



Tripping Matrix Device 7UW5010

As of Tripping Circuit Management Unit or Non-electric Protection Device

DIEGO GAO/PLM

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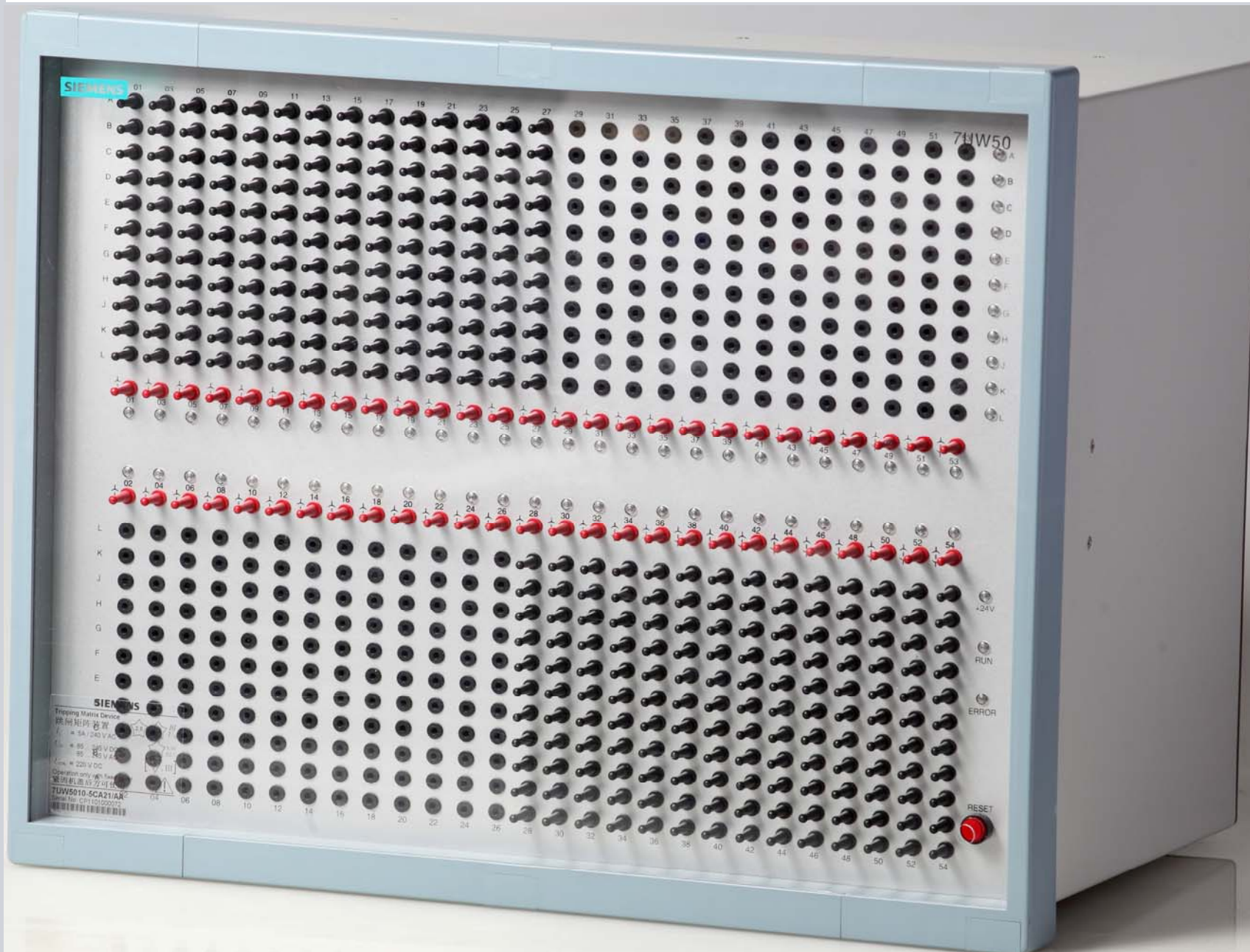
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Tripping Matrix Device: 7UW5010



Tripping Circuit: **What** To Do?

In case of generator protection system, we have to manage the tripping circuit

- ❑ Program the tripping matrix of protection functions and the tripping objects;
- ❑ Local indication of either tripping or alarming;
- ❑ To route the operating message of either tripping or alarming to multi remote centre via wiring, e.g, DCS, Fault Disturbance Recorder;
- ❑ To send the operating message of either tripping or alarming to multi remote control centre over protocol, e.g, DCS, Protection and Fault Record Management Center;
- ❑ To trip the required objects, e.g, GCB, HV CB, Station Service CB, Shut-down, Excitation CB, and to initiate the function Break Failure, HSBT, etc.;
- ❑ To physically disconnect the protection functions to tripping relays;
- ❑ To physically disconnect the tripping relays to tripping objects.

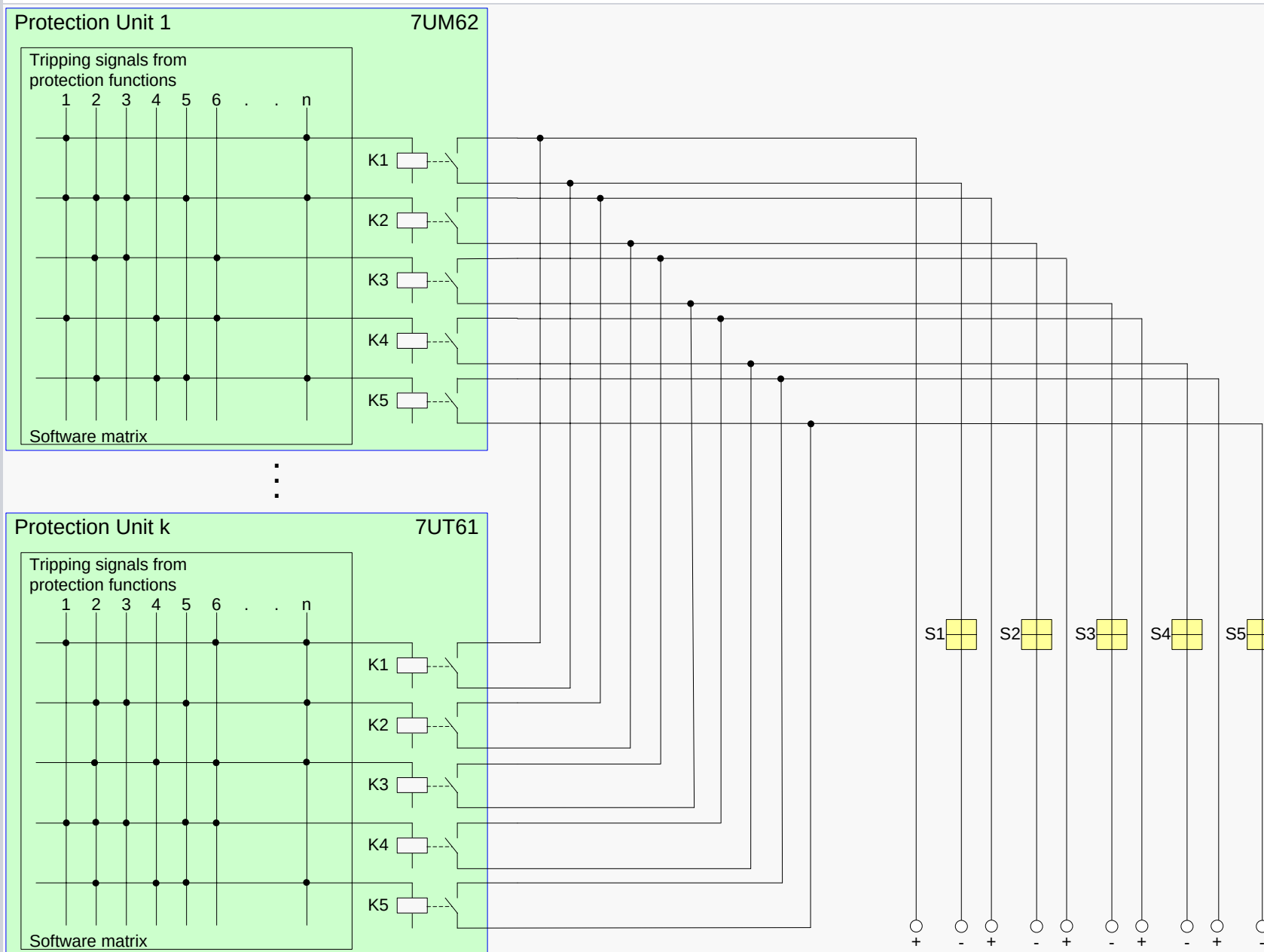
Actualization of various concepts to tripping matrix

- ❑ Software matrix inside the protection device;
- ❑ Wiring and mater relays;
- ❑ Hardware matrix device;

Siemens answers:

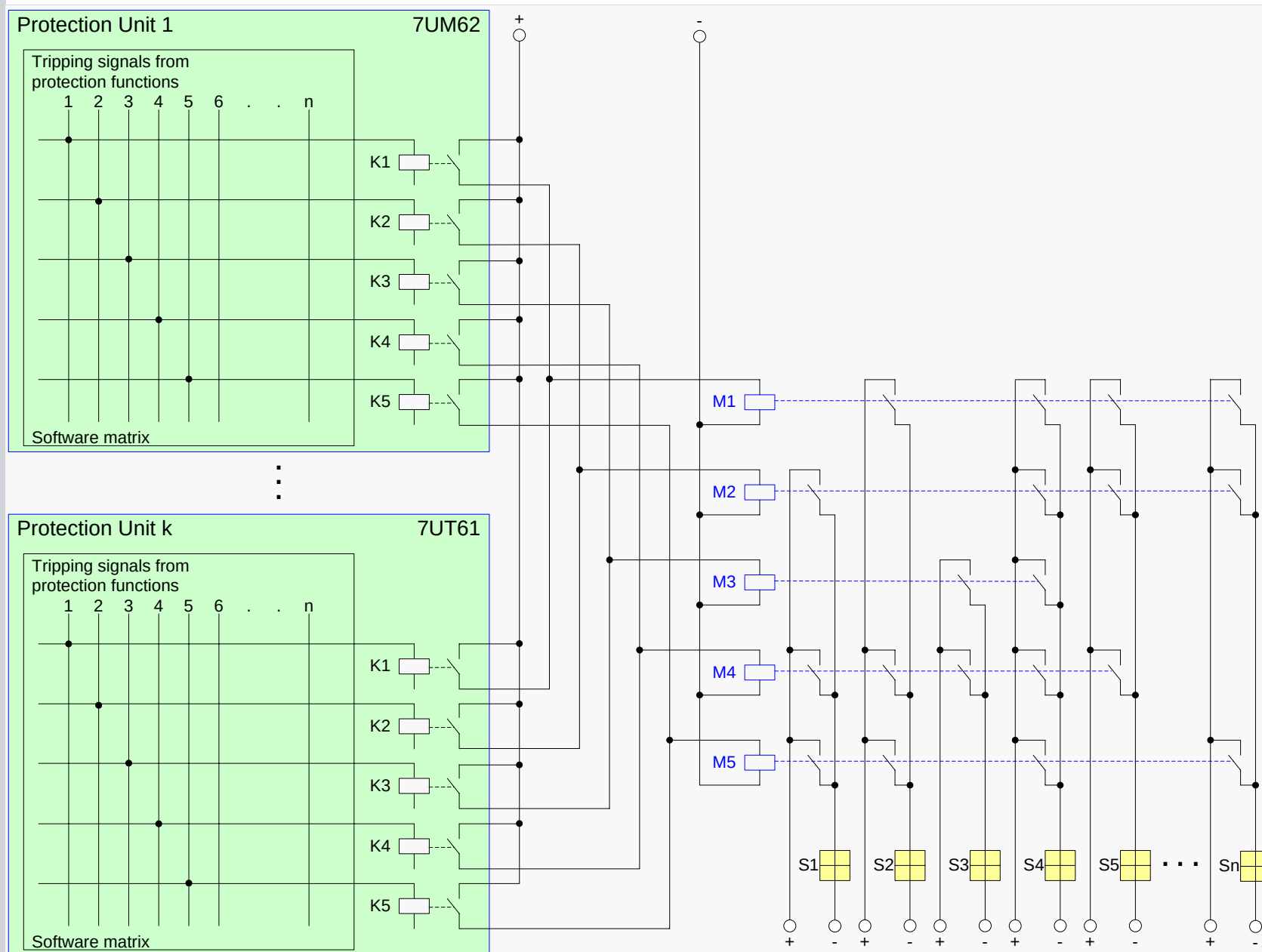
- ❑ Re-designed Tripping Matrix Device 7UW5010!
- ❑ Actualization of tripping combination via hardware matrix module!

