Oriental motor

HP-5065-6

Network Converter Slave Edition

Applicable product: BLV Series

Thank you for purchasing an Oriental Motor product.
This Operating Manual describes product handling procedures and safety precautions.

- Please read it thoroughly to ensure safe operation.
- Always keep the manual where it is readily available.

Table of Contents

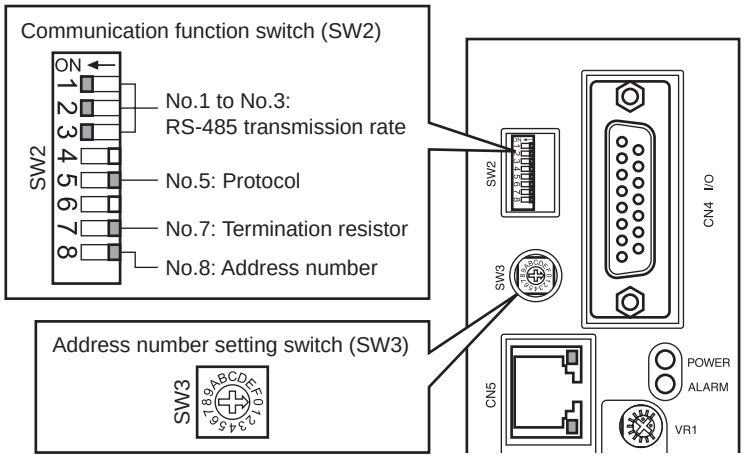
1 Setting and connection for BLV Series

This chapter explains the setting of switches and the connections for when the **BLV** Series (hereinafter referred to as **BLV**) is used in combination with the network converter **NETC01-CC**, **NETC01-M2**, or **NETC01-M3**.

1.1 Setting of switches for BLV

When the **BLV** is used with the network converter, set the switches of the **BLV** driver in advance.

Note
- Be sure to turn off the power of the **BLV** before setting the switches. Setting the switches while the power is supplied will not cause the setting to be effective.
- Do not set the No.4 and No.6 of the communication function switch (SW2) to ON.



■ Protocol

Set the No.5 of the communication function switch (SW2) to OFF.
Factory setting OFF

■ Address number (slave address)

Set the address number (slave address) using the address number setting switch (SW3) and No.8 of the communication function switch (SW2) concurrently.
Set the address number (slave address) so as not to duplicate among drivers.
Factory setting SW3: 0, SW2-No.8: OFF (address number 0)

SW3	SW2-No.8	Address number (slave address)
0	OFF	0
1		1
2		2
3		3
4		4
5		5
6		6
7		7
8		8
9		9
A		10
B		11
C		12
D		13
E		14
F		15

SW3	SW2-No.8	Address number (slave address)
0	ON	16
1		17
2		18
3		19
4		20
5		21
6		22
7		23
8		24
9		25
A		26
B		27
C		28
D		29
E		30
F		31

■ Transmission rate

Set all the No.1 to No.3 of the communication function switch (SW2) to ON to set the transmission rate to 625 kbps.
Factory setting All OFF

■ Termination resistor

Set a termination resistor to the **BLV** driver located the farthest away (positioned at the end) from the network converter. Set the No.7 of communication function switch (SW2) to ON, and set the termination resistor for RS-485 communication (120 Ω).
Factory setting OFF (termination resistor disabled)

SW2-No.7	Termination resistor (120 Ω)
OFF	Disabled
ON	Enabled

1.2 Connection between BLV and control power supply

Although all functions including the communication function can be used with the main power supply, connecting the control power supply to the **BLV** driver allows to communicate with the master device without turning on the main power supply. Using the communication function only, the operation data and parameters can be set, and also the alarm history can be checked.

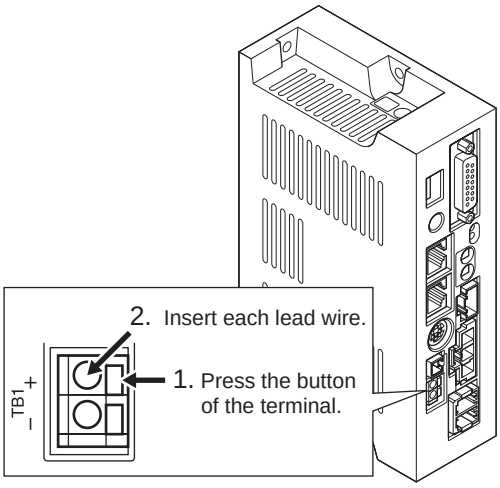
Note If an operation signal is input when the driver was connected to the control power supply without connecting the main power supply, the undervoltage alarm is generated but the communication operation can still be performed.

■ Specifications of control power supply

Model	Input power supply voltage	Current capacity
BLV510	24 VDC± 10%	300 mA or more
BLV620		
BLV640	48 VDC± 10%	

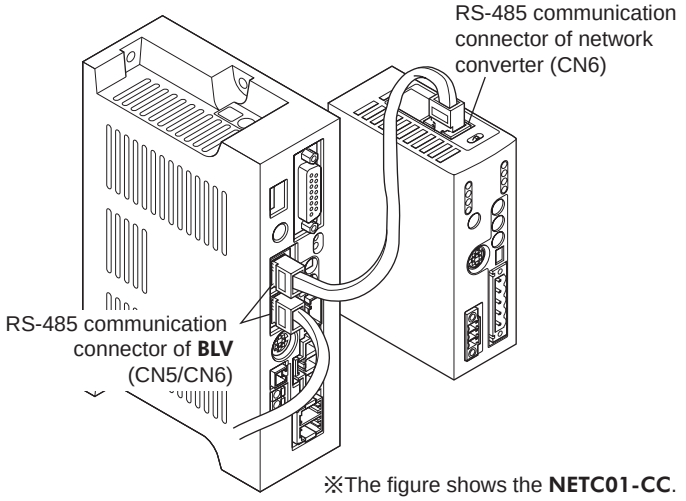
■ Applicable lead wire

- Length of the lead wire which can be peeled: 11 mm (0.43 in.)
- Applicable lead wire: AWG24 to 16 (0.2 to 1.25 mm^2)



1.3 Connection between network converter and BLV

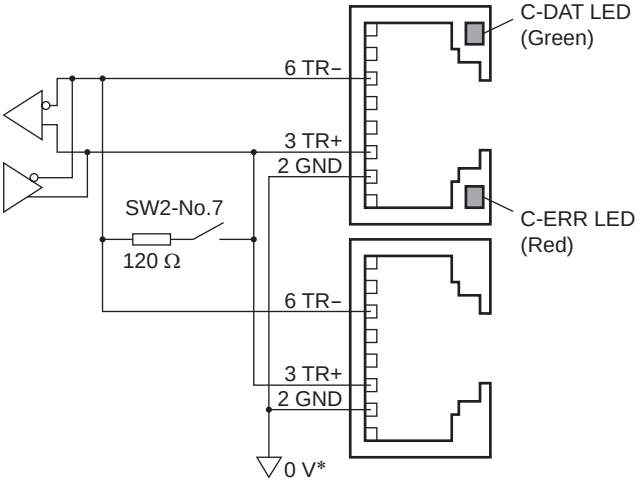
Using an accessory (sold separately) or commercially available LAN cable (straight cable), connect the CN6 of the network converter and the CN5 (or CN6) of the **BLV** driver.
The vacant connector of the **BLV** driver can be used to connect a different driver. Connect among the drivers using the accessory (sold separately) or commercially available LAN cable (straight cable).



※The figure shows the **NETC01-CC**.

Connector of **BLV** (CN5/CN6)

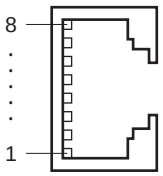
• Internal circuit



∗ The GND line is used in common with main power supply input terminal (CN1) and control power supply input terminal (TB1) [not insulated].

• CN5/CN6 connector pin assignments

Pin No.	Signal name	Description
1	N.C.	Not used
2	GND	GND
3	TR+	RS-485 communication signal (+)
4	N.C.	Not used
5	N.C.	Not used
6	TR−	RS-485 communication signal (−)
7	N.C.	Not used
8	N.C.	Not used



• LED

Name	Description
C-DAT LED (Green)	This LED is lit when the driver is communicating with the master station properly via RS-485 communication.
C-ERR LED (Red)	This LED is lit when a RS-485 communication error occurs with the master station.

2 Using via CC-Link communication

Read this chapter when the **BLV** Series (hereinafter referred to as **BLV**) is used in combination with the **NETC01-CC** via CC-Link communication.

2.1 Guidance

If you are new to these products, read this section to understand the operating methods along with the operation flow.

Note
- Before operation, check the conditions of the surrounding area to ensure safety.
- Refer to the network converter **NETC01-CC** USER MANUAL for how to set the parameter.

STEP 1 Set the transmission rate, station address and address number.

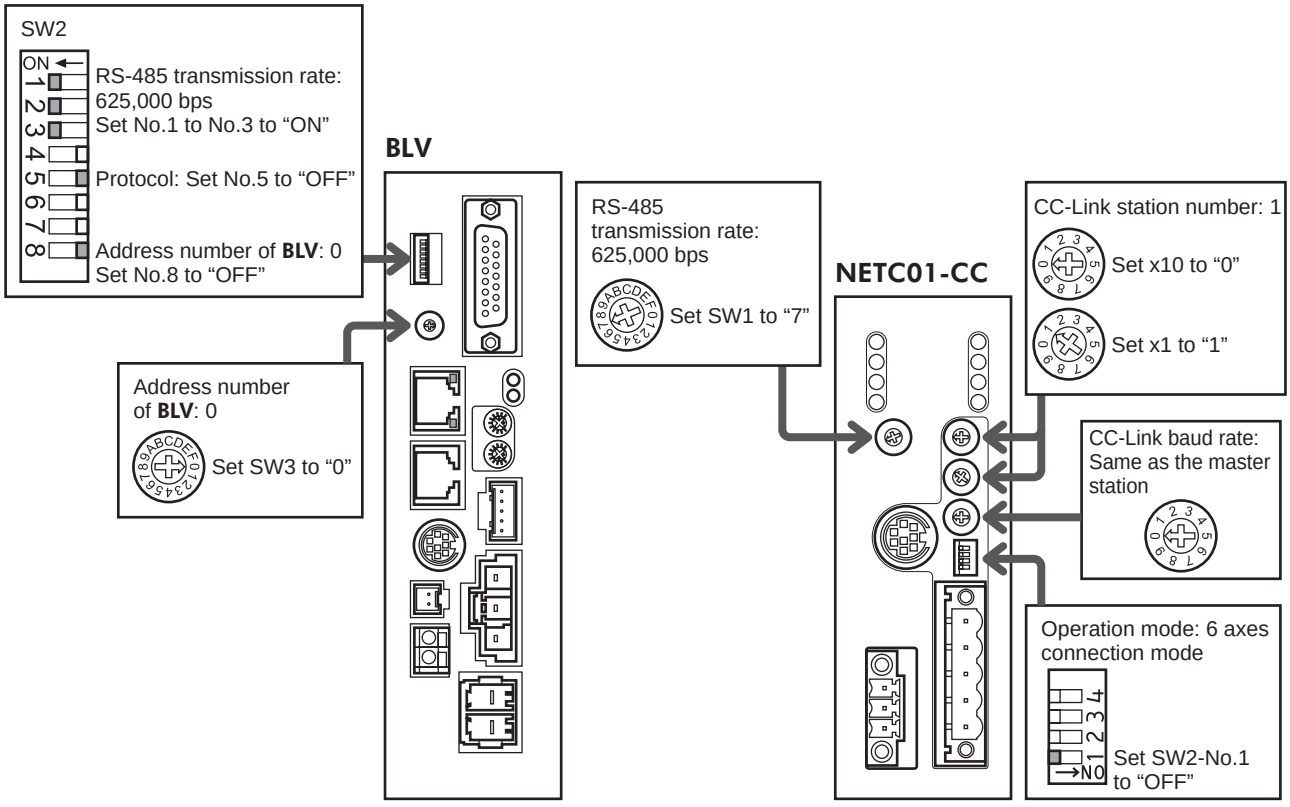
■ Using the switches

Setting conditions of **BLV**

- Address number of **BLV**: 0
- RS-485 transmission rate: 625,000 bps
- Protocol: SW2-No.5: OFF

