Chapter 5
Command

1 Command 5-2
1.1 Bit / JMP / RST 5-2
1.2 FB(Action) 5-8
1.3 FB(Compare) 5-25
1.4Command List 5-26
2 Contact List 5-30
2.1 X Contact 5-30
2.2 Y Contact 5-33
2.3 D Register 5-36
2.4 S Contact 5-36
2.5 Other Contact 5-37

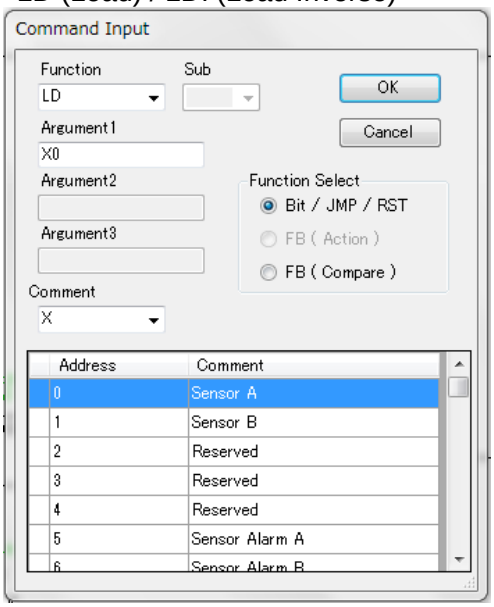
1 Command

Double click an active part in ladder creation window.

For details, refer to Chapter 4 Section 2-2 “Command Input (Basic Mode)”

1.1 Bit / JMP / RST

LD (Load) / LDI (Load Inverse)



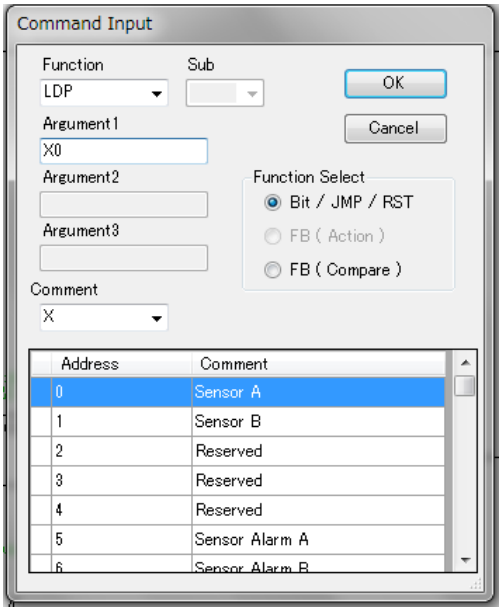
Select contact from [Argument1]

LD
Normally open contact.

LDI
Normally close contact.

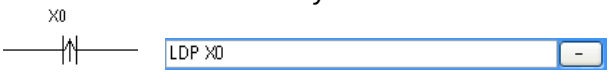
> D register need to be specified bit by bit.
> Example: Argument1 entry D5.0 will indicate checked first bit of D5 .

LDP/LDF

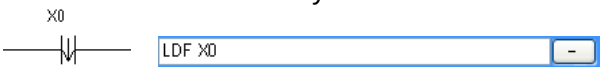


Select contact from [Argument1]

LDP
Each time the checking condition becmes satisfied, the cotact turns on for one scan only.

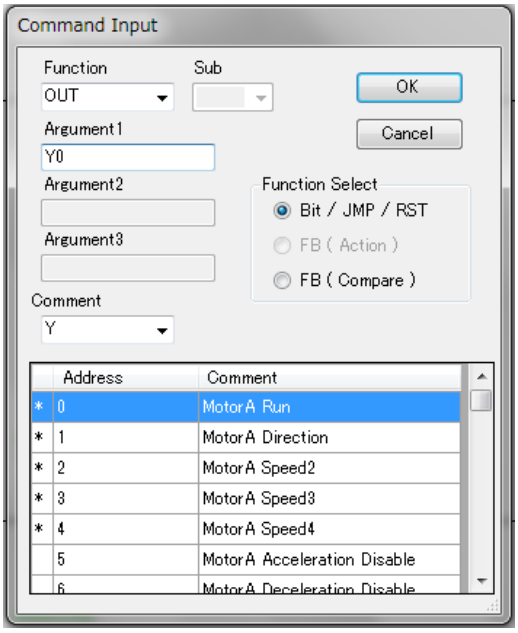


LDF
Each time the checking condition becomes fail, the cotact turns on for one scan only.



> D register cannot be used at LDP and LDF.
> “Y” and “M” contact which have been used at SET and RST cannot be used at LDP and LDF command.

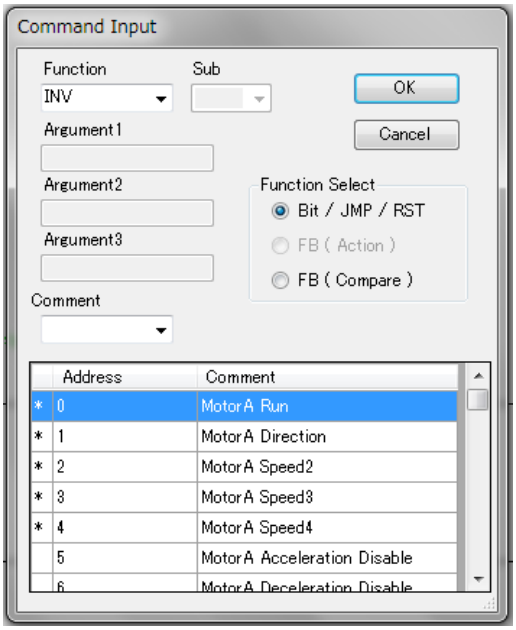
OUT



[Argument1]:
Set a coil that needs to be ON when OUT is active.

When the coil turns ON, a target contact also turns ON.
When “Y” or “S” is selected, output processing of IB controller according to the setting is executed.
D register is specified in bit unit.
Example: When “D5.0” is entered to Argument1, 1st bit of D register D5 turns ON .
D100 to D849 (e.g. Receiving data) cannot be specified.

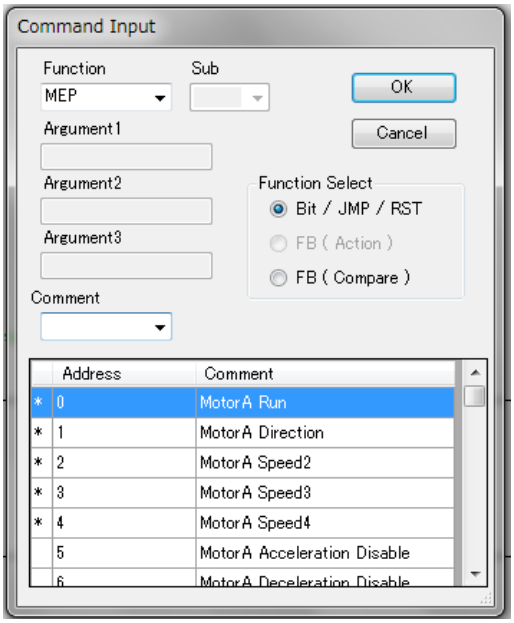
INV



Invert operation result of True and False before INV command.
Argument setting is not necessary.

INV command can not be used at left hand bus bar.

MEP

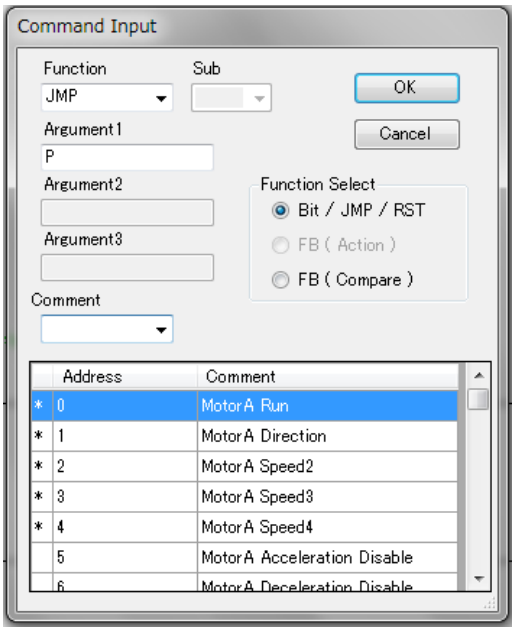


Conversion of operation result to leading edge pulse.
Argument setting is not necessary.

MEP can not be placed left hand bus bar.

Up to 255 MEP can be used on one ladder logic.

LBL/JMP



JMP

Select address from [Argument1]. (Jump from)

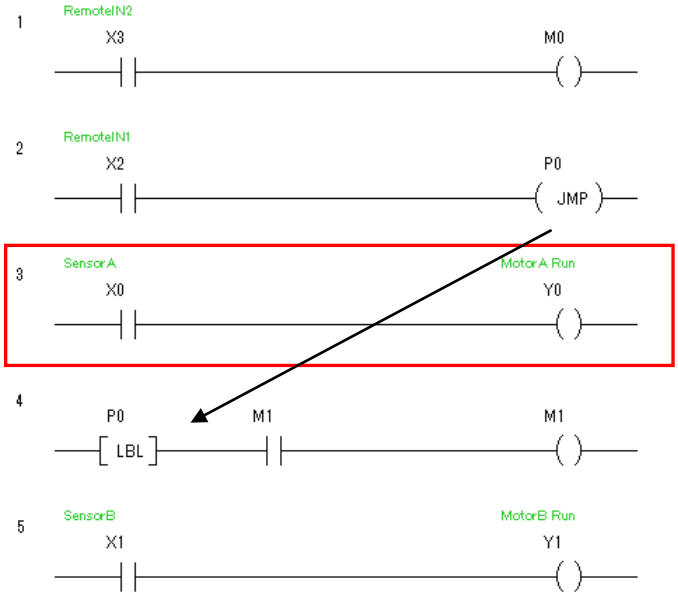
LBL

Select address from [Argument1]. (Jump to)

If JMP command is active, the program between JMP and LBL is not active.

Example to use JMP and LBL

Place “JMP before “LBL”

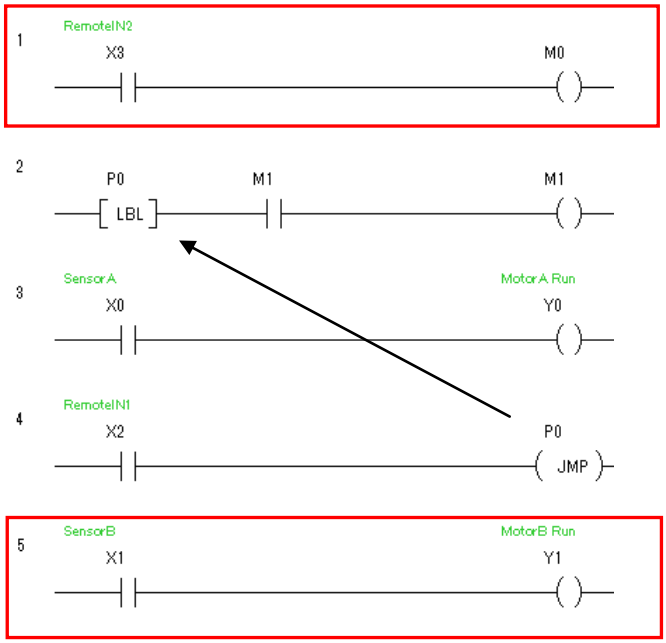


When [JMP] is placed before [LBL], the operation will be executed as shown to the left.

