

Motion Controller

**GM1 Controller RTEX  
User's Manual**

---

Setup

(MEMO)

## Introduction

Thank you for purchasing a Panasonic product. Before you use the product, please carefully read through the installation instructions and the manuals, and understand them in detail to use the product properly.

## Types of Manual

- There are different types of manuals for the GM1 series. Refer to the appropriate manual according to your need.

These manuals can be downloaded from our website: <https://industrial.panasonic.com/ac/e/motor/motion-controller/mc/gm1/index.jsp>.

### Manuals for GM1 series

| Manual name                                     | Manual code   | Description  |
|---|---------------|--|
| GM1 Controller RTEX User's Manual (Setup)       | WUME-GM1RTXSU | Explains wiring between the GM1 and its peripheral devices, installation method, and operation check method.                     |
| GM1 Controller RTEX User's Manual (Operation)   | WUME-GM1RTXOP | Explains how to use GM Programmer and PANATERM Lite for GM, set up each function, create projects, and perform other operations. |
| GM1 Series Reference Manual (Hardware)          | WUME-GM1H     | Explains the functions and performance of each GM1 unit.   |
| GM1 Series Reference Manual (Instruction)       | WUME-GM1PGR   | Explains the specifications of each instruction that can be used with the GM1 Series.  |
| GM1 Series Reference Manual (Analog I/O Unit)   | WUME-GM1AIO   | Explains the functions and performance of the Analog Expansion Unit.   |
| GM1 Series Reference Manual (Pulse Output Unit) | WUME-GM1PG    | Explains the functions and performance of the GM1 Pulse Output Unit.   |

## Copyright / Trademarks

- The copyright of this manual is owned by **Panasonic Industry Co., Ltd.**
- Unauthorized reproduction of this manual is strictly prohibited.
- Windows is a registered trademark of Microsoft Corporation in the U.S. and other countries.
- Ethernet is a registered trademark of FUJIFILM Business Innovation Corp. and Xerox Corporation.
- EtherNet/IP is a registered trademark of ODVA (Open DeviceNet Vendor Association).
- SDHC and SD logos are trademarks of LLC.
- Other company and product names are trademarks or registered trademarks of their respective companies.

(MEMO)

# Table of Contents

|  |            |
|--|------------|
| <b>1 Before Using This Product.....</b>  | <b>1-1</b> |
| 1.1 Safety Precautions.....  | 1-2        |
| 1.2 Description of Icons Used in this Document .....                                 | 1-3        |
| 1.3 Software License Agreement.....  | 1-4        |
| <b>2 Basic System Configuration .....</b>  | <b>2-1</b> |
| 2.1 Outline of the GM1 System.....   | 2-2        |
| 2.2 Unit Types.....  | 2-3        |
| 2.3 Restrictions on the Number of Expansion Units .....                              | 2-5        |
| <b>3 Restrictions on the GM1 Controller and Servo Amplifiers .....</b>               | <b>3-1</b> |
| 3.1 Restrictions on the Combination of the GM1 Controller and Servo Amplifiers ..... | 3-2        |
| 3.2 Restrictions on Servo Amplifier Parameters .....                                 | 3-3        |
| <b>4 Basic Operations of the GM1 Controller.....</b>                                 | <b>4-1</b> |
| 4.1 Power ON .....   | 4-2        |
| 4.2 Operation Mode Switching.....  | 4-3        |
| <b>5 Installation and System Setup.....</b>  | <b>5-1</b> |
| 5.1 System Configuration Diagram.....  | 5-2        |
| 5.2 Work Flowchart.....  | 5-4        |
| <b>6 Overview of the GM Programmer .....</b>   | <b>6-1</b> |
| 6.1 System Requirements.....   | 6-2        |
| 6.1.1 Usage Environment of the GM Programmer.....                                    | 6-2        |
| 6.2 Installation and Uninstallation .....  | 6-3        |
| 6.2.1 Installing GM Programmer .....   | 6-3        |
| 6.2.2 Uninstalling GM Programmer.....  | 6-7        |
| 6.3 Basic Operations.....  | 6-8        |
| 6.3.1 How to start.....  | 6-8        |
| 6.3.2 How to quit.....   | 6-9        |
| 6.4 Component Names .....  | 6-10       |
| 6.5 Other Functions .....  | 6-11       |
| 6.5.1 Display Language Setting Function .....  | 6-11       |
| 6.5.2 Online Help Function .....   | 6-12       |
| 6.5.3 Version Display Function .....   | 6-13       |
| <b>7 Overview of PANATERM Lite for GM.....</b>                                       | <b>7-1</b> |
| 7.1 System Requirements.....   | 7-2        |
| 7.1.1 Operating Environment of PANATERM Lite for GM.....                             | 7-2        |
| 7.2 Basic Operations.....  | 7-3        |

|           |   |             |
|-----------|---|-------------|
| 7.2.1     | How to Start .....  | 7-3         |
| 7.2.2     | How to Exit .....   | 7-5         |
| 7.3       | Component Names .....   | 7-6         |
| 7.4       | Parameter Window .....  | 7-7         |
| 7.4.1     | Configuration of Parameters Window .....                          | 7-7         |
| 7.4.2     | Setting Parameters .....  | 7-9         |
| 7.5       | Monitor Window .....  | 7-11        |
| 7.5.1     | Configuration of Monitor Window .....                             | 7-11        |
| 7.5.2     | Checking the Monitor Window .....                                 | 7-13        |
| 7.6       | Alarm Window .....  | 7-14        |
| 7.6.1     | Configuration of Alarm Window .....                               | 7-14        |
| 7.6.2     | Checking Alarms .....   | 7-16        |
| 7.7       | Other Functions .....   | 7-18        |
| 7.7.1     | Language Setting Function .....                                   | 7-18        |
| 7.7.2     | Help Function .....   | 7-18        |
| 7.7.3     | Version Display Function .....                                    | 7-18        |
| <b>8</b>  | <b>Preparing for Servo Amplifiers .....</b>                       | <b>8-1</b>  |
| 8.1       | Initial Setup for Servo Amplifiers .....                          | 8-2         |
| 8.1.1     | Connecting the Servo Amplifier and PC .....                       | 8-2         |
| 8.1.2     | Installing the USB Driver .....                                   | 8-2         |
| 8.1.3     | Initial Setup for Servo Amplifiers .....                          | 8-2         |
| 8.1.4     | Disconnecting the Servo Amplifier from the PC .....               | 8-4         |
| <b>9</b>  | <b>Connecting the GM1 Controller and Servo Amplifiers .....</b>   | <b>9-1</b>  |
| 9.1       | Setting an Address for Each Servo Amplifier .....                 | 9-2         |
| 9.2       | Connecting the GM1 Controller and Servo Amplifiers via RTEX ..... | 9-3         |
| <b>10</b> | <b>Connecting the GM1 Controller and the GM Programmer .....</b>  | <b>10-1</b> |
| 10.1      | Connecting the GM1 Controller and PC .....                        | 10-2        |
| 10.1.1    | Selecting a Connection Port for GM Programmer .....               | 10-2        |
| 10.1.2    | Connecting the GM1 Controller and PC with a Cable .....           | 10-2        |
| 10.2      | Creating a New Project .....                                      | 10-3        |
| 10.3      | Communication Setting .....                                       | 10-6        |
| 10.3.1    | Setting the LAN Port .....  | 10-6        |
| 10.3.2    | Addition of the USB Port .....                                    | 10-6        |
| 10.4      | Adding and Setting up Servo Amplifiers .....                      | 10-9        |
| 10.5      | Basic Settings of the RTEX Axis .....                             | 10-13       |
| 10.5.1    | General Settings .....  | 10-13       |
| 10.5.2    | Scaling / Mapping Settings .....                                  | 10-15       |
| 10.6      | Connecting to the GM1 Controller .....                            | 10-17       |
| 10.7      | Commissioning .....   | 10-19       |
| 10.7.1    | Online Config Mode .....  | 10-19       |
| 10.7.2    | Conducting Commissioning for Servo Amplifiers .....               | 10-20       |
| 10.8      | Login .....   | 10-24       |
| 10.9      | Logout .....  | 10-25       |

|           |   |              |
|-----------|---|--------------|
| <b>11</b> | <b>Setting up the Servo Amplifier Connected to the GM1 Controller</b> | <b>11-1</b>  |
| 11.1      | Setting up the Servo Amplifier Connected to the GM1 Controller        | 11-2         |
| 11.1.1    | When Connected Using the Ethernet Cable                               | 11-2         |
| 11.1.2    | When Connected Using the USB Cable                                    | 11-4         |
| 11.2      | Writing Parameters to Servo Amplifier                                 | 11-6         |
| <b>12</b> | <b>Preparation for Operation</b>                                      | <b>12-1</b>  |
| 12.1      | Checking Wiring   | 12-2         |
| 12.2      | Checking Safety Circuit Design  | 12-3         |
| 12.2.1    | Safety Circuit Design   | 12-3         |
| 12.2.2    | Items to Check during Wiring  | 12-4         |
| 12.2.3    | Power ON Operation  | 12-4         |
| 12.2.4    | Power OFF Operation   | 12-5         |
| 12.3      | Operation Check   | 12-7         |
| 12.3.1    | Checking the Network  | 12-7         |
| 12.3.2    | Checking Input Signals  | 12-7         |
| 12.3.3    | Checking Rotating and Moving Directions and Moving Distance           | 12-8         |
|           | <b>Appendix Warranty / Cautions for Proper Use</b>                    | <b>App-1</b> |
|           | Warranty  | App-2        |
|           | Warranty Period   | App-2        |
|           | Warranty Scope  | App-2        |
|           | Cautions for Proper Use   | App-3        |

(MEMO)

# 1 Before Using This Product

---

|  |     |
|--|-----|
| 1.1 Safety Precautions.....                          | 1-2 |
| 1.2 Description of Icons Used in this Document ..... | 1-3 |
| 1.3 Software License Agreement.....                  | 1-4 |

## 1.1 Safety Precautions

### 1.1 Safety Precautions

This section explains important rules that must be observed to prevent personal injury and property damage.

- Injuries and damages that may occur as a result of incorrect use are classified into the following levels and safety precautions are explained according to the level.

|  |   |
|--|---|
|  <b>WARNING</b> | Indicates that there is a risk of death or serious injury         |
|  <b>CAUTION</b> | Indicates that there is a risk of minor injury or property damage |

|   |  |
|---|--|
|  | Indicates an action that is prohibited |
|  | Indicates an action that must be taken |

|  <b>WARNING</b> |  |
|--|--|
|                 | <ul style="list-style-type: none"> <li>• Take safety measures outside this product to ensure the safety of the entire system even if this product fails or an error occurs due to external factors.</li> </ul> |
|                 | <ul style="list-style-type: none"> <li>• Do not use this product in atmospheres that contain flammable gases. Doing so may result in explosion.</li> </ul>   |
|                 | <ul style="list-style-type: none"> <li>• Do not throw this product into the fire. Doing so may cause the batteries or other electronic parts to explode.</li> </ul>  |

|  <b>CAUTION</b> |   |
|--|---|
|                 | <ul style="list-style-type: none"> <li>• To prevent abnormal heat generation or smoke generation, use this product with some leeway from the guaranteed characteristics and performance values of the product.</li> </ul> |
|                 | <ul style="list-style-type: none"> <li>• Do not disassemble or modify this product. Doing so may result in abnormal heat generation or smoke generation.</li> </ul>   |
|                 | <ul style="list-style-type: none"> <li>• Do not touch any terminals while the power is on. Doing so may result in electrical shock.</li> </ul>  |
|                 | <ul style="list-style-type: none"> <li>• Configure emergency stop and interlock circuits outside this product.</li> </ul>   |
|                 | <ul style="list-style-type: none"> <li>• Connect wires and connectors properly. Failure to do so may result in abnormal heat generation or smoke generation.</li> </ul>   |
|                 | <ul style="list-style-type: none"> <li>• Do not perform work (such as connection or removal) with the power turned on. Doing so may result in electrical shock.</li> </ul>  |
|                 | <ul style="list-style-type: none"> <li>• If this product is used in any way that is not specified by Panasonic, its protection function may be impaired.</li> </ul>   |
|                 | <ul style="list-style-type: none"> <li>• This product has been developed and manufactured for industrial use only.</li> </ul>   |

### 1.2 Description of Icons Used in this Document

- In this manual, the following symbols are used to indicate safety information that must be observed.

|   |  |
|---|--|
|  | Indicates an action that is prohibited or a matter that requires caution.          |
|  | Indicates an action that must be taken.  |
|  | Indicates supplemental information.  |
|  | Indicates details about the subject in question or information useful to remember. |
|  | Indicates operation procedures.  |

## 1.3 Software License Agreement

---

### 1.3 Software License Agreement

Panasonic Industry Co., Ltd. (“PANASONIC”) grants to you a license to use this Software on condition that you accept this Agreement. You must read this Software License Agreement (this “Agreement”) carefully before using this Software. Only in case that you accept this Agreement, you may start your use of this Software.

Your unsealing the package of this Software, or your downloading, installing or launching this Software or the like shall be deemed as your acceptance of this Agreement.

The Software includes not only proprietary computer programs owned by or licensed by PANASONIC but also open source software programs. As for the open source software programs, refer to the detailed terms and conditions thereof shown in the installation package of the Software. Should a discrepancy arise between any of the terms of this Agreement and any open source software program license statement, the open source software program license statement shall take precedence over this Agreement.

#### Article 1 Grant of License

PANASONIC hereby grants to you a non-exclusive license to use this Software only in combination with PANASONIC product(s) specified in the manual of this Software (the “Product”) in accordance with the terms of this Agreement. You may not use this Software in connection with products of any third party other than PANASONIC.

#### Article 2 Restrictions

You may NOT:

1. Modify, reverse engineer, decompile, or disassemble this Software, except where the terms and conditions of open source software program license statement (including, but not limited to, GPL and LGPL) apply.  
Should a defect of the Software arise owing to your modification, reverse engineering, decompiling, or disassembling, to the extent permitted under the law, PANASONIC shall not assume any responsibility for such defect,
2. Use this Software by methods or for purposes other than those specified in the manual of this Software provided by PANASONIC, nor
3. Distribute, rent, lease or otherwise transfer this Software to any third party; provided, however, that you may assign the rights to use this Software under this Agreement along with the Product on the condition that the assignee agrees to be bound by all the terms of this Agreement. In the case of such assignment, you must deliver any and all the copies of this Software and all the accompanying materials to the assignee and you may not retain any copies of this Software including backups.

#### Article 3 Disclaimer

1. PANASONIC HEREBY DISCLAIMS ALL OTHER WARRANTIES ON THIS SOFTWARE, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, AND NON-INFRINGEMENT OF THIRD PARTY RIGHTS.
2. UNDER NO CIRCUMSTANCES SHALL PANASONIC BE LIABLE FOR ANY DAMAGES (INCLUDING DIRECT, INDIRECT, INCIDENTAL, CONSEQUENTIAL OR SPECIAL OR WHATSOEVER) ARISING OUT OF THE USE OF THIS SOFTWARE, INABILITY TO USE THIS SOFTWARE, DEFECTS IN THIS SOFTWARE (e.g., BUGS, SECURITY HOLES, AND MALFUNCTION), OR OTHERWISE IN CONNECTION WITH THIS SOFTWARE.

#### Article 4 Term

1. This Agreement shall come into effect upon your unsealing the package of this Software, or your downloading, installing or launching this Software or the like.

2. PANASONIC may terminate this Agreement immediately, if you breach any of the provisions of this Agreement.
3. You shall, at your own costs, return, delete or destroy this Software and any of its copies within four (4) weeks after termination of this Agreement.

### Article 5 Export Control

You shall comply with all laws and regulations regarding export control under any competent jurisdiction, including but not limited to the Japanese Foreign Exchange & Foreign Trade Control Law, the export control regulations based on resolutions of the United Nations Security Council, etc. If any license or appropriate approval from a governmental authority is required under the applicable laws, you may not export this Software without such approval to any countries either directly or indirectly. Furthermore, you shall neither use nor sell this Software for military purposes either directly or indirectly.

### Article 6 Intellectual Property Rights

Except the open source software program (including, but not limited to, GPL and LGPL), all intellectual property rights in this Software, including the copyright, belong to PANASONIC and/or the licensors of PANASONIC.

### Article 7 Upgrade of this Software

1. Release of future upgrades or updates of this Software is not guaranteed and left to the sole discretion of PANASONIC. Furthermore, PANASONIC may charge fees for upgrading or updating of this Software.
2. If any upgrades or updates are provided to you either for fees or for free, such upgrades or updates shall be deemed as a part of this Software and shall be governed by this Agreement, unless PANASONIC designates otherwise at the time of provision of such upgrades or updates.

### Article 8 Limitation on Liability

AGGREGATE LIABILITIES OF PANASONIC IN CONNECTION WITH THIS AGREEMENT OR THIS SOFTWARE SHALL IN NO EVENT EXCEED TEN THOUSAND (10,000) YEN.

### Article 9 Governing Law and Jurisdiction

1. This Agreement shall be governed by the laws of Japan.
2. Should any dispute arise from or in connection with this Agreement, Osaka District Court, Japan shall exclusively have the jurisdiction over such dispute.

This Software consists of the following types of software.

1. Software developed independently by PANASONIC
2. Software owned by and licensed by the third party
3. Software licensed under GNU General Public License Version 2.0 (GPL V2.0)
4. Software licensed under GNU Lesser General Public License Version 2.0 (LGPL V2.0) or Version 2.1 (LGPL V2.1)
5. Open source software licensed on conditions other than those of GPL V2.0, LGPL V2.0, or LGPL V2.1

Software in categories 3. - 5. above is distributed with the expectation of effectiveness as a single piece of software, but there is no guarantee provided, including implied guarantees regarding viability as a product and/or suitability for specific purposes. For details, Please refer to the detailed terms and conditions thereof shown in the installation package of the Software.

For at least three years following the release of the Product, PID will provide, at customer's expense, complete machine-readable source code for software licensed under GPL V2.0, LGPL V2.0, LGPL V2.1, or a license based on other conditions that meet source code disclosure requirements, along with information on the respective copyright holders, to customers who contact us at the following e-mail address.

【Contact e-mail address: [oss-cd-request@gg.jp.panasonic.com](mailto:oss-cd-request@gg.jp.panasonic.com)】

(MEMO)

# 2 Basic System Configuration

---

- 2.1 Outline of the GM1 System.....2-2
- 2.2 Unit Types .....2-3
- 2.3 Restrictions on the Number of Expansion Units .....2-5

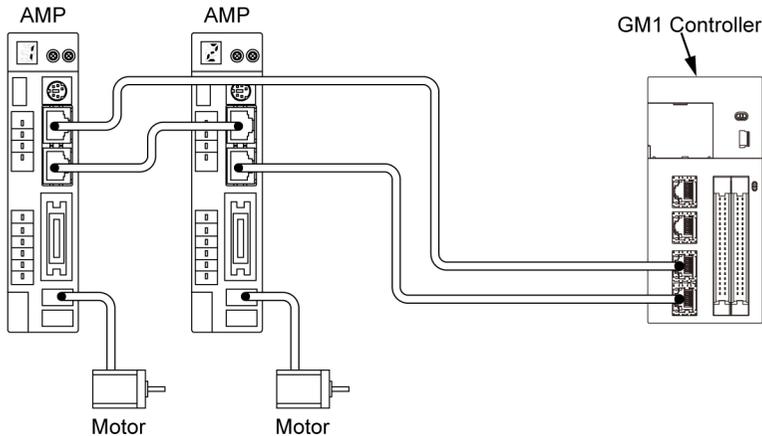
## 2.1 Outline of the GM1 System

---

### 2.1 Outline of the GM1 System

#### ■ Network control

A MINAS series servomotor network system can be easily configured using the RTEX network dedicated to motion control.



#### ■ System configuration including virtual axes

A motion system that combines real and virtual axes can be configured.

#### ■ Two LAN ports

Other than the RTEX, there are two Ethernet connection ports.

Each port can have a unique IP address. They can be used for different purposes, such as for an in-device network or for a host system network.

#### ■ Equipped with the high-speed counter input and PWM output

The GM1 Controller is equipped with a 2-ch high-speed counter input for 16 MHz (multiplied by 4) and a 4-ch PWM output that can output a maximum of 100 kHz. These functions can be used without adding expansion units.

## 2.2 Unit Types

### ■ Controller

| Type                                       | Function   | Model number |
|--|--|--------------|
| RTEX-compatible GM1 Controller (sink type) | RTEX motion controller<br>Transistor NPN output type | AGM1CSRX16T  |

### ■ Expansion units

| Type                                     | Function  | Model number |
|--|---|--------------|
| Digital input (64 points)                | 24 V DC, 64 input points  | AGM1X64D2    |
| Digital output (64 points) (sink type)   | Output (64 points)<br>Transistor NPN type                           | AGM1Y64T     |
| Digital output (64 points) (source type) | Output (64 points)<br>Transistor PNP type                           | AGM1Y64P     |
| Digital I/O (64 points) (sink type)      | 24 V DC, 32 input points<br>32 output points<br>Transistor NPN type | AGM1XY64D2T  |
| Digital I/O (64 points) (source type)    | 24 V DC, 32 input points<br>32 output points<br>Transistor PNP type | AGM1XY64D2P  |
| Analog input (8 points)                  | 8 input points  | AGM1AD8      |
| Analog output (4 points)                 | 4 output points   | AGM1DA4      |
| Pulse output (transistor output type)    | 4-axis, pulse train, 500 kpps<br>Open collector output              | AGM1PG04T    |
| Pulse output (line driver output type)   | 4-axis, pulse train, 4 Mpps<br>Line driver output                   | AGM1PG04L    |

## 2.2 Unit Types

---

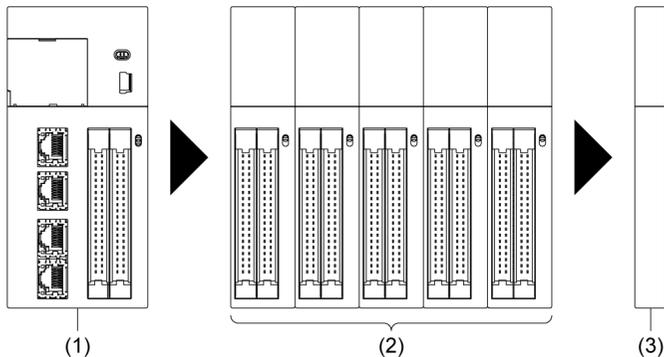
### Info.

- For the RTEX-compatible GM1 Controller and expansion units to be used, compatible GM Programmer versions are as follows.

| Type                                       | Model number | Version of GM Programmer |
|--|--------------|--------------------------|
| RTEX-compatible GM1 Controller (sink type) | AGM1CSRX16T  | Ver.1.0 or later         |
| Digital input (64 points)                  | AGM1X64D2    | Ver.1.0 or later         |
| Digital output (64 points) (sink type)     | AGM1Y64T     | Ver.1.0 or later         |
| Digital output (64 points) (source type)   | AGM1Y64P     | Ver.1.2 or later         |
| Digital I/O (64 points) (sink type)        | AGM1XY64D2T  | Ver.1.0 or later         |
| Digital I/O (64 points) (source type)      | AGM1XY64D2P  | Ver.1.2 or later         |
| Analog input (8 points)                    | AGM1AD8      | Ver.1.2 or later         |
| Analog output (4 points)                   | AGM1DA4      | Ver.1.2 or later         |
| Pulse output (transistor output type)      | AGM1PG04T    | Ver.1.2 or later         |
| Pulse output (line driver output type)     | AGM1PG04L    | Ver.1.2 or later         |

### 2.3 Restrictions on the Number of Expansion Units

Up to 15 expansion units can be mounted on the right side of the GM1 Controller.



|     |            |     |                 |     |          |
|-----|------------|-----|-----------------|-----|----------|
| (1) | Controller | (2) | Expansion units | (3) | End unit |
|-----|------------|-----|-----------------|-----|----------|



- Make sure to connect an end unit to the end of the system.

(MEMO)

# 3 Restrictions on the GM1 Controller and Servo Amplifiers

---

|  |     |
|--|-----|
| 3.1 Restrictions on the Combination of the GM1 Controller and Servo Amplifiers ..... | 3-2 |
| 3.2 Restrictions on Servo Amplifier Parameters .....                                 | 3-3 |

## 3.1 Restrictions on the Combination of the GM1 Controller and Servo Amplifiers

### 3.1 Restrictions on the Combination of the GM1 Controller and Servo Amplifiers

As for the combination of the GM1 Controller and each MINAS series, confirm the following restrictions.

#### Combination of the GM1 Controller and servo amplifiers

| Connectable servo amplifier |     | Description                                       |
|-----------------------------|-----|---|
| A5N                         | A6N |   |
| •                           | •   | A5N and A6N can be connected to the same network. |

#### Note

- When using servo amplifiers in combination with the GM1 Controller, use the ones with the latest software version.

#### Setting ranges of movement amount and speed

The input range of the movement amount or speed specified in the GM1 Controller may differ from the upper and lower setting limits of the servo amplifier.