Setting conditions of **NETC01-CC**

- CC-Link station number: 1
- RS-485 transmission rate: 625,000 bps
- CC-Link baud rate: Same as the master station
- Operation mode: 6 axes connection mode

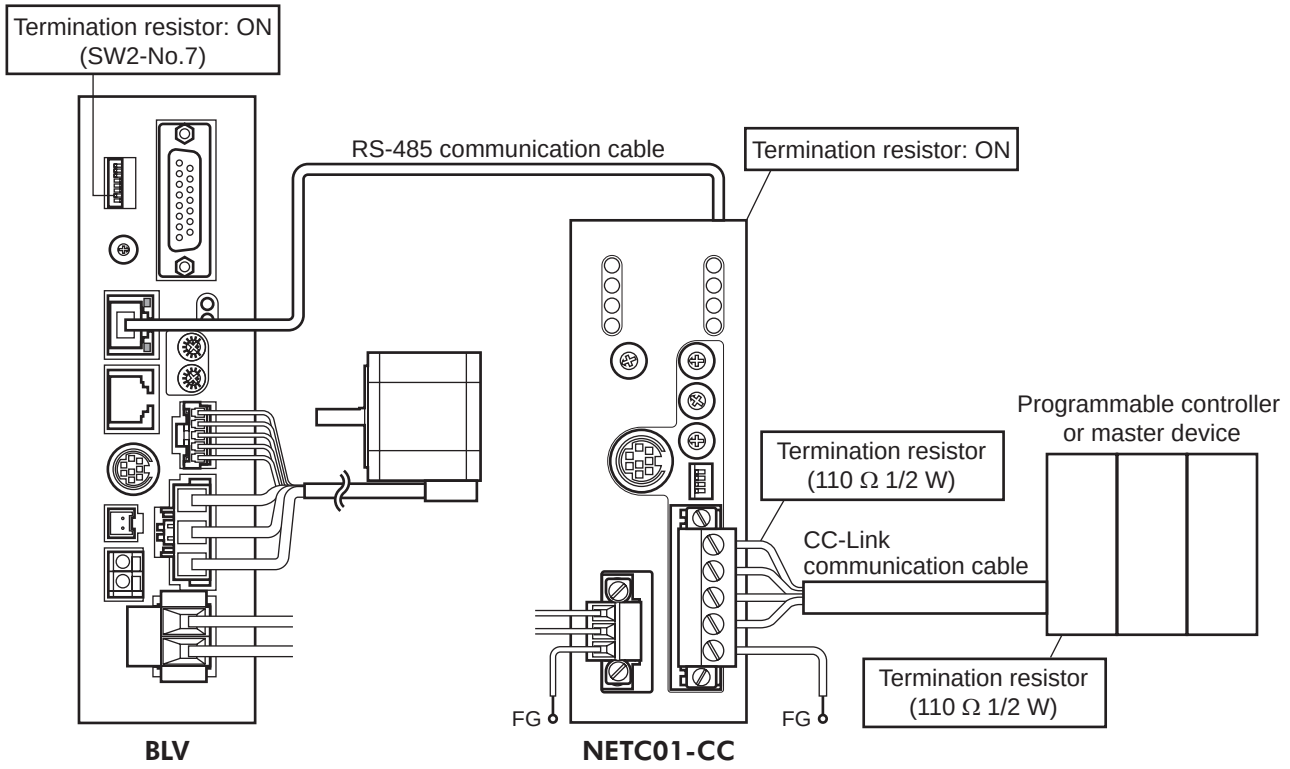


■ Using the parameter

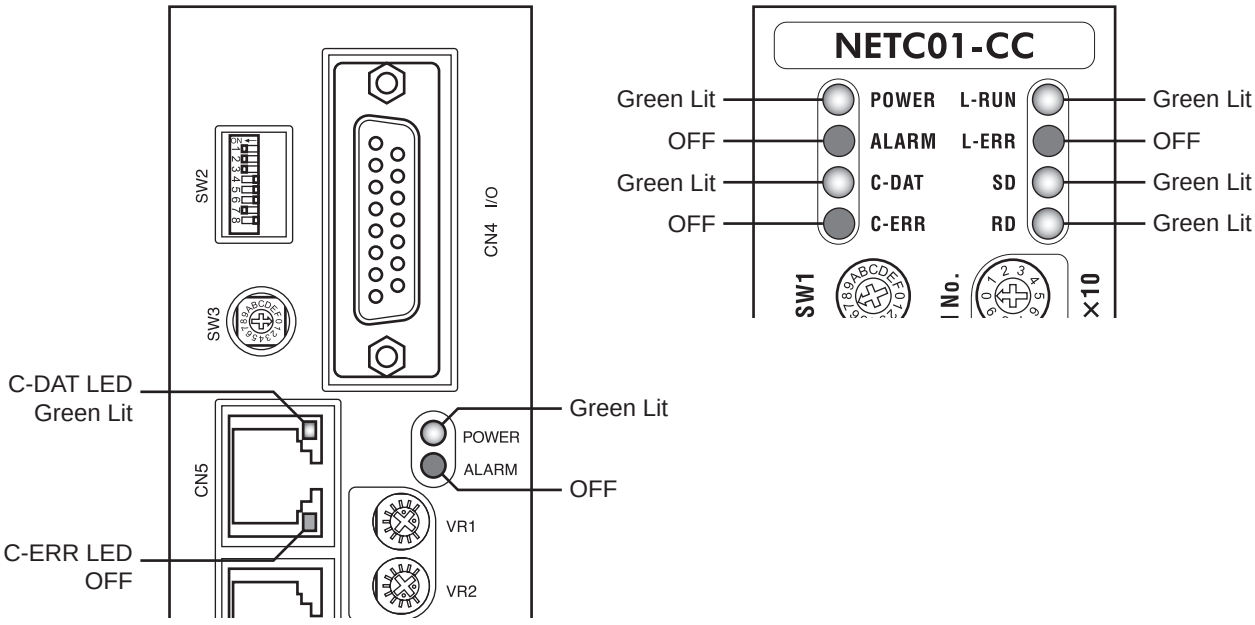
1. Set the "connection (address number 0) (1D80h)" parameter of the **NETC01-CC** to "1: Enable."
2. Execute the "batch NV memory write (3E85h)" command of the **NETC01-CC**.
3. Cycle the **NETC01-CC** power.

Note The “connection” parameters will be enabled after the power is cycled.

STEP 2 Check the connection and the termination resistor.



STEP 3 Turn on the power and check the setting



When C-ERR (red) of the **BLV** or **NETC01-CC** is lit: Check the transmission rate or address number of RS-485 communication.
When L-ERR (red) of the **NETC01-CC** is lit: Check the type of the CC-Link communication error.

STEP 4 Execute an operation via remote I/O of CC-Link communication.

1. Set the operating speed using the internal potentiometer of the **BLV** driver.
2. Turn the NET-IN3 (FWD) of the address number 0 for remote I/O of CC-Link communication ON to execute an operation.

RY (Master to **NETC01-CC**)		
Device No.	Signal name	Initial value
RY0	NET-IN0	M0
RY1	NET-IN1	M1
RY2	NET-IN2	M2
RY3	NET-IN3	FWD (START/STOP)*
RY4	NET-IN4	REV (RUN/BRAKE)*
RY5	NET-IN5	STOP-MODE (FWD/REV)*
RY6	NET-IN6	Not used
RY7	NET-IN7	

RY (Master to **NETC01-CC**)		
Device No.	Signal name	Initial value
RY8	NET-IN8	Not used
RY9	NET-IN9	
RYA	NET-IN10	
RYB	NET-IN11	
RYC	NET-IN12	
RYD	NET-IN13	
RYE	NET-IN14	
RYF	NET-IN15	

* The parentheses ( ) will be applied when selecting "3-wire input mode" with the "operation input mode selection" parameter.

STEP 5 Were you able to operate the motor properly?

How did it go? Were you able to operate the motor properly?
If the motor does not function, check the following points:

- Is any alarm present in the **BLV** or **NETC01-CC**?
- Are the address number, transmission rate and termination resistor set correctly?
- Is the "connection" parameter of the **NETC01-CC** set correctly?
- Is the C-ERR LED lit? (RS-485 communication error)
- Is the L-ERR LED lit? (CC-Link communication error)
- Are the parameters of the **BLV** set correctly?

For more detailed settings and functions, refer to the next page and later as well as the **NETC01-CC** USER MANUAL.

2.2 Remote register list

Remote register is common to 6-axes connection mode and 12-axes connection mode.
Monitor, read and write of parameters, and maintenance command for the **BLV** or **NETC01-CC** are executed using remote register.
n is an address assigned to the master station by the CC-Link station number setting.

RWw (Master to **NETC01-CC**)		RWr (**NETC01-CC** to Master)	
Address No.	Description	Address No.	Description
RWwn0	Command code of monitor 0	RWrn0	Data of monitor 0 (lower 16 bit)
RWwn1	Address number of monitor 0	RWrn1	Data of monitor 0 (upper 16 bit)
RWwn2	Command code of monitor 1	RWrn2	Data of monitor 1 (lower 16 bit)
RWwn3	Address number of monitor 1	RWrn3	Data of monitor 1 (upper 16 bit)
RWwn4	Command code of monitor 2	RWrn4	Data of monitor 2 (lower 16 bit)
RWwn5	Address number of monitor 2	RWrn5	Data of monitor 2 (upper 16 bit)
RWwn6	Command code of monitor 3	RWrn6	Data of monitor 3 (lower 16 bit)
RWwn7	Address number of monitor 3	RWrn7	Data of monitor 3 (upper 16 bit)
RWwn8	Command code of monitor 4	RWrn8	Data of monitor 4 (lower 16 bit)
RWwn9	Address number of monitor 4	RWrn9	Data of monitor 4 (upper 16 bit)
RWwnA	Command code of monitor 5	RWrnA	Data of monitor 5 (lower 16 bit)
RWwnB	Address number of monitor 5	RWrnB	Data of monitor 5 (upper 16 bit)
RWwnC	Command code	RWrnC	Command code response
RWwnD	Address number	RWrnD	Address number response
RWwnE	Data (lower)	RWrnE	Data (lower)
RWwnF	Data (upper)	RWrnF	Data (upper)

2.3 Assignment for remote I/O

Remote I/O assignments of the **BLV** are as follows.
n is an address assigned to the master station by the CC-Link station number setting.
Refer to the network converter **NETC01-CC** USER MANUAL for 6 axes connection mode and 12 axes connection mode.

