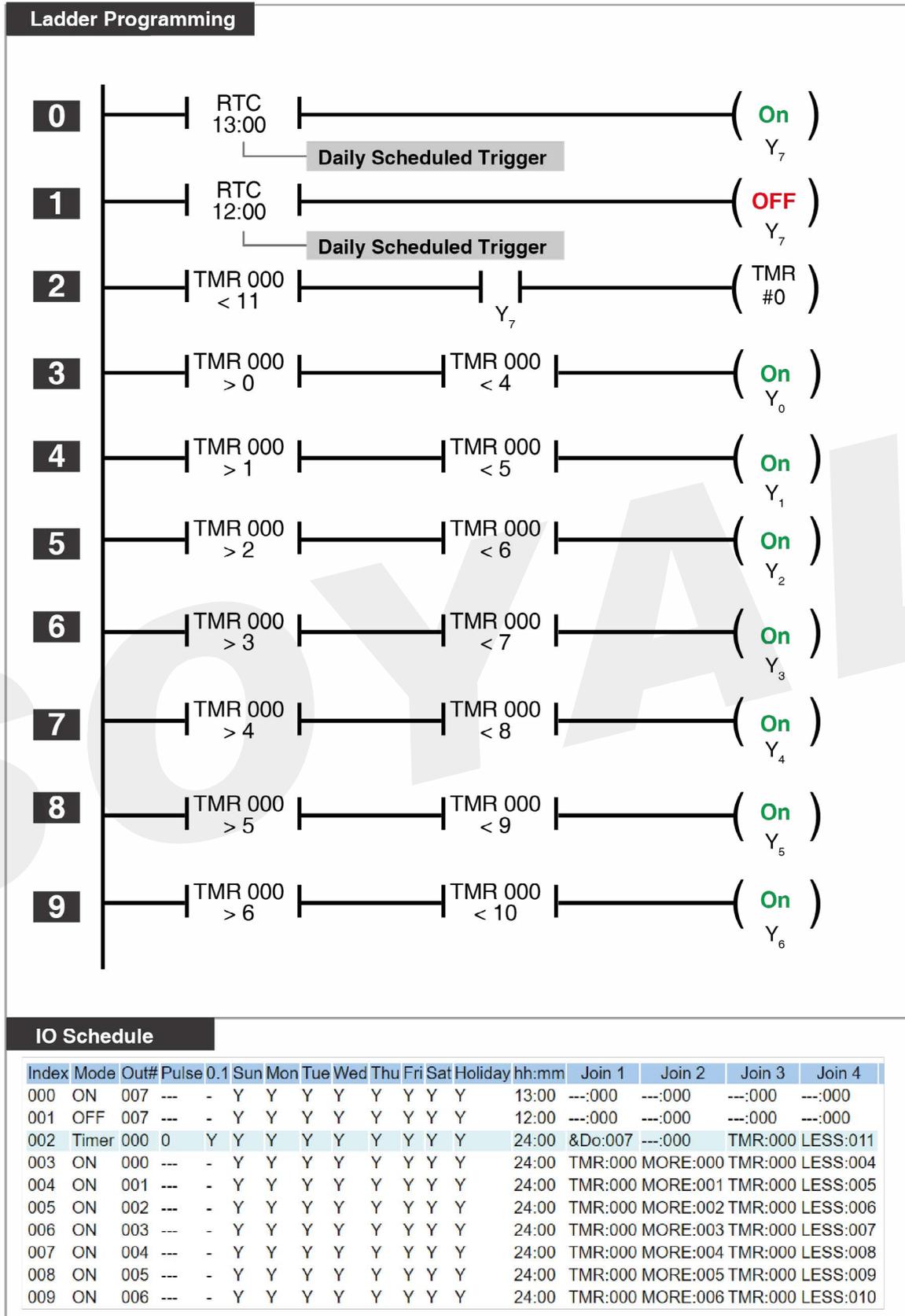
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7. Case Introduction

Schedule Setting

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7. Case Introduction



7. Case Introduction

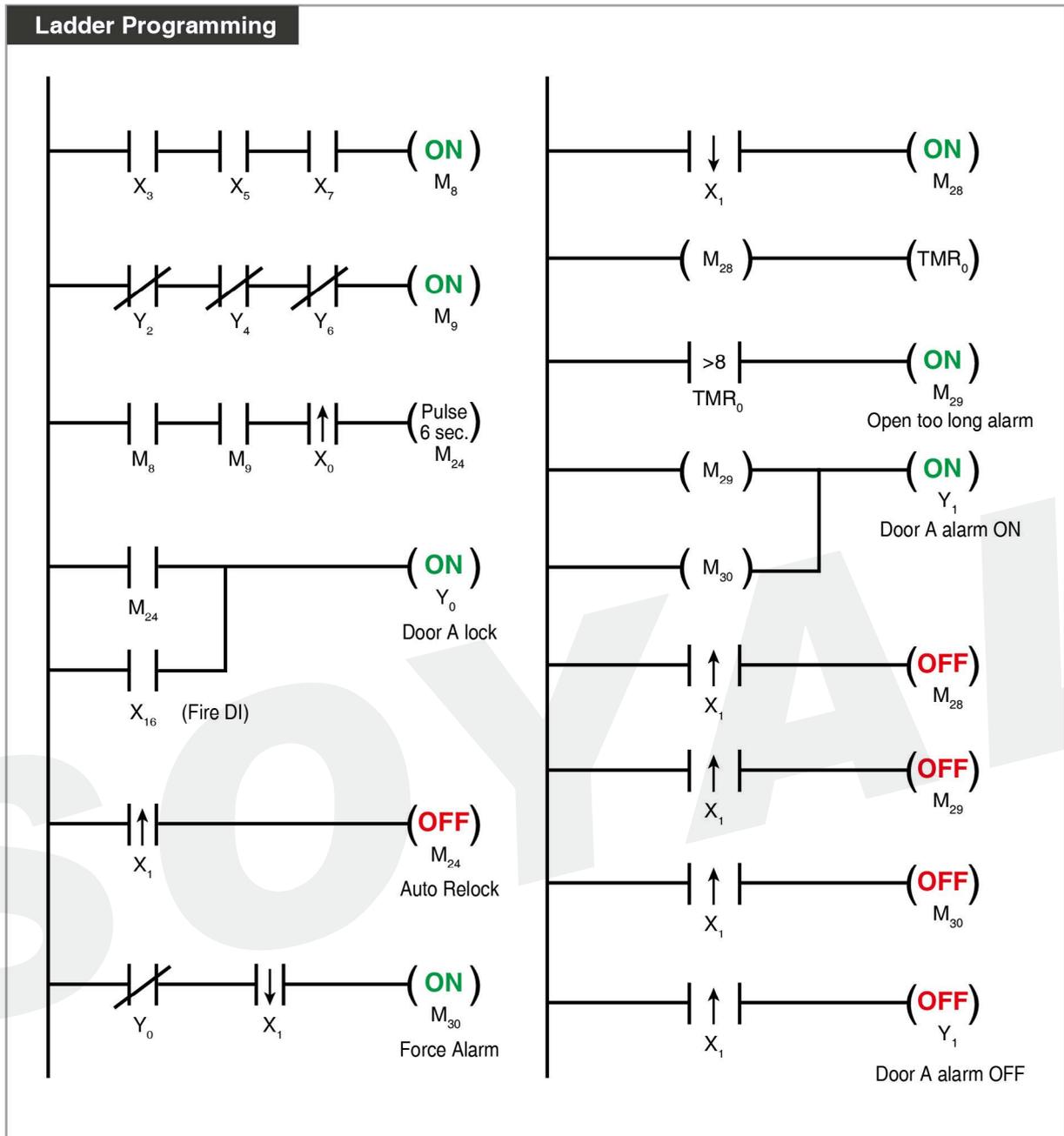
C-4 Four-Door Interlock

4 Doors Interlock: When one of the doors is unlocked, other 3 doors could not be unlocked until that door is closed

Command Explanation:

1. When the door sensor $DIX_3 / DX_5 / DIX_7$ and the door lock relay $DOY_2 / DOY_4 / DOY_6$ of door B/door C/door D are closed, press Door A push button DIX_0 , the door lock relay DOY_0 can be trigger on 6 seconds.
2. When the fire alarm input DIX_{16} is closed, the door lock relay of door A/door B/door C/door D can be released on;
3. When the door sensor DIX_1 of door A is closed, the door lock relay of door A can be automatically relocked;
4. When the door sensor DIX_1 of door A is forced to open and the door relay DOY_0 of door A is off, the alarm relay DOY_1 of door A will be turned on;
5. When the door sensor DIX_1 of door A is open, the timer TMR0 is triggered. When TMR0 is more than 8 seconds, the door open too long alarm relay DOY_1 is triggered.
6. When the door sensor DIX_1 of door A is closed, the alarm relay DOY_1 can be stopped.

