

# Motionnet Starter Kit

## G9001A-EV,

## G9002A\_G9103C-EV

## G9004A-EX

### User's Manual

### Application Software

Motionnet Starter Kit																
Tool (T) Other (O)																
Device Number	Address Map	Data		Status		Interrupt Status		Error Counter		Cycle Counter						
01 d	104 h	0000 h		0001 h		0000 h		244 d		31 μs						
		<input type="button" value="WRITE"/>						<input type="button" value="READ"/>				<input type="button" value="STOP"/>				
<b>Device Number [d]</b>	<b>00</b>	<b>01</b>	<b>02</b>	<b>03</b>	<b>04</b>	<b>05</b>	<b>06</b>	<b>07</b>	<b>08</b>	<b>09</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>
Device Information	8B	81	00	00	00	00	00	8B	00	00	00	00	00	00	00	00
I/O Communication Error Flags	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Setting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Flagg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Port Data No.1-0	0000	0000	0000	0000	0000	0000	0000	0800	0000	0000	0000	0000	0000	0000	0000	0000
Port Data No.3-2	00FF	0000	0000	0000	0000	0000	0000	0036	0000	0000	0000	0000	0000	0000	0000	0000
Device Attribute	G9103C	G9002A						G9004A								
<b>Device Number [d]</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>	<b>31</b>
Device Information	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
I/O Communication Error Flags	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Setting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Flagg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Port Data No.1-0	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Port Data No.3-2	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Device Attribute																
<b>Device Number [d]</b>	<b>32</b>	<b>33</b>	<b>34</b>	<b>35</b>	<b>36</b>	<b>37</b>	<b>38</b>	<b>39</b>	<b>40</b>	<b>41</b>	<b>42</b>	<b>43</b>	<b>44</b>	<b>45</b>	<b>46</b>	<b>47</b>
Device Information	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
I/O Communication Error Flags	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Setting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Flagg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Port Data No.1-0	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Port Data No.3-2	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Device Attribute																
<b>Device Number [d]</b>	<b>48</b>	<b>49</b>	<b>50</b>	<b>51</b>	<b>52</b>	<b>53</b>	<b>54</b>	<b>55</b>	<b>56</b>	<b>57</b>	<b>58</b>	<b>59</b>	<b>60</b>	<b>61</b>	<b>62</b>	<b>63</b>
Device Information	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
I/O Communication Error Flags	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Setting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Flagg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Port Data No.1-0	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Port Data No.3-2	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Device Attribute																

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# 1. Introduction

Thank you for choosing our Motionnet Starter Kit Application software (MNET-STK.exe).

This manual describes the specifications, functions, connections, and usages of our Motionnet Starter Kit Application software (MNET-STK.exe).

Be sure to read this manual thoroughly and keep it handy in order to use the product appropriately.

## 1.1 How to use this manual

1. Reproduction of this manual in whole or in part without permission is prohibited by the Copyright Act.
2. The contents of this manual are subject to change without the prior notice along with the improvement of performance and quality.
3. Although this manual is produced with the utmost care, please contact our sales representative if there are any questions, errors or omissions.

### 1.1.1 Symbol description

#### 1.1.1.1 Physical damage level

In this manual, the physical damage level is defined as follows.

- Serious injury

Those that might cause aftereffects such as loss of sight, wound, burn, electric shock, fracture, poisoning, or those requiring hospitalization or long-term outpatient treatment.

- Minor injury

Those not requiring hospitalization or long-term outpatient treatment. (Other than "serious injury" above)

#### 1.1.1.2 Hazardous level

The product is designed with the top priority for the safety of operators. However, due to the nature of the product, there are risks that cannot be eliminated. In this manual, the seriousness and level of these risks are divided into three categories: "Danger," "Warning," and "Caution." Be sure to read and understand the symbols descriptions thoroughly before operating or performing maintenance work on the product.

"Danger", "Warning", and "Caution" are indicated in the order of severity of hazard: (danger > warning > caution), and the meanings are described underneath.

### **D a n g e r**

"Danger" indicates that it might cause an imminent risk that could result in the death or serious injury of the operator during operations of this product.


### **W a r n i n g**

"Warning" indicates that it may result in the death or serious injury of the operator during operations of this product.

## C a u t i o n

"Caution" indicates that it may result in minor injury of the operator during operations of this product.

## C a u t i o n

"Caution" without warning symbol  indicates that the operator is not likely to be injured, but it can cause damage or result in a malfunction to this product, your equipment, or your instruments.

In addition to the hazardous level classifications described above, the following notations are also used.

## I m p o r t a n c e

"Importance" indicates the information and contents that must be known particularly in operations and maintenance works of this product.

## R e m a r k s

"Remarks" initiates the useful information or contents for operations and maintenance works of this product.

### 1.1.1.1 Warning symbol

In this manual, the following symbols are added along with the notations "Danger," "Warning," "Caution," and "Importance" to indicate the warning contents in an easy-to-understand manner.



Indicates that a high voltage may be applied.  
Failure to confirm safety or mishandling of this product might cause a risk of electric shock, burn, or death.



Indicates that some parts have a high surface temperature, and the mishandling can cause a risk of burns.



Indicates that mishandling may cause a fire.



Indicates "prohibited" actions that must not be performed in the operation and the maintenance work of this product.



Indicates "mandatory" actions that must be performed in the operation and the maintenance work of this product.

## 1.2 Warranty

This content is the warranty of the product purchased from Nippon Pulse Motor.

When the product is purchased from a supplier other than NPM, please contact that supplier regarding the product's warranty.

### 1.2.1 Warranty period

The warranty period is one year after delivery of the product to the designated location.

### 1.2.2 Warranty coverage

If a failure occurs within the warranty period under normal use according to this manual, we will repair or replace it free of charge at our discretion.

However, even within the warranty period, if the cause of failure falls under any of the following, it will not be covered by the warranty.

1. When the damage is caused by remodeling or repair by someone other than our company or a person designated by our company
2. In case of falling after delivery or damage during transportation
3. Due to natural deterioration, wear or fatigue of parts
4. Caused by usage other than what is described in this manual
5. Fire, earthquake, lightning strike, wind and flood damage, salt damage, abnormal voltage, other natural disasters or force majeure.
6. In addition, if the cause of the failure is due to reasons that are not considered to be the responsibility of our company.