■ 6 axes connection mode

Command RY（Master to **NETC01-CC**）		Response RX（**NETC01-CC** to Master）	
Device No.	Description	Device No.	Description
RYn7 to RYn0	Address number "0" remote I/O input	RXn7 to RXn0	Address number "0" remote I/O output
RYnF to RYn8		RXnF to RXn8	
RY (n+1) 7 to RY (n+1) 0	Address number "1" remote I/O input	RX (n+1) 7 to RX (n+1) 0	Address number "1" remote I/O output
RY (n+1) F to RY (n+1) 8		RX (n+1) F to RX (n+1) 8	
RY (n+2) 7 to RY (n+2) 0	Address number "2" remote I/O input	RX (n+2) 7 to RX (n+2) 0	Address number "2" remote I/O output
RY (n+2) F to RY (n+2) 8		RX (n+2) F to RX (n+2) 8	
RY (n+3) 7 to RY (n+3) 0	Address number "3" remote I/O input	RX (n+3) 7 to RX (n+3) 0	Address number "3" remote I/O output
RY (n+3) F to RY (n+3) 8		RX (n+3) F to RX (n+3) 8	
RY (n+4) 7 to RY (n+4) 0	Address number "4" remote I/O input	RX (n+4) 7 to RX (n+4) 0	Address number "4" remote I/O output
RY (n+4) F to RY (n+4) 8		RX (n+4) F to RX (n+4) 8	
RY (n+5) 7 to RY (n+5) 0	Address number "5" remote I/O input	RX (n+5) 7 to RX (n+5) 0	Address number "5" remote I/O output
RY (n+5) F to RY (n+5) 8		RX (n+5) F to RX (n+5) 8	
RY (n+6) 7 to RY (n+6) 0	Control input of **NETC01-CC**∗	RX (n+6) 7 to RX (n+6) 0	Status output of **NETC01-CC**∗
RY (n+6) F to RY (n+6) 8		RX (n+6) F to RX (n+6) 8	
RY (n+7) 7 to RY (n+7) 0	Control input of system area∗	RX (n+7) 7 to RX (n+7) 0	Status output of system area∗
RY (n+7) F to RY (n+7) 8		RX (n+7) F to RX (n+7) 8	

∗ Refer to the network converter **NETC01-CC** USER MANUAL for details.

■ 12 axes connection mode

Command RY（Master to **NETC01-CC**）		Response RX（**NETC01-CC** to Master）	
Device No.	Description	Device No.	Description
RYn7 to RYn0	Address number "0" remote I/O input	RXn7 to RXn0	Address number "0" remote I/O output
RYnF to RYn8	Address number "1" remote I/O input	RXnF to RXn8	Address number "1" remote I/O output
RY (n+1) 7 to RY (n+1) 0	Address number "2" remote I/O input	RX (n+1) 7 to RX (n+1) 0	Address number "2" remote I/O output
RY (n+1) F to RY (n+1) 8	Address number "3" remote I/O input	RX (n+1) F to RX (n+1) 8	Address number "3" remote I/O output
RY (n+2) 7 to RY (n+2) 0	Address number "4" remote I/O input	RX (n+2) 7 to RX (n+2) 0	Address number "4" remote I/O output
RY (n+2) F to RY (n+2) 8	Address number "5" remote I/O input	RX (n+2) F to RX (n+2) 8	Address number "5" remote I/O output
RY (n+3) 7 to RY (n+3) 0	Address number "6" remote I/O input	RX (n+3) 7 to RX (n+3) 0	Address number "6" remote I/O output
RY (n+3) F to RY (n+3) 8	Address number "7" remote I/O input	RX (n+3) F to RX (n+3) 8	Address number "7" remote I/O output
RY (n+4) 7 to RY (n+4) 0	Address number "8" remote I/O input	RX (n+4) 7 to RX (n+4) 0	Address number "8" remote I/O output
RY (n+4) F to RY (n+4) 8	Address number "9" remote I/O input	RX (n+4) F to RX (n+4) 8	Address number "9" remote I/O output
RY (n+5) 7 to RY (n+5) 0	Address number "10" remote I/O input	RX (n+5) 7 to RX (n+5) 0	Address number "10" remote I/O output
RY (n+5) F to RY (n+5) 8	Address number "11" remote I/O input	RX (n+5) F to RX (n+5) 8	Address number "11" remote I/O output
RY (n+6) 7 to RY (n+6) 0	Control input of **NETC01-CC**∗	RX (n+6) 7 to RX (n+6) 0	Status output of **NETC01-CC**∗
RY (n+6) F to RY (n+6) 8		RX (n+6) F to RX (n+6) 8	
RY (n+7) 7 to RY (n+7) 0	Control input of system area∗	RX (n+7) 7 to RX (n+7) 0	Status output of system area∗
RY (n+7) F to RY (n+7) 8		RX (n+7) F to RX (n+7) 8	

∗ Refer to the network converter **NETC01-CC** USER MANUAL for details.

■ Remote I/O input

( ): Initial value

- 6 axes connection mode

Device No.	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
RYn7 to RYn0	NET-IN7 (MB-FREE)	NET-IN6 (Not used)	NET-IN5 (STOP-MODE)∗	NET-IN4 (REV)∗	NET-IN3 (FWD)∗	NET-IN2 (M2)	NET-IN1 (M1)	NET-IN0 (M0)
RYnF to RYn8	NET-IN15 (Not used)	NET-IN14 (Not used)	NET-IN13 (Not used)	NET-IN12 (Not used)	NET-IN11 (Not used)	NET-IN10 (Not used)	NET-IN9 (Not used)	NET-IN8 (Not used)

∗ When the "3-wire input mode" is set with the "operation input mode selection" parameter, the following signals are applied.
FWD to START/STOP, REV to RUN/BRAKE, STOP-MODE to FWD/REV

- 12 axes connection mode

Device No.	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
RYn7 to RYn0	NET-IN7 (MB-FREE)	NET-IN6 (Not used)	NET-IN5 (STOP-MODE)∗	NET-IN4 (REV)∗	NET-IN3 (FWD)∗	NET-IN2 (M2)	NET-IN1 (M1)	NET-IN0 (M0)

∗ When the "3-wire input mode" is set with the "operation input mode selection" parameter, the following signals are applied.
FWD to START/STOP, REV to RUN/BRAKE, STOP-MODE to FWD/REV

■ Remote I/O output

( ): Initial value

- 6 axes connection mode

Device No.	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
RXn7 to RXn0	NET-OUT7 (ALARM-OUT1)	NET-OUT6 (WNG)	NET-OUT5 (STOP-MODE_R)∗	NET-OUT4 (REV_R)∗	NET-OUT3 (FWD_R)∗	NET-OUT2 (M2_R)	NET-OUT1 (M1_R)	NET-OUT0 (M0_R)
RXnF to RXn8	NET-OUT15 (TLC)	NET-OUT14 (VA)	NET-OUT13 (MOVE)	NET-OUT12 (ALARM-OUT2)	NET-OUT11 (Not used)	NET-OUT10 (Not used)	NET-OUT9 (Not used)	NET-OUT8 (S-BSY)

∗ When the "3-wire input mode" is set with the "operation input mode selection" parameter, the following signals are applied.
FWD_R to START/STOP_R, REV_R to RUN/BRAKE_R, STOP-MODE_R to FWD/REV_R

- 12 axes connection mode

Device No.	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
RXn7 to RXn0	NET-OUT7 (ALARM-OUT1)	NET-OUT6 (WNG)	NET-OUT5 (STOP-MODE_R)∗	NET-OUT4 (REV_R)∗	NET-OUT3 (FWD_R)∗	NET-OUT2 (M2_R)	NET-OUT1 (M1_R)	NET-OUT0 (M0_R)

∗ When the "3-wire input mode" is set with the "operation input mode selection" parameter, the following signals are applied.
FWD_R to START/STOP_R, REV_R to RUN/BRAKE_R, STOP-MODE_R to FWD/REV_R

3 Using via MECHATROLINK communications

Read this chapter when the **BLV** Series (hereinafter referred to as **BLV**) is used in combination with the **NETC01-M2** or **NETC01-M3** (hereinafter referred to as **NETC01-M2/M3**) via MECHATROLINK communications.

3.1 Guidance

If you are new to these products, read this section to understand the operating methods along with the operation flow.

Note
- Before operating the motor, check the condition of the surrounding area to ensure safety.
- Refer to the network converter **NETC01-M2/NETC01-M3** USER MANUAL for how to set the parameter.

STEP 1 Set the transmission rate, station address and address number.

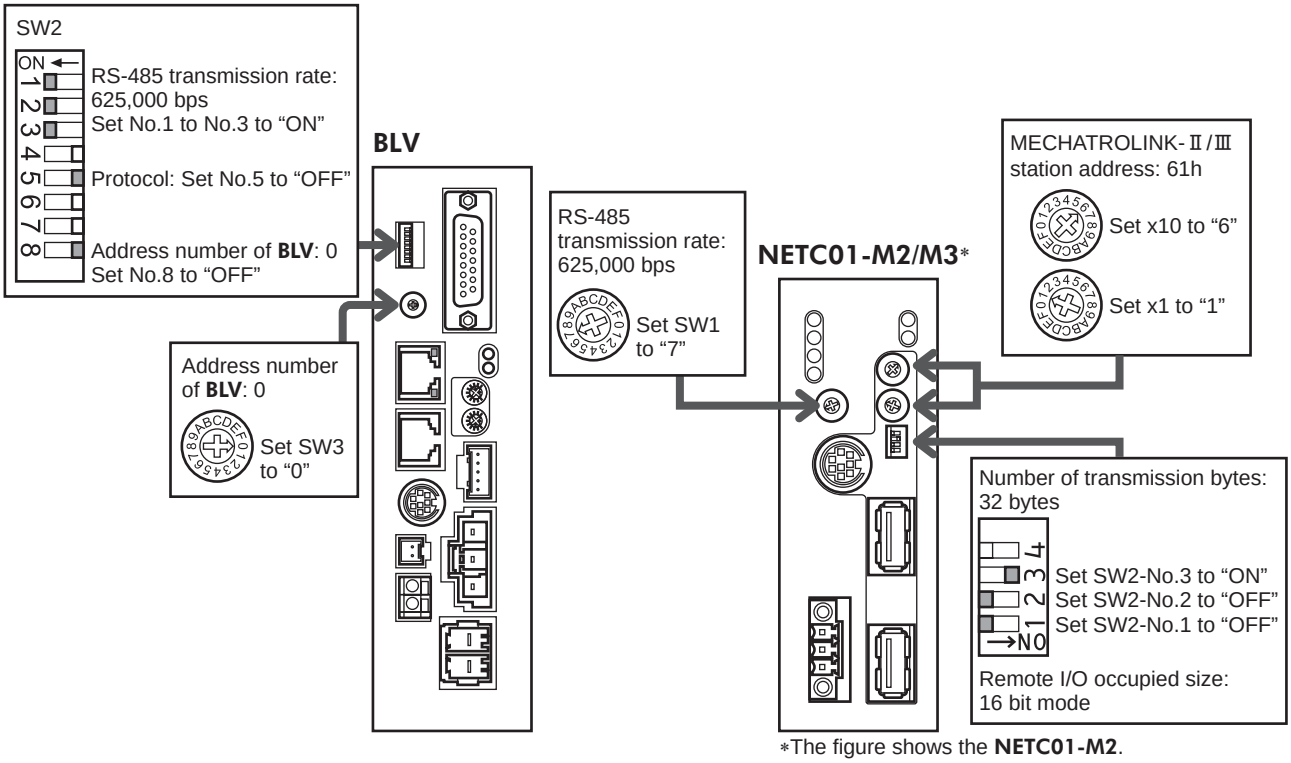
■ Using the switches

Setting conditions of **BLV**

- Address number of **BLV**: 0
- RS-485 transmission rate: 625,000 bps
- Protocol: SW2-No.5: OFF

Setting conditions of **NETC01-M2/M3**

- MECHATROLINK-Ⅱ/Ⅲ station address: 61h
- RS-485 transmission rate: 625,000 bps
- Remote I/O occupied size: 16 bit mode
- Number of transmission bytes: 32 bytes