When active [JMP], program jump to [LBL]. The program between [JMP] and [LBL] will be canceled.

When X2 is ON, red box will be skipped and jump to line 4.

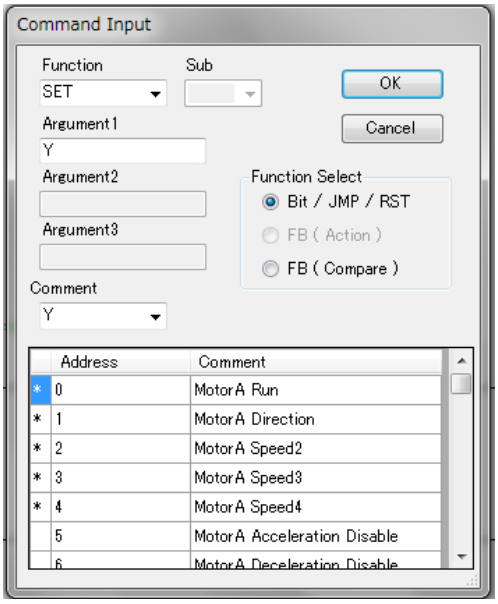
Place “LBL” before “JMP”



When [JMP] is placed after [LBL], the operation will be executed as shown to the left.

When X2 is ON, jump to [LBL] and red box will be skipped.

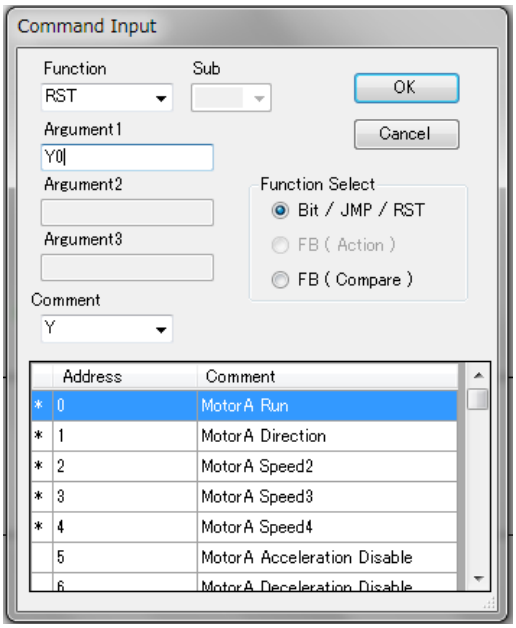
SET



Select coil from [Argument1]

Selected coil is latched by SET when SET is active.
In order to reset the latched coil, RST is needed.
D100 to D849 (Received data etc.) cannot be specified.
SET can be used with OUT.
“Y” and “M” contacts which have been used at SET and RST cannot be used at LDP and LDF command.

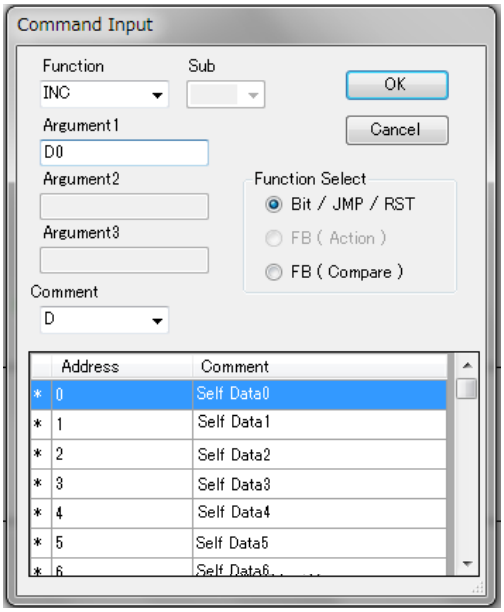
RST



Select coil from [Argument1].

Selected coil is reset by RST.
RST can reset timer and counter as well.
D register can not be reset by RST.
D100 to D849 (Received data etc.) cannot be specified.
RST can be used with OUT.
“Y” and “M” contacts which have been used at SET and RST cannot be used at LDP and LDF command.

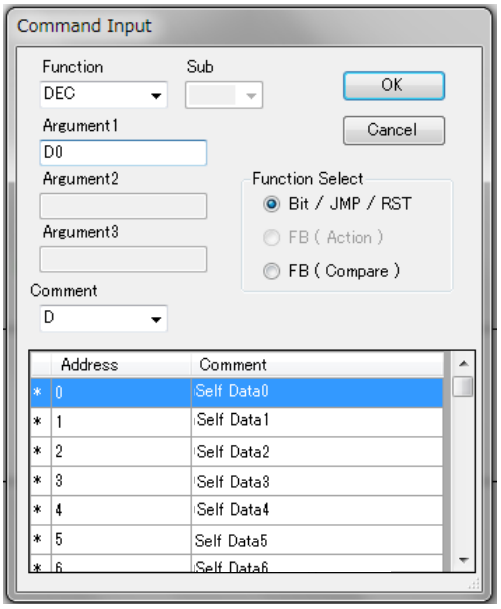
INC



Set D register from [Argument1].

Increase D register value each time the command is active.
The command is not incresed when D register value is 0xFFFF(65535).
D register is 0 to 99.
There is no double coil restriction.

DEC

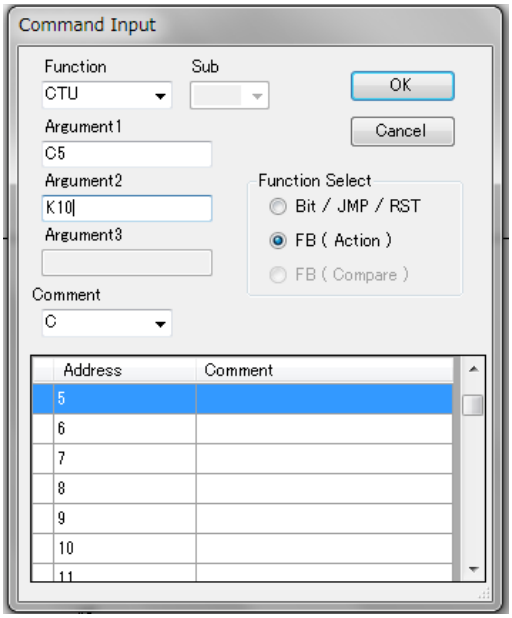


Set D register from [Argument1].

Decrease D register value each time the command is active.
The command is not decreased when D register value is 0xFFFF(65535).
D register is 0 to 99.
There is no double coil restriction.

1.2 FB(Action)

CTU

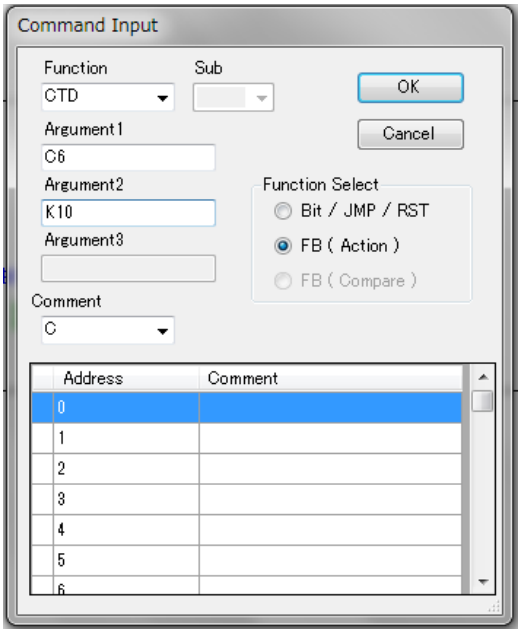


Select counter from [Argument1].
Set counter value at [Argument2].

Count value is incremented for each time CTU is active.
C contact becomes ON when target counter value is reached.
C contact becomes OFF when count value is reset by RST.

- Set K0 at Argument2, then target counter vaule can be set from property screen.
  For dfetails, refer to Chapter 3 Section 6 “Counter settings”.
- C contact becomes OFF when target value increase after count up.
- C contact becomes ON when target value decrease under current value while counting.

CTD

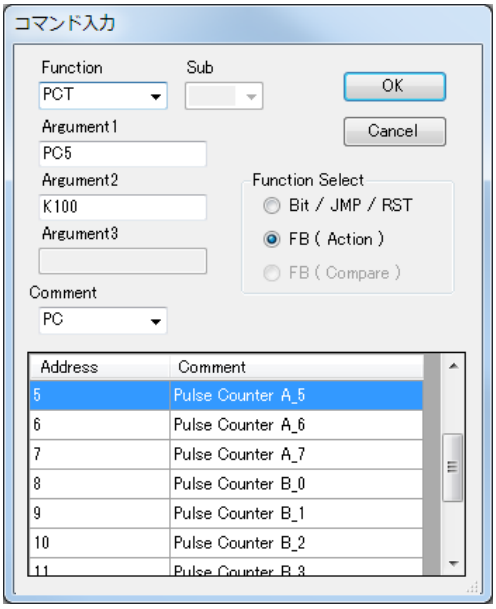


Select counter from [Argument1].
Set counter value at [Argument2].

Count value is decremented for each time CTD is active.
C contact becomes ON when the target counter value becomes 0.
C contact becomes OFF when use RST to reset the counter.

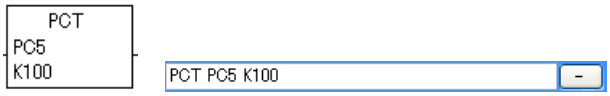
- Set K0 at Argument2, then target counter vaule can be set from property screen.
  For details, refer to Chapter 3 Section 6 “Counter settings”.
- When a target counter value is D register, the target value is set as a value of D register at starting counter.
- The target value is not changed even if change a value of D register after start count.

PCT: Pulse count



Select counter from [Argument1].
Set target count value at [Argument2].

Motor Pulse Counter will be counted when motor pulse is changed during PCT is active.
PC contact becomes ON after count up.
A count value is reset, contact PC becomes OFF when PCT is not activated.

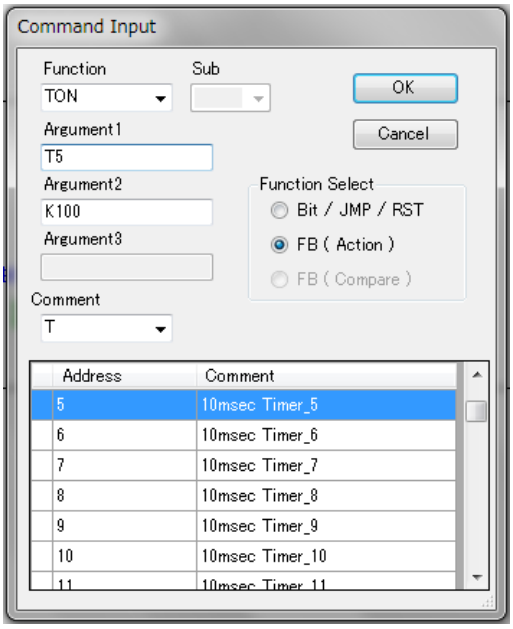


PC0 to PC15 for Motor A
PC0 to PC7 for CW and CCW
PC8 to PC11 for CW
PC12 to PC15 for CCW
PC16 to PC31 for Motor B
PC16 to PC23 for CW and CCW
PC24 to PC27 for CW
PC28 to PC31 for CCW

- Set K0 at Argument2, then target counter vaule can be set from property screen.
  For details, refer to Chapter 3 Section 7 “Pulse Counter settings”.

