

Learn PLC in a Day

OMRON CP1E



Learning Made
Easy



*This is an
Omron PLC*

PLC Inputs

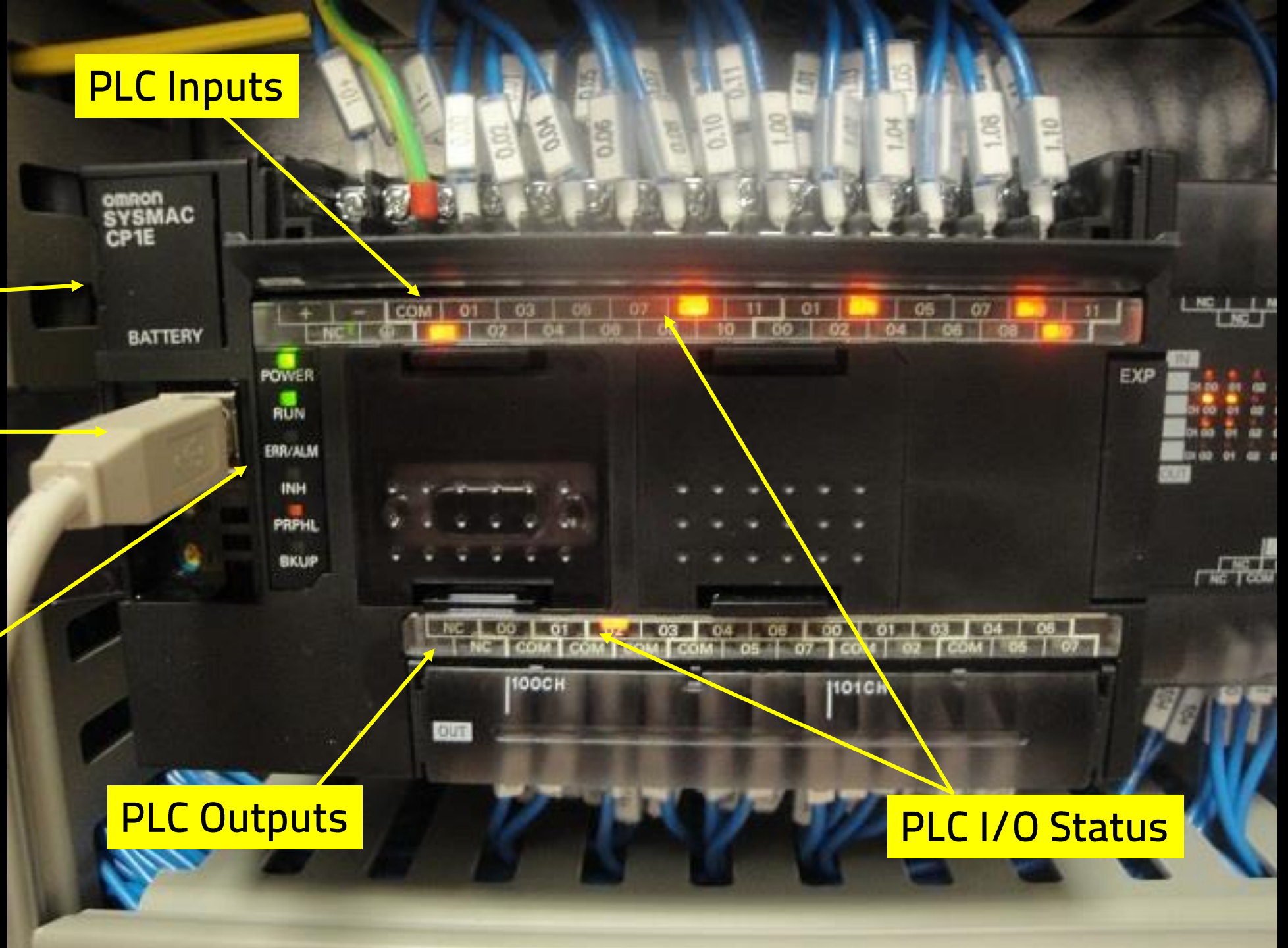
Battery

Programming
Cable

PLC Processor
Status

PLC Outputs

PLC I/O Status



Omron PLC CP 1E

S. No	Elements	Addressing
1	Inputs	0.0 ~ 0.7
2	Outputs	100.00 ~ 100.07
3	Input Memory	W0.0 ~ W512.0
4	Timers	T000 ~ T4095
5	Counters	C000 ~ C4095
6	Data Registers	D0 ~ D32767
7	Holding Registers	H0 ~ H1535 H0.0 ~ H1535.15