#### Info.

- The input range of the movement amount or speed specified in the GM1 Controller may differ from the upper and lower setting limits of the servo amplifier.
  - RTEK-compatible GM1 Controller: Communication cycle: 500  $\mu$ s to 2 ms, Command update cycle: 500  $\mu$ s to 4ms
  - Servo amplifier A5N: Communication cycle: 500  $\mu$ s to 1 ms, Command update cycle: 500  $\mu$ s to 1 ms
  - Servo amplifier A6N: Communication cycle: 500  $\mu$ s to 2 ms, Command update cycle: 500  $\mu$ s to 4 ms

## 3.2 Restrictions on Servo Amplifier Parameters

Some parameters for servo amplifiers on the A5N/A6N side affect the behaviors of the RTEX-compatible GM1 Controller. Use the following parameters.

| No.    | Name                            | Description   | Standard factory default setting |
|--------|---------------------------------|---|----------------------------------|
| Pr5.04 | Over-travel inhibit input setup | Use setting value "1 (Disable the over-travel inhibit input)".<br>(Mandatory)   | 1 <sup>(Note 1)</sup>            |
| Pr7.22 | RTEX function extended setup 1  | With a setting of 0 (16-byte mode), the maximum connection is 32 axes. With setting 1 (32-byte mode), the maximum number of connections is 16 axes.<br>(Default setting value: 0)   | 0 <sup>(Note 2)</sup>            |
| Pr7.23 | RTEX function extended setup 2  | Use setting value "18".<br>(Mandatory)<br>This parameter sets each function in bits.<br><b>bit 0: Allow parameter values to be written via RTEX communication</b><br>0: Allow, 1: Disallow<br><b>bit 1: Set a sub-number for alarm code</b><br>0: Fixed at 0, 1: Enable sub-number<br><b>bit 2: Set RTEX status response conditions when "Over-travel inhibit input setup" is disabled (Pr5.04 = 1)</b><br>0: Enable status, 1: Fixed at 0<br><b>bit 3: Set RTEX status bit assignment for POT and NOT</b><br>0: POT corresponds to bit 1 and NOT corresponds to bit 0, 1: NOT corresponds to bit 1 and POT corresponds to bit 0<br>0: POT corresponds to bit 1 and NOT corresponds to bit 0, 1: NOT corresponds to bit 1 and POT corresponds to bit 0<br><b>bit 4: Set display mode for "COM" LED</b><br>0: Mode 1, 1: Mode 2<br><b>bit 5: Set non-cyclic command start mode</b><br>0: When a change from base command occurs<br>1: When command code or command argument changes<br><b>bit 6: Set RTEX status logic for POT and NOT</b><br>0: Do not reverse, 1: Reverse<br><b>bit 7: Set RTEX status logic for PSL and NSL</b><br>0: Do not reverse, 1: Reverse<br><b>bit 8: Select RTEX status from In_Progress / AC_OFF</b><br>0: In_Progress, 1: AC_OFF<br>(It is linked to the setting in bit 15.)<br><b>bit 9: Select whether to return a command error when a command for motion toward the direction of over-travel prohibition is received after deceleration stop is executed by "Over-travel inhibit input setup"</b><br>0: Do not return a command error<br>1: Return a command error | 18 <sup>(Note 2)</sup>           |

### 3.2 Restrictions on Servo Amplifier Parameters

| No.    | Name                  | Description  | Standard factory default setting |
|--------|-----------------------|--|----------------------------------|
|        |                       | <p><b>(Bit 10 to bit 13 are not used.)</b><br/>Fix to "0".</p> <p><b>bit 14: Set position deviation [command unit] output</b><br/>0: Internal commanded position (after filtering) [command unit] - Actual position [command unit]<br/>1: Internal commanded position (before filtering) [command unit] - Actual position [command unit]</p> <p><b>Bit 15: Select extended RTEX status from In_Progress / AC_OFF / Pr7.112 settings</b><br/>0: Follow the setting of Pr7.23 bit 8 (In_Progress / AC_OFF)<br/>1: Follow the setting of Pr7.112.</p> |                                  |
| Pr7.25 | RTEX speed unit setup | Use setting value "1 (command unit/s)".<br>(Mandatory)   | 0(Note 2)                        |

(Note 1) We recommend that the set value should not be changed judging from the characteristics of the GM1 and MINAS.

(Note 2) Do not change the set value. If the set value is changed, the GM1 Controller will make an error stop.

# 4 Basic Operations of the GM1 Controller

---

|                                   |     |
|-----------------------------------|-----|
| 4.1 Power ON .....                | 4-2 |
| 4.2 Operation Mode Switching..... | 4-3 |

## 4.1 Power ON

### 4.1 Power ON

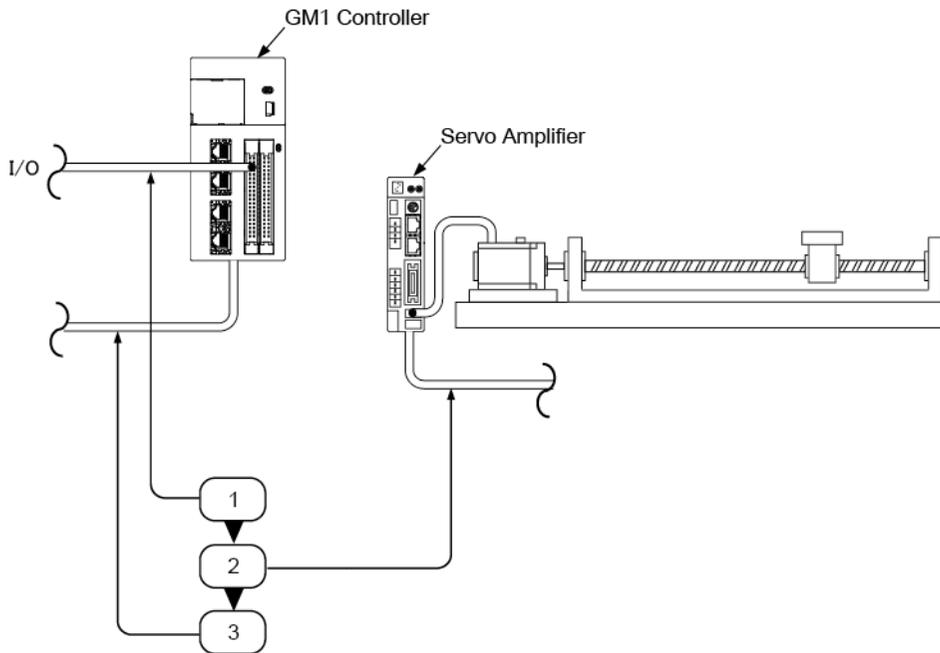
When turning ON the power supply to the system incorporating the GM1 Controller, turn ON the power supply in the following order.



- Consider the nature and statuses of any external devices connected to the system, and take sufficient care so that turning ON the power supply will not initiate unexpected movements.

#### 1 2 Procedure

1. Turn ON the power supplies to the I/O devices connected to the GM1 Controller.
2. Turn ON the power supply to the servo amplifier.
3. Turn ON the power supply to the GM1 Controller.



### 4.2 Operation Mode Switching

#### ■ Switching to the RUN mode

There are the following two methods.

- Press the operation button (▶) on the GM Programmer while the STOP LED is lit.
- Set the RUN/STOP switch on the GM1 Controller to RUN.

#### Info.

- The switch cannot be set to the RUN mode if an error that does not allow to continue operation has occurred or if an exceptional situation has occurred.

#### ■ Switching to the STOP mode

There are the following two methods.

- Press the stop button (■) on the GM Programmer while the RUN LED is lit.
- Set the RUN/STOP switch on the GM1 Controller to STOP.

(MEMO)

# 5 Installation and System Setup

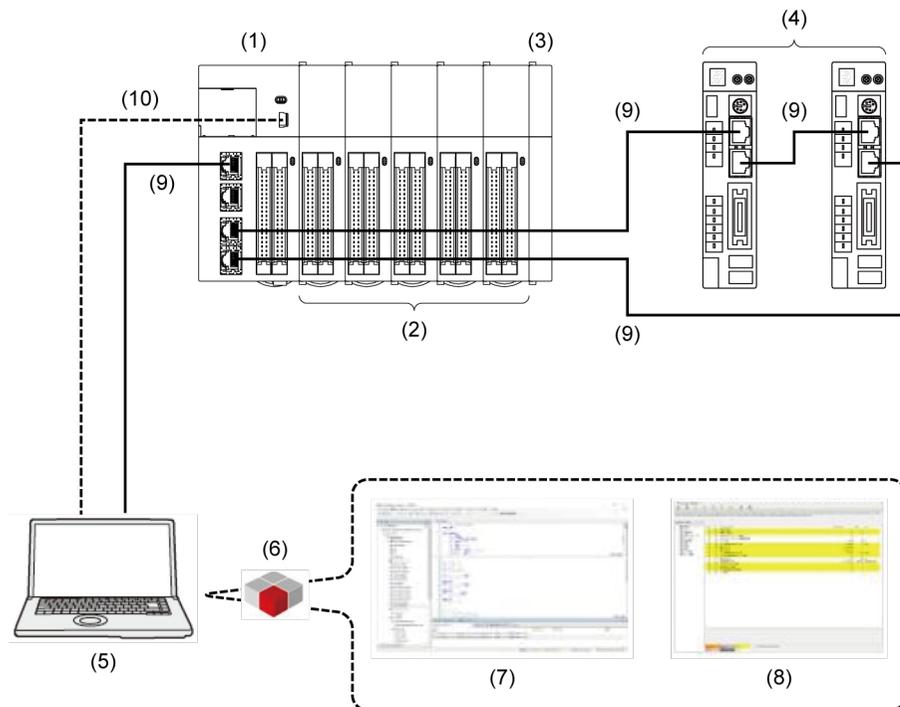
---

|  |     |
|--|-----|
| 5.1 System Configuration Diagram ..... | 5-2 |
| 5.2 Work Flowchart .....               | 5-4 |

## 5.1 System Configuration Diagram

### 5.1 System Configuration Diagram

The figure below shows the configuration of the GM1 series motion controller (Controller and expansion units), servo amplifiers, and PC. The GM Programmer and PANATERM Lite for GM communicate with the GM1 Controller via Gateway.



| No.  | Name   |
|------|--|
| (1)  | GM1 controller   |
| (2)  | Expansion unit   |
| (3)  | End unit   |
| (4)  | Servo amplifier  |
| (5)  | PC (on which GM Programmer and PANATERM Lite for GM are installed) |
| (6)  | Gateway, CodeMeter   |
| (7)  | GM Programmer  |
| (8)  | PANATERM Lite for GM   |
| (9)  | Ethernet cable <sup>(Note 1)</sup>                                 |
| (10) | USB cable <sup>(Note 1)</sup>                                      |

(Note 1) Use either one of the two cables: Ethernet cable or USB cable.

**i Info.**

- To operate the system, you must install GM Programmer and PANATERM Lite for GM on the PC.
- When GM Programmer is installed, MINAS setup support software "PANATERM Lite for GM", Gateway (the application that connects GM Programmer and the GM1 Controller), and CodeMeter are installed at the same time.

## 5.2 Work Flowchart

### 5.2 Work Flowchart

The following table explains the workflow from installation of the GM1 controller through to its operation.

| Step | Description  | Reference   |   |
|------|--|---|---|
| 1    | Install GM Programmer and PANATERM Lite for GM.  | "P.6-3"   |   |
| 2    | Make preparations for the servo amplifiers.  | "P.8-1"   |   |
|      | 2-1  | Connect the servo amplifiers and the PC.  | "P.8-2"   |
|      | 2-2  | Install the USB driver on the PC.   | "P.8-2"   |
|      | 2-3  | Configure initial settings for the servo amplifiers.                                | "P.8-2"   |
|      | 2-4  | Disconnect the servo amplifiers from the PC.  | "P.8-4"   |
| 3    | Connect the GM1 Controller and each servo amplifier with cables.   | "P.9-1"   |   |
| 4    | Connect the GM1 Controller and the GM Programmer.  | "P.10-1"  |   |
|      | 4-1  | Connect the GM1 Controller and the PC with a cable.                                 | "P.10-2"  |
|      | 4-2  | Creating a new project.   | "P.10-3"  |
|      | 4-3  | Make communication settings.  | "P.10-6"  |
|      | 4-4  | Add and set up device objects for servo amplifiers.                                 | "P.10-9"  |
|      | 4-5  | Make basic settings of the RTEX axis  | "P.10-13"   |
|      | 4-6  | Connect the GM1 Controller and each servo amplifier and perform an operation check. | "P.10-19"   |
|      | 4-7  | Log in to the GM1 Controller.   | "P.10-24"   |
|      | 4-8  | Log out from the GM1 Controller.  | "P.10-25"   |
| 5    | Connect the GM1 Controller and PANATERM Lite for GM.   | "P.11-1"  |   |
|      | 5-1  | Set up the servo amplifier connected to the GM1 Controller.                         | "P.11-2"  |
|      | 5-2  | Write parameters to the servo amplifier.  | "P.11-6"  |
| 6    | Prepare for operation.   | "P.12-1"  |   |
|      | 6-1  | Check if safety circuit design is implemented.                                      | "P.12-3"  |
|      | 6-2  | Check wiring for each device.   | "P.12-2"  |
|      | 6-3  | Perform an operation check.   | "P.12-7"  |
| 7    | Using the GM Programmer, make settings for GM1 parameters, motion control, unit control, and communication function. | GM1 Controller RTEX User's Manual (Operation)                                       |   |
|      | 7-1  |   | Make settings for the GM1 Controller.   |
|      | 7-2  |   | Make settings for the motion control.   |
|      | 7-3  |   | Make settings for the unit control.   |
|      | 7-4  |   | Make settings for the communication function  |
| 8    | Create programs with GM Programmer.  |   |   |
|      | 8-1  |   | Create objects (POU objects) for a program.   |
|      | 8-2  |   | Select a program language (LD program / ST program / SFC program / FBD program / IL program / CFC program) and enter a program. |

---

| Step | Description                                       | Reference |
|------|---|-----------|
|      | 8-3 Set variables.                                |           |
| 9    | Set the GM1 controller with the GM Programmer.    |           |
|      | 9-1 Make time setting.                            |           |
|      | 9-2 Log in to the GM1 Controller.                 |           |
|      | 9-3 Log out from the GM1 Controller.              |           |
|      | 9-4 Upload the source.                            |           |
| 10   | Configure security settings with GM Programmer.   |           |
|      | 10-1 Configure user management settings.          |           |
|      | 10-2 Configure encryption and signature settings. |           |
|      | 10-3 Configure write-protection settings.         |           |

(MEMO)

# 6 Overview of the GM Programmer

---

|   |      |
|---|------|
| 6.1 System Requirements.....                      | 6-2  |
| 6.1.1 Usage Environment of the GM Programmer..... | 6-2  |
| 6.2 Installation and Uninstallation .....         | 6-3  |
| 6.2.1 Installing GM Programmer .....              | 6-3  |
| 6.2.2 Uninstalling GM Programmer.....             | 6-7  |
| 6.3 Basic Operations.....                         | 6-8  |
| 6.3.1 How to start.....                           | 6-8  |
| 6.3.2 How to quit .....                           | 6-9  |
| 6.4 Component Names .....                         | 6-10 |
| 6.5 Other Functions .....                         | 6-11 |
| 6.5.1 Display Language Setting Function .....     | 6-11 |
| 6.5.2 Online Help Function .....                  | 6-12 |
| 6.5.3 Version Display Function .....              | 6-13 |

## 6.1 System Requirements

---

### 6.1 System Requirements

#### 6.1.1 Usage Environment of the GM Programmer

##### Programming software

| Product name  | Applicable language          |
|---------------|------------------------------|
| GM Programmer | Japanese / English / Chinese |

(Note 1) When GM Programmer is installed, MINAS setup support software "PANATERM Lite for GM" is installed at the same time.

##### Software operating environment

| Item               | Description  |
|--------------------|--|
| OS                 | Microsoft(R) Windows(R) 10 : 32bit/64bit<br>Microsoft(R) Windows(R) 11 : 64bit   |
| PC                 | PC with the following installed: <ul style="list-style-type: none"><li>● Microsoft.NET Framework 4.6.1 or higher</li><li>● Microsoft Visual C++ 2010 SP1 Redistributable Package (x86)</li><li>● Microsoft Visual C++ 2010 SP1 Redistributable Package (x64)</li><li>● Microsoft Visual C++ 2013 Redistributable Package (x86)</li><li>● Microsoft Visual C++ 2013 Redistributable Package (x64)</li><li>● Microsoft Visual C++ 2015 Update 3 Redistributable Package (x86)</li><li>● Microsoft Visual C++ 2015 Update 3 Redistributable Package (x64)</li></ul> |
| HDD                | At least 4 GB of free space  |
| Memory             | At least 8 GB  |
| Communication port | LAN port (for Ethernet connection)<br>USB 2.0 port (for USB connection)  |

## 6.2 Installation and Uninstallation

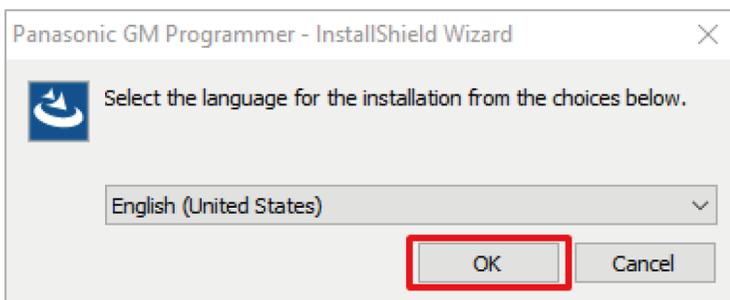
### 6.2.1 Installing GM Programmer

Before installing the GM Programmer on a PC, log on to the PC as an account with Administrator privileges.

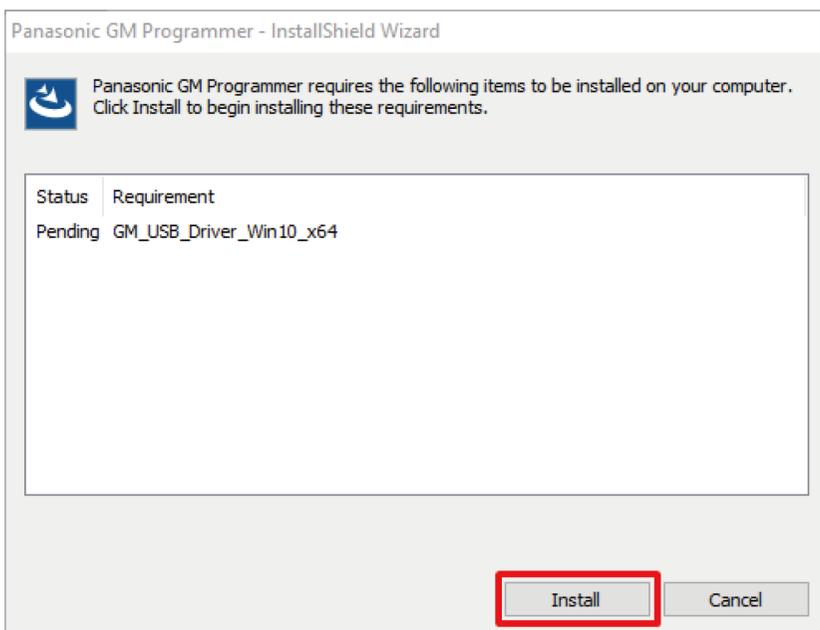
If other applications are running, be sure to close all the applications before installing GM Programmer.

#### 1 2 Procedure

1. Double-click "setup.exe".  
The following window will be displayed. Click [OK].

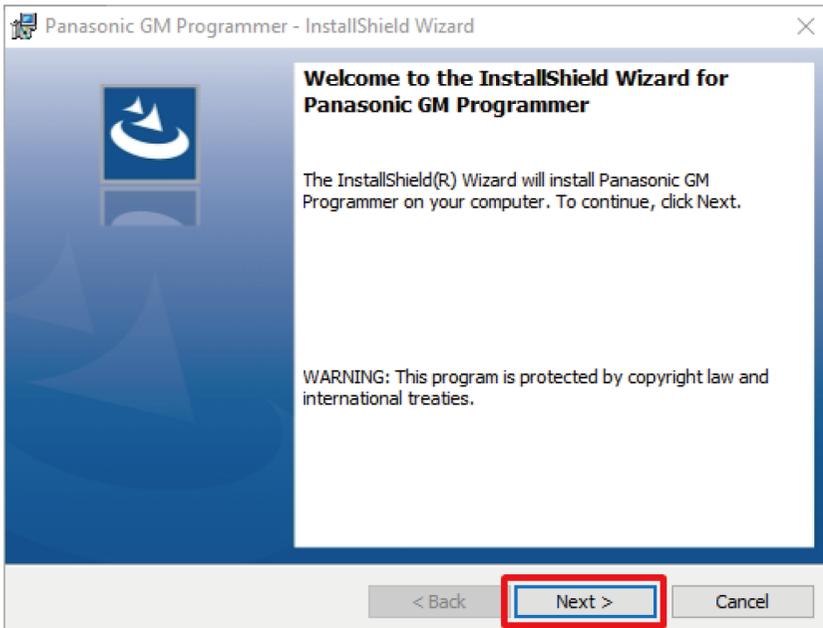


2. The following window will be displayed. Click [Install].  
The display content differs according to the PC environment that you use. (This window may not be displayed at all, depending on the situation.)

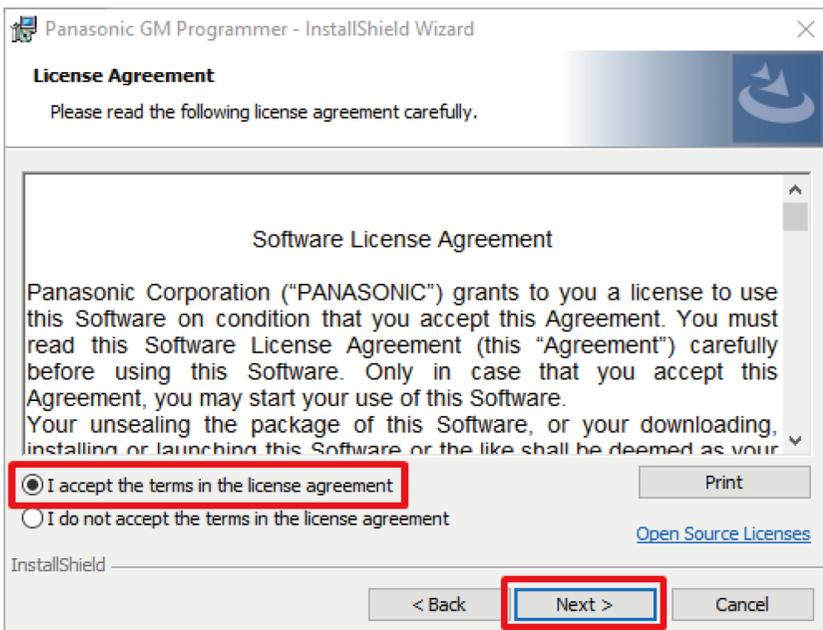


## 6.2 Installation and Uninstallation

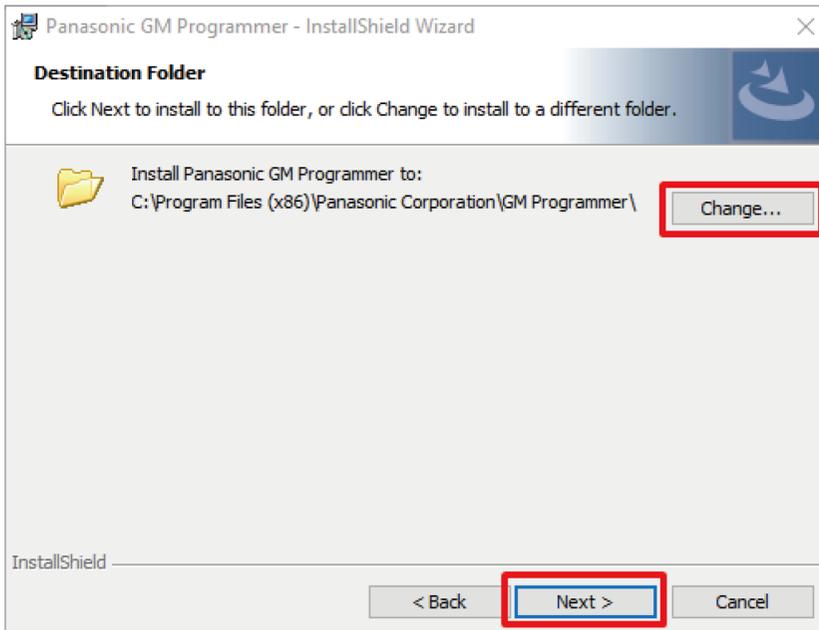
3. The following window will be displayed. Click [Next].



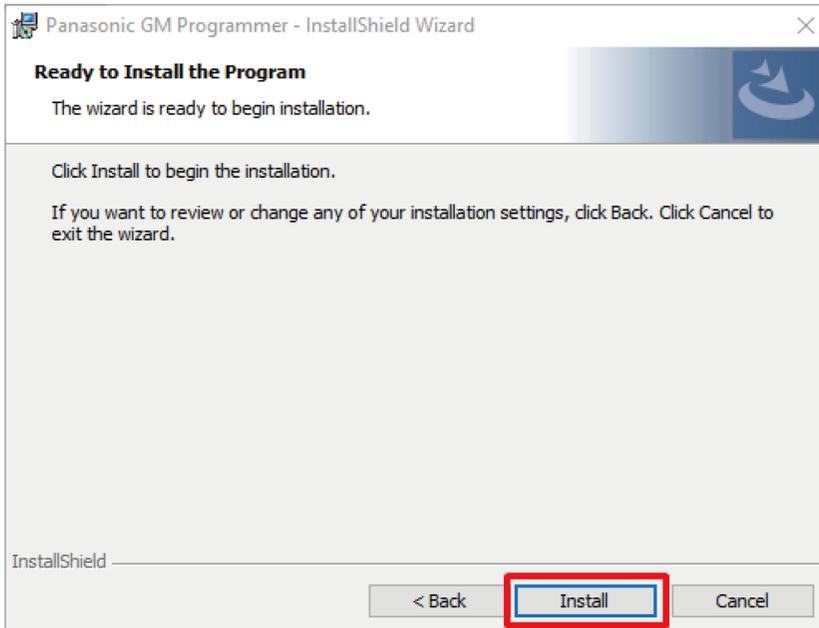
4. The following window will be displayed. Select [I accept the terms in the license agreement] and click [Next].



5. The following window will be displayed. If you change the installation destination folder, click [Change] and specify a desired installation destination. If you do not change the installation destination folder, click [Next].

