

mitsubishi

General Purpose AC Servo

MELSERVO-J2-A

Communication Function Operating Installation Guide

CONTENTS

| | |
|---|-----------------------|
| 1. COMMUNICATIONS | 1 - 1 |
| 1.1 Introduction | 1 - 1 |
| 1.2 Electrical Characteristics | 1 - 1 |
| 1.3 Communication Protocol | 1 - 1 |
| 2. CABLE CONNECTION | 2 - 1 - 2 - 2 |
| 2.1 Connector Pins and Signals | 2 - 1 |
| 2.2 Fabrication of Communication Cable | 2 - 1 |
| 2.2.1 Configuration diagram | 2 - 1 |
| 2.2.2 Precautions for wiring | 2 - 1 |
| 2.2.3 Connection diagram | 2 - 2 |
| 3. BASIC PROTOCOL | 3 - 1 - 3 - 5 |
| 3.1 Frames | 3 - 1 |
| 3.2 Character Codes | 3 - 1 |
| 3.3 Send and Receive Data Format | 3 - 2 |
| 3.3.1 Reading data from the slave | 3 - 2 |
| 3.3.2 Writing data to the slave | 3 - 2 |
| 3.4 Checksum | 3 - 3 |
| 3.5 Retry and Time-Out Processings | 3 - 3 |
| 3.5.1 Reply contains an error code | 3 - 4 |
| 3.5.2 No reply (for longer than 300ms) | 3 - 4 |
| 3.6 Initializing | 3 - 5 |
| 3.7 Communication Procedure Example | 3 - 5 |
| 4. COMMUNICATION COMMANDS | 4 - 1 - 4 - 4 |
| 4.1 Read Commands | 4 - 1 |
| 4.2 Write Commands | 4 - 3 |
| 5. COMMANDS USED WITH SPECIFIC FUNCTIONS | 5 - 1 - 5 - 12 |
| 5.1 Communication Procedure | 5 - 1 |
| 5.2 Status Display | 5 - 2 |
| 5.2.1 Status display read | 5 - 2 |
| 5.2.2 Status display data clear | 5 - 3 |
| 5.3 Diagnostic | 5 - 3 |
| 5.3.1 External I/O signal states | 5 - 3 |
| 5.3.2 Alarm history read | 5 - 4 |
| 5.3.3 Alarm history clear | 5 - 4 |
| 5.3.4 Test operation mode | 5 - 5 |
| 5.4 Current Alarm | 5 - 9 |
| 5.4.1 Current alarm read | 5 - 9 |
| 5.4.2 Status display data at alarm occurrence | 5 - 9 |
| 5.4.3 Current alarm reset | 5 - 10 |

| | |
|-----------------------------|--------------|
| 5.5 Parameters | 5 - 11 |
| 5.5.1 Parameter read | 5 - 11 |
| 5.5.2 Parameter write | 5 - 12 |
| 6. ERROR CODES | 6 - 1 |

1. COMMUNICATIONS

1. COMMUNICATIONS

1.1 Introduction

When used for communications, the MELSERVO-J2 series is designed to reply to an instruction received. A device which gives this instruction (personal computer or other computer) is called a master and a device which replies to the instruction (MR-J2-A servo amplifier) is called a slave. To fetch data consecutively, the master repeats a data request command.

1.2 Electrical Characteristics

The signal voltage levels, High/Low definitions, communication speed, etc. are defined below. In this communication function, the signal level conforms to the international standard RS-232C. The servo amplifier can be connected with a master marked "RS-232C" or "in conformance with RS-232C".

| Item | Description |
|---------------------------------------|--|
| Slave's communication connector (CN3) | Half-pitch 20 pins |
| Signal level | Conforms to RS-232C. |
| Baudrate | 9600/19200bps, asynchronous |
| Start bit | 1 bit |
| Data length | 8 bits |
| Parity | Even |
| Stop bit | 1 bit |
| Transfer system | Character method Variable frame Half-duplex communication |
| Functions | Operating status monitoring, servo diagnostic, alarm data read, parameter read/write, test operation |

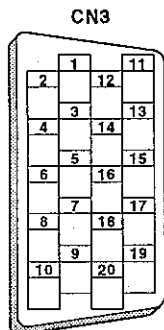
1.3 Communication Protocol

The protocol used in this communication function is dedicated to the MELSERVO-J2 series and cannot be altered. A program which will match this protocol should be created on the master side.

2. CABLE CONNECTION

2. CABLE CONNECTION

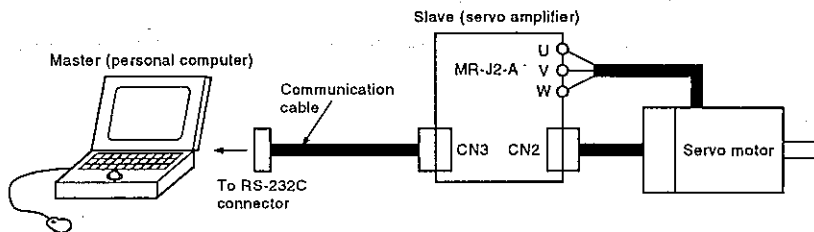
2.1 Connector Pins and Signals



| Pin Number | Signal Name | I/O | Application |
|------------|-------------|-----|---|
| 1 | GND | | Control common |
| 2 | RXD | I | Receive data |
| 3 to 10 | Reserved | | Used for other purpose than RS-232C communication |
| 11 | GND | | Control common |
| 12 | TXD | O | Send data |
| 13 to 20 | Reserved | | Used for other purpose than RS-232C communication |
| Plate | FG | | Grounding for shield |