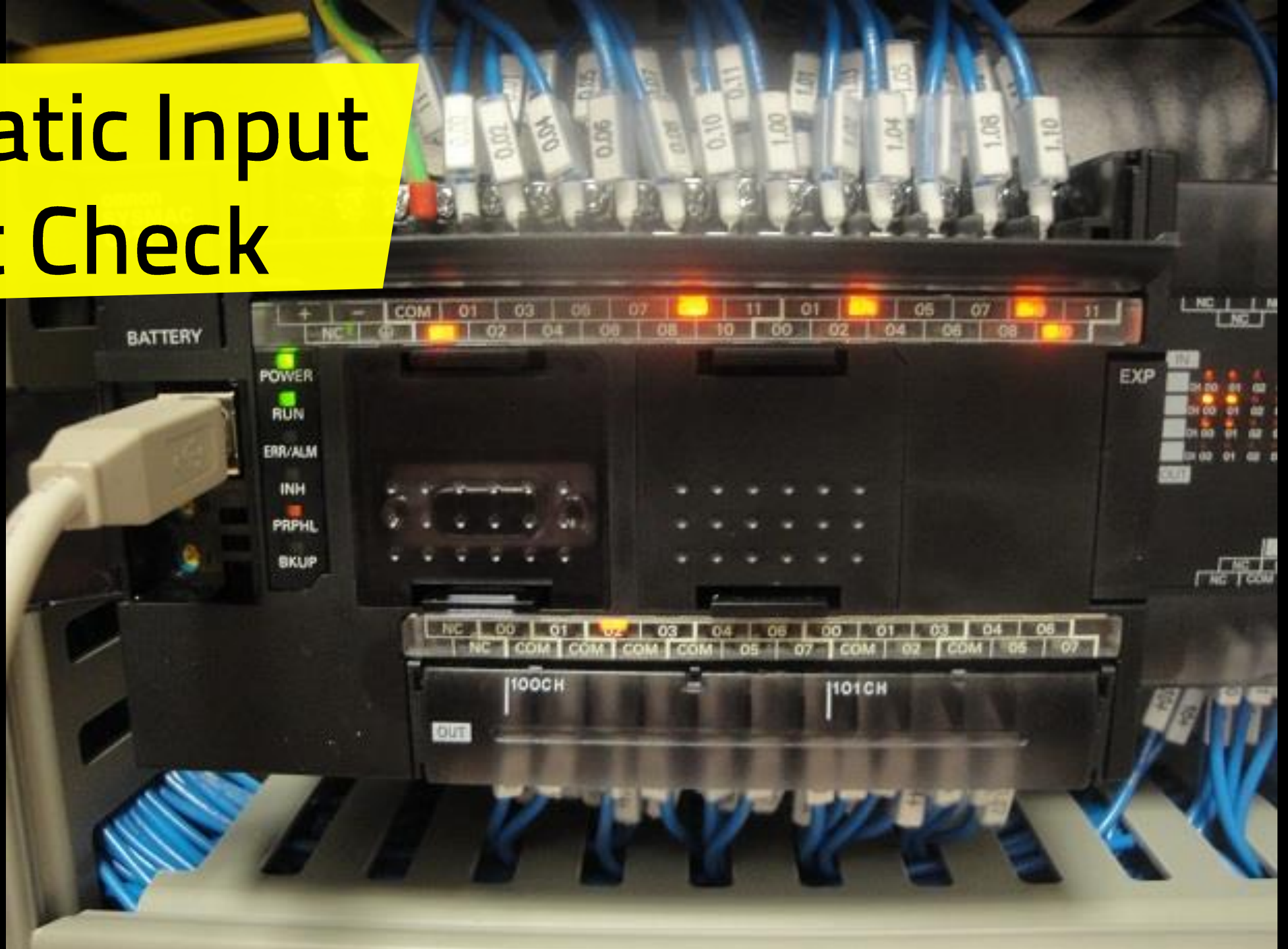


Note: We cannot take same addressing for Counters & Timers. In other words if We are using T000, we cannot use C000 in the same program.