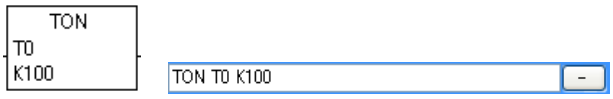
Distance (mm) = Motor pulse / (12pulses x gear reduction) x Pi (π) x pipe diameter (mm)
Note; 12pulses / rotating of Itoh MDR.
Gear reduction, refer to a motor manual.

TON



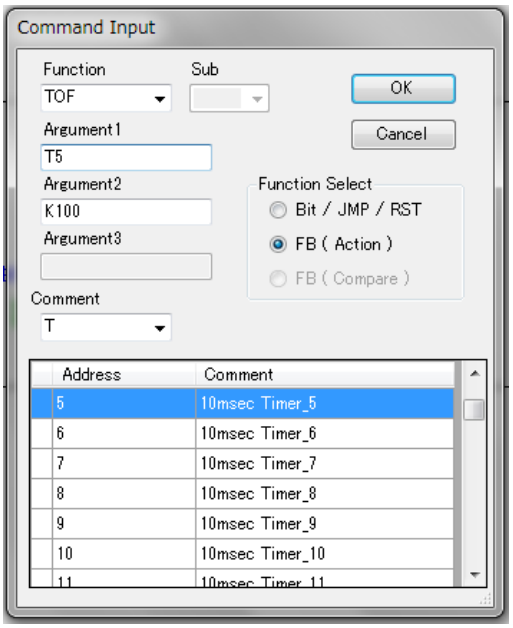
Select timer from [Argument1].
Set timer value at [Argument2],
K = 0 to 65535 or D = 0 to 849.

TON starts counting until total counted value reached set value at Argument2 or TON is reset by RST.



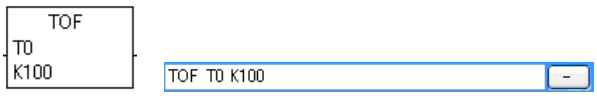
- Timer is 10ms timer.
- Set K0 at Argument2, then target timer vaule can be set from property screen.
  For details, refer to Chapter 3 Section 5 “Timer settings”.

TOF



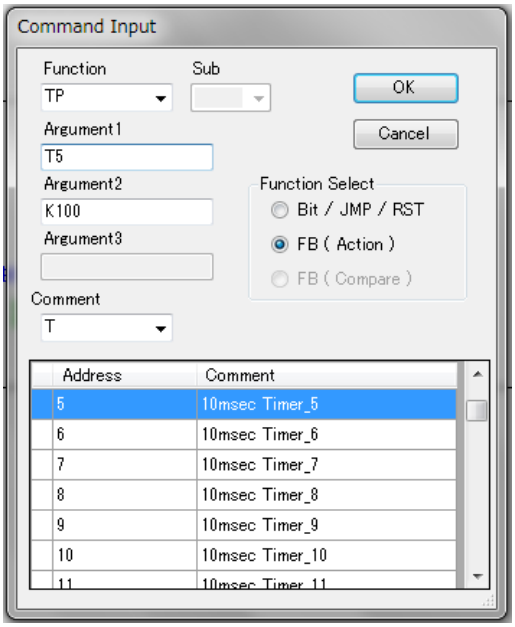
Select timer from [Argument1].
Set timer value at [Argument2]. K = 0 to 65535

Count time base intervals when the instruction is false.
When total counted value reached set value at [Argument2], coil of TOF becoming ON.



- Timer is 10ms timer.
- Set K0 in Argument2, then target timer vaule can be set from property screen.
  For details, refer to Chapter 3 Section 5 “Timer settings”.

TP

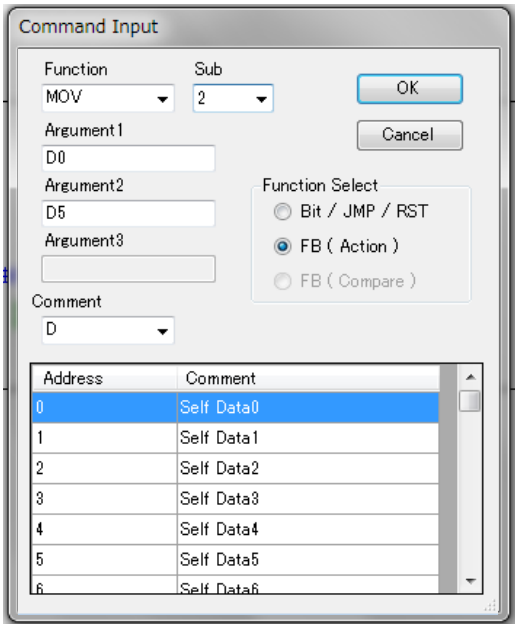


Select timer from [Argument1].
Set timer value at [Argument2]. K = 0 to 65535 or D=0 to 849

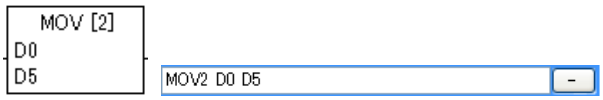
Counts time base intervals when the instruction is false.
When total counted value reached set value at [Argument2], coil of TP becoming ON.

- Timer is 10ms timer.
- Set K0 at Argument2, then target timer vaule can be set from property screen.
  For details, refer to Chapter 3 Section 5 “Timer settings”.

MOV

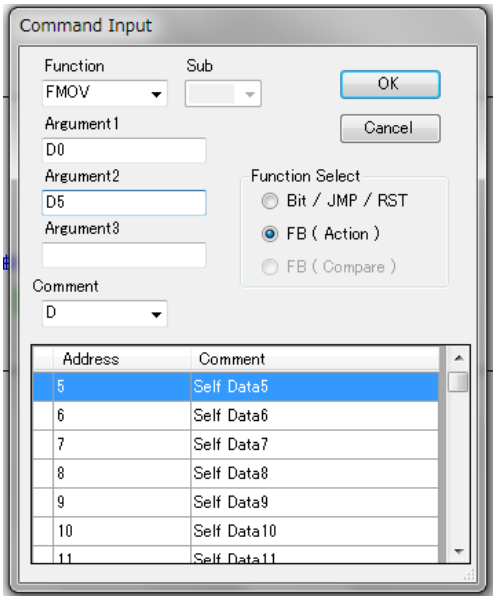


[Argument1]; Set a source of D register.
[Argument2]; Forwarding address of D register
[Sub]; Specify a forwarding data size
1=2[byte], 2=4[byte]

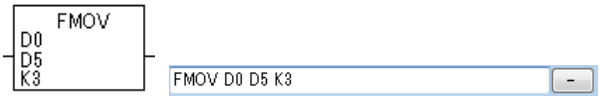


Fixed value K = 0 to 65535 also can be used at Argument1.
Enter “1” at [Sub] when use the fixed value.
Receive Data (D100 to D849...etc) can not be used at Argument2.
Copy D0 data to D5 and D1 to D6 if sub command is 2 as shown on the left setting.

FMOV: Fill move

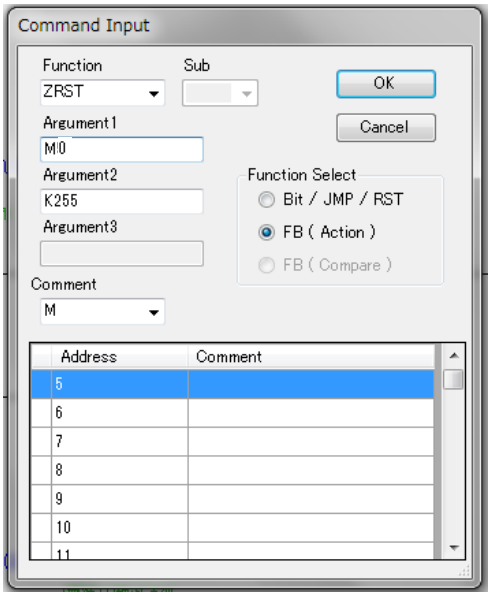


[Argument1]; Set a source of D register
[Argument2]; Forwarding address of D register
[Argument3]; A number of forwarding address K = 1 to 99

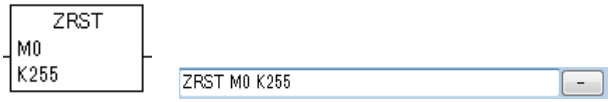


Fixed value K = 0 to 65535 can be used at Argument1.
Receive Data (D100 to D849...etc) can not be used at Argument2.
Argument3 is K3 as shown on the left, copy D0 date to D5, D6 and D7.

ZRST: Zone reset

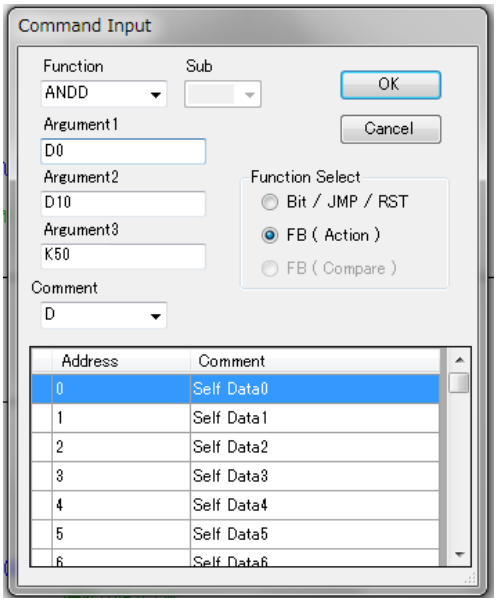


[Argument1]; Enter first device
[Argument2]; Enter range of reset.
When Argument1 is D register, K = 1 to 100
When Ar gument1 is Internal coil(M), K = 1 to 600



Receive Data (D100 to D849...etc) can not be used at Argument1.
Turn a specified coil off.
ZRST can be used with OUT command.

ANDD

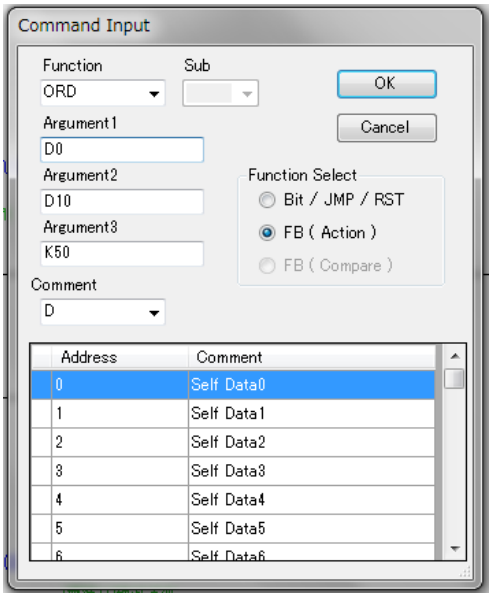


[Argument1]; Set a source of D register
[Argument2]; Forwarding address of D register
[Argument3]; Enter a fixed value operating AND with Arguement1.

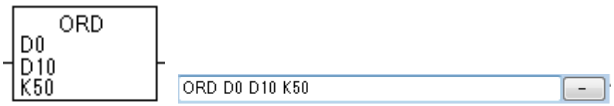
Agreemant1 and Agreement2 can be set at same register.

Example: Argument3 is K50, D0value and 0x50 logical conjunction value is input to D10.