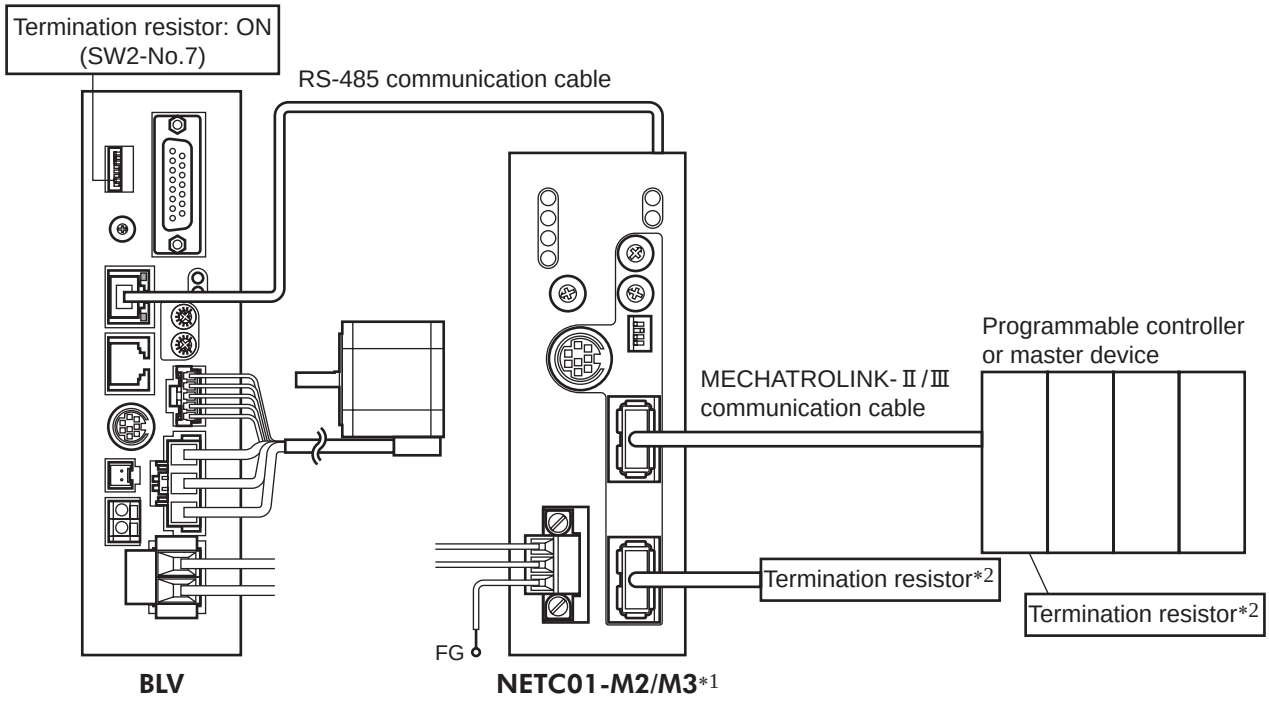
*The figure shows the **NETC01-M2**.

■ Using the parameter

1. Set the "communication (address number 0)" parameter of the **NETC01-M2/M3** to "1: Enable."
2. Cycle the **NETC01-M2/M3** power.

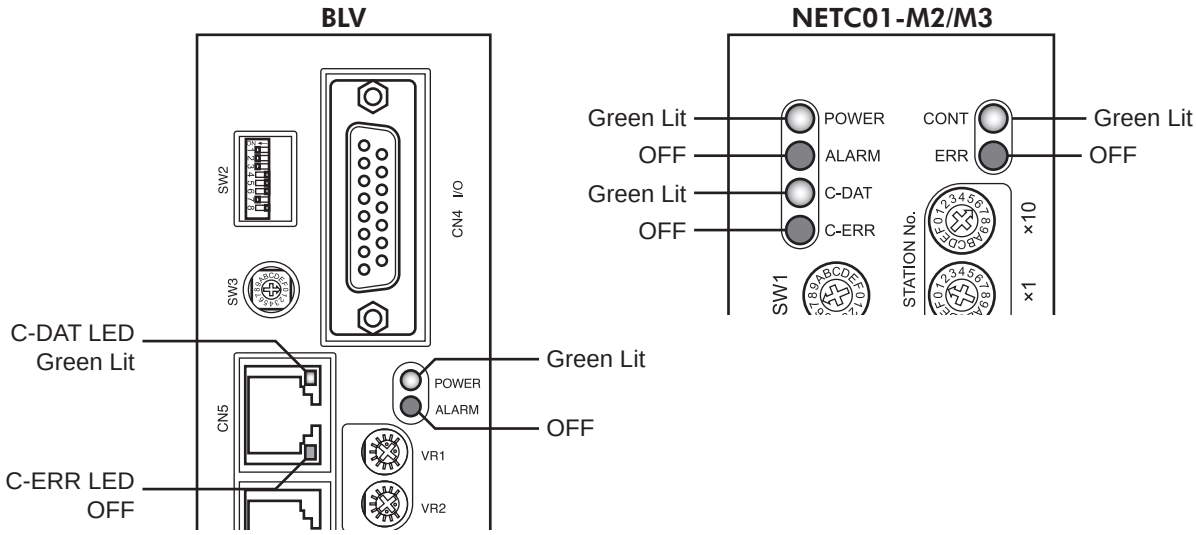
Note
- The "communication" parameters will be enabled after the power is cycled.
- When setting the parameters of the **NETC01-M2/M3**, use the **OPX-2A** or **MEXE02**.

STEP 2 Check the connection and the termination resistor.



*1 The figure shows the **NETC01-M2**.
*2 No termination resistor is required for the **NETC01-M3**.

STEP 3 Turn on the power and check the setting



When C-ERR (red) of the **BLV** driver or **NETC01-M2/M3** is lit: Check the transmission rate or address number of RS-485 communication.
When ERR (red) of the **NETC01-M2/M3** is lit: Check the type of the MECHATROLINK-Ⅱ /Ⅲ communication error.

STEP 4 Execute an operation

1. Set the operating speed using the internal potentiometer of the **BLV** driver.
2. For the **NETC01-M2**, set the NET-IN3 (FWD) of the address number 0 to ON with the I/O command (DATA_RWA: 50h) of MECHATROLINK-Ⅱ communications to execute an operation.
   For the **NETC01-M3**, set the NET-IN3 (FWD) of the address number 0 to ON with the I/O command (DATA_RWA: 20h) of MECHATROLINK-Ⅲ communications to execute an operation.

( ): Initial value

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
NET-IN7 (MB-FREE)	NET-IN6 (Not used)	NET-IN5 (STOP-MODE)*	NET-IN4 (REV)*	NET-IN3 (FWD)*	NET-IN2 (M2)	NET-IN1 (M1)	NET-IN0 (M0)
NET-IN15 (Not used)	NET-IN14 (Not used)	NET-IN13 (Not used)	NET-IN12 (Not used)	NET-IN11 (Not used)	NET-IN10 (Not used)	NET-IN9 (Not used)	NET-IN8 (Not used)

* When the "3-wire input mode" is set with the "operation input mode selection" parameter, the following signals are applied.
  FWD to START/STOP, REV to RUN/BRAKE, STOP-MODE to FWD/REV

STEP 5 Were you able to operate the motor properly?

How did it go? Were you able to operate the motor properly?
If the motor does not function, check the following points:

- Is any alarm present in the **BLV** driver or **NETC01-M2**/**M3**?
- Are the address number, transmission rate and termination resistor set correctly?
- Is the "communication" parameter of the **NETC01-M2**/**M3** set correctly?
- Is the C-ERR LED lit? (RS-485 communication error)
- Is the ERR LED lit? (MECHATROLINK Ⅱ /Ⅲ communication error)
- Are the parameters of the **BLV** set correctly?

For more detailed settings and functions, refer to the next page and later as well as the **NETC01-M2**/**M3** USER MANUAL.

3.2 I/O field map for the NETC01-M2

Update of remote I/O data (asynchronous) is executed with the "DATA_RWA" command (50h).
When the remote I/O occupied size is 16-bit mode and the number of transmission bytes is 32 bytes (initial value), I/O field map will be as follows. Refer to the network converter **NETC01-M2** USER MANUAL for other I/O field map.

Byte	Part	Type	Command	Response
1	Header field	–	DATA_RWA (50h)	DATA_RWA (50h)
2		–	OPTION	ALARM
3		–		STATUS
4		–		
5	Data field	–	Reserved	Connection status
6		–		
7		Remote I/O	Address number "0" remote I/O input	Address number "0" remote I/O output
8				
9			Address number "1" remote I/O input	Address number "1" remote I/O output
10				
11			Address number "2" remote I/O input	Address number "2" remote I/O output
12				
13			Address number "3" remote I/O input	Address number "3" remote I/O output
14				
15			Address number "4" remote I/O input	Address number "4" remote I/O output
16				
17			Address number "5" remote I/O input	Address number "5" remote I/O output
18				
19			Address number "6" remote I/O input	Address number "6" remote I/O output
20				
21			Address number "7" remote I/O input	Address number "7" remote I/O output
22				
23		Remote resistor	Register address number	Register address number response
24				
25			Command code + TRIG	Command code response + TRIG response + STATUS
26				
27			DATA	DATA response
28				
29				
30				
31		–	Reserved	Reserved

3.3 I/O field map for the NETC01-M3

Update of remote I/O data (asynchronous) is executed with the "DATA_RWA" command (20h).
When the remote I/O occupied size is 16-bit mode and the number of transmission bytes is 32 bytes (initial value), I/O field map will be as follows. Refer to the network converter **NETC01-M3** USER MANUAL for other I/O field map.

Byte	Type	Command	Response
0	–	DATA_RWA (20h)	DATA_RWA (20h)
1	–	WDT	RWDT
2	–	CMD_CTRL	CMD_STAT
3	–		
4	–	Reserved	Connection status
5	–		
6	Remote I/O	Address number "0" remote I/O input	Address number "0" remote I/O output
7			
8		Address number "1" remote I/O input	Address number "1" remote I/O output
9			
10		Address number "2" remote I/O input	Address number "2" remote I/O output
11			
12		Address number "3" remote I/O input	Address number "3" remote I/O output
13			
14		Address number "4" remote I/O input	Address number "4" remote I/O output
15			
16		Address number "5" remote I/O input	Address number "5" remote I/O output
17			
18		Address number "6" remote I/O input	Address number "6" remote I/O output
19			
20		Address number "7" remote I/O input	Address number "7" remote I/O output
21			
22	Remote resistor	Register address number	Register address number response
23			
24		Command code + TRIG	Command code response + TRIG response + STATUS
25			
26		DATA	DATA response
27			
28			
29			
30	–	Reserved	Reserved
31	–		

3.4 Communication format

Communication formats between the **BLV** and **NETC01-M2/M3** are shown below.