PLC Static Input Output Check

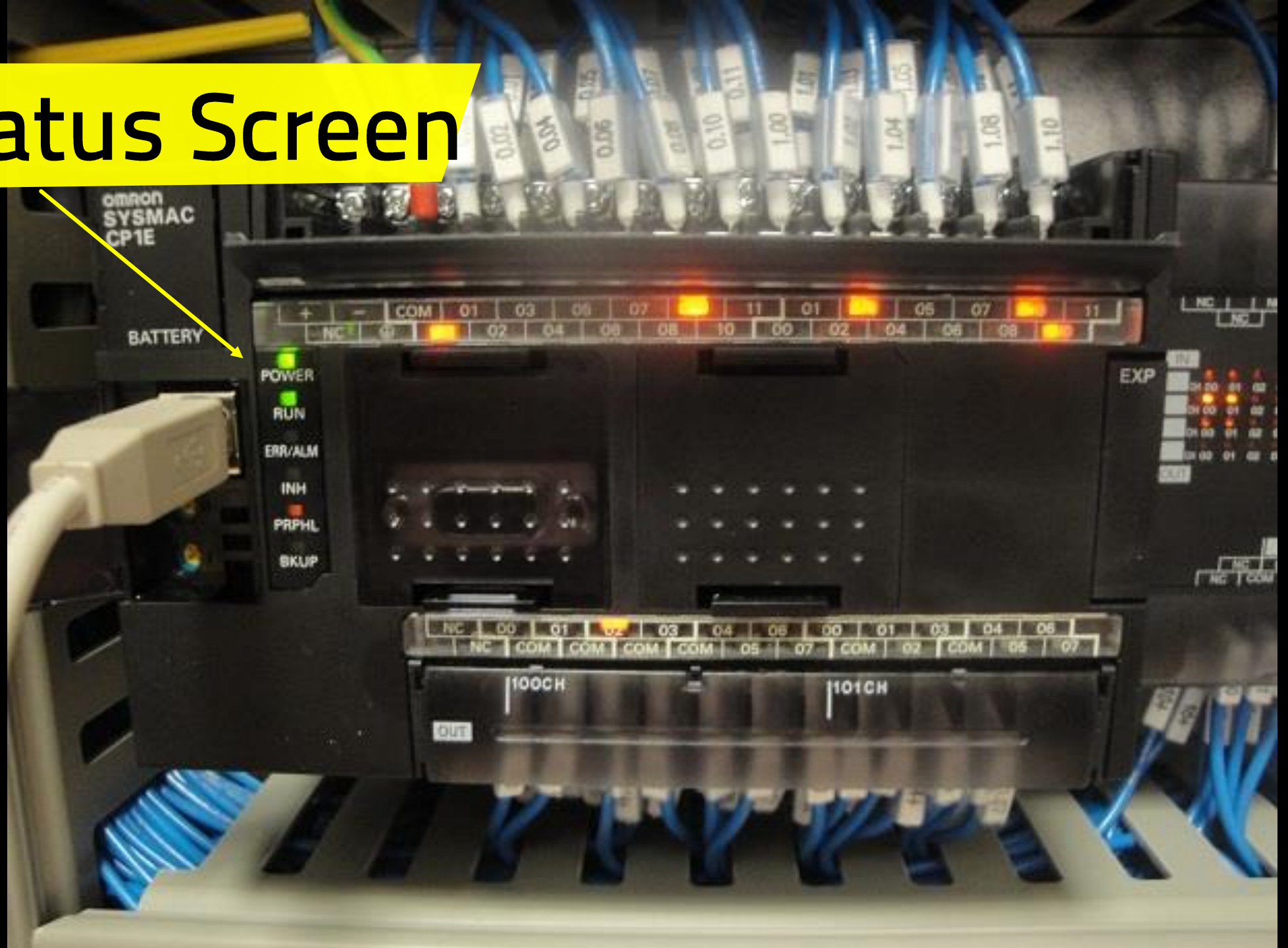
Understanding Sink/Source Principle

To ensure Proper working of Inputs & Outputs



PLC Status Screen

To determine the Processor status



PLC Status Screen

To determine the Processor status



PLC RUN



PLC PROGRAM/STOP

Lesson 1

Series & Parallel Circuit

Instructions to be used:

LD
LDNOT
OUT



Lesson 1

Series & Parallel Circuit

1. Device a circuit when 0.0 is ON, 100.0 should be ON
2. Device a Series circuit such that when 0.0 & 0.1 is ON, 100.0 is ON
3. Device a Parallel Input circuit such that when either of 0.0 or 0.1 is ON, 100.0 is ON
4. Device a Parallel Output Circuit such that when 0.0 is ON, 100.0 & 100.1 are ON
5. Device a circuit when 0.0 is ON, 100.0 is ON & 100.1 is OFF & when 0.0 is OFF, 100.1 should be ON & 100.0 should be OFF