Tripping Concept: Software Matrix (1/3)

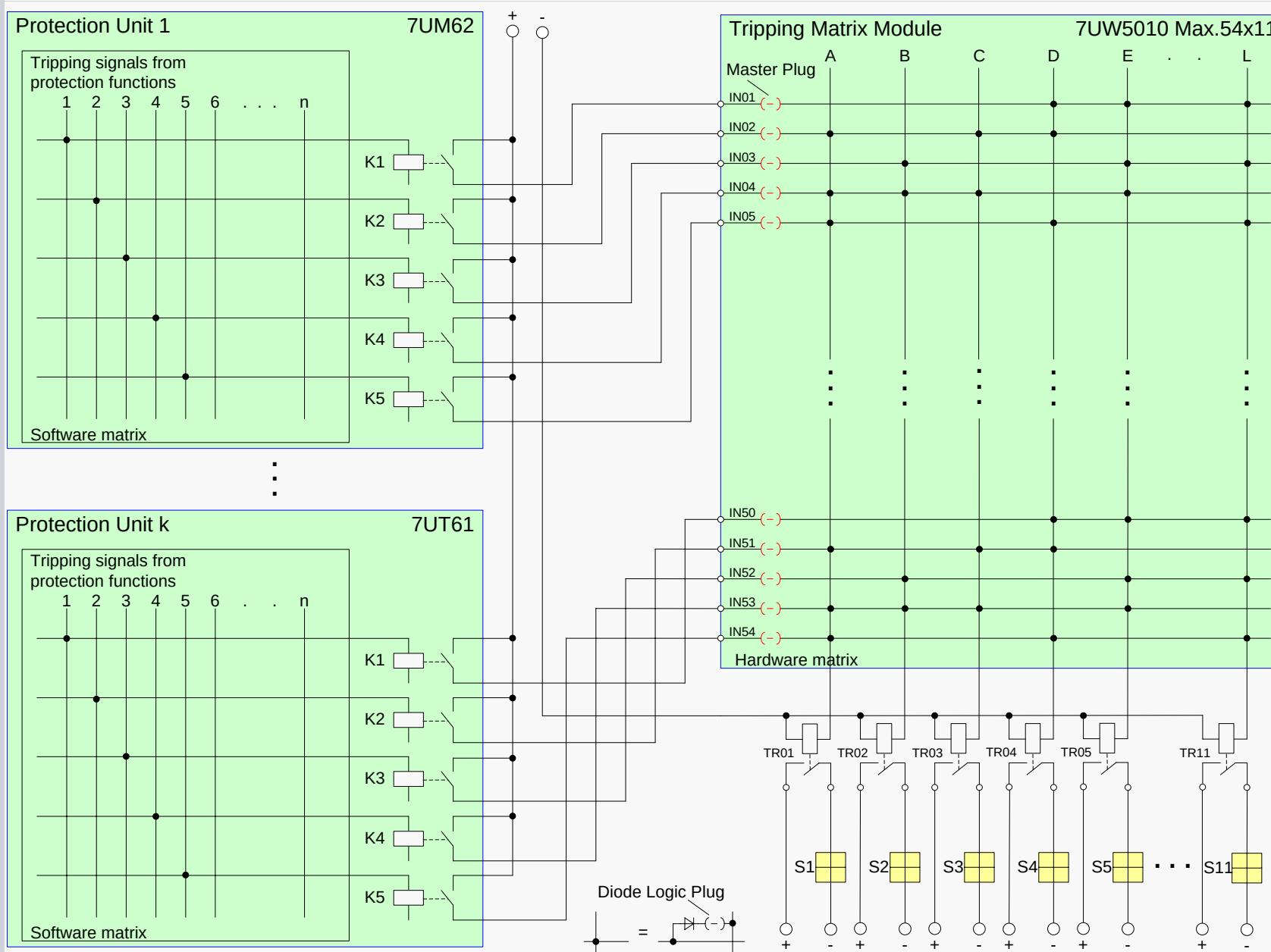


Tripping Concept: Master Relays

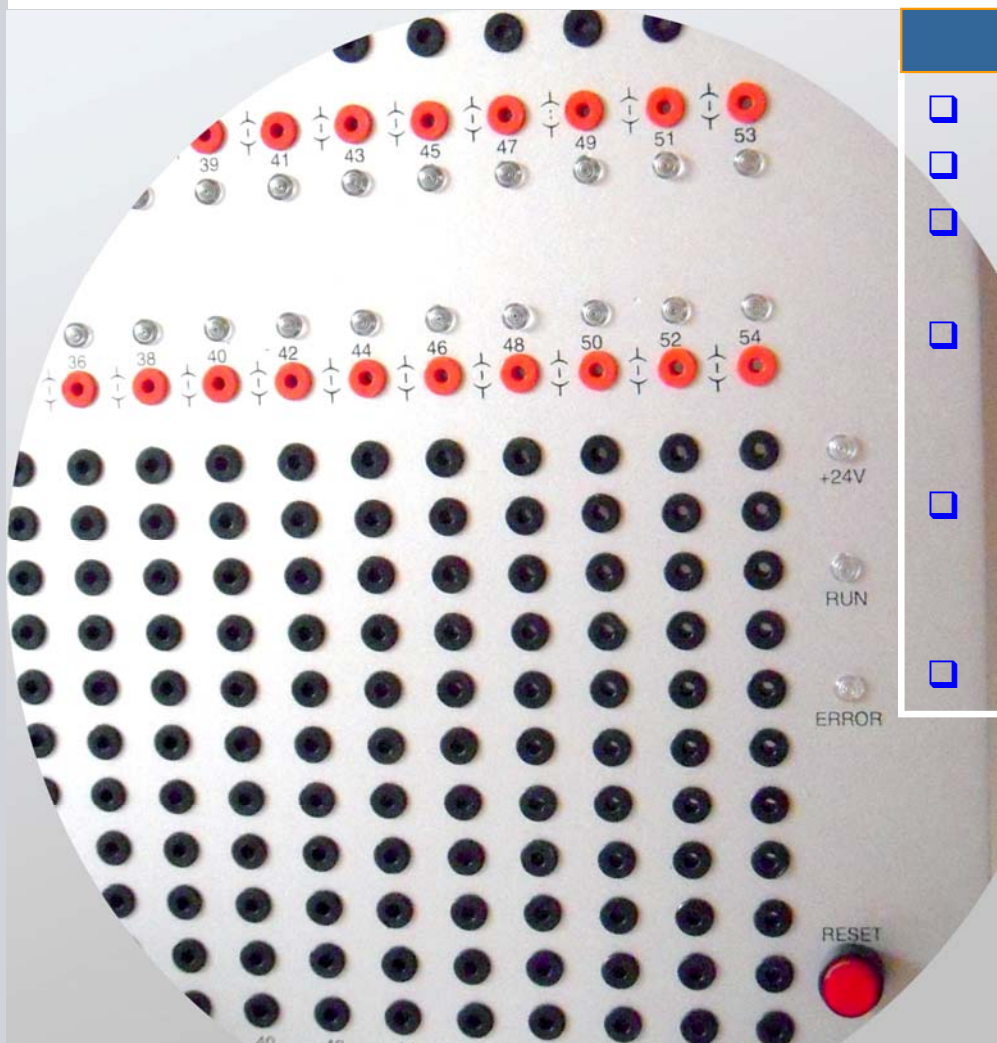
(2/3)



Tripping Concept: Hardware Matrix (3/3)



Tripping Matrix Device 7UW5010: Profile



BASIC INFORMATION

- ☐ 19" width, 8U height
- ☐ Matrix max. 54x11, Options at 30x11/54x2/30x2
- ☐ Signalling contacts per input: 1 in individual, 2 in group
- ☐ Tripping contacts per output: 4 in individual for Row A,B,G,H; 2 in individual for Row C-F,J-L. Lockout type optional
- ☐ Local LED Indicators: 54(R)@ inputs, 11(R)@Outputs, 1(G)@+24VDC, 1(G)@Run, 1(R)@Error
- ☐ Rated control voltage at 110VDC or 220VDC