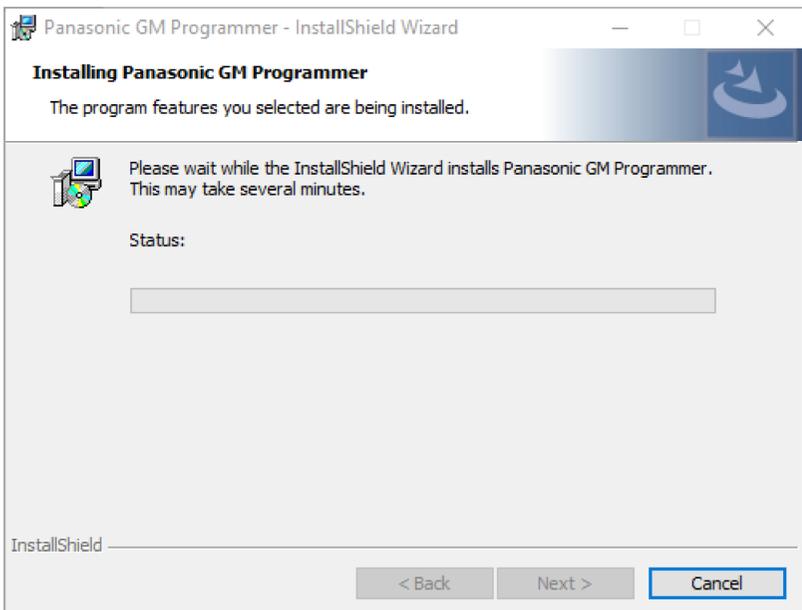


6. The window below will be displayed. Click [Install] to start the installation.



7. The following window will be displayed while the installation is in progress.

## 6.2 Installation and Uninstallation

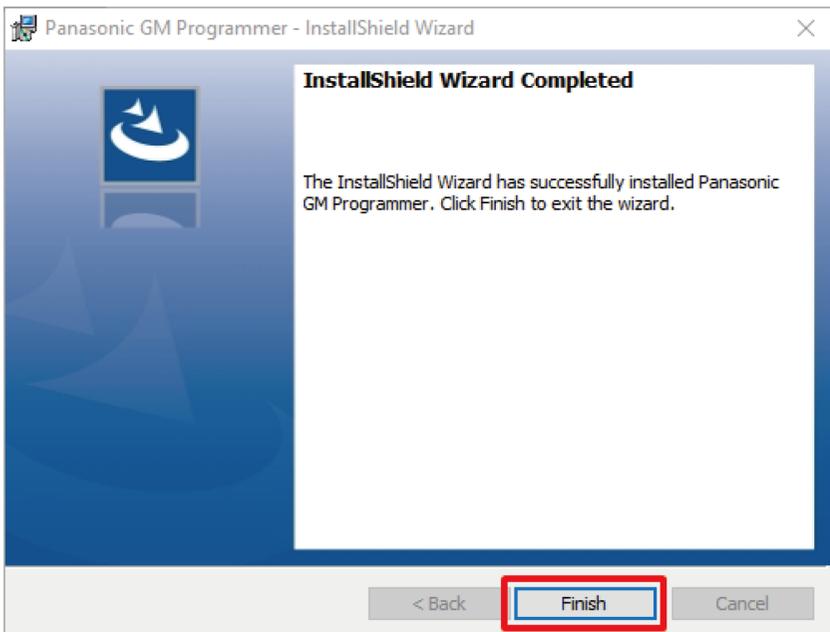


Following this installation, the three packages below will be installed. (The segments indicated by \* differ according to the version of the software.)

- CODESYS SoftMotion\*.\*.\*.\*\_P
- GMPLibrary (\*.\*.\*.\*)
- PANATERM-Lite for GM V\*.\*

These packages take a long time to install. Take care not to click [Cancel] while the installation is in progress.

8. When the installation of all the packages is completed, the following window will be displayed. Click [Finish].



This completes the installation procedure.

### Info.

- When the GM Programmer is installed, PANATERM Lite for GM, Gateway (CODESYS Gateway), and CodeMeter applications are installed at the same time.

## 6.2.2 Uninstalling GM Programmer

### **1 2** Procedure

1. From the Start menu, select **Windows System>Control Panel**, and then click "Uninstall a program".  
A list of installed programs will be displayed.
2. Double-click "Panasonic GM Programmer".  
The following window will be displayed. [Yes]



3. Click the [Yes] button.  
The GM Programmer will be uninstalled.

### Info.

- When the GM Programmer is uninstalled, PANATERM Lite for GM and Gateway are also uninstalled at the same time.
- CodeMeter will not be uninstalled at this time. Uninstall it separately.

## 6.3 Basic Operations

---

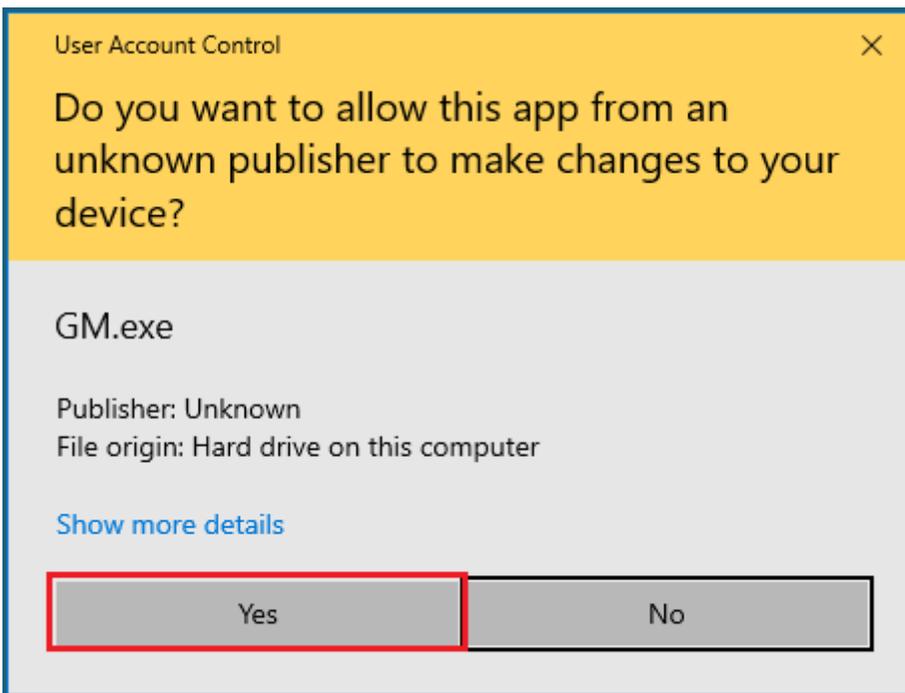
### 6.3 Basic Operations

This section explains how to start and quit GM Programmer.

#### 6.3.1 How to start

##### 1 2 Procedure

1. Click the [Start] button and select **Panasonic Corporation>GM Programmer**. The "User Account Control" dialog box will be displayed. Click [Yes].



GM Programmer will be started.



### 6.3.2 How to quit



- Before closing GM Programmer, be sure to save any project files that you are editing and must save.

1 2

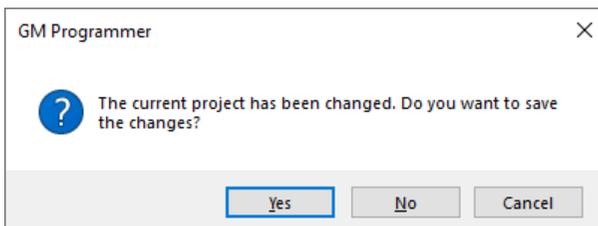
#### Procedure

1. From the menu bar, select **File>Exit**.

If changes have not been saved, the following window will be displayed.

If exiting without saving, select [No].

If changes need to be saved, select [Yes] to perform the save process.



2. Click the [Yes] button.  
GM Programmer will be closed.

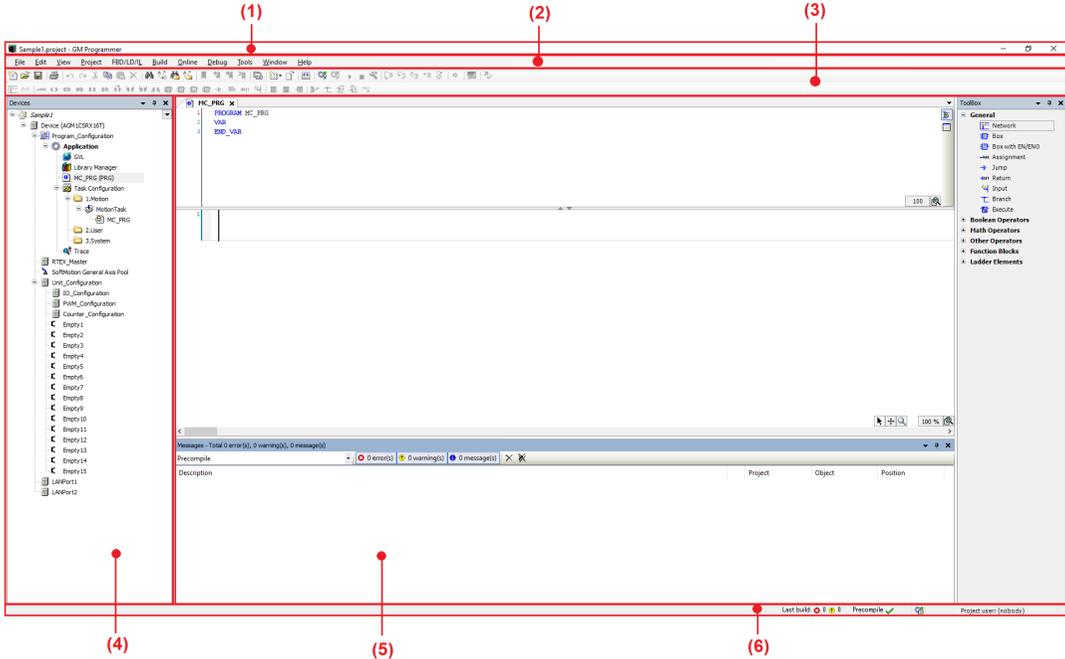
#### Info.

- You can also close GM Programmer by clicking the [x] button on the title bar.

## 6.4 Component Names

### 6.4 Component Names

This section presents the name and display content of each component of GM Programmer.



| No. | Name           | Description   |
|-----|----------------|---|
| (1) | Title bar      | The title bar displays the project file name, [minimize] button, [maximize] button, and [close] button.                               |
| (2) | Menu bar       | The menu bar displays the menu commands for each purpose in list format.  |
| (3) | Toolbar        | The toolbar displays each command as an icon.   |
| (4) | Navigator pane | The navigator pane displays the objects (such as devices, applications, and programs) added to the project in a tree structure.       |
| (5) | Main pane      | The main pane displays a program, function settings, messages, and other data. The window can be switched by selecting a desired tab. |
| (6) | Status field   | The status bar displays the build status, logged-in users, and other information.   |

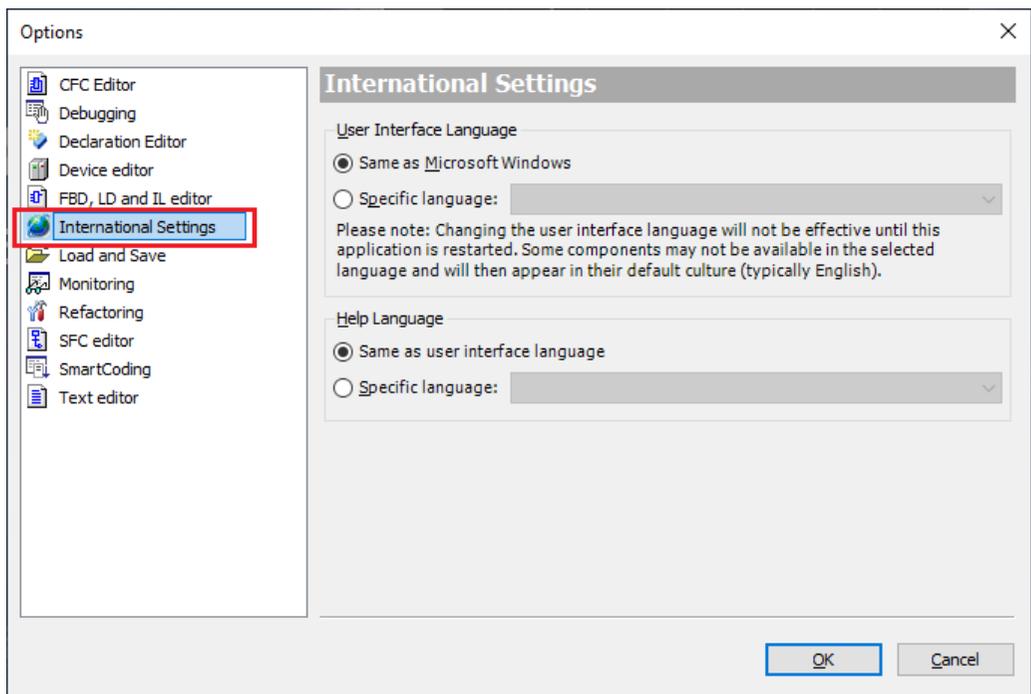
## 6.5 Other Functions

### 6.5.1 Display Language Setting Function

This function allows the user to change the display language setting for GM Programmer. The default setting is the same language as the one used in the operating system. If you want to use a different language from the one used in the operating system, change the display language setting. After you change the language setting, you must restart GM Programmer.

#### 1 2 Procedure

1. From the menu bar, select **Tools>Options**.  
The "Options" dialog box will be displayed.
2. Select "International Settings" from the Categories pane.  
The "International Settings" pane will be displayed.



3. Select **User Interface Language>Specific language** option and specify a desired language in the field.
4. Click [OK].  
The "Options" dialog box will be closed.  
At this stage, the language has not been changed yet.
5. Close GM Programmer and then start GM Programmer again.  
After GM Programmer is started, the selected language takes effect.

## 6.5 Other Functions

### **i** Info.

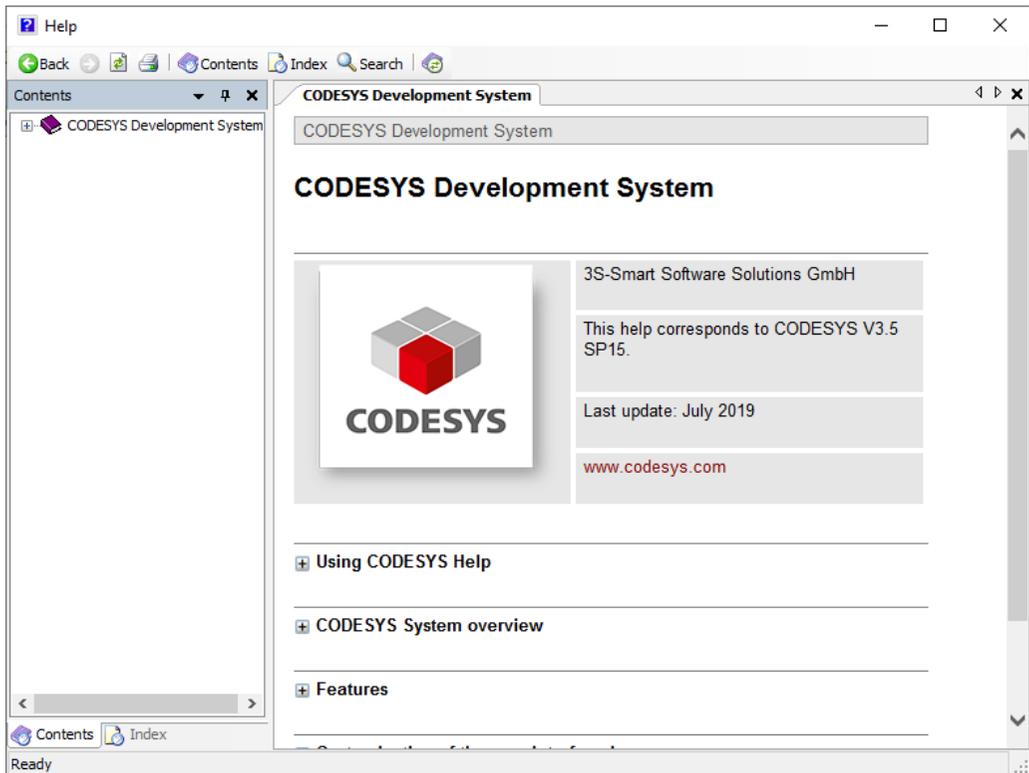
- The display language setting of GM Programmer is linked with that of PANATERM Lite for GM. Therefore, if the display language setting of PANATERM Lite for GM is changed, the display language setting of GM Programmer will also be changed automatically.

### 6.5.2 Online Help Function

This function allows the user to open the manual and check information such as operating methods.

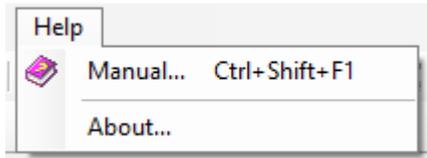
### **1 2** Procedure

1. Press the [F1] key.  
Online help will be started and the page corresponding to the displayed window will be displayed.



### Info.

- You can also start online help by selecting **Help>Manual** from the menu bar.



## 6.5.3 Version Display Function

This function allows the user to check the version, license, and other information for GM Programmer.

### **1 2** Procedure

- From the menu bar, select **Help>Version Info**.  
The GM Programmer version is displayed in parentheses on the title bar.

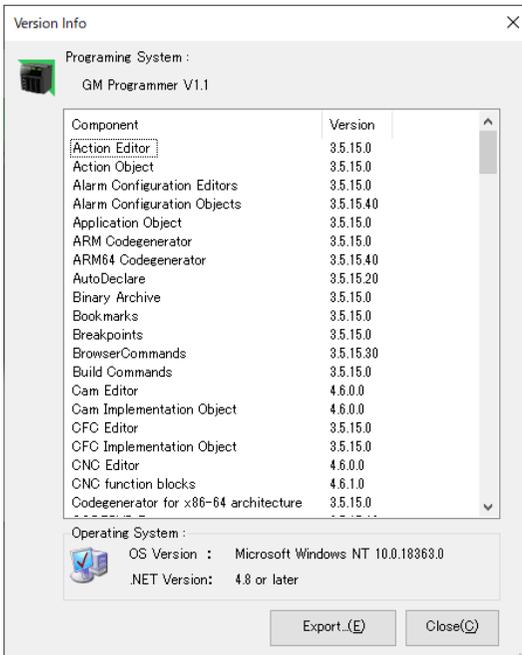


- Click a desired button at the bottom of the window.

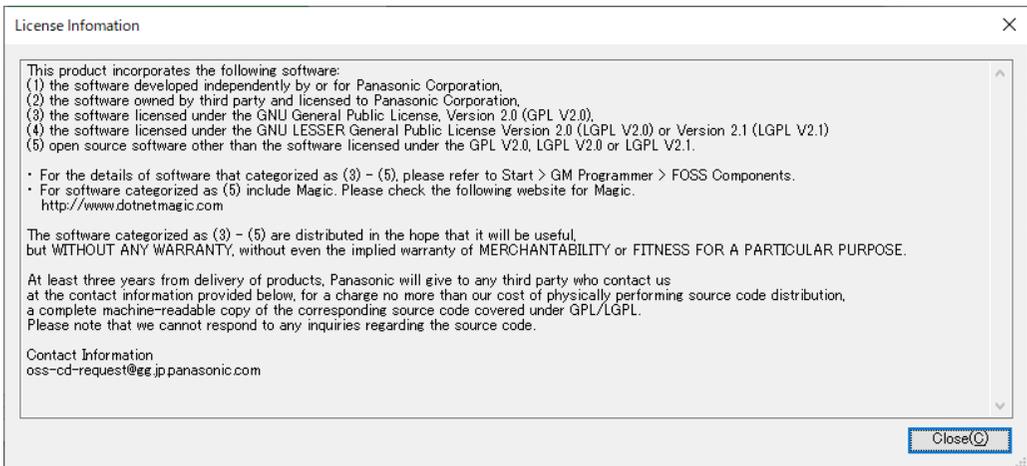
| Button       | Description   |
|--------------|---|
| Version Info | Displays information about the plug-ins that have been applied and the operating system of the PC that is used. |
| License Info | Displays license information for the software used by GM Programmer.  |

Clicking the [Version Info] button displays the "Version Info" dialog box.

## 6.5 Other Functions



Clicking the [License Info] button displays the "License Information" dialog box.



# 7 Overview of PANATERM Lite for GM

---

|  |      |
|--|------|
| 7.1 System Requirements.....                             | 7-2  |
| 7.1.1 Operating Environment of PANATERM Lite for GM..... | 7-2  |
| 7.2 Basic Operations.....                                | 7-3  |
| 7.2.1 How to Start.....                                  | 7-3  |
| 7.2.2 How to Exit.....                                   | 7-5  |
| 7.3 Component Names.....                                 | 7-6  |
| 7.4 Parameter Window.....                                | 7-7  |
| 7.4.1 Configuration of Parameters Window.....            | 7-7  |
| 7.4.2 Setting Parameters.....                            | 7-9  |
| 7.5 Monitor Window.....                                  | 7-11 |
| 7.5.1 Configuration of Monitor Window.....               | 7-11 |
| 7.5.2 Checking the Monitor Window.....                   | 7-13 |
| 7.6 Alarm Window.....                                    | 7-14 |
| 7.6.1 Configuration of Alarm Window.....                 | 7-14 |
| 7.6.2 Checking Alarms.....                               | 7-16 |
| 7.7 Other Functions.....                                 | 7-18 |
| 7.7.1 Language Setting Function.....                     | 7-18 |
| 7.7.2 Help Function.....                                 | 7-18 |
| 7.7.3 Version Display Function.....                      | 7-18 |

## 7.1 System Requirements

---

### 7.1 System Requirements

#### 7.1.1 Operating Environment of PANATERM Lite for GM

##### Programming software

| Product name         | Applicable language          |
|----------------------|------------------------------|
| PANATERM Lite for GM | Japanese / English / Chinese |

(Note 1) When GM Programmer is installed, MINAS setup support software "PANATERM Lite for GM" is installed at the same time.

##### Software operating environment

| Item               | Description  |
|--------------------|--|
| OS                 | Microsoft(R) Windows(R) 10: 32bit / 64bit  |
| PC                 | PC with the following software installed: <ul style="list-style-type: none"><li>● Microsoft.NET Framework 4.6.1 or later</li><li>● Microsoft Visual C++ 2010 SP1 Redistributable Package (x86)</li><li>● Microsoft Visual C++ 2010 SP1 Redistributable Package (x64)</li><li>● Microsoft Visual C++ 2013 Redistributable Package (x86)</li><li>● Microsoft Visual C++ 2013 Redistributable Package (x64)</li><li>● Microsoft Visual C++ 2015 Update 3 Redistributable Package (x86)</li><li>● Microsoft Visual C++ 2015 Update 3 Redistributable Package (x64)</li></ul> |
| HDD                | At least 4 GB of free space  |
| Memory             | At least 8 GB  |
| Communication port | LAN port (for Ethernet connection)<br>USB 2.0 port (for USB connection)  |

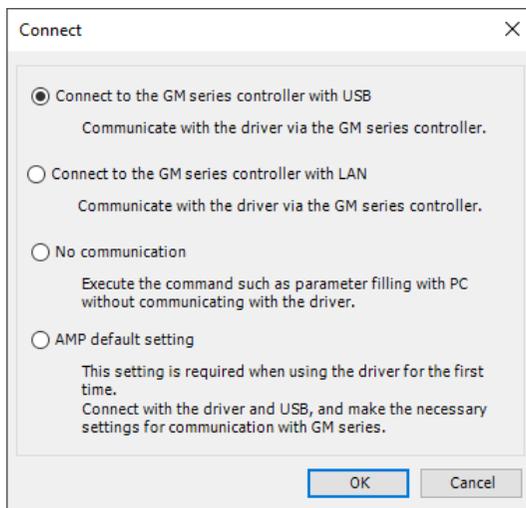
## 7.2 Basic Operations

This section explains how to start and exit PANATERM Lite for GM.

### 7.2.1 How to Start

#### 1 2 Procedure

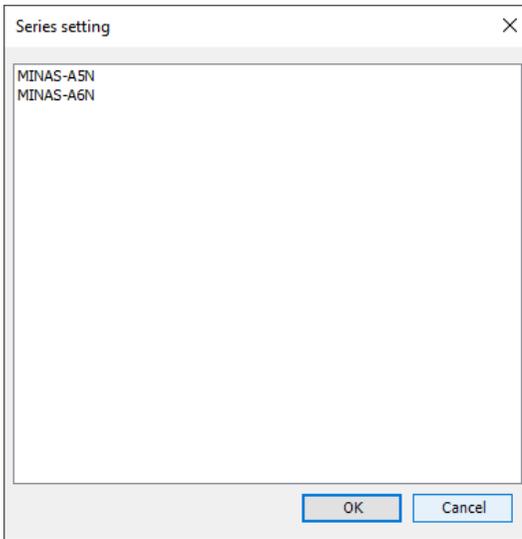
1. Click the [Start] button in the Windows task bar and select **Panasonic Corporation>PANATERM Lite for GM**.
2. The "Connect" dialog box will be displayed.  
Select communication settings and click [OK].



3. The "Series setting" dialog box will be displayed.

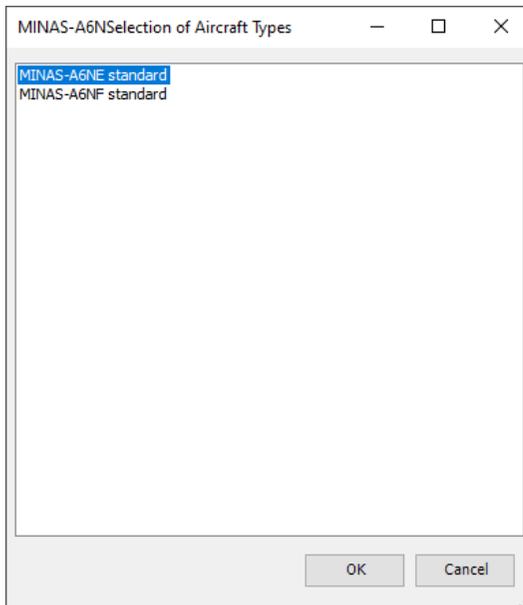
## 7.2 Basic Operations

---

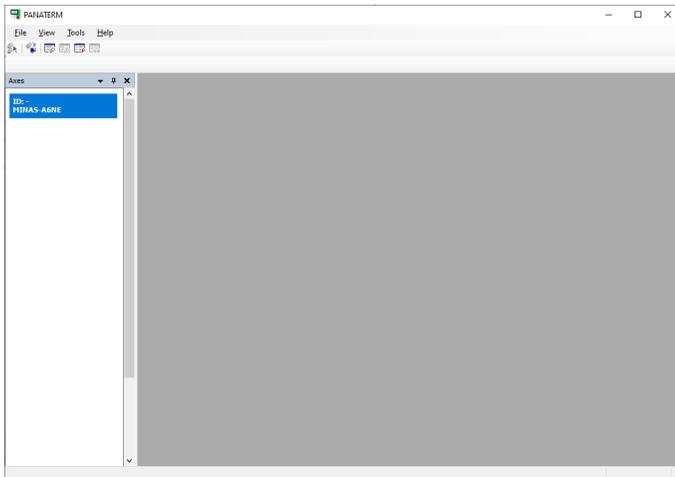


### Note

When the "Selection of Aircraft Types" dialog box is displayed, select a model and click the "OK" button.



4. PANATERM Lite for GM will be started.



### 7.2.2 How to Exit



- Note that all information will be lost if you close the program without saving settings, collected data, or other information.