Lesson 2

Latching & Interlocking

Instructions to Be used:

LD
OUT



Lesson 2

Latching & Interlocking

1. Device a circuit 0.2 is ON, 100.0 should be latched & when 0.1 is ON, 100.0 should be unlatched. *(In this case consider 0.2 as NO Push Button & 0.1 as NC Push Button)*
2. Device a circuit 0.1 is ON, 100.0 should be latched & when 0.2 is ON, 10.0 should be unlatched. *(In this case consider 0.1 as NC Push Button & 0.2 as NO Push Button)*
3. Device a circuit 0.2 is ON, 100.0 should be latched & when 0.3 is ON, 100.0 should be unlatched. *(In this case consider 0.2 & 0.3 NO Push Button)*

Lesson 2

Latching & Interlocking

4. Device a circuit 0.1 is ON, 100.0 should be latched & when 0.4 is ON, 100.0 should be unlatched. *(In this case consider 0.1 & 0.4 NC Push Button)*
5. Device a Circuit to interlock 100.0 & 100.1 using 0.2 & 0.3 & stop the output using 0.1 *(Consider 0.2 & 0.3 as NO Push Buttons & 0.1 as NC Push Button)*

Lesson 3

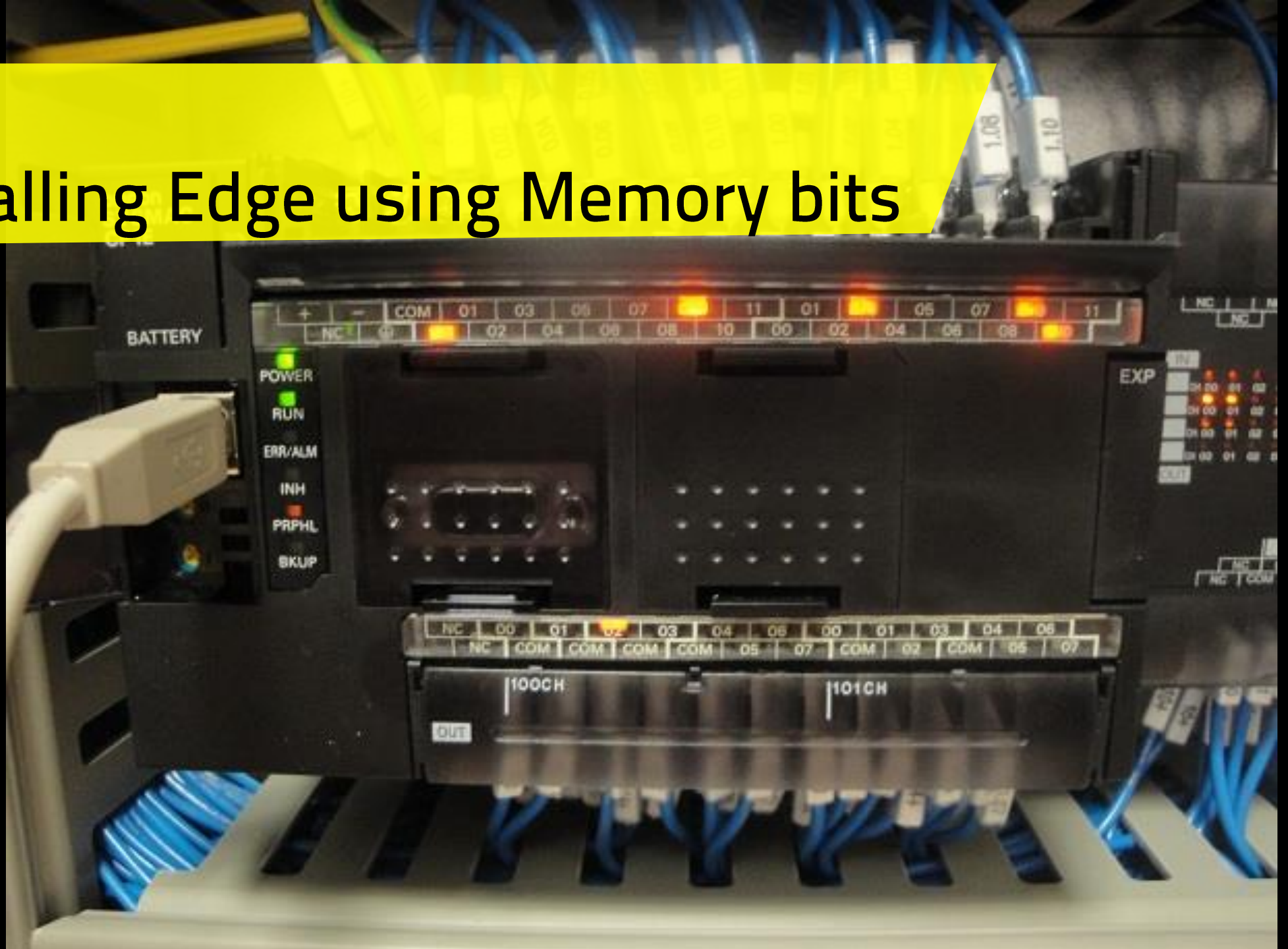
Rising/Falling Edge using Memory bits

Instructions to
Be used:

LD
OUT

Up

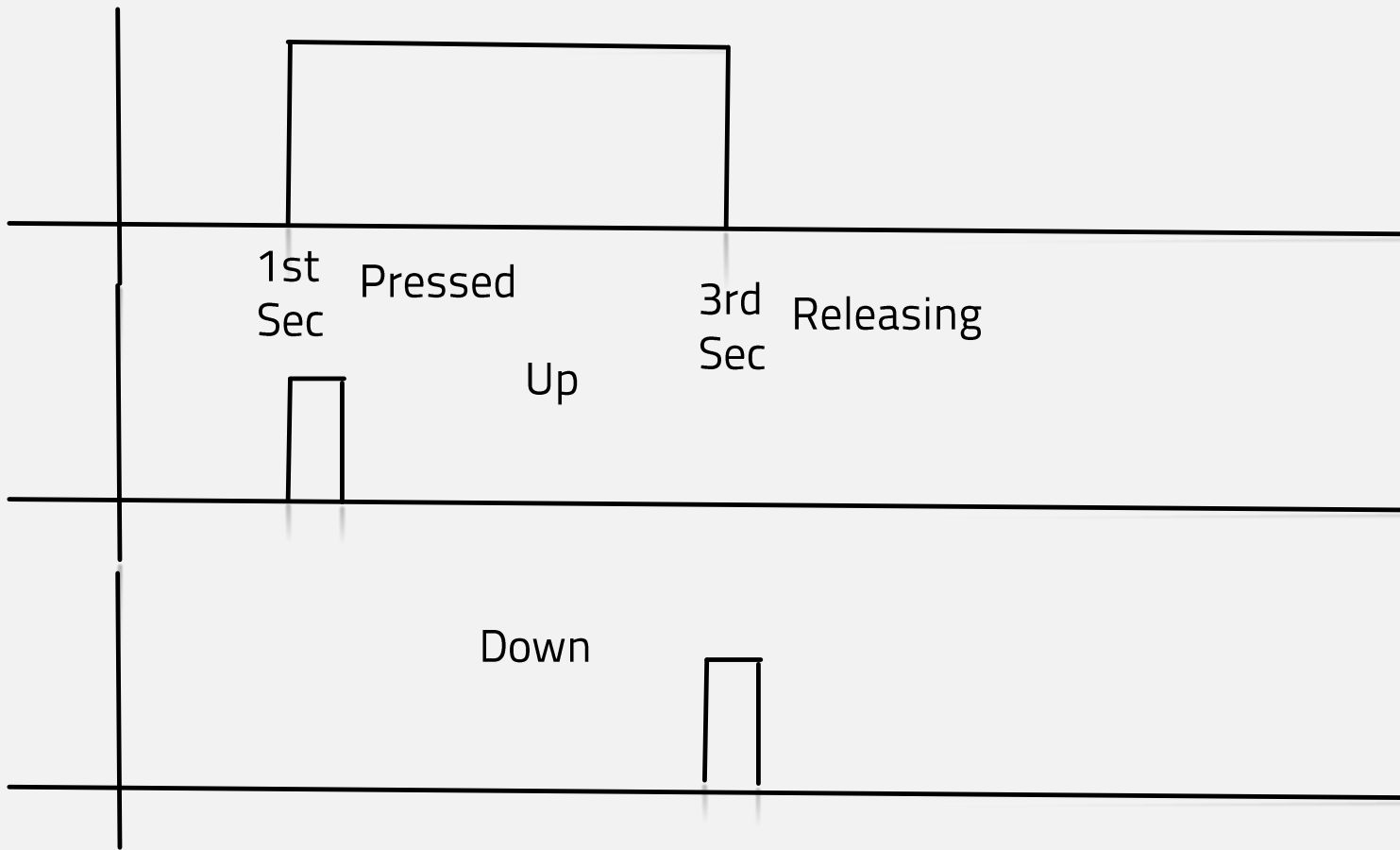
Down



Lesson 3

Rising/Falling Edge using Memory bits

1. Device a Circuit such that when 0.0 is pressed, 100.0 gets latched. When 0.1 is pressed, nothing should happen, but when 0.1 is released 100.0 should unlatched.



Lesson 4 Timers

Instructions to
Be used:

LD
OUT
TIM



Lesson 4

Timers

1. Device a Circuit such that when 0.0 is pressed 100.0 gets ON after delay of 5 seconds
2. Do the similar operation, but delay should change to 2.5 seconds
3. Device a circuit when 0.0 is pressed 100.0 gets ON after 3 seconds delay & then after delay of 3 more seconds 100.1 should be on & after delay of 3 seconds 100.2 should be ON.
4. Device a circuit, when 0.0 is pressed, 100.0 is ON for 10 seconds then OFF.

Lesson 4

Timers

5. Devise a circuit that can be used to start a motor and then after a delay of 10 sec start a pump. When the motor is switched off there should be delay of 10 sec before the pump is off.

6. Devise a circuit in which 100.0 is on only when 0.1 is pressed in 10 sec. just after start of the machine (0.0). Otherwise if 0.1 is pressed after 10 sec. Nothing should happen

