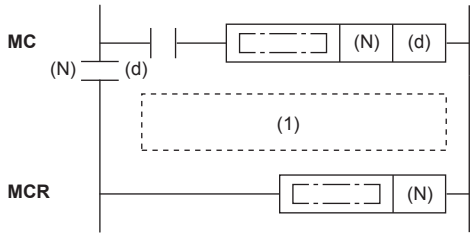
6.5 Master Control Instruction

Setting/resetting the master control

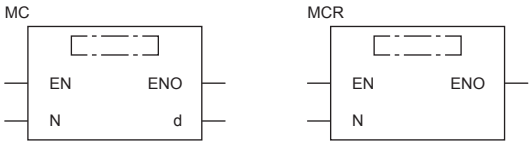
MC, MCR

FX5S FX5UJ FX5U FX5UC

- MC: This instruction starts master control.
- MCR: This instruction ends master control.

Ladder diagram	Structured text
 (1): Master control ladder	ENO:=MC(EN,n,d); ENO:=MCR(EN,n);

FBD/LD



Setting data

■Descriptions, ranges, and data types

Operand	Description	Range	Data type	Data type (label)
(N)*1	Nesting	0 to 14	Device name	ANY16_S
(d)	Number of device to be turned ON	—	Bit	ANY_BOOL
EN	Execution condition	—	Bit	BOOL
ENO	Execution result	—	Bit	BOOL

*1 In the case of the ST language and the FBD/LD language, N displays as n.

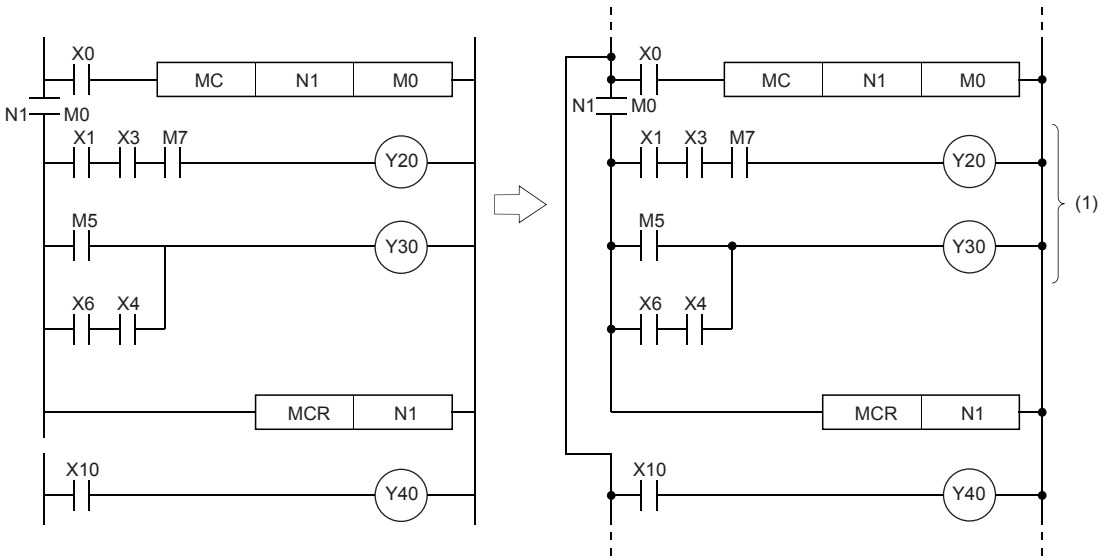
■Applicable devices

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	$	N	DY
(N)	—	—	—	—	—	—	—	—	—	—	○	—
(d)	○	○*1	—	—	—	—	—	—	—	—	—	○

*1 T, ST, and C cannot be used.

Processing details

These instructions create program with efficient ladder switching by opening/closing common buses in ladders.
Ladder using master control is illustrated below.
(Left: Display on the engineering tool, Right: Actual operation)



(1) Executed only when X0 is on

■MC

- When the execution command of the MC instruction turns ON at the start of master control, the operation result between the MC and MCR instructions is as per the instructions (according to ladder). When the execution command of MC instruction turns OFF, the operation result between the MC and MCR instructions becomes as follows.