7. Case Introduction



7. Case Introduction

IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	ON	008	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:003	&Di:005	&Di:007	---:000
001	ON	009	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&DoN:002	&DoN:004	&DoN:006	---:000
002	ON	010	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:001	&Di:005	&Di:007	---:000
003	ON	011	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&DoN:000	&DoN:004	&DoN:006	---:000
004	ON	012	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:001	&Di:003	&Di:007	---:000
005	ON	013	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&DoN:000	&DoN:002	&DoN:006	---:000
006	ON	014	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:001	&Di:003	&Di:005	---:000
007	ON	015	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&DoN:000	&DoN:002	&DoN:004	---:000
008	Pulse	024	6	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	&Do:008	&Do:009	^Di:000
009	Pulse	025	6	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	&Do:010	&Do:011	^Di:002
010	Pulse	026	6	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	&Do:012	&Do:013	^Di:004
011	Pulse	027	6	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	&Do:014	&Do:015	^Di:006
012	ON	030	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	&DoN:000	^Di:001
013	ON	033	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	&DoN:002	^Di:003
014	ON	036	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	&DoN:004	^Di:005
015	ON	039	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	&DoN:006	^Di:007
016	ON	000	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	Do:024	Di:016
017	OFF	024	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:001
018	ON	002	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	Do:025	Di:016
019	OFF	025	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:003
020	ON	004	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	Do:026	Di:016
021	OFF	026	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:005
022	ON	006	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	Do:027	Di:016
023	OFF	027	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:007
024	OFF	001	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:001
025	OFF	003	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:003
026	OFF	005	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:005
027	OFF	007	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:007
028	ON	028	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:001
029	Timer	000	183	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	&Do:028
030	ON	029	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	TMR:000	MORE:008
031	ON	001	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	Do:029	Do:030
032	OFF	028	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:001
033	OFF	030	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:001
034	ON	031	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:003
035	Timer	001	205	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	&Do:031
036	ON	032	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	TMR:001	MORE:008
037	ON	003	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	Do:032	Do:033
038	OFF	031	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:003
039	OFF	033	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:003
040	ON	034	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:005
041	Timer	002	202	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	&Do:034
042	ON	035	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	TMR:002	MORE:008
043	ON	005	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	Do:035	Do:036
044	OFF	034	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:005
045	OFF	036	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:005
046	ON	037	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:007
047	Timer	003	14	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	&Do:037
048	ON	038	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	TMR:003	MORE:008
049	ON	007	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	Do:038	Do:039
050	OFF	037	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:007
051	OFF	039	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:007
052	OFF	029	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:001
053	OFF	032	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:003
054	OFF	035	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:005
055	OFF	038	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:007
056	OFF	000	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:016
057	OFF	002	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:016
058	OFF	004	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:016
059	OFF	006	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:016

C-5 Queue Output (Pipe Output)

※Pipe output (Applicable to firmware version 5.06 and above, released on December 22, 2023)

Starting from this version, Pipe Output is supported. When the virtual output 255 is ON (as fixed conditions), it will trigger Pipe Output. This means that within the same time, Pipe outputs will not do the output simultaneously; instead, they will be queued and executed in the order of triggering.

※The schedule for selecting Pipe output will not be executed when the virtual output 255 is OFF.

Condition Requirements:

There are three entrances to the parking lot, and each parking space is equipped with occupancy detection. When the parking system detects that the number of parking spaces is full, it will provide a signal to the 0808 PLC as a input to switch the barrier gate activation mode.

When parking spaces are not full:

All three entrances can directly trigger the barrier gate through infrared sensing, allowing vehicles to enter the parking lot.

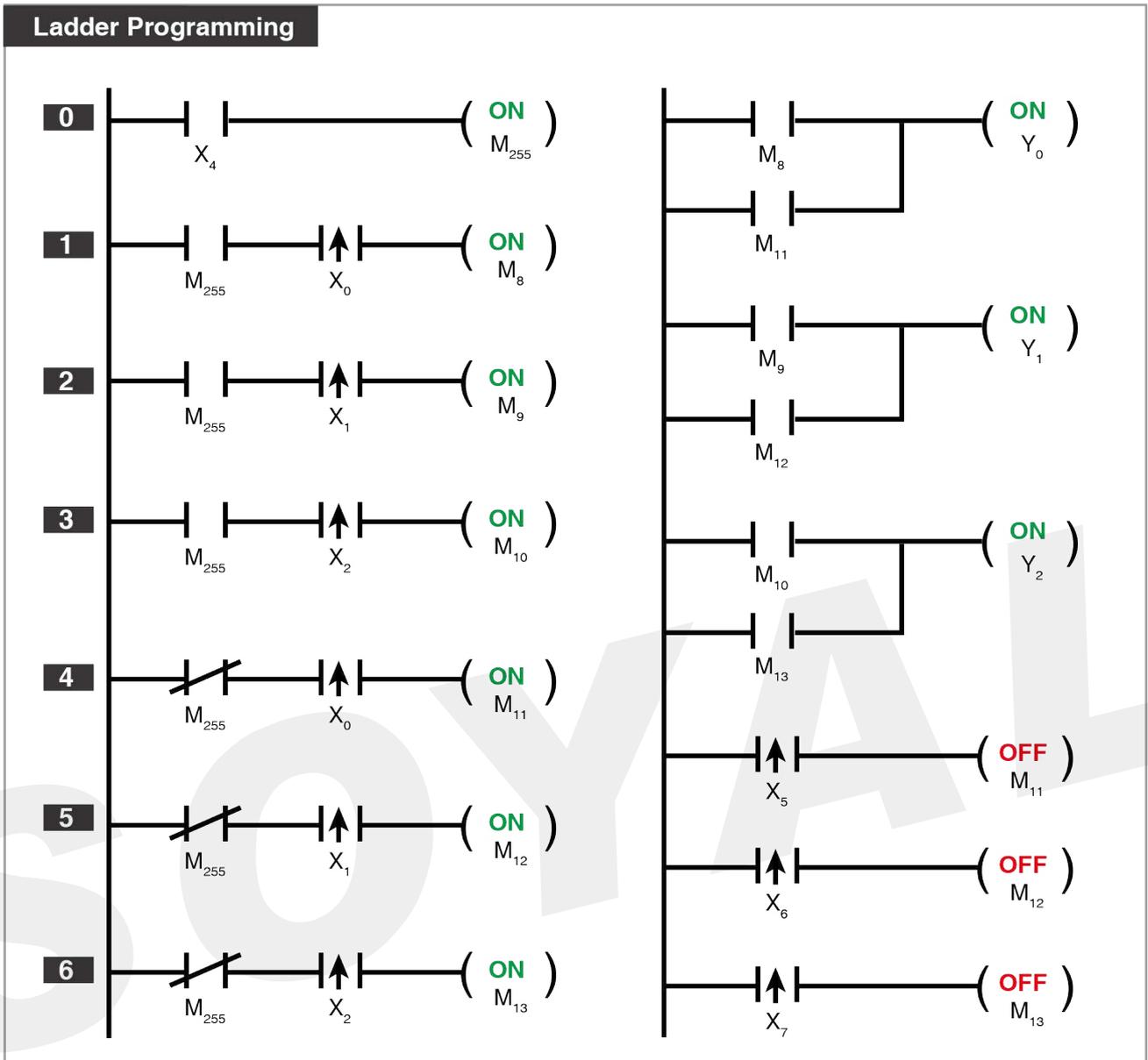
When parking spaces are full:

The three entrances follow a queuing process. The one that first detects infrared signals will be given priority to enter the queue (Pipe). The barrier gates will be opened in a rotating manner through the queuing system to allow vehicles to enter.

Command Explanation:

- **Index 000:** X_4 is the signal input for full parking spaces, activating virtual output Y_{255} and switching the output mode to Pipe output.
- **Index 001~3:** Queue output conditions. When the infrared edge trigger X_0 is activated for the first entrance (output for ten seconds), and condition Y_{255} is ON, virtual point M_8 is output. Similar conditions apply for the other entrances.
- **Index 004~6:** General output conditions. When the infrared edge trigger X_0 is activated for the first entrance (Latch output), and condition Y_{255} is OFF, virtual point M_{11} is output. Similar conditions apply for the other entrances.
- **Index 007~9:** Combined conditions of Index 001~3 and Index 004~6. When M_8 or M_{11} is triggered, output Y_0 . Similar conditions apply for the two other conditions.
- **Index 010~12:** Conditions for closing virtual points $Y_{11} \sim Y_{13}$. After a vehicle passes through the barrier gate, the another infrared sensor should be triggered to execute the action of closing $Y_{11} \sim Y_{13}$.

7. Case Introduction



IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	ON (Pipe)	255	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	Di:004	---:000	---:000	---:000
001	ON (Pipe)	008	10	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Do:255	---:000	---:000	^^Di:000
002	ON (Pipe)	009	10	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Do:255	---:000	---:000	^^Di:001
003	ON (Pipe)	010	10	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Do:255	---:000	---:000	^^Di:002
004	ON (Pipe)	011	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&DoN:255	---:000	---:000	^^Di:000
005	ON (Pipe)	012	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&DoN:255	---:000	---:000	^^Di:001
006	ON (Pipe)	013	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&DoN:255	---:000	---:000	^^Di:002
007	ON (Pipe)	000	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	Do:008	Do:011	---:000	---:000
008	ON (Pipe)	001	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	Do:009	Do:012	---:000	---:000
009	ON (Pipe)	002	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	Do:010	Do:013	---:000	---:000
010	OFF	011	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:005
011	OFF	012	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:006
012	OFF	013	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:007

C-6 Motor Rotation Trigger(Usage Count Comparison)

Conditions:

There are two sets of motor devices on-site (Motor A/Motor B). Each day at noon (12:00), one set of motor is triggered for one hour. Motor A is the primary motor, and it operates when the counter of Motor A is less than or equal to the usage count of Motor B. Motor B is the secondary motor and operates when the counter of Motor B is less than the usage count of Motor A.

Command Explanation:

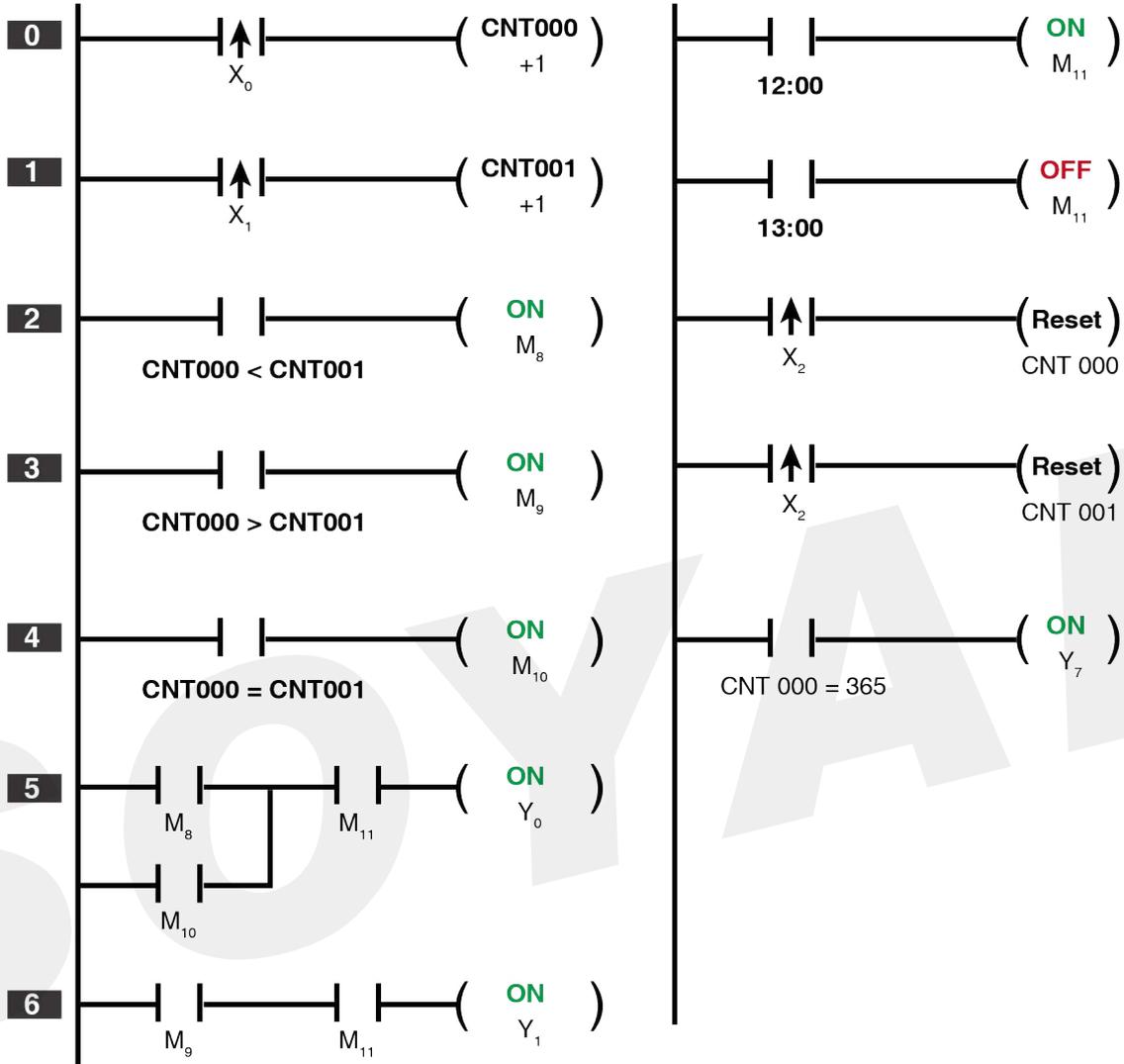
- Index 000: When Y_0 triggers Motor A, it synchronously triggers X_0 . A rising edge trigger on X_0 increments the counter (CNT000) by 1.
- Index 001: When Y_1 triggers Motor B, it synchronously triggers X_1 . An rising edge trigger on X_1 increments the counter (CNT001) by 1.
- Index 002: When CNT000 is less than CNT001, trigger M_8 .
- Index 003: When CNT001 is less than CNT000, trigger M_9 .
- Index 004: When CNT000 equals CNT001, trigger M_{10} .
- Index 005: Set the trigger condition for Y_0 . Y_0 is energized when either M_8 or M_{10} is on, and M_{11} is also on. Ensure that Y_0 is simultaneously wired to X_0 for counting conditions.
- Index 006: Set the trigger condition for Y_1 . Y_1 is energized when M_9 is on, and M_{11} is also on. Ensure that Y_1 is simultaneously wired to X_1 for counting conditions.
- Index 007: Y_{11} will be turned ON at noon (12:00) as a necessary condition for motor triggering.
- Index 008: Y_{11} will be turned OFF at 1:00 PM, stopping the motor output.
- Index 009: Counter reset point. When the management center receives information that the motor usage has reached a certain count, the maintenance provider should be contacted for equipment maintenance, press the reset button (X_2) to reset counter CNT000 after the maintenance.
- Index 010: Same as Index 009, pressing the reset button (X_2) resets counter CNT001.
- Index 011: When CNT000 counts to 365, Y_7 will be triggered, providing a warning signal to the management center. When this signal light is on, proactive contact with the maintenance provider is required.

Referenced Commands:

Edge Trigger (Rising) / Counter / CNT Comparison / Action Time

7. Case Introduction

Ladder Programming



IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	CNT Inc	000	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:000
001	CNT Inc	001	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:001
002	ON (Pipe)	008	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	CNT:200	LESS:001	---:000	---:000
003	ON (Pipe)	009	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	CNT:201	LESS:000	---:000	---:000
004	ON (Pipe)	010	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	CNT:200	EQUA:001	---:000	---:000
005	ON (Pipe)	000	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	Dc:008	Dc:010	---:000	&Dc:011
006	ON (Pipe)	001	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	Dc:009	---:000	---:000	&Dc:011
007	ON (Pipe)	011	0	-	Y	Y	Y	Y	Y	Y	Y	Y	12:00	---:000	---:000	---:000	---:000
008	OFF	011	---	-	Y	Y	Y	Y	Y	Y	Y	Y	13:00	---:000	---:000	---:000	---:000
009	CNT Rst	000	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:002
010	CNT Rst	001	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^Di:002
011	ON (Pipe)	007	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	CNT:000	EQUA:365	---:000	---:000

C-7 Create a 24-hour Clock by Timer & Counter

Conditions:

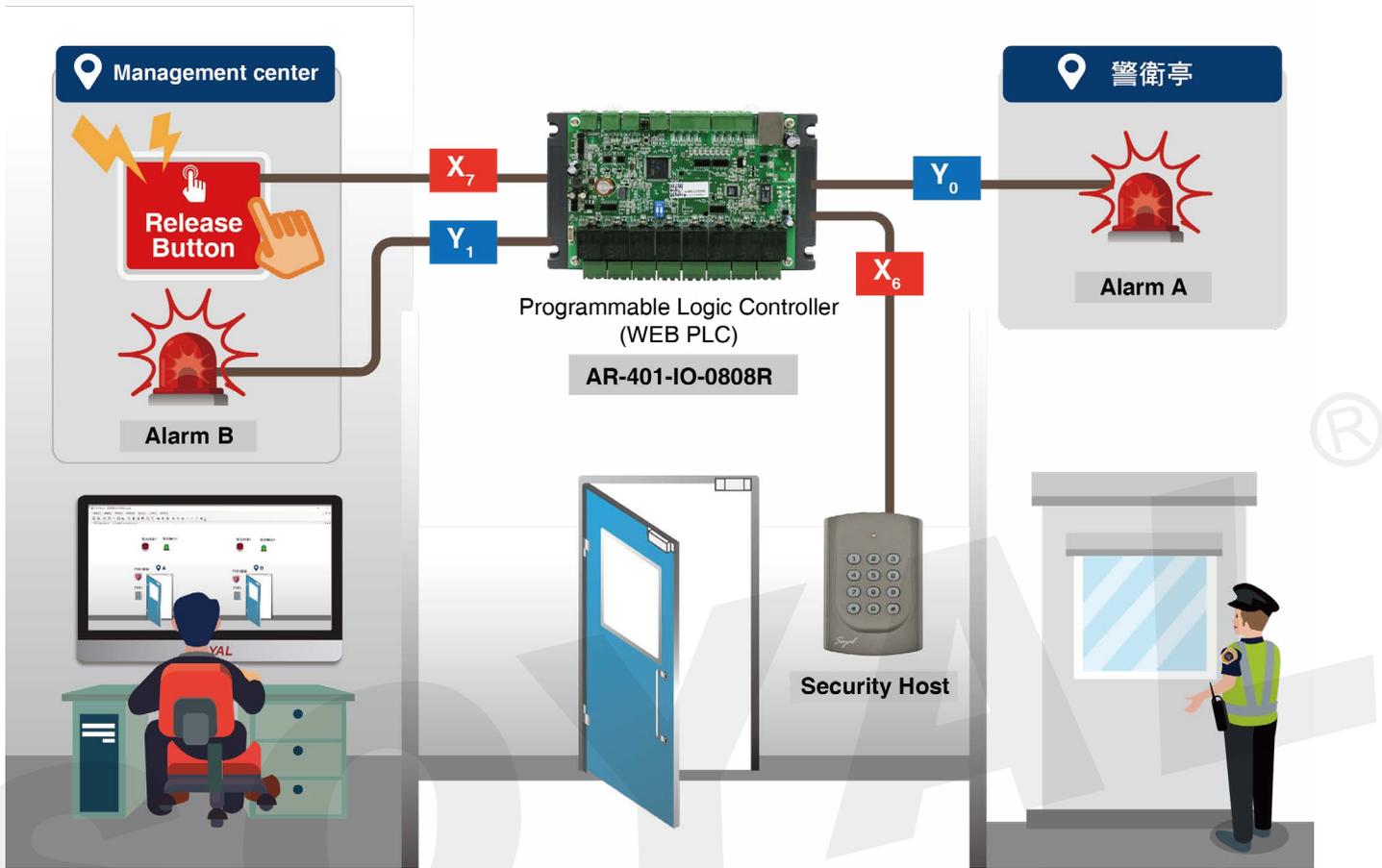
This method can generate a timer of any custom duration. In this example, a TIMER paired with a Counter creates a 24-hour cycle timer, which then triggers outputs at specific times. Following this logic, it can measure seconds, minutes, hours, days, months, years, etc., and specify conditions for triggering specific devices after a certain period.

A practical example: Patrolling point alarm output. Security personnel must swipe their security card at the site every hour. If there is no card swipe for over an hour, an alarm will be triggered at the security booth. If there is no card swipe for over three hours, an alarm will be triggered at the management center. This setup achieves different conditional alarms at multiple locations for different durations.

Command Explanation:

- **Indexes 000-004** form the 24-hour timer logic
- **Index 005-006** control the security booth alarm output
- **Index 007-008** control the management center alarm output
- **Index 000:** TMR 000 cycles every 60 seconds
- **Index 001:** (seconds) When TMR 000 = 60, Counter CNT 001 increments by 1
- **Index 002:** (minutes) When CNT 001 = 60, Counter CNT 001 resets
- **Index 003:** (hours) When CNT 001 = 60, Counter CNT 002 increments by 1
- **Index 004:** (days) When CNT 002 = 24, Counter CNT 002 resets
- **Index 005:** When CNT 002 > 0, it indicates that more than 1 hour has passed without a security card swipe, triggering the alarm at the security booth (output Y_0)
- **Index 006:** On-site security mainframe relay controls input point X_6 . When triggered, it resets CNT 002 to 0, stopping the security booth/management center alarm outputs.
- **Index 007:** When CNT 002 > 2, it indicates that more than 3 hours have passed without a security card swipe, triggering the alarm at the management center (output Y_1)
- **Index 008:** The management center has an external alarm cancel button controlling input point X_7 . When triggered, it resets CNT 002 to 0, stopping the security booth/management center alarm outputs.

