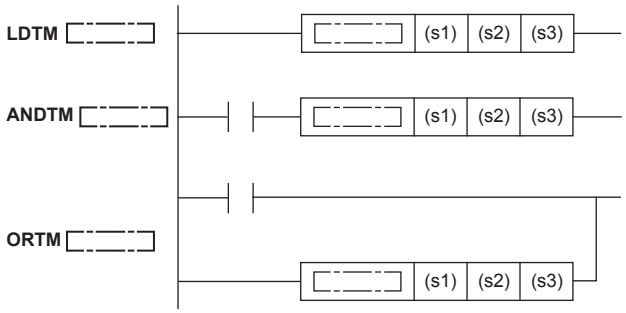
Comparing time data

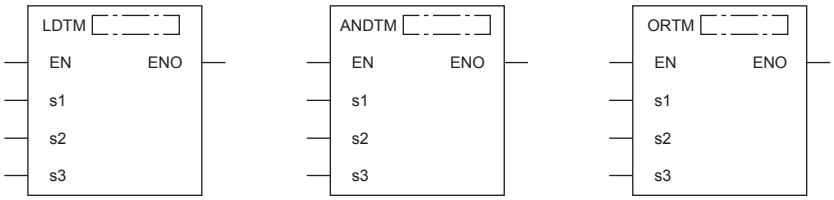
LDTM□, ANDTM□, ORTM□

FX5S FX5UJ FX5U FX5UC

These instructions compare the time data in the devices specified by (s1) and (s2). Or, these instructions compare the time data in the device specified by (s1) with the current time.
Set the comparison target by (s3).

Ladder diagram	Structured text*1
 ("=", "<>", ">", "<=", "<", ">=" enters □.)	ENO:=LDTM_□(EN,s1,s2,s3); ENO:=ANDTM_□(EN,s1,s2,s3); ENO:=ORTM_□(EN,s1,s2,s3); ("EQ", "NE", "GT", "LE", "LT", "GE" enters □.)*2

FBD/LD



("_EQ", "_NE", "_GT", "_LE", "_LT", "_GE" enters □.)*2

*1 Supported by engineering tool version "1.035M" and later.
*2 EQ is =, NE is <>, GT is >, LE is <=, LT is <, and GE is >=.

Setting data

■Descriptions, ranges, and data types

Operand	Description	Range	Data type	Data type (label)
(s1)	Head device number where the comparison data is stored	—	16-bit signed binary	ANY_TM
(s2)	Head device number where the comparison data is stored	—	16-bit signed binary	ANY_TM
(s3)	Comparison target setting value or the number of comparison target data	0001H to 0007H, 8001H to 8007H	16-bit signed binary	ANY16
EN	Execution condition	—	Bit	BOOL
ENO	Execution result	—	Bit	BOOL

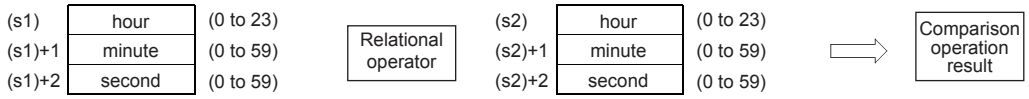
■Applicable devices

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)	—	○	—	—	—	—	○	—	—	—	—
(s3)	—	○	○	○	—	—	○	○	—	—	—

Processing details

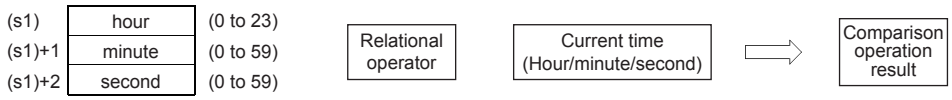
- These instructions compare the time data in the devices specified by (s1) and (s2), or compare the time data in the device specified by (s1) with the current time. Set the comparison target by (s3).
  - Comparing two specified time data

    These instructions compare the time data in the device specified by (s1) with the time data in the device specified by (s2) in accordance with the conditions set by (s3). (Devices are used as a normally open contact.)

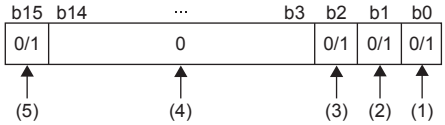


  - Comparing specified time data with current time data

    These instructions compare the time data in the device specified by (s1) with the current time data in accordance with the conditions set by (s3). (Devices are used as a normally open contact.) The time data in the device specified by (s2) is regarded as dummy data and ignored.