**1** **2**

#### Procedure

1. From the menu bar, select **File>Exit**.  
PANATERM Lite for GM will be closed.

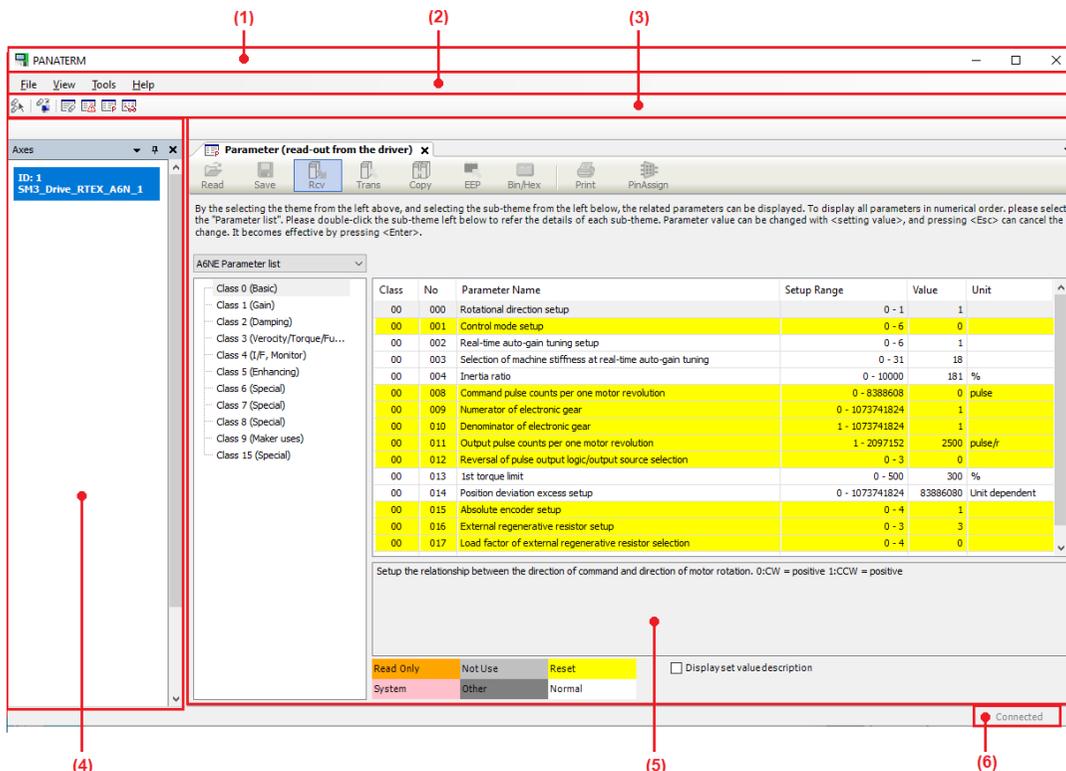
#### Info.

- You can also close PANATERM Lite for GM by clicking the [x] button on the title bar.

## 7.3 Component Names

### 7.3 Component Names

This section explains the components and displays of PANATERM Lite for GM.

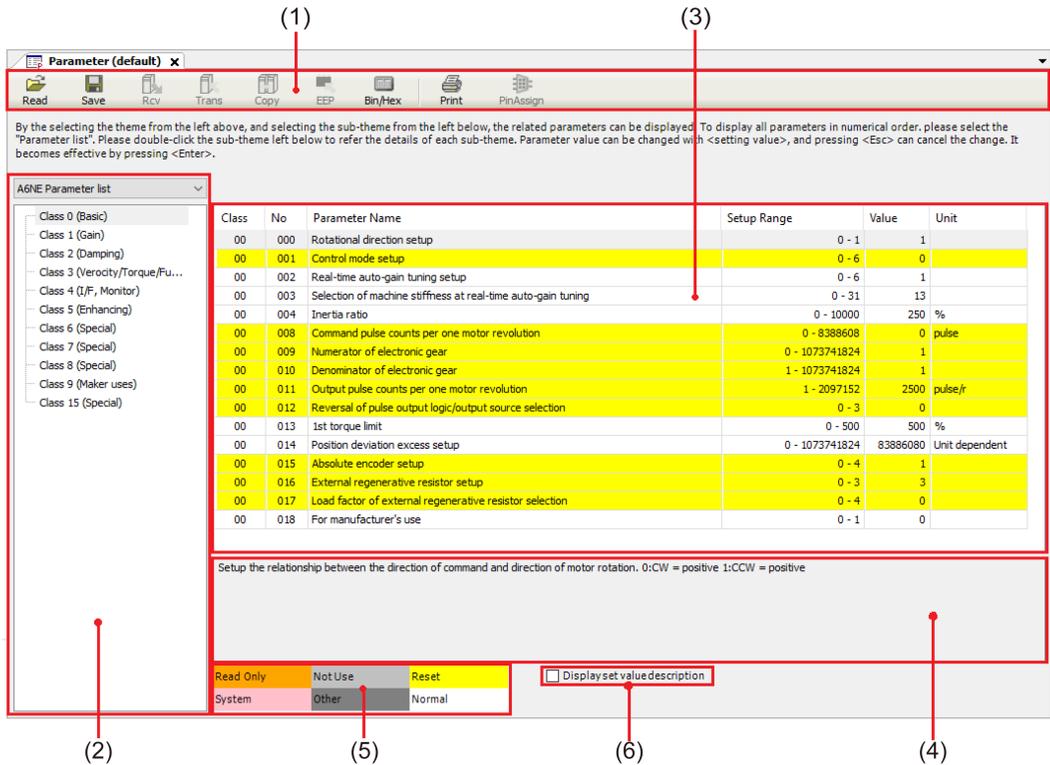


| No. | Name           | Description   |
|-----|----------------|---|
| (1) | Title bar      | The title bar displays the project file name, [minimize] button, [maximize] button, and [close] button.   |
| (2) | Menu bar       | The menu bar displays the menu commands for each purpose in list format.  |
| (3) | Toolbar        | The toolbar displays each command as an icon.   |
| (4) | Navigator pane | This pane displays a list of axes.  |
| (5) | Main pane      | This pane displays the Parameter window, Monitor window, Alarm window, and other windows.<br>The window can be switched by selecting a desired tab. |
| (6) | Status field   | This field displays the status of connection to the GM1 controller.   |

## 7.4 Parameter Window

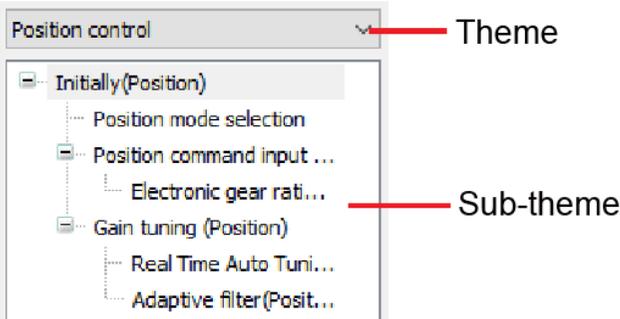
The Parameter window allows the user to check and rewrite the values of servo amplifier parameters, save them to parameter files, and perform parameter-related operations.

### 7.4.1 Configuration of Parameters Window



| No. | Name    | Function  |      |          |          |  |      |   |  |      |                                    |  |     |   |
|-----|---------|---|------|----------|----------|--|------|---|--|------|------------------------------------|--|-----|---|
| (1) | Toolbar | The toolbar consists of basic operation commands related to parameters, such as save and read.  |      |          |          |  |      |   |  |      |                                    |  |     |   |
|     |         | <table border="1"> <thead> <tr> <th>Icon</th> <th>Name</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td></td> <td>Read</td> <td>Reads parameters from file ".prm5".<br/>When this button is enabled, you can specify a parameter file also by drag-and-drop operation.</td> </tr> <tr> <td></td> <td>Save</td> <td>Writes parameters to file ".prm5".</td> </tr> <tr> <td></td> <td>Rcv</td> <td>Receives parameters from the servo amplifier.</td> </tr> </tbody> </table> | Icon | Name     | Function |  | Read | Reads parameters from file ".prm5".<br>When this button is enabled, you can specify a parameter file also by drag-and-drop operation. |  | Save | Writes parameters to file ".prm5". |  | Rcv | Receives parameters from the servo amplifier. |
|     |         | Icon  | Name | Function |          |  |      |   |  |      |                                    |  |     |   |
|     | Read    | Reads parameters from file ".prm5".<br>When this button is enabled, you can specify a parameter file also by drag-and-drop operation.   |      |          |          |  |      |   |  |      |                                    |  |     |   |
|     | Save    | Writes parameters to file ".prm5".  |      |          |          |  |      |   |  |      |                                    |  |     |   |
|     | Rcv     | Receives parameters from the servo amplifier.   |      |          |          |  |      |   |  |      |                                    |  |     |   |

## 7.4 Parameter Window

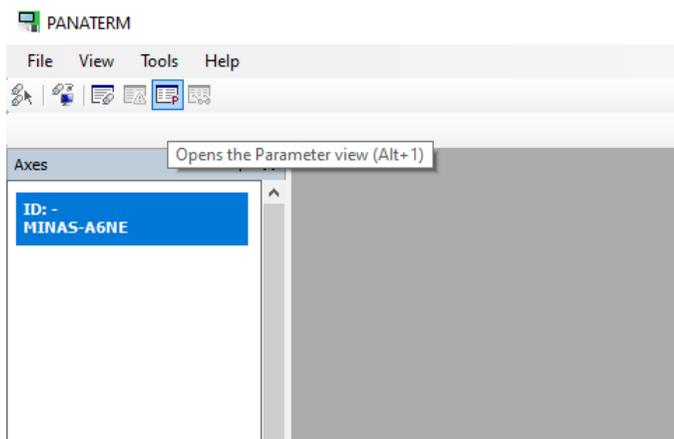
| No.            | Name   | Function  |                        |  |      |          |       |                               |     |                            |                |                          |             |   |       |  |
|----------------|--|---|------------------------|--|------|----------|-------|-------------------------------|-----|----------------------------|----------------|--------------------------|-------------|---|-------|--|
|                |  | Icon  | Name                   | Function   |      |          |       |                               |     |                            |                |                          |             |   |       |  |
|                |  |    | Trans                  | Transmits parameters to the servo amplifier.                                   |      |          |       |                               |     |                            |                |                          |             |   |       |  |
|                |  |    | Copy                   | Copies the parameters of a servo amplifier to servo amplifiers for other axes. |      |          |       |                               |     |                            |                |                          |             |   |       |  |
|                |  |    | EEP                    | Writes parameters to EEPROM of the servo amplifier.                            |      |          |       |                               |     |                            |                |                          |             |   |       |  |
|                |  |    | Bin / Hex              | Inputs the selected settings in binary or hexadecimal format.                  |      |          |       |                               |     |                            |                |                          |             |   |       |  |
|                |  |    | Print                  | Prints parameters.   |      |          |       |                               |     |                            |                |                          |             |   |       |  |
|                |  |    | Pin assignment setting | Sets I/O pin assignment.   |      |          |       |                               |     |                            |                |                          |             |   |       |  |
| (2)            | Theme selection pane   | <p>After a theme is selected, if a parameter category is selected from a sub-theme, related parameters will be displayed in the parameter setting area.</p>  <p>For details on each parameter, refer to the instruction manual and other technical references for the servo amplifier.</p>   |                        |  |      |          |       |                               |     |                            |                |                          |             |   |       |  |
| (3)            | Parameter setting area   | <p>Allows the user to set or edit parameters.</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>Class</td> <td>Displays parameter categories</td> </tr> <tr> <td>No.</td> <td>Displays parameter numbers</td> </tr> <tr> <td>Parameter Name</td> <td>Displays parameter names</td> </tr> <tr> <td>Setup Range</td> <td>Displays the maximum and minimum allowable values of parameter settings</td> </tr> <tr> <td>Value</td> <td>Displays parameter values. Values can be changed. For parameters provided with a ▼ button beside the set value, a desired value can be selected from the combo box. After selecting a value from the combo box, press the &lt;Enter&gt; key. For parameters without a ▼ button beside the set value, either directly enter a value using &lt;numerical&gt; keys or click "▲""▼" to edit the value by increasing or decreasing it. To set a</td> </tr> </tbody> </table> |                        |  | Name | Function | Class | Displays parameter categories | No. | Displays parameter numbers | Parameter Name | Displays parameter names | Setup Range | Displays the maximum and minimum allowable values of parameter settings | Value | Displays parameter values. Values can be changed. For parameters provided with a ▼ button beside the set value, a desired value can be selected from the combo box. After selecting a value from the combo box, press the <Enter> key. For parameters without a ▼ button beside the set value, either directly enter a value using <numerical> keys or click "▲""▼" to edit the value by increasing or decreasing it. To set a |
| Name           | Function   |   |                        |  |      |          |       |                               |     |                            |                |                          |             |   |       |  |
| Class          | Displays parameter categories  |   |                        |  |      |          |       |                               |     |                            |                |                          |             |   |       |  |
| No.            | Displays parameter numbers   |   |                        |  |      |          |       |                               |     |                            |                |                          |             |   |       |  |
| Parameter Name | Displays parameter names   |   |                        |  |      |          |       |                               |     |                            |                |                          |             |   |       |  |
| Setup Range    | Displays the maximum and minimum allowable values of parameter settings  |   |                        |  |      |          |       |                               |     |                            |                |                          |             |   |       |  |
| Value          | Displays parameter values. Values can be changed. For parameters provided with a ▼ button beside the set value, a desired value can be selected from the combo box. After selecting a value from the combo box, press the <Enter> key. For parameters without a ▼ button beside the set value, either directly enter a value using <numerical> keys or click "▲""▼" to edit the value by increasing or decreasing it. To set a |   |                        |  |      |          |       |                               |     |                            |                |                          |             |   |       |  |

| No. | Name                                      | Function  |  |
|-----|---|---|--|
|     |   | Name  | Function                                 |
|     |   | Unit  | Displays the unit of parameter settings. |
| (4) | Text display area                         | Displays a description related to the selected parameter.   |  |
| (5) | Parameter attribute description area      | Displays a description of parameter attributes. The background color of each parameter in the parameter setting area represents an attribute.   |  |
| (6) | "Display-set value description" check box | Selecting the check box displays combo boxes and decimal points in the "Value" column of the parameter setting area. To display parameter set values in an easy-to-understand manner, select the check box. |  |

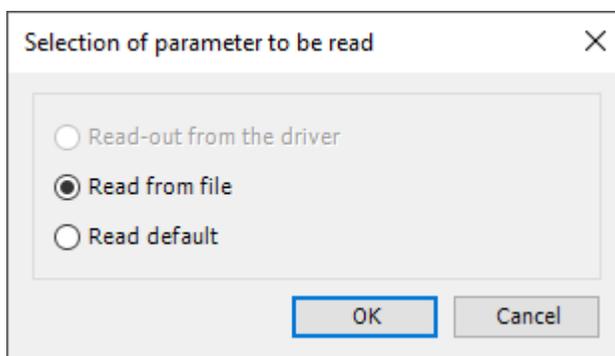
## 7.4.2 Setting Parameters

### 1 2 Procedure

1. From the menu bar on the main pane, select **Display>Parameter**. Alternatively, on the toolbar, click the "Open the Parameter view" icon.



The "Selection of parameter to be read" dialog box will be displayed.



## 7.4 Parameter Window

### Read-out from the driver

Communicates with the connected servo amplifier and reads the parameter settings from the servo amplifier. If this mode is selected, parameter values will be reflected in the servo amplifier as soon as they are changed.

### Read from file

Read the parameter file ("prm5") that was edited previously. If communication is performed with the servo amplifier, parameter values will be reflected in the servo amplifier as soon as they are changed.

### Read default

Reads the standard default settings of the servo amplifier that were saved during installation. If communication is performed with the servo amplifier, parameter values will be reflected in the servo amplifier as soon as they are changed.

2. Select one of the three options above and click the [OK] button.

The Parameter window will be displayed.

By the selecting the theme from the left above, and selecting the sub-theme from the left below, the related parameters can be displayed. To display all parameters in numerical order, please select the "Parameter list". Please double-click the sub-theme left below to refer the details of each sub-theme. Parameter value can be changed with <setting value>, and pressing <Esc> can cancel the change. It becomes effective by pressing <Enter>.

| Class | No  | Parameter Name   | Setup Range    | Value    | Unit           |
|-------|-----|--|----------------|----------|----------------|
| 00    | 000 | Rotational direction setup                                   | 0 - 1          | 1        |                |
| 00    | 001 | Control mode setup   | 0 - 6          | 0        |                |
| 00    | 002 | Real-time auto-gain tuning setup                             | 0 - 6          | 1        |                |
| 00    | 003 | Selection of machine stiffness at real-time auto-gain tuning | 0 - 31         | 13       |                |
| 00    | 004 | Inertia ratio  | 0 - 10000      | 250      | %              |
| 00    | 008 | Command pulse counts per one motor revolution                | 0 - 8388608    | 0        | pulse          |
| 00    | 009 | Numerator of electronic gear                                 | 0 - 1073741824 | 1        |                |
| 00    | 010 | Denominator of electronic gear                               | 1 - 1073741824 | 1        |                |
| 00    | 011 | Output pulse counts per one motor revolution                 | 1 - 2097152    | 2500     | pulse/r        |
| 00    | 012 | Reversal of pulse output logic/output source selection       | 0 - 3          | 0        |                |
| 00    | 013 | 1st torque limit   | 0 - 500        | 500      | %              |
| 00    | 014 | Position deviation excess setup                              | 0 - 1073741824 | 83886080 | Unit dependent |
| 00    | 015 | Absolute encoder setup                                       | 0 - 4          | 1        |                |
| 00    | 016 | External regenerative resistor setup                         | 0 - 3          | 3        |                |
| 00    | 017 | Load factor of external regenerative resistor selection      | 0 - 4          | 0        |                |
| 00    | 018 | For manufacturer's use                                       | 0 - 1          | 0        |                |

Setup the relationship between the direction of command and direction of motor rotation. 0: CW = positive 1: CCW = positive

Display set value description

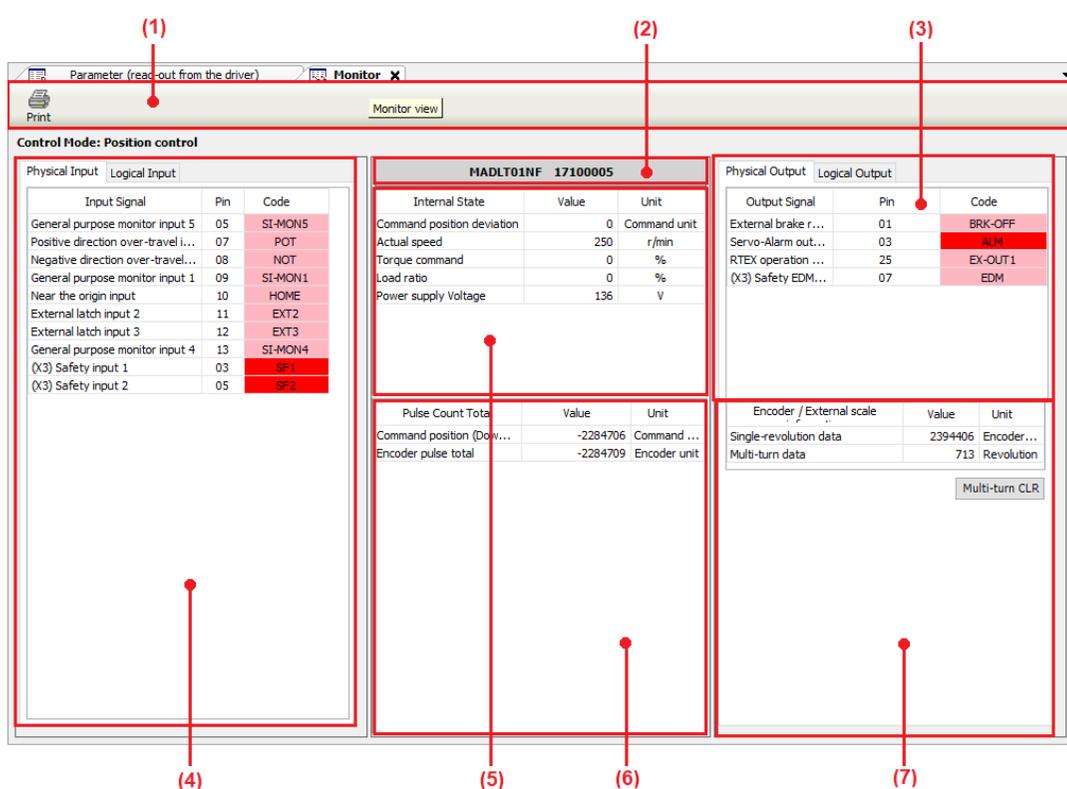
Read Only   Not Use   Reset   System   Other   Normal

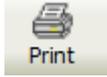
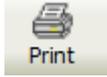
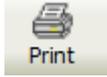
3. After changing the parameter settings, click the [EEP] button to write the parameter settings to the EEPROM of the servo amplifier.
4. Click the [x] button on the Parameter window to close the Parameter window.

## 7.5 Monitor Window

The Monitor window displays the operating states of servo amplifiers and motors, I/O signals, internal statuses, and other information and also allows the user to check them.

### 7.5.1 Configuration of Monitor Window



| NO.   | Name                                   | Description  |      |      |          |   |       |  |
|---|--|--|------|------|----------|---|-------|--|
| (1)   | Toolbar                                | <p>The toolbar consists of basic operation commands related to parameters.</p> <table border="1"> <thead> <tr> <th>Icon</th> <th>Name</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td></td> <td>Print</td> <td>Prints the contents of the Monitor window.</td> </tr> </tbody> </table> | Icon | Name | Function |  | Print | Prints the contents of the Monitor window. |
| Icon  | Name                                   | Function   |      |      |          |   |       |  |
|  | Print                                  | Prints the contents of the Monitor window.   |      |      |          |   |       |  |
| (2)   | Amplifier model name and serial number | Displays the model name and serial number of the servo amplifier.  |      |      |          |   |       |  |
| (3)   | Output signal status monitor           | <p>Displays the status of each output signal. The tab can be switched between "Physical Output" and "Logical Output".</p> <p>Physical Output – Displays the status of output signals from the servo amplifier.</p> <p>Red: Indicates that output transistor is ON</p> <p>Pink: Indicates that output transistor is OFF</p>   |      |      |          |   |       |  |

## 7.5 Monitor Window

| NO.                          | Name  | Description   |                  |  |                              |   |              |                            |                |                              |             |   |                            |  |
|------------------------------|---|---|------------------|--|------------------------------|---|--------------|----------------------------|----------------|------------------------------|-------------|---|----------------------------|--|
|                              |   | Logical Output – Displays the status of signals within the servo amplifier.<br>Red: Indicates that signal status is active<br>Pink: Indicates that signal status is inactive  |                  |  |                              |   |              |                            |                |                              |             |   |                            |  |
| (4)                          | Input signal status monitor   | Displays the status of input signals. The tab can be switched between "Physical Input" and "Logical Input".<br>Physical Input – Displays the status of input signals to the servo amplifier.<br>Red: Indicates that COM- is connected<br>Pink: Indicates that signal status is open<br>Logical Input – Displays the status of signals within the servo amplifier.<br>Red: Indicates that signal status is active<br>Pink: Indicates that signal status is inactive  |                  |  |                              |   |              |                            |                |                              |             |   |                            |  |
| (5)                          | Internal status monitor   | Displays the internal status of the servo amplifier. <table border="1" data-bbox="491 681 1212 996"> <thead> <tr> <th>Name</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>Commanded position deviation</td> <td>Displays the position deviation of a command unit.</td> </tr> <tr> <td>Actual speed</td> <td>Displays the monitor speed</td> </tr> <tr> <td>Torque command</td> <td>Displays the torque command.</td> </tr> <tr> <td>Load factor</td> <td>Displays the ratio relative to the rated load. Adjust the operation pattern so that 100% is not exceeded.</td> </tr> <tr> <td>Power supply voltage value</td> <td>Displays the voltage (voltage between the P and N terminals) of power supply to the servo amplifier.</td> </tr> </tbody> </table> | Name             | Function   | Commanded position deviation | Displays the position deviation of a command unit.              | Actual speed | Displays the monitor speed | Torque command | Displays the torque command. | Load factor | Displays the ratio relative to the rated load. Adjust the operation pattern so that 100% is not exceeded. | Power supply voltage value | Displays the voltage (voltage between the P and N terminals) of power supply to the servo amplifier. |
| Name                         | Function  |   |                  |  |                              |   |              |                            |                |                              |             |   |                            |  |
| Commanded position deviation | Displays the position deviation of a command unit.  |   |                  |  |                              |   |              |                            |                |                              |             |   |                            |  |
| Actual speed                 | Displays the monitor speed  |   |                  |  |                              |   |              |                            |                |                              |             |   |                            |  |
| Torque command               | Displays the torque command.  |   |                  |  |                              |   |              |                            |                |                              |             |   |                            |  |
| Load factor                  | Displays the ratio relative to the rated load. Adjust the operation pattern so that 100% is not exceeded. |   |                  |  |                              |   |              |                            |                |                              |             |   |                            |  |
| Power supply voltage value   | Displays the voltage (voltage between the P and N terminals) of power supply to the servo amplifier.      |   |                  |  |                              |   |              |                            |                |                              |             |   |                            |  |
| (6)                          | Pulse sum monitor   | Displays the sum of command and encoder pulses received by the servo amplifier.   |                  |  |                              |   |              |                            |                |                              |             |   |                            |  |
| (7)                          | Encoder information monitor   | Displays encoder information. <table border="1" data-bbox="491 1114 1212 1244"> <tbody> <tr> <td>Single-turn data</td> <td>Displays an absolute position when the motor makes no more than a single turn.</td> </tr> <tr> <td>Multi-turn data</td> <td>Displays how many turns the motor made after "Clear" operation.</td> </tr> </tbody> </table> <p>Clicking "Clear Multi-turn" resets the multi-turn data stored in the encoder to "0" and clears all encoder errors.</p> <p>Note: Before using "Clear Multi-turn", check the precautions on use. To clear encoder errors, you may need to restart the servo amplifier.</p>   | Single-turn data | Displays an absolute position when the motor makes no more than a single turn. | Multi-turn data              | Displays how many turns the motor made after "Clear" operation. |              |                            |                |                              |             |   |                            |  |
| Single-turn data             | Displays an absolute position when the motor makes no more than a single turn.                            |   |                  |  |                              |   |              |                            |                |                              |             |   |                            |  |
| Multi-turn data              | Displays how many turns the motor made after "Clear" operation.   |   |                  |  |                              |   |              |                            |                |                              |             |   |                            |  |

- (Note 1) Because Ethernet communication is used to transfer data between the servo amplifier and PC, there is a difference or delay between the value displayed on the screen and the actual value of the servo amplifier.
- (Note 2) When the polarity is "+", symbol "+" is not displayed.
- (Note 3) The monitor function is not a measuring instrument. Use the values displayed in the Monitor window as a guide.
- (Note 4) If the servo amplifier outputs "Error 40.0 Error protection from absolute system failure" or "Error 42.0 Error protection from absolute overspeed", execute "Clear Multi-turn". Unless the absolute encoder is reset, the alarm cannot be cleared.