2.2 Fabrication of Communication Cable

2.2.1 Configuration diagram



2.2.2 Precautions for wiring

Use the optional communication cable (MR-CPC98CBL3M or MR-CP-CATCBL3M) for connection of the slave and master. When fabricating the cable, refer to Section 2.2.3 and note the following:

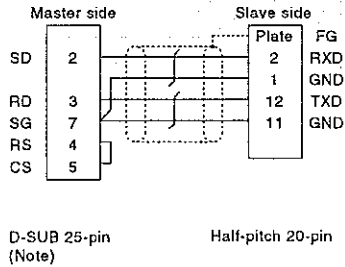
- 1) Always use a multi-core shielded cable and connect the shield to FG of the slave securely.
- 2) The wiring distance is 15m maximum in offices or the like where noise influence is minimal. The cable used should be as short as possible.

2. CABLE CONNECTION

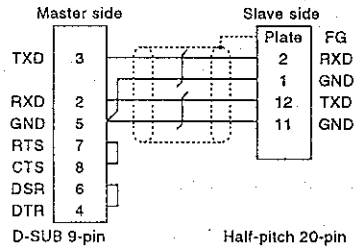
2.2.3 Connection diagram

| Communication cable | Connector | |
|---------------------|------------------------------------|--|
| | Master side (Personal computer) | Slave side (Servo amplifier) |
| MR-CPC98CBL3M | Honda Tsushin make GM-25LM | 3M make 10120-6000EL (connector) 10320-3210-0000 (shell kit) |
| MR-CPCATCBL3M | Honda Tsushin make GM-9LM | |

• MR-CPC98CBL3M



• MR-CPC98CBL3M



Note: Some PC98 Notes have the half-pitch 14-pin connectors. Check the RS-232C connector shape of your personal computer.

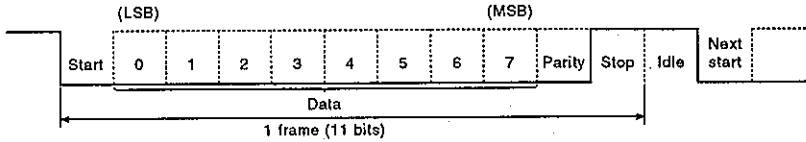
3. BASIC PROTOCOL

3. BASIC PROTOCOL

3.1 Frames

Communication protocols are classified into a fixed frame length format and a variable frame length format. In the variable frame length format, a send data length may be transmitted as part of data at the beginning of communication or a control code may be used as a terminator. The MELSERVO-J2 series uses the variable frame length format with a control code.

A frame means a single character of control code, instruction, data or the like, and consists of 11 bits as shown below:



3.2 Character Codes

The characters are defined in ASCII as listed below:

| HEX | HEX | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-----|------|----------|------|----------|----------|---------|---------|----------|------------|
| HEX | BIN | 0000 | 0001 | 0010 | 0011 | 0100 | 0101 | 0110 | 0111 |
| 0 | 0000 | NUL 0 | | SP 32 | 0 48 | ⌀ 64 | P 80 | ' 96 | p 112 |
| 1 | 0001 | SOH 1 | | ! | 1 49 | A 65 | Q 81 | a 97 | q 113 |
| 2 | 0010 | STX 2 | | " | 2 50 | B 66 | R 82 | b 98 | r 114 |
| 3 | 0011 | ETX 3 | | # | 3 51 | C 67 | S 83 | c 99 | s 115 |
| 4 | 0100 | EOT 4 | | \$ | 4 52 | D 68 | T 84 | d 100 | t 116 |
| 5 | 0101 | | 5 | % | 5 53 | E 69 | U 85 | e 101 | u 117 |
| 6 | 0110 | | 6 | & | 6 54 | F 70 | V 86 | f 102 | v 118 |
| 7 | 0111 | | 7 | ' | 7 55 | G 71 | W 87 | g 103 | w 119 |
| 8 | 1000 | | 8 | (| 8 56 | H 72 | X 88 | h 104 | x 120 |
| 9 | 1001 | | 9 |) | 9 57 | I 73 | Y 89 | i 105 | y 121 |
| A | 1010 | | 10 | * | 10 58 | J 74 | Z 90 | j 106 | z 122 |
| B | 1011 | | 11 | + | 11 59 | K 75 | [91 | k 107 | { 123 |
| C | 1100 | | 12 | , | 12 60 | L 76 | \ 92 | l 108 | 124 |
| D | 1101 | | 13 | - | 13 61 | M 77 |] 93 | m 109 | } 125 |
| E | 1110 | | 14 | . | 14 62 | N 78 | ^ 94 | n 110 | ~ 126 |
| F | 1111 | | 15 | / | 15 63 | O 79 | _ 95 | o 111 | DEL 127 |