FUNCTIONS

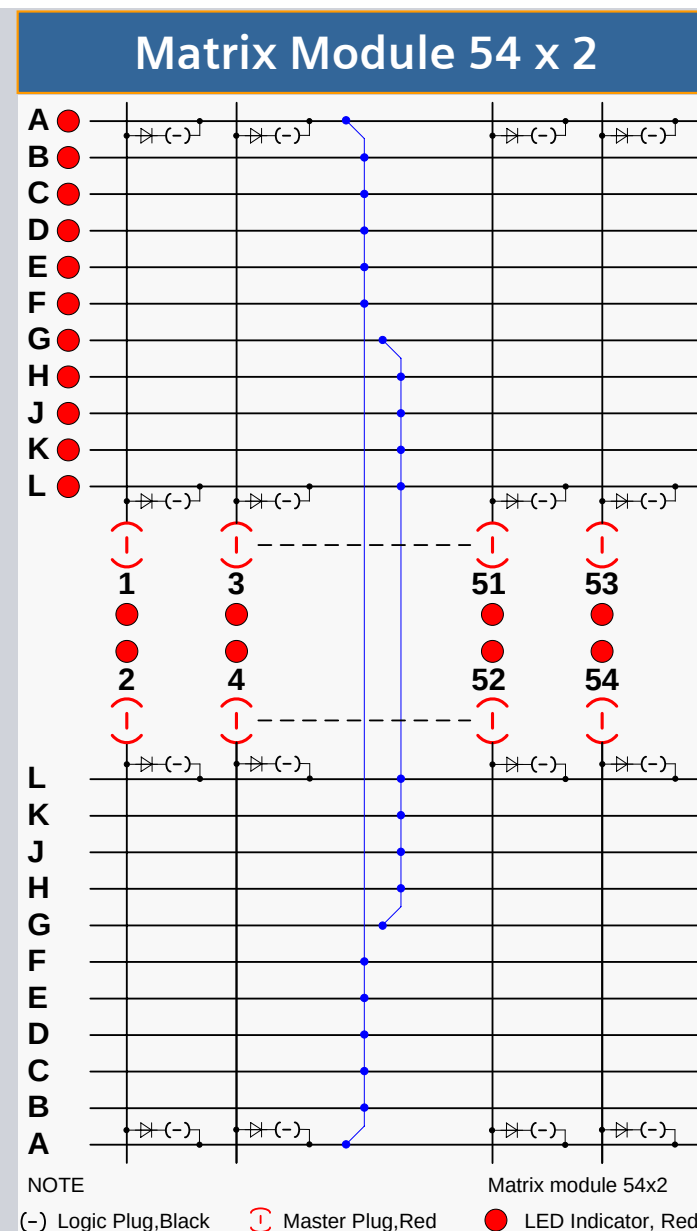
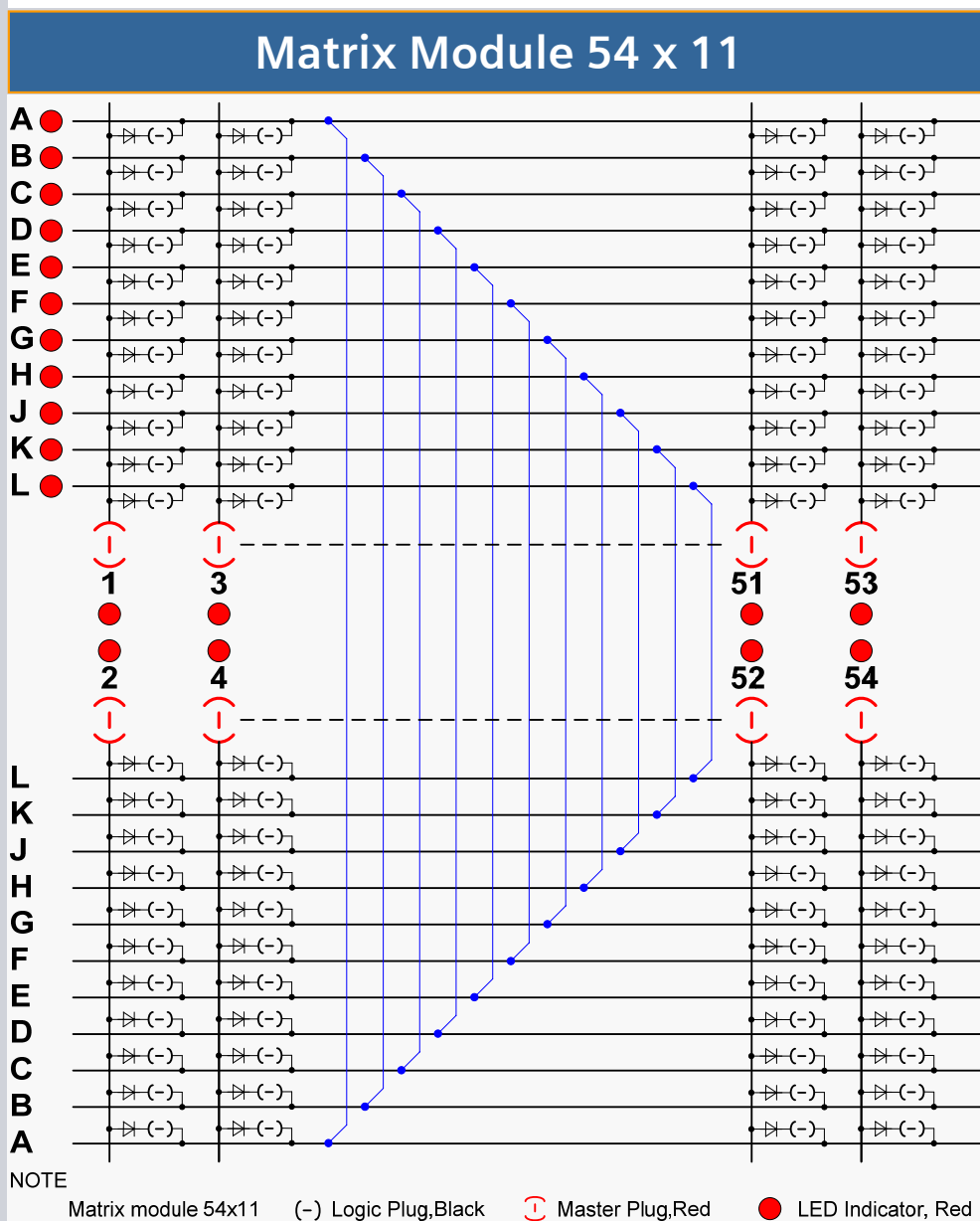
- ☐ Programmable Tripping Matrix
- ☐ Signalling Relay
- ☐ Tripping Relay
- ☐ Communication via IEC 103/Modbus RTU
- ☐ Event Record
- ☐ Time Synchronization
- ☐ LED Indicators
- ☐ Remote and Local Reset

APPLICATIONS

- ☐ Tripping Circuit Management Unit
- ☐ Non-electric Protection Device

Hardware Matrix Module: Principle

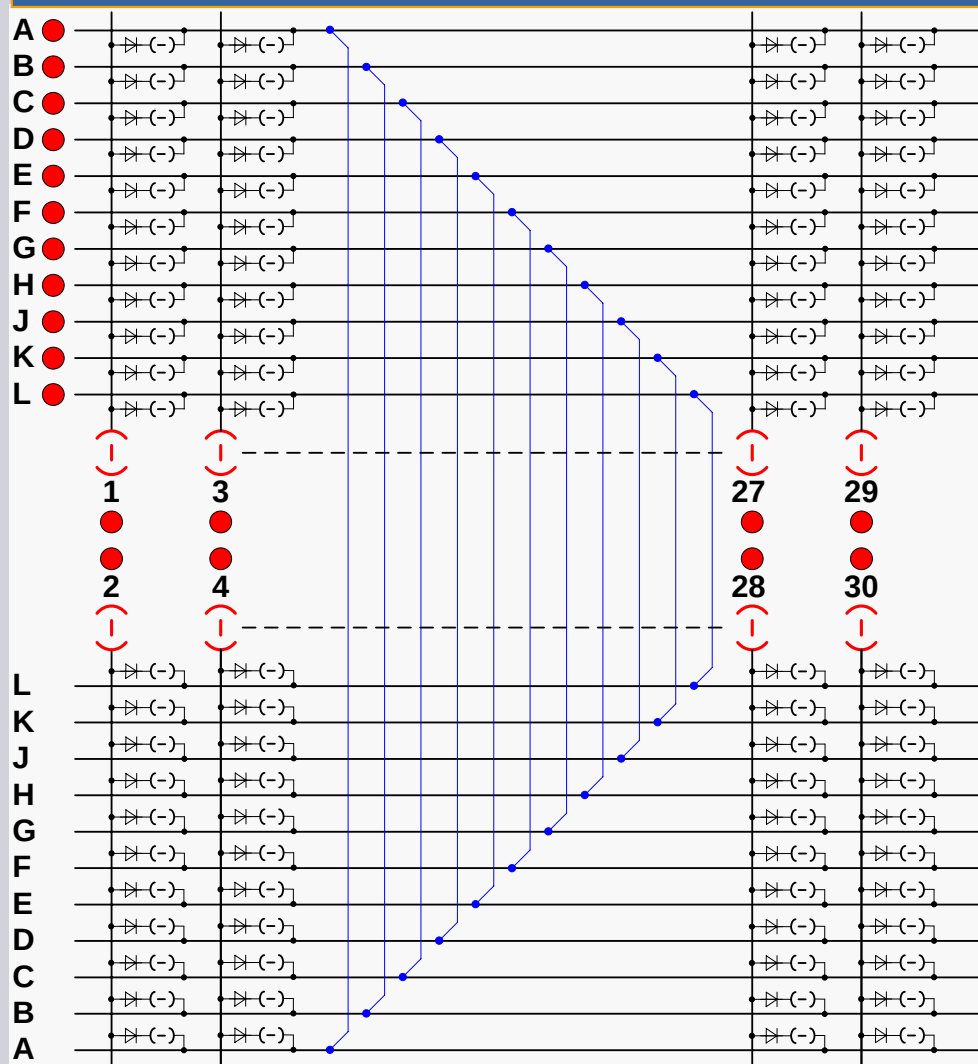
(1/2)



Hardware Matrix Module: Principle

(2/2)

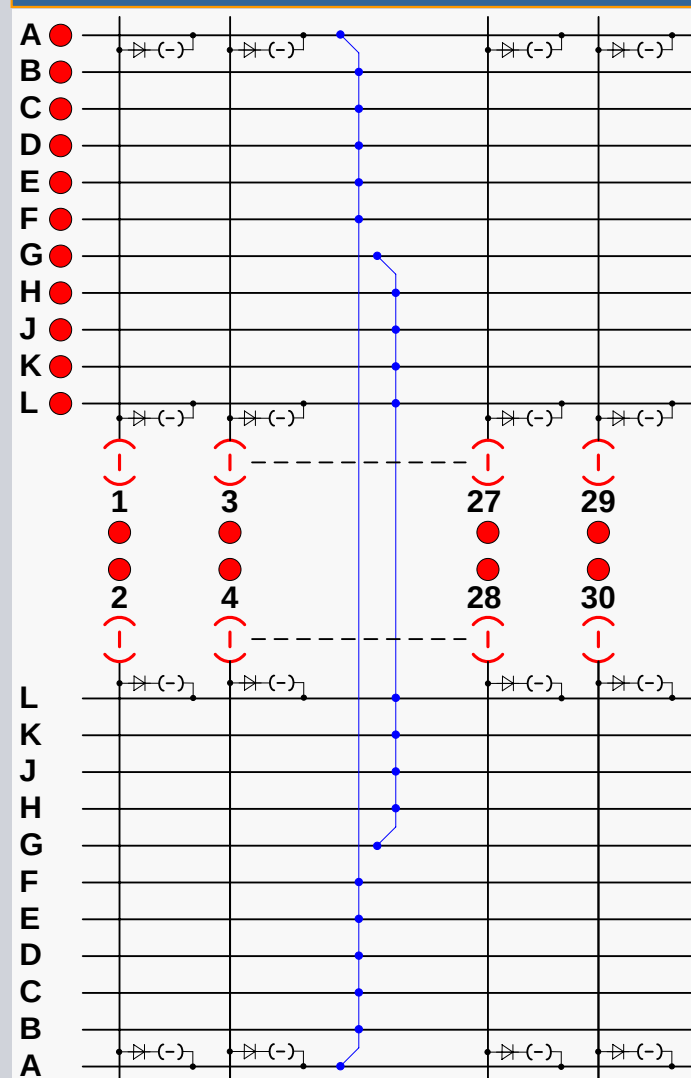
Matrix Module 30 x 11



NOTE

Matrix module 30x11 (-) Logic Plug,Black (T) Master Plug,Red (●) LED Indicator, Red

