MITSUBISHI ELECTRIC

CC-Link IE TSN

MR-JET Firmware Update Reference Manual

CONTENTS

1. OVERVIEW

The MR-JET series servo amplifier provides a firmware update function. This function allows the customer to update the firmware of the servo amplifier to the desired version. The firmware update requires a dedicated firmware update tool. For details, contact your local sales office.

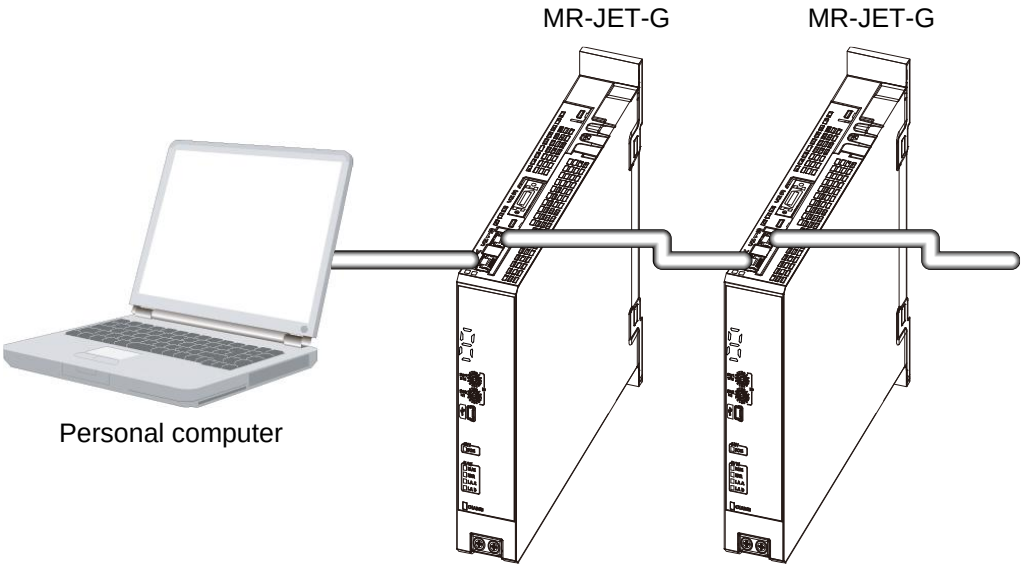


Fig. 1-1: Example of connection with servo amplifier

1.1. Compatible models

The following lists the models that are compatible with the firmware update.

- MR-JET-G

1.2. Firmware update procedure

The following shows the firmware update procedure. For details, refer to the applicable chapter.