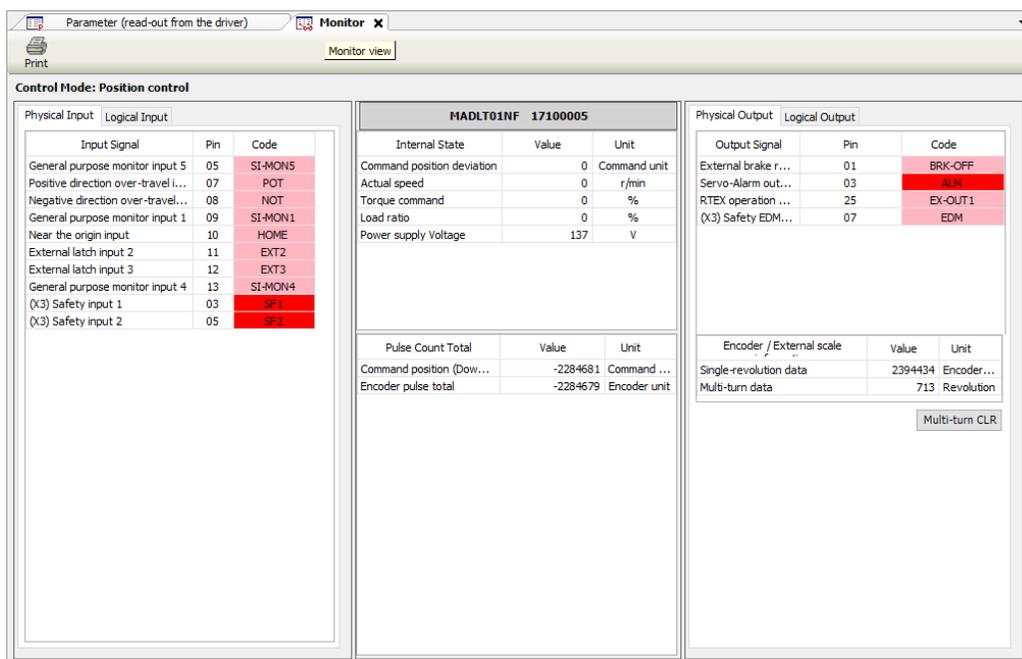
## 7.5.2 Checking the Monitor Window

### 1 2 Procedure

1. From the menu bar on the main pane, select **Display>Monitor**. Alternatively, on the toolbar, click the "Open the Monitor view" icon.



The Monitor window will be displayed.



2. Check each item.  
Check the input signal state, output signal state, and the internal status of the servo amplifier.
3. Click the [×] button on the Monitor window.  
The Monitor window will be closed.

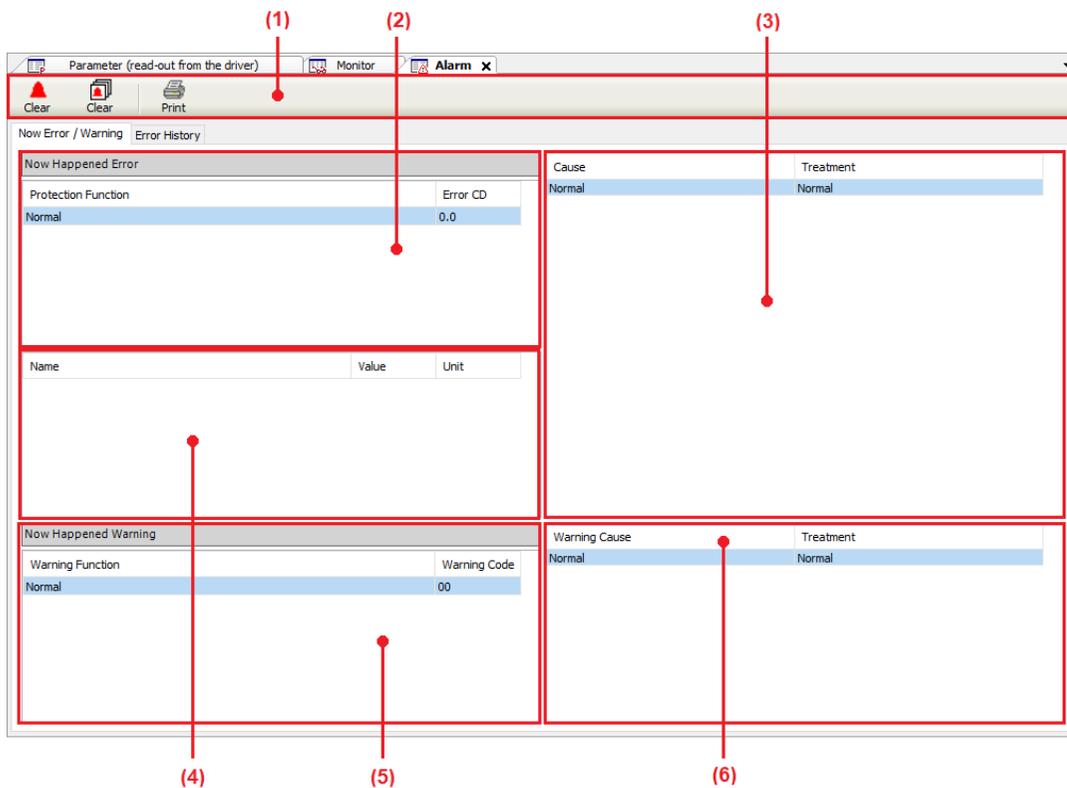
## 7.6 Alarm Window

### 7.6 Alarm Window

If the front panel of the servo amplifier is blinking, such as when the motor is not working, you can check the alarm status. Please note that the alarm cannot be cleared.

#### 7.6.1 Configuration of Alarm Window

Display of the current errors and warnings (only during communication with servo amplifier)



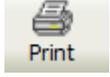
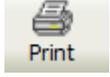
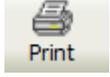
## Display of error histories

The screenshot shows the Alarm window interface. At the top, there are buttons for 'Clear', 'Clear', and 'Print'. Below these, there are tabs for 'Now Error / Warning' and 'Error History'. The main area is divided into three sections:

- Error History Table:** A table with columns 'Hist', 'Protection Function', and 'Error CD'. It lists 14 entries, including 'Command error protection' and multiple 'RTEX communication timeout error protection' entries.
- Parameters Table:** A table with columns 'Name', 'Value', and 'Unit'. It lists various parameters such as 'Control mode', 'Motor speed', 'Position control speed', etc.
- Cause and Treatment:** A detailed view for a selected error, showing the 'Cause' (Position command variation) and 'Treatment' (Check whether the position command was significantly changed, etc.).

Red callouts are placed as follows:

- (7) points to the 'Error CD' column in the error history table.
- (8) points to the 'Cause' and 'Treatment' columns in the detailed error view.
- (9) points to the 'Value' column in the parameters table.

| No.   | Name                       | Description   |       |  |          |   |       |  |   |       |   |   |       |                                   |
|---|----------------------------|---|-------|--|----------|---|-------|--|---|-------|---|---|-------|-----------------------------------|
| (1)   | Toolbar                    | <table border="1"> <thead> <tr> <th>Icon</th> <th>Name</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td></td> <td>Clear</td> <td>Allows the user to clear the current alarm history. If you click this button after eliminating the cause of the alarm, the current alarm will be cleared and normal operation will be performed. However, you cannot clear any alarms that cannot be cleared by alarm clear input signals of servo amplifiers. In such a case, turn off the servo amplifier, eliminate the cause of the alarm, and then turn the power on again.</td> </tr> <tr> <td></td> <td>Clear</td> <td>Allows the user to clear error histories.</td> </tr> <tr> <td></td> <td>Print</td> <td>Prints error-related information.</td> </tr> </tbody> </table> | Icon  | Name   | Function |  | Clear | Allows the user to clear the current alarm history. If you click this button after eliminating the cause of the alarm, the current alarm will be cleared and normal operation will be performed. However, you cannot clear any alarms that cannot be cleared by alarm clear input signals of servo amplifiers. In such a case, turn off the servo amplifier, eliminate the cause of the alarm, and then turn the power on again. |  | Clear | Allows the user to clear error histories. |  | Print | Prints error-related information. |
|   |                            | Icon  | Name  | Function   |          |   |       |  |   |       |   |   |       |                                   |
|   |                            |    | Clear | Allows the user to clear the current alarm history. If you click this button after eliminating the cause of the alarm, the current alarm will be cleared and normal operation will be performed. However, you cannot clear any alarms that cannot be cleared by alarm clear input signals of servo amplifiers. In such a case, turn off the servo amplifier, eliminate the cause of the alarm, and then turn the power on again. |          |   |       |  |   |       |   |   |       |                                   |
|  | Clear                      | Allows the user to clear error histories.   |       |  |          |   |       |  |   |       |   |   |       |                                   |
|  | Print                      | Prints error-related information.   |       |  |          |   |       |  |   |       |   |   |       |                                   |
| (2)   | Current error display area | Displays the alarm numbers and names of all errors that are currently occurring.<br>The alarm displayed on the top of the list is the alarm displayed on the front panel of the servo amplifier.  |       |  |          |   |       |  |   |       |   |   |       |                                   |

## 7.6 Alarm Window

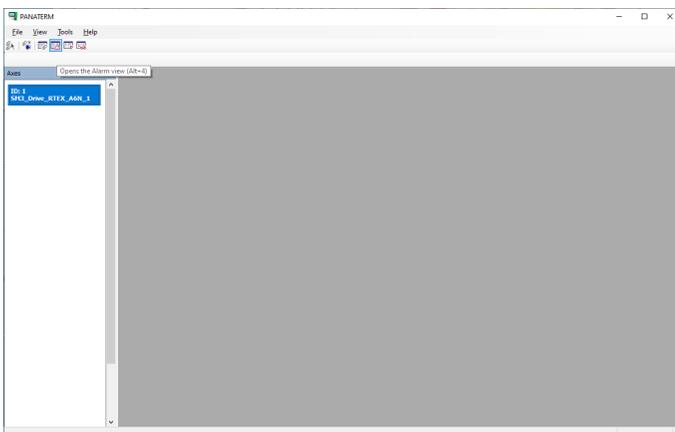
| No. | Name                                   | Description  |
|-----|--|--|
| (3) | Error cause / treatment display area   | Displays the cause and treatment of the selected error.                              |
| (4) | Motor internal status display area     | Displays the motor internal status in the event of an alarm.                         |
| (5) | Current warning display area           | Displays the warning numbers and names of all warnings that are currently occurring. |
| (6) | Warning cause / treatment display area | Displays the cause and treatment of the selected warning.                            |
| (7) | Error history display area             | Displays the order of error histories, alarm numbers, and error names.               |
| (8) | Error cause / treatment display area   | Displays the cause and treatment of the selected error.                              |
| (9) | Motor internal status display area     | Displays the motor internal status in the event of an alarm.                         |

- (Note 1) Some alarms cause tripping as errors but are not recorded in error histories. For alarms that are not recorded in error histories, refer to the instruction manual of the servo amplifier.
- (Note 2) Up to 14 error histories are stored. When more than 14 errors occur, error histories are erased in chronological order (the oldest error history is erased first).
- (Note 3) Up to three histories of motor internal status in the event of an alarm are stored. If an alarm occurs immediately after the power is turned on, motor internal status may not be captured normally.

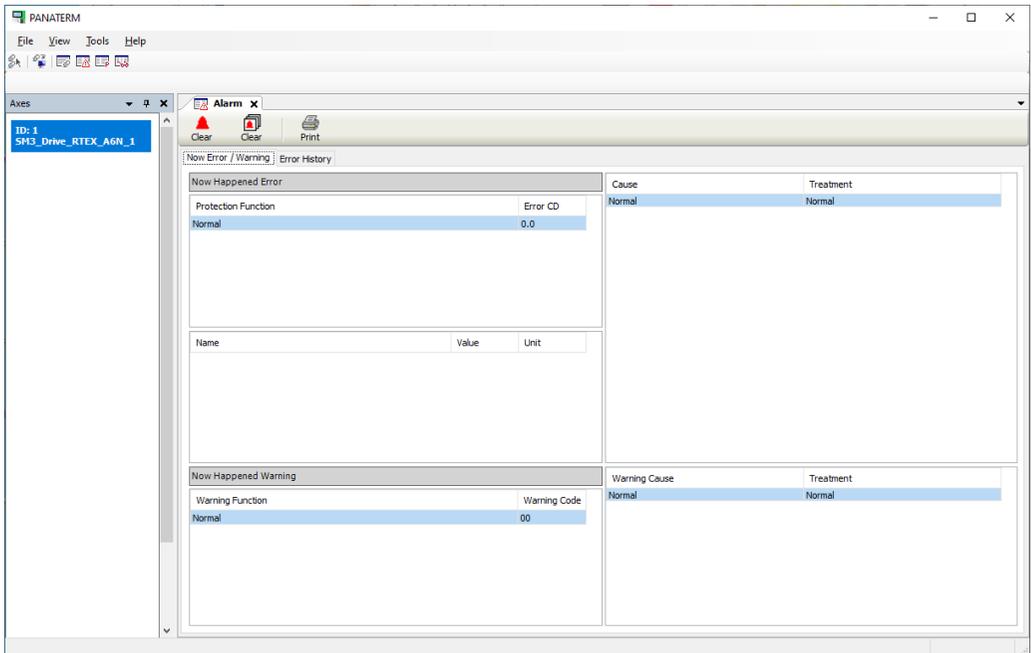
### 7.6.2 Checking Alarms

#### 1 2 Procedure

- From the menu bar on the main pane, select **Display>Alarm**. On the toolbar of the main pane, click the "Open the Alarm view" icon.



The Alarm window will be displayed.



2. Check for any errors that are currently occurring.  
Click the current "Now Error / Warning" tab and check for any errors that are currently occurring.
3. Check for any errors that occurred in the past.  
Click the "Error History" tab and check for any errors that occurred in the past.
4. Click the [×] button on the Alarm window.  
The Alarm window will be closed.

## 7.7 Other Functions

---

### 7.7 Other Functions

#### 7.7.1 Language Setting Function

This function allows the user to set the display language of PANATERM Lite for GM. The default setting is the same language as the one set in GM Programmer.

##### **1 2** Procedure

1. Select a language from the menu bar tool.  
The language set in PANATERM Lite for GM will be switched.

##### **i** Info.

- The display language setting of PANATERM Lite for GM is linked with that of the GM Programmer.

#### 7.7.2 Help Function

While performing operation in PANATERM Lite for GM, you can start the Help function to check information such as operating methods.

##### **1 2** Procedure

1. From the menu bar, select **Help>PANATERM Lite for GM Help**.  
"PANATERM Lite for GM Operation Guide" will be started.

#### 7.7.3 Version Display Function

This function allows the user to check the version, license, and other information for PANATERM Lite for GM.

##### **1 2** Procedure

1. From the menu bar, select **Help>Version Info**.



2. Click a desired button at the bottom of the window.

| Button       | Description   |
|--------------|---|
| Version Info | Displays information about the plug-ins that have been applied and the operating system of the PC that is used. |
| License Info | Displays license information for the software used by PANATERM Lite for GM.                                     |

(MEMO)

# 8 Preparing for Servo Amplifiers

---

|  |     |
|--|-----|
| 8.1 Initial Setup for Servo Amplifiers.....              | 8-2 |
| 8.1.1 Connecting the Servo Amplifier and PC .....        | 8-2 |
| 8.1.2 Installing the USB Driver .....                    | 8-2 |
| 8.1.3 Initial Setup for Servo Amplifiers .....           | 8-2 |
| 8.1.4 Disconnecting the Servo Amplifier from the PC..... | 8-4 |

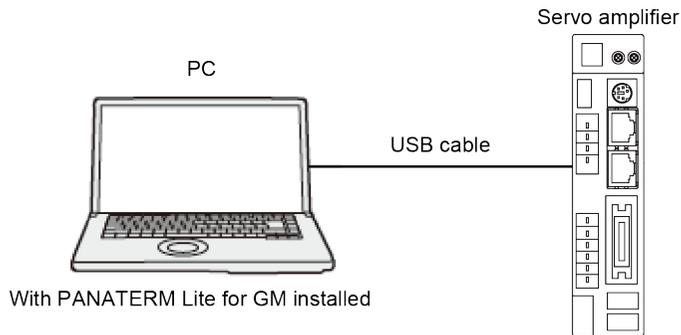
## 8.1 Initial Setup for Servo Amplifiers

---

### 8.1 Initial Setup for Servo Amplifiers

#### 8.1.1 Connecting the Servo Amplifier and PC

Use a USB cable to connect the servo amplifier and a PC on which PANTERM Lite for GM has been installed.



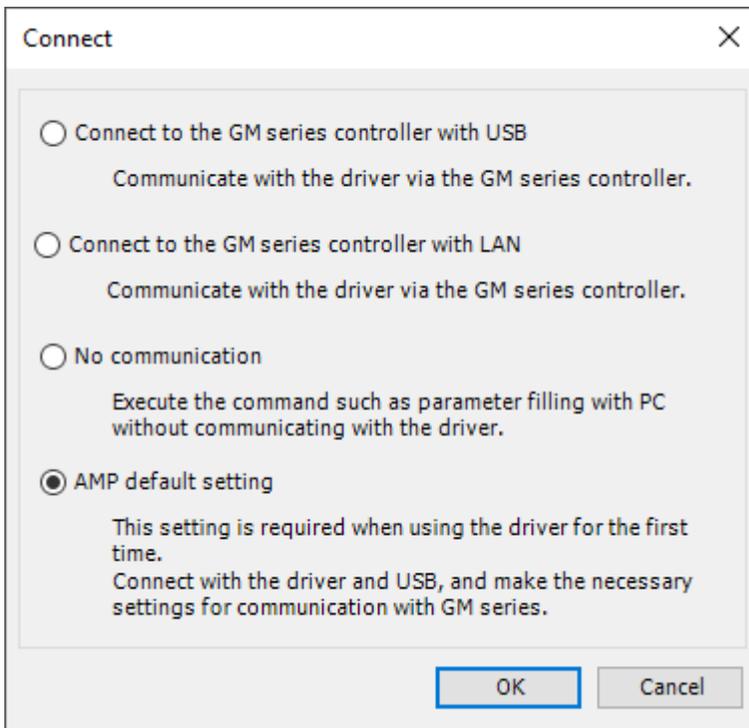
#### 8.1.2 Installing the USB Driver

When the GM Programmer is installed, the USB driver is also installed at the same time.

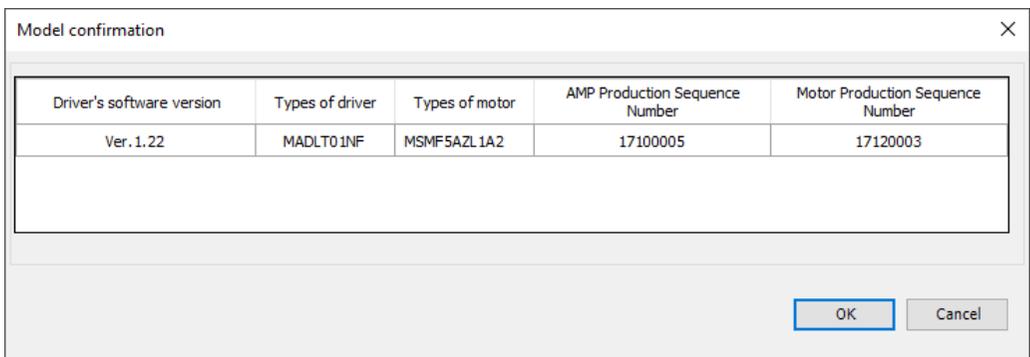
#### 8.1.3 Initial Setup for Servo Amplifiers

### 1 2 Procedure

1. Start PANATERM Lite for GM.  
The "Connect" dialog box will be displayed.

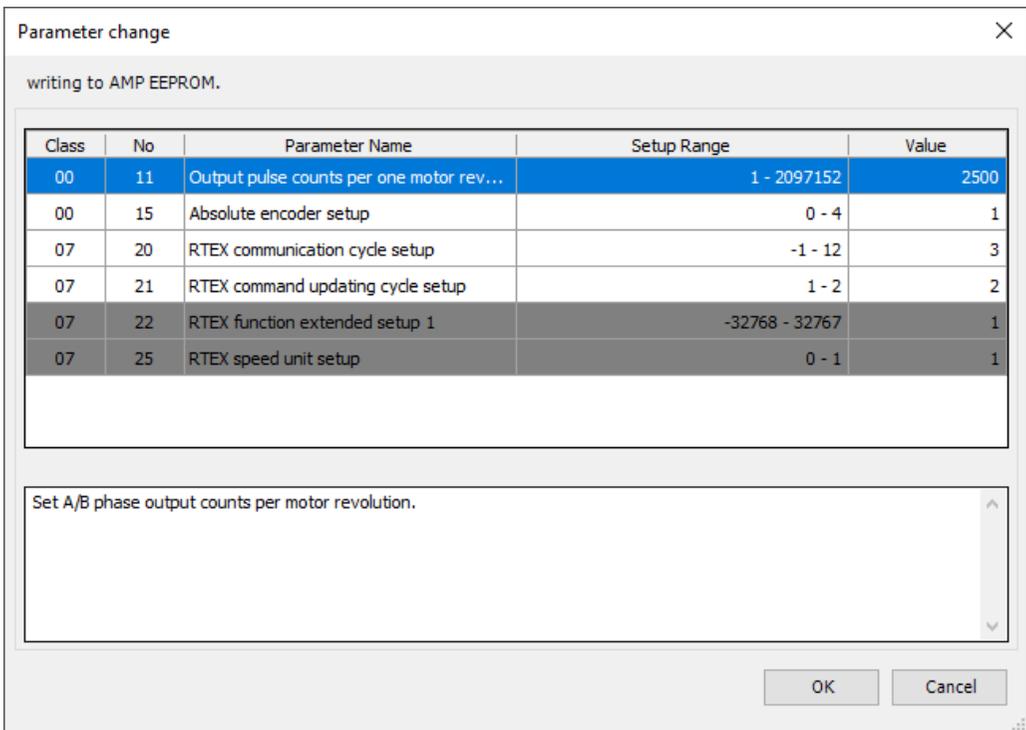


2. Select "AMP default setting" and click [OK].  
The "Model confirmation" dialog box will be displayed.



3. Check the software version of the servo amplifier for which settings are to be changed and then click [OK].  
The "Parameter change" dialog box will be displayed.

## 8.1 Initial Setup for Servo Amplifiers

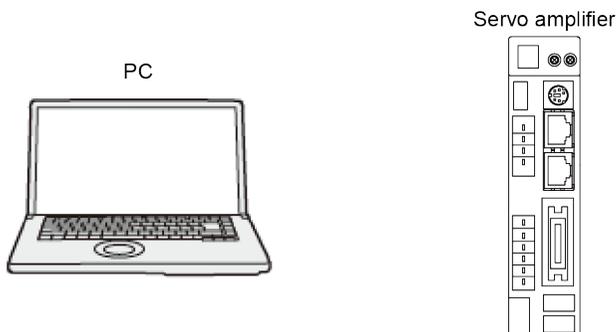


If you use parameters "Absolute encoder setup", "Output pulse counts per one motor rev...", "RTEX communication cycle setup", and "RTEX command updating cycle setup", change the settings according to the operating environment.

4. Click [OK].  
The "Setting Complete" dialog box will be displayed.
5. Click [OK].  
The main pane will be displayed. Start the servo amplifier.

### 8.1.4 Disconnecting the Servo Amplifier from the PC

Disconnect the USB cable connecting the PC and the servo amplifier.



# 9 Connecting the GM1 Controller and Servo Amplifiers

---

|  |     |
|--|-----|
| 9.1 Setting an Address for Each Servo Amplifier.....                 | 9-2 |
| 9.2 Connecting the GM1 Controller and Servo Amplifiers via RTEX..... | 9-3 |

## 9.1 Setting an Address for Each Servo Amplifier

---

### 9.1 Setting an Address for Each Servo Amplifier

Set the MAC ID using the address switch of the servo amplifier.

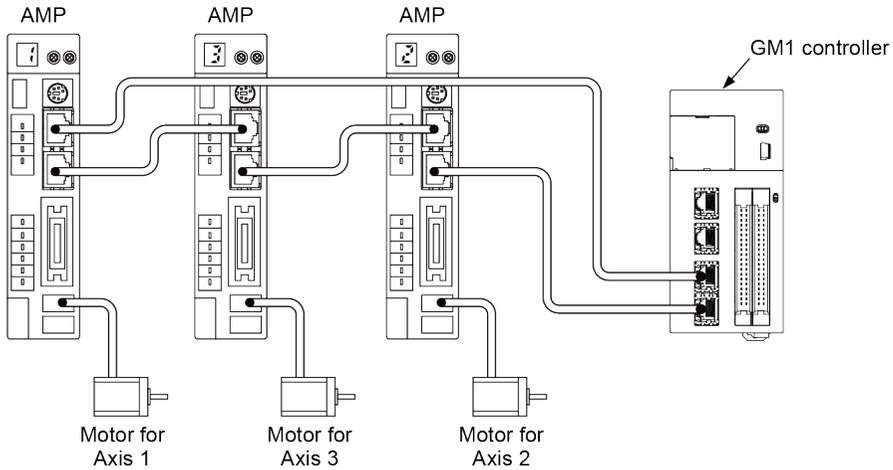
The order of connections on the network is not related to the MAC ID.

#### **Note**

- For details on how to set station numbers for servo amplifiers, refer to the instruction manual of each servo amplifier.

### 9.2 Connecting the GM1 Controller and Servo Amplifiers via RTEX

Connect the RTEX ports on the GM1 controller and each servo amplifier.



(MEMO)

# 10 Connecting the GM1 Controller and the GM Programmer

---

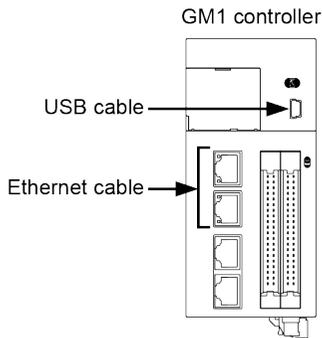
|        |  |       |
|--------|--|-------|
| 10.1   | Connecting the GM1 Controller and PC .....             | 10-2  |
| 10.1.1 | Selecting a Connection Port for GM Programmer .....    | 10-2  |
| 10.1.2 | Connecting the GM1 Controller and PC with a Cable..... | 10-2  |
| 10.2   | Creating a New Project.....                            | 10-3  |
| 10.3   | Communication Setting.....                             | 10-6  |
| 10.3.1 | Setting the LAN Port .....                             | 10-6  |
| 10.3.2 | Addition of the USB Port .....                         | 10-6  |
| 10.4   | Adding and Setting up Servo Amplifiers .....           | 10-9  |
| 10.5   | Basic Settings of the RTEX Axis.....                   | 10-13 |
| 10.5.1 | General Settings .....                                 | 10-13 |
| 10.5.2 | Scaling / Mapping Settings .....                       | 10-15 |
| 10.6   | Connecting to the GM1 Controller .....                 | 10-17 |
| 10.7   | Commissioning .....                                    | 10-19 |
| 10.7.1 | Online Config Mode .....                               | 10-19 |
| 10.7.2 | Conducting Commissioning for Servo Amplifiers.....     | 10-20 |
| 10.8   | Login .....  | 10-24 |
| 10.9   | Logout.....  | 10-25 |

## 10.1 Connecting the GM1 Controller and PC

### 10.1 Connecting the GM1 Controller and PC

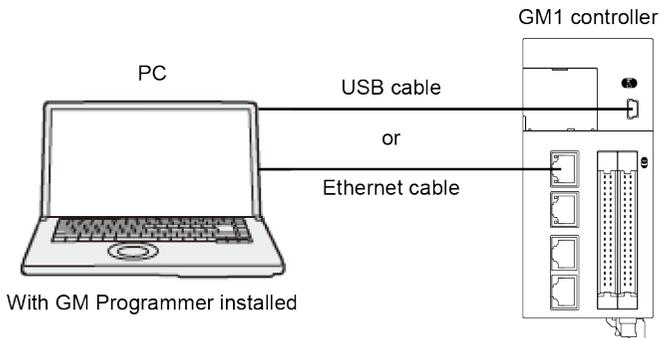
#### 10.1.1 Selecting a Connection Port for GM Programmer

Select either LAN port connection or USB port connection.