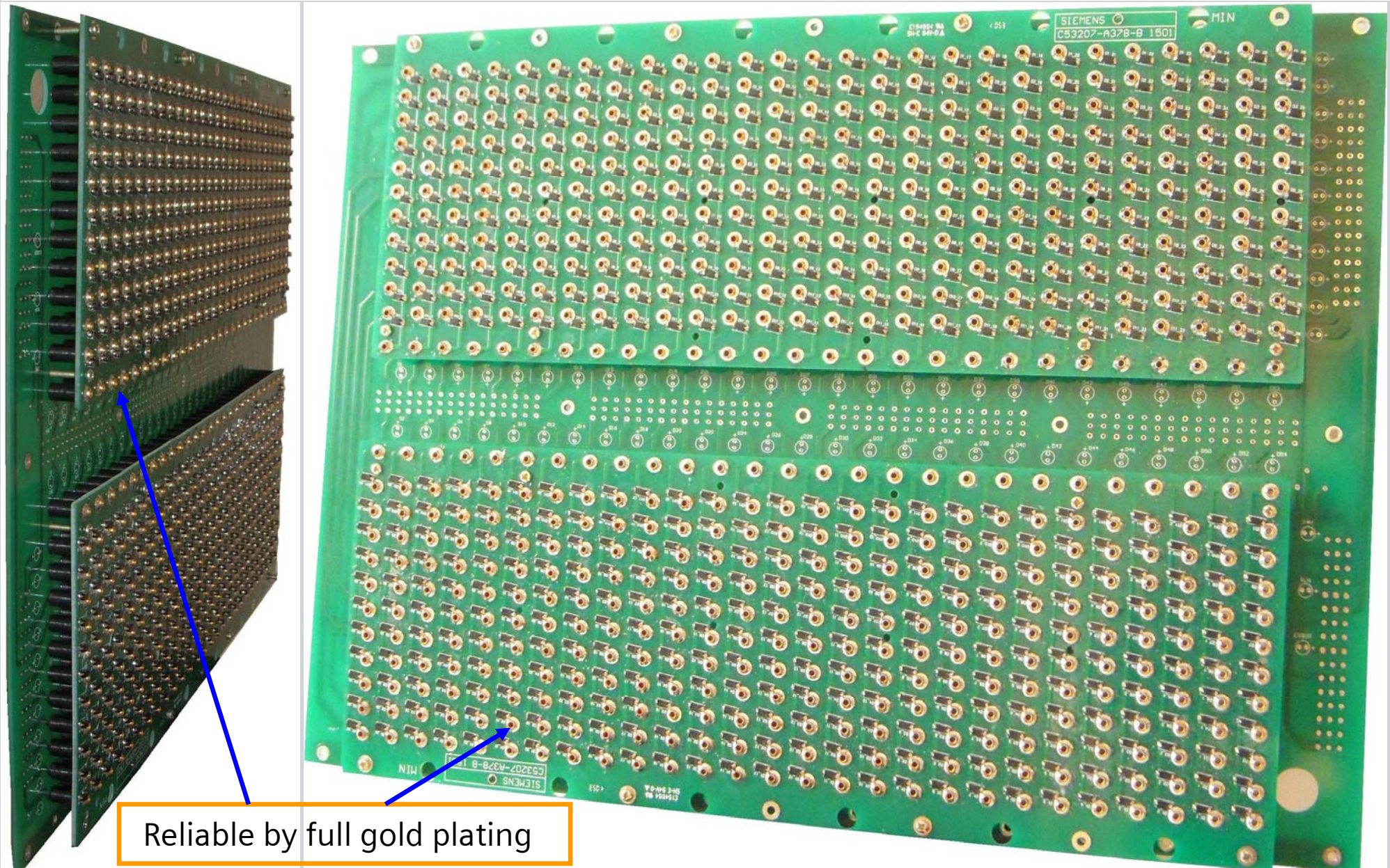
Matrix Module 30 x 2



Matrix module 30x2

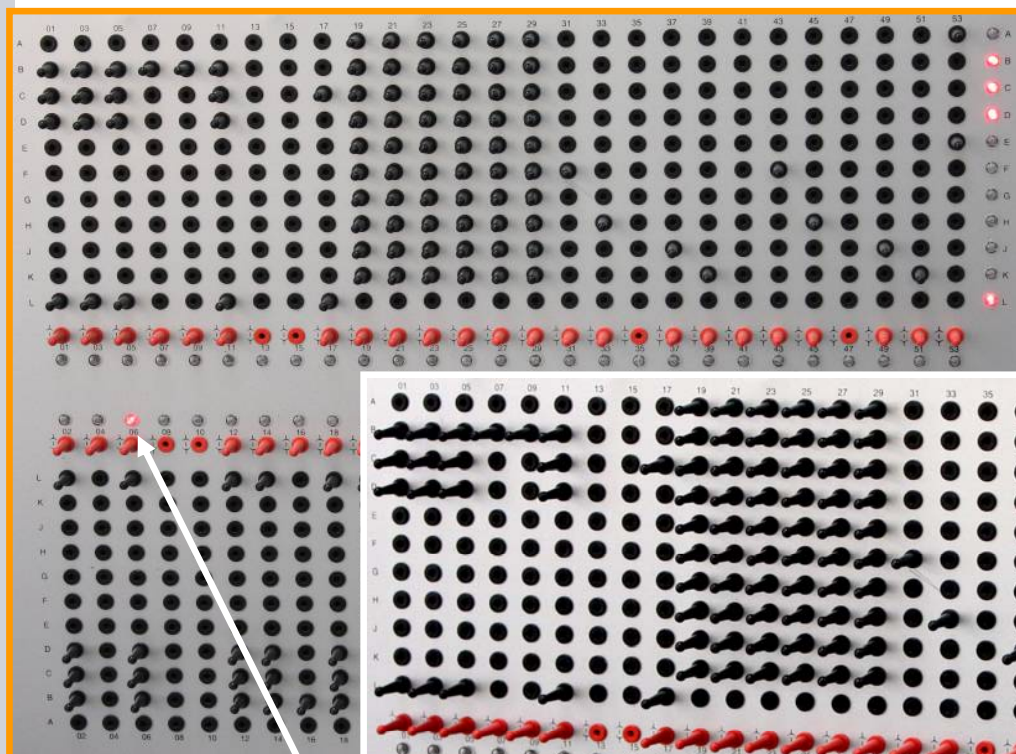
(-) Logic Plug,Black (T) Master Plug,Red (●) LED Indicator, Red