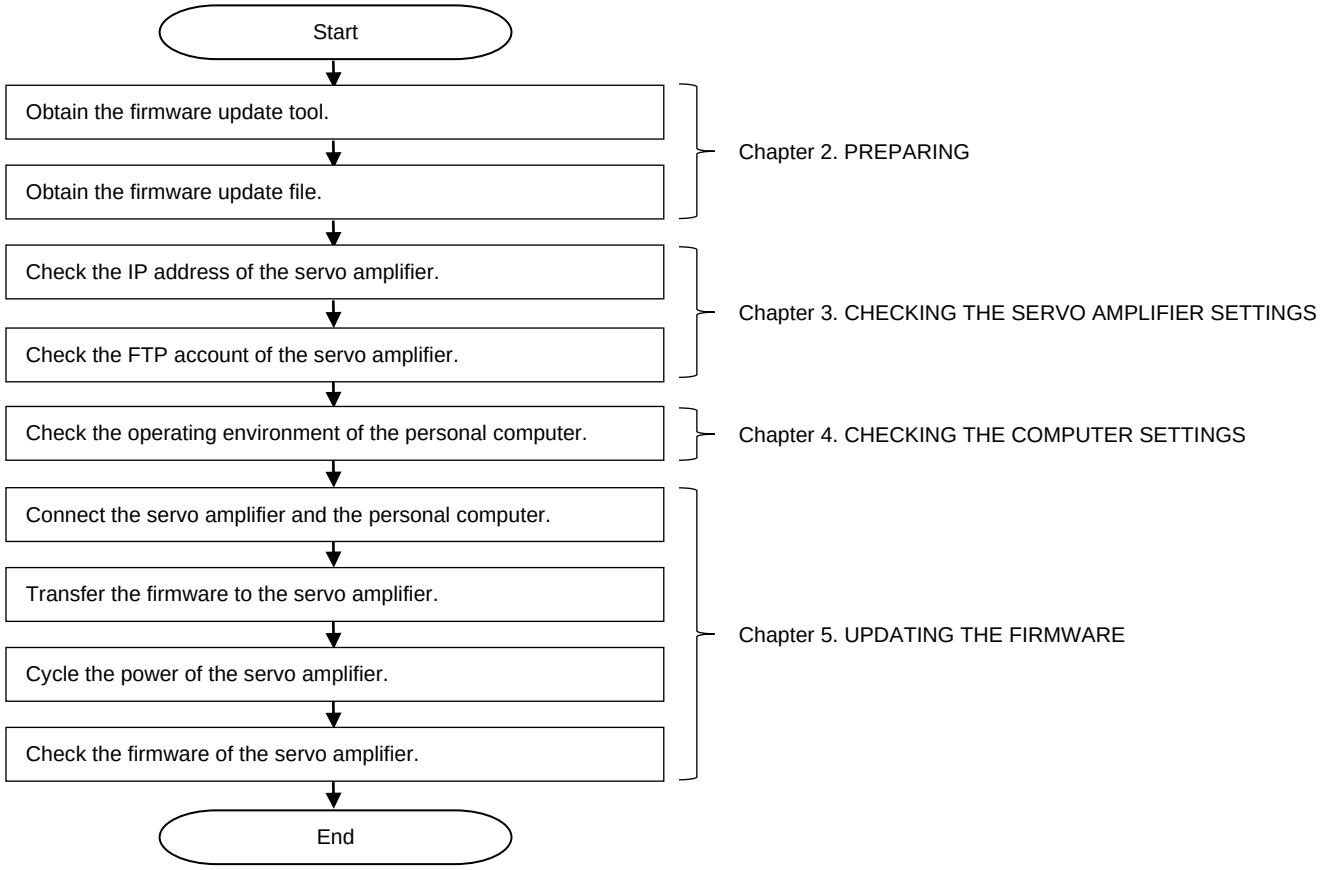


Fig. 1.2-1: Firmware update procedure

2. PREPARING

The firmware update requires a firmware update tool and firmware update file. Prepare the firmware update tool and firmware update file while referring to this chapter.

2.1. Firmware update tool

The firmware update requires the "CC-Link IE TSN Firmware Update Tool". Contact your local sales office to download the CC-Link IE TSN Firmware Update Tool. For details on the firmware update tool, refer to "CC-Link IE TSN Firmware Update Tool Reference Manual" included with the firmware update tool.

For details, contact your local sales office.

2.2. Firmware update file

The firmware update requires a firmware update file for the target model. Contact your local sales office to download the firmware update file. Firmware update files for each model are provided as a single compressed file. Download and decompress the compressed file that contains the firmware update file for the model to be updated.

For details, contact your local sales office.

3. CHECKING THE SERVO AMPLIFIER SETTINGS

Check the following settings of the servo amplifier to update the firmware.

- IP address
- FTP account

3.1. IP address

The IP address of the servo amplifier is used in Chapter 5 "UPDATING THE FIRMWARE". Check the IP address of the target servo amplifier. If the IP address needs to be set, refer to Chapter 6.

Point

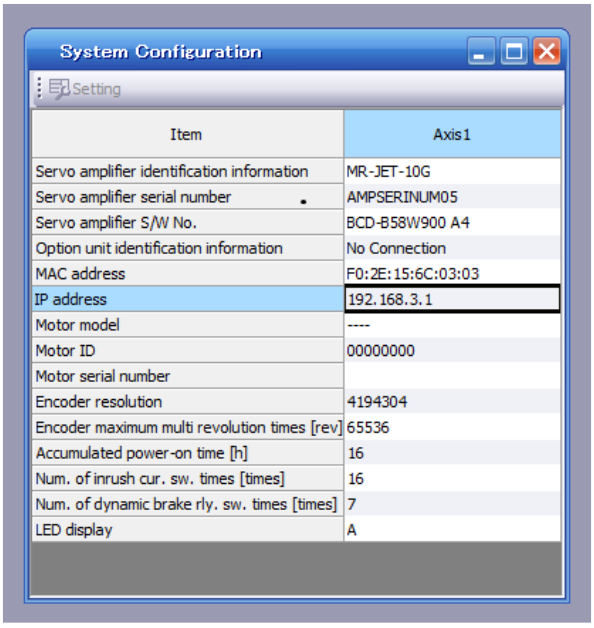
- The IP address setting is not required for servo amplifiers used in a CC-Link IE TSN system.
- If the same IP address is used for another device in the same network, the firmware update may not be possible.