ORD



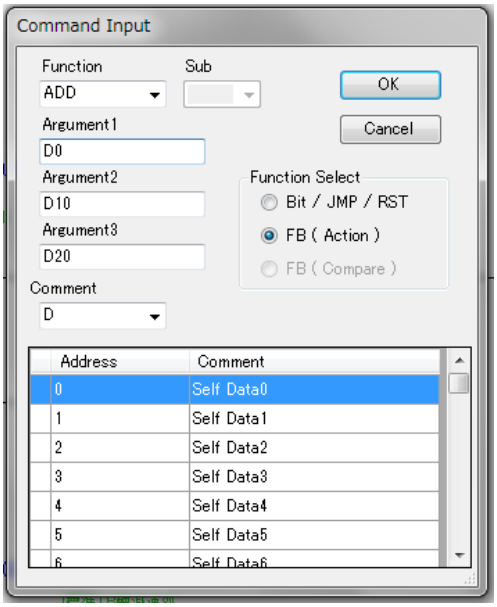
[Argument1]; Set a source of D register
[Argument2]; Forwarding address of D register
[Argument3]; Enter the fixed value operating OR with Argument1.



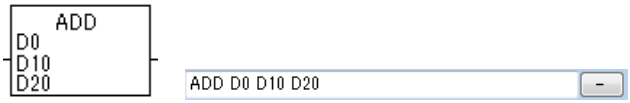
Argument1 and Argument2 can be set at same register.

Example: Argument3 is K50 , D0 value and 0x50 logical disjunction value is input to D10.

ADD

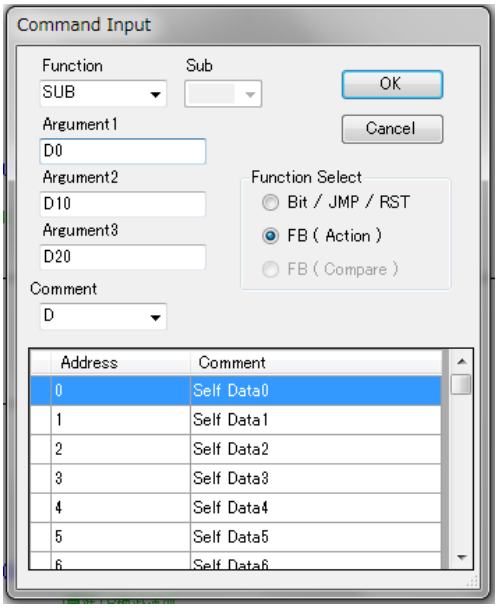


[Argument1]; Set (Select) D register of operand 1
[Argument2]; Set (Select) D register of operand 2
[Argument3]; Set forwarding address of calculated data
Additional value = operand 1 + operand 2

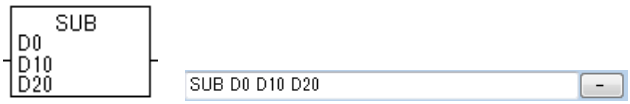


The fixed value (K=0 to 65536) can not be set at same time in Argument1 and Argument 2.
When a total additional value is 65535 or more, forwarding address of D register is set 65535 at Argument3.
Example: The value that added value of D0 and D10 is input to D20.

SUB

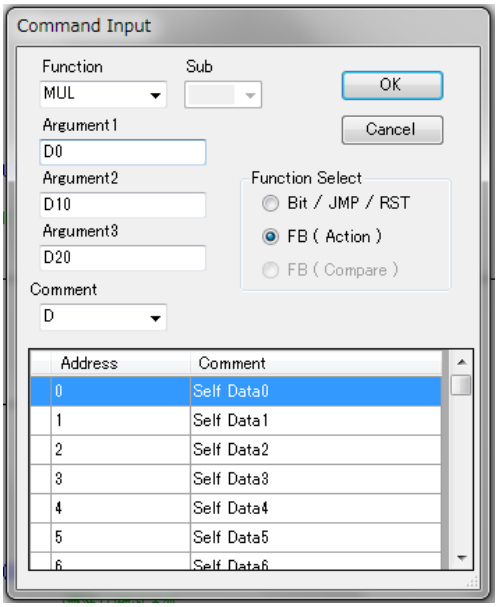


[Argument1]; Set (Select) D register of operand 1
[Argument2]; Set (Select) D register of operand 2
[Argument3]; Set forwarding address of calculated data
Subtraction value = operand 1 - operand 2

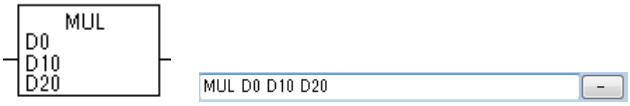


The fixed value (K=0 to 65535) can not be set at same time in Argument 1 and Argument 2.
When a total additional value is 65535 or more, forwarding address of D register is set 65535.
Example: The value that subtracted value of D0 and D10 is input to D20.

MUL



[Argument1]; Set (Select) D register of operand 1
[Argument2]; Set (Select) D register of operand 2
[Argument3]; Set forwarding address of calculated data
Multiplication value = operand 1 × calculated value2

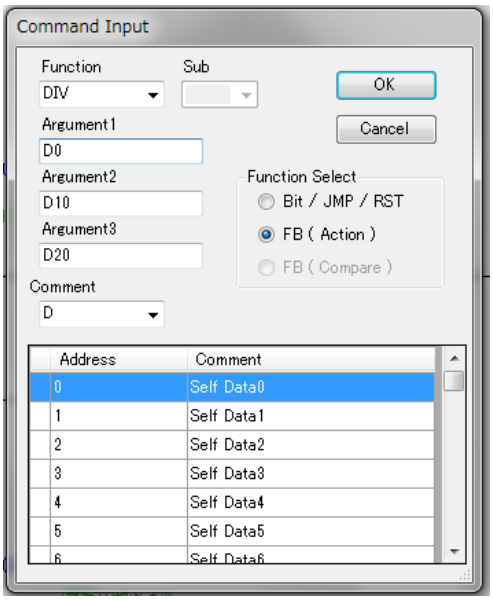


The fixed value (K=0 to 65535) can not be set at Argument 1 and Argument 2.

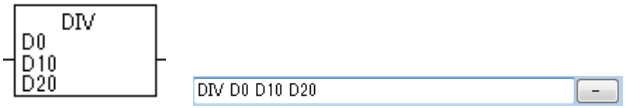
When value is over 65535, forwarding address of D register is 65535.

Example: The value that multiplied value of D0 and D10 is input to D20.

DIV



[Argument1]; Set (Select) D register of operand 1
[Argument2]; Set (Select) D register of operand 2
[Argument3]; Set forwarding address of calculated data
Division value = operand 1 ÷ calculated value2

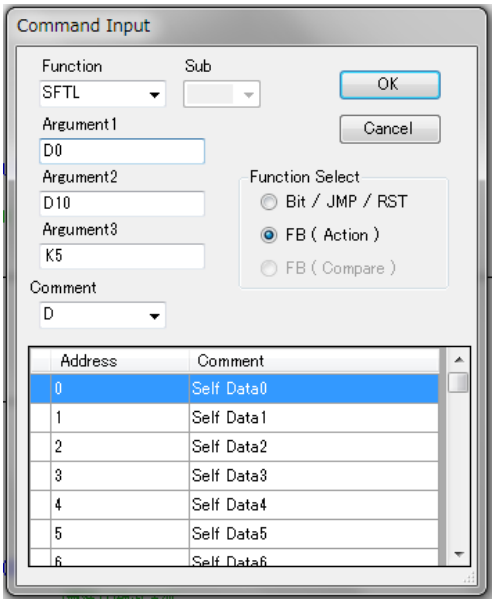


The fixed value (K=0 to 65535) can not be set in Argument 1 and Argument 2.

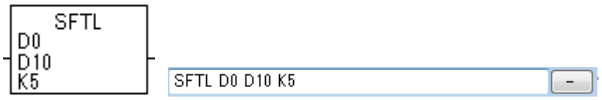
The surplus is forwarded to next data.

Example: The surplus value by divided D0 by D10 is input to D20.

SFTL



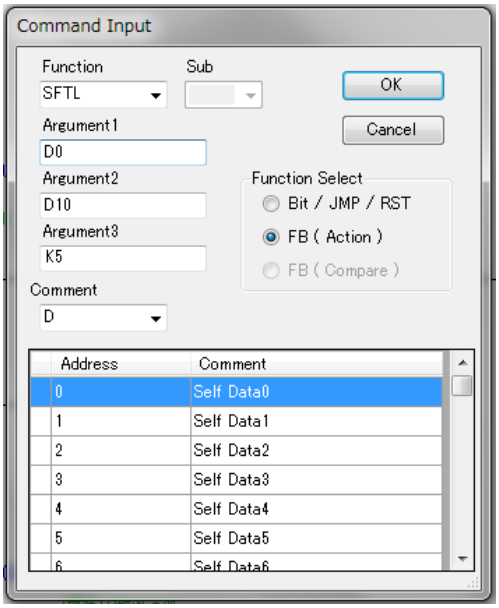
[Argument1]; Set a source of D register
[Argument2]; Forwarding address of D register
[Argument3]; Set a bit shifted a value of Argument1 to the left



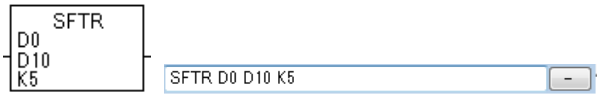
Arguement1 and Arguement2 can be set at same register.

Example: Argument3 is K=5, a value shifted D0 by 5 bit to the left is input to D10.

SFTR



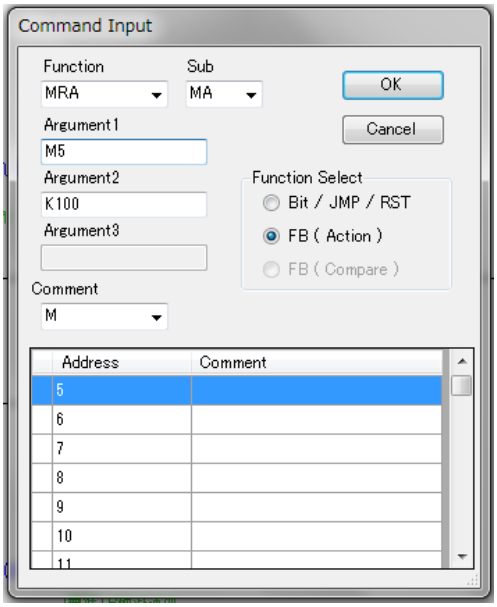
[Argument1]; Set source of D register
[Argument2]; Forwarding address of D register
[Argument3]; Set a bit shifted a value of Argument1 to the left



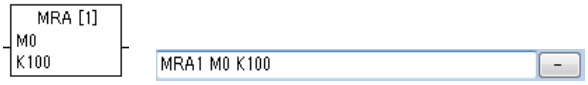
Argument1 and Argument2 can be set at same register.

Example: Argument3 is K=5, a value shifted D0 by 5 bit to the right is input to D10.