For free repair, only bring the product to our company, and we will not repair it by a business trip.

The warranty period of the repaired product will be the same as the warranty period before the repair.

The warranty here means the warranty for the product itself, and the damage caused by the failure of the product is not covered by the warranty.

## 1.3 Notice

This document aims to describe the details of the functions of this product. It does not warrant fitness for a particular purpose of the customer. Also, the examples of applications and circuit diagrams in this manual are included only for your reference.

Please confirm the features and safety of device or equipment before use.

## 1.4 Confirmation

Please do not use this product in the following conditions. If you need to use in the following conditions, please contact our sales representatives:

1. Any equipment that may require a high reliability or a safety, such as nuclear facilities, electricity or gas supply systems, transportation facilities, vehicles, various safety systems, medical equipment, etc.
2. Any equipment that may directly affect human survival or property.
3. Usages under conditions or circumstances that are not specified in the catalog, manual, etc.

For applications that may cause serious damage to a human life or property due to failure of this product, ensure high reliability and safety by redundant design.

## 2. Information

This manual is the operation manual of the application software(MNET-STK.exe) that operates a control board.

By using this software and Motionnet Starter Kit (G9001A, G9002A\_G9103C-EV, G9004A-EX), you can learn the Motionnet communication specifications, I/O control functions, motor control functions, CPU emulation functions, and message functions using the center device G9001A, local devices G9002A , G9103C and G9004A.

Please refer to the following manuals along with this manual.

(x: revision)

	Manual Name [Outline]	Document File name	Software File name	Document No.
Hardware Manual	Motionnet Starter Kit User's Manual (Hardware)	MotionnetStarterKit_HardwareManual_VerxE.pdf	—	TA600036-ENx/x
	Motionnet Starter Kit User's Manual (Simple Manual)	MotionnetStarterKit_SimpleManual_VerxE.pdf	—	TA600035-ENx/x
	Motionnet Starter Kit G9004A-EX User's Manual (Hardware)	MotionnetStarterKit_G9004A-EX_HardwareManual_VerxE.pdf	—	TA600140-ENx/x
Application Software Manual	Motionnet Starter Kit User's Manual (Application Software) [Display of all registers]	MotionnetStarterKit_ApplicationManual_VerxE.pdf	MotionnetStarterKit_Application_VxxxJE.zip	TA600037-ENx/x (This document)
	Motionnet Starter Kit G9004A-EX User's Manual (Application Software)	MotionnetStarterKit_G9004A-EX_MessageManual_VerxE.pdf	MotionnetStarterKit_Message_VxxxJE.zip	TA600141-ENx/x
I/O Sample Software Manual	Motionnet Starter Kit I/O Sample Software Manual	MotionnetStarterKit_IO_SampleManual_VerxE.pdf	MotionnetStarterKit_IO_Sample_Vxxx.zip	TA600048-ENx/x
Axis Sample Software Manual	Motionnet Starter Kit Axis Sample Software Manual	MotionnetStarterKit_AXIS_SampleManual_VerxE.pdf	MotionnetStarterKit_AXIS_Sample_Vxxx.zip	TA600049-ENx/x
Reference	G9001A/G9002A User's Manual			DA70109-4/xE
	G9103C User's Manual			DA70143-1/xE
	G9004A User's Manual			DA70120-1/xE

Please download application software and related materials from our NPM website.

### 2.1 Operating environment

This software is confirmed to operate on Windows 7 and Windows10 (both 32 bit and 64 bit).

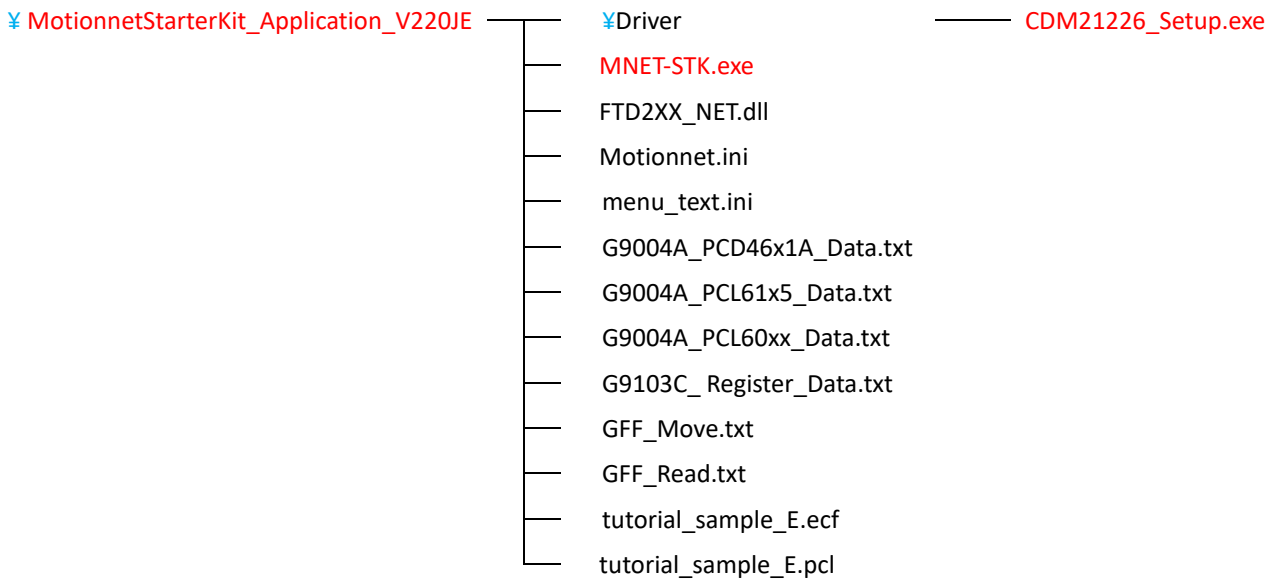
(Not confirmed to operate on OS other than the above.)

Please change the power saving setting in your PC so as not to move to "sleep mode" during operation.