Matrix Module: MIN and MOUT

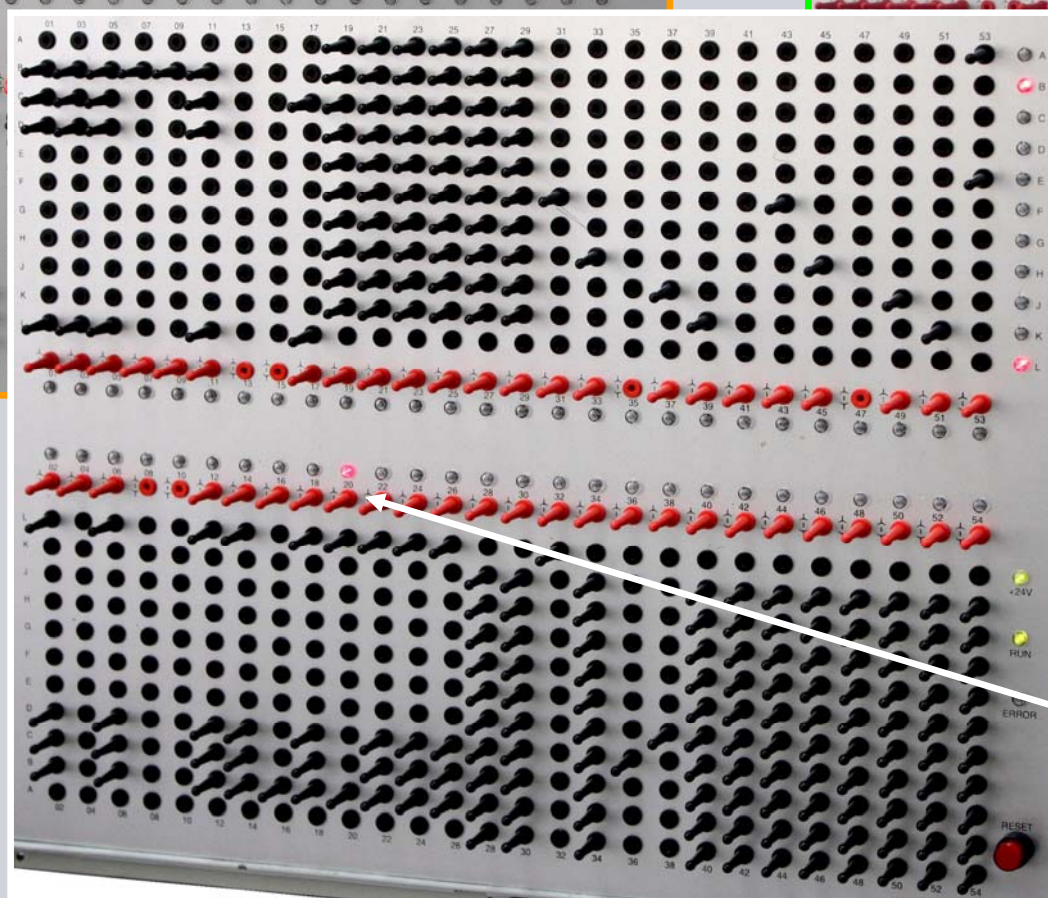


Reliable by full gold plating

Matrix: Easy to Handle by Plug In/Out

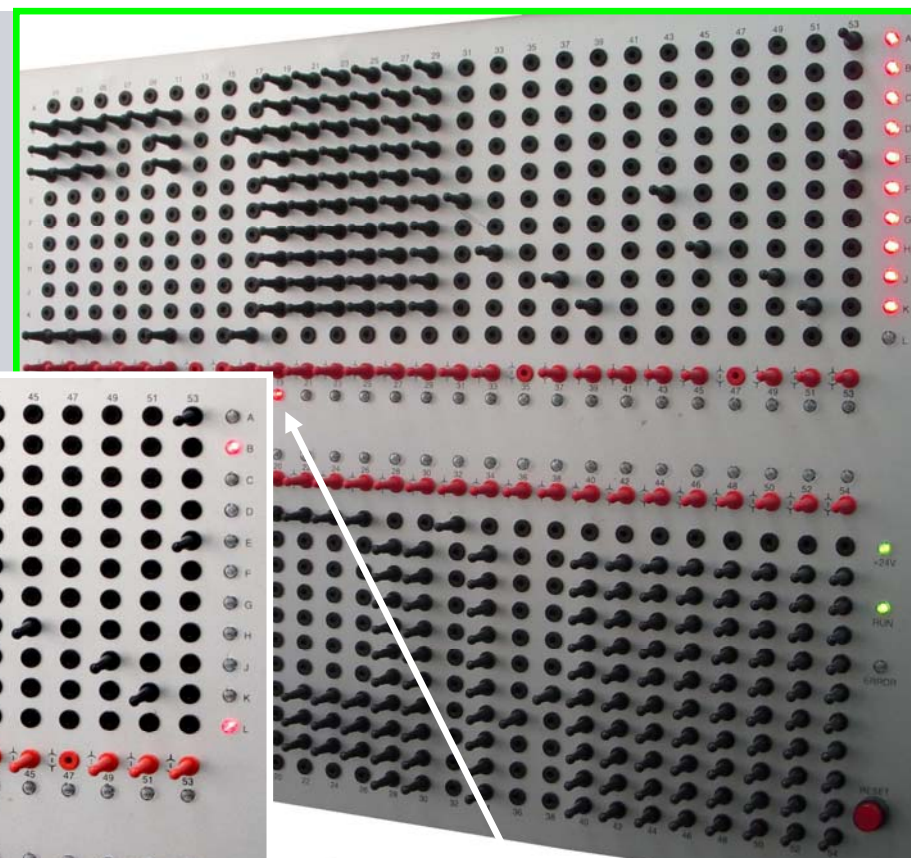


Input: 06
Output:
B,C,D,L



Input: 19
Output: A,B,C,D,E,F,G,H,J,K

Input: 20
Output: B,L



Matrix, Tripping, Signaling and Indicating: Interaction

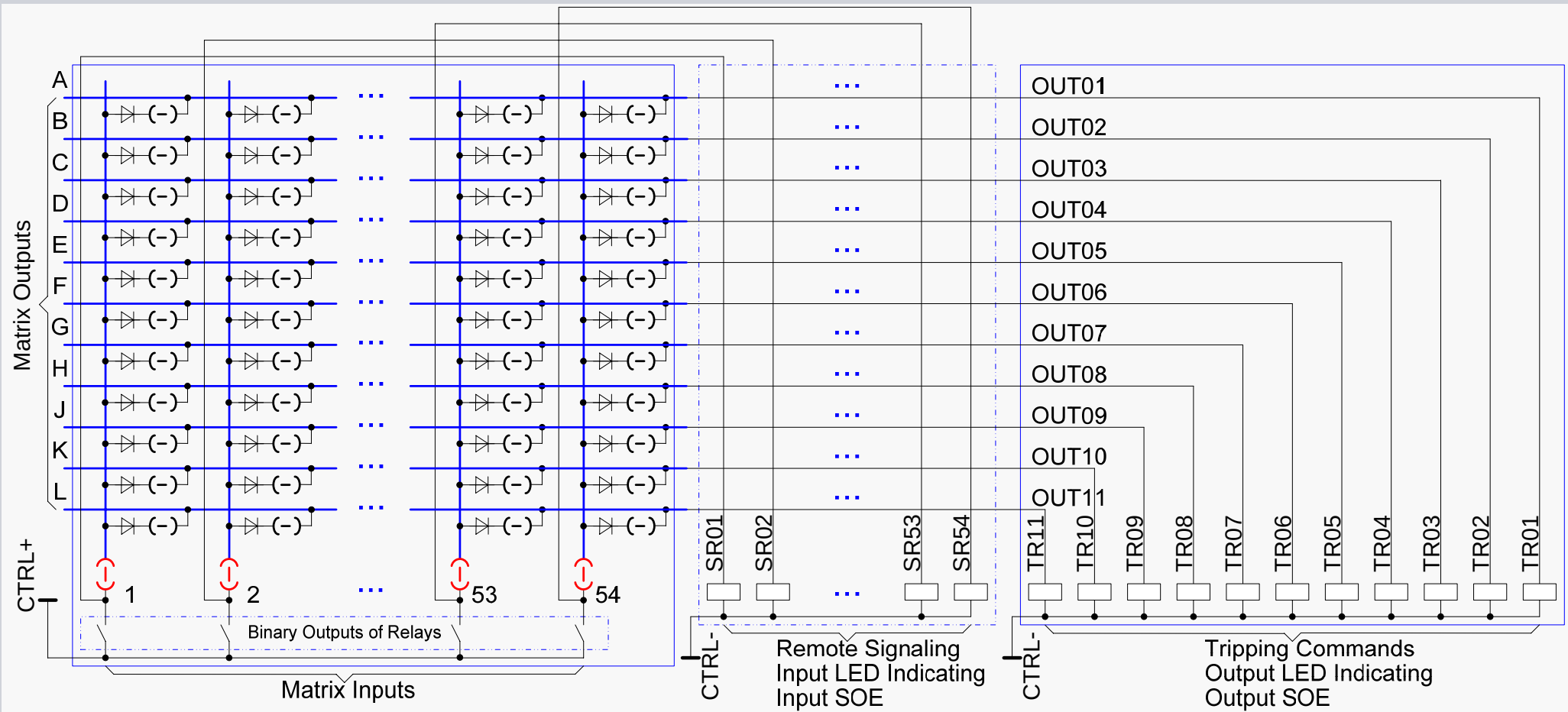
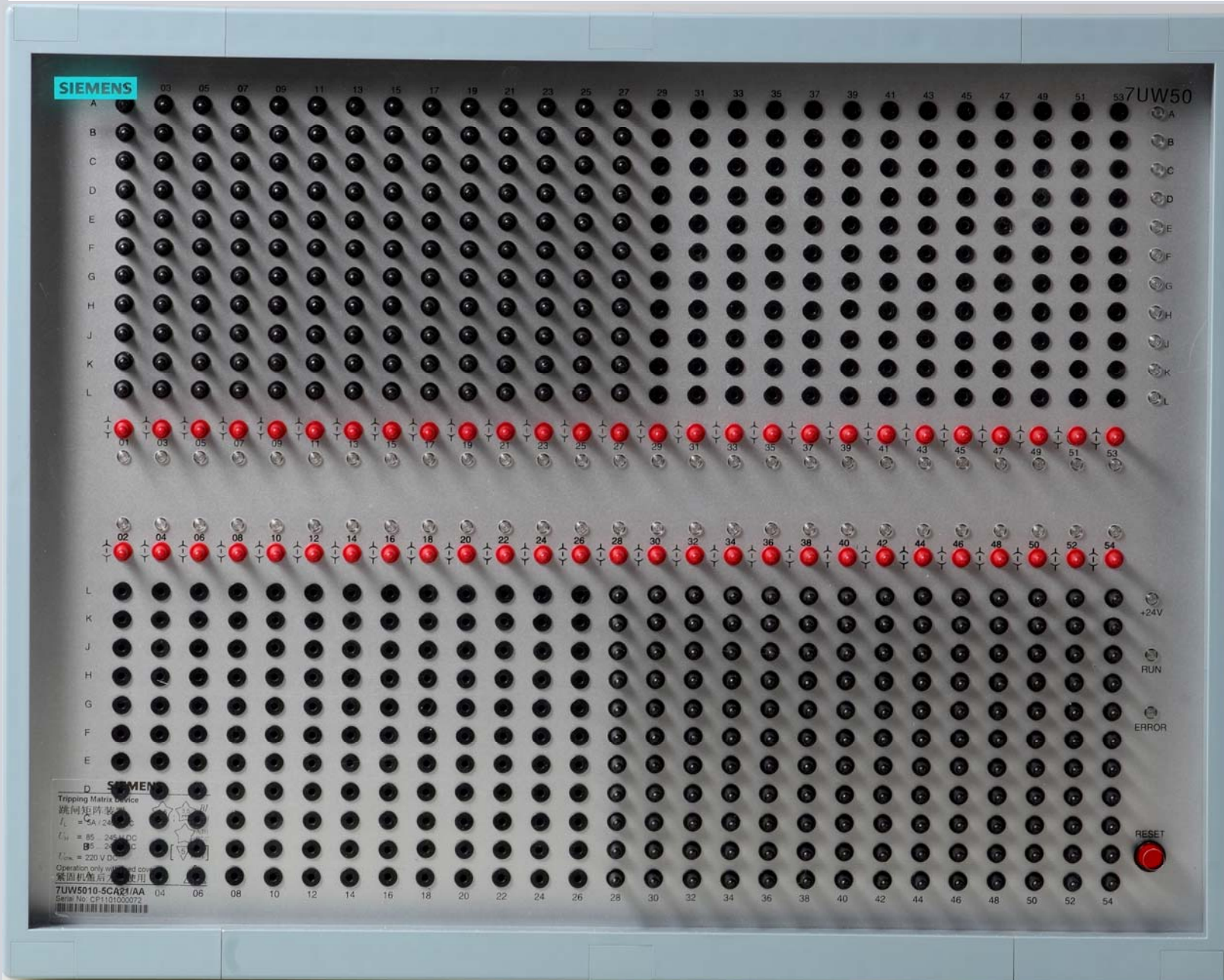