Device	Device status
Timer	The count value becomes 0, and both coils and contacts turn OFF.
Counters, retentive timers	Coils turn OFF but the current status of both count values and contacts is maintained.
Devices in OUT instruction	Forcibly turned OFF.
Devices in SET and RST instructions Devices in SFT(P) instruction Devices in basic instructions and applied instructions	Current status is maintained.

Point

When an instruction (e.g. FOR to NEXT instructions etc.) not requiring NO contact instruction is programmed in a ladder using master control, the CPU module executes that instruction regardless of the execution command of this instruction.

- With this instruction, the same nesting (N) number can be used as many times as necessary by changing the device specified by (d).
- When this instruction is ON, the coil of the device specified by (d) turns ON. Also, the coil becomes a double coil when the same device is used by the OUT instruction, for example. So, do not use the device specified by (d) in other instructions.

■MCR

- This instruction indicates the end of the master control range by the master control release instruction.
- Do not prefix this instruction with NO contact instruction.
- Use these (MC and MCR) instructions with same nesting number as a pair. Note, however, that when this instruction is nested at a single location, all master controls can be ended by just one (N) number, the smallest number. (Refer to Caution.)

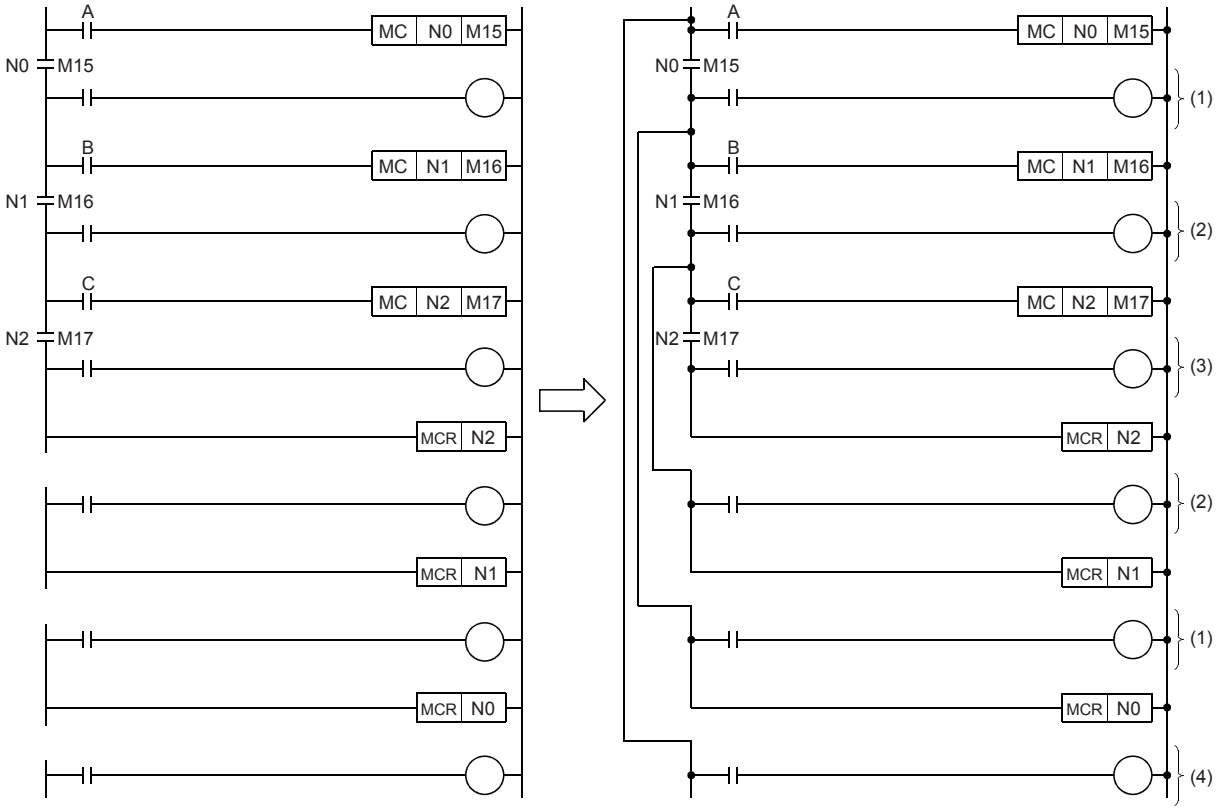
Point

Master control instructions can be used in a nested fashion. Each master control section is distinguished by nesting (N). Nesting is available within the range N0 to N14.