## 3. Install the device driver

### 3.1 Folder structure

When unzipping the compressed file ([MotionnetStarterKit\\_Application\\_V220JE.zip](#)), the following folders are generated.



“MNET-STK.exe” is an executable file of the software and “CDM21226\_Setup.exe” is a device driver installer.

“Motionnet.ini”, “menu\_text.ini” are the text files for MNET-STK.

“G9004A\_PCD46x1A\_Data.txt”, “G9004A\_PCL61x5\_Data.txt”, and “G9004A\_PCL60xx\_Data.txt” are for MNET-STK G9004A CPU emulation mode setting data file.

“G9103C\_Register\_Data.txt”, “GFF\_Move.txt”, “GFF\_Read.txt”, “tutorial\_sample\_E.ecf”, and “tutorial\_sample\_E.pcl” are the G9103C setting data files for MNET-STK.

### 3.2 Installation

Double-click “CDM21226\_Setup.exe” to launch the installer and follow the instructions on the screen to complete the installation.

If you have already installed it, you do not need to install it again.

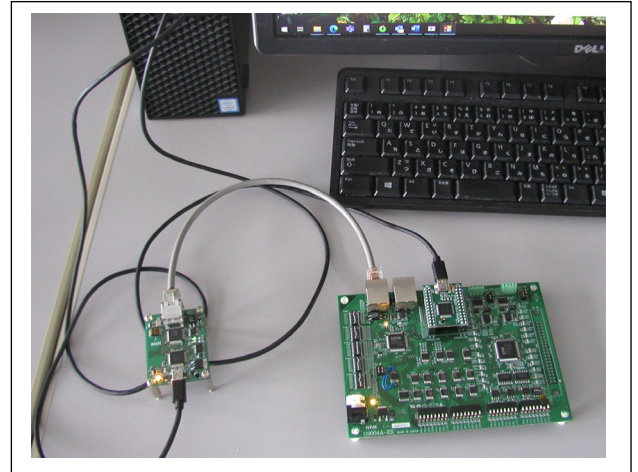
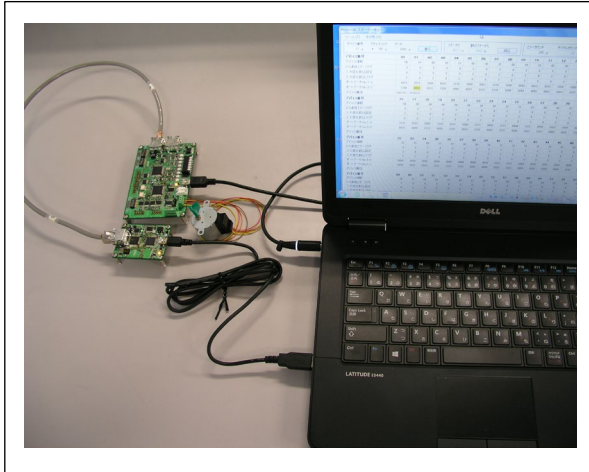


Note: Please download the latest version of the device driver on FTDI's website: (<http://www.ftdichip.com/Drivers/D2XX.htm>).

## 4. Basic operations of software

### 4.1 Start-up software

Make sure that the Motionnet Starter Kit (G9001A-EV, G9002A\_G9103C-EV) is properly connected to your PC. Also, use Motionnet cables to connect the center device board (G9001A-EV) and the local device board (G9002A\_G9103C-EV, G9004A-EX).



Double-click the executable file, “MNET-STK.exe” to open the “main screen” as follows.

#### 4.1.1 Main Screen

Motionnet Starter Kit																
Tool (T) Other (O)																
Device Number	Address Map	Data		Status	Interrupt Status		Error Counter		Cycle Counter							
00	d	h	h	0000	h	0000	h	0	d	0	μs	START				
Device Number [d]	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
Device Information	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
I/O Communication Error Flags	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Setting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Flags	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Port Data No.1-0	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Port Data No.3-2	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Device Attribute																
Device Number [d]	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Device Information	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
I/O Communication Error Flags	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Setting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Flags	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Port Data No.1-0	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Port Data No.3-2	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Device Attribute																
Device Number [d]	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Device Information	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
I/O Communication Error Flags	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Setting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Flags	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Port Data No.1-0	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Port Data No.3-2	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Device Attribute																
Device Number [d]	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
Device Information	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
I/O Communication Error Flags	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Setting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Flags	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Port Data No.1-0	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Port Data No.3-2	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Device Attribute																

This screen shows up to 64 local devices that are connected to G9001A, as well as “Device Information”, “I/O Communication Error Flags”, “input Change Interrupt Setting”, “Input Change Interrupt Flags”, and “Port Data No. 1-0 & 3-2” in the address area of G9001A (512 bytes).



When you click “START” button, the data in “Device Number” of a local device board (G9002A\_G9103C-EV, G9004A -EX) connected to the center device board (G9001A-EV) are displayed. Also “Status” of G9001A, “Interrupt Status”, “Error Counter”, and “Cycle Counter” values are displayed at the top of the screen.

Motionnet Starter Kit

Tool (T) Other (O)

Device Number: 01 d, Address Map: 104 h, Data: 0000 h [WRITE]

Status: 0001 h, Interrupt Status: 0000 h [READ]

Error Counter: 244 d, Cycle Counter: 30 μs [STOP]

Device Number [d]	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
Device Information	8B	81	00	00	00	00	8B	00	00	00	00	00	00	00	00	00
I/O Communication Error Flags	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Setting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Flags	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Port Data No.1-0	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Port Data No.3-2	00FF	0000	0000	0000	0000	0000	0036	0000	0000	0000	0000	0000	0000	0000	0000	0000
Device Attribute	G9103C	G9002A					G9004A									

Device Number [d]	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Device Information	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
I/O Communication Error Flags	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Setting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Flags	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Port Data No.1-0	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Port Data No.3-2	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Device Attribute																

Device Number [d]	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Device Information	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
I/O Communication Error Flags	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Setting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Flags	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Port Data No.1-0	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Port Data No.3-2	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Device Attribute																

Device Number [d]	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
Device Information	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
I/O Communication Error Flags	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Setting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input Change Interrupt Flags	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Port Data No.1-0	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Port Data No.3-2	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Device Attribute																

“Device Number” of the local device board (G9002A\_G9103C-EV) connected to the center device board (G9001A-EV) shows “0” (blank) .