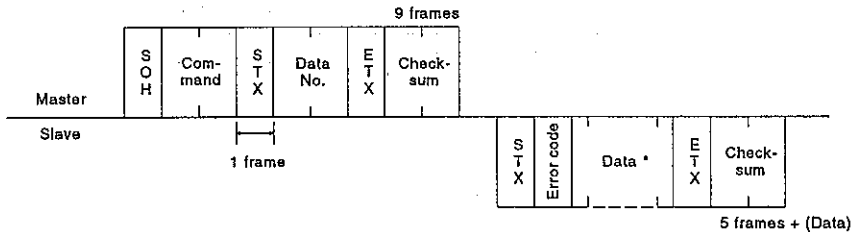
3. BASIC PROTOCOL

As data delimiters, the control codes are defined as follows:

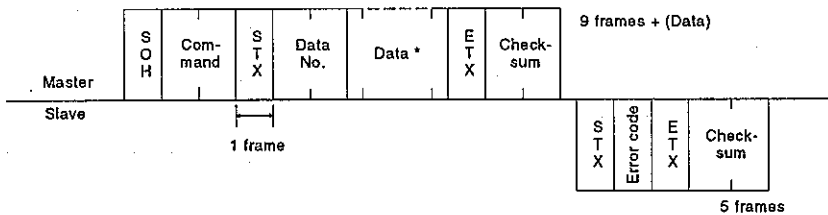
| Code Name | Hexadecimal (ASCII code) | Contents | Conventional Key Operations at a Personal Computer or Terminal |
|-----------|--------------------------|--|--|
| SOH | 01H | start of header (Communication start) | ctrl + A |
| STX | 02H | start of text (Text start) | ctrl + B |
| ETX | 03H | end of text (Text end) | ctrl + C |
| EOT | 04H | end of transmission (Communication interruption) | ctrl + D |

3.3 Send and Receive Data Format

3.3.1 Reading data from the slave



3.3.2 Writing data to the slave

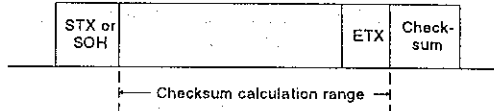


Note: Select the data length from among 4, 8, 12 and 16 frames. (The data length depends on the command.)

3. BASIC PROTOCOL

3.4 Checksum

A checksum is required at the end of send data from the master. Since a checksum is also appended to receive data from the slave, use it to check for an error in the receive data. To find a checksum to be appended, the hexadecimal numbers of character codes between the one following the first control code and ETX are summed, and the two least significant digits of the sum are converted into hexadecimal.



(Example)

| | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------|-----|
| S | [A] | [1] | [3] | [C] | [E] | [1] | [A] | [2] | [3] | E | [0] | [4] |
| T | | | | | | | | | | X | | |
| X | | | | | | | | | | | | |
| 02H | 41H | 31H | 33H | 43H | 45H | 31H | 41H | 32H | 33H | 03H | 30H | 34H |
| | | | | | | | | | | | Checksum | |

Checksum calculation:

```

41H
+ 31H
+ 33H
+ 43H
+ 45H
+ 31H
+ 41H
+ 32H
+ 30H
+ 03H
-----
204H
  |
  |
[0] [4]
30H 34H
    
```

3.5 Retry and Time-Out Processings

The slave may not reply to an instruction from the master if:

- 1) The communication cable is broken or the connector is not in proper contact; or
- 2) Control code STX or ETX is not received.

As the problem in 2) may be solved by repeating the instruction, make retries. If the problem still persists after three retries, the communication path has a problem. In this case, perform time-out processing to suspend communication.

3. BASIC PROTOCOL

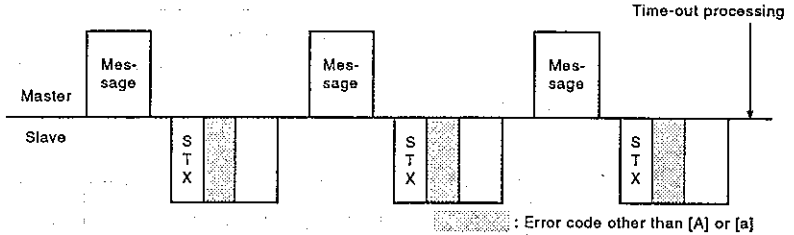
3.5.1 Reply contains an error code

<Factor>

- 1) The command or data returned contains an unrecognizable character code.
- 2) Error was detected in parity check.
- 3) Checksum error.
- 4) Data or data No. received does not exist in the specifications.

<Action>

Make retries since the error code in the data returned is a negative acknowledge code (B to F, b to f).



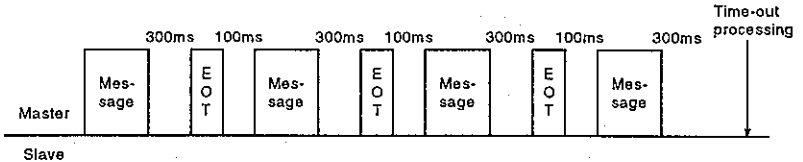
3.5.2 No reply (for longer than 300ms)

<Factor>

- 1) The command or data sent has not reached.
- 2) The control code as a terminator is not recognized by the slave and the master judged that the slave did not receive the entire message.

<Action>

The slave may be in the receive mode. If a command or data is sent in this mode, the slave cannot recognize it properly. Transmit EOT once to place the slave in the receive neutral mode, and then make retries. Each retry should be made 100ms after EOT has been sent.