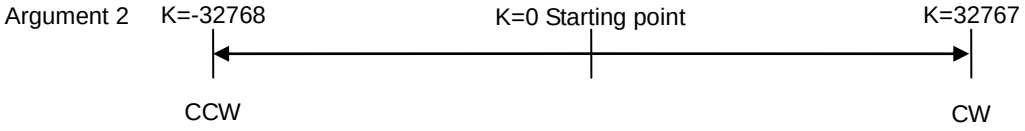
MRA: Motor Run Absolute



[Argument1]; Enter device
[Argument2]; Range of motor pulse K = -32768 to 32767
[Sub]; Select motor, MA (Motor A) or MB (Motor B)

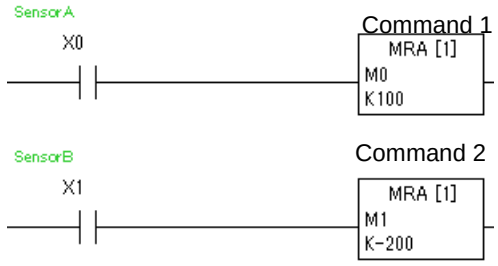


Motor is running unilt a motor pulse achive to value of Argument2. Then, entered devise is ON.
Default starting point is K=0 which is motor stopped position when power is ON.
When motor is running to CW direction, value of K is added. CCW direction is negative.
Range of K is –32768 to 32676 which is ±32.9m on PM486FE-60. (Dia.48.6mm;Gear 1/12.64)



- Starting point(Zero point) can be changed with RZP.
- LD, Y0 and Y1 contacts are active while MRA is active.
- OUT, Y1 and Y31 for direction commands is canceled while MRA is active.
- First location of pulse control commands(MRA, MRI and MRIC) on ladder program is high priority.
- First activated pulse control commands is priority.
- OUT, SET and RST commands are canceled when MRA, MRI or MRIC is active.

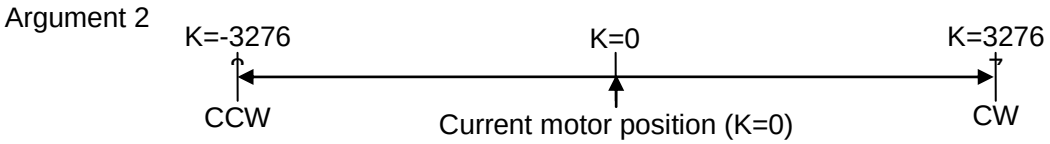
Example to use for MRA



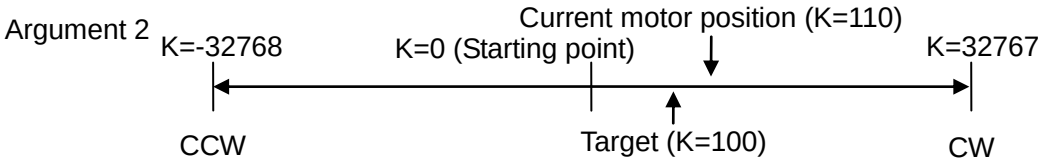
Command 1	Command 2
[Argument1]; M0	[Argument1]; M1
[Argument2]; K100	[Argument2]; K-200
[Sub command]; MA	[Sub command]; MA

1. Power ON

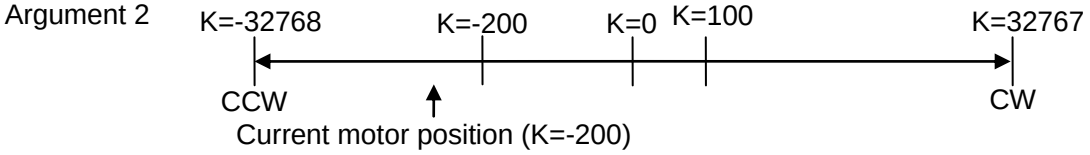
Current motor position becomes K=0.



2. Active MRA (Command 1)
During X0 is ON, command 1 is active which is motor run to CW direction until motor pulse becoms 100 pulses. When motor pulse becomes 100 pulses, motor is stopped. Then M0 is ON. However there is inertia when motor is stopped, therefore current motor position is longer than target value of K.



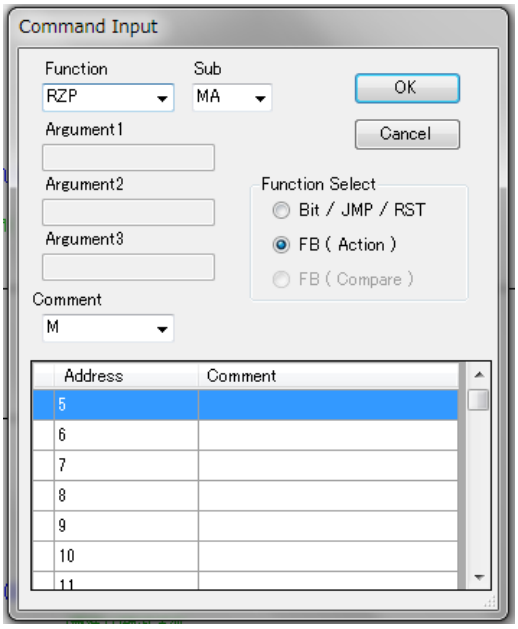
3. Active MRA (Command 2)
During X1 is ON (and X0 is OFF), command 2 is active which is motor run to CCW direction until motor pulse becoms -200 pulses from K=100.



If X0 becomes OFF at the current position of K=50 during motor run in above “Active MRA (Command 1)”, the motor stop command is activated.
When X0 becomes ON again, motor is running to CW direction until the current motor position reaches K=100.

Note;
When X0 and X1 becomes ON at same time, Command 1 described earlier in the ladder logic is activated.
When X0 becomes ON during X1 is ON, Command 2 excuted eariler continues to be activated.

RZP: Redefine Zero Point

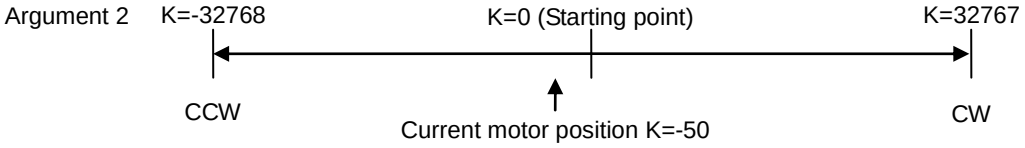


[Sub]; Specify motor (MA or MB) to redefine zero position.

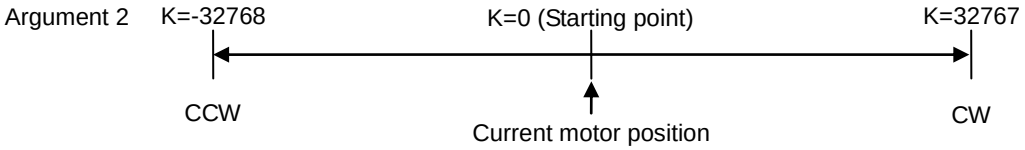
* When specify motor by Advance Mode, enter 1 for MA or enter 2 for MB

When status of RZP is changed from ON to OFF, current motor position become “Starting point” which is K=0.

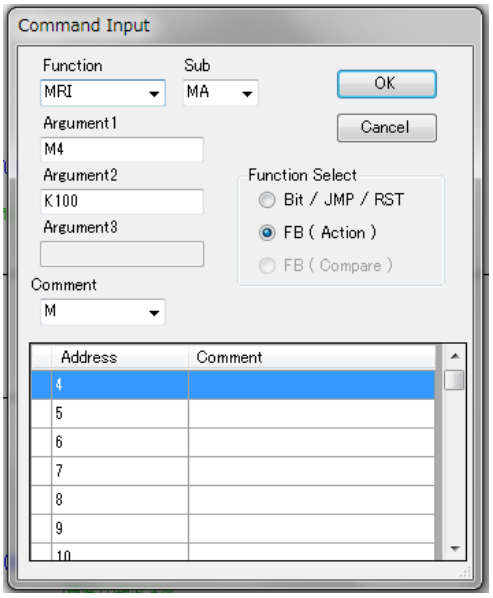
Before RZP is active.



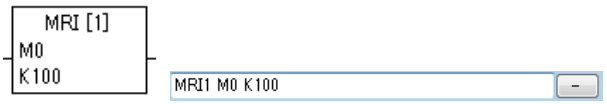
After RZP is active



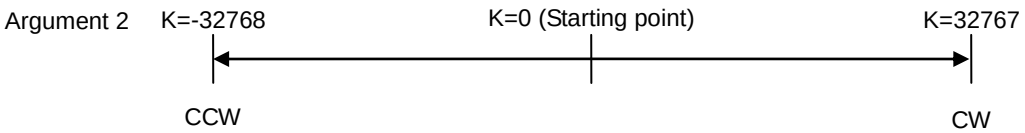
MRI: Motor Run Increment



[Argument1]; Select internal coil (M)
[Argument2]; Range of motor pulse K = -32768 to 32767
1 to 32767 for CW direction
-32768 to -1 for CCW direction
[Sub]; Select motor, MA or MB



Specify motor pulse by the difference of motor pulse. Motor is running unilt the motor pulse achive to value of Argument2. Then, contact of Argument 1 becomes ON.
Range of K is – 32768 to 32676 which is ±32.9m on PM486FE-60. (Dia.48.6mm;Gear 1/12.64)

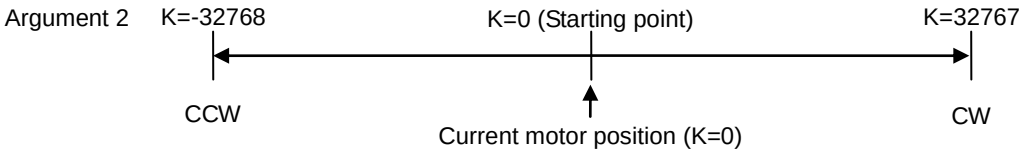


- LD, Y0 and Y30 contacts are active while motor is running by MRI.
- OUT, Y1 and Y30 for direction commands are canceled while MRI is active.
- First location of pulse control commands(MRA, MRI and MRIC) on ladder program is high priority.
- First activated pulse control commands is priority.
- OUT, SET and RST commands are canceled when MRA, MRI or MRIC is active.

Example to use for MRI

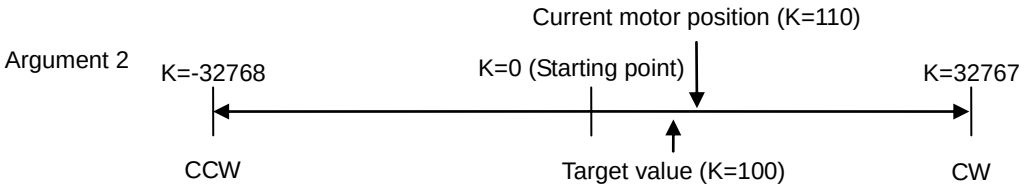
[Argument1]; M0
[Argument2]; K100
[Sub]; MA

1. When MRI is active by X0, starting point and current motor position becomes K=0.



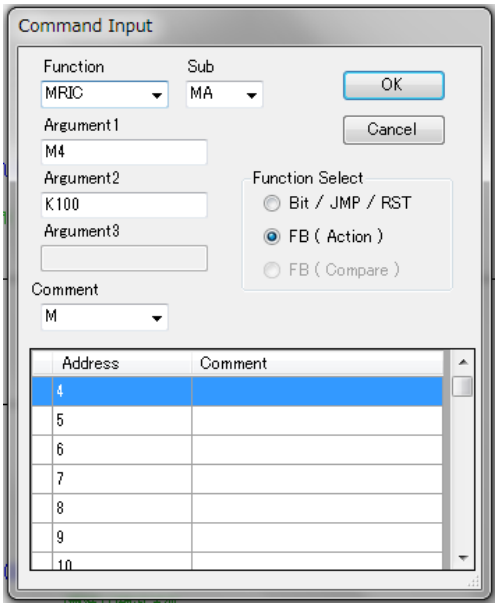
* Starting point can not be changed by RZP.