- Set each data in binary.
- Set the "hour" data as in the 24-hour clock in the devices specified by (s1) and (s2) within the range 0 to 23.
- Set the "minute" data in the devices specified by (s1)+1 and (s2)+1 within the range 0 to 59.
- Set the "second" data in the devices specified by (s1)+2 and (s2)+2 within the range 0 to 59.
- Set the following in (s3) as comparison target setting values. The following shows the bit configuration of (s3).



(1) Set "second" as comparison target.
(2) Set "minute" as comparison target.
(3) Set "hour" as comparison target.
(4) Set 0. If a value other than 0 is set, the operation result will be non-continuity.
(5) When 1 is set to the 15 bit, the data in the device specified by (s1) is compared with the current time in accordance with the conditions set in the 0 to 2 bits.

- When 0 is set to the 0 to 2 bits, the time data (hour, minute, and second) are not compared. When 1 is set, the entire time data (hour, minute, and second) are compared.
- When 0 is set to the 15 bit, the data in the device specified by (s1) and the time data in the device specified by (s2) are compared. When 1 is set, the data in the device specified by (s1) is compared with the current time. The time data in the device specified by (s2) is ignored.
- The following table lists processing details of each bit.

(s3) value when comparing two specified time data	(s3) value when comparing the specified time data with the current time	Comparison target	Contents of processing
0001H	8001H	Second data	Only data in the device specified by (s1)+2 is compared.
0002H	8002H	Minute data	Only data in the device specified by (s1)+1 is compared.
0003H	8003H	Minute and second data	Data in the device areas specified by (s1)+2 and (s1)+2 are compared.
0004H	8004H	Hour data	Only data in the device specified by (s1) is compared.
0005H	8005H	Hour and second data	Data in the device areas specified by (s1) and (s1)+2 are compared.
0006H	8006H	Hour and minute data	Data in the device areas specified by (s1) and (s1)+1 are compared.
0007H	8007H	Hour, minute, and second data	The entire time data in the device areas specified by (s1), (s1)+1, and (s1)+2 are compared.
Other than 0001H to 0007H, 8001H to 8007H		None	The entire time data in the device areas specified by (s1), (s1)+1, and (s1)+2 are not compared. (The operation result will be non-continuity.)

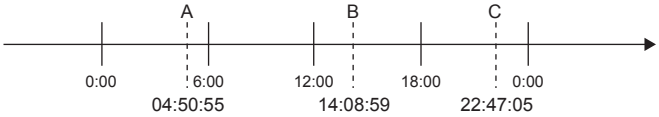
- If the comparison target data in the device are not recognized as time data, SM709 turns on after the instruction is executed and the operation result will be non-continuity. If the device areas specified by (s1) to (s1)+2 or (s2) to (s2)+2 exceed the corresponding device range, SM709 turns on after the instruction is executed and the operation result will be non-continuity as well. Once SM709 turns on, the on state is held until the CPU module is powered off or reset. Turn off SM709 as needed.

• The following table lists the comparison operation results of each instruction.

Instruction symbol	Condition	Result
TM=	(s1)=(s2)	Conductive state
TM<>	(s1)≠(s2)	
TM>	(s1)>(s2)	
TM<=	(s1)≤(s2)	
TM<	(s1)<(s2)	
TM>=	(s1)≥(s2)	
TM=	(s1)≠(s2)	Non-conductive state
TM<>	(s1)=(s2)	
TM>	(s1)≤(s2)	
TM<=	(s1)>(s2)	
TM<	(s1)≥(s2)	
TM>=	(s1)<(s2)	

Ex.

The time data A, B, and C are compared.



• The following table lists the comparison operation results between A, B, and C. Even when the data are compared under the same conditions, the results differ depending on the comparison target data.

○: Continuity, ×: Non-continuity

Comparison target data	Condition		
	A<B	B<C	A<C
Second data	○	×	×
Minute data	×	○	×
Minute and second data	×	○	×
Hour data	○	○	○
Hour and second data	○	○	○
Hour and minute data	○	○	○
Hour, minute, and second data	○	○	○
None	×	×	×

Operation error

There is no operation error.