3. BASIC PROTOCOL

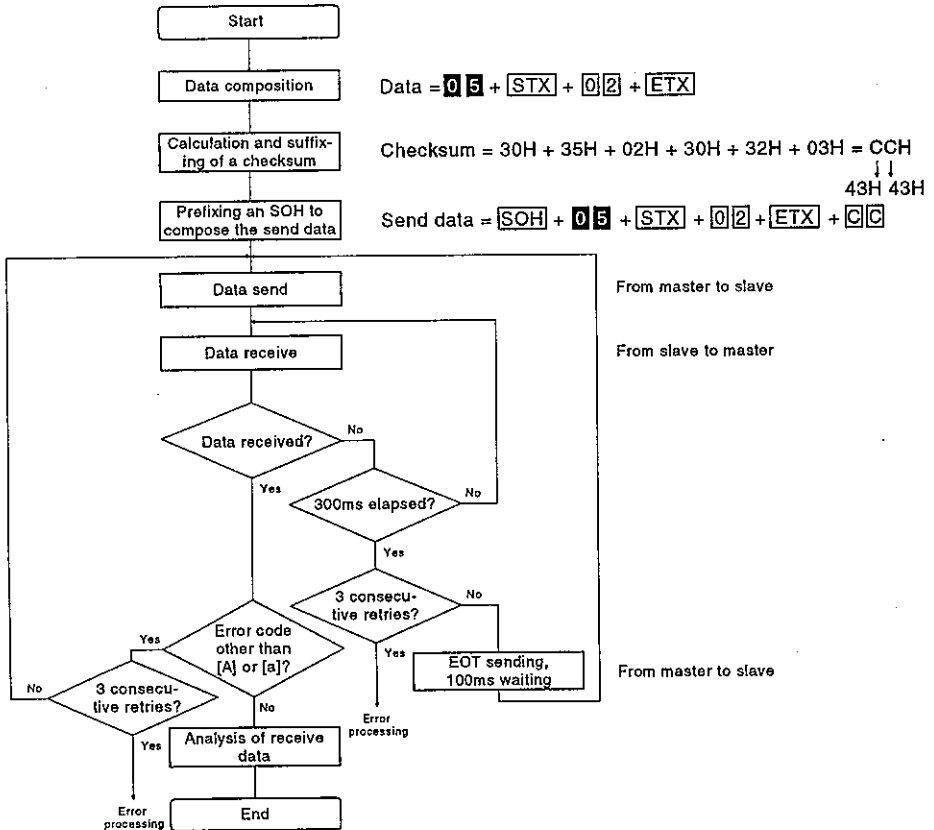
3.6 Initializing

After the slave is switched on, it cannot reply to any communication until internal initialization processing finishes. Hence, when the slave has been switched on, normal communication should be started after:

- 1) More than 1s has elapsed after the slave was switched on; or
- 2) Performing parameter read or other operation, which will not pose a problem to safety, to ensure that communication may be made properly. (In this case, use the method described in Section 3.5.2.)

3.7 Communication Procedure Example

The following example assumes that command **05** and data No. **02** are used to read the value set for auto tuning in parameter No. 2 on the MR-J2-A servo amplifier.



4. COMMUNICATION COMMANDS

| Command | Data No. | Description | Frame Length |
|---------|----------|---|--------------|
| 33 | 10 | Alarm number in alarm history (first alarm in the past) | 4 |
| 33 | 11 | Alarm number in alarm history (second alarm in the past) | 4 |
| 33 | 12 | Alarm number in alarm history (third alarm in the past) | 4 |
| 33 | 13 | Alarm number in alarm history (fourth alarm in the past) | 4 |
| 33 | 14 | Alarm number in alarm history (fifth alarm in the past) | 4 |
| 33 | 15 | Alarm number in alarm history (sixth alarm in the past) | 4 |
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| 33 | 20 | Time of alarm occurrence alarm history (first alarm in the past) | 4 |
| 33 | 21 | Time of alarm occurrence alarm history (second alarm in the past) | 4 |
| 33 | 22 | Time of alarm occurrence alarm history (third alarm in the past) | 4 |
| 33 | 23 | Time of alarm occurrence alarm history (fourth alarm in the past) | 4 |
| 33 | 24 | Time of alarm occurrence alarm history (fifth alarm in the past) | 4 |
| 33 | 25 | Time of alarm occurrence alarm history (sixth alarm in the past) | 4 |
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| 35 | 80 to 8C | Data value and processing information of status display at alarm occurrence | 12 |
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4. COMMUNICATION COMMANDS

4.2 Write Commands

| Command | Data No. | Description | Setting Range | Frame Length |
|---------|----------|---|-------------------------------------|--------------|
| 81 | 00 | Status display data clear | 1EA5 | 4 |
| 82 | 00 | Alarm reset | 1EA5 | 4 |
| 82 | 20 | Alarm history clear | 1EA5 | 4 |
| 84 | 00 to 31 | Write of corresponding parameters (the decimal numbers in data No. correspond to the parameter numbers) | Aries according to parameter number | 8 |
| 8B | 00 | Test operation mode selection | 0000 to 0004 | 4 |
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4. COMMUNICATION COMMANDS

| Command | Data No. | Description | Setting Range | Frame Length |
|---------|----------|--|---------------------------|--------------|
| 90 | 00 | External input signal inhibit | 1EA5 | 4 |
| 90 | 03 | External output signal inhibit | 1EA5 | 4 |
| 90 | 10 | External input signal inhibit cancel | 1EA5 | 4 |
| 90 | 13 | External output signal inhibit cancel | 1EA5 | 4 |
| 92 | 00 | Input signals for test operation | | 8 |
| 92 | A0 | Forced output of signal pins | | 8 |
| A0 | 10 | Test operation mode speed data write | 0000 to permissible speed | 4 |
| A0 | 11 | Test operation mode acceleration/deceleration time constant write | 00000000 to 00004E20 | 8 |
| A0 | 12 | Test operation mode acceleration/deceleration time constant cancel | 1EA5 | 4 |
| A0 | 13 | Test operation mode travel amount write | 80000000 to 7FFFFFFF | 8 |
| A0 | 15 | Temporary stop for test operation mode | 1EA5 | 4 |
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5. COMMANDS USED WITH SPECIFIC FUNCTIONS