#### 10.1.2 Connecting the GM1 Controller and PC with a Cable

Use an Ethernet cable or USB cable to connect the GM1 Controller and a PC on which the GM Programmer is installed.



## 10.2 Creating a New Project

When creating a program using the GM Programmer for the first time, create a new project. For the new project, set a device and a programming language to be used.

This section describes how to create a new project.

Given below is an example that explains the procedure to create a project for the GM1 controller (product number: AGM1CSRX16T) in Structured Text (ST) format.

### 1.2 Procedure

1. Start up the GM Programmer.

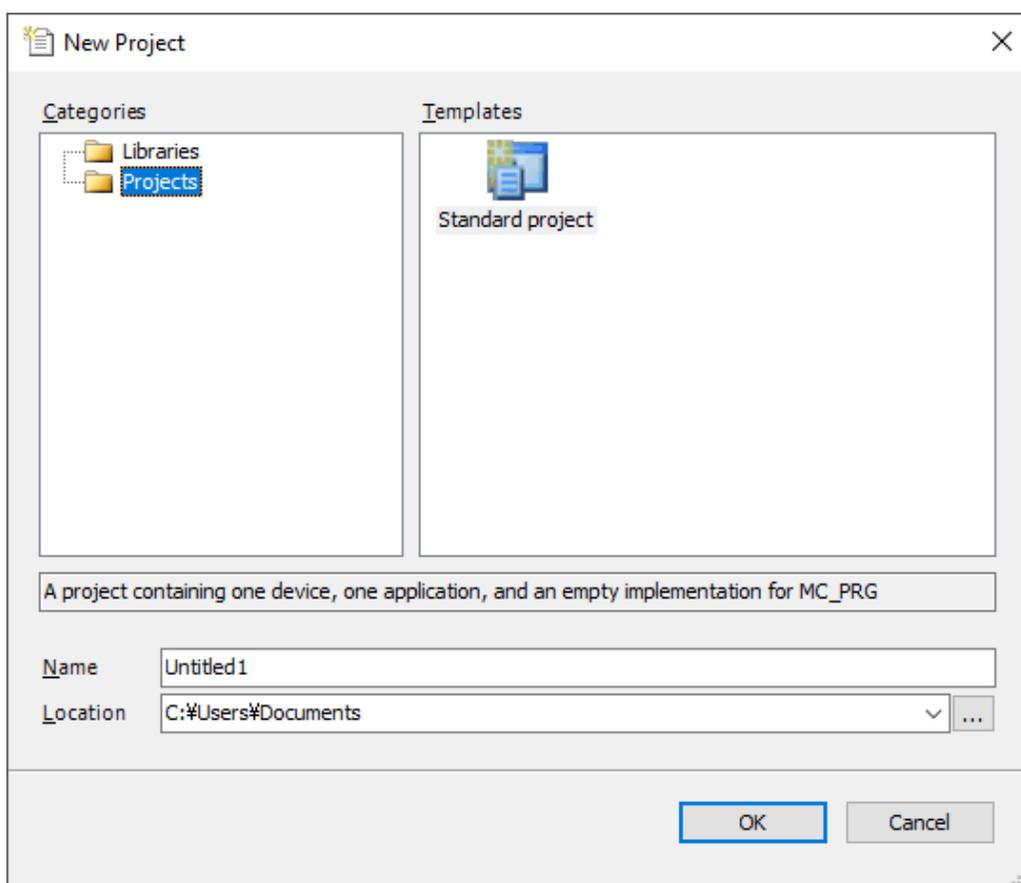
For details on how to start up, refer to ["6.3.1 How to start"](#).

When the GM Programmer is successfully started, the Start Page will be displayed.

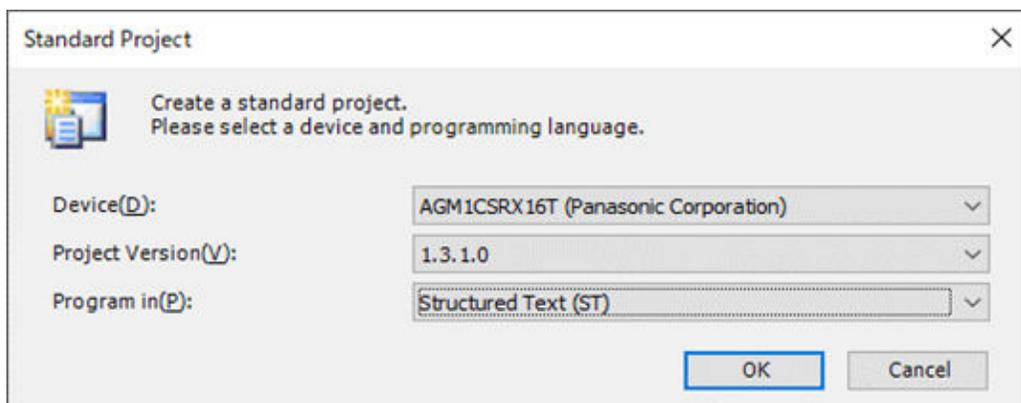


2. Select "New Project" under "Basic Operations".  
The "New Project" dialog box will be displayed.

## 10.2 Creating a New Project



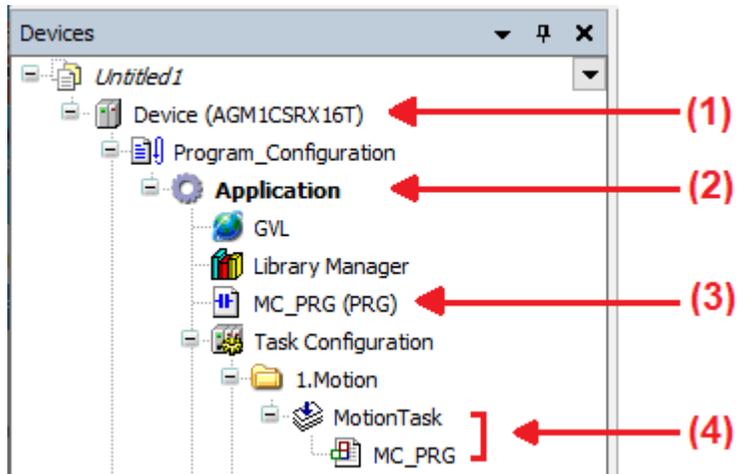
3. Select **Project>Standard project**, and specify a project file name in the "Name" field and a project storage location in the "Location" field.
4. Click the [OK] button.  
The "Standard Project" dialog box will be displayed.



5. Select "AGM1CSRX16T(Panasonic Corporation)" in the "Device" field and "Structured Text (ST)." in the "Program in" field, and click the [OK] button.

A new project will be created. Device and other objects including objects for ST programs are arranged in the navigator pane.

### <Uses of objects arranged in the navigator pane>



| No. | Name                        | Function                               |
|-----|-----------------------------|--|
| (1) | Device object               | Sets up device objects.                |
| (2) | Application object          | Sets up application objects.           |
| (3) | Program object (POU object) | Sets up program objects (POU objects). |
| (4) | Task object                 | Sets up task objects.                  |

### **i** Info.

- A new project can also be created from the menu bar by selecting **File>New Project**.

### 10.3 Communication Setting

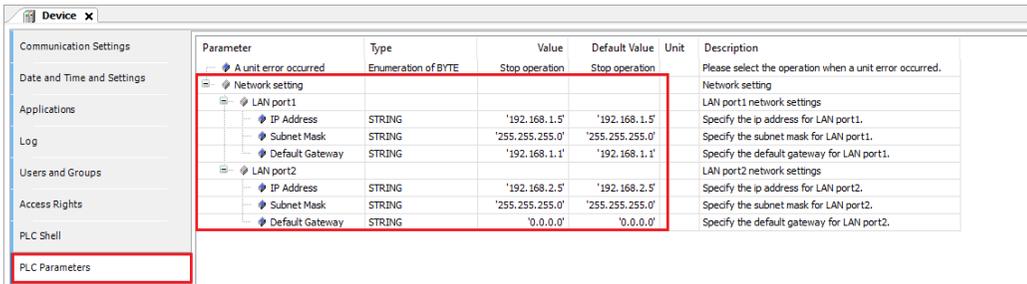
#### 10.3.1 Setting the LAN Port

Set communication settings of the LAN port through the network settings of the PLC parameters.

When connecting the GM Programmer and the GM1 via the LAN port, match the PC network settings with those of the GM1.

#### 1 2 Procedure

1. Double-click the "Device(AGM1CSR16T)" object in the navigation pane. The device editor will open.
2. Open the "PLC Parameters" tab.



| Parameter             | Type                | Value           | Default Value   | Unit | Description   |
|-----------------------|---------------------|-----------------|-----------------|------|---|
| ▲ Unit error occurred | Enumeration of BYTE | Stop operation  | Stop operation  |      | Please select the operation when a unit error occurred. |
| Network setting       |                     |                 |                 |      | Network setting   |
| LAN port1             |                     |                 |                 |      | LAN port1 network settings                              |
| IP Address            | STRING              | '192.168.1.5'   | '192.168.1.5'   |      | Specify the ip address for LAN port1.                   |
| Subnet Mask           | STRING              | '255.255.255.0' | '255.255.255.0' |      | Specify the subnet mask for LAN port1.                  |
| Default Gateway       | STRING              | '192.168.1.1'   | '192.168.1.1'   |      | Specify the default gateway for LAN port1.              |
| LAN port2             |                     |                 |                 |      | LAN port2 network settings                              |
| IP Address            | STRING              | '192.168.2.5'   | '192.168.2.5'   |      | Specify the ip address for LAN port2.                   |
| Subnet Mask           | STRING              | '255.255.255.0' | '255.255.255.0' |      | Specify the subnet mask for LAN port2.                  |
| Default Gateway       | STRING              | '0.0.0.0'       | '0.0.0.0'       |      | Specify the default gateway for LAN port2.              |

3. Check the GM1 network settings and match the PC network settings with those of the GM1.
4. Open the "Communication Settings" tab and click "Network scan".
5. Select a GM1 Controller that you want to connect and click the [ OK ] button.



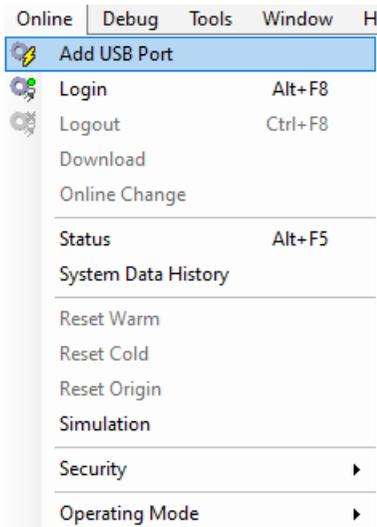
- When the GM1 settings have been changed, the changes will become valid after the project is downloaded.

#### 10.3.2 Addition of the USB Port

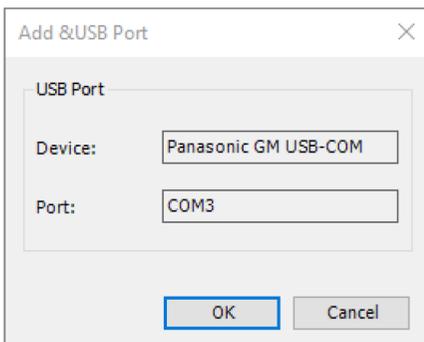
This function allows the user to set a USB port to the communication interface between the GM Programmer, PANATERM Lite for GM, or other tool and the GM1 Controller.

#### 1 2 Procedure

1. Connect the GM1 Controller and PC with a USB cable.
2. From the menu bar, select **Online>Add USB Port**.



The "Add &USB Port" dialog box will be displayed.



3. Click the [OK] button.

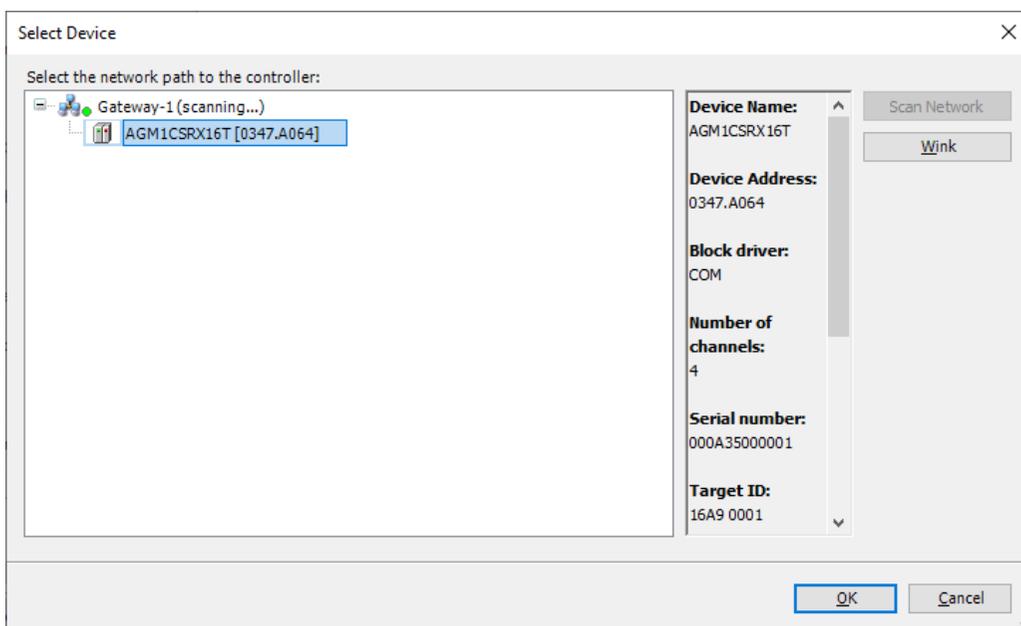
A dialog box to restart the Gateway will be displayed.



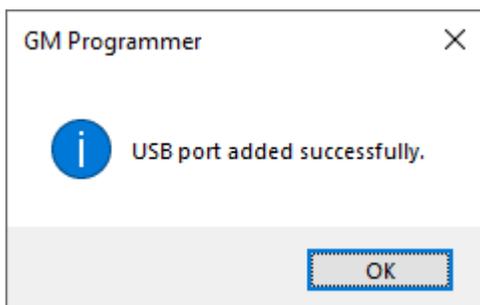
4. Click the [OK] button.

The "Select Device" dialog box will be displayed.

## 10.3 Communication Setting



5. Select a GM1 Controller that you want to connect and click the [OK] button.  
When the connection is completed, a dialog box will be displayed to notify successful connection.



6. Click the [OK] button.  
A USB port is added the communication interface between the PC and GM1 Controller.

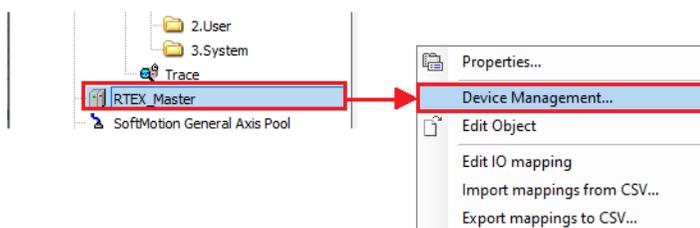
## 10.4 Adding and Setting up Servo Amplifiers

Add device objects for servo amplifiers to a project and set them up.

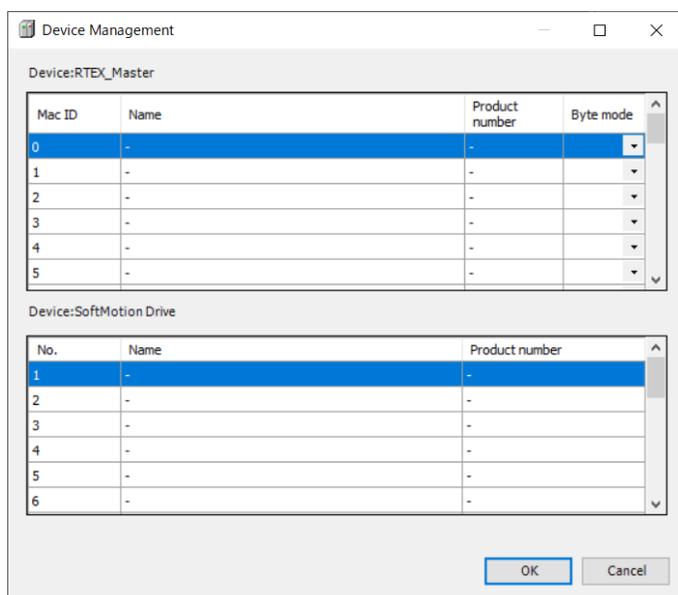
The description below explains how to add device objects for A6N servo amplifiers to a project and how to set them up.

### 1.2 Procedure

1. Right-click the [RTEX\_Master] object in the navigator pane and then select "Device Management" from the context-sensitive menu that is displayed.



The "Device Management" dialog box will be displayed.



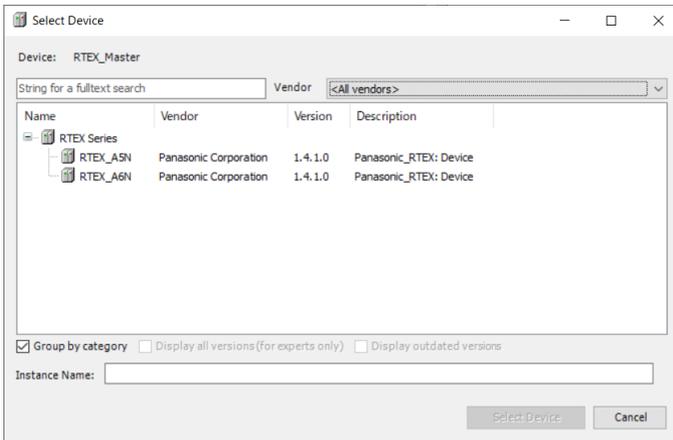
2. Double-click the MAC ID row in the "Device: RTEX\_Master" table.

### Info.

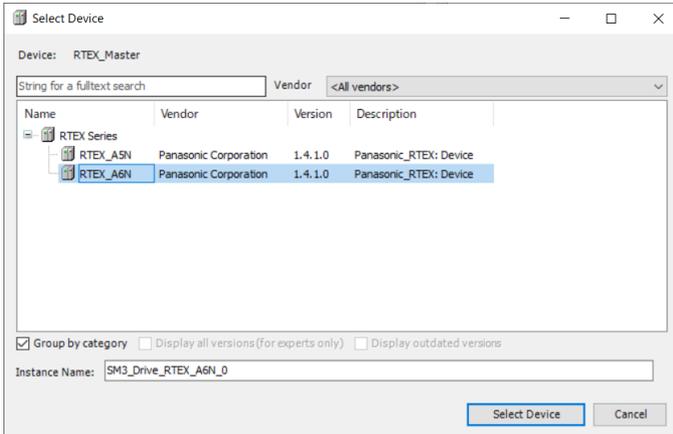
- For the MAC ID, double-click the same No. as the No. set using the address switch of the servo amplifier.

The "Select Device" dialog box will be displayed.

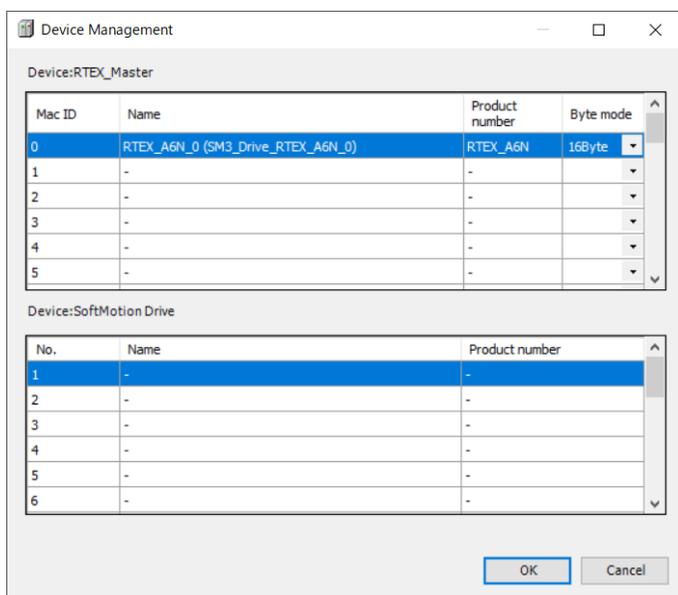
## 10.4 Adding and Setting up Servo Amplifiers



3. Select a device object for the servo amplifier.  
The selected device object of the servo amplifier will be added.



4. Click the [Select Device] button.

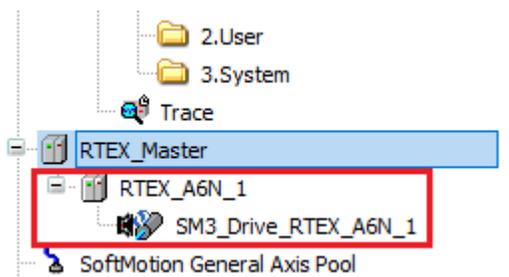


### **i** Info.

- Match the "bite mode" to the byte mode setting of the servo amplifier.
- A servo amplifier set to 16 bytes in "byte mode" is counted as 1 block, and a servo amplifier set to 32 bytes is counted as 2 blocks. You can add devices up to a total of 32 blocks.

#### 5. Click the [OK] button.

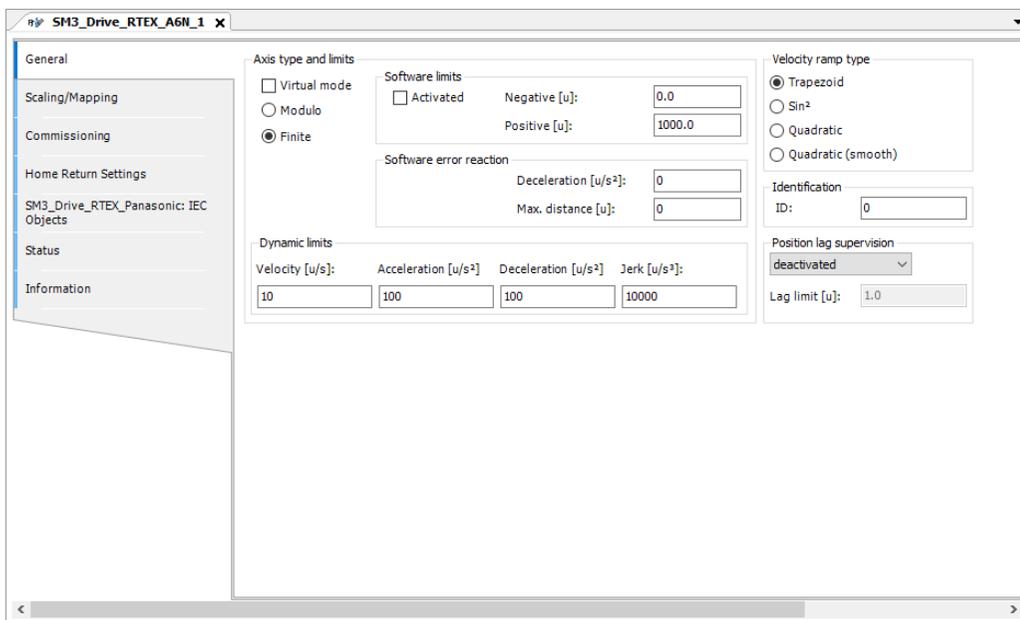
The selected device object of the servo amplifier will be added to the navigator pane.



#### 6. Double-click the added object.

The setting pane will be displayed in the main pane. Specify settings related to servo amplifier A6N.

## 10.4 Adding and Setting up Servo Amplifiers



### **i** Info.

- To remove a device object that has been added, select the device object in the navigator pane and press the "Delete" key.

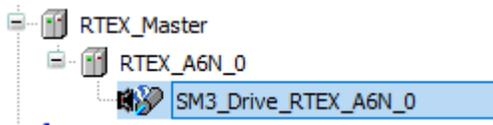
## 10.5 Basic Settings of the RTEX Axis



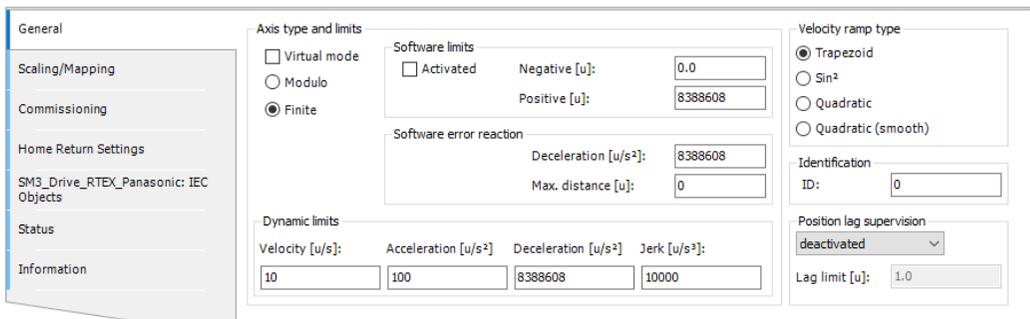
- Be sure to set the RTEX axis,

### 1 2 Procedure

1. Double-click the servo amplifier object in the navigator pane.

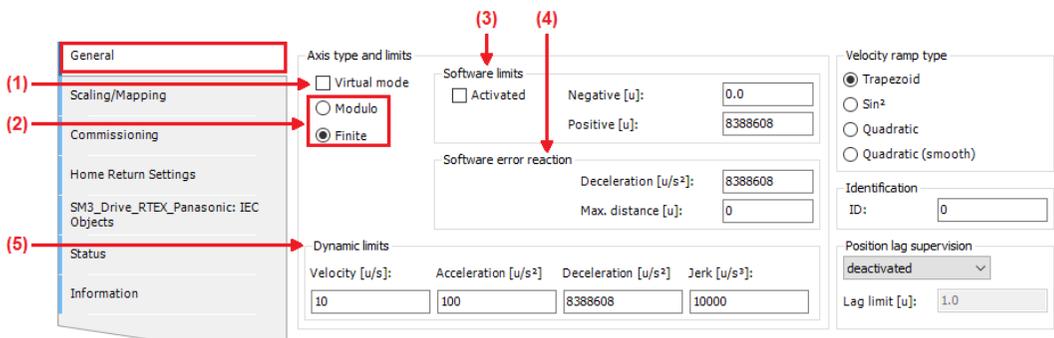


2. From the displayed menu, select "Edit Object".  
The "RTEX Axis Setting" dialog box will be displayed.



### 10.5.1 General Settings

Select the "General" tab and set the following items.