3.1.1. Checking the IP address with MR Configurator2

Connect the servo amplifier and a personal computer, and select System Configuration from Diagnosis in MR Configurator2. The IP address of the servo amplifier is displayed.

Point

Some servo amplifier models and MR Configurator2 versions do not support the display of IP addresses. In such cases, check the IP address in the network basic parameters: [Pr. NPA01 IP address setting] and [Pr. NPA02 IP address]. For details on the parameters, refer to Chapter 6.



3.2 FTP account

The FTP account is used in Chapter 5 "UPDATING THE FIRMWARE". The following default account is provided as an FTP account for firmware updates.

Table 3.2-1: FTP account for firmware updates (default account)

Item	Value
User name	user
Password	user

Point

- The FTP account can be changed. Refer to Chapter 7 if the FTP account needs to be set.
- Refer to Section 7.1 for prohibiting firmware updates performed by the default account.

3.3. Communication speed

The servo amplifier communication speed can be checked with [Pr. NPA12 Communication speed] (network basic parameter).
[Pr. NPA12] is set to "network automatic setting" from the factory, and the communication speed is shown below. Set [Pr. NPA12] as required.

Table 3.3-1: Parameter details (communication speed)

Setting value	Communication speed
00000001	100 Mbps
00000002 (initial state)	Network automatic setting

Model	Communication speed when "network automatic setting" is used
• MR-JET-_G_	Depending on the setting value of [Pr. PN13.0-3 Network protocol setting], the communication speed is either of the following: 0000h (CC-Link IE TSN) (initial value): 1 Gbps 0004h (CC-Link IE Field Network Basic): 100 Mbps

4. CHECKING THE PERSONAL COMPUTER SETTINGS

To use the firmware update tool, the personal computer settings need to be checked. For details, refer to "Operating environment" in the CC-Link IE TSN Firmware Update Tool Reference Manual.

5. UPDATING THE FIRMWARE

This chapter describes the procedure for updating the firmware of the servo amplifier. When updating the firmware of the servo amplifier, the CC-Link IE TSN Firmware Update Tool is used to transfer the firmware. After the firmware has been transferred, the firmware update starts when the power of the servo amplifier is cycled. After the firmware update is completed, confirm that the firmware of the servo amplifier has been updated.

5.1. Connecting the servo amplifier and the personal computer

Connect the servo amplifier to the personal computer by using an Ethernet cable. For the servo amplifier, connect the Ethernet cable to the Ethernet cable connector listed below. Connect the servo amplifier to the personal computer directly via the Ethernet cable or through a switching hub.

Table 5.1-1: Ethernet cable connector

Model	Ethernet connector
MR-JET-G	CN1A, CN1B

Point

For the models compatible with the CC-Link IE TSN network, configure the network as listed below.

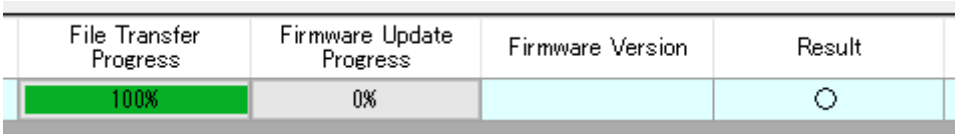
- Line connection
- Star connection
- Line/star mixed connection

5.2 Transferring the firmware

Transfer the firmware to the servo amplifier by using the CC-Link IE TSN Firmware Update Tool. For details on the procedure, refer to "Firmware update procedure" in the CC-Link IE TSN Firmware Update Tool Reference Manual. When the transfer of the firmware is completed, "○" is displayed in the result field.

Point

The firmware update for the servo amplifier starts when the power of the servo amplifier is cycled after the firmware has been transferred. Therefore, when the firmware transfer is completed, "0 %" is displayed in the firmware update progress field.