5. COMMANDS USED WITH SPECIFIC FUNCTIONS

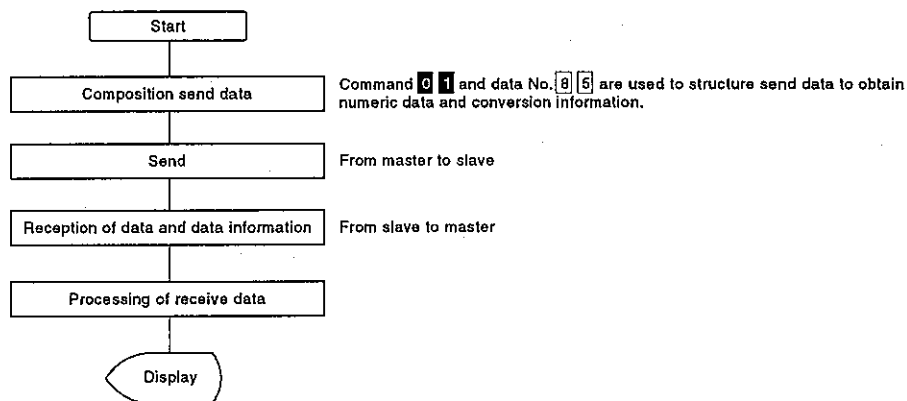
5.1 Communication Procedure

When "command + data No." or "command + data No. + data" are transmitted from the master to the slave, the servo amplifier returns a reply or data according to the intended purpose. These send and receive data include numeric information on decimal, hexadecimal or other representation.

Receive data used are data whose numerical values have been converted and decimal point positions have been processed. Send data to be transmitted should have been processed according to this rule.

Example:

To obtain data used to show the analog speed command voltage [V] on the CRT of the master.



If the display type is 0, 8-character hexadecimal data is converted into a decimal number and a decimal point is placed according to the decimal point position information.

If the display type is 1, the 8-character data remains unchanged.

Example:

If receive data is **00000929H**

00000929H is converted into 2345. As the decimal point position is 3 (third least significant digit), 23.45 is displayed.

Whether data needs processing or not and its processing method depend on the monitor, parameter, etc. Refer to the corresponding detailed explanation.

Data **□□□□** in the following description means the frame shown in Section 3.3.

The frames marked **□** in the data are meaningless.

5. COMMANDS USED WITH SPECIFIC FUNCTIONS

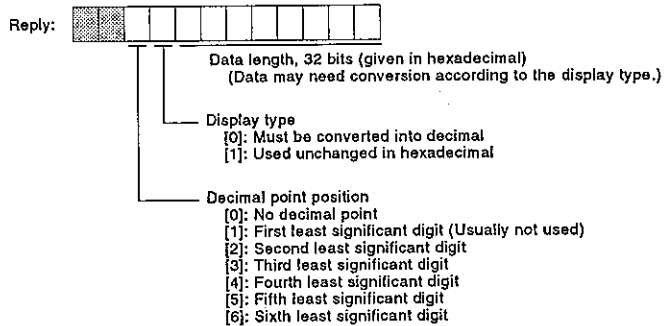
5.2 Status Display

5.2.1 Status display read

Status display data is read. For status display data, its data value and data processing information are returned when the data No. (for assignment, refer to the table below) is transmitted.

Command Data No. Data No.
01 **80** to **8C** : Data value and processing information of status display

The data value is read in hexadecimal. Data is displayed in hexadecimal or in decimal after conversion, and may include a decimal point. Whether hexadecimal data has been converted into decimal or not and the decimal point position command are indicated as follows:



Data No. Assignment Table

| Data No. | Monitored Data |
|----------|---------------------------------------|
| 80 | Cumulative feedback pulses |
| 81 | Motor speed |
| 82 | Droop pulses |
| 83 | Cumulative command pulses |
| 84 | Command pulse frequency |
| 85 | Analog speed command (limit) voltage |
| 86 | Analog torque command (limit) voltage |
| 87 | Regenerative load ratio |
| 88 | Effective load ratio |
| 89 | Peak load ratio |
| 8A | Within-one-revolution position |
| 8B | ABS counter |
| 8C | Load inertia moment rate |

5. COMMANDS USED WITH SPECIFIC FUNCTIONS

5.2.2 Status display data clear

Command Data No.
8 1 **0 0** : Status display data clear

Clears the cumulative command pulses or cumulative feedback pulses of the status display. Send this command immediately after reading the corresponding status display item. Only the status display item sent is cleared and its data is reset to zero.