■ Remote I/O input

( ): Initial value

- 16 bit mode

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
NET-IN7 (MB-FREE)	NET-IN6 (Not used)	NET-IN5 (STOP-MODE)∗	NET-IN4 (REV)∗	NET-IN3 (FWD)∗	NET-IN2 (M2)	NET-IN1 (M1)	NET-IN0 (M0)
NET-IN15 (Not used)	NET-IN14 (Not used)	NET-IN13 (Not used)	NET-IN12 (Not used)	NET-IN11 (Not used)	NET-IN10 (Not used)	NET-IN9 (Not used)	NET-IN8 (Not used)

∗ When the "3-wire input mode" is set with the "operation input mode selection" parameter, the following signals are applied.
FWD to START/STOP, REV to RUN/BRAKE, STOP-MODE to FWD/REV

- 8 bit mode

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
NET-IN7 (MB-FREE)	NET-IN6 (Not used)	NET-IN5 (STOP-MODE)∗	NET-IN4 (REV)∗	NET-IN3 (FWD)∗	NET-IN2 (M2)	NET-IN1 (M1)	NET-IN0 (M0)

∗ When the "3-wire input mode" is set with the "operation input mode selection" parameter, the following signals are applied.
FWD to START/STOP, REV to RUN/BRAKE, STOP-MODE to FWD/REV

■ Remote I/O output

( ): Initial value

- 16 bit mode

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
NET-OUT7 (ALARM-OUT1)	NET-OUT6 (WNG)	NET-OUT5 (STOP-MODE_R)∗	NET-OUT4 (REV_R)∗	NET-OUT3 (FWD_R)∗	NET-OUT2 (M2_R)	NET-OUT1 (M1_R)	NET-OUT0 (M0_R)
NET-OUT15 (TLC)	NET-OUT14 (VA)	NET-OUT13 (MOVE)	NET-OUT12 (ALARM-OUT2)	NET-OUT11 (Not used)	NET-OUT10 (Not used)	NET-OUT9 (Not used)	NET-OUT8 (S-BSY)

∗ When the "3-wire input mode" is set with the "operation input mode selection" parameter, the following signals are applied.
FWD_R to START/STOP_R, REV_R to RUN/BRAKE_R, STOP-MODE_R to FWD/REV_R

- 8 bit mode

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
NET-OUT7 (ALARM-OUT1)	NET-OUT6 (WNG)	NET-OUT5 (STOP-MODE_R)∗	NET-OUT4 (REV_R)∗	NET-OUT3 (FWD_R)∗	NET-OUT2 (M2_R)	NET-OUT1 (M1_R)	NET-OUT0 (M0_R)

∗ When the "3-wire input mode" is set with the "operation input mode selection" parameter, the following signals are applied.
FWD_R to START/STOP_R, REV_R to RUN/BRAKE_R, STOP-MODE_R to FWD/REV_R

■ Remote register field

- Command (from **NETC01-M2/M3** to **BLV**)

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
–	TRIG	Command code					
DATA							

Description

Name	Description	Setting range
Command code	The command sets the command code for “write and read of parameters, ” monitor” and “maintenance."	–
TRIG	This is the trigger for handshake to execute the command code. If the TRIG is set to 1 from 0, the command code and DATA will be executed.	0: No motion 1: Execution
DATA	This is the data writing to the driver (little endian).	–

- Response (from **BLV** to **NETC01-M2/M3**)

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
STATUS	TRIG_R	Command code					
DATA_R							

Description

Name	Description	Setting range
Command code	The response returns the command code of the command.	–
TRIG_R	This is the trigger for handshake indicating the completion of the command code. If the command code is completed, the TRIG_R will be set to 1 from 0.	0: Not processing 1: Execution completion
STATUS	This indicates the result that executed the command code.	0: Normal operation 1: Error
DATA_R	This is the data reading from the driver (little endian).	–

4 Details of remote I/O

This is common to the **NETC01-CC**, **NETC01-M2** and **NETC01-M3**.

4.1 Remote I/O input (input to BLV)

The following input signals can be assigned to the NET-IN0 to NET-IN15 of remote I/O using the parameter.
Refer to the table below for the arrangement of the NET-IN0 to NET-IN15.
Refer to "I/O function (remote I/O)" on p.25 for parameters.

( ): Initial value

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
NET-IN7 (MB-FREE)	NET-IN6 (Not used)	NET-IN5 (STOP-MODE)*	NET-IN4 (REV)*	NET-IN3 (FWD)*	NET-IN2 (M2)	NET-IN1 (M1)	NET-IN0 (M0)
NET-IN15 (Not used)	NET-IN14 (Not used)	NET-IN13 (Not used)	NET-IN12 (Not used)	NET-IN11 (Not used)	NET-IN10 (Not used)	NET-IN9 (Not used)	NET-IN8 (Not used)

* When the "3-wire input mode" is set with the "operation input mode selection" parameter, the following signals are applied.
FWD to START/STOP, REV to RUN/BRAKE, STOP-MODE to FWD/REV

Signal name	Function	Setting range
Not used	Set when the input terminal is not used.	–
FWD	[2-wire input mode] The motor rotates in the forward direction when the FWD input is set to 1. The motor stops when it is set to 0. The motor rotates in the reverse direction when the REV input is set to 1. The motor stops when it is set to 0. Select the method for how the motor should stop with the STOP-MODE input.	0: Stop 1: Rotation in the forward direction
REV		0: Stop 1: Rotation in the reverse direction
STOP-MODE		0: Instantaneous stop 1: Deceleration stop
START/STOP	[3-wire input mode] The motor rotates when the START/STOP input and RUN/BRAKE input are set to 1. The motor decelerates to a stop when the START/STOP input is set to 0, and the motor instantaneously stops when the RUN/BRAKE input is set to 0. Select the motor rotation direction with the FWD/REV input.	0: Deceleration stop 1: Operation
RUN/BRAKE		0: Instantaneous stop 1: Operation
FWD/REV		0: Forward direction 1: Reverse direction
MB-FREE	Select the operation of the electromagnetic brake for when the motor stops.	0: Lock when it stops 1: Release when it stops
H-FREE	This is the input signal that can be used when the load holding function is enabled. If the H-FREE input is turned ON when the stopped motor shaft is electrically held by the load holding function, the motor shaft can be rotated by an external force (free-run state).	0: Load holding function enable 1: Motor shaft free-run state
HMI	Release of the function limitation of the **MEXE02** and **OPX-2A**.	0: Function limitation 1: Function limitation release
M0 to M2	Select the operation data number using these three bits.	0 to 7: Operation data number

Note

- Do not assign the same input signal to multiple input terminals. If the same input signal is assigned to multiple input terminals, the function is executed if any of the terminals becomes active.
- If the same input signal is assigned to both remote I/O and direct I/O (X0 to X5), the function is executed if any of them becomes active.
- If the HMI input is not assigned to the input terminal, the HMI input is always set to 1 (function limitation release). If the HMI input is assigned to both remote I/O and direct I/O (X0 to X5), the function limitation is released when both of them are set to 1.

4.2 Remote I/O output (output from BLV)

The following output signals can be assigned to the NET-OUT0 to NET-OUT15 of remote I/O using the parameter.
Refer to the table below for the assignments of the NET-OUT0 to NET-OUT15.
Refer to "I/O function (remote I/O)" on p.25 for parameters.

( ): Initial value

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
NET-OUT7 (ALARM-OUT1)	NET-OUT6 (WNG)	NET-OUT5 (STOP-MODE_R)∗	NET-OUT4 (REV_R)∗	NET-OUT3 (FWD_R)∗	NET-OUT2 (M2_R)	NET-OUT1 (M1_R)	NET-OUT0 (M0_R)
NET-OUT15 (TLC)	NET-OUT14 (VA)	NET-OUT13 (MOVE)	NET-OUT12 (ALARM-OUT2)	NET-OUT11 (Not used)	NET-OUT10 (Not used)	NET-OUT9 (Not used)	NET-OUT8 (S-BSY)

∗ When the "3-wire input mode" is set with the "operation input mode selection" parameter, the following signals are applied.
FWD_R to START/STOP_R, REV_R to RUN/BRAKE_R, STOP-MODE_R to FWD/REV_R

Signal name	Function		Setting range
Not used	Set when the output terminal is not used.		–
FWD_R	2-wire input mode	Output in response to the FWD input.	0: FWD=OFF 1: FWD=ON
REV_R		Output in response to the REV input.	0: REV=OFF 1: REV=ON
STOP-MODE_R		Output in response to the STOP-MODE input.	0: STOP-MODE=OFF 1: STOP-MODE=ON
START/STOP_R	3-wire input mode	Output in response to the START/STOP input.	0: START/STOP=OFF 1: START/STOP=ON
RUN/BRAKE_R		Output in response to the RUN/BRAKE input.	0: RUN/BRAKE=OFF 1: RUN/BRAKE=ON
FWD/REV_R		Output in response to the FWD/REV input.	0: FWD/REV=OFF 1: FWD/REV=ON
MB-FREE_R	Output in response to the MB-FREE input.		0: MB-FREE=OFF 1: MB-FREE=ON
H-FREE_R	Output in response to the H-FREE input.		0: H-FREE=OFF 1: H-FREE=ON
M0_R	Output in response to the M0 input.		0: M0=OFF 1: M0=ON
M1_R	Output in response to the M1 input.		0: M1=OFF 1: M1=ON
M2_R	Output in response to the M2 input.		0: M2=OFF 1: M2=ON
ALARM-OUT1	Output an alarm of the **BLV**.		0: Normal operation 1: Alarm present
WNG	Output a warning of the **BLV**.		0: Normal operation 1: Warning present
MOVE	Output when the motor operates.		0: Motor standstill 1: Motor operating
TLC	Output when a load exceeded the torque limiting value.		0: Within the torque limiting value 1: Outside the torque limiting value
VA	Output when the speed difference between the set rotation speed and the actual rotation speed of the motor reaches below the value in the “Rotating speed attainment band” parameter.		0: Outside the speed attainment band 1: Within the speed attainment band
S-BSY	Output when the **BLV** is in an internal processing state.		0: No internal processing 1: During internal processing
ALARM-OUT2	Output when the load torque of the motor exceeded the overload warning level.		0: Normal operation 1: In overload operation
MPS	Output the ON-OFF state of the main power supply.		0: Main power-OFF 1: Main power-ON
DIR	Output a state of the rotation direction of the motor shaft.		0: Reverse direction 1: Forward direction

5 Command code list

This is common to the **NETC01-CC**, **NETC01-M2** and **NETC01-M3**.

5.1 Maintenance command

These commands are used to clear the alarm history and warning history, and also used to execute the batch processing for the non-volatile memory.

Command code	Name	Description	Setting range
30C0h	Reset alarm	Resets the alarm presently generated.	1: Execute
30C2h	Clear alarm history	Clears the alarm history.	
30C3h	Clear warning history	Clears the warning history.	
30C4h	Clear communication error history	Clears the communication error history.	
30C6h	Configuration	Executes the parameter recalculation and the setup.	
30C7h	Batch data initialization∗1	Restores the parameters saved in the non-volatile memory to their initial values. (Excluding parameters related to communication setting)	
30C8h	Batch NV memory read	Reads the operation data and parameters saved in the non-volatile memory to the RAM. All operation data and parameters previously saved in the RAM are overwritten.	
30C9h	Batch NV memory write	Writes the operation data and parameters saved in the RAM to the non-volatile memory. The non-volatile memory can be rewritten approximately 100,000 times.	
30CAh	All data batch initialization∗2	Restores all parameters saved in the non-volatile memory to their initial values. (Including parameters related to communication)	

∗1 Even if "batch data initialization" is executed, communication parity (Modbus), communication stop bit (Modbus), and transmission waiting time (Modbus) are not initialized.

∗2 If "all data batch initialization" is executed, communication parity (Modbus), communication stop bit (Modbus), and transmission waiting time (Modbus) are also initialized.

Note Before executing "batch data initialization" or "all data batch initialization" of the maintenance command, be sure to turn the X0 and X1 terminals of the direct I/O and the NET-IN3 and NET-IN4 of the remote I/O to OFF. The motor may suddenly rotate after initialization unless these signals are turned OFF.

5.2 Monitor command

These commands are used to monitor the conditions of the **BLV**.