7. Case Introduction



7. Case Introduction

Schedule Setting					
Item	Value	Item	Value	Item	Value
Schedule	<< 0 Go to >>	Schedule	<< 1 Go to >>	Schedule	<< 2 Go to >>
Mode	6:TIMER	Mode	7:CNT Inc	Mode	8:CNT RST
Out #	0	Out #	1	Out #	1
Clicks	0	Clicks	0	Clicks	0
Fast Click	<input type="checkbox"/>	Fast Click	<input type="checkbox"/>	Fast Click	<input type="checkbox"/>
Action Time	24:00	Action Time	24:00	Action Time	24:00
Holiday	<input checked="" type="checkbox"/>	Holiday	<input checked="" type="checkbox"/>	Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>	Sun	<input checked="" type="checkbox"/>	Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>	Mon	<input checked="" type="checkbox"/>	Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>
Join 1	TMR :# 0	Join 1	TMR :# 0	Join 1	CNT :# 1
Join 2	LESS :# 60	Join 2	EQUA :# 60	Join 2	MORE :# 60
Join 3	--- :# 0	Join 3	--- :# 0	Join 3	--- :# 0
Join 4	--- :# 0	Join 4	--- :# 0	Join 4	--- :# 0
Update		Update		Update	
Item	Value	Item	Value	Item	Value
Schedule	<< 3 Go to >>	Schedule	<< 3 Go to >>	Schedule	<< 5 Go to >>
Mode	7:CNT Inc	Mode	7:CNT Inc	Mode	2:ON/Pulse Pipe
Out #	2	Out #	2	Out #	0
Clicks	0	Clicks	0	Clicks	0
Fast Click	<input type="checkbox"/>	Fast Click	<input type="checkbox"/>	Fast Click	<input type="checkbox"/>
Action Time	24:00	Action Time	24:00	Action Time	24:00
Holiday	<input checked="" type="checkbox"/>	Holiday	<input checked="" type="checkbox"/>	Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>	Sun	<input checked="" type="checkbox"/>	Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>	Mon	<input checked="" type="checkbox"/>	Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>
Join 1	CNT :# 1	Join 1	CNT :# 1	Join 1	CNT :# 2
Join 2	EQUA :# 60	Join 2	EQUA :# 60	Join 2	MORE :# 0
Join 3	--- :# 0	Join 3	--- :# 0	Join 3	--- :# 0
Join 4	--- :# 0	Join 4	--- :# 0	Join 4	--- :# 0
Update		Update		Update	
Item	Value	Item	Value	Item	Value
Schedule	<< 6 Go to >>	Schedule	<< 7 Go to >>	Schedule	<< 8 Go to >>
Mode	8:CNT RST	Mode	2:ON/Pulse Pipe	Mode	8:CNT RST
Out #	2	Out #	1	Out #	2
Clicks	0	Clicks	0	Clicks	0
Fast Click	<input type="checkbox"/>	Fast Click	<input type="checkbox"/>	Fast Click	<input type="checkbox"/>
Action Time	24:00	Action Time	24:00	Action Time	24:00
Holiday	<input checked="" type="checkbox"/>	Holiday	<input checked="" type="checkbox"/>	Holiday	<input checked="" type="checkbox"/>
Sun	<input checked="" type="checkbox"/>	Sun	<input checked="" type="checkbox"/>	Sun	<input checked="" type="checkbox"/>
Mon	<input checked="" type="checkbox"/>	Mon	<input checked="" type="checkbox"/>	Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>
Sat	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>
Join 1	--- :# 0	Join 1	CNT :# 2	Join 1	--- :# 0
Join 2	--- :# 0	Join 2	MORE :# 2	Join 2	--- :# 0
Join 3	--- :# 0	Join 3	--- :# 0	Join 3	--- :# 0
Join 4	^^Di :# 6	Join 4	--- :# 0	Join 4	^^Di :# 7
Update		Update		Update	

7. Case Introduction

Ladder Programming

0 | TMR000 < 60 | (TMR000 Start)

1 | TMR000 = 60 | (CNT001 +1)

2 | CNT001 > 60 | (Reset CNT001)

3 | CNT001 = 60 | (CNT002 +1)

4 | CNT002 = 24 | (Reset CNT002)

5 | CNT002 > 0 | (ON Y₀)

6 | ↑ X₆ | (Reset CNT002)

7 | CNT002 > 2 | (ON Y₁)

8 | ↑ X₇ | (Reset CNT002)

IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	Timer	000	32	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	TMR:000	LESS:060	---:000	---:000
001	CNT Inc	001	29	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	TMR:000	EQUA:060	---:000	---:000
002	CNT Rst	001	29	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	CNT:001	MORE:060	---:000	---:000
003	CNT Inc	002	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	CNT:001	EQUA:060	---:000	---:000
004	CNT Rst	002	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	CNT:002	EQUA:024	---:000	---:000
005	ON (Pipe)	000	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	CNT:002	MORE:000	---:000	---:000
006	CNT Rst	002	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:006
007	ON (Pipe)	001	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	CNT:002	MORE:002	---:000	---:000
008	CNT Rst	002	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:007

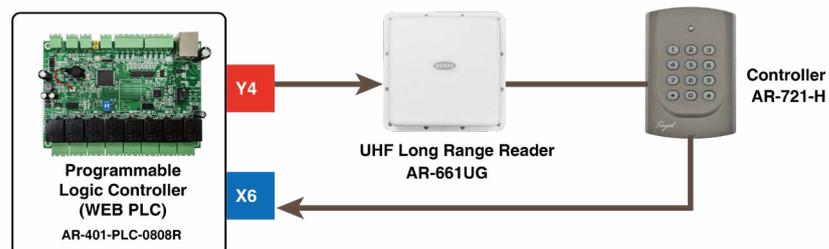
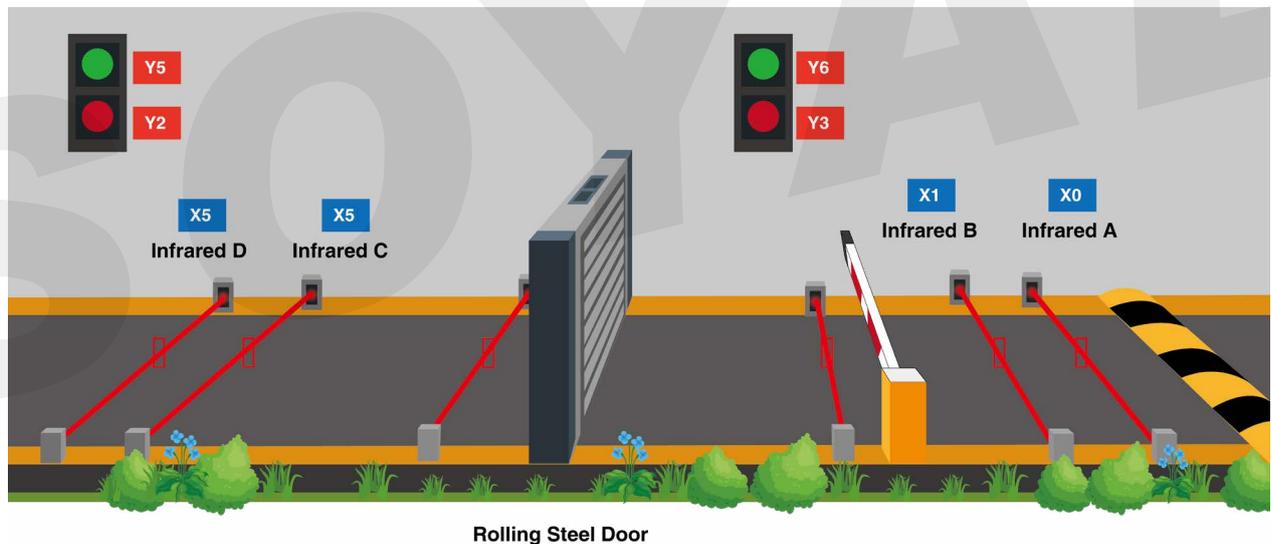
C-8 Single Lane Bidirectional Control

Scenario:

This lane allows bidirectional traffic and includes direction detection functionality to open barriers/rolling doors according to the direction of travel.

✘ The barriers/rolling doors used in this setup have timed drop and anti-pinch functions. Therefore, this example only controls the "Up" contact of the barriers/rolling doors and does not control the "Stop" & "Down" contacts.

✘ The anti-pinch RF for the rolling doors in this setup is triggered in parallel with the same DI point on the PLC. It is normally open, and when a vehicle passes through, it short-circuits, causing the rolling door to continuously trigger the "Up" contact.



7. Case Introduction

Conditions:

A. Vehicle Entry (1F -> B1)

1. After the vehicle enters and meets the direction detection for 1F, the long-range card reader is activated, and the B1 red light is turned on.
2. When the card reader identifies a valid card, it triggers the "Up" function for both the barrier gate and the rolling door.
3. The B1 traffic light remains green while in standby. When a vehicle enters 1F, the light changes to red to warn that no vehicles should exit from B1 until the vehicle passes through and meets the direction detection for B1. Once the vehicle meets B1's direction detection, the B1 traffic light returns to green.

B. Vehicle Exit (B1 -> 1F)

1. After the vehicle exits and meets the direction detection for B1, the B1 red light is activated.
2. Once the vehicle satisfies the B1 exit direction detection, it triggers the "Up" function for both the barrier gate and the rolling door.
3. The 1F traffic light remains green while in standby. When a vehicle exits from B1, the light changes to red to warn that no vehicles should enter 1F until the vehicle has passed through. Once the vehicle meets the direction detection for 1F, the 1F traffic light returns to green.

DI/DO Contacts							
DI	Device	Status	Optional	DO	Device	Status	Optional
X ₀	1F RF-A	NO		Y ₀	Barrier Up	NO	
X ₁	1F RF-B	NO		Y ₁	Rolling Door Up	NO	
X ₂	B1 RF-C	NO		Y ₂	B1 Red Light	NO	●
X ₃	B1 RF-D	NO		Y ₃	1F Red Light	NO	●
X ₄	Barrier Anti-pinch	NO		Y ₄	Activate Card Reader	NO	
X ₅	Rolling Door Anti-pinch	NO		Y ₅	B1 Green Light	NO	●
X ₆	Card Reader RELAY (Valid Card Opens Door Output)	NO		Y ₆	1F Green Light	NO	●

Command Explanation:

The following durations can all be customized to match the specific lane configuration on site.

