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Basic Programmable Logic Controller

PLC Hardware Configuration

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Chapter Overview

1. PLC Configuration
2. Power Supply Unit
3. CPU Module
4. I/O Units
5. Point Addressing
6. Expanded PLC Systems
7. Power Consumptions

Learning Outcomes

Describe and Compare different types of PLC configurations

Identify and describe the function of the hardware components in Omron CQM1H

Explain I/O addressing of Omron CQM1H

PLC Configuration - Size

Micro (Fixed)

- The smallest configuration (as small as a deck of card), with very limited capabilities.
- I/O Count: up to 32

Shoebox (Fixed)

- Compact, all-in-one unit with limited expansion capabilities.
- I/O Count: 32 up to 128

PLC Configuration - Size

Mini (Modular)

- Half the size of rack.
- Can hold multiple modules, but limited.
- I/O Count: 128 to 2048

Rack (Modular)

- The largest configuration, as large as 18”x30”x10”.
- Multiple racks can be connected together using expansion module.
- I/O Count: 1024 and above.

CQM1H Features

Find the detail features
HERE

- For building distributed control system with high speed and capacity Controller Link System.
- Flexible system configurations using advanced inner boards.
- Up to 512 I/O points, 15.2k-word program, 12k-word Data Memory (DM).
- Program execution time around 0.375us for basic instructions and 17.7us for special instructions.

Power Supply

- To convert line voltage to low-voltage DC and then isolate it for the use to operate the CPU and any other associated modules.

CPU Module

- Comprises the controller and memory system to direct all other modules, execute program, and store program and data.
- Contains 16 built-in DC input points and one Controller Link Unit.
- Can mount 2 inner boards.
- Can connect up to maximum 11 I/O and Dedicated I/O modules.

Input Modules

- Serve as the link between field devices and the PLC's CPU.
- It converts the input signal to a signal that CPU can work with, electrically isolate it and send to input memory area in CPU.
- Each module has terminals for attaching input wiring.
- Can either have 8, 16 or 32 input terminals.

Output Modules

- Serve as the link between PLC's CPU and output devices.
- After the CPU updates the output signal, it will be stored inside output memory area. Output module will take the signal, electrically isolate it, and energize or de-energize the output device.
- Each module has output terminals (8, 16 or 32) for attaching output wiring.

Point Addressing

- Refer to the class/video illustration and explanation.

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