If no local device is connected, “256” is displayed in “Error Counter”. (When there is no response even if the maximum 64-local device repeats 4 times, “Error Counter” becomes  $64 \times 4 = 256$ ).

If the local device board (G9002A\_G9103C-EV) is connected, “248” is displayed in “Error Counter” because G9002A and G9103C are mounted on the board.

## 4.1.2 Writing data to the address area

When you double-click a column where the value of each device is displayed, the value will be highlighted in yellow as shown below, and the cursor moves to “Data” (data input part). Also, the device number of the selected value is set in “Device Number” column, and the address map data of the selected data is set in the “Address Map” column as shown below.

Device Number [d]	00	01	02
Device Information	8B	81	00
I/O Communication Error Flags	0	0	0
Input Change Interrupt Setting	0	0	0
Input Change Interrupt Flags	0	0	0
Port Data No.1-0	0000	0000	0000
Port Data No.3-2	00FF	0000	0000
Device Attribute	G9103C	G9002A	

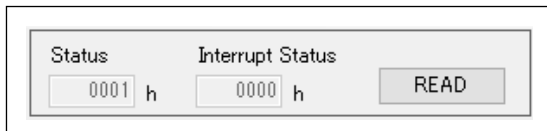
Device Number: 01 d, Address Map: 104 h, Data: 0000 h [WRITE]

Enter a value you want in “Data” and click “WRITE” button.

However, if you enter out-of-range value, “WRITE” button disappears. “WRITE” button also disappears when a number other than 00 to 63 is entered in “Device Number”.

### 4.1.3 Read and display the status value

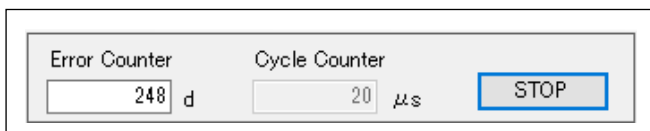
Click “START” button to read and display the values of “Status” of the center device board (G9001A-EV) and “Interrupt Status”.  
Click “READ” button to read and display the current values of “Status” and “Interrupt Status”.



### 4.1.4 Display the error counter and cycle counter

Click “START” button to read and display the data of Error Counter register and Cycle Counter register of the center device board (G9001A-EV). Data is read periodically using an interrupt timer, and it is displayed when different from the previous data. The upper limit of “Error Counter” and “Cycle Counter” is “65535”.

Click the value of “Error Counter” and issue the counter clear command to display “0” in “Error Counter”. See also 4.2.6 “Counter” menu.



### 4.1.5 Display of device number

By clicking the device number part, the device number display can be changed from decimal display to hexadecimal display and from hexadecimal display to decimal display.

Device Number  d    Address Map  h    Data  h    WRITE

Device Number  h    Address Map  h    Data  h    WRITE

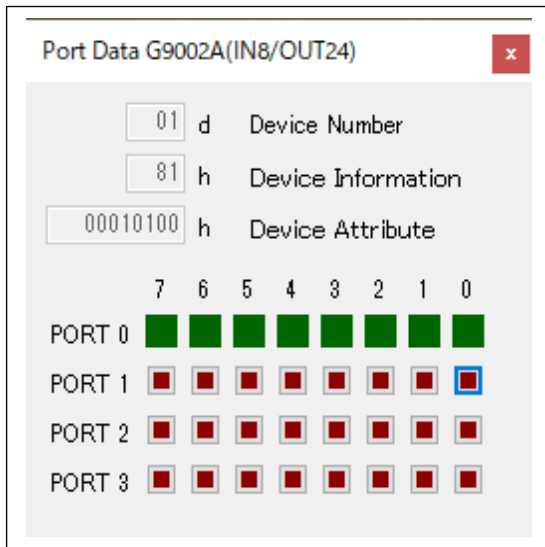
  

Device Number [d]	00	01	02
Device Information	8B	81	00
I/O Communication Error Flags	0	0	0
Input Change Interrupt Setting	0	0	0
Input Change Interrupt Flags	0	0	0
Port Data No.1-0	0000	0000	0000
Port Data No.3-2	00FF	0000	0000
Device Attribute	G9103C	G9002A	
Device Number [d]	16	17	18
Device Information	00	00	00

Device Number [h]	00	01	02
Device Information	8B	81	00
I/O Communication Error Flags	0	0	0
Input Change Interrupt Setting	0	0	0
Input Change Interrupt Flags	0	0	0
Port Data No.1-0	0000	0000	0000
Port Data No.3-2	00FF	0000	0000
Device Attribute	G9103C	G9002A	
Device Number [h]	10	11	12
Device Information	00	00	00

## 4.1.6 Display the device attributes

Double-click the device name in “Device Attribute” column to display a screen corresponding to the device name. When double-clicking “G9002A”, the following screen will be displayed.



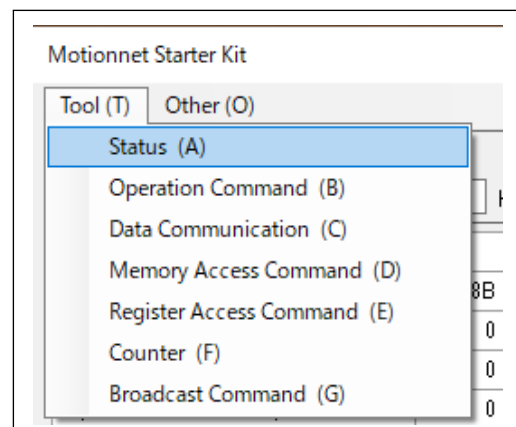
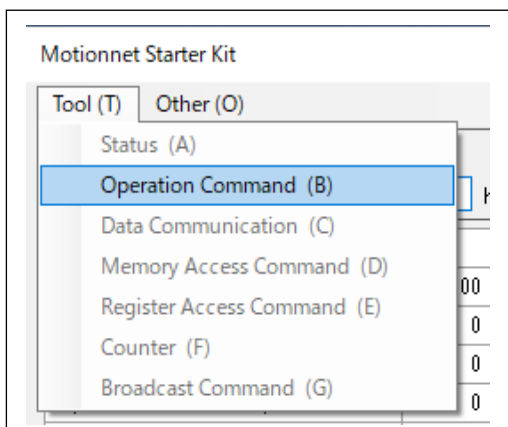
Refer to the section 4.4 “Device Attribute” menus.

