

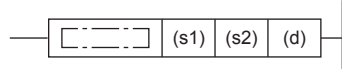
Adding clock data

TADD(P)

FX5S **FX5UJ** **FX5U** **FX5UC**

These instructions add the time data stored in the device number specified by (s2) and later to the clock data stored in the device number specified by (s1) and later, and store the result to the device number specified by (d) and later.

Ladder diagram



Structured text

ENO:=TADD(EN,s1,s2,d);
ENO:=TADDP(EN,s1,s2,d);

FBD/LD



Setting data

■Descriptions, ranges, and data types

| Operand | Description | Range | Data type | Data type (label) |
|---------|---|-------|----------------------|--|
| (s1) | Head device number where the clock data to be added is stored. | — | 16-bit signed binary | ANY16_ARRAY (Number of elements: 3) |
| (s2) | Head device number where the adding time value (or clock data value) is stored. | — | 16-bit signed binary | ANY16_ARRAY (Number of elements: 3) |
| (d) | Head device number where the resultant clock data (or time value) is stored. | — | 16-bit signed binary | ANY16_ARRAY (Number of elements: 3) |
| EN | Execution condition | — | Bit | BOOL |
| ENO | Execution result | — | Bit | BOOL |

■Applicable devices

| Operand | Bit | Word | | | Double word | | Indirect specification | Constant | | | Others |
|---------|-----------------------------|---------------------------|-------|---|-------------|----|------------------------|----------|---|----|--------|
| | X, Y, M, L, SM, F, B, SB, S | T, ST, C, D, W, SD, SW, R | U□\G□ | Z | LC | LZ | | K, H | E | \$ | |
| (s1) | — | ○ | ○ | — | — | — | ○ | — | — | — | — |
| (s2) | — | ○ | ○ | — | — | — | ○ | — | — | — | — |
| (d) | — | ○ | ○ | — | — | — | ○ | — | — | — | — |

Processing details

- These instructions add the time data stored in the device numbers starting from (s2) to the clock data stored in the device numbers starting from (s1), and store the result to the device numbers starting from (d).

| | | | | | | | | | | |
|--------|--------|-----------|---|--------|--------|-----------|---|-------|--------|-----------|
| (s1) | hour | (0 to 23) | | (s2) | hour | (0 to 23) | | (d) | hour | (0 to 23) |
| (s1)+1 | minute | (0 to 59) | + | (s2)+1 | minute | (0 to 59) | ⇒ | (d)+1 | minute | (0 to 59) |
| (s1)+2 | second | (0 to 59) | | (s2)+2 | second | (0 to 59) | | (d)+2 | second | (0 to 59) |

Ex.

When adding 7:48:10 to 6:32:40

| | | | | | | | |
|--------|----|---|--------|----|---|-------|----|
| (s1) | 6 | | (s2) | 7 | | (d) | 14 |
| (s1)+1 | 32 | + | (s2)+1 | 48 | ⇒ | (d)+1 | 20 |
| (s1)+2 | 40 | | (s2)+2 | 10 | | (d)+2 | 50 |

- If the sum of two values exceeds 24:00:00, the carry flag turns on, and the result will be the sum minus 24:00:00. For example, if a time value of 20:20:20 is added to another time value of 14:30:30, the sum is 34:40:50. However, the actual addition result will be 10:40:50.

| | | | | | | | |
|--------|----|---|--------|----|---|-------|----|
| (s1) | 14 | | (s2) | 20 | | (d) | 10 |
| (s1)+1 | 20 | + | (s2)+1 | 20 | ⇒ | (d)+1 | 40 |
| (s1)+2 | 30 | | (s2)+2 | 20 | | (d)+2 | 50 |

- If the result is 0 (0:00:00), the zero flag turns on.
- If 1 second is added to 23:59:59, the result will be 0:00:00. This turns on both the carry flag and the zero flag.
- The table below shows the related devices.

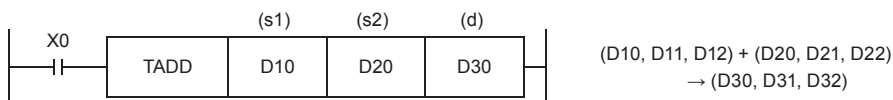
| Device | Name | Description |
|--------|-------|--|
| SM700 | Carry | If the result exceeds the maximum value of the time data, 23:59:59, this special relay turns on. |
| SM8020 | Zero | If the result is 0:00:00, this special relay turns on. |
| SM8022 | Carry | If the result exceeds the maximum value of the time data, 23:59:59, this special relay turns on. |

Precautions

- These instructions occupy three points for each of three devices starting from device number specified by (s1), (s2), and (d) respectively. Make sure that these devices are not used by other machine controls.
- When using the time value (hour, minute, second) of the built-in real time clock in the CPU module for the operation, use the TRD(P) operation to read the special register values first. Then specify the word devices where the read values are stored to each operand.

Program example

In the program shown below, when X0 is set to ON, the time obtained by adding the D20 to D22 time data to the D10 to D12 clock data is stored in D30 to D32.



| | | | | | | | |
|----------|-------------|---|---------|-------------|---|----------|-------------|
| D10 | 10 (hour) | | D20 | 3 (hour) | | D30 | 13 (hour) |
| D11 | 30 (minute) | + | D21 | 10 (minute) | → | D31 | 40 (minute) |
| D12 | 10 (second) | | D22 | 5 (second) | | D32 | 15 (second) |
| 10:30:10 | | | 3:10:05 | | | 13:40:15 | |

- When the operation result exceeds 24 hours

| | | | | | |
|-------------|---|-------------|---|-------------|----------------------|
| (s1) | | (s2) | | (d) | |
| 18 (hour) | | 10 (hour) | | 4 (hour) | ← 18 + 10 = 28 (≥24) |
| 10 (minute) | + | 20 (minute) | → | 30 (minute) | |
| 30 (second) | | 5 (second) | | 35 (second) | |
| 18:10:30 | | 10:20:05 | | 4:30:35 | |

Operation error

| Error code (SD0/SD8067) | Description |
|----------------------------|--|
| 2820H | The device range specified by (s1), (s2), and (d) exceeds the corresponding device range. |
| 3405H | Any of values specified by (s1) and (s2) is outside the following range. 0 to 23 |
| | Any of values specified by (s1)+1, (s2)+1, (s1)+2, and (s2)+2 is outside the following range. 0 to 59 |