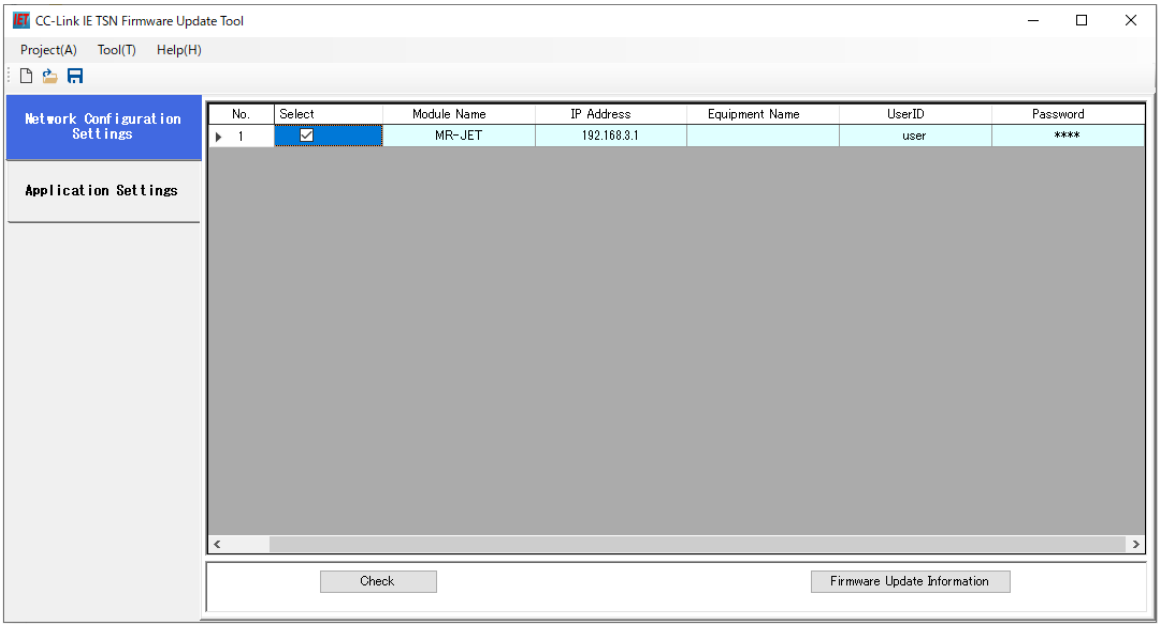


5.2.1. Setting the network configuration screen

Set the following items in the network configuration screen.

Table 5.2-1: List of setting items in the network configuration screen

Item	Setting
Module Name	Set the model of the servo amplifier whose firmware is being updated.
IP Address	Set the IP address of the servo amplifier whose firmware is being updated.
Device Name	This item is optional.
FTP Username	Set the user name of the FTP account that is set for the servo amplifier whose firmware is being updated. "user" is set for the default account.
FTP Password	Set the password of the FTP account that is set for the servo amplifier whose firmware is being updated. "user" is set for the default account.



5.3 Firmware update

After the firmware transfer is completed, cycle the power of the servo amplifier. The firmware update starts after the power is cycled. During the firmware update, the update status is displayed on the 7-segment LED. After the update is completed, the servo amplifier starts with the updated firmware.

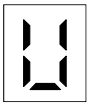
Point

When downgrading the firmware version of the servo amplifier, the functionality cannot be guaranteed. When the firmware version has been downgraded, be sure to reset the settings to the factory settings. "MR Mode Change" can be used to reset the servo amplifier to the factory settings. For the usage of MR Mode Change, refer to Help of MR Configurator2.

5.3.1. Display of 7-segment LED during firmware update

During the firmware update, "U" is displayed in the 7-segment LED.

Table 5.3-1: Display on the 7-segment LED (during firmware update)

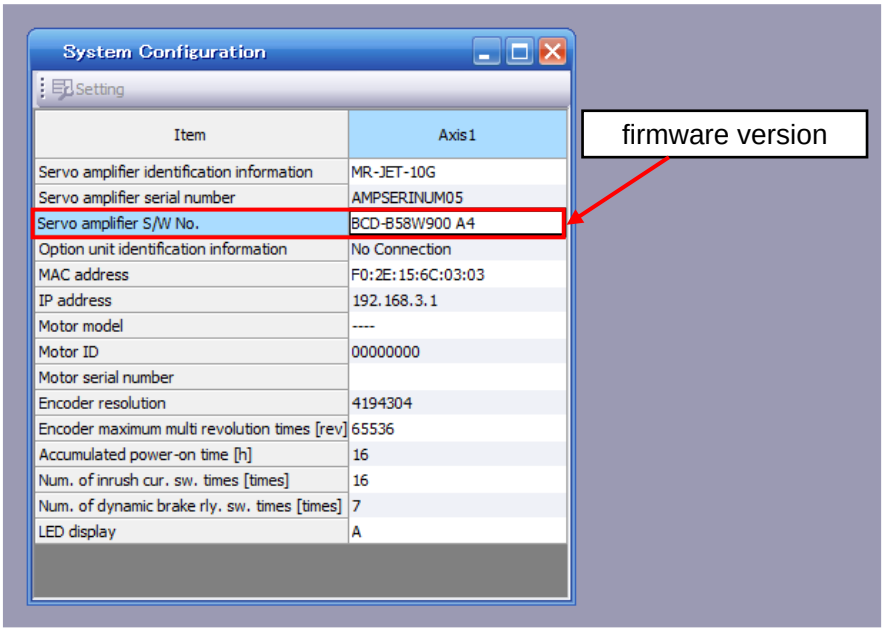
Type of 7-segment LED	Display
7-segment LED	