Illustration: Front View



Front Panel: Elements

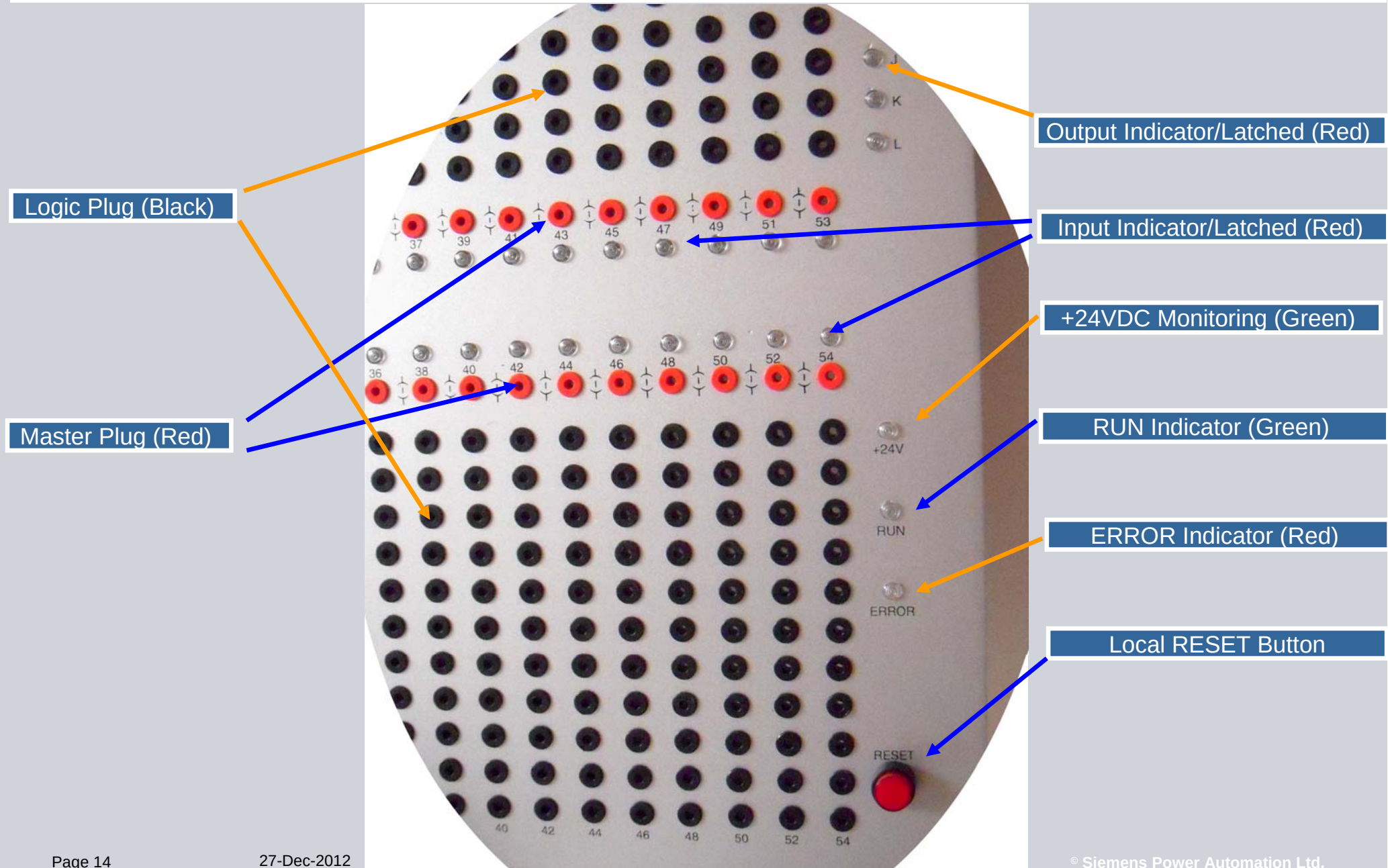
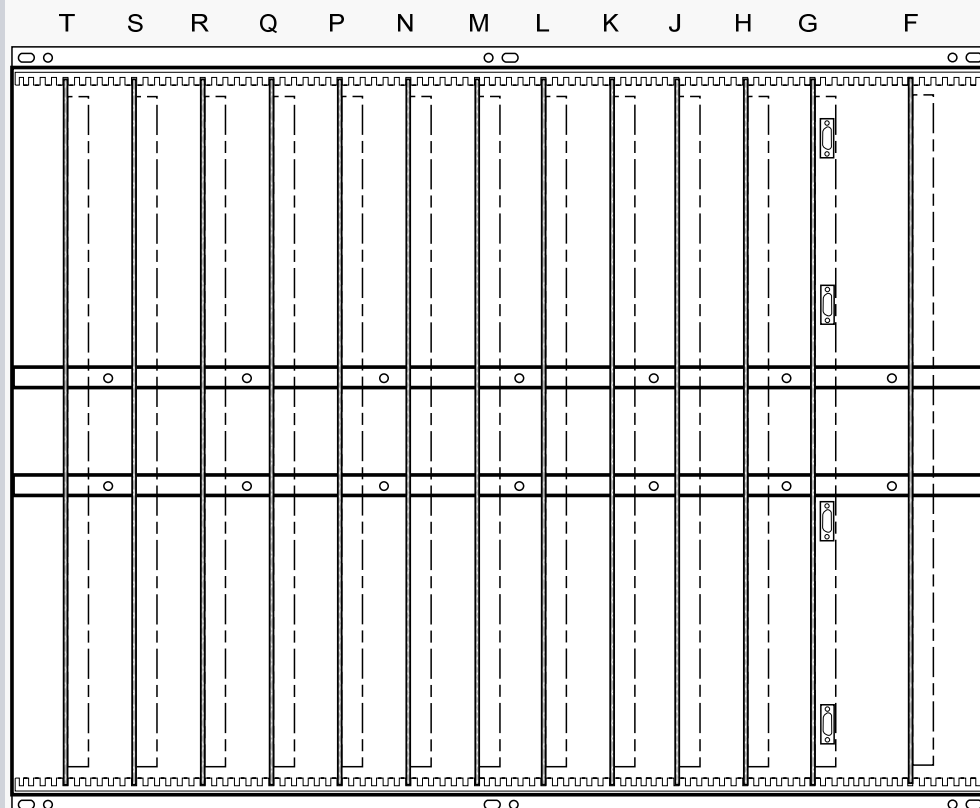


Illustration: Rear View



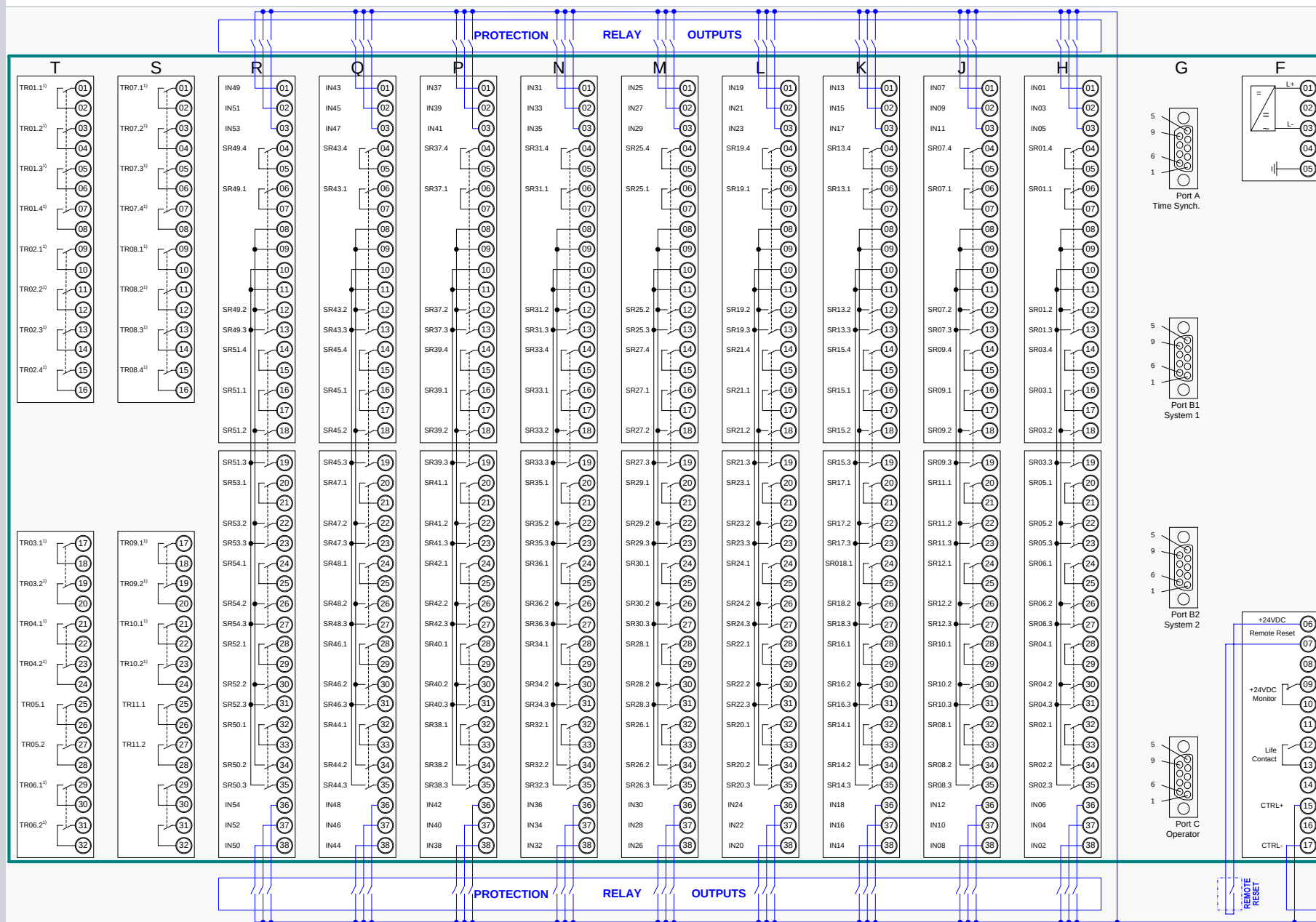
Rear Panel: Layout



- ① Power Supply Board(PWR)
- ② CPU and Communication Board(CPU)
- ③ Signaling Relay Board(IN)
- ④ Tripping Relay Board Lockout(TRL)
- ⑤ Tripping Relay Board(TR)
- ⑥ Output Signaling Board(OUT)

⑥	⑥	③	③	③	③	③	③	③	③	③	②	①	← 7UW5010-*CA00, 7UW5010-*CC00
⑥	⑥					③	③	③	③	③	②	①	← 7UW5010-*CB00, 7UW5010-*CD00
⑤	⑤	③	③	③	③	③	③	③	③	③	②	①	← 7UW5010-*CA1*, 7UW5010-*CC1*
⑤	⑤					③	③	③	③	③	②	①	← 7UW5010-*CB1*, 7UW5010-*CD1*
④	④	③	③	③	③	③	③	③	③	③	②	①	← 7UW5010-*CA2*, 7UW5010-*CC2*
④	④					③	③	③	③	③	②	①	← 7UW5010-*CB2*, 7UW5010-*CD2*
⑤	⑥	③	③	③	③	③	③	③	③	③	②	①	← 7UW5010-*CA3*, 7UW5010-*CC3*
⑤	⑥					③	③	③	③	③	②	①	← 7UW5010-*CB3*, 7UW5010-*CD3*
④	⑥	③	③	③	③	③	③	③	③	③	②	①	← 7UW5010-*CA4*, 7UW5010-*CC4*
④	⑥					③	③	③	③	③	②	①	← 7UW5010-*CB4*, 7UW5010-*CD4*