## 4.2 “Tool (T)” menu

Click "Tool (T)" to display the tool menu.

The tool menu is processed using commands (“Status (A)”, “Operation Command (B)”, “Data Communication (C)”, “Memory Access Command (D)”, “Register Access Command (E)”, Counter (F), and “Broadcast Command (G)”).

Before clicking "START" button, only "Operation Command (B)" tool is enabled. Click “START” button to enable all tools.



## 4.2.1 “Status (A)” menu

Click this menu to display the following status screen. You can check the details of each Status and Interrupt Status bit.

Status
×

Status = 1003 h

CEND	1		1 when data transmission FIFO can be written
BRKF	1		1 when receiving a break frame
IOPC	0		1 when the state of the input port with “Input change interrupt setting” set to 1 changes
EIOE	0		1 when a cyclic communication error occurs
EDTE	0	<input type="checkbox"/>	1 when a data communication error occurs
ERAE	0	<input type="checkbox"/>	1 when a local device reception processing error occurs
CAER	0	<input type="checkbox"/>	1 when there is an inappropriate access
	0		
REF	0		1 when there is unsend output port data
TDBB	0		1 when there is transmission data in the data transmission FIFO
RDBB	0		1 when there is received data in the data reception FIFO
	0		
SBSY	1		1 when cyclic communication starts
RBSY	0		1 during reset processing
DBSY	0		1 during system communication or data communication
BBSY	0		When break communication command (0610h) is issued with RENV0 (8) = “1”, 1 until break communication is completed

Interrupt Status = 0000 h

EDN5-0	0	d	Device number when EDTE = “1” in status or ERAE = “1” error occurs
	0		
LNRV	0		1 when local data is not received
ERA3-0	0	d	Display code if packet content does not match local device type
CAE3-0	0	d	Code displayed when unauthorized access to G9001A

READ

0400h

Clear command for the INT group status

Click “READ” button to read and display the current status and interrupt status data.

When clicking “0400h” button, the corresponding status is cleared by adding the weight of the bit to command 0400h if the box to the status bit’s is checked. However, it is disabled when bit 9 (MCLR) of RENV0 register is “0”.

## 4.2.2 “Operation Command (B)” menu

Click this menu to display various operation command buttons on the following window.

The screenshot shows a window titled "Operation Command" with a close button (X) in the top right corner. The window contains a list of command buttons and their descriptions:

- 0100h**: Resets the software
- 0200h**: Resets the transmitting FIFO
- 0300h**: Resets the receiving FIFO
- 0600h**: Error count clear command
- 0610h**: Break communication command
- 1000h**: System communication to all devices
- 1100h**: System communication to all devices except those devices excluded from cyclic communication
- 1200h**: System communication to specified devices. Below this button is a text input field containing "00" and "(00h)".
- 1300h**: Obtain attribute information for the specified devices. Below this button is a text input field containing "00" and "(00h)".

Below the list, there is a section for attribute information display:

Attribute Data	Type	I/O Setting	Model Code	Data Number
00000000 h	000 h	0 h	00 h	00 h

At the bottom of the window, there are two more buttons:

- 3000h**: Start cyclic communication
- 3100h**: Stop cyclic communication

Click “0100h” button to write the software reset command 0100h and reset the center device.

Click “0200h” button to write the transmitting FIFO reset command 0200h and reset only the FIFO for data transmission.

Click “0300h” button to write the receiving FIFO reset command 0300h and reset only the FIFO for data receiving.

Click “0600h” button to write the error counter reset command 0600h and clear the error count register to zero.

Click “0610h” button to write the break communication command 0610h and issue the break communication. However, it is invalid when bit-8 (BKOFr) of RENV0 register is “0”.

Click “1000h” button to write the system communication command 1000h to all devices, to poll all devices sequentially, and to update the “Device Information” column corresponding to the “Device Number”.

Click “1100h” button to write the system communication command 1100h to all devices that are excluded from cyclic communication. It sequentially polls all devices whose “device use” bit is 0 in “device information” and update the “Device Information” column corresponding to the “Device Number”. The updated contents are the same as for the command 1000h.

Click “1200h” button to write the “Device Number” on the right in addition to the system communication command 1200h to the specified device. It polls only the specified device and updates the “Device Information” column corresponding to the “Device Number”. The update value is the same as for the command 1000h.

Click “1300h” button to write the “Device Number” on the right in addition to the attribute information acquisition command 1300h of the specified device. It polls the specified device, and the attribute information is copied to the data receiving FIFO. The attribute information and contents (type, I/O setting, model code and the number of data) are displayed.