A nested structure allows you to create a ladder for successively restricting program execution conditions.

A nested structure ladder is illustrated as follows:

(Left: Display on the engineering tool, Right: Actual operation)



(1) Executed when A is ON

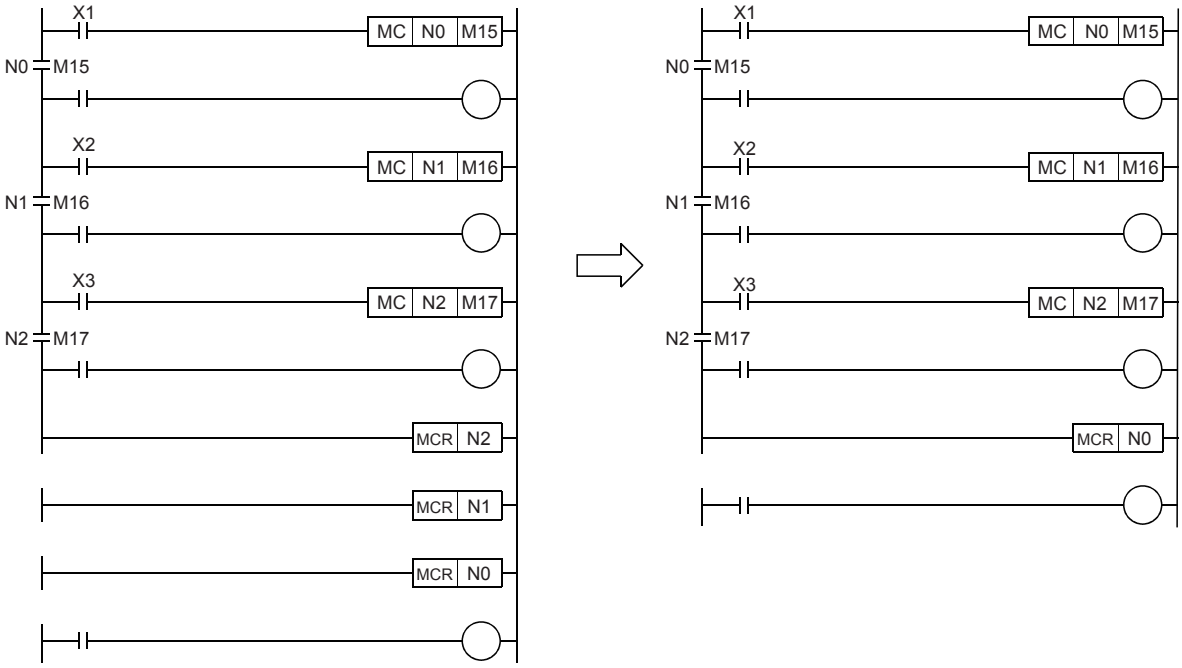
(2) Executed when A and B are ON

(3) Executed when A, B, and C are ON

(4) Regardless of A, B, and C

Precautions

- If an instruction (e.g. LD, LDI) to be connected to the bus is not programmed following the MC instruction, a program structure error (error code: 33E0) occurs.
- These instructions cannot be used in FOR to NEXT, STL to RETSTL, P to RET (SRET), and I to IRET. Also, do not block by I, IRET, FEND, END, RET (SRET), RETSTL, etc. Addition by write during RUN mode results in an error.
- Nesting up to 15 levels (N0 to N14) is possible. When nesting instructions, the MC instruction is used starting from the smallest (N) number and the MCR instruction is started starting from the biggest number. Programming in reverse order does not produce a nested structure and hence the CPU module cannot execute operations properly.
- When the MCR instruction is nested at a single location, all master controls can be ended by just one nesting (N) number, the smallest number.



Operation error

There is no operation error.