Send data: **1 E A 5**

Example:

After sending command **0 1**, data No. **8 0** and receiving its information, transmit command **8 1**, data No. **0 0** and send data **1 E A 5** to reset the cumulative feedback pulse value to zero.

5.3 Diagnostic

5.3.1 External I/O signal states

The ON/OFF states of the external I/O pins are read.

Command Data No.
1 2 **4 0** : External input pin states

Reply:

| | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

 Command for each bit is sent to the slave in hexadecimal.

0: OFF 1:ON

| bit | External Input Pin |
|-----|--------------------|
| 0 | CN1B-16 |
| 1 | CN1B-17 |
| 2 | CN1B-15 |
| 3 | CN1B-5 |
| 4 | CN1B-14 |

| bit | External Input Pin |
|-----|--------------------|
| 5 | CN1A-8 |
| 6 | CN1B-7 |
| 7 | CN1B-8 |
| 8 | CN1B-9 |
| | |

Command Data No.
1 2 **C 0** : External output pin states

Reply:

| | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

 Command for each bit is sent to the slave in hexadecimal.

0: OFF 1:ON

| bit | External Output Pin |
|-----|---------------------|
| 0 | CN1A-19 |
| 1 | CN1A-18 |
| 2 | CN1B-19 |
| 3 | CN1B-6 |
| 4 | CN1B-4 |

| bit | External Output Pin |
|-----|---------------------|
| 5 | CN1B-18 |
| 6 | CN1A-14 |
| | |
| | |

5. COMMANDS USED WITH SPECIFIC FUNCTIONS

5.3.2 Alarm history read

The history of alarms which occurred in the past are read.
Alarm numbers and occurrence times of alarms No. 0 (the latest alarm) to No. 5 (sixth alarm in the past) are read.

Command Data No. Data No.

3 3 to : Alarm number in alarm history

Provides the alarm number corresponding to the data No. (Refer to Section 4.1.)

Reply:

The alarm number is transferred in decimal.

Example:
Data 0032 for A.32
Data 00FF for A.--

Command Data No. Data No.

3 3 to : Alarm occurrence time in alarm history

Provides the time when the alarm corresponding to the data No. occurred after the start of operation in terms of total time truncated to the hour unit. (Refer to Section 4.1.)

Reply:

Time is transferred in hexadecimal.
Hexadecimal-to-decimal conversion is needed.

Example:
If power had been switched off 32 hours 43 minutes after power-on and an alarm occurred 6 hours 59 minutes after power was switched on again:
While actual time is 32:43+6:59=39:42,
the time displayed is 32:00+6:00=38:00 → 38 hours (data: 0026H)

5.3.3 Alarm history clear

Command Data No.

8 2 : Alarm history clear

Clears the alarm history.

Send data:

5. COMMANDS USED WITH SPECIFIC FUNCTIONS

5.3.4 Test operation mode

(1) Test operation procedure

(a) Output signal forced-output

| Procedure | Reference Command/Command Name |
|---|---|
| <Enter the operation mode> | |
| 1) Inhibit the external output signals. | 9 0 0 3 External output signal inhibit |
| 2) Select the operation mode. | 8 B 0 0 Test operation mode selection |
| <Forcibly output the output signals> | |
| Set the forced output of signal pins. | 9 2 A 0 Forced output of signal pins |
| <Cancel the operation mode> | |
| 1) Select (cancel) the operation mode. | 8 B 0 0 Test operation mode selection |
| 2) Cancel the external output signal inhibit. | 9 0 1 3 Cancel of external output signal inhibit |

(b) Test operation (jog operation, positioning operation, motor-less operation)

| Procedure | Reference Command/Command Name |
|---|--|
| <Enter the operation mode> | |
| 1) Switch off all the external input signals. | |
| 2) Switch off all the input signals for test operation. (Note) | 9 2 0 0 Input signals for test operation |
| 3) Inhibit the external input signals. | 9 0 0 0 External input signal inhibit |
| 4) Select the operation mode. | 8 B 0 0 Test operation mode selection |
| Note: When only SON is kept on, the test operation mode can be selected without the base circuit being switched off. | |
| <Set data and start operation> | |
| 1) Enter data (command speed, acceleration/deceleration time constant). | A 0 1 0 , 1 1 Speed, acceleration/deceleration time constant |
| 2) Set the input signals for test operation (SON, LSP, etc.). | 9 2 0 0 Input signals for test operation |
| 3) Perform operation. | |
| • Positioning operation is performed by setting the travel. | A 0 1 3 Travel |
| • Any other operation is performed under the control of the input signals for test operation. | 9 2 0 0 Input signals for test operation |
| 4) To continue, send any command. | |
| 5) To make a temporary stop, set a temporary stop for test operation mode. | A 0 1 5 Temporary stop |
| Note: If communication stops for more than 1s during operation, the servo motor stops automatically and therefore the base circuit does not switch off. | |
| <Cancel the operation mode> | |
| 1) Switch off all the input signals for test operation. (Note) | 9 2 0 0 Input signals for test operation |
| 2) Reset the acceleration/deceleration time constant. | A 0 1 2 Acceleration/deceleration time constant cancel |
| 3) Select (cancel) the operation mode. | 8 B 0 0 Test operation mode selection |
| 4) Cancel the external input signal inhibit. | 9 0 1 0 Cancel of external input signal inhibit |
| Note: When only SON is kept on, the test operation mode can be canceled without the base circuit being switched off. | |

5. COMMANDS USED WITH SPECIFIC FUNCTIONS

Command Data No.