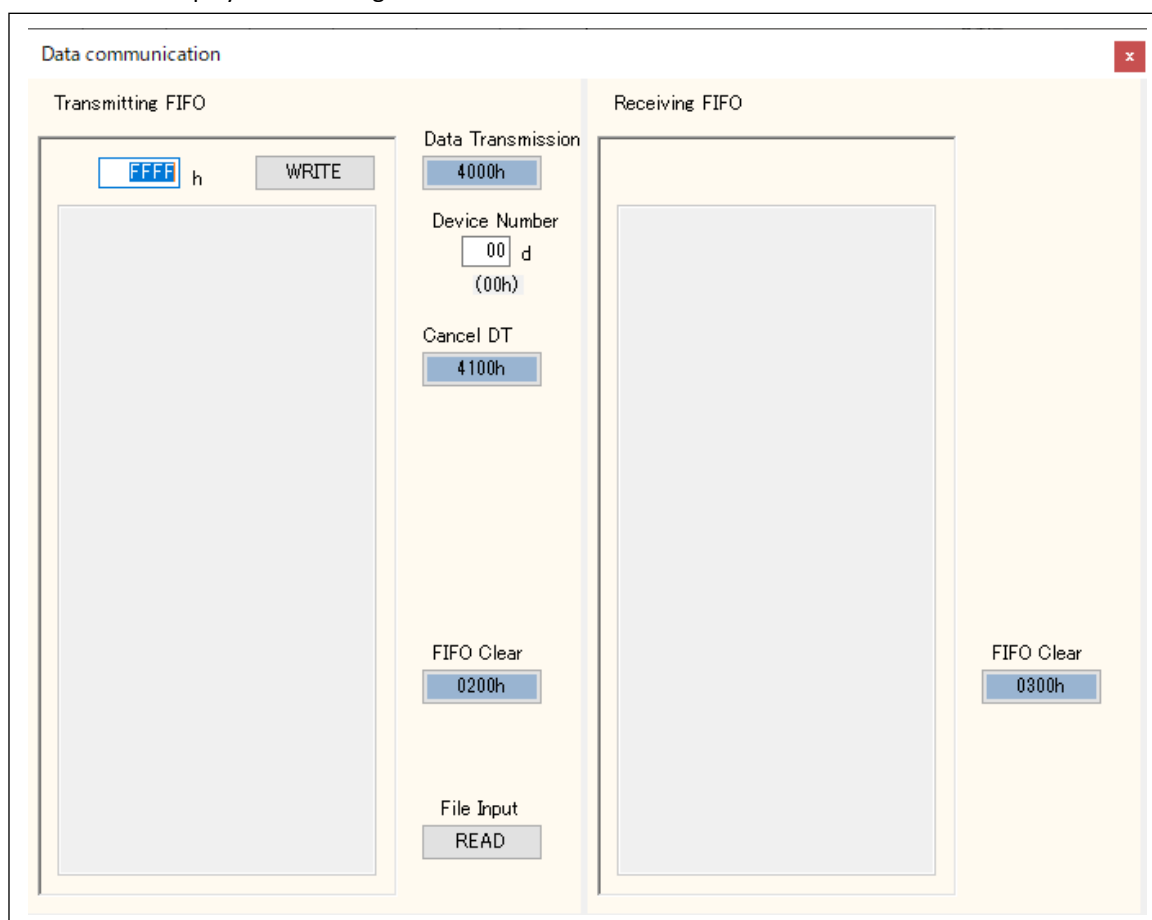
Click “3000h” button to write the I/O communication(cyclic communication) start command 3000h and start I/O communication(cyclic communication) for devices whose “Device use” bit is “1” in “Device Information”.

Click the “3100h” button to write the I/O communication(cyclic communication) stop command 3100h and stop I/O communication(cyclic communication).

Click “START” button in the main screen to write the software reset command 0100h, the system communication command 1000h to all devices, and the I/O communication (cyclic communication) start command 3000h.

### 4.2.3 “Data Communication (C)” menu

Click this menu to display the following screen.



#### 4.2.3.1 “Data communication other than G9004A message communication”

Manual writing to the transmitting FIFO is performed as follows.

Enter 4-digit hexadecimal data in the data input box and click “WRITE” button to write the data in Transmitting FIFO in G9001A and displayed data in the data display section. Up to 128 words can be written.

If the written data exceeds 128 words, the setting data in the FIFO buffer is not guaranteed.

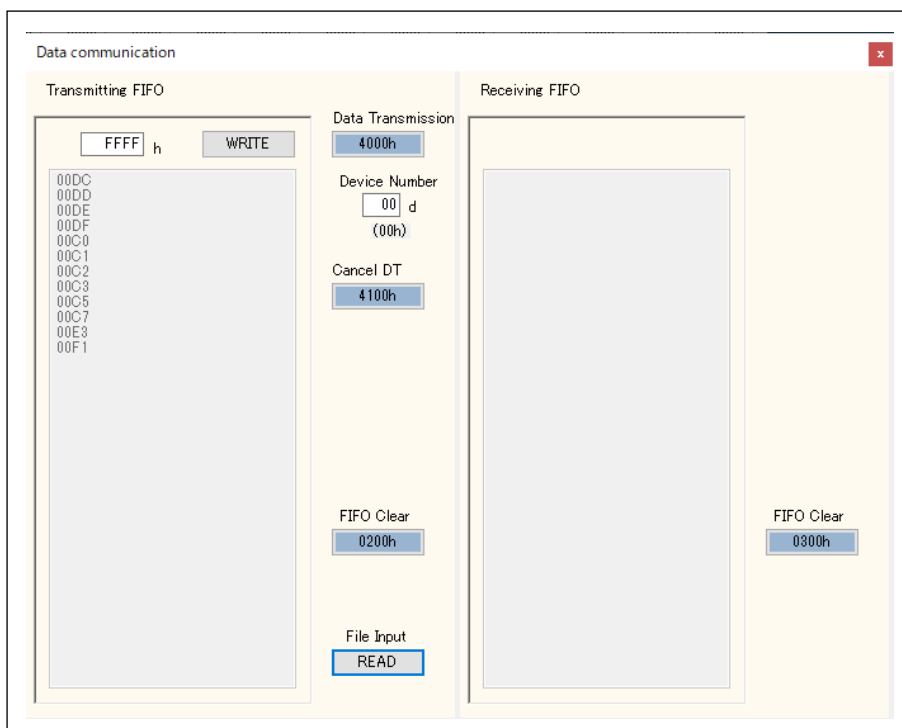
The data written to the FIFO buffer is sent to the device specified by the device number when Data Transmission “4000h” button is clicked. When the data transmission is completed, the data displayed in the display section is deleted.

Click the Communication Cancel “4100h” button to interrupt the data communication and reset the Transmitting FIFO.