Schematic Connection Diagram: Inputs

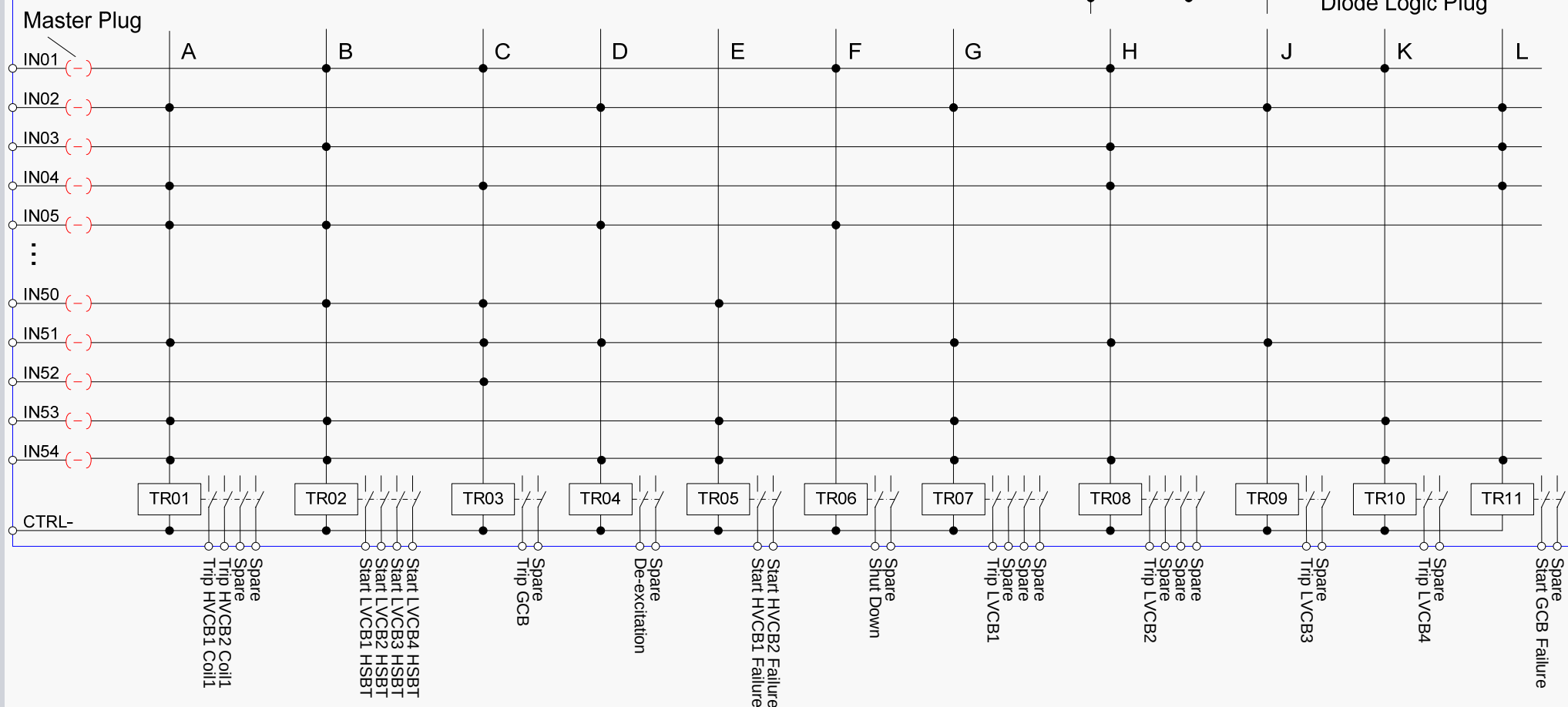
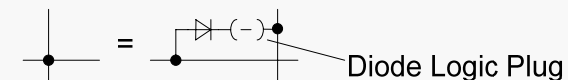


Schematic Allocation Diagram of Tripping Commands:

Tripping Circuit Management Unit



7UW5010 max.54x11

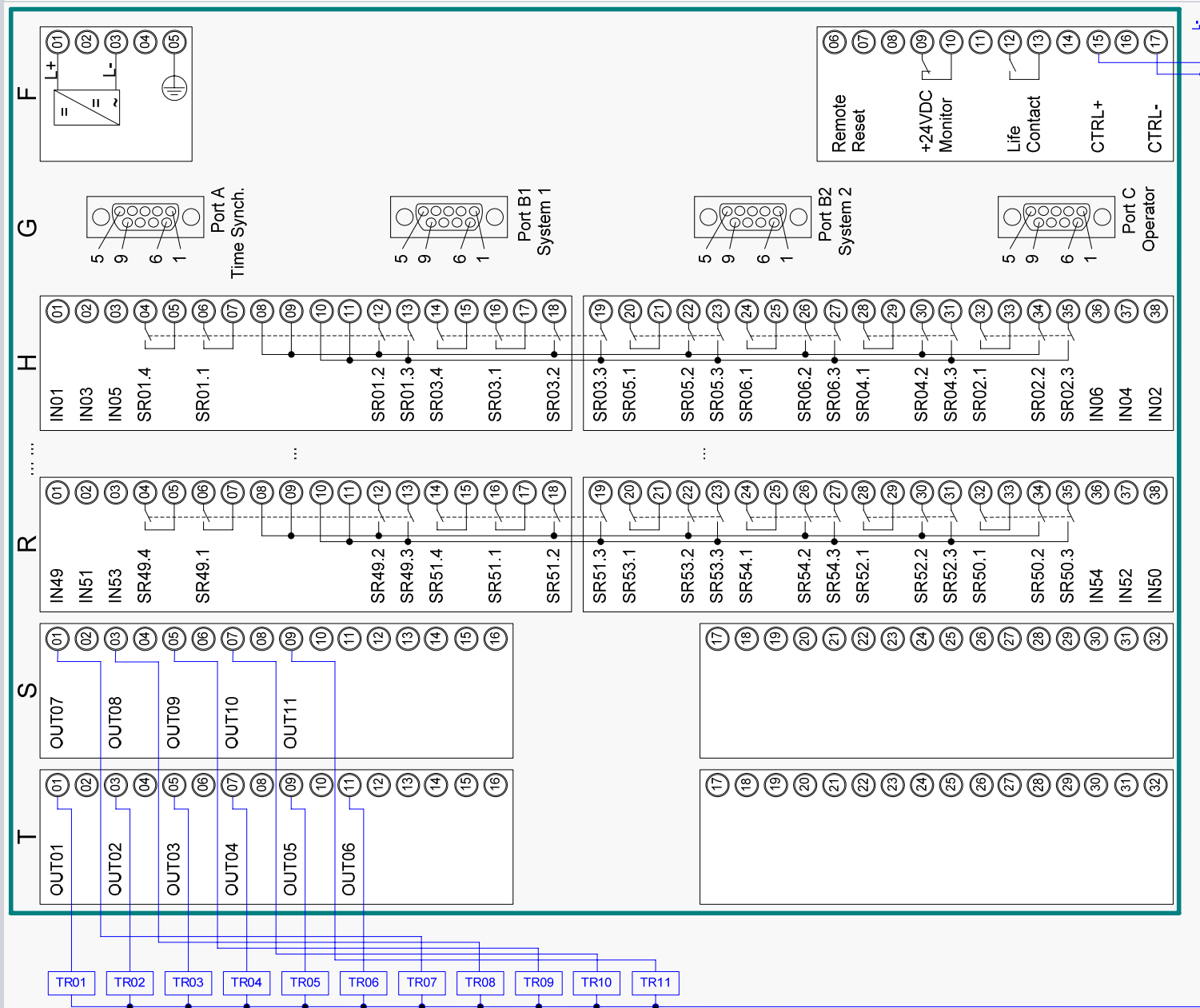


SIEMENS

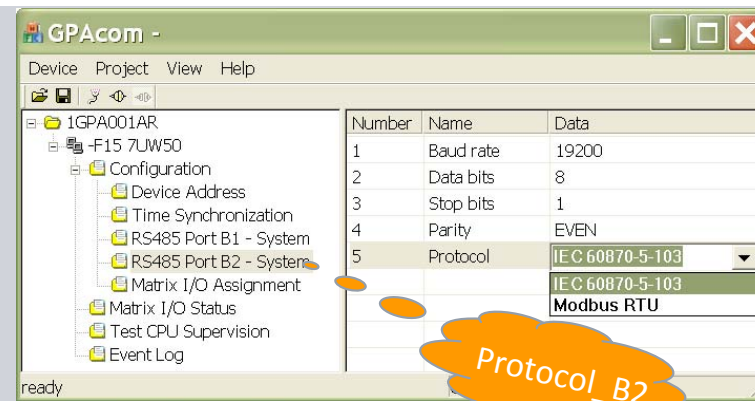
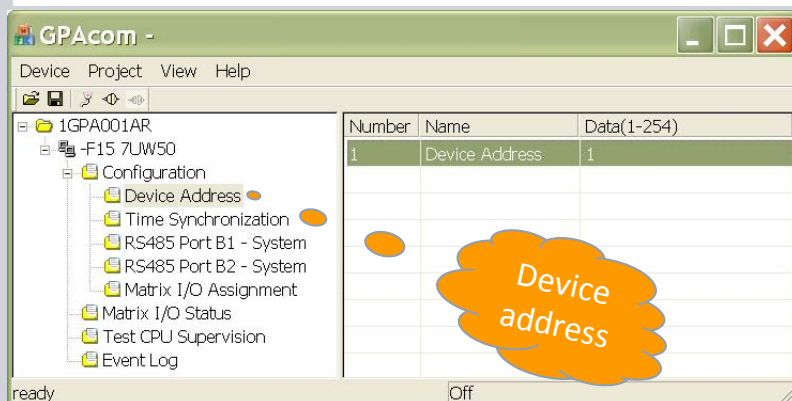