2. During X0 is ON, motor run to CW direction until motor pulse becoms 100 pulses. When motor pulse becomes 100 pulses, motor is stopped. Then M0 is ON. However there is inertia when motor is stopped, therfore current motor position is longer than target valuse of K.

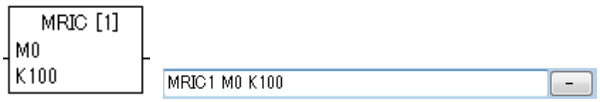


NOTE;
Consider additional motor pulses by inertia.
When MRI command is active 10 times as shown upper action, the command is changed 10 pulse each after motor is stopped.
In this case, the actual amount to run is total 1100 pulse.

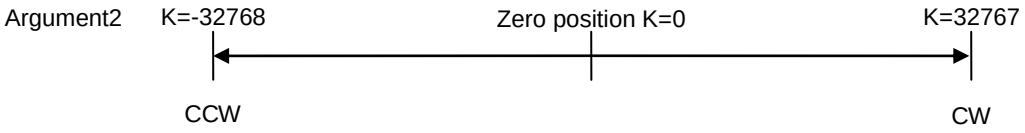
MRIC: Motor Run Increment Correct



[Argument1]; Select internal coil (M)
[Argument2]; Range of motor pulse K= -32768 to 32767
1 to 32767 for CW direction
-32768 to -1 for CCW direction
[Sub]; Select motor, MA or MB



Specify motor pulse by difference of motor pulse. Motor is achived to motor pulse specified, motor is stopped, then contact of Argument 1 becomes ON.
MRIC command also counts motor pulse during motor is stopped. The motor pulse counted is reflected when next active MRIC command.
Range of K is – 32768 to 32676 which is ±32.9m on PM486FE-60. (Dia.48.6mm;Gear 1/12.64)



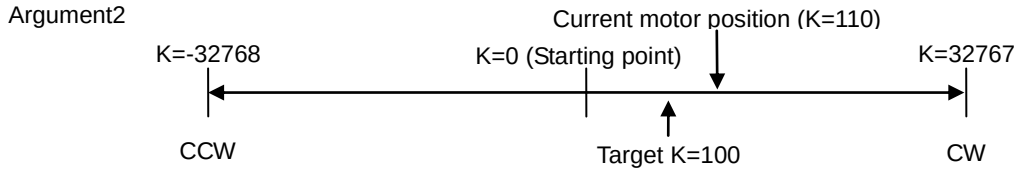
- Motor stop: Y0, Y1, MRA, MRI and MRIC is not active.
- LD, Y0 and Y30 contact is active while motor is running by MRIC.
- OUT Y30 or Y31 for direction commands is canceled while MRIC is active.
- First location of pulse control commands(MRA, MRI and MRIC) on ladder program is high priority.
- First actived pulse control commands is priority.
- OUT, SET and RST are canceled when MRA, MRI or MRIC is active.

Example to use for MRIC

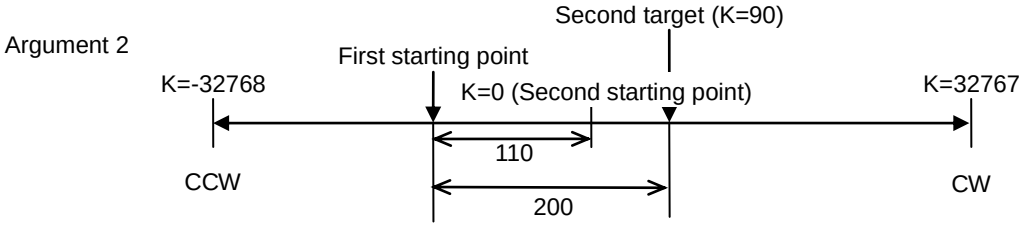
[Arguement1]; M0
[Arguement2]; K100
[Sub]; MA

1. Power ON
   Current motor position becomes K=0.
   * Starting point can not be changed by RZP.

2. During X0 is ON, command1 is active which is motor turns on to CW direction until motor pulse becoms 100 pulses. When motor pulse becomes 100 pulses, motor is stopped.
   Then M0 is ON. However there is inertia when motor is stopped, therefore current motor position is K=100 pulse inertia(K=10 for example) total K=110 for current motor position.



3. When X1 is ON(X0 is OFF), motor starts running to CW direction.
   Current motor position is K=110, therfore motor will run for 90pulses to CW direction to achive K=200.



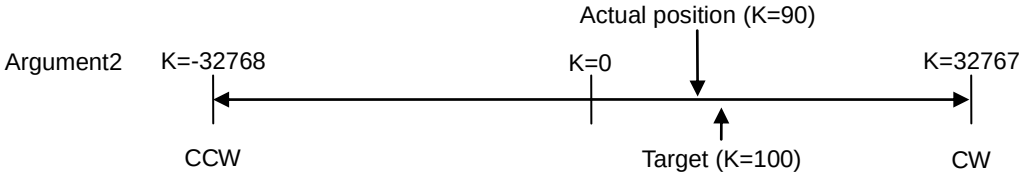
Motor stop distance by MRIC is more accurate.

Example to use for MRIC 2
(When a power acts in opposite carrying direction by incline etc.)

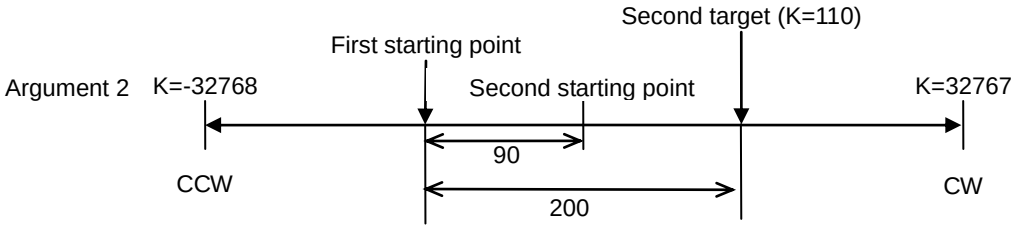
[Arguement1]; M0
[Arguement2]; K100
[Sub]; MA

1. Power ON
   Current motor position becomes K=0.

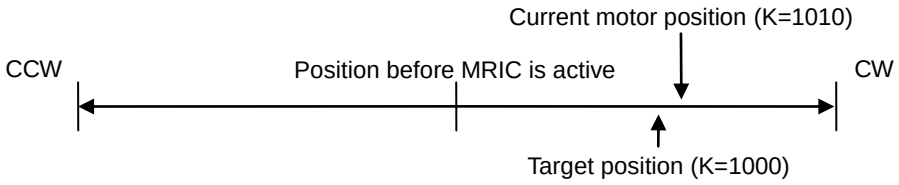
2. During X0 is ON, command1 is active which is motor turns on to CW direction until motor pulse becoms 100 pulses. When motor pulse becomes 100 pulses, motor is stopped.
   Then M0 is ON. However if there have -10 pulse change by power of opposite carrying direction after motor is stopped, current motor position is K=90.



3. When X1 is ON (X0 is OFF), motor starts running to CW direction.
   Current motor position is K=90, therefore motor will run for 110pulses to CW direction to achive K=200.

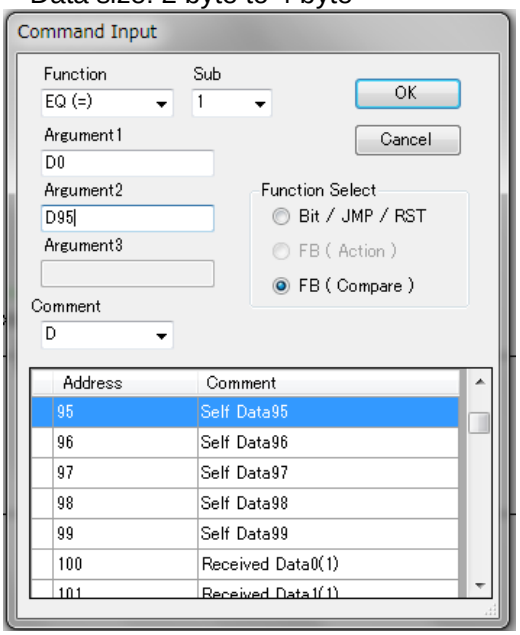


MRIC command is active several times,
If MRIC command is active 10 times and Argument2 is set as K=100, the command is changed 10 pulse each after motor is stopped. In this case, the actual amount to run is total 1010pulse. Therefore, the difference of running can be small even if MRIC command is active several times.

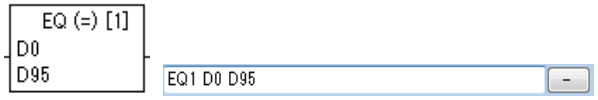


1.3 FB (Compare)

Compare 2 different data
Data size: 2 byte to 4 byte

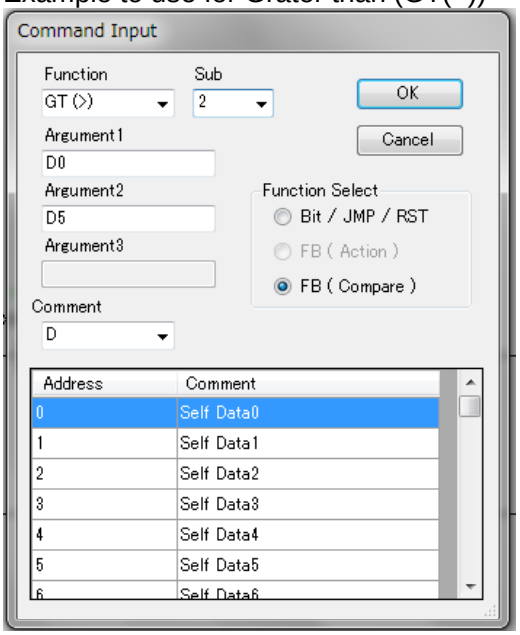


[Function]; Command
[Argument1]; Data 1
[Argument2]; Data 2
[Sub]; Data size
1=2[byte], 2=4[byte]



・Contact is active when the result, [Data 1], [Data2] and [Command], is true.

Example to use for Grater than (GT(<))



[Function]; GT(>)
[Argument1]; D0
[Argument2]; D5
[Sub]; 2

[D register]
D0 : 0x0502
D1 : 0x2512
D2 : 0xA351
D3 : 0xC001
D4 : 0xF125
D5 : 0x0021
D6 : 0x8500
D7 : 0x999A
D8 : 0x302D

1. Data1 D0 to D4 (4byte) [D0・D1] = [0x0502 2512]
2. Data2 D5 to D8 (4byte) [D5・D6] = [0x0021 8500]
3. Compare Data 1 and Data 2 = Data 1 > Data 2 = [0x05022512] > [0x218500]
   Data 2 is smaller than Data 1, result is true.