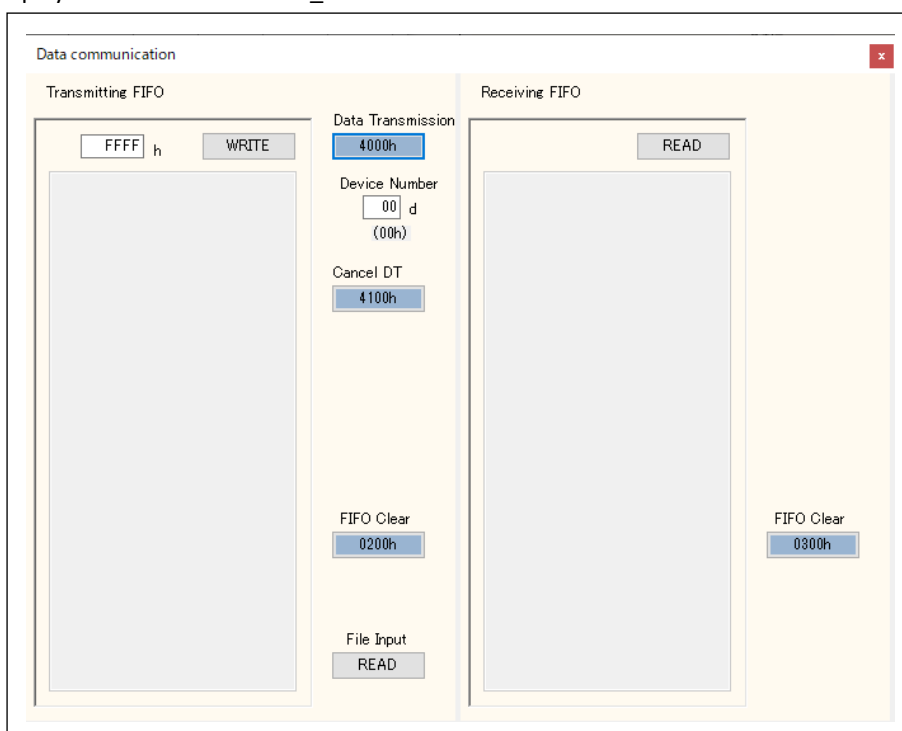
Click the FIFO Clear “0200h” button to reset only the Transmitting FIFO, and deletes the data written in the FIFO buffer and the data displayed in the data display section.

Create a data file for transmission in advance and click "Read" button to display the file selection screen.

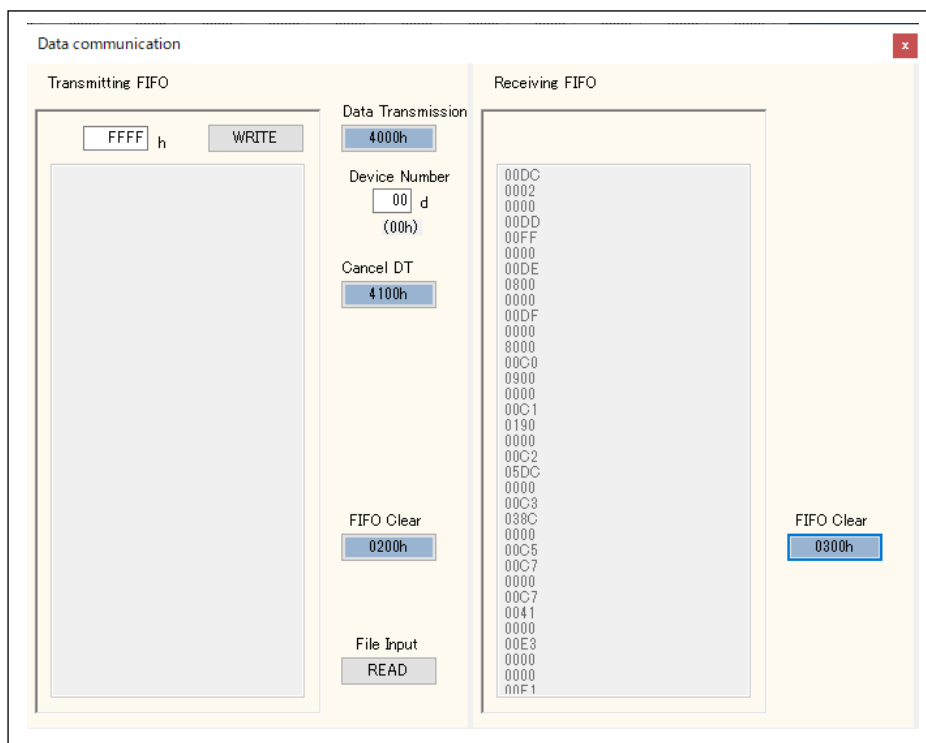
Select the file you created. The data for transmission is written to the Transmitting FIFO in G9001A, and it is displayed on the data display section.



This is the display screen when the "GFF\_Read.txt" file is read.



When a read command is sent to the specified device by clicking "4000h" button, "READ" button is displayed in the receiving FIFO.



Click “READ” button of the Receiving FIFO to read the data stored in the receiving FIFO buffer and display in the data display section. When the receiving FIFO buffer is empty, the “READ” button is deleted.

Click the FIFO Clear “0300h” button in the Receiving FIFO to delete the data stored in the receiving FIFO buffer and the data displayed in the data display section.

Create a file by an editor tool. The following shows the contents of the “GFF\_Move.txt” file as an example.

The first line must be “# GFF #”. Insert a space between # and “GFF”.

The line preceded by “#” is a comment. Blank lines are ignored. Describe data using 4 hexadecimal digits.

The data is written in the FIFO buffer for transmission sequentially from the first line. Describe the data not as to exceed 128 words.

```
# GFF #
# 位置決め動作ﾆｰﾀ
#####
# RENV1=00000002h 環境設定 1
009C
0002
0000
# RENV2=000000FFh 環境設定 2
009D
00FF
0000
# RENV3=00000800h 環境設定 3
009E
0800
0000
# RENV4=80000000h 環境設定 4
009F
0000
8000
# PRMV=2304 位置決め量
00B0
0900
0000
```