- Index 000: When entering, activate the long-range card reader function to read the card for 20 seconds.
- Index 001: When a valid card is read, the card reader outputs a relay to the PLC, which then triggers the barrier and rolling door to open (2 seconds).
- Index 002: When entering, the vehicle triggers the B1 red light at the lower edge of 1F; B1 red light ON for 20 seconds.
- Index 003: When entering, the vehicle triggers the B1 red light at the lower edge of B1; B1 red light OFF.
 - ✘ The B1 red light will turn back to green after the specified duration or when the vehicle has passed through B1's ground loop/RF.
- Index 004: B1 Green Light (green while in standby); activation condition is B1 red light OFF.
- Index 005: When exiting, the vehicle triggers the upper edge of B1, opening the barrier and rolling door.
- Index 006: When exiting, the vehicle triggers the 1F red light at the lower edge of B1; 1F red light ON for 20 seconds.
- Index 007: When exiting, the vehicle triggers the 1F red light at the lower edge of 1F; 1F red light OFF.
 - ✘ The 1F red light will turn back to green after the specified duration or when the vehicle has passed through 1F's ground loop/RF.
- Index 008: 1F Green Light (green while in standby); activation condition is 1F red light OFF.
- Index 009: Remote control door open dry contact; opens the barrier and rolling door.
- Index 010: Barrier opening conditions (virtual points), combined points, with more than four conditions.
- Index 011: Barrier opening conditions (actual points), including conditions from Index 010 and remote control door open trigger.
- Index 012: Rolling door opening conditions (virtual points), combined points, with more than four conditions.
- Index 013: Rolling door opening conditions (actual points), including conditions from Index 012 and remote control door open trigger.
- Index 014: Close the barrier; if "Barrier Up" is not outputting, it can be triggered to "Barrier Down" via the remote control.
- Index 015: Close the rolling door; if "Rolling Door Up" is not outputting, it can be triggered to "Rolling Door Down" via the remote control.

7. Case Introduction

Schedule Setting

Item	Value	Item	Value	Item	Value	Item	Value
Schedule	<< 0 Go to >>	Schedule	<< 1 Go to >>	Schedule	<< 2 Go to >>	Schedule	<< 3 Go to >>
Mode	3:Pulse	Mode	3:Pulse	Mode	3:Pulse	Mode	1:OFF
Out #	4	Out #	104	Out #	2	Out #	2
Clicks	20	Clicks	2	Clicks	20	Clicks	0
Fast Click	<input type="checkbox"/>						
Action Time	24:00						
Holiday	<input checked="" type="checkbox"/>						
Sun	<input checked="" type="checkbox"/>						
Mon	<input checked="" type="checkbox"/>						
Tue	<input checked="" type="checkbox"/>						
Wed	<input checked="" type="checkbox"/>						
Thu	<input checked="" type="checkbox"/>						
Fri	<input checked="" type="checkbox"/>						
Sat	<input checked="" type="checkbox"/>						
Join 1	&Di :#0	Join 1	--- :#0	Join 1	&Di :#1	Join 1	&Di :#3
Join 2	--- :#0						
Join 3	--- :#0						
Join 4	^Di :#1	Join 4	^Di :#6	Join 4	^Di :#0	Join 4	^Di :#2

Item	Value	Item	Value	Item	Value	Item	Value
Schedule	<< 4 Go to >>	Schedule	<< 5 Go to >>	Schedule	<< 6 Go to >>	Schedule	<< 7 Go to >>
Mode	2:ON/Pulse Pipe	Mode	3:Pulse	Mode	3:Pulse	Mode	1:OFF
Out #	5	Out #	103	Out #	3	Out #	3
Clicks	0	Clicks	2	Clicks	20	Clicks	0
Fast Click	<input type="checkbox"/>						
Action Time	24:00						
Holiday	<input checked="" type="checkbox"/>						
Sun	<input checked="" type="checkbox"/>						
Mon	<input checked="" type="checkbox"/>						
Tue	<input checked="" type="checkbox"/>						
Wed	<input checked="" type="checkbox"/>						
Thu	<input checked="" type="checkbox"/>						
Fri	<input checked="" type="checkbox"/>						
Sat	<input checked="" type="checkbox"/>						
Join 1	&DoN :#2	Join 1	&Di :#3	Join 1	&Di :#2	Join 1	&Di :#0
Join 2	--- :#0						
Join 3	--- :#0						
Join 4	--- :#0	Join 4	^Di :#2	Join 4	^Di :#3	Join 4	^Di :#1

Item	Value	Item	Value	Item	Value	Item	Value
Schedule	<< 8 Go to >>	Schedule	<< 9 Go to >>	Schedule	<< 10 Go to >>	Schedule	<< 11 Go to >>
Mode	2:ON/Pulse Pipe	Mode	3:Pulse	Mode	2:ON/Pulse Pipe	Mode	2:ON/Pulse Pipe
Out #	6	Out #	107	Out #	108	Out #	0
Clicks	0	Clicks	2	Clicks	0	Clicks	0
Fast Click	<input type="checkbox"/>						
Action Time	24:00						
Holiday	<input checked="" type="checkbox"/>						
Sun	<input checked="" type="checkbox"/>						
Mon	<input checked="" type="checkbox"/>						
Tue	<input checked="" type="checkbox"/>						
Wed	<input checked="" type="checkbox"/>						
Thu	<input checked="" type="checkbox"/>						
Fri	<input checked="" type="checkbox"/>						
Sat	<input checked="" type="checkbox"/>						
Join 1	&DoN :#3	Join 1	--- :#0	Join 1	Do :#107	Join 1	Do :#108
Join 2	--- :#0	Join 2	--- :#0	Join 2	Do :#104	Join 2	Di :#17
Join 3	--- :#0	Join 3	--- :#0	Join 3	Do :#103	Join 3	--- :#0
Join 4	--- :#0	Join 4	^Di :#7	Join 4	Di :#4	Join 4	--- :#0

7. Case Introduction

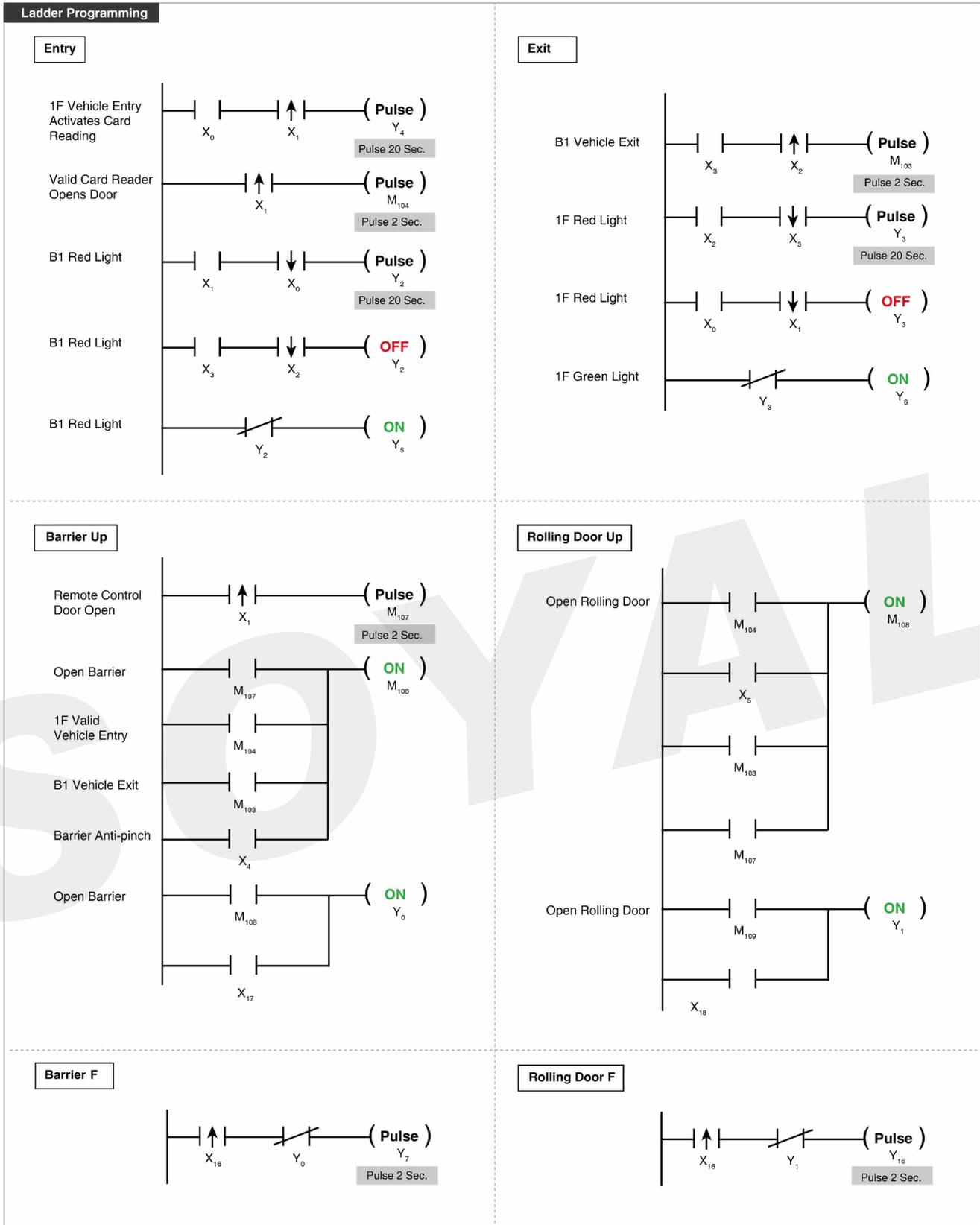
Schedule Setting

Item	Value	Item	Value	Item	Value	Item	Value
Schedule	<< 12 Go to >>	Schedule	<< 13 Go to >>	Schedule	<< 14 Go to >>	Schedule	<< 15 Go to >>
Mode	2:ON/Pulse Pipe v	Mode	2:ON/Pulse Pipe v	Mode	3:Pulse v	Mode	3:Pulse v
Out #	109	Out #	1	Out #	7	Out #	16
Clicks	0	Clicks	0	Clicks	2	Clicks	2
Fast Click	<input type="checkbox"/>						
Action Time	24:00						
Holiday	<input checked="" type="checkbox"/>						
Sun	<input checked="" type="checkbox"/>						
Mon	<input checked="" type="checkbox"/>						
Tue	<input checked="" type="checkbox"/>						
Wed	<input checked="" type="checkbox"/>						
Thu	<input checked="" type="checkbox"/>						
Fri	<input checked="" type="checkbox"/>						
Sat	<input checked="" type="checkbox"/>						
Join 1	Do :#104	Join 1	Do :#109	Join 1	&DoN :#0	Join 1	&DoN :#1
Join 2	Di :#5	Join 2	Di :#18	Join 2	--- :#0	Join 2	--- :#0
Join 3	Do :#103	Join 3	--- :#0	Join 3	--- :#0	Join 3	--- :#0
Join 4	Do :#107	Join 4	--- :#0	Join 4	^^Di :#16	Join 4	^^Di :#16