5.4. Checking the firmware update

After the firmware update is completed, confirm that the firmware of the servo amplifier has been updated. Check the firmware update with the firmware version.

5.4.1. Checking the firmware version with MR Configurator2

Connect the servo amplifier and a personal computer, and select "System Configuration" from "Diagnosis" in MR Configurator2. The firmware version of the servo amplifier is displayed.



6. SETTING THE IP ADDRESS

The IP address of the servo amplifier can be set. The IP address is set with the network basic parameters. This chapter describes IP address-related parameters.

6.1. Details of IP address-related parameters

The following table shows the parameters required for setting the IP address.

Table 6.1-1: Parameter specifications list (related to IP addresses)

Parameter	Initial value
[Pr. NPA01 IP address setting]	0
[Pr. NPA02 IP address]	192.168.3.1
[Pr. NPA04 Subnet mask]	255.255.255.0

6.1.1. [Pr. NPA01 IP address setting]

For the IP address setting, select whether to use the rotary switches on the servo amplifier or use the parameters. After setting this parameter, cycle the power or reset the software to enable it.

Table 6.1-2: Parameter details (IP address setting)

Setting value	Rotary switches (SW1/SW2)	IP address of the servo amplifier
0: Rotary switches are used.	00h	Setting value of [Pr. NPA02 IP address]
	01h to FEh	1st octet: Setting value of [Pr. NPA02 IP address] 2nd octet: Setting value of [Pr. NPA02 IP address] 3rd octet: Setting value of [Pr. NPA02 IP address] 4th octet: Setting value of the rotary switches
	FFh	Not used
1: Parameters are used.	-	Setting value of [Pr. NPA02 IP address]

6.1.2. [Pr. NPA02 IP address]

This parameter can set the IP address of the servo amplifier. After setting this parameter, cycle the power or reset the software to enable it.

6.1.3. [Pr. NPA04 Subnet mask]

This parameter can set the subnet mask of the servo amplifier. After setting this parameter, cycle the power or reset the software to enable it.

7. SETTING THE FTP ACCOUNT

A new FTP account can be set for the servo amplifier. The FTP account is set with the user authentication parameters. This chapter describes the FTP account.

7.1. Default account

In the factory setting, the initial values are set to user information No.1 as a default account.

Table 7.1-1: Parameter initial values (default account)

Parameter	Initial value
[Pr. NPB04 User name No.1]	user
[Pr. NPB05 Authorization level No.1]	00000001
[Pr. NPB06 Password No.1]	user

Point

Use of the default account can be prohibited by changing the parameters of user information No.1.

7.2. Details of FTP account parameters

Up to eight FTP accounts can be set (user information No.1 to No.8). One or more account needs to be set to perform the firmware update. The following lists the parameters corresponding to each account.

Table 7.2-1: List of parameter specifications (related to the FTP account)

Account	User name	Authorization level	Password
User information No.1	[Pr. NPB04]	[Pr. NPB05]	[Pr. NPB06]
User information No.2	[Pr. NPB07]	[Pr. NPB08]	[Pr. NPB09]
User information No.3	[Pr. NPB10]	[Pr. NPB11]	[Pr. NPB12]
User information No.4	[Pr. NPB13]	[Pr. NPB14]	[Pr. NPB15]
User information No.5	[Pr. NPB16]	[Pr. NPB17]	[Pr. NPB18]
User information No.6	[Pr. NPB19]	[Pr. NPB20]	[Pr. NPB21]
User information No.7	[Pr. NPB22]	[Pr. NPB23]	[Pr. NPB24]
User information No.8	[Pr. NPB25]	[Pr. NPB26]	[Pr. NPB27]

7.2.1. User name

The user name can be set for each account. Set the user name within the following limits. An account with a blank user name (0 characters) is considered invalid. No firmware updates can be performed with an invalid account.