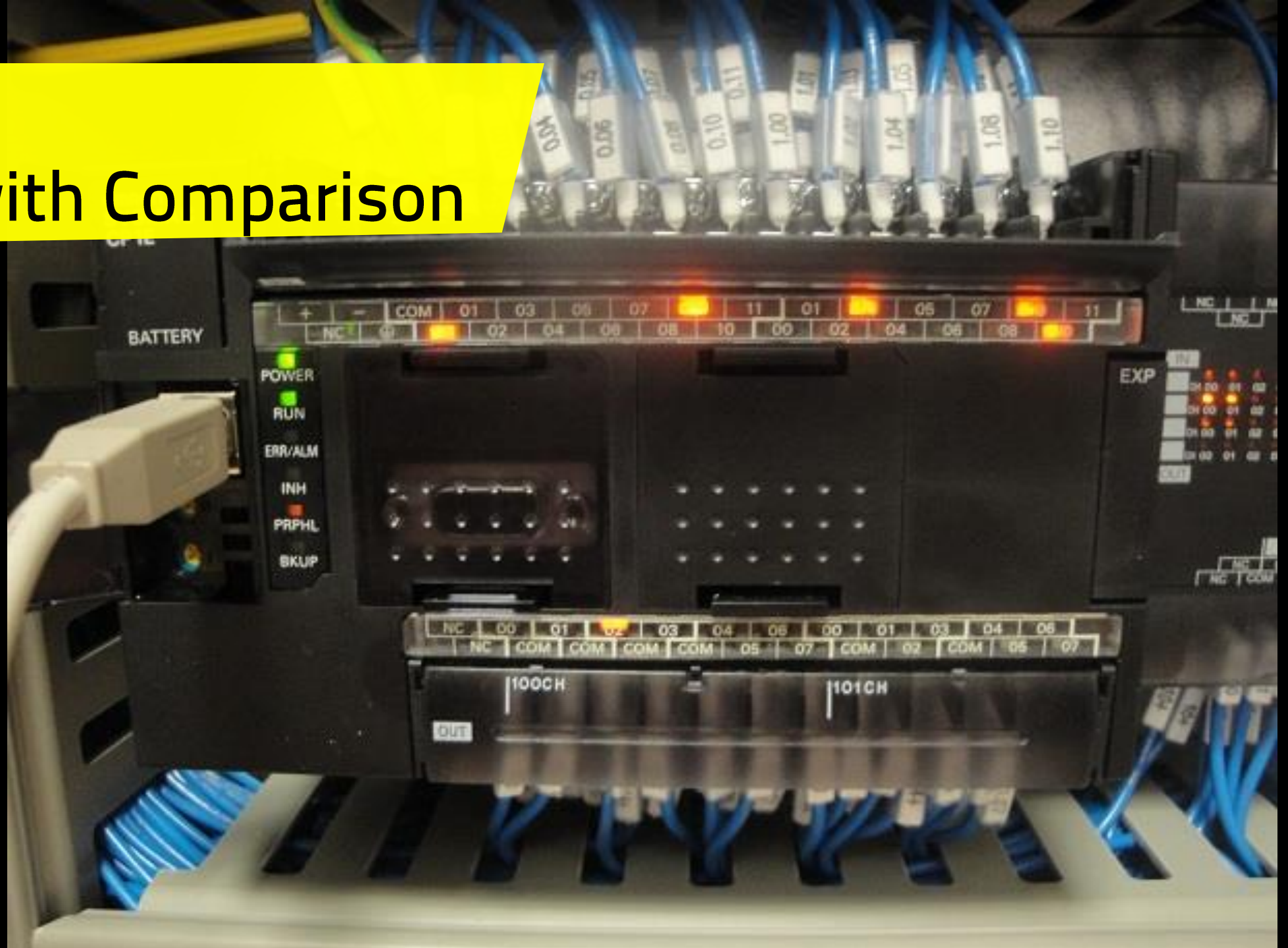
Lesson 5

Timers with Comparison

Instructions to
Be used:

LD
OUT
TIM

>, <, =, >=, <=



Lesson 5

Timers with Comparison

1. Use one push button (0.1) turn ON 100.0 in following sequence:
100.0 on for 2 sec. then off for 2 sec. then on for 3 sec. then off for 3 sec then on for 4 sec. then continuously off.
2. Use 0.0 to blink 100.0. (On Time 0.5 second & OFF time 0.5 second).
3. Use 0.0 to blink 100.0. (On Time 0.5 second & OFF time 1 second).

Lesson 5

Timers with Comparison

4. When you Turn ON 0.0, 100.0 and 100.1 should blink with the delay of 1 sec continuously (such that 1 sec. ON & 1 sec. OFF) and when you Turn Off 0.0, 100.0 and 100.1 should blink with the delay of 1.5 sec.

5. Device a Traffic Light Simulator such that when you press 0.0 following sequence should occur

Time {Sec(s)}	100.0 (Red)	100.1 (Yellow)	100.2 (Green)
25 ~ 15	ON	OFF	OFF
15 ~ 13	ON	ON	OFF
13 ~ 10	OFF	OFF	ON
10 ~ 0	OFF	OFF	ON