1.4 Command List

Format	Mnemonic	Description	Available device	Example	Note
⊣⊢	[LD]	Normally open contact	X, Y, M, D, C, T, PC, S	LD␣X0	-
⊣/⊢	[LDI]	Normally closed contact	X, Y, M, D, C, T, PC, S	LDI␣Y0	-
⊣↑⊢	[LDP]	Rising edge pulse	X, Y, M, C, T, PC, S	LDP␣X0	-
⊣↓⊢	[LDF]	Falling edge pulse	X, Y, M, C, T, PC, S	LDF␣Y0	-
⊣⊢⊣⊢	[AND]	Serial connection of normally open contact	X, Y, M, D, C, T, PC, S	AND␣X0	-
⊣⊢⊣/⊢	[ANDI]	Serial connection of normally closed contact	X, Y, M, D, C, T, PC, S	ANDI␣Y0	-
⊣⊢⊣↑⊢	[ANDP]	Serial connection of rising edge pulse contact	X, Y, M, C, T, PC, S	ANDP␣X0	-
⊣⊢⊣↓⊢	[ANDF]	Serial connection of falling edge pulse contact	X, Y, M, C, T, PC, S	ANDF␣Y0	-
└⊣⊢┘	[OR]	Parallel connection of normally open contact	X, Y, M, D, C, T, PC, S	OR␣X0	-
└⊣/⊢┘	[ORI]	Parallel connection of normally closed contact	X, Y, M, D, C, T, PC, S	ORI␣Y0	-
└⊣↑⊢┘	[ORP]	Parallel connection of rinsing edge pulse contact	X, Y, M, C, T, PC, S	ORP␣X0	-
└⊣↓⊢┘	[ANDI]	Serial connection of normally closed contact	X, Y, M, C, T, PC, S	ANDI␣Y0	-
—( )—	[OUT]	Coil device	Y, M, D	OUT␣Y0	D=0 to 99
—/—	[INV]	Invert operation result	-	INV	-
—↑—	[MEP]	Conversion of operation result to leading edge pulse	-	MEP	Up to 255 MEP commands
—[LBL]—	[LBL]	Label	-	LBL␣[P]	P=0 to 255
—(JMP)—	[JMP]	Jump to	-	JMP␣[P]	P=0 to 255
—(SET)—	[SET]	Set a bit device	Y, M	SET␣M0	-
—(RST)—	[RST]	Reset a bit device	Y, M, C, T, PC, D	RST␣M0	D=0 to 99
—(INC)—	[INC]	Increasement	D	INC␣[D]	D=0 to 99
—(DEC)—	[DEC]	Decreasement	D	DEC␣[D]	D=0 to 99

- No need to write [ ], and ␣ means a space.

FB (Action)

Format	Mnemonic	Description	Available device	Example	Note
CTU	[CTU]	UP Counter	C,D	CTU␣[C]␣[K] CTU␣[C]␣[D]	C=0 to 63 K=0 to 255 D=0 to 849
CTD	[CTD]	Down Counter	C, D	CTD␣[C]␣[K] CTD␣[C]␣[D]	C=0 to 63 K=0 to 255 D=0 to 849
PCT	[PCT]	Pulse counter	PC, D	PCT␣[PC]␣[K] PCT␣[PC]␣[D]	PC=0 to 31 K=0 to 65535 D=0 to 849
TON	[TON]	On delay timer	T, D	TON␣[T]␣[K] TON␣[T]␣[D]	T=0 to 63 K=0 to 65535 D=0 to 849
TOF	[TOF]	Off delay timer	T, D	TOF␣[T]␣[K] TOF␣[T]␣[D]	K=0 to 65535 D=0 to 849 T=0 to 63
TP	[TP]	Pulse timer	T, D	TP␣[T]␣[K] TP␣[T]␣[D]	K=0 to 65535 D=0 to 849 T=0 to 63
MOV	[MOV]	Move data to new storage area	D, SD, C, T,PC	MOV[Sub]␣[D1]␣[D2] MOV[Sub]␣[K]␣[D2] MOV[Sub]␣[SD]␣[D2] MOV[Sub]␣[C]␣[D2] MOV[Sub]␣[T]␣[D2] MOV[Sub]␣[PC]␣[D2]	Sub=1 to 2 D1=0 to 849 D2=0 to 99 K=0 to 65535 SD=0 to 99 C=0 to 63 T=0 to 63 PC=0 to 31
FMOV	[FMOV]	Move data to new storage area	D	FMOV␣[D1]␣[D2]␣[K1] FMOV␣[K2]␣[D2]␣[K1]	D1=0 to 849, D2=0 to 99 K1=1 to 100 K2=0 to 65535
ZRST	[ZRST]	Reset area of device	D, M	ZRST␣[D]␣[K1] ZRST␣[M]␣[K2]	D=0 to 99 K1=1 to 100 M=0 to 599 K2=1 to 599
MRA	[MRA]	Motor Run Absolute	M	MRA[Sub]␣[M]␣[K]	Sub=1(MA) or 2(MB) M=0 to 599 K=-32768 to 32767
RZP	[RZP]	Redefine Zero Point	M	RZP[Sub]	Sub=1(MA) or 2(MB)
MRI	[MRI]	Motor Run Increment	M	MRI[Sub]␣[M]␣[K]	Sib=1(MA) or 2(MB) M=0 to 599 K=-32768 to 32767
MRIC	[MRIC]	Motor Run Increment Correct	M	MRIC[Sub]␣[M]␣[K]	Sub=1(MA) or 2(MB) M=0 to 599 K=-32768 to 32767

- [ ] is not necessary to write, and ␣ means a space.
- K is a fixed value.
  (When input as decimal number, use K. When input hexademical number, use H before number.)

FB (Action)

Format	Mnemonic	Description	Available device	Example	Note
ANDD	[ANDD]	AND Day	D	ORD␣[D1]␣[D2]␣[K]	D1=0 to 849, D2=0 to 99 K=0 to 65535
ORD	[ORD]	OR Day	D	ANDD␣[D1]␣[D2]␣[K]	D1=0 to 849, D2=0 to 99 K=0 to 65535
ADD	[ADD]	Add	D	ADD␣[D1]␣[D2]␣[D3] ADD␣[K]␣[D2]␣[D3] ADD␣[D1]␣[K]␣[D3]	D1=0 to 849, D2=0 to 849 D3=0 to 99 K=0 to 65535
SUB	[SUB]	Subtraction	D	SUB␣[D1]␣[D2]␣[D3] SUB␣[K]␣[D2]␣[D3] SUB␣[D1]␣[K]␣[D3]	D1=0 to 849, D2=0 to 849 D3=0 to 99 K=0 to 65535
MUL	[MUL]	Multiplication	D	MUL␣[D1]␣[D2]␣[D3] MUL␣[K]␣[D2]␣[D3] MUL␣[D1]␣[K]␣[D3]	D1=0 to 849, D2=0 to 849 D3=0 to 99 K=0 to 65535
DIV	[DIV]	Division	D	DIV␣[D1]␣[D2]␣[D3] DIV␣[K]␣[D2]␣[D3] DIV␣[D1]␣[K]␣[D3]	D1=0 to 849, D2=0 to 849 D3=0 to 99 K=0 to 65535
SFTL	[SFTL]	Sift Left	D	SFTL␣[D1]␣[D2]␣[K]	D1=0 to 849, D2=0 to 849 K=0 to 65535
SFTR	[SFTR]	Sift Right	D	SFTR␣[D1]␣[D2]␣[K]	D1=0 to 849, D2=0 to 99 K=0 to 15

FB (Compare)

Format	Mnemonic	Description	Available device	Example	Note
	[EQ(=)]	Equal to	D, SD, T, PC	EQ[Sub]␣[D]␣[D] EQ[Sub]␣[K]␣[D] EQ[Sub]␣[D]␣[K] *EQ is possible to switch [=]	Sub=1 to 2 K=0 to 65535 D=0 to 849 T=0 to 63 PC=0 to 31
	[GT(>)]	Greater than	D, SD, T, PC	GT[Sub]␣[D]␣[D] GT[Sub]␣[K]␣[D] GT[Sub]␣[D]␣[K] *GT is possible to switch [>]	Sub=1 to 2 K=0 to 65535 D=0 to 849 T=0 to 63 PC=0 to 31
	[GE(>=)]	Greater than or Equal to	D, SD, T, PC	GE[Sub]␣[D]␣[D] GE[Sub]␣[K]␣[D] GE[Sub]␣[D]␣[K] *GE is possible to switch [>=]	Sub=1 to 2 K=0 to 65535 D=0 to 849 T=0 to 63 PC=0 to 31
	[LT(<)]	Less than	D, SD, T, PC	LT[Sub]␣[D]␣[D] LT[Sub]␣[K]␣[D] LT[Sub]␣[D]␣[K] *LT is possible to switc [<]	Sub=1 to 2 K=0 to 65535 D=0 to 849 T=0 to 63 PC=0 to 31
	[LE(<=)]	Less than or Equal to	D, SD, T, PC	LE[Sub]␣[D]␣[D] LE[Sub]␣[K]␣[D] LE[Sub]␣[D]␣[K] *LE is possible to switch [<=]	Sub=1 to 2 K=0 to 65535 D=0 to 849 T=0 to 63 PC=0 to 31
	[NE(≠)]	Not Equal to	D, SD, T, PC	NE[Sub]␣[D]␣[D] NE[Sub]␣[K]␣[D] NE[Sub]␣[D]␣[K] *NE is possible to switch [!=]	Sub=1 to 2 K=0 to 65535 D=0 to 849 T=0 to 63 PC=0 to 31

- No need to write [ ], and ␣ means a space.
- K is a fixed value.
  (If input as decimal number, use K. If input hexademical number, use H before number)

2 Command List

2.1 X Contact

Address	Description	Point	Note
X0	Sensor A	1	Self Node (Self IP address)
X1	Sensor B	1	
X2 to X4	Reserved	3	
X5	Sensor Alarm A	1	
X6	Sensor Alarm B	1	
X7 to X9	Reserved	3	
X10	RemoteIN 1	1	
X11	RemoteIN 2	1	
X12	RemoteIN 3	1	
X13 to X15	Reserved	3	
X16	Error A(H/W)	1	
X17	Error A(S/W)	1	
X18	Error B(H/W)	1	
X19	Error B(S/W)	1	
X20 to 99	Reserved	80	
X100	Sensor A(1)	1	Other Node Information1 (Other IP address)
X101	Sensor B(1)	1	
X102 to X104	Reserved	3	
X105	Sensor Alarm A(1)	1	
X106	Sensor Alarm B(1)	1	
X107 to X109	Reserved (1)	3	
X110	RemoteIN 1(1)	1	
X111	RemoteIN 2(1)	1	
X112	RemoteIN 3(1)	1	
X113 to X115	Reserved (1)	3	
X116	Error A(H/W) (1)	1	
X117	Error A(S/W) (1)	1	
X118	Error B(H/W) (1)	1	
X119	Error B(S/W) (1)	1	
X120	Motor A RUN (1)	1	
X121	Motor A Direction (1)	1	
X122	Motor Speed2 (1)	1	
X123	Motor A Speed3 (1)	1	
X124	Motor A Speed4 (1)	1	
X125	Motor A Acceleration invalid (1)	1	
X126	Motor A Deceleration invalid (1)	1	
X127	Motor A Jam Error(1)	1	
X128	Motor A Software Error1 (1)	1	
X129	Motor A Sofrware Error2 (1)	1	
X130	Completed Initial RUN Motor A(1)	1	
X131	Delivering permmision Motor A(1)	1	
X132	Carried in Motor A(1)	1	
X133	Carried out requirement Motor A(1)	1	
X134	Carried out Motor A(1)	1	