#### (1) Virtual mode

You can set the real axis or virtual axis.

Use of the real axis: The real axis is used to actually control the servo amplifier.

Use of the virtual axis: A virtual servo amplifier is created in the GM1 Controller and its virtual axis is used.

## 10.5 Basic Settings of the RTEX Axis

### (2) Modulo / Finite

The axis type can be specified.

- Modulo

Modulo: The motor rotates infinitely (belt drive, etc.) without limiting the travel range.

- The command position value keeps looping between 0 and modulo value.
- The maximum settable modulo value is "255×units in application"(\*1).

\*1: Set the units in application in the Scaling / Mapping.

- A negative value cannot be set. (A warning is issued. If the data is downloaded as is, an error will occur when executing the GM1.

Axis type and limits

Virtual mode

Modulo

Finite

Modulo settings

Modulo value [u]:

- Finite

The set value for the command position is a finite value.

Software limit can be set. Note that an error will occur if a 32-bit real number is exceeded.

Axis type and limits

Virtual mode

Modulo

Finite

Software limits

Activated

Negative [u]:

Positive [u]:

### (3) Software limit

A software limit can be set if the axis type is set to "Finite".

If the command position is outside the software limit setting range, an error stop occurs and operation stops.

When operation is stopped by exceeding the software limit, the shortest time from the start of deceleration to the stop among the following settings is applied: the value set for the deceleration in response to the software error, for the maximum distance in response to the software error, or for the dynamic limit.

Axis type and limits

Virtual mode

Modulo

Finite

Software limits

Activated

Negative [u]:

Positive [u]:

### (4) Software error reaction

Settings can be made to stop operation when an error occurs.

Software error reaction

Deceleration [u/s<sup>2</sup>]:

Max. distance [u]:

### **i** Info.

- When operation is switched from Run to Stop, an emergency stop is made regardless of the software error reaction.
- For the stop operation that takes place when an error stop occurs or when the software limit is exceeded, the shortest time from the start of deceleration to the stop among the following settings is applied.
  - Deceleration in software error reaction
  - Maximum distance in software error reaction
  - Dynamic limit
- If the deceleration and maximum distance in software error reaction are set to 0, these become invalid. In that case, operation stops according to the deceleration rate set in the dynamic limit.

#### (5) Dynamic limit

Speed, acceleration, and deceleration settings cannot be set to 0. If they are set to 0, a warning is issued.

| Dynamic limits  |                                  |                                  |                           |
|-----------------|----------------------------------|----------------------------------|---------------------------|
| Velocity [u/s]: | Acceleration [u/s <sup>2</sup> ] | Deceleration [u/s <sup>2</sup> ] | Jerk [u/s <sup>3</sup> ]: |
| 10              | 100                              | 8388608                          | 10000                     |

The values set in the dynamic limit can be checked if they are exceeded during axis operations using the "SMC\_CheckLimits" function block. Note that an excess of the jerk cannot be detected using the "SMC\_CheckLimits" function block. Therefore, do not use the jerk column.

## 10.5.2 Scaling / Mapping Settings

Select the "Scaling/Mapping" tab and set the following items.

#### (6) Scaling/Mapping

- Rotary type
 

When the axis type is set to modulo, the ratio in the conversion from the drive increment to the application unit is set.

The unit on the servo amplifier and the unit on the application (POU) are converted.

Example:

One rotation of the MINAS A6N is 0x800000. To treat one rotation as 360 on the application, set this to 360.

## 10.5 Basic Settings of the RTEX Axis

---

| Motor Type                              | Scaling  |
|---|--|
| <input checked="" type="radio"/> Rotary | <input type="checkbox"/> Invert direction        |
| <input type="radio"/> Linear            | 16#800000 increments <=> motor turns 1           |
|   | 1 motor turns <=> gear output turns 1            |
|   | 1 gear output turns <=> units in application 360 |

Note: Invert direction: The direction is inverted.

- Linear type

When the axis type is set to finite, the ratio in the conversion from the drive increment to the application unit is set.

| Motor Type                              | Scaling   |
|---|---|
| <input type="radio"/> Rotary            | <input type="checkbox"/> Invert direction         |
| <input checked="" type="radio"/> Linear | 16#800000 increments <=> units in application 360 |

Note: Invert direction: The direction is inverted.

## 10.6 Connecting to the GM1 Controller

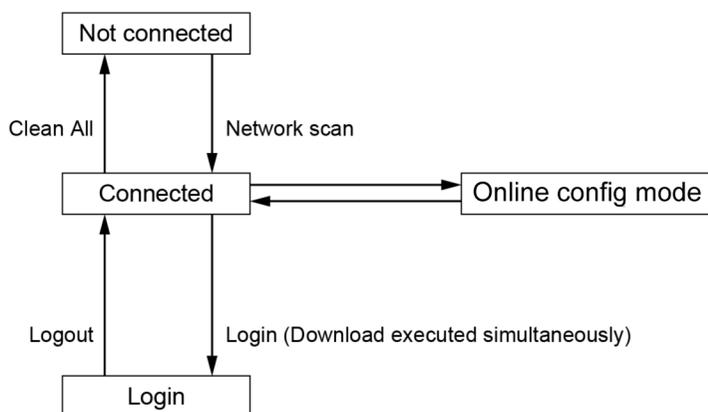
Connect the PC where the GM Programmer is installed to the GM1 Controller.

The connection status of the PC includes "Connected", "Connection as a device user", "Login", and "Online config mode".

Depending on the connection status, operations that can be executed are different.

If the Controller is provided with a device user registration, connection must be made as the device user.

### ■ Without device user registration



### List of available GM1 Controller operations

| Function                                   | Not connected | Connected | Login     | Online config mode |
|--|---------------|-----------|-----------|--------------------|
| Setting / acquiring Controller information | ×             | ○         | ○(Note 1) | ×                  |
| Application management                     | ×             | ×(Note 2) | ○         | ×                  |
| Reset                                      | ×             | ×(Note 3) | ○         | ×(Note 4)          |
| Security                                   | ×             | ×         | ○         | ○                  |
| Debug                                      | ×             | ×         | ○         | ×                  |
| Commissioning                              | ×             | ×         | ×         | ○                  |

(Note 1) Not possible to operate the PLC Shell.

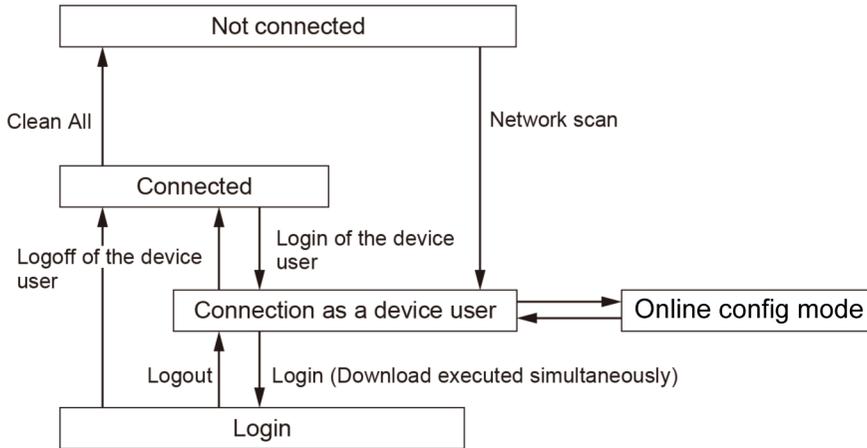
(Note 2) Possible to upload the source.

(Note 3) Possible to reset the device (PLC initialization) or to delete device application from the device.

(Note 4) Possible to reset the device (PLC initialization).

## 10.6 Connecting to the GM1 Controller

### ■ With device user registration



### List of available GM1 Controller operations

| Function                                   | Not connected | Connected | as a device user | Login      | Online config mode |
|--|---------------|-----------|------------------|------------|--------------------|
| Setting / acquiring Controller information | x             | x         | o                | o (Note 1) | x                  |
| Application management                     | x             | x         | x (Note 2)       | o          | x                  |
| Reset                                      | x             | x         | x (Note 3)       | o          | x (Note 4)         |
| Security                                   | x             | x         | o (Note 5)       | o          | o                  |
| Debug                                      | x             | x         | x                | o          | x                  |
| Commissioning                              | x             | x         | x                | x          | o                  |

(Note 1) Not possible to operate the PLC Shell.

(Note 2) Possible to upload the source.

(Note 3) Possible to reset the device (PLC initialization) or to delete device application from the device.

(Note 4) Possible to reset the device (PLC initialization).

(Note 5) Addition of the device user, changing the password for the device user, or deletion of the device user cannot be made if the user of the Device Editor is not synchronized with "Synchronization" of the group tab.

## 10.7 Commissioning

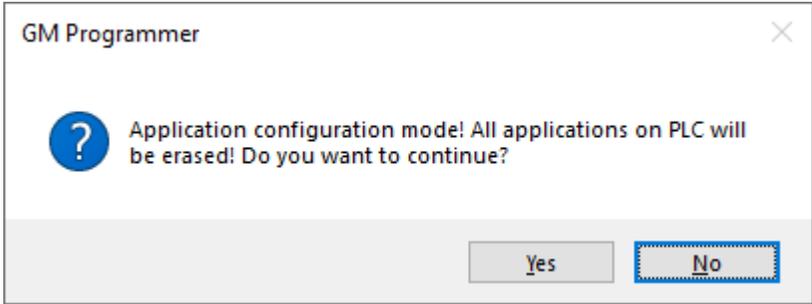
### 10.7.1 Online Config Mode

When the online config mode is selected, the servo amplifiers are set to be connected to the GM1 Controller.

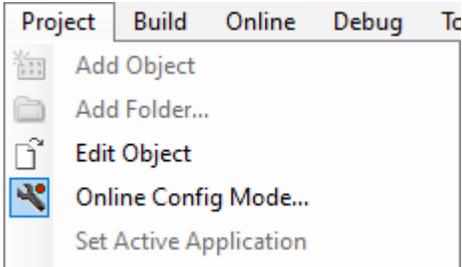
When using the online config mode, perform the setting as described in "10.3 Communication Setting" in advance.

#### 1 2 Procedure

1. From the menu bar, select **Project>Online Config Mode**.  
A confirmation message will be displayed, asking whether to remove all applications.



2. Click [Yes].  
All applications will be removed from the GM1 controller, and the GM1 controller and servo amplifiers will be connected in online config mode.  
While online config mode is in progress, "Online Config Mode" in the menu bar remains selected.



#### **i** Info.

- To cancel the online config mode, select **Project>Online Config Mode** from the menu bar again.

## 10.7 Commissioning

---

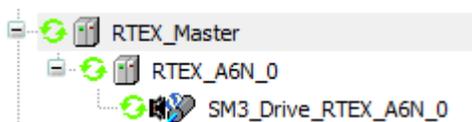
### 10.7.2 Conducting Commissioning for Servo Amplifiers

While in the online config mode, you can conduct commissioning for servo amplifiers. There is no need to create a program for commissioning.

The following is an example of commissioning using the A6N-series servo amplifiers.

#### **1** Procedure

1. Double-click the servo amplifier object in the navigator pane.



The "RTEX Axis Setting" dialog box will be displayed.

2. Click the "Commissioning" tab.  
The Commissioning screen will be displayed.

Drive

Power

Homing

Forced stop

Stop

Deceleration(T):

 [u/s<sup>2</sup>]

Inching

Forward(+)

Backward(-)

Distance:  [u]

Velocity:  [u/s]

Acceleration:  [u/s<sup>2</sup>]

Deceleration:  [u/s<sup>2</sup>]

Jerk:  [u/s<sup>3</sup>]

\*The operation of home return method follows the parameters set on the "Home return setting" tab.

Status

| Item                             | Set Value | Actual Value |
|----------------------------------|-----------|--------------|
| Position [u]                     | 0.00      | 0.00         |
| Velocity [u/s]                   | 0.00      | 0.00         |
| Acceleration [u/s <sup>2</sup> ] | 0.00      | 0.00         |
| Torque [%]                       | -         | 0.00         |

Servo ON/OFF:

Communication Status:

Error

| Error Type   | Error Content                             |
|--------------|---|
| Axis error   | <input checked="" type="radio"/> No error |
| Driver error | <input checked="" type="radio"/> No error |
| RTEX error   | <input type="radio"/> No error            |
| + FBError    | <input checked="" type="radio"/> No error |

| Group  | Description   |
|--------|---|
| Drive  | Allows the user to set commissioning parameters.<br>Allows the user to execute commissioning. |
| Status | Displays the running status of the servo amplifiers during commissioning.                     |
| Error  | Displays errors that occurred during commissioning.<br>Allows the user to clear errors.       |

- Click an appropriate button in the Operation group to start commissioning. Clicking an icon starts the corresponding commissioning procedure. To change home return parameters, use the "Home Return Settings" tab.

## 10.7 Commissioning

**Drive**

Power

ON

OFF

Homing

**Forced stop**

Stop

Deceleration(I):

[u/s<sup>2</sup>]

**Inching**

Forward(+)

Backward(-)

Distance:

[u]

Velocity:

[u/s]

Acceleration:

[u/s<sup>2</sup>]

Deceleration:

[u/s<sup>2</sup>]

Jerk:

[u/s<sup>3</sup>]

\*The operation of home return method follows the parameters set on the "Home return setting" tab.

4. For the servo amplifier and RTEX statuses during commissioning, check the "Status" and "Error" groups.

**4-1** To erase errors that are displayed, click the [Clear] button or [All Clear] button in the "Error" group.

- Pressing the [Clear] button will erase axis errors, drive errors, RTEX errors, and FB errors [0].
- Pressing the [All Clear] button will erase axis errors, drive errors, RTEX errors, and FB errors [0] to [5].

**Status**

| Item                             | Set Value | Actual Value |
|----------------------------------|-----------|--------------|
| Position [u]                     | 0.00      | 0.00         |
| Velocity [u/s]                   | 0.00      | 0.00         |
| Acceleration [u/s <sup>2</sup> ] | 0.00      | 0.00         |
| Torque [%]                       | -         | 0.00         |

Servo ON/OFF:

Off

Communication Status:

initialization of base communication (10)

**Error**

Clear

All Clear

| Error Type   | Error Content   |
|--------------|---|
| Axis error   | <span style="color: green; font-size: 1.2em;">●</span> No error |
| Driver error | <span style="color: green; font-size: 1.2em;">●</span> No error |
| RTEX error   | <span style="color: green; font-size: 1.2em;">●</span> No error |
| + FBError    | <span style="color: green; font-size: 1.2em;">●</span> No error |

If the display of FB errors is collapsed, the number of FB errors will be displayed as "0" in the "Error Content" column.

5. From the menu bar, select **Project>Online Config Mode**.

If online config mode is canceled, commissioning will be terminated.

This completes commissioning for servo amplifiers.

### Info.

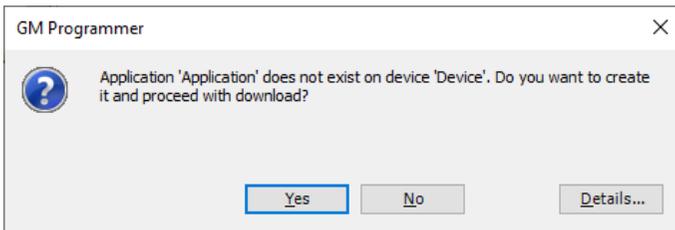
- If you display another window during commissioning, "Stop" will be executed.
- Even if communication with the servo amplifier is disrupted during "Inching" or "Home Return" operation, the servo amplifier will continue commissioning operation.
- If online config mode is canceled, commissioning will be terminated. To cancel the online config mode, select **Project>Online Config Mode** from the menu bar again.

## 10.8 Login

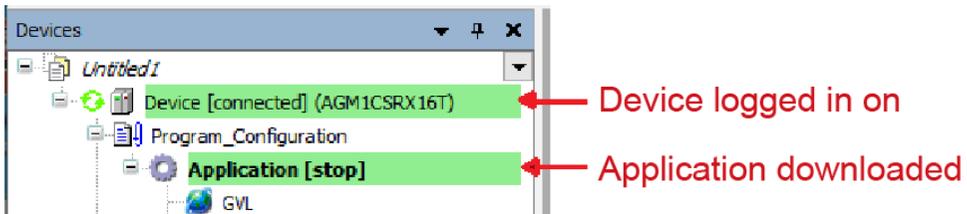
GM Programmer allows the user to log in to the GM1 Controller. When "Login" is executed, applications are downloaded to the GM1 Controller.

### 1 2 Procedure

1. From the menu bar, select **Online>Login**, or press the <Alt> key and the <F8> key simultaneously.  
A confirmation message will be displayed, asking whether to download the applications to the GM1 controller (device).



2. Click [Yes].  
The applications will be downloaded to the GM Programmer at the same time as you log in to the GM1 Controller (device).  
"connected" will be displayed at the [Device] object in the navigator pane and the status of the downloaded applications will be displayed.



### i Info.

- You can also log in by clicking  on the toolbar.
- If you log in again after the applications have been downloaded, the confirmation message will not be displayed.

---

## 10.9 Logout

This function allows the user to log out from the device to which the user logged in.

### **1 2** Procedure

1. From the menu bar, select **Online>Logout**, or press the <Ctrl > + <F8> key simultaneously. You will be logged out.

### **i** Info.

- You can also log out by clicking  on the toolbar.

(MEMO)

# 11 Setting up the Servo Amplifier Connected to the GM1 Controller

---

|        |   |      |
|--------|---|------|
| 11.1   | Setting up the Servo Amplifier Connected to the GM1 Controller..... | 11-2 |
| 11.1.1 | When Connected Using the Ethernet Cable .....                       | 11-2 |
| 11.1.2 | When Connected Using the USB Cable.....                             | 11-4 |
| 11.2   | Writing Parameters to Servo Amplifier .....                         | 11-6 |

## 11.1 Setting up the Servo Amplifier Connected to the GM1 Controller

### 11.1 Setting up the Servo Amplifier Connected to the GM1 Controller

The PC communicates with the servo amplifier connected to the GM1 Controller. Connect the PC and GM1 Controller with a USB cable or Ethernet cable. With the GM1 Controller and servo amplifier connected with a Cat5e shielded cable, set up the servo amplifier.



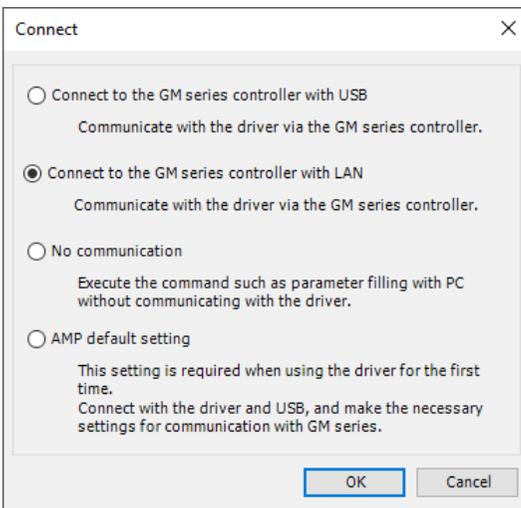
Make this setting only after the connection between the GM1 Controller and the servo amplifier has been established.

#### 11.1.1 When Connected Using the Ethernet Cable

If connected using the Ethernet cable, use the following procedure.

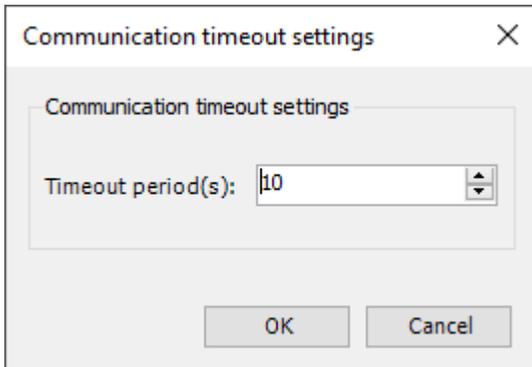
#### 1 2 Procedure

1. Start PANATERM Lite for GM.  
The "Connect" dialog box will be displayed.

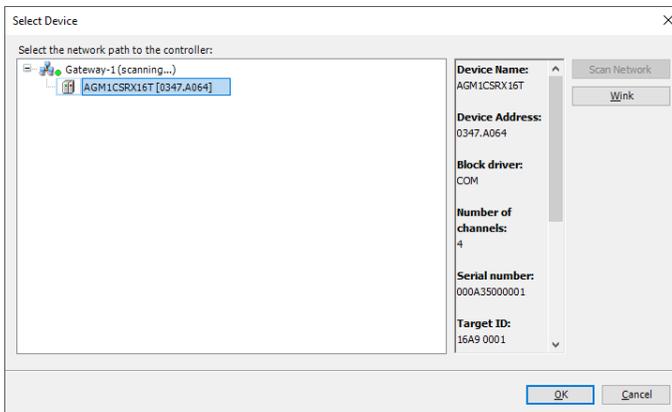


2. Select "Connect to the GM series controller with LAN" and click the [OK] button.  
The "Communication timeout settings" dialog box will be displayed

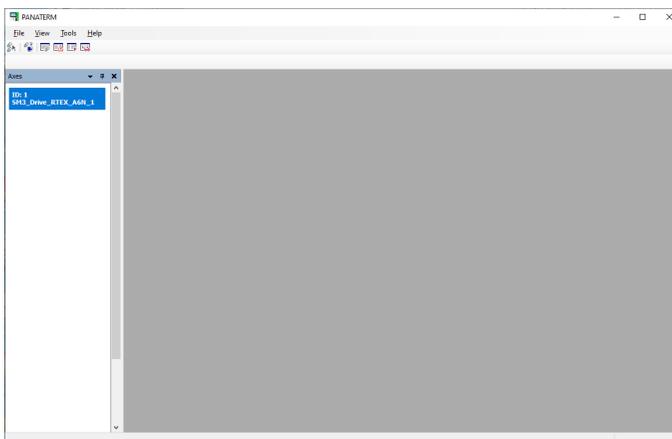
## 11.1 Setting up the Servo Amplifier Connected to the GM1 Controller



3. Change the timeout time and click the [OK] button. The "Select Device" dialog box will be displayed.



4. Click the [Scan Network] button, select the GM1 Controller, and click the [OK] button. The main pane will be displayed.



## 11.1 Setting up the Servo Amplifier Connected to the GM1 Controller

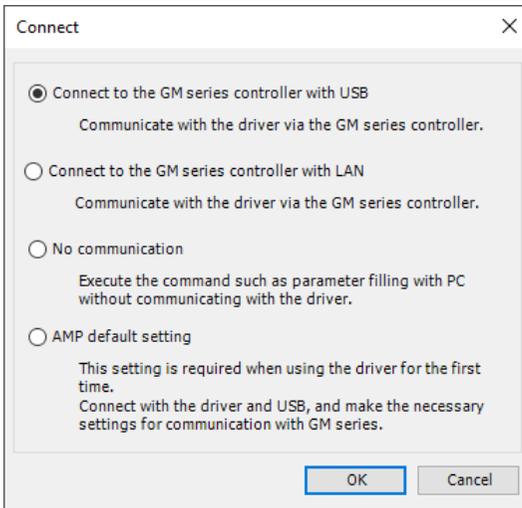
### 11.1.2 When Connected Using the USB Cable

If connected using the USB cable, use the following procedure.

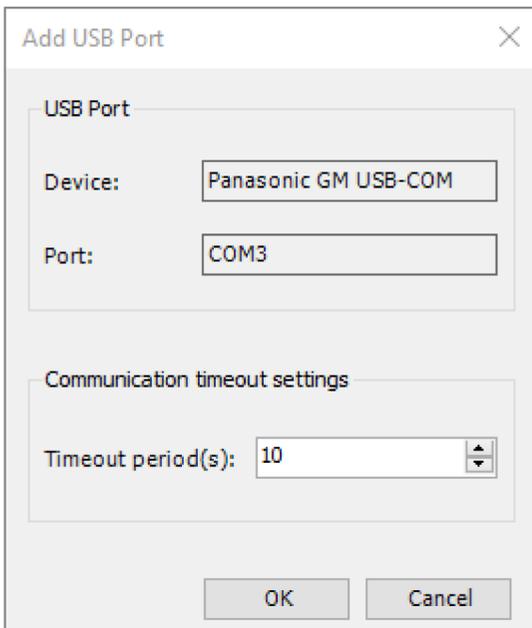
#### 1 2 Procedure

1. Start PANATERM Lite for GM.

The "Connect" dialog box will be displayed.

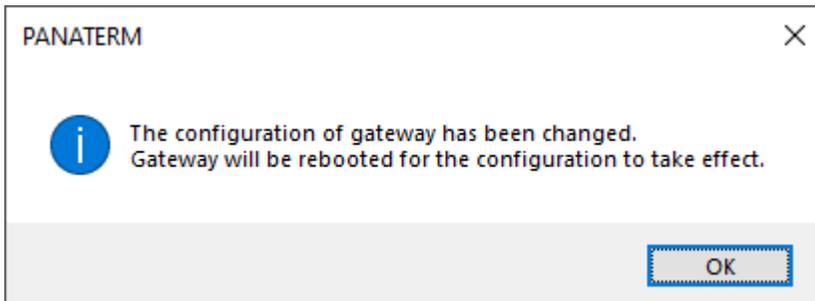


2. Select "Connect to the GM series controller with USB" and click the [OK] button.  
The "Add USB Port" dialog box will be displayed.