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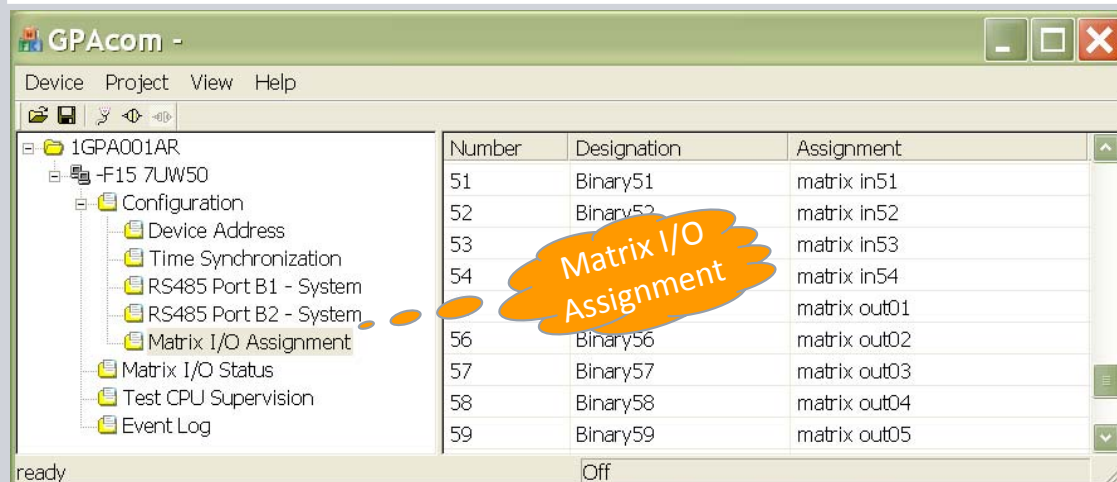
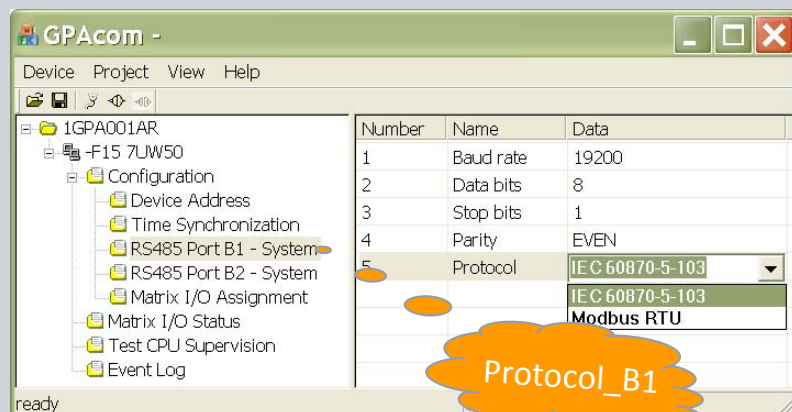
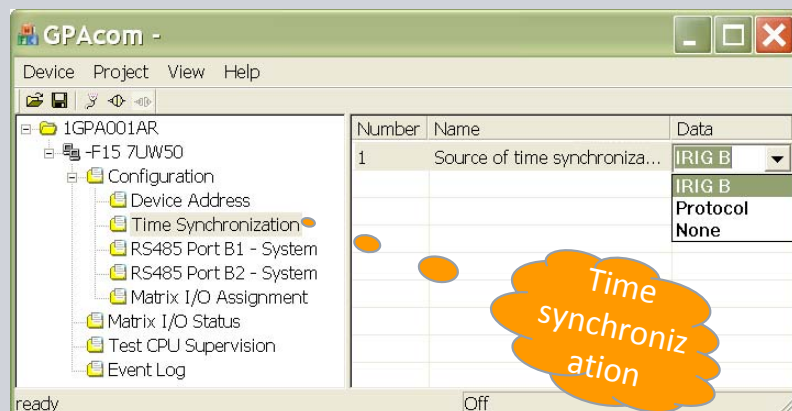
Schematic Connection: External Tripping Relays



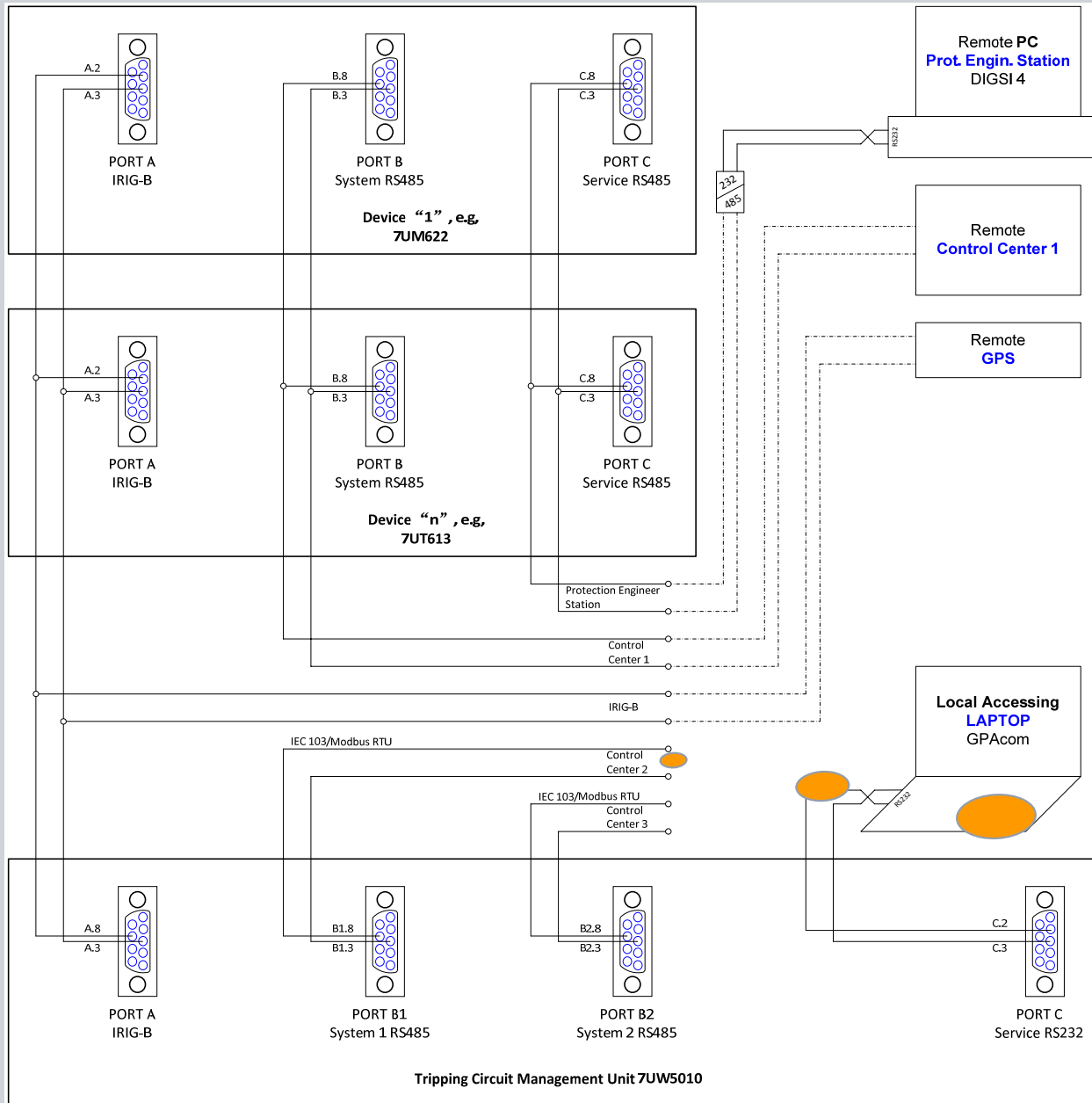
PC端程序: GPCom



Local PC connected to rear RS232 PORT C;
 Locally set the communication parameters;
 Default settings are illustrated on the pictures;
 No efforts are required if no Remote Control Center is connected;



Communication: Structure Philosophy



7UW5010 As of Tripping Circuit Management Unit

Interfaces:

- Local accessing via GPAcom over PORT C
- Time synchronization via IRIG-B over PORT A
- Tripping messages can be accessed by additional Remote Control Center 2 or 3 (if have) over PORT B1/B2
- IEC 103/Modbus RTU can be selected over PORT B1/B2

PORT B1 to be connected to Remote Control Center 1 in case 7UW5010 as of Non-electric Protection Device

Labeling Table: Put on Cubicle's Door

The diagram illustrates the logic for a 500kV busbar system, showing the interconnection of various relays and logic gates. The diagram is divided into two main sections: the top section for '500kV Busbar' and the bottom section for '500kV Busbar'.

Top Section (500kV Busbar):

- Inputs:** 01, 03, 05, 07, 09, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53.
- Outputs:** A, B, C, D, E, F, G, H, J, K, L.
- Logic Gates:** AND, OR, NOT, XOR, XNOR, NAND, NOR, XNAND, XNOR.
- Relays:** TR01, TR02, TR03, TR04, TR05, TR06, TR07, TR08, TR09, TR10, TR11.

Bottom Section (500kV Busbar):

- Inputs:** 02, 04, 06, 08, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54.
- Outputs:** L, K, J, H, G, F, E, D, C, B, A.
- Logic Gates:** AND, OR, NOT, XOR, XNOR, NAND, NOR, XNAND, XNOR.
- Relays:** TR01, TR02, TR03, TR04, TR05, TR06, TR07, TR08, TR09, TR10, TR11.

Legend:

- A
- B
- C
- D
- E
- F
- G
- H
- J
- K
- L
- +24V
- RUN
- ERROR

Additional Output Configuration:

Output	Configuration
LP20_Initiate Extinguishing System	SR01, SR10, SR14
LP21_Decrease-loading	SR15, SR16
LP22_Decrease-excitation	SR17, SR18
LP23_Block HSBT 10kV Branch A	SR21, SR24, SR25
LP24_Block HSBT 10kV Branch B	SR23, SR24, SR25
LP25_Block HSBT 10kV Branch C	SR27, SR28, SR29
LP26_Block HSBT 10kV Branch D	SR29, SR30, SR31

Selection and Ordering Code: Device, Modules

DEVICE							MODULES				
1	2	3	4	5	6	7	8	9	10	11	12
7	U	W	5	0	1	0		C			
7UW50 Tripping Matrix Device											
Auxiliary Voltage Range 85-245V AC/DC											
<u>Rated Control Voltage</u>											
110V DC							4				
220V DC							5				
<u>Matrix Module</u>											
54 x 11									A		
30 x 11									B		
54 x 2									C		
30 x 2									D		
<u>Tripping Modules</u>											
2OUT										0	
2TR										1	
2TRL										2	
1TR/1OUT										3	
1TRL/1OUT										4	
<u>Contact Form-Tripping Relay</u>											
If position 11th = 0											0
all in Normal Open(NO) type											1
some in Normal Close(NC) type											2

FULL NAME/SHORT NAME	ORDERING CODE
Signaling Relay Board_110VDC/IN1	C53207-A378-B1011
Signaling Relay Board_220VDC/IN2	C53207-A378-B1021
Tripping Relay Board Lockout_110VDC/TRL1	C53207-A378-B1111
Tripping Relay Board Lockout_220VDC/TRL2	C53207-A378-B1121
Tripping Relay Board_110VDC/TR1	C53207-A378-B1131
Tripping Relay Board_220VDC/TR2	C53207-A378-B1141
Output Signaling Board_110VDC/OUT1	C53207-A378-B1211
Output Signaling Board_220VDC/OUT2	C53207-A378-B1221
Power Supply Board/PWR	C53207-A378-B1311
CPU and Communication Board/CPU	C53207-A378-B1401
Master Plug Pin (Red)	C53207-A378-B1801
Logic Plug Pin (Black)	C53207-A378-B1901

If the contact form of tripping relay is **some in Normal Close(NC) type**, it should be additionally noted for ordering of TR1,TR2,TRL1 or TRL2.

Re-designed Tripping Matrix Device: 7UW5010

FEATURES

- ❑ With more matrix inputs and outputs
- ❑ Signaling modules and tripping modules integrated
- ❑ Communication available via IEC 103/Modbus RTU, dual RS485
- ❑ Actualization of input disconnection via Master Plugs
- ❑ Customer's requirements fully covered
- ❑ Compact tripping circuit, reduced maintenance effort
- ❑ Flexible and visible in matrix marshalling
- ❑ Easy to handle
- ❑ Efforts saving in project discussion, designing, wiring and commissioning
- ❑ Space saving in panel setting-up
- ❑ Cost saving
- ❑ Standardized drawings
- ❑ Application extended to non-electric protection

7UW5010

Tripping Circuit:

- Simplified,
- but Reliable!

JUST HAVE IT!!!