IO Schedule

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	Pulse	004	20	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:000	---:000	---:000	^^Di:001
001	Pulse	104	2	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:006
002	Pulse	002	20	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:001	---:000	---:000	^^Di:000
003	OFF	002	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:003	---:000	---:000	^^Di:002
004	ON (Pipe)	005	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&DoN:002	---:000	---:000	---:000
005	Pulse	103	2	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:003	---:000	---:000	^^Di:002
006	Pulse	003	20	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:002	---:000	---:000	^^Di:003
007	OFF	003	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:000	---:000	---:000	^^Di:001
008	ON (Pipe)	006	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&DoN:003	---:000	---:000	---:000
009	Pulse	107	2	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:007
010	ON (Pipe)	108	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	Do:107	Do:104	Do:103	Di:004
011	ON (Pipe)	000	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	Do:108	Di:017	---:000	---:000
012	ON (Pipe)	109	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	Do:104	Di:005	Do:103	Do:107
013	ON (Pipe)	001	0	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	Do:109	Di:018	---:000	---:000
014	Pulse	007	2	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&DoN:000	---:000	---:000	^^Di:016
015	Pulse	016	2	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&DoN:001	---:000	---:000	^^Di:016

7. Case Introduction



Referenced Commands:

Rising Edge Trigger / Falling Edge Trigger / Direction Detection / Pulse Output

8-1 Firmware Update

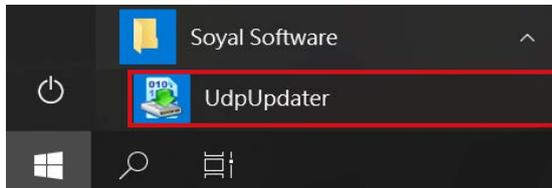
• 1. SOYAL Device Tools Software Update

After installing SoyolToolSetup , run UDP UPDATER software

1 After installing SoyolToolSetup, UDP UPDATER shortcut will be automatically created. Double click to run UDP UPDATER

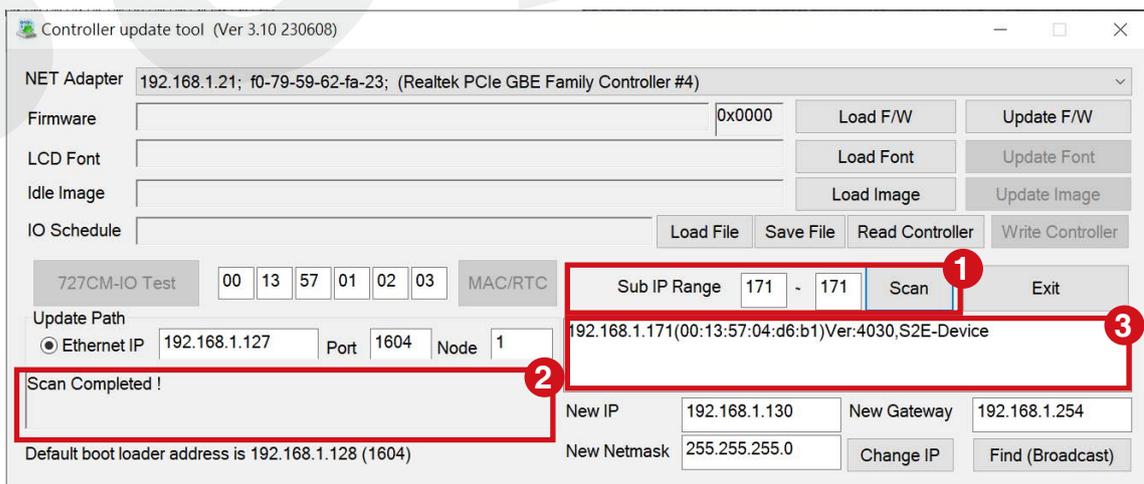


2 Another method to run UDP UPDATER, on your computer > Start > Soyol Software folder > click to run UDP UPDATER



(Note: If your computer has running 701 Server software, you need to close 701Server before running this software to avoid communication port being occupied)

• 2. Device Reading



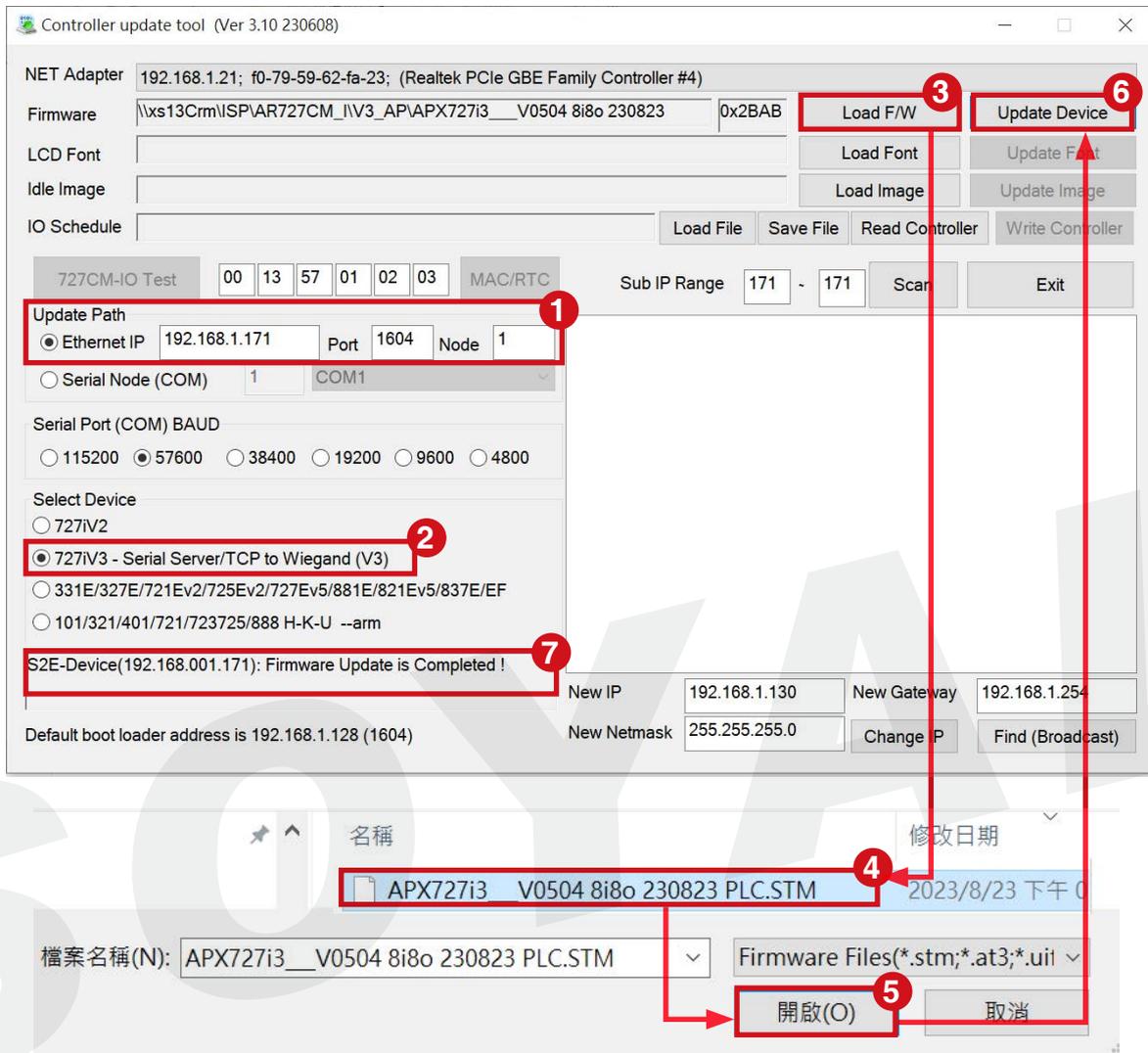
STEP 1 : It is recommended to first check the controller status in the Sub IP Range. Enter the IP address and then press SCAN.

STEP 2 : After displaying "Scan Completed!", the process is finished.

STEP 3 : The device information displayed in the message box indicates that the device connection is normal.