8 B **0 0** : Test operation mode selection

Performs speed control/position control operation, etc. without any external command.

To perform test operation, inhibit external inputs using command **9 0** .

Send data: **0 0 0**

Operation mode

- 0: Test operation mode cancel
- 1: Jog operation selection
- 2: Positioning operation selection
- 3: Motor-less operation selection
- 4: DO forced output selection

Command Data No.

9 0 **0 0** : External input signal inhibit

Inhibits the input of external input signals.

Send data: **1 E A 5**

Command Data No.

9 0 **0 3** : External output signal inhibit

Inhibits the output of external output signals.

Send data: **1 E A 5**

Command Data No.

9 0 **1 0** : Cancel of external input signal inhibit

Cancels the input inhibit of external input signals.

Send data: **1 E A 5**

Command Data No.

9 0 **1 3** : Cancel of external output signal inhibit

Cancels the output inhibit of external output signals.

Send data: **1 E A 5**

5. COMMANDS USED WITH SPECIFIC FUNCTIONS

Command Data No.

9 2 **0 0** : Input signals for test operation

Allows input signals to be switched on/off forcibly to the ports.

Before using this command, inhibit external inputs using command **9 0**.

The signal names corresponding to the bits depend on the model of the slave. Refer to the following lists.

Send data:

| | | | |
|-----|-------|----|----|
| b31 | ----- | b1 | b0 |
| | | | |

 Command for each bit is sent to the slave as hexadecimal data.

0: OFF command, 1: ON command

| bit | Signal Name |
|-----|-------------|
| 0 | SON |
| 1 | LSP |
| 2 | LSN |
| 3 | TL |
| 4 | |

| bit | Signal Name |
|-----|-------------|
| 5 | PC |
| 6 | RES |
| 7 | CR |
| 8 | |
| 9 | |

| bit | Signal Name |
|-----|-------------|
| 10 | |
| 11 | ST1 |
| 12 | ST2 |
| 13 | |
| 14 | |

Command Data No.

9 2 **A 0** : Forced output of signal pins

Allows the signal pins to be switched on/off forcibly independently of each other. If they are output forcibly, the outputs will be returned by the internal processing of the slave. To prevent this, external outputs must be inhibited using command **9 0**, data No. **0 3** before executing forced output.

Send data:

| | | | |
|-----|-------|----|----|
| b31 | ----- | b1 | b0 |
| | | | |

 Command for each bit is sent to the slave as hexadecimal data.

0: OFF command, 1: ON command

| bit | Signal Pin |
|-----|------------|
| 0 | CN1A-19 |
| 1 | CN1A-18 |
| 2 | CN1B-19 |
| 3 | CN1B-6 |
| 4 | CN1B-4 |

| bit | Signal Pin |
|-----|------------|
| 5 | CN1B-18 |
| 6 | CN1A-14 |
| | |
| | |

5. COMMANDS USED WITH SPECIFIC FUNCTIONS

Command Data No.

A 0 **1 0** : Speed

Used to specify the running speed for the test operation mode. Write the speed (unit: r/min) of the servo motor shaft in hexadecimal. Give this command after inhibiting the external DI/analog input using command **9 0**.

Example: 2000r/min → send data 07D0 (write a 4-digit value)

Command Data No.

A 0 **1 1** : Acceleration/deceleration time constant

Used to specify the acceleration/deceleration time constant for the test operation mode. Write the acceleration/deceleration time constant (unit: ms) in hexadecimal.

Example: 1000ms → send data 00002710 (write an 8-digit value)

When shifting to ordinary operation after the end of test operation without switching power on again, execute command **A 0**, data No. **1 2** to cancel the acceleration/deceleration time constant written for the test.

Command Data No.

A 0 **1 2** : Acceleration/deceleration time constant cancel

Unless power is switched on again, the acceleration/deceleration time constant for test operation remains on memory and is also made valid for ordinary operation. When shifting to ordinary operation after the end of test operation, send the cancel instruction.

Send data: **1 E A 5**

Command Data No.

A 0 **1 3** : Travel

The travel for test operation is made valid when SON, LSP and LSN have been switched on with command **9 2**, data No. **0 0**.

Write a travel (unit: pulse) used for positioning operation in the test operation mode in hexadecimal. Provide a plus (+) sign to run the servo motor in the forward rotation or a minus (-) sign to run it in the reverse direction.

The number of pulses required to run the servo motor one revolution depends on the encoder resolution of the servo motor. Refer to the servo motor specifications given in the MELSERVO-J2 series specifications and installation guide.

Note that such functions as position smoothing and electronic gear are invalid in the test operation mode.

Example:

To run the HC-SF servo motor 15 revolutions (15 × 16384 pulses) on its shaft
Send data 0003C000

Command Data No.

A 0 **1 5** : Temporary stop

Allows positioning operation to be decelerated to a stop at any point.

Send data: **1 E A 5**

5. COMMANDS USED WITH SPECIFIC FUNCTIONS

5.4 Current Alarm

5.4.1 Current alarm read

Information on the current alarm is provided.

Command Data No.
0 2 0 0 : Current alarm number

Provides the current alarm number in 2-digit decimal.

Reply: 0 0

The alarm number is transferred in decimal.