Command code	Item	Description	Range
2040h	Present alarm	Monitors the present alarm code.	00h to FFh
2041h	Alarm history 1	Monitors the alarm history 1 to 10.	
2042h	Alarm history 2		
2043h	Alarm history 3		
2044h	Alarm history 4		
2045h	Alarm history 5		
2046h	Alarm history 6		
2047h	Alarm history 7		
2048h	Alarm history 8		
2049h	Alarm history 9		
204Ah	Alarm history 10		
204Bh	Present warning	Monitors the present warning code.	
204Ch	Warning history 1	Monitors the warning history 1 to 10.	
204Dh	Warning history 2		
204Eh	Warning history 3		
204Fh	Warning history 4		
2050h	Warning history 5		
2051h	Warning history 6		
2052h	Warning history 7		
2053h	Warning history 8		
2054h	Warning history 9		
2055h	Warning history 10		

Command code	Item	Description	Range
2056h	Present communication error code	Monitors the present error code.	00h to FFh
2057h	Communication error code history 1	Monitors the communication error code history 1 to 10.	
2058h	Communication error code history 2		
2059h	Communication error code history 3		
205Ah	Communication error code history 4		
205Bh	Communication error code history 5		
205Ch	Communication error code history 6		
205Dh	Communication error code history 7		
205Eh	Communication error code history 8		
205Fh	Communication error code history 9		
2060h	Communication error code history 10		
2062h	Present operation data No.	Monitors the present operation data number.	0 to 7
2064h	Command speed	Monitors the present command speed (motor output shaft).	**BLV510**: −3010 to +3010 r/min **BLV620**, **BLV640**: −4010 to +4010 r/min +: Forward rotation −: Reverse rotation 0: Stop
2067h	Feedback speed	Monitors the present feedback speed (motor output shaft).	−5200 to +5200 r/min +: Forward rotation −: Reverse rotation 0: Stop
206Ah	Direct I/O and electromagnetic brake status	Monitors the each direct I/O (X0 to X5, Y0, Y1) and electromagnetic brake status.	Refer to the next table.
2080h	Operating speed	Monitors the feedback speed calculated by the "speed reduction ratio" parameter or "speed increasing ratio" parameter. (unit: r/min)	+: Forward −: Reverse 0: Stop
2081h	Operating speed decimal position	Monitors the decimal position in the operating speed. ∗1	0: No decimal point 1: 1 decimal place 2: 2 decimal places 3: 3 decimal places
2082h	Conveyor transfer speed	Monitors the feedback speed calculated by the "conveyor speed reduction ratio" parameter or "conveyor speed increasing ratio" parameter. (unit: r/min)	+: Forward −: Reverse 0: Stop
2083h	Conveyor transfer speed decimal position	Monitors the decimal position in the conveyor transfer speed. ∗2	0: No decimal point 1: 1 decimal place 2: 2 decimal places 3: 3 decimal places
2084h	Load factor	Monitors the torque that is output by the motor based on the rated torque being 100%. (unit: %)	0 to 200%
2086h	External analog speed setting	Monitors the operating speed setting value by the analog setting. (unit: r/min) ∗3	**BLV510**: 0 to 3010 r/min **BLV620**, **BLV640**: 0 to 4010 r/min
2088h	External analog torque limit setting	Monitors the torque limiting value by the analog setting. (unit: %) ∗3	0 to 200%
208Bh	External analog voltage setting	Monitors the voltage setting value by the analog setting. (unit: 0.1 V) ∗4	0 to 50 (1=0.1 V)

∗1 The decimal position is automatically changed based on the setting of the "speed reduction ratio" parameter or "speed reduction ratio decimal digit setting" parameter.

∗2 The decimal position is automatically changed based on the setting of the "conveyor speed reduction ratio" parameter or "conveyor speed reduction ratio decimal digit setting" parameter.

∗3 When it is not selected in the "analog input signal selection" parameter, "FFFFh" is displayed.

∗4 When No.2 of the basic function switch (SW1) is set to ON, the indicated value of the input voltage will be half.

Direct I/O and electromagnetic brake status (206Ah)

Bit	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	–	–	X5	X4	X3	X2	X1	X0
1	–	–	–	–	–	–	–	–
2	–	–	–	–	–	–	Y1	Y0
3	–	–	–	–	–	–	–	MB

5.3 Operation data

There are the following two types of parameters required to operate the motor.

- Operation data
- User parameters

The parameters are saved in the RAM or non-volatile memory. The data saved in the RAM will be erased once the power is turned off.
When the power of the **BLV** is turned on, the parameters saved in the non-volatile memory is sent to the RAM, and the recalculation and setup for the parameters are executed in the RAM.

When a parameter is changed, the timing to enable the new value varies depending on the parameter. See the following four types.

- Effective immediately .....Executes the recalculation and setup immediately when writing the parameter.
- Effective after stopping the operation .....Executes the recalculation and setup after stopping the operation.
- Effective after executing the configuration .....Executes the recalculation and setup after executing the configuration.
- Effective after turning on the power again.....Executes the recalculation and setup after turning on the power again.

Note

- The parameters are written in the RAM area when writing.
- To save the data to the non-volatile memory, execute "batch NV memory write" of the maintenance command.
- The non-volatile memory can be rewritten approximately 100,000 times.

Command code		Item	Setting range	Setting unit	Initial value	Effective*
Read	Write					
0240h	1240h	Rotation speed No.0	**BLV510**: 0 r/min, or 80 to 3000 r/min **BLV620**, **BLV640**: 0 r/min, or 80 to 4000 r/min	1	0	A
0241h	1241h	Rotation speed No.1				
0242h	1242h	Rotation speed No.2				
0243h	1243h	Rotation speed No.3				
0244h	1244h	Rotation speed No.4				
0245h	1245h	Rotation speed No.5				
0246h	1246h	Rotation speed No.6				
0247h	1247h	Rotation speed No.7				
0300h	1300h	Acceleration time No.0	2 to 150（1=0.1 s）	1	5	
0301h	1301h	Acceleration time No.1				
0302h	1302h	Acceleration time No.2				
0303h	1303h	Acceleration time No.3				
0304h	1304h	Acceleration time No.4				
0305h	1305h	Acceleration time No.5				
0306h	1306h	Acceleration time No.6				
0307h	1307h	Acceleration time No.7				
0340h	1340h	Deceleration time No.0	2 to 150 （1=0.1 s）	1	5	
0341h	1341h	Deceleration time No.1				
0342h	1342h	Deceleration time No.2				
0343h	1343h	Deceleration time No.3				
0344h	1344h	Deceleration time No.4				
0345h	1345h	Deceleration time No.5				
0346h	1346h	Deceleration time No.6				
0347h	1347h	Deceleration time No.7				
0380h	1380h	Torque limit No.0	0 to 200%	1	200	
0381h	1381h	Torque limit No.1				
0382h	1382h	Torque limit No.2				
0383h	1383h	Torque limit No.3				
0384h	1384h	Torque limit No.4				
0385h	1385h	Torque limit No.5				
0386h	1386h	Torque limit No.6				
0387h	1387h	Torque limit No.7				

* Indicates the timing for the data to become effective.
A: Effective immediately

5.4 Parameter

■ User parameters

Command code		Item	Description	Setting range	Setting unit	Initial value	Effective*
Read	Write						
0143h	1143h	JOG operating speed	Sets the rotation speed of JOG operation.	0 r/min, or 80 to 4000 r/min	1	300	A
01C2h	11C2h	Motor rotation direction selection	Sets the motor rotation direction to be applied when the FWD input is turned ON.	0: + direction=CCW 1: + direction=CW	–	1	C
0815h	1815h	Load holding function selection	Selects whether to generate a force to hold the shaft electrically when the motor stops.	0: Disable 1: Enable	–	0	
0818h	1818h	Load holding torque limiting setting value	Sets the limiting value of the load holding torque. If −1 is set, the torque limiting value set to the selected operation data number is applied.	−1 to 50%	1	−1	A
0820h	1820h	Operation input mode selection	Switches operation signals of external input between 2-wire input mode and 3-wire input mode.	0: 2-wire input mode 1: 3-wire input mode	–	0	C
0821h	1821h	JOG operation torque	Sets the torque limiting value of JOG operation.	0 to 200%	1	200	A
0825h	1825h	Speed reduction ratio	When the gear ratio of the gearhead is entered, the rotation speed of the gearhead output shaft can be displayed. The speed reduction ratio is calculated by multiplying a value in the "speed reduction ratio" parameter by that in the "speed reduction ratio decimal digit setting" parameter.	100 to 9999	1	100	
0826h	1826h	Speed reduction ratio decimal digit setting		0: x 1 1: x 0.1 2: x 0.01	–	2	
0827h	1827h	Speed increasing ratio	Sets the speed increasing ratio relative to the rotation speed of the motor output shaft. The displays vary depending on the setting value. If the speed increasing ratio is set to 1, the speed reduction ratio will be effective. If the speed increasing ratio is set to other than 1, the speed increasing ratio will be effective.	1 to 5	–	1	
0828h	1828h	Conveyor speed reduction ratio	When the conveyor speed reduction ratio is set, the transfer speed of the conveyor can be displayed. The conveyor speed reduction ratio is calculated by multiplying a value in the "conveyor speed reduction ratio" parameter by that in the "conveyor speed reduction ratio decimal digit setting" parameter.	100 to 9999	1	100	
0829h	1829h	Conveyor speed reduction ratio decimal digit setting		0: x 1 1: x 0.1 2: x 0.01	–	2	
082Ah	182Ah	Conveyor speed increasing ratio	Sets the conveyor speed increasing ratio relative to the rotation speed of the motor output shaft.	1 to 5	–	1	
0871h	1871h	Analog input signal selection	The setting method of operation data can be changed. Refer to the next page for details.	0: Mode 0 1: Mode 1 2: Mode 2 3: Mode 3 4: Mode 4 5: Mode 5	–	0	C
08A7h	18A7h	Rotation speed attainment band	Sets the band within which the motor rotation speed is deemed to have reached the set value.	0 to 400 r/min	1	200	A
0A03h	1A03h	Communication parity (Modbus)	Sets the parity for RS-485 communication.	0: None 1: Even parity 2: Odd parity	–	1	D
0A04h	1A04h	Communication stop bit (Modbus)	Sets the stop bit for RS-485 communication.	0: 1 bit 1: 2 bits	–	0	
0A05h	1A05h	Transmission waiting time (Modbus)	Sets the transmission waiting time for RS-485 communication.	0 to 10000 (× 0.1 ms)	1	100	

* Indicates the timing for the data to become effective.
A: Effective immediately, C: Effective after executing the configuration, D: Effective after turning on the power again

Operation data setting using analog input signal selection

The setting method of operation data can be changed using the analog input signal selection parameter. Combinations of the mode number and analog setting/digital setting are shown below. Only the combinations shown below are available to set.

Mode No.	Operation data No.	VR1	VR2	VR3	External potentiometer	Digital setting
Mode 0 (factory setting)	0	Rotation speed	Acceleration/ Deceleration time	Torque limiting value	–	–
	1	–	Acceleration/ Deceleration time	Torque limiting value	Rotation speed	–
	2 to 7	–	–	–	–	Rotation speed Acceleration time Deceleration time Torque limiting value
Mode 1	0 to 7	–	–	–	–	Rotation speed Acceleration time Deceleration time Torque limiting value
Mode 2	0 to 7	–	–	–	Torque limiting value	Rotation speed Acceleration time Deceleration time
Mode 3	0	Acceleration time	Deceleration time	Rotation speed	–	Torque limiting value
	1	Acceleration time	Deceleration time	–	Rotation speed	Torque limiting value
	2 to 7	–	–	–	–	Rotation speed Acceleration time Deceleration time Torque limiting value
Mode 4	0	Rotation speed	Torque limiting value	Acceleration/ Deceleration time	–	–
	1	–	Torque limiting value	Acceleration/ Deceleration time	Rotation speed	–
	2 to 7	–	–	–	–	Rotation speed Acceleration time Deceleration time Torque limiting value
Mode 5	0	Torque limiting value	Acceleration/ Deceleration time	Rotation speed	–	–
	1	Torque limiting value	Acceleration/ Deceleration time	–	Rotation speed	–
	2 to 7	–	–	–	–	Rotation speed Acceleration time Deceleration time Torque limiting value

Note The torque limiting potentiometer (VR3) is set to the maximum value at the time of shipment. When selecting the mode 3 to mode 5, check the setting value before operating a motor because the rotation speed and acceleration/deceleration time are set to the maximum value initially.