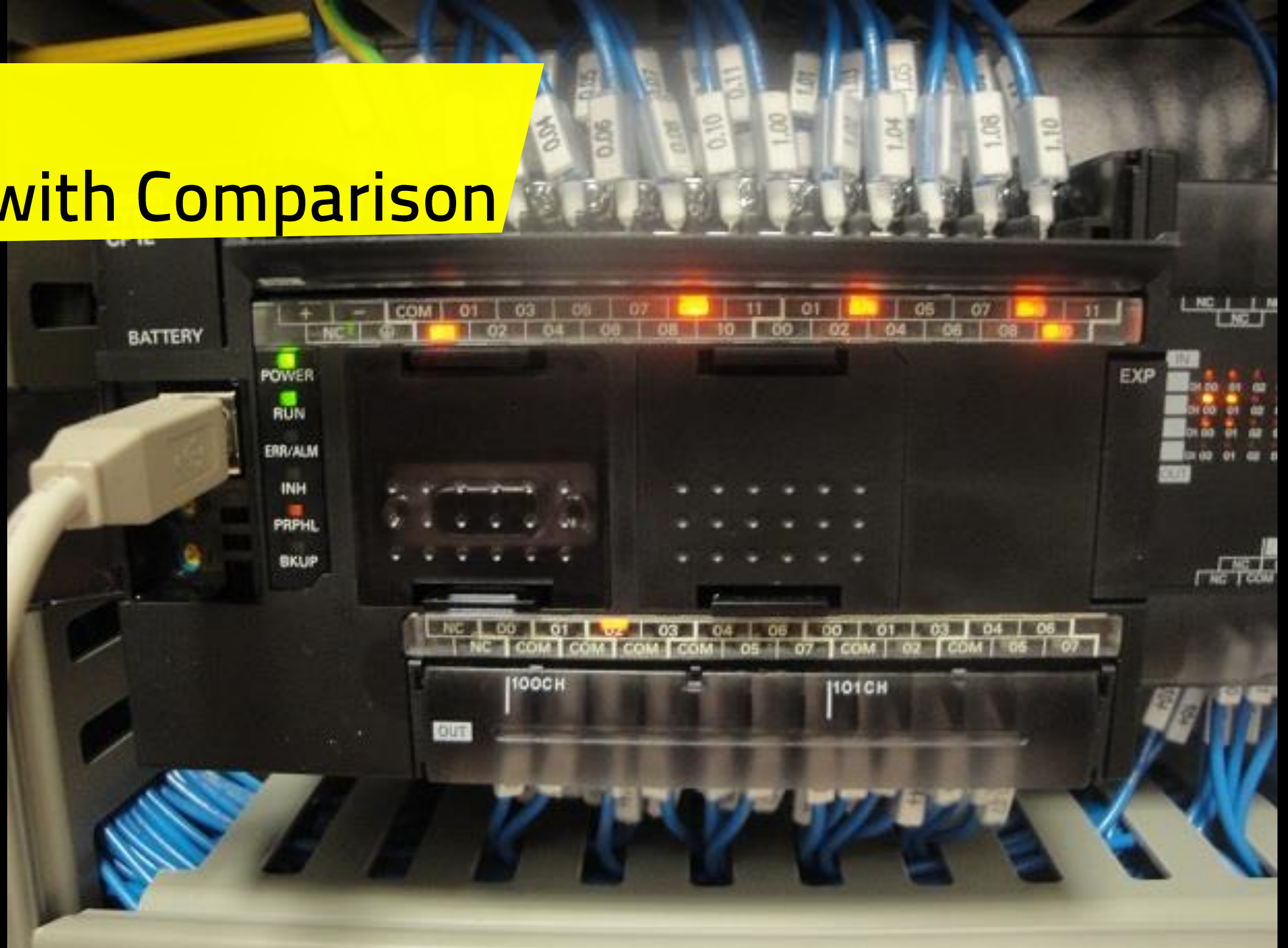
Timer should reset & Cycle should repeat

Lesson 6

Counter with Comparison

Instructions to
Be used:

LD
OUT
CNT
>, <, =, >=, <=



Lesson 6

Counter with Comparison

1. Device a circuit such that When 0.2 is pressed 3 times, 100.0 should be ON.
2. Device a circuit such that When 0.2 is pressed 3 times, 100.0 should be ON & when 0.1 is pressed 100.0 should be OFF (Use Counter reset command)
3. Use 0.3 to latch the conveyor (100.00) & after 0.2 (Sensor) counts 10, conveyor should be unlatched.

Lesson 6

Counter with Comparison

4. Device a circuit in which

- When 0.2 is pressed once– 100.0 gets ON, 100.1,100.2 get off,
- When 0.2 is pressed twice – 100.1 gets ON and 100.0, 100.2 get OFF
- When 0.2 is pressed thrice – 100.2 gets ON and 100.0, 100.1 get OFF
- When 0.2 is pressed fourth time, all outputs should be OFF & Cycle should repeat on pressing 0.1 again

Lesson 7

Use of Data Registers & Related Commands

Instructions to Be used:

MOV, CNR
'+' Addition
'-' Subtraction
'*' Multiply
'/' Divide
'++' Increment
'--' Decrement



Lesson 7

Use of Data Registers & Related Commands

1. Switch ON a Lamp (100.0) after 5 sec. Make a provision using "MOV" command to change the delay time to 10 second by pressing 0.1 & then back to 5 sec by pressing 0.2. You have 1 maintained button (0.0) and 2 push buttons only. Maintained button to switch on/off the lamp. Other two push button for changing the time from 5 to 10 sec and vice-versa
2. Device a circuit to Change the time of above timer using Increment & (0.3- PB) Decrement (0.4- PB) commands.

Lesson 7

Use of Data Registers & Related Commands

3. Device a circuit to blink the output 100.0 using following delay time sequence using MOV command
 - a. Default Delay Time = ON time 1 Second & OFF Time 1 second
 - b. Case A, When 0.1 is pressed = ON time 2 seconds & OFF time 2 sec
 - c. Case B, When 0.2 is pressed = ON time 4 seconds & OFF Time 4 seconds
4. I have a constant 10 in D0
 - a. Multiply it with 100, & then Add 56 to it
 - c. Subtract 14 from it & finally store it in D10 = 1042