8. Appendix

● 3. Firmware Update



STEP 1 : Enter Device IP Address, Port remain as default value '1604',
enter Device Node ID

STEP 2 : Select Device model number [727iV3-Serial Server/TCP to Wiegand (V3)]

STEP 3 : Press [Load F/W]

STEP 4 : Select firmware file

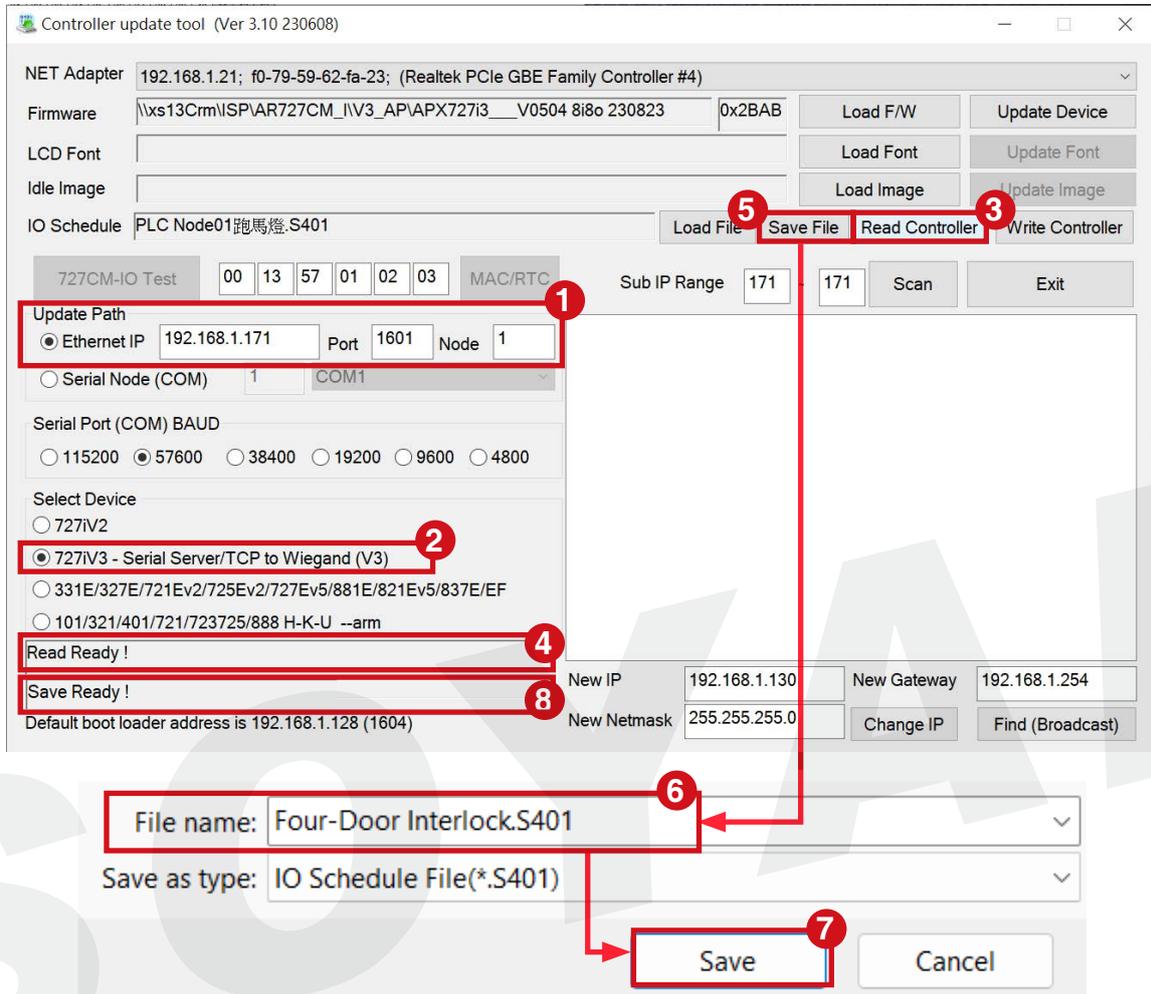
STEP 5 : Select [Open]

STEP 6 : Select [Update F/W]

STEP 7 : Update firmware status will show on the progress bar.

When it shows " CONTROLLER Programming Completed! " indicated
Update Firmware has been successfully.

8-2 Schedule Export



STEP 1 : Enter Device IP Address, Port remain as default value '1601',
enter Device Node ID

STEP 2 : Select Device model number [727iV3-Serial Server/TCP to Wiegand (V3)]

STEP 3 : Press [Read Controller]

STEP 4 : The message box displaying " Read Ready! " indicates the completion
of the process.

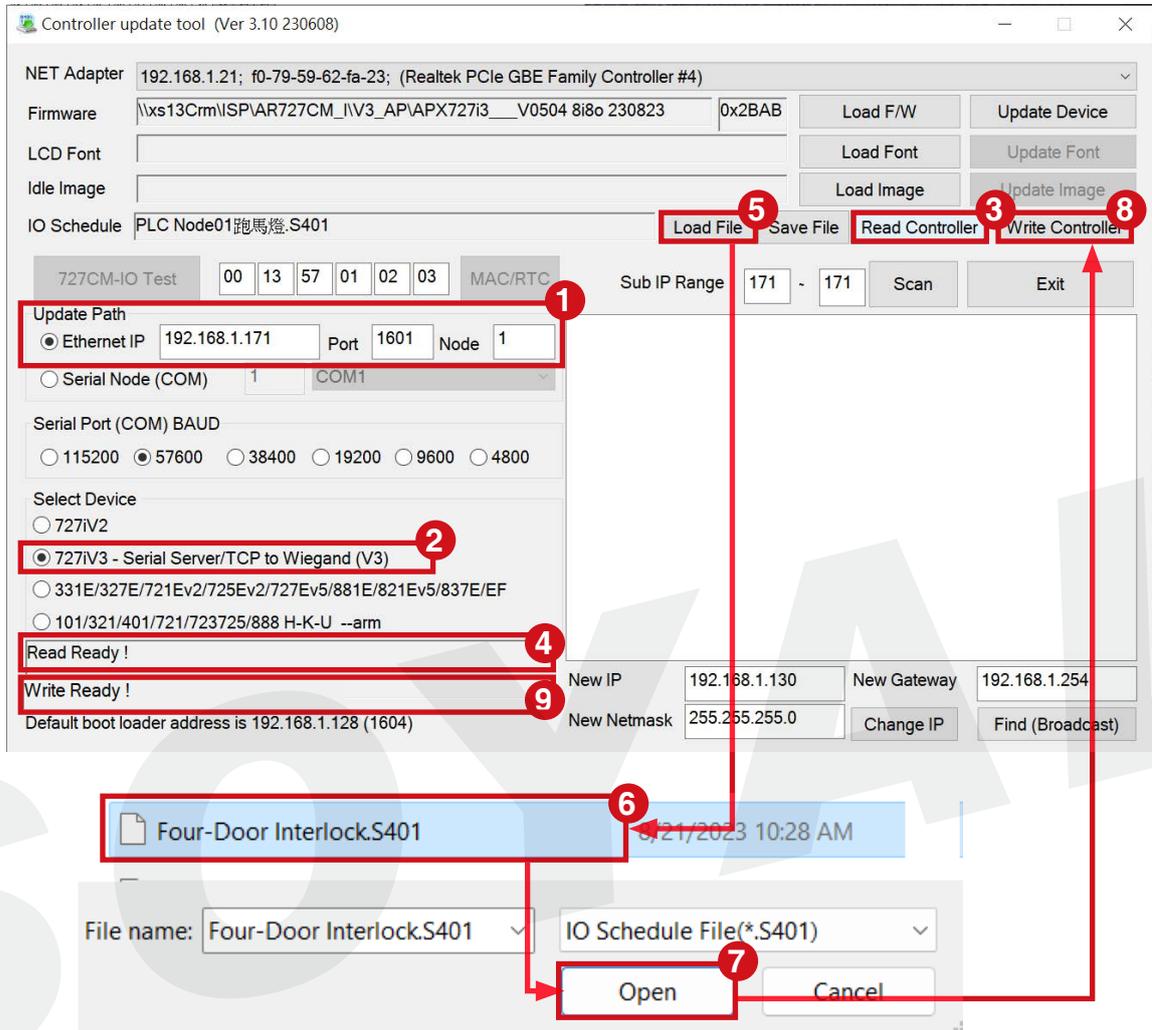
STEP 5 : Press [Save File]

STEP 6 : Select the path for exporting the programming file and edit the export
file name.

STEP 7 : Select [Save]

STEP 8 : Export is complete when "Save Ready" is displayed.

8-3 Schedule Import



STEP 1 : Enter Device IP Address, Port remain as default value '1601', enter Device Node ID

STEP 2 : Select Device model number [727iV3-Serial Server/TCP to Wiegand (V3)]

STEP 3 : Press [Read Controller]

STEP 4 : The message box displaying " Read Ready! " indicates the completion of the process.

STEP 5 : Press [Load File]

STEP 6 : Select the programming file you want to import.

STEP 7 : Select [Open]

STEP 8 : Click the [Write Controller] button to execute the file import.

STEP 9 : After the import is completed, it will display "Write Ready! " indicating the process is finished.

8-4 FAQ

Q 1 : Incorrect CNT Inc Counting?

A : To ensure accurate counting with CNT Inc, it's crucial to select edge-triggering conditions like $\wedge\wedge\text{Di}$ or $\wedge.\text{Di}$. Opting for other triggering conditions might result in erratic counting behavior.

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
004	CNT Inc	000	28	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	$\wedge.\text{Di}:007$

Q 2 : Why Does the Timer Keep Showing 0 After Triggering?

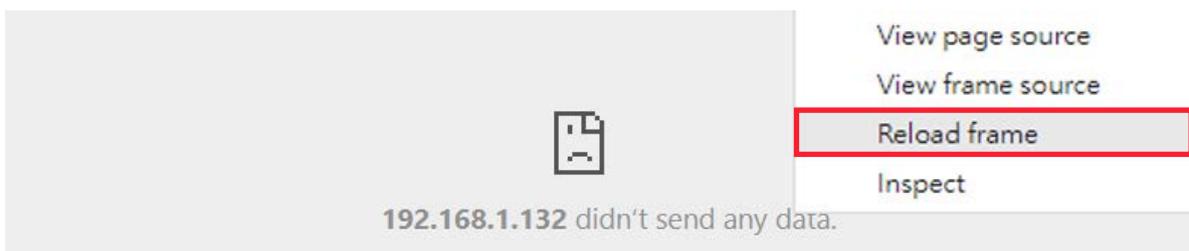
A : The Timer displays 0 after triggering because it starts counting when triggered and resets to 0 when the trigger stops. Therefore, to accurately view the Timer's triggering time, you need to check it while the trigger is active.

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
005	Timer	000	129	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	&Di:006

Q 3 : How to Trigger Timer in a Loop?

A : When you set TIMER conditions as LESS:011, it means the Timer will cycle between 0 to 11 seconds. You can use this TMR value as a triggering condition. For more details, you can refer to the example provided in 3-2, the "Running Light" scenario.

Q 4 : When encountering an error page while trying to access the webpage login settings, as shown below, you can right-click on that section and choose to reload that specific page section.