■ Alarm/warning

Command code		Item	Description	Setting range	Setting unit	Initial value	Effective*
Read	Write						
01A4h	11A4h	Undervoltage warning level	Sets the warning level for the undervoltage of the main power supply.	0 to 480 (1=0.1 V)	1	24 VDC specification: 216 48 VDC specification: 432	A
0840h	1840h	Electromagnetic brake action at alarm	Sets the activated timing of the electromagnetic brake when an alarm is generated. If 0 is set, after the motor coasts to a stop, the electromagnetic brake activates and holds the position.	0: Lock after coasting to a stop 1: Lock immediately	–	1	C
0841h	1841h	Prevention of operation at power-on alarm function	Sets whether to enable or disable the prevention of operation at power-on alarm.	0: Disable 1: Enable	–	0	
0842h	1842h	Undervoltage alarm latch	Switches enable/disable of the undervoltage warning function. If 0 is set, the undervoltage alarm will automatically be cleared when the main power supply voltage returns to the undervoltage detection level or more.	0: Disable 1: Enable	–	0	
0851h	1851h	Overload warning function	Enable/disable the overload warning function.	0: Disable 1: Enable	–	1	A
0854h	1854h	Undervoltage warning function	Enable/disable the undervoltage warning function.	0: Disable 1: Enable	–	1	
0855h	1855h	Overload warning level	Sets the warning level for the load torque of the motor.	50 to 100%	1	100	

* Indicates the timing for the data to become effective.
A: Effective immediately, C: Effective after executing the configuration

■ Data setter alarm/ warning

Command code		Item	Description	Setting range	Initial value	Effective*
Read	Write					
01E0h	11E0h	Data setter speed display	Sets the display method of the operating speed shown in the monitor mode. If 0 is set, "−" will be displayed when rotating in the reverse input direction.	0: Signed 1: Absolute value	0	A
01E1h	11E1h	Data setter edit	Switches enable/disable of the following editing functions. ・Alarm and warning history in the monitor mode ・Change of the setting value in the data mode and parameter mode ・All operations in the copy mode	0: Disable 1: Enable	1	D
0870h	1870h	Data setter initial display	Selects the initial screen for when the power is supplied to the **BLV**.	0: Rotation speed 1: Conveyor speed 2: Load factor 3: Operation number 4: Top screen of monitor mode	0	

* Indicates the timing for the data to become effective.
A: Effective immediately, D: Effective after turning on the power again

■ I/O function (direct I/O)

Command code		Item	Setting range	Initial value	Effective∗1
Read	Write				
0880h	1880h	X0 input function selection	0: Not used 1: FWD (START/STOP)∗2 2: REV (RUN/BRAKE)∗2 19: STOP-MODE (FWD/REV)∗2 20: MB-FREE 21: EXT-ERROR 24: ALARM-RESET 27: HMI 28: H-FREE 48: M0 49: M1 50: M2	1	B
0881h	1881h	X1 input function selection		2	
0882h	1882h	X2 input function selection		19	
0883h	1883h	X3 input function selection		48	
0884h	1884h	X4 input function selection		24	
0885h	1885h	X5 input function selection		20	
08A0h	18A0h	Y0 output function selection	0: Not used 65: ALARM-OUT1 66: WNG 68: MOVE 71: TLC 77: VA 81: ALARM-OUT2 84: DIR	65	A
08A1h	18A1h	Y1 output function selection		66	

∗1 Indicates the timing for the data to become effective.
A: Effective immediately, B: Effective after stopping the operation

∗2 The parentheses ( ) will be applied when selecting "3-wire input mode" with the "operation input mode selection" parameter.

■ I/O function (remote I/O)

Command code		Item	Setting range	Initial value	Effective∗1
Read	Write				
08B0h	18B0h	NET-IN0 input function selection	0: Not used 1: FWD (START/STOP)∗2 2: REV (RUN/BRAKE)∗2 19: STOP-MODE (FWD/REV)∗2 20: MB-FREE 27: HMI 28: H-FREE 48: M0 49: M1 50: M2	48	C
08B1h	18B1h	NET-IN1 input function selection		49	
08B2h	18B2h	NET-IN2 input function selection		50	
08B3h	18B3h	NET-IN3 input function selection		1	
08B4h	18B4h	NET-IN4 input function selection		2	
08B5h	18B5h	NET-IN5 input function selection		19	
08B6h	18B6h	NET-IN6 input function selection		0	
08B7h	18B7h	NET-IN7 input function selection		20	
08B8h	18B8h	NET-IN8 input function selection		0	
08B9h	18B9h	NET-IN9 input function selection		0	
08BAh	18BAh	NET-IN10 input function selection		0	
08BBh	18BBh	NET-IN11 input function selection		0	
08BCh	18BCh	NET-IN12 input function selection		0	
08BDh	18BDh	NET-IN13 input function selection		0	
08BEh	18BEh	NET-IN14 input function selection		0	
08BFh	18BFh	NET-IN15 input function selection		0	
08C0h	18C0h	NET-OUT0 output function selection	0: Not used 1: FWD_R (START/STOP_R)∗2 2: REV_R (RUN/BRAKE_R)∗2 19: STOP-MODE_R (FWD/REV_R)∗2 20: MB-FREE_R 27: HMI_R 28: H-FREE_R 48: M0_R 49: M1_R 50: M2_R 65: ALARM-OUT1 66: WNG 68: MOVE 71: TLC 77: VA 80: S-BSY 81: ALARM-OUT2 82: MPS 84: DIR	48	
08C1h	18C1h	NET-OUT1 output function selection		49	
08C2h	18C2h	NET-OUT2 output function selection		50	
08C3h	18C3h	NET-OUT3 output function selection		1	
08C4h	18C4h	NET-OUT4 output function selection		2	
08C5h	18C5h	NET-OUT5 output function selection		19	
08C6h	18C6h	NET-OUT6 output function selection		66	
08C7h	18C7h	NET-OUT7 output function selection		65	
08C8h	18C8h	NET-OUT8 output function selection		80	
08C9h	18C9h	NET-OUT9 output function selection		0	
08CAh	18CAh	NET-OUT10 output function selection		0	
08CBh	18CBh	NET-OUT11 output function selection		0	
08CCh	18CCh	NET-OUT12 output function selection		81	
08CDh	18CDh	NET-OUT13 output function selection		68	
08CEh	18CEh	NET-OUT14 output function selection		77	
08CFh	18CFh	NET-OUT15 output function selection		71	

∗1 Indicates the timing for the data to become effective.
C: Effective after executing the configuration

∗2 The parentheses ( ) will be applied when selecting "3-wire input mode" with the "operation input mode selection" parameter.

5.5 Group function

The **BLV** has a group function. The group function is a function to form a group of multiple slaves and send the operation command to each slave in the group concurrently.

■ Group composition

A group consists of one parent slave and child slaves.

■ Group address

To perform a group send, set a group address to the child slaves to be included in the group.
The child slaves to which the group address has been set can receive a command sent to the parent slave.
Sending an operation command to the parent slave will send it also to the child slaves in the same group.

- Parent slave

No special setting is required on the parent slave to perform a group send. The address number of the parent slave will be the group address.

- Child slave

Use "group" (1018h) to set a group address to each child slave.

Note Only the remote I/O input is available to execute the group function. Read and write of commands and parameters cannot be executed.

■ Group setting

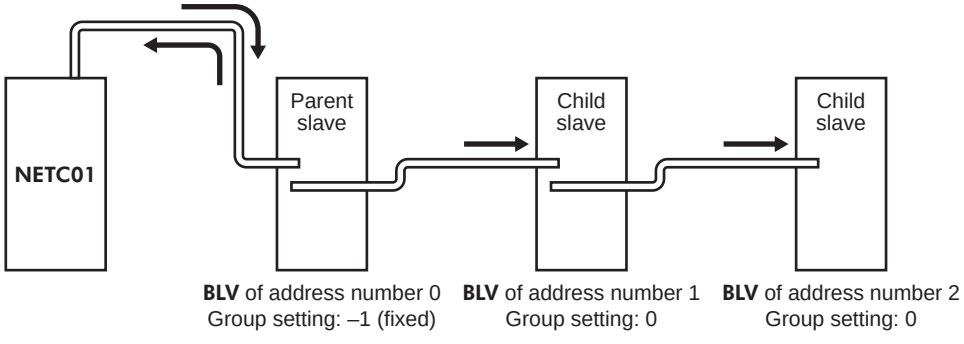
The group setting is not saved in the non-volatile memory even if the maintenance command "batch NV memory write" is executed.

Command code		Description	Setting range	Initial value
Read	Write			
0018h	1018h	Group	Sets a group. −1: Individual (a group is not set.) 0 to 31: Sets a group address.∗	−1: Individual

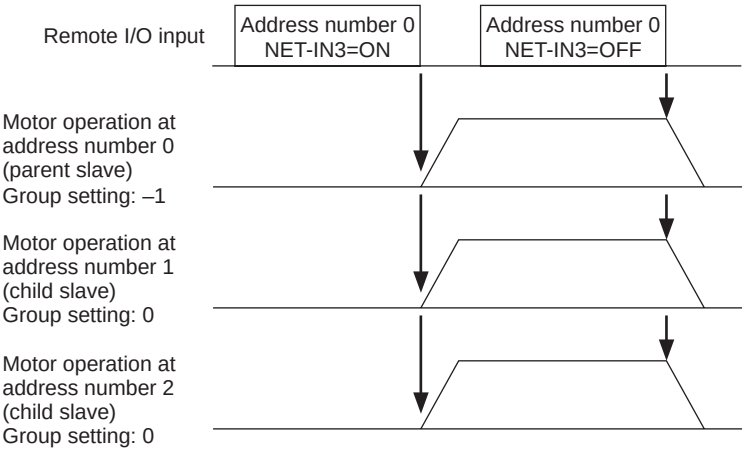
∗ Set in a range of 0 to 11 when the **NETC01-CC** is used, and set in a range of 0 to 15 when **NETC01-M2** or **NETC01-M3** is used.

■ Setting example of group function

When a group is formed by setting the **BLV** of the address number 0 to the parent slave and the **BLV** of the address number 1 and 2 to the child slaves, set as shown below.



This is the timing chart for when the FWD was assigned to the NET-IN3 (remote I/O) of the **BLV** composed the group.



Note If remote I/O is input to the parent slave, the child slaves also operates. Inputting remote I/O to the child slaves does not cause to operate.

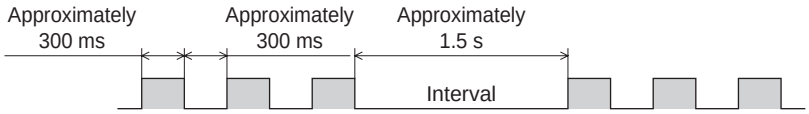
6 Alarms, warnings and communication errors of BLV

The **BLV** provides alarms (protective functions) to protect the **BLV** from overheating, poor connection, wrong operation and others, as well as warnings (warning functions) to output before the corresponding alarms generate. A communication error will be returned when the processing requested by the master controller could not be executed.

6.1 Alarms

If an alarm is generated, the ALARM-OUT output is turned OFF, and the motor stops. At the same time, the ALARM LED will start blinking. The present alarm can be checked by counting the number of times the ALARM LED blinks, or using the **MEXE02**, **OPX-2A** or RS-485 communication.

