Technician's Guide To Programmable Controllers

Chapter 4. Memory Organization

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Chapter 4   Memory Organization

1   The following types of information are normally found and/or stored in one of the PLC's two memory categories (user and storage). Place an S (for storage memory) or a U (for user memory) before the information type to indicate in which category it is normally found and/or stored.

　　__S___   a. status of discrete input devices

　　__S__   b. preset values of timers and counters

　　__S__   c. numeric values of arithmetic

　　__U__   d. holding registers

2   Identify the following PLC-5 files:

Answer:

a. `I = Input`   f. `T = Timer File`

b. `O` = Output   g. `R = Control` File

c. `N = Integer`   h. `F = Floating Point File`

d. `S = Status`   I. `C = Counter File`

e. `B = Bit or Binary`

3   Define the term *byte*.

Answer:

A byte is a group of 8 bits.

4   In a PLC-5, data file 5 is what type of file?

Answer:

Data file 5 represents the Counter designated by C.

5   What word and bit number are represented by PLC-5 address O:010/01?

Answer:

Output = O, Word Image = 010 Terminal = 01

6   Using SLC 500 addressing, what do the following addresses indicate?

a. O:3/15   b. I:2.1/3

b. O:5/0   d. I:7/8

Answer:

a. O:3/15   O = Output, Slot = 3, Terminal 15.
    Programming Methodology
    Word = 3, Bit = 15

b. I:2.1/3   I = Input, Slot = 2, Terminal = 20.
    Programming Methodology
    Word = 2 (Two words) Bit = 19 (16+3)

c. O:5/0   O = Output Slot = 5, Terminal = 0.
    Programming Methodology
    Word = 5, Bit = First

d. I:7/8   I = Input, Slot = 7, Terminal = 8.
    Programming Methodology
    Word = 7, bit = 8

7   Using Allen-Bradley PLC-5 address format, what would address I:013/12 indicate?

Answer:

I = Input, Rack = 1, Module = 3, Terminal = 12

8   Using SLC 500 or MicroLogix address format, what would address I:1.0/4 indicate?

Answer:

Analog Input

I = Input, Slot = 2, Word = 0, Terminal = 4

9   Referring to Figure 4-14, what would address O:6.2 indicate?

Answer:

O = Output, Slot = 6, Output/Terminal = 2

10 Define the term *scope tags*.

Answer:

Defines the availability of a tag to the user programs. A tag can be designated as either a controller-scoped tag or a program-scoped tag.

11 Describe the following data types:

Answer:

a. REAL: A memory location for a 32-bit value that contains a mantissa or an exponent (raised by a power of 10) that can be very large or very small.

b. BOOL: A memory location for a single bit where 1 = On and 0 = Off.

c. **SINT**: a memory location for storing a short integer (8 bits) number from −128 to +127.

d. **DINT**: A memory location for storing a base integer number in the range of −2,147,483,648 to +2,147,483,647. DINT stands for double integer or double word (32 bits).

12 What is an *array*?

Answer:

An array allocates a contiguous block of memory in the controller of the same data type. Each data type in the array is a single tag, and each tag is considered to be one element in the array. The elements in the array occupy memory in order, meaning the array starts at 0 and extends to the number of elements in the array.

13. User storage - stores information on the status of input-output devices, preset and accumulated values, and timers, counter internal relay equivalents, numerical values, ect.

Answer:

Storage memory is that portion of memory that will store information on the status of input and output devices, preset and accumulated values of timers and counters, internal relay equivalents, numerical values for arithmetic functions, and so on. The entire storage memory is called a data table, a register table, or other names, depending on the PLC manufacturer. A register is defined as an area for storing information (logic or numeric).

14. User memory - where ethe programmed ladder logic is stared, holding registers

Answer:

The user memory, or logic memory as it is sometimes called, is where the programmed ladder logic is stored. Within the user memory, words are set aside as holding registers. Holding registers typically store information generated and used by the processor when it is solving the user program.