Address	Description	Point	Note
X135	User Flug A-1(1)	1	Other Node Information 1
X136	User Flug A-2(1)	1	
X137	User Flug A-3(1)	1	
X138	User Flug A-4(1)	1	
X139	User Flug A-5(1)	1	
X140	User Flug A-6(1)	1	
X141	User FlugA-7(1)	1	
X142	User Flug A-8(1)	1	
X143	User Flug A-9(1)	1	
X144	User Flug A-10(1)	1	
X145	User Flug A-11(1)	1	
X146	User Flug A-12(1)	1	
X147	Motor A Port U(1)	1	
X148	Motor A Port V(1)	1	
X149	Reserved（1）	1	
X150	Motor B RUN(1)	1	
X151	Motor B Direction (1)	1	
X152	Motor B Speed2 (1)	1	
X153	Motor B Speed3 (1)	1	
X154	Motor B Speed4 (1)	1	
X155	Motor B Acceleration invalid (1)	1	
X156	Motor B Deceleration invalid (1)	1	
X157	Motor B Jam Error (1)	1	
X158	Motor B Software Error1 (1)	1	
X159	Motor B Software Error2 (1)	1	
X160	Completed Initial RUN Motor B (1)	1	
X161	Delivering permmision Motor B (1)	1	
X162	Carried in Motor B (1)	1	
X163	Carried out requirement Motor B (1)	1	
X164	Carried out Motor B (1)	1	
X165	User Flug B-1 (1)	1	
X166	User Flug B-2 (1)	1	
X167	User Flug B-3 (1)	1	
X168	User Flug B-4 (1)	1	
X169	User Flug B-5 (1)	1	
X170	User Flug B-6 (1)	1	
X171	User Flug B-7 (1)	1	
X172	User Flug B-8 (1)	1	
X173	User Flug B-9 (1)	1	
X174	User Flug B-10 (1)	1	
X175	User Flug -11 (1)	1	
X176	User Flug B-12 (1)	1	
X177	Motor B Port U (1)	1	
X178	Motor B Port V (1)	1	
X179	Reserved （1）	1	

Address	Description	Point	Note
X180	RemoteOUT 1(1)	1	Other Node Information 1
X181	RemoteOUT 2(1)	1	
X182	RemoteOUT 3(1)	1	
X183	RemoteOUT 4(1)	1	
X184	RemoteOUT 5(1)	1	
X185 to X189	Reserved (1)	5	
X190	User Flug 1(1)	1	
X191	User Flug 2(1)	1	
X192	User Flug 3(1)	1	
X193	User Flug 4(1)	1	
X194	User Flug 5(1)	1	
X195	User Flug 6(1)	1	
X196	User Flug 7(1)	1	
X197	User Flug 8(1)	1	
X198	User Flug 9(1)	1	
X199	Stop output (1)	1	
X200 to X299	Other Node Information 2	100	Other Node Information 2
X300 to X399	Other Node Information 3	100	Other Node Information 3
X400 to X499	Other Node Information 4	100	Other Node Information 4
X500 to X599	Other Node Information 5	100	Other Node Information 5
X600 to X699	Other Node Information 6	100	Other Node Information 6
X700 to X799	Other Node Information 7	100	Other Node Information 7

・Other Node Information 2 to 7 is the same as 1.

2.2 Y Contact

Address	Description	Point	Note
Y0	Motor A RUN	1	Self Node
Y1	Motor A Direction	1	
Y2	Motor A Speed 2	1	
Y3	Motor A Speed 3	1	
Y4	Motor A Speed 4	1	
Y5	Motor A Acceleration invalid	1	
Y6	Motor A Deceleration invalid	1	
Y7	Motor A JAM Error	1	
Y8	Motor A Software Error 1	1	
Y9	Motor A Software Error 2	1	
Y10	Completed Initial RUN Motor A	1	
Y11	Delivering permmision Motor A	1	
Y12	Carried in Motor A	1	
Y13	Carried out requirement Motor A	1	
Y14	Carried out Motor A	1	
Y15	User Flug A-1	1	
Y16	User Flug A-2	1	
Y17	User Flug A-3	1	
Y18	User Flug A-4	1	
Y19	User Flug A-5	1	
Y20	User Flug A-6	1	
Y21	User Flug A-7	1	
Y22	User Flug A-8	1	
Y23	User Flug A-9	1	
Y24	User Flug A-10	1	
Y25	User Flug A-11	1	
Y26	User Flug A-12	1	
Y27	Motor A Port U	1	
Y28	Motor A Port V	1	
Y29	Reserved	1	
Y30	Motor B RUN	1	
Y31	Motor B Direction	1	
Y32	Motor B Speed 2	1	
Y33	Motor B Speed 3	1	
Y34	Motor B Speed 4	1	
Y35	Motor B Acceleration invalid	1	
Y36	Motor B Deceleration invalid	1	
Y37	Motor B JAM Error	1	
Y38	Motor B Software Error 1	1	
Y39	Motor B Software Error 2	1	
Y40	Completed Initial RUN Motor B	1	
Y41	Delivering permmision Motor B	1	
Y42	Carried in Motor B	1	
Y43	Carried out requirement Motor B	1	
Y44	Carried out Motor B	1	

Address	Description	Point	Note
Y45	User Flug B-1	1	Self Node
Y46	User Flug B-2	1	
Y47	User Flug B-3	1	
Y48	User Flug B-4	1	
Y49	User Flug B-5	1	
Y50	User Flug B-6	1	
Y51	User Flug B-7	1	
Y52	User Flug B-8	1	
Y53	User Flug B-9	1	
Y54	User Flug B-10	1	
Y55	User Flug B-11	1	
Y56	User Flug B-12	1	
Y57	Motor B Port U	1	
Y58	Motor B Port V	1	
Y59	Reserved	1	
Y60	RemoteOUT 1	1	
Y61	RemoteOUT 2	1	
Y62	RemoteOUT 3	1	
Y63	RemoteOUT 4	1	
Y64	RemoteOUT 5	1	
Y65 to Y69	Reserved	5	
Y70	User Flug 1	1	
Y71	User Flug 2	1	
Y72	User Flug 3	1	
Y73	User Flug 4	1	
Y74	User Flug 5	1	
Y75	User Flug 6	1	
Y76	User Flug 7	1	
Y77	User Flug 8	1	
Y78	User Flug 9	1	
Y79	Stop output	1	
Y80 to Y99	Reserved	20	

Address	Description	Point	Note
Y100	Motor A RUN (1)	1	Other Node 1
Y101	Motor A Direction (1)	1	
Y102	Motor A Speed 2(1)	1	
Y103	Motor A Speed 3(1)	1	
Y104	Motor A Speed 4(1)	1	
Y105	Motor A Acceleration invalid (1)	1	
Y106	Motor A Deceleration invalid (1)	1	
Y107	Motor A JAM Error (1)	1	
Y108	Motor A Software Error 1(1)	1	
Y109	Motor A Software Error 2(1)	1	
Y110	Motor A Port U(1)	1	
Y111	Motor A Port V(1)	1	
Y112	Reserved（1）	1	
Y113 to Y119	Reserved (1)	7	
Y120	Motor B RUN(1)	1	
Y121	Motor B Direction(1)	1	
Y122	Motor B Speed 2(1)	1	
Y123	Motor B Speed 3(1)	1	
Y124	Motor B Speed 4(1)	1	
Y125	Motor B Acceleration invalid (1)	1	
Y126	Motor B Deceleration invalid (1)	1	
Y127	Motor B JAM Error (1)	1	
Y128	Motor B Software Error 1(1)	1	
Y129	Motor B Software Error 2(1)	1	
Y130	Motor B Port U(1)	1	
Y131	Motor B Port V(1)	1	
Y132	Reserved（1）	1	
Y133 to Y139	Reserved (1)	7	
Y140	RemoteOUT 1(1)	1	
Y141	RemoteOUT 2(1)	1	
Y142	RemoteOUT 3(1)	1	
Y143	RemoteOUT 4(1)	1	
Y144	RemoteOUT 5(1)	1	
Y145 to Y199	Reserved (1)	55	
Y200 to Y299	Other Node 2	100	Other Node 2
Y300 to Y399	Other Node 3	100	Other Node 3
Y400 to Y499	Other Node 4	100	Other Node 4
Y500 to Y599	Other Node 5	100	Other Node 5
Y600 to Y699	Other Node 6	100	Other Node 6
Y700 to Y799	Other Node 7	100	Other Node 7

- Other Node 2 to 7 are the same as Other Node 1.
- Other Node 1 to 7 are used at Master/Slave setting.
- Motor speed setting Y2 to Y4 and Y32 to Y34 is Motor Speed 2.
  There is no setting to be a Motor Speed1.
- Controller output, MotorRUN, Motor Port and RemoteOUT, are all stop.
  Stop output is also the controller connected Slave.

2.3 D Register

Address	Description	Point	Note
D0 to D99	Self Date0	100	Self Node
D100 to D199	Receive date 0(1)	100	Other Node 1
D200 to D299	Receive date 0(2)	100	Other Node 2
D300 to D399	Receive date 0(3)	100	Other Node 3
D400 to D499	Receive date 0(4)	100	Other Node 4
D500 to D599	Receive date 0(5)	100	Other Node 5
D600 to D699	Receive date 0(6)	100	Other Node 6
D700 to D799	Receive date 0(7)	100	Other Node 7
D800 to D849	Receive date 0(PLC) to 49(PLC)	50	PLC

- Data size of D register is 2 byte.
- Value of Receive Data (D100 to...etc) can not be used on Ladder Logic.
- Value of Self Data(D0 to D31) is kept even if power is OFF.

2.4 S Contact

Address	Description	Point	Note
S0 to S6	Connect Status (1) to (7)	7	Self Node
S7	EtherNet/IP Status	1	
S8	Error Host Clear A	1	
S9	Error Host Clear B	1	
S10	Always ON	1	
S11	Always OFF	1	
S12 to S63	Reserved	2	

- S contact information can not be sent to the other IB-E.
- S0 to S6 become OFF when fail to communicate with IB set received Node.
- S7 turns ON when connect I/O connection.
- S08 and S09 becomes one shot ON when error reset command was received.
- S10 is always ON during power is ON.
- S11 is always OFF during power is ON.

2.5 Other Contant

Address	Description	Point	Note
M0 to M599	Internal device	600	Self Node

Address	Description	Point	Note
T0 to T63	10msec timer	64	Self Node

Address	Description	Point	Note
C0 to C63	Counter	64	Self Node

Address	Description	Point	Note
PC0 to PC7	Pulse counter A_0 to 7	8	Self Node
PC8 to PC11	Pulse counter A_8(CW) to 11(CW)	4	
PC12 to PC15	Pulse counter A_12(CCW) to 12(CCW)	4	
PC16 to PC23	Pulse counter B_0 to 7	8	
PC24 to PC27	Pulse counter B_8(CW) to 11(CW)	4	
PC28 to PC31	Pulse counter B_12(CCW) to 12(CCW)	4	

Address	Description	Point	Note
SD0	Node ID	1	Self Node
SD1	Voltage value (MA)	1	
SD2	Voltage value (MB)	1	
SD3	Current value (MA)	1	
SD4 to SD10	Current value (MA)(1) to (7)	7	Other Node
SD11	Current value (MB)	1	Self Node
SD12 to SD18	Current value (MB)(1) to (7)	7	Other Node
SD19	Reserved	1	Self Node
SD20 to SD27	Barcode date 1 to 8	8	
SD28 to SD99	Reserved	72	

- M contact information can not be sent to the other IB controller.
- Contact for TON, TOF and TD is C.
- Contact for CTU and CTD is C.
- PC0 to PC15 count A motor pulse, and PC16 to PC31 counts B motor pulse.
- 12 count per turning
- SD is for reading only.
- SD is used EQ, GT, GE, LT, LE, NE and MOV.
- Node ID of SD0 is assigned a node number of self controller.
- SD1 and SD2 are input the each current value of motor A and motor B.
  The standard current value is 0.1A/Step with 0A
  (Example) 1.5A=15, 3.0A=30