Example: Sensor error alarm (number of blinks: 3)



■ Alarm list

Alarm code	Number of ALARM LED blinks	Alarm type	Cause	Remedial action	Reset using the ALARM-RESET input
30h	2	Overload	A load exceeding the rated torque was applied to the motor for 5 seconds or more.	• Decrease the load. • Re-examine the operating pattern such as the acceleration time and deceleration time.	Possible
28h	3	Sensor error	The motor sensor signal line was disconnected during operation, or the motor signal connector was come off.	Check the connection between the **BLV** driver and motor.	
42h		Initial sensor error	The motor sensor signal line was disconnected or the motor signal connector was come off before the main power supply was turned on.		
22h	4	Overvoltage	• The main power supply voltage exceeded the overvoltage detection level. [Detection level] **BLV510**, **BLV620**: Approximately 40 VDC **BLV640**: Approximately 72 VDC • Sudden starting/stopping of a large inertia load was performed.	• Check the main power supply voltage. • If this alarm is generated during operation, reduce the load or increase the acceleration time or deceleration time. • If the alarm is generated in acceleration, set the speed response to the regenerative power suppress mode. • If the alarm is generated when the motor stops, set the STOP-MODE to instantaneous stop.	
25h	5	Undervoltage	The main power supply voltage dropped below the undervoltage detection level. [Detection level] **BLV510**: Approximately 18 VDC **BLV620**: Approximately 10 VDC **BLV640**: Approximately 20 VDC	• Check the main power supply voltage. • Check the wiring of the power supply cable.	
31h	6	Overspeed	The rotation speed of the motor output shaft exceeded the value below. **BLV510**: Approximately 3600 r/min **BLV620**, **BLV640**: Approximately 4800 r/min	• Decrease the load. • Re-examine the operating pattern such as the acceleration time and deceleration time.	
20h	7	Overcurrent	Excessive current was flown through the **BLV** due to ground fault, etc.	Check the wiring between the driver and motor for damage after turning off the power, and turn on the power again.	Not possible

Alarm code	Number of ALARM LED blinks	Alarm type	Cause	Remedial action	Reset using the ALARM-RESET input
41h	8	EEPROM error	• Stored data was damaged. • Data became no longer writable or readable.	Initialize the parameters using the **MEXE02**, **OPX-2A** or RS-485 communication and cycle the power.	Not possible
21h	9	Main circuit overheat	The temperature inside the **BLV** driver exceeded the main circuit overheat level.	Review the ventilation condition in the enclosure.	Possible
6Eh	10	External stop ∗1	The EXT-ERROR input was turned OFF.	Check the EXT-ERROR input.	
46h	11	Prevention of operation at power-on ∗2	The main power supply was turned on when the FWD input or REV input was being ON. ※ When the “3-wire input mode” was set with the “operation input mode selection" parameter, the main power supply was turned on in a state where the START/STOP input and RUN/BRAKE input were being ON.	Turn the FWD input and REV input OFF, and turn on the main power supply again. ※ When the “3-wire input mode” was set with the “operation input mode selection" parameter, turn either the START/STOP input or RUN/BRAKE input OFF before turning on the main power supply again.	
81h	12	Network bus error	The master controller for the network converter showed a disconnection status while the motor operates.	Check the connector and cable of the master controller.	
83h		Communication switch setting error	No.4 of the communication function switch (SW2) was turned ON.	Turn No.4 of the communication function switch (SW2) OFF, and turn on the power again.	Not possible
84h		RS-485 communication error	The number of consecutive RS-485 communication errors reached the value set in the "communication error alarm" parameter.	• Check the connection with the master controller. • Check the setting of the RS-485 communication.	Possible
85h		RS-485 communication timeout	The time set in the "communication timeout" parameter has elapsed, and yet the communication could not be established with the master controller.	Check the connection with the master controller.	
8Eh		Network converter error	An alarm was generated in the network converter.	Check the alarm code of the network converter.	
2Dh	14	Main circuit output error ∗3	• The motor power line was disconnected, or the motor power connector was come off. • When the operation input signal was switched instantaneously, the motor could not follow and continued a state of not rotating.	• Check the connection between the **BLV** driver and motor. • Check the motor has rotated before switching the operation command.	

∗1 This alarm is generated when the EXT-ERROR is assigned to the X0 to X5 inputs.

∗2 This alarm is generated when the "prevention of operation at power-on alarm function" parameter is set to "Enable."

∗3 This alarm is not generated when the torque limit is set to less than 200% .

■ Alarm reset

Before resetting an alarm, be sure to remove the cause of the alarm and turn the FWD input and REV input OFF to ensure the safety, and then perform one of the reset operations specified below. Refer to the **BLV** Series USER MANUAL Basic Function for the timing chart.

- Turn the ALARM-RESET input ON (keep it ON for 10 ms or more).
- Execute an alarm reset with the maintenance command.
- Execute an alarm reset using the **MEXE02** or **OPX-2A**.
- Cycle the main power supply. If the control power supply is connected, also cycle it.

Note

- Some alarms cannot be reset with the ALARM-RESET input, **MEXE02**, **OPX-2A** or maintenance command. Check with the alarm list. To reset these alarms, you must cycle the driver power. If the product does not operate properly after the power is cycled, the internal circuit may have been damaged. Contact your nearest Oriental Motor sales office.
- In the case of resetting an alarm with the maintenance command, if an alarm reset is executed in a state where the FWD input or REV input is being ON, it is dangerous because the motor will start rotating after the alarm reset. Be sure to turn the FWD input and REV input OFF before resetting the alarm.

■ Alarm history

Up to 10 generated alarms are saved in the non-volatile memory in order of the latest to oldest. The stored alarm history can be read or cleared if any of the following items is performed.

- Read the alarm history with the monitor command.
- Clear the alarm history with the maintenance command.
- Read or clear the alarm history using the **MEXE02** or **OPX-2A**.

6.2 Warnings

If a warning is generated, the WNG output is turned ON. The motor will continue to operate.
Once the cause of the warning is removed, the WNG output will be turned OFF automatically.

■ Warning list

Code	Warning type	Cause	Remedial action
21h	Main circuit overheat	The temperature inside the **BLV** driver exceeded the overheat warning level.	Re-examine the ventilation condition in the enclosure.
25h	Undervoltage*	The main power supply voltage dropped by approximately 10% or more from the rated voltage.	• Check the input voltage of the main power supply. • Check the wiring of the power supply cable.
30h	Overload*	The load torque of the motor exceeded the overload warning level.	• Decrease the load. • Re-examine the operating pattern such as the acceleration time and deceleration time.
6Ch	Operation prohibited	• When the mode was moved from the test mode to other mode using the **MEXE02** or **OPX-2A**, the FWD input or REV input was being ON. ※ When the "3-wire input mode" was set with the "operation input mode selection" parameter, the START/ STOP input and RUN/ BRAKE input was being ON. • When the assignment of the input terminal was changed using the **MEXE02**, **OPX-2A**, or RS-485 communication, the assigned terminal was being ON.	Turn the input signal OFF.
84h	RS-485 communication error	A RS-485 communication error was detected.	• Check the connection with the master controller. • Check the setting of RS-485 communication.

* The detection level can be changed using the **MEXE02** or **OPX-2A**.

■ Warning history

Up to 10 generated warnings are saved in the RAM in order of the latest to oldest. The warning history stored in the RAM can be read or cleared if any of the following items is performed.

- Read the warning history with the monitor command.
- Clear the warning history with the maintenance command.
- Read or clear the warning history using the **MEXE02** or **OPX-2A**.

Note The warning history will be cleared when the power supply of the **BLV** is turned off.

6.3 Communication errors

Up to 10 communication errors are saved in the RAM in order of the latest to the oldest and you can check via RS-485 communication.

■ Communication error list

Code	Communication error type	Cause	Remedial action
84h	RS-485 communication error	One of the following errors was detected. ・Framing error ・BCC error	• Check the connection with the master controller. • Check the setting of RS-485 communication.
88h	Command not yet defined	The command requested by the master could not be executed because of being undefined.	• Check the setting value for the command. • Check the flame configuration.
89h	Execution disable due to user I/F communication in progress	The command requested by the master could not be executed because the **MEXE02** or **OPX-2A** was communicating with the **BLV** driver.	Wait until the processing for the **MEXE02** or **OPX-2A** will be completed.
8Ah	Execution disable due to non-volatile memory processing in progress	The command could not be executed because the **BLV** driver was performing the non-volatile memory processing. ・Internal processing is in progress. (S-BSY is ON.) ・An EEPROM error alarm is present.	• Wait until the internal processing will complete. • When the EEPROM error was generated, initialize all parameters using the **MEXE02**, **OPX-2A** or RS-485 communication.
8Ch	Outside setting range	The setting data requested by the master could not be executed due to out of the range.	Check the setting data.
8Dh	Command execute disable	When the command could not be executed, it tried to do it.	Check the **BLV** status.

■ Communication error history

Up to 10 communication errors are saved in the RAM in order of the latest to oldest. The communication error history saved in the RAM can be read or cleared if any of the following items is performed.

- Read the communication error history with the monitor command.
- Clear the communication error history with the maintenance command.
- Read and clear the communication error history using the **MEXE02**.

Note The communication error history will be cleared when the power supply of the **BLV** is turned off.

- Unauthorized reproduction or copying of all or part of this manual is prohibited.
  If a new copy is required to replace an original manual that has been damaged or lost, please contact your nearest Oriental Motor branch or sales office.
- Oriental Motor shall not be liable whatsoever for any problems relating to industrial property rights arising from use of any information, circuit, equipment or device provided or referenced in this manual.
- Characteristics, specifications and dimensions are subject to change without notice.
- While we make every effort to offer accurate information in the manual, we welcome your input. Should you find unclear descriptions, errors or omissions, please contact the nearest office.
- ***Orientalmotor*** is a registered trademark or trademark of Oriental Motor Co., Ltd., in Japan and other countries.
  CC-Link is a registered trademark of the CC-Link Partner Association.
  MECHATROLINK is a registered trademark of the MECHATROLINK Members Association.
  Other product names and company names mentioned in this manual may be registered trademarks or trademarks of their respective companies and are hereby acknowledged. The third-party products mentioned in this manual are recommended products, and references to their names shall not be construed as any form of performance guarantee. Oriental Motor is not liable whatsoever for the performance of these third-party products.

Published in July 2025

• Please contact your nearest Oriental Motor office for further information.

ORIENTAL MOTOR U.S.A. CORP.
Technical Support Tel:800-468-3982
8:30am EST to 5:00pm PST (M-F)

ORIENTAL MOTOR (EUROPA) GmbH
Schiessstraße 44, 40549 Düsseldorf, Germany
Technical Support Tel:00 800/22 55 66 22

ORIENTAL MOTOR (UK) LTD.
Blythe Valley Business Park,
Central Blvd Blythe Valley Park,
Solihull B90 8AG, United Kingdom
Tel:+44-1926-671220

ORIENTAL MOTOR (FRANCE) SARL
Tel:+33-1 47 86 97 50

ORIENTAL MOTOR ITALIA s.r.l.
Tel:+39-02-93906347

ORIENTAL MOTOR ASIA PACIFIC PTE. LTD.
Singapore
Tel:1800-842-0280

ORIENTAL MOTOR (MALAYSIA) SDN. BHD.
Tel:1800-806-161

ORIENTAL MOTOR (THAILAND) CO., LTD.
Tel:1800-888-881

ORIENTAL MOTOR (INDIA) PVT. LTD.
Tel:1800-120-1995 (For English)
1800-121-4149 (For Hindi)

TAIWAN ORIENTAL MOTOR CO., LTD.
Tel:0800-060708

SHANGHAI ORIENTAL MOTOR CO., LTD.
Tel:400-820-6516

INA ORIENTAL MOTOR CO., LTD.
Korea
Tel:080-777-2042

ORIENTAL MOTOR CO., LTD.
4-8-1 Higashiueno, Taito-ku, Tokyo
110-8536 Japan
Tel:+81-3-6744-0361
www.orientalmotor.co.jp/ja