Table 7.2-2: Number of characters that can be set and character type list (user name)

Number of characters	1 to 32
Character types	• Single-byte English letters (uppercase) • Single-byte English letters (lowercase) • Single-byte numbers

Point

If the same user name is set for multiple accounts, those accounts may be unusable. Ensure that there are no duplicated user names.

7.2.2. Authorization level

The authorization level can be set for each account. Set the authorization level to permit the firmware update. The following table explains the details of the authorization level. If [Pr. NPB05 Authorization level No.1] is set to "00000001", the account of user information No.1 can perform the firmware update.

Table 7.2-3: Parameter details (authorization level)

Setting digit (HEX)	Setting digit (BIN)	Details
[Pr. NPB05.0] (*1)	_ _ _ x	Firmware update permission selection 0: Prohibit 1: Permit
	_ _ x _	These are for manufacturer setting. Do not change these settings.
	_ x _ _	
	x _ _ _	

*1: The details of the following parameters are the same as for [Pr. NPB05 Authorization level No.1].

- [Pr. NPB08 Authorization level No.2]
- [Pr. NPB11 Authorization level No.3]
- [Pr. NPB14 Authorization level No.4]
- [Pr. NPB17 Authorization level No.5]
- [Pr. NPB20 Authorization level No.6]
- [Pr. NPB23 Authorization level No.7]
- [Pr. NPB26 Authorization level No.8]

7.2.3. Password

The password can be set for each account. Set the password within the following limits.

Table 7.2-4: Number of characters that can be set and character type list (password)

Number of characters	4 to 32
Character types	• Single-byte English letters (uppercase) • Single-byte English letters (lowercase) • Single-byte numbers • Special characters (*1) *1: The special characters are ` ~ ! @ # $ % ^ & * ( ) _ + - = { } | \ : " ; ' < > ? , . / [ ] (single-byte space).

7.3. Prohibiting FTP account setting via Ethernet

Setting the user authentication parameter via the Ethernet can be prohibited. To prohibit setting the user authentication parameter via the Ethernet, set [Pr. NPB01 User authentication and authorization setting] to "1". This prohibits setting the FTP account via the Ethernet.

Table 7.3-1: Parameter details (user authentication and authorization setting)

Parameter	Setting value	Details
[Pr. NPB01 User authentication and authorization setting]	0	Full access allowed: User authentication parameters can be set via USB or Ethernet.
	1	USB only: User authentication parameters can be set only via USB.

Point

- For USB connections, the FTP account can be set regardless of the setting value of [Pr. NPB01 User authentication and authorization setting].
- If [Pr. NPB01] is set to "1", [Pr. NPB01] cannot be changed via Ethernet. To return [Pr. NPB01] to "0", use a USB connection.

8. TROUBLESHOOTING

If an error occurs during a firmware update, check the descriptions in this chapter.

8.1. If the firmware update cannot be performed with the default account

The default account may be changed or disabled. Set a new FTP account and perform the firmware update using the new account. Refer to Chapter 7 for information on FTP settings.

8.2. If the update status is not displayed on the 7-segment LED when updating the firmware

The firmware update file may be corrupted. Confirm that the firmware update file is correct for the target model and transfer the file again.

8.3. If an alarm occurs after completing the firmware update

If an alarm occurs after completing the firmware update, check the following items. For details on other alarms, refer to "MR-JET User's Manual (Troubleshooting)".

8.3.1. [AL. 037 Parameter error]

Table 8.3-1: Alarm details (parameter error)

Alarm	Cause	Action
[AL. 037.1 Parameter setting range error]	The firmware is not compatible with the parameters.	Reset the settings to the factory settings or update the firmware to a compatible version.
[AL. 037.2 Parameter combination error]		
[AL. 037.7 Network parameter setting error]		

8.3.2. [AL. 017 Board error]

Table 8.3-2: Alarm details (board error)

Alarm	Cause	Action
[AL. 017.4 Board error 3]	The servo amplifier is not compatible with the firmware.	The firmware is not compatible. Perform a firmware update to return the firmware to the version before the update.
[AL. 017.7 Board error 7]		

Revisions

Revision date	Version	Description
June 2020	BCN-B62005-987-A	First edition
July 2021	BCN-B62005-987-B	Added Section 3.3.