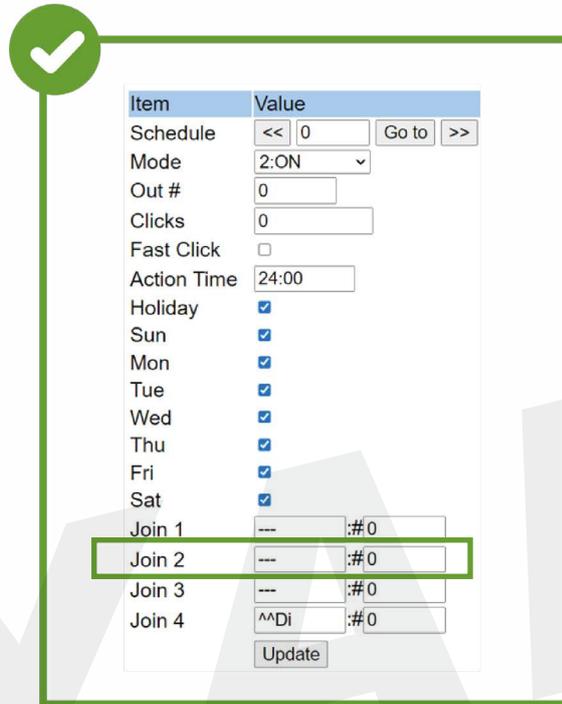
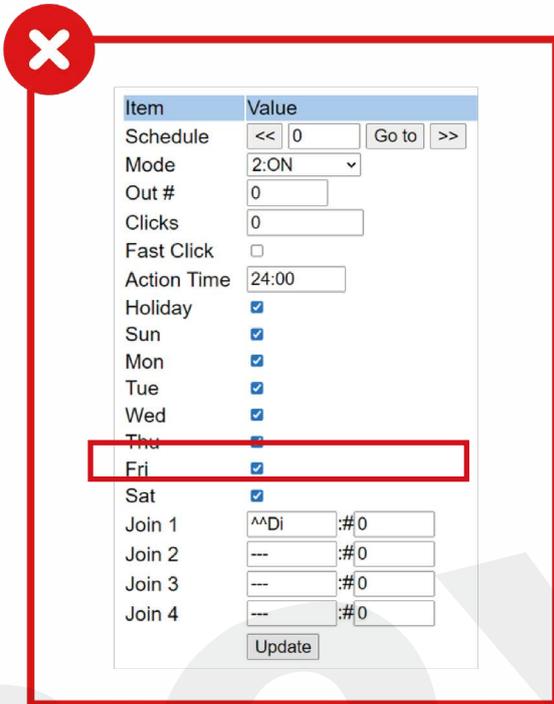


8. Appendix

Q 5 : Edge trigger as a condition doesn't trigger the output properly?

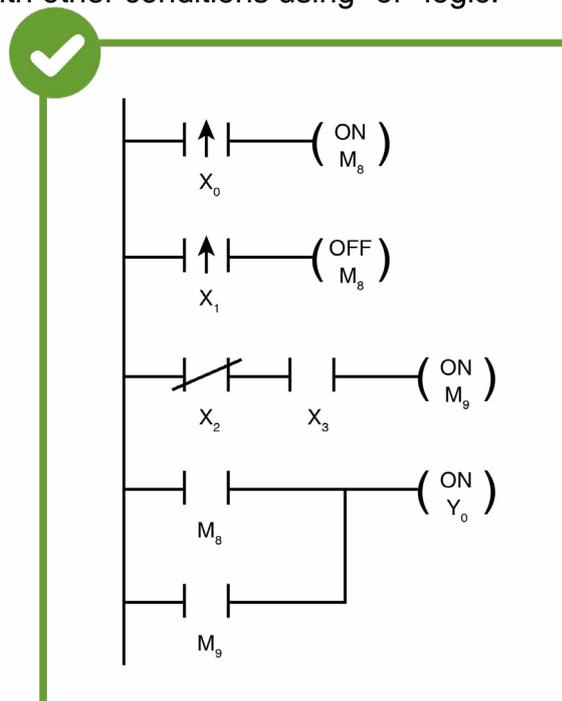
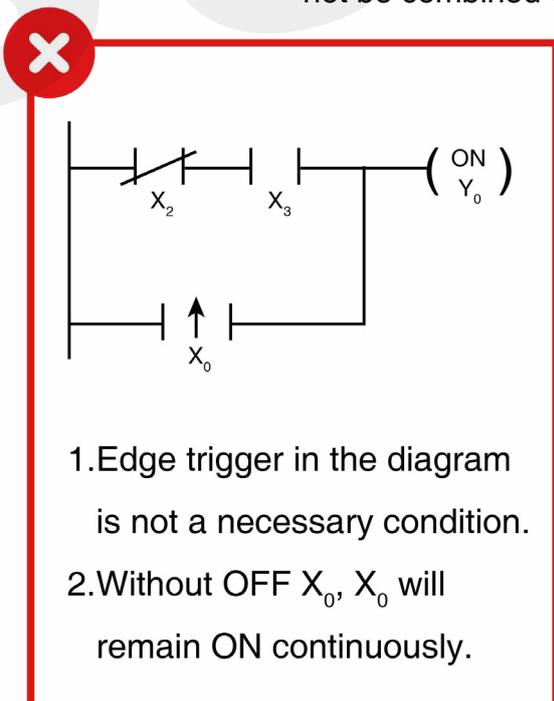
A: Common Mistake 1: Incorrect edge trigger setup

Correct setup: Both rising edge (^Di) and falling edge (^Di) triggers must be set in the condition Join.



A : Common Mistake 2: Condition conflicts

Correct setup: Edge trigger should always be a required condition and should not be combined with other conditions using "or" logic.



A : Common Mistake 3: Multiple edge triggers

Correct setup: Time conditions are also edge triggers, so they cannot be directly set in the same schedule with edge triggers.

Item	Value
Schedule	<< 1 Go to >>
Mode	2:ON
Out #	0
Clicks	0
Fast Click	<input type="checkbox"/>
Action Time	12:30
Holiday	<input type="checkbox"/>
Sun	<input type="checkbox"/>
Mon	<input checked="" type="checkbox"/>
Tue	<input checked="" type="checkbox"/>
Wed	<input checked="" type="checkbox"/>
Thu	<input checked="" type="checkbox"/>
Fri	<input checked="" type="checkbox"/>
Sat	<input type="checkbox"/>
Join 1	---:#0
Join 2	---:#0
Join 3	---:#0
Join 4	^^Di:#0

Update



Index	Mode	Out#	Pulse 0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	ON	008	---	-	Y	Y	Y	Y	Y	-	-	12:30	---:000	---:000	---:000	---:000
001	ON	009	---	-	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:000
002	ON	000	---	-	Y	Y	Y	Y	Y	Y	Y	24:00	&Do:008	&Do:009	---:000	---:000
003	OFF	009	---	-	Y	Y	Y	Y	Y	Y	Y	24:00	---:000	---:000	---:000	^^Di:001

1. M_9 with ON/OFF conditions (X_0/X_1) as edge triggers.
2. Time trigger (12:30) set as a separate condition to trigger M_8 , avoiding conflicts with two edge outputs used as conditions.
3. X_0 edge trigger linked to virtual point M_9 , avoiding conflicts with two edge outputs used as conditions.

✘ Actually, the time edge condition triggered at 12:30 can be written in Index002 and linked to M_9 , showcasing the expansion of edge condition usage.

8. Appendix

Q 6 : Same output point duplicated in multiple conditionals

A : Common mistake: Same output point set in multiple conditions.

The same input point can be used as a condition for multiple output points; however, the same output point cannot be used as the output for multiple schedules.

X

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	ON	000	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:000	---:000	---:000	---:000
001	ON	000	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:001	---:000	---:000	---:000
002	ON	000	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:002	---:000	---:000	---:000

✓

Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	ON	000	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	Di:000	Di:001	Di:002	---:000
Index	Mode	Out#	Pulse	0.1	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Holiday	hh:mm	Join 1	Join 2	Join 3	Join 4
000	ON	000	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:000	---:000	---:000	---:000
001	ON	001	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:000	---:000	---:000	---:000
002	ON	002	---	-	Y	Y	Y	Y	Y	Y	Y	Y	24:00	&Di:000	---:000	---:000	---:000

Q7. Abnormal operation of Pulse/Cycle/Toggle.

A : Common mistake: Trigger condition is not an edge trigger.

The parameter setting page reminds that Pulse/Cycle/Toggle is Timed/Edge only, in other words, it must be used with edge triggers as conditions; using non-edge trigger conditions may result in abnormal operation or failure to reset.

Item	Value	Rule	Descriptions
Schedule	<< 0 Go to >>	Clear	Empty All IO Rules
Mode	2:ON		Pulse/Cycle/Toggle action on Timed/Edge only.
Out #	0		IO#(0~255), TMR/CNT #(0~31)
Clicks	0		Pulse(1~65535) or Cycle(1~255:1~255)

8-5 List of WEB PLC and I/O Expansion Board Models

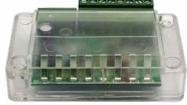
• Available WEB PLC Models

Model no.		AR-727-CM-PLC-0804R	AR-401-PLC-0808R	AR-401-PLC-1616R	
Product Images					
DI	Quantity	8	8	16	
	Source Input mode		●	●	
	Sink Input mode	●	●	●	
	Optical Isolation	●	●	●	
DO	Quantity	4	8	16	
	MosFet				
	Relay	TypeA			●
		TypeC	●	●	
Independent I/O Power Supply		●	●	●	

• Available Expansion I/O Module Models

Model no.		AR-401-IO-0016R	AR-401-IO-1616R	AR-401-IO-1616M	AR-401-IO-1608R	
Product Images						
DI	Quantity	0	16	16	16	
	Source Input mode		●			
	Sink Input mode	●	●	●	●	
	Optical Isolation		●	●	●	
DO	Quantity	16	16	16	8	
	MosFet			●		
	Relay	TypeA		●		
		TypeC	●			●
Independent I/O Power Supply			●	●	●	

8. Appendix

Model no.		AR-403-IO-0404P	AR-403-IO-0404M	AR-403-IO-0202M-IR	
Product Images					
DI	Quantity	4	4	2	
	Source Input mode				
	Sink Input mode				
	Optical Isolation	●			
DO	Quantity	4	4	2	
	MosFet	●	●	●	
	Relay	TypeA			
		TypeC			
Independent I/O Power Supply		●			