Example:

Data 0032 for A.32

Data 0050 for A.50

Data 00FF (no alarm) for A._

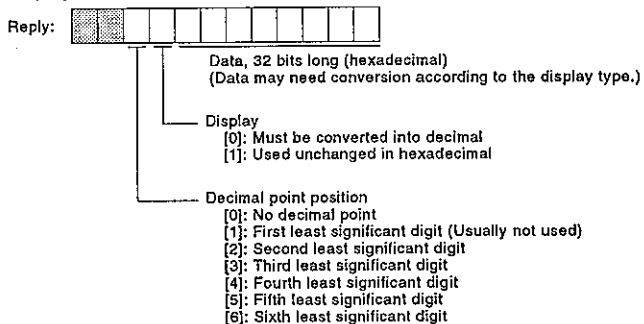
5.4.2 Status display data at alarm occurrence

The status display data at alarm occurrence is read.

When the data No. (for assignment, refer to the status display read/data No. assignment list in Section 5.1.1) is sent, the status display data is returned in the form of data value and data processing information.

Command Data No. Data No.
3 5 8 0 to 8 C : Data value and processing information of status display at alarm occurrence

Whether hexadecimal to decimal conversion is needed or not and the decimal point position command are appended to the read data value. Process the display data according to the data.



5. COMMANDS USED WITH SPECIFIC FUNCTIONS

5.4.3 Current alarm reset

Command Data No.

| | | | |
|---|---|---|---|
| 8 | 2 | 0 | 0 |
|---|---|---|---|

 : Alarm reset

Has the same function as the input from terminal RES, i.e. resets the alarm of the servo amplifier to make it operable. After removing the cause of the alarm, give this command without a command being entered.

Send data:

| | | | |
|---|---|---|---|
| 1 | E | A | 5 |
|---|---|---|---|

5. COMMANDS USED WITH SPECIFIC FUNCTIONS

5.5 Parameters

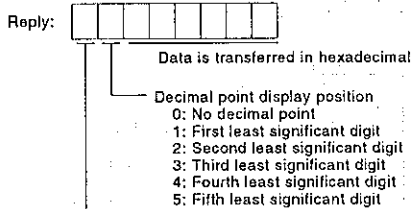
5.5.1 Parameter read

Use command **0 5** to read parameter values and processing information.

Command **0 5** Data No. **0 0** to **3 1** : Current values of corresponding parameters

Whether hexadecimal to decimal conversion is needed or not and the decimal point position command are appended to the read data value. Process the display data according to the data.

When data cannot be read, any of the display type data 8 to F is returned.

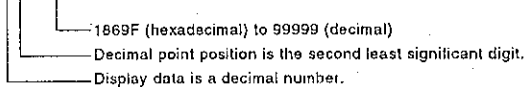


Display type, etc.

| Data | Display Type | Timing of making data valid |
|------|-------------------------------------|-----------------------------|
| 0 | Hex | Write |
| 1 | Dec | Write |
| 2 | Hex | Power on |
| 3 | Dec | Power on |
| 8 | Indicates that data cannot be read. | |
| 9 | | |
| A | | |
| B | | |
| C | | |
| D | | |
| E | | |
| F | | |

Timing of making data valid
Indicates whether a new data written is made valid immediately after it is written or after power is switched on.

Example: 9999.9 (decimal display form)
for data '1 2 01869F'



3ABC (hexadecimal display form) for data '0003ABC'

5. COMMANDS USED WITH SPECIFIC FUNCTIONS

5.5.2 Parameter write

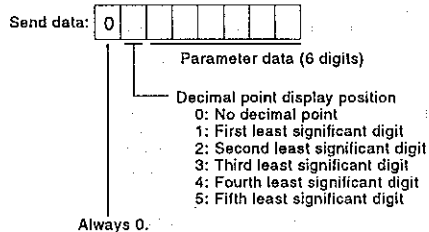
Any parameter value written should be within the setting range, which is given in the specifications and installation guide of the slave.

Command Data No. Data No.

34 **00** to **31** : Write of corresponding parameters

When the data written is handled in decimal, the decimal point position must be specified. Otherwise, that data cannot be written. When the data is handled in hexadecimal, specify the decimal point position as 0.

Before writing, read the data of the parameter to be written to, confirm the decimal point position, and create send data. This will prevent an error from occurring. On completion of writing, read the same parameter data to check that it has been written correctly.



Note: Before writing any data, make sure that it is within the range of the upper and lower limit values given in the specifications and installation guide.

6. ERROR CODES

6. ERROR CODES

On receipt of any command from the master, the slave returns STX which is followed by a one-character error code. This error code returned is an upper-case alphabet when there is no alarm in the slave or a lower-case alphabet when there is an alarm. The master can use this error code to judge if the intended communication completed without fault and the slave is in an operable state (no alarm).

| Error Code | | Error Name | Description | Remarks |
|--------------|-------------|------------------|--|-------------------|
| Servo normal | Servo alarm | | | |
| A | a | Normal operation | Data transmitted was processed properly. | Positive response |
| B | b | Parity error | Parity error occurred in the send data transmitted. | Negative response |
| C | c | Checksum error | Checksum error occurred in the send data transmitted. | |
| D | d | Character error | Character transmitted is not included in the specifications. | |
| E | e | Command error | Command transmitted is not included in the specifications. | |
| F | f | Data No. error | Data No. transmitted is not included in the specifications. | |

REVISIONS

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