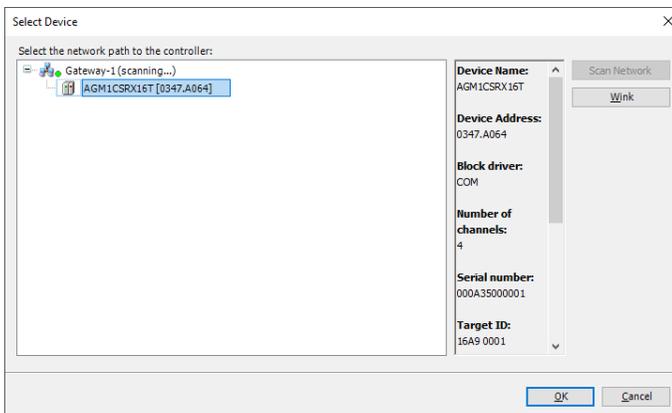


## 11.1 Setting up the Servo Amplifier Connected to the GM1 Controller

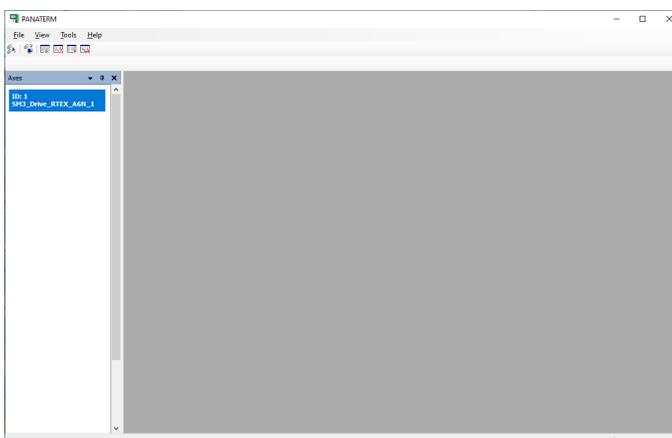
3. Change the timeout time and click the [OK] button.  
A dialog box to add a USB port and to restart the Gateway will be displayed.



4. Click the [OK] button.  
The "Select Device" dialog box will be displayed.



5. Click the [Scan Network] button, select the GM1 Controller, and click the [OK] button.  
The main pane will be displayed.



## 11.2 Writing Parameters to Servo Amplifier

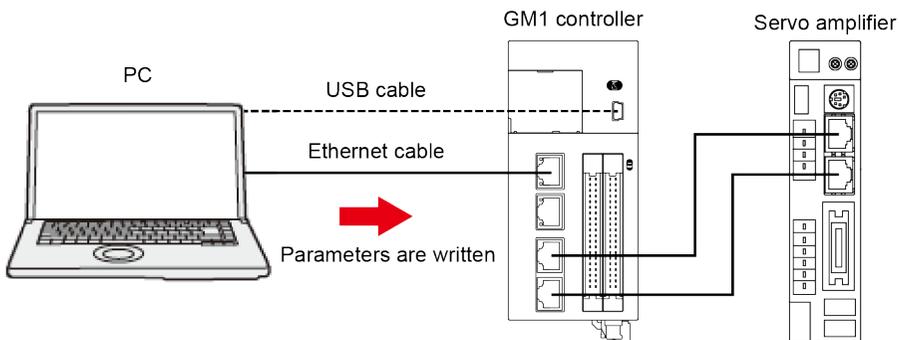
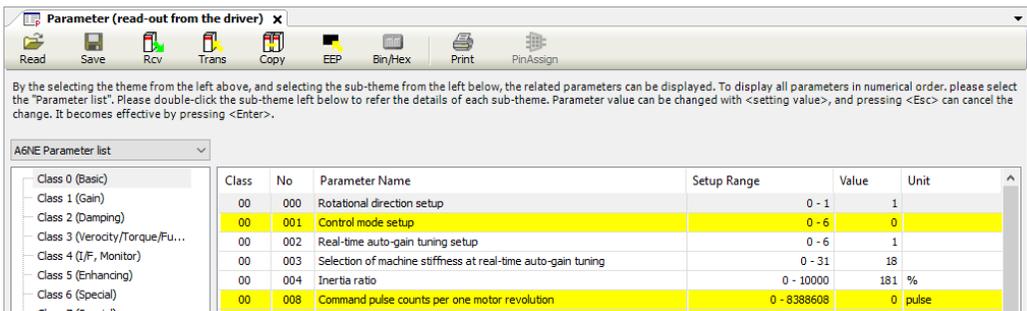
### 11.2 Writing Parameters to Servo Amplifier

Connect the PC with the servo amplifier and directly write the parameters set with PANATERM Lite for GM to the servo amplifier.

#### 1 2 Procedure

1. Start PANATERM Lite for GM.
2. Click "Trans" on the toolbar.

The parameters will be sent from PANATERM Lite for GM to the servo amplifier.



#### i Info.

- When changes were made to the parameters with yellow background, click "EEP" on the toolbar to restart the servo amplifier.

# 12 Preparation for Operation

---

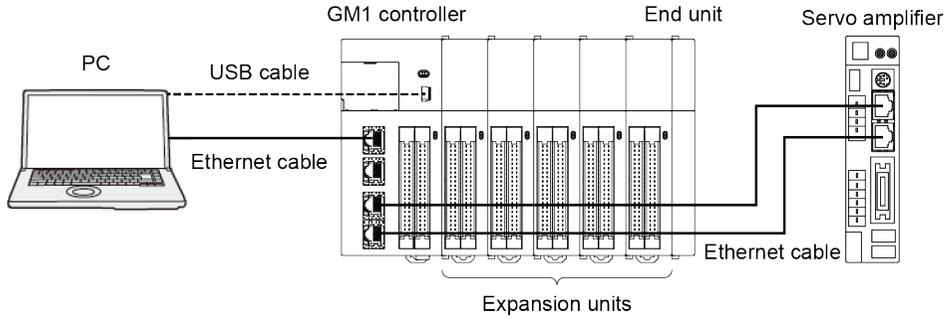
|        |  |      |
|--------|--|------|
| 12.1   | Checking Wiring .....  | 12-2 |
| 12.2   | Checking Safety Circuit Design .....                           | 12-3 |
| 12.2.1 | Safety Circuit Design .....                                    | 12-3 |
| 12.2.2 | Items to Check during Wiring .....                             | 12-4 |
| 12.2.3 | Power ON Operation .....                                       | 12-4 |
| 12.2.4 | Power OFF Operation .....                                      | 12-5 |
| 12.3   | Operation Check .....  | 12-7 |
| 12.3.1 | Checking the Network .....                                     | 12-7 |
| 12.3.2 | Checking Input Signals .....                                   | 12-7 |
| 12.3.3 | Checking Rotating and Moving Directions and Moving Distance .. | 12-8 |

## 12.1 Checking Wiring

---

### 12.1 Checking Wiring

Firstly, check whether the GM1 Controller, expansion units, servo amplifier, and PC are connected correctly.



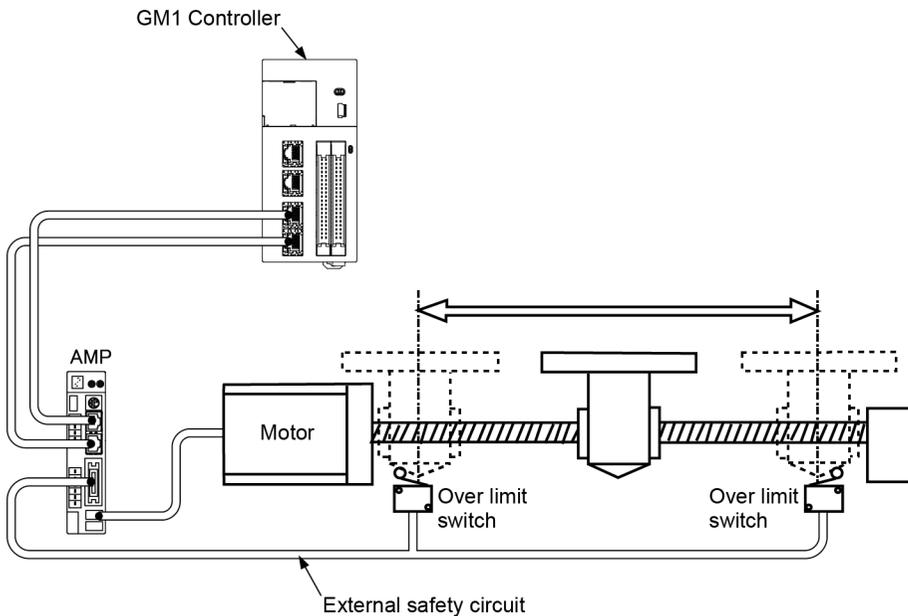
## 12.2 Checking Safety Circuit Design

### 12.2.1 Safety Circuit Design

#### ■ Example of a safety circuit

Be sure to create a safety circuit when using this product.

#### Installation of over limit switches



- Install over limit switches as shown above.
- Connect them to the CW and CCW over-travel inhibit inputs of the parallel I/O connector of the servo amplifier. For the GM1 Controller, connect them to the limit input (+) and limit input (-) through the network.

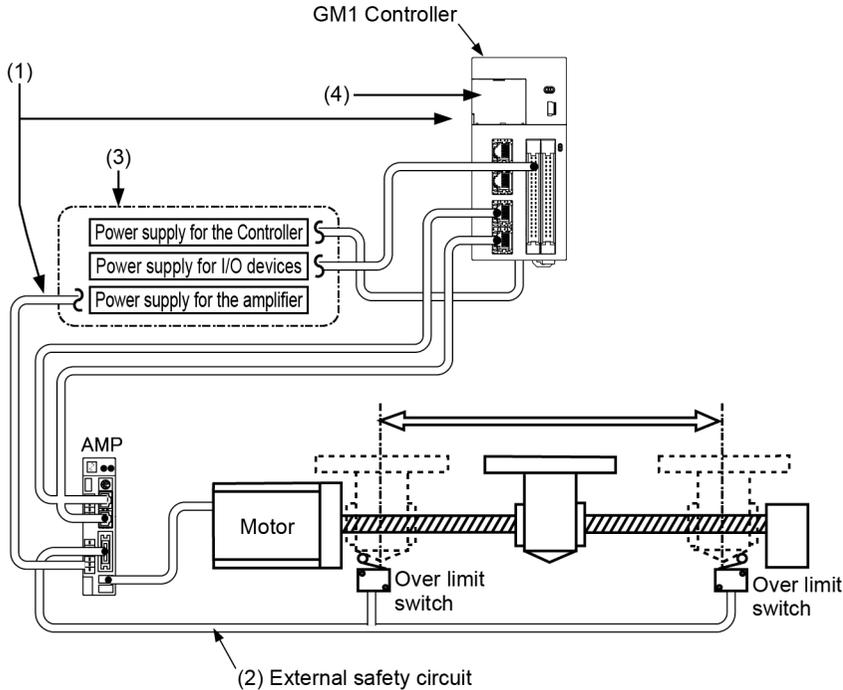


- Install the safety circuit recommended by the manufacturer of the motor being used.

## 12.2 Checking Safety Circuit Design

### 12.2.2 Items to Check during Wiring

#### ■ System configuration example



#### (1) Checking connections of each device

Check to make sure that each device has been connected as indicated by the design.

#### (2) Checking the installation of the external safety circuit

Check to make sure the safety circuit (wiring and installation of over limit switch) based on the external circuit has been installed properly.

#### (3) Checking the settings for power ON sequence

Make sure that settings have been entered so that power supplies will be turned according.

#### (4) Checking the GM1 Controller mode selector switch

Set the GM1 Controller to the STOP mode. Setting it in the RUN mode can cause inadvertent operation.

### REFERENCE

#### [12.2.3 Power ON Operation](#)

### 12.2.3 Power ON Operation

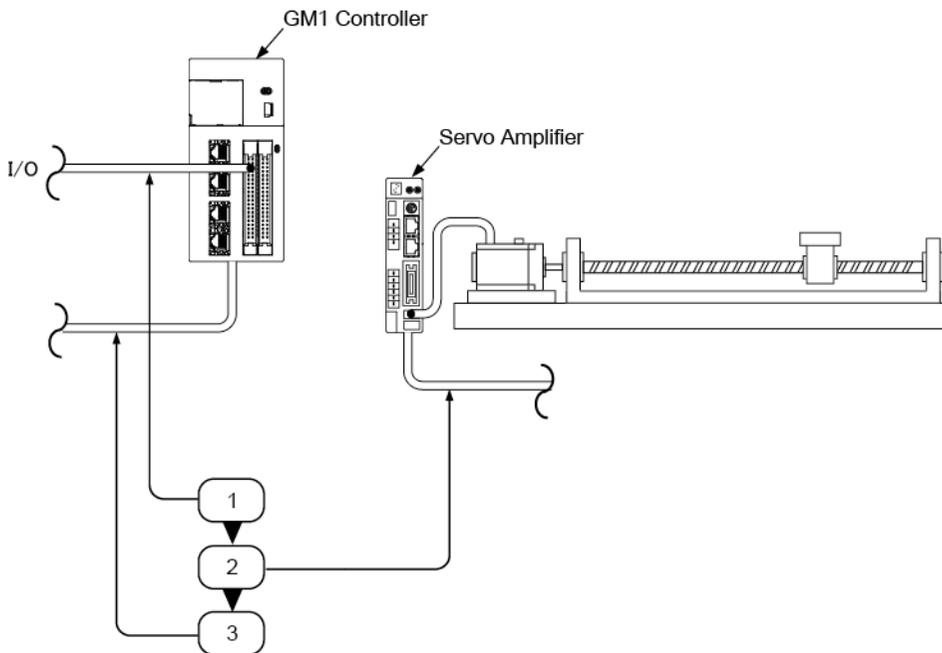
When turning ON the power supply to the system incorporating the GM1 Controller, turn ON the power supply in the following order.



- Consider the nature and statuses of any external devices connected to the system, and take sufficient care so that turning ON the power supply will not initiate unexpected movements.

### 1 2 Procedure

1. Turn ON the power supplies to the I/O devices connected to the GM1 Controller.
2. Turn ON the power supply to the servo amplifier.
3. Turn ON the power supply to the GM1 Controller.



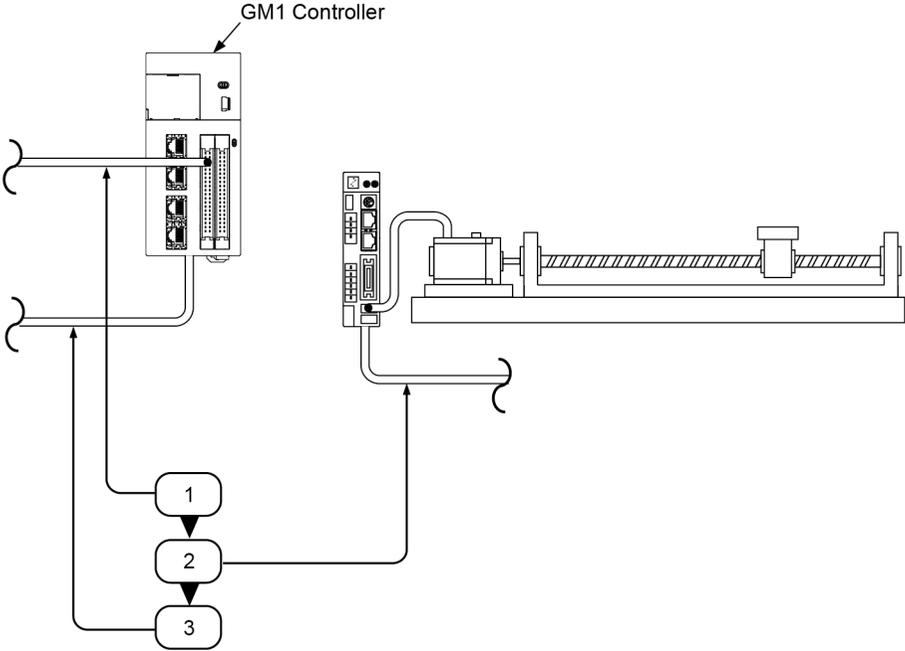
### 12.2.4 Power OFF Operation

#### 1 2 Procedure

1. Check to make sure the rotation of the motor has stopped, and then turn OFF the power supply to the GM1 Controller.
2. Turn OFF the power supply to the servo amplifier.
3. Turn OFF the power supplies to the I/O devices connected to the GM1 Controller.

# 12.2 Checking Safety Circuit Design

---



## 12.3 Operation Check

### 12.3.1 Checking the Network

After turning ON the power supplies, check if the operation monitor LEDs of the GM1 Controller are in the following states.

- STATUS: Lit
- LINK: Lit

#### Info.

- If the "STATUS" LED is flashing, the network is not established.
- If the "LINK" LED is not lit, the "RX" (reception side) of the GM1 Controller and "TX" (transmission side) of the servo amplifier are not electrically connected normally.

### 12.3.2 Checking Input Signals

Check the input of the over limit switch for the safety circuit connected to the servo amplifier and the input of the near home (DOG) switch.

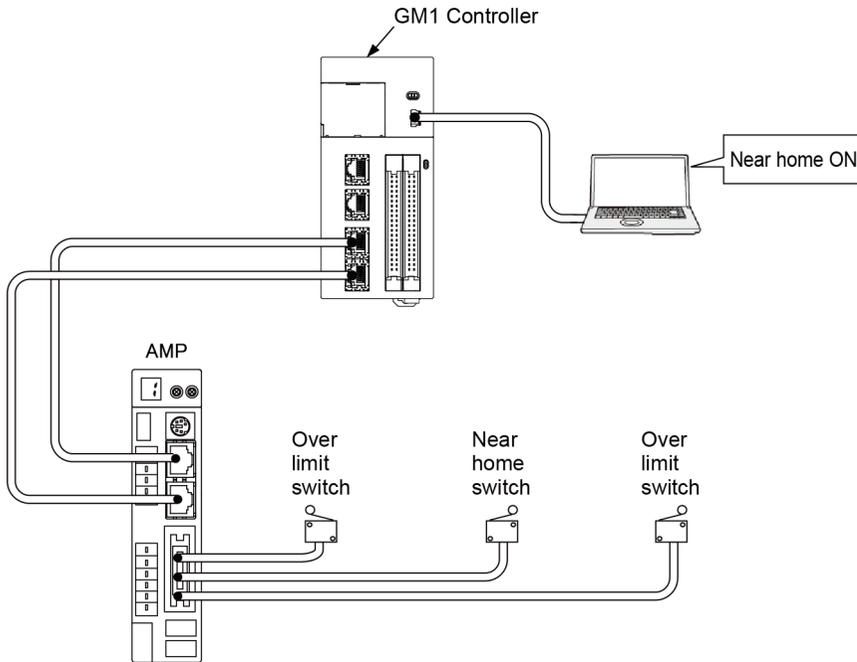
Check whether signal inputs are properly loaded into the GM1 Controller, with each switch operated forcibly.

The input state of each switch can be checked on the monitor screen of the MINAS Series Setup Support Software "PANATERM Lite for GM".

#### Info.

- If the operating direction of the motor is opposite to the position of the limits (+) and (-) after the installation of the over limit switch, check the physical connection of the limit switch.

## 12.3 Operation Check



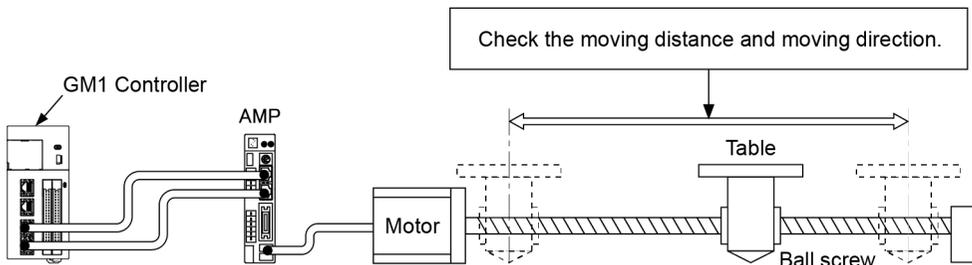
### 12.3.3 Checking Rotating and Moving Directions and Moving Distance

Check whether the rotating and moving directions of the motor and the moving distance are correct. The operations can be easily confirmed using the commissioning function of the GM Programmer without user programs.

#### ■ Using the commissioning function

On the GM Programmer, select **Project>Online Setting Mode**.

Open the “Commissioning” screen for each axis to use the commissioning function.



#### ■ Checking the rotation direction

Set the rotation direction on the servo amplifier.

Check the rotation direction by executing inching operation on the Commissioning screen.

#### ■ Checking the moving distance

Set the moving distance on the servo amplifier.

Next, set the scale on the "Scaling / Mapping" screen for each axis on the GM Programmer. Check the moving distance by executing inching operation on the Commissioning screen.

**i Info.**

For details on inching operation on the Commissioning screen, refer to "[10.7.2 Conducting Commissioning for Servo Amplifiers](#)".

(MEMO)

# Appendix Warranty / Cautions for Proper Use

---

|                               |       |
|-------------------------------|-------|
| Warranty .....                | App-2 |
| Warranty Period .....         | App-2 |
| Warranty Scope .....          | App-2 |
| Cautions for Proper Use ..... | App-3 |

### Warranty

#### Warranty Period

The warranty period of the Product shall be 12 months from the ex-factory date or 18 months from the date of manufacturing unless otherwise specified between both parties.

#### Warranty Scope

Panasonic warrants the replacement of the defected parts of the Product or repair of them when the defects of the Product occur during the Warranty Period, and when the defects are under Panasonic responsibility. This Warranty only covers the Product itself and does not cover any damage to your company and the third party incurred by the Product, such as damage that is induced by an object machined or produced using the Product or by the defects of the Product. This Warranty shall be exempted in the following cases,

1. Defects resulting from misuse and/or repair or modification by the customer.
2. Defects resulting from drop of the Product or damage during transportation.
3. Defects resulting from improper usage of the Product beyond the Specifications.
4. Defects resulting from fire, earthquake, lightening, flood, damage from salt, abnormal voltage or other Act of God, or other disaster.
5. Defects resulting from the intrusion of foreign material to the Product, such as water, oil or metallic particles.
6. Parts exceeding their standard lifetime specified in this document.
7. The machines are not assembled in accordance with the instructions or precautions noted in this specification.
8. When the machine does not match the Product assembled in the machine.
9. When the machine condition is not caused by Panasonic reasons.
10. Defects that Panasonic could not foresee at the time of delivery of the Product.

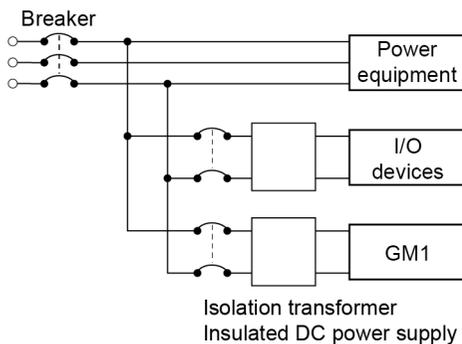
## Cautions for Proper Use

### ■ Selection of a power supply

- Use a low noise power supply.
- The inherent noise resistance is sufficient for the noise superimposed on the power wires, however, the noise can be attenuated further by using the isolation transformer / insulated power supply.

### ■ Isolation of power supply systems

- Wiring to the units, I/O devices, and other power devices should have separate wiring systems.

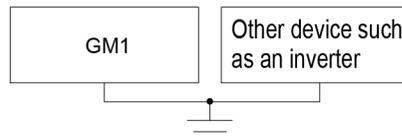
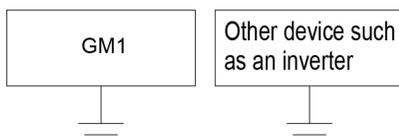


### ■ Power supply sequence

- Start the GM1 controller only after I/O devices and power devices are energized. In case of stopping the operation of the GM1 controller, have the I/O devices or power devices turned OFF after the GM1 controller has stopped operating.

### ■ Grounding

- The grounding connection should have a resistance of 100  $\Omega$  or less.
- The point of grounding should be as close to the GM1 controller as possible. The ground wire should be as short as possible.
- Sharing the ground with another device may have an adverse effect. Therefore, be sure that grounding is dedicated.



Conversely, depending on your environment, grounding may cause a problem. Do not ground the function earth when grounding a plus (+) terminal of the power.

## Cautions for Proper Use

---

### ■ Wiring

- Turn OFF the power supply when carry out wiring or connecting the GM1 controller to expansion units.
- Noise resistance measures such as attaching a noise filter, a surge absorber or a ferrite core may be necessary in some cases, depending on the usage environment.

### ■ Installation of an interlock circuit

- When controlling conflicting operations such as the motor rotation in clockwise or counter-clockwise direction, provide an interlock circuit external to the GM1 controller.

### ■ Installation of an emergency stop circuit

- Provide an emergency stop circuit external to the GM1 controller to turn OFF the power supply of the output device.

### ■ Installation environment

Do not use it in the following environments.

- Direct sunlight
- Sudden temperature changes causing condensation.
- Inflammable or corrosive gas.
- Excessive airborne dust, metal particles or saline matter.
- Benzine, paint thinner, alcohol or other organic solvents or strong alkaline solutions such as ammonia or caustic soda.
- Direct vibration, shock or direct drop of water.
- Influence from power transmission lines, high voltage equipment, power cables, power equipment, radio transmitters, or any other equipment that would generate high switching surges. (100 mm or more)

### ■ Handling instructions

- Before touching the unit, always touch a grounded piece of metal in order to discharge static electricity.
- Always rid yourself of any static electricity before handling this product.
- Do not connect a unit other than our GM1 series to the side connector on the unit.
- Use copper wires with a temperature rating of 90°C or higher.

## Revision History

The manual code is shown at the bottom of the cover page.

| Date of issue | Manual code      | Revision details  |
|---------------|------------------|---|
| February 2021 | WUME-GM1RTXSU-01 | First Edition   |
| August 2021   | WUME-GM1RTXSU-02 | 2nd Edition <ul style="list-style-type: none"><li>Added the following models.<ul style="list-style-type: none"><li>Digital I/O unit (Source type)</li><li>Analog I/O unit</li><li>Pulse output unit</li></ul></li></ul> |
| March 2022    | WUME-GM1RTXSU-03 | 3rd Edition <ul style="list-style-type: none"><li>Clerical corrections</li></ul>  |
| April 2022    | WUME-GM1RTXSU-04 | 4th Edition <ul style="list-style-type: none"><li>Changed the Company name</li></ul>  |
| November 2023 | WUME-GM1RTXSU-05 | 5th Edition <ul style="list-style-type: none"><li>Made changes associated with RTEX maximum 32 axes</li><li>Windows® 11: 64-bit support</li></ul>   |

(MEMO)

(MEMO)

---

Please contact .....

**Industrial Device Business Division,  
Panasonic Industry Co., Ltd.**

7-1-1 Morofuku, Daito City, Osaka, 574-0044, Japan  
[industrial.panasonic.com/ac/e/](http://industrial.panasonic.com/ac/e/)

© Panasonic Industry Co., Ltd 2021-2023

WUME-GM1RTXSU-05