### 4.2.3.2 About "G9004A message communication mode"

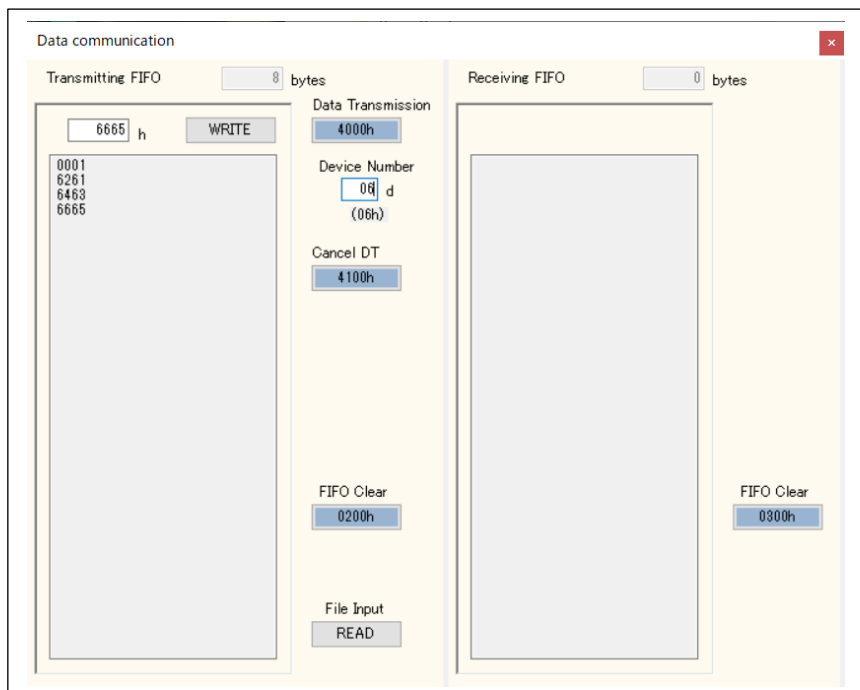
To send a message to the G9004A, first input 4 digits of hexadecimal data "0001" (information command) in the data input column and click the "Write" button. You can then write a message of up to 127 words.

The data written to the FIFO buffer will be communicated to the device specified in the device number when you click the data transmission "4000h" button.

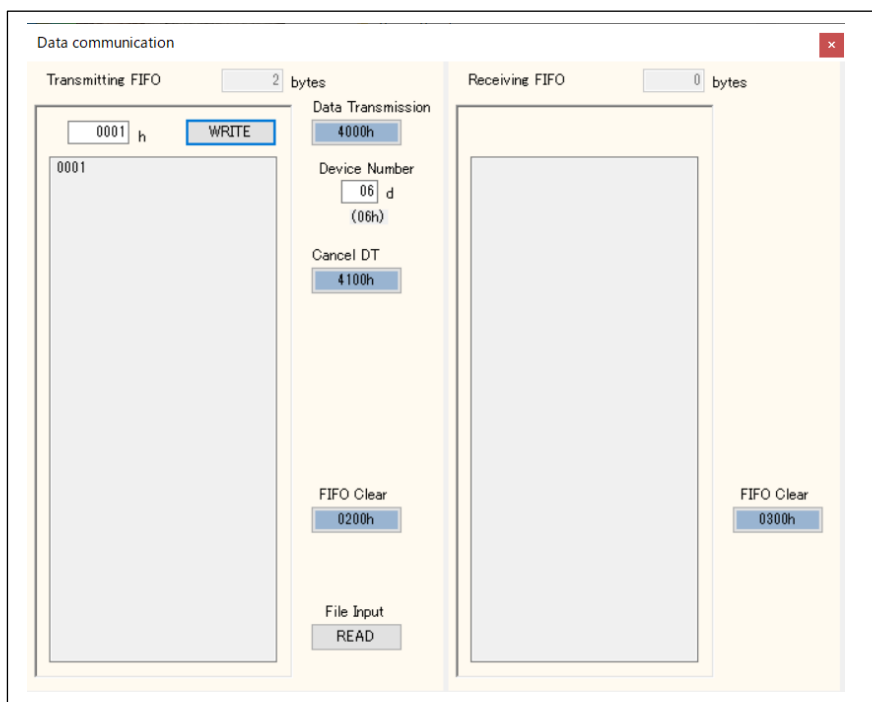
When data transmission is completed, the data displayed in the data display area will be erased.

"0100" (data exists in the local side receiving FIFO) will be displayed in port data No.1-0 of the specified device number.

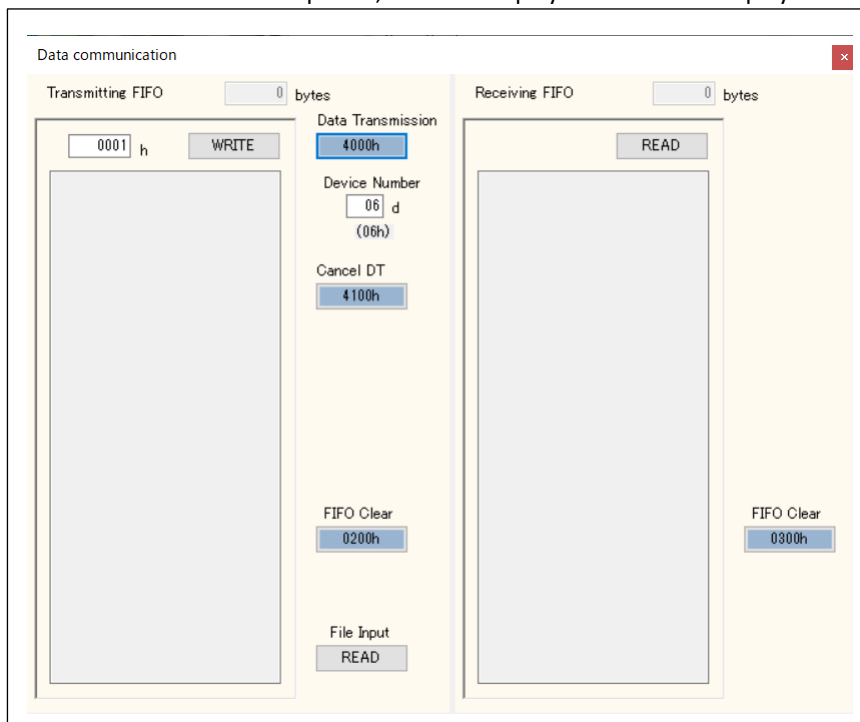
When the G9004A reads the message, port data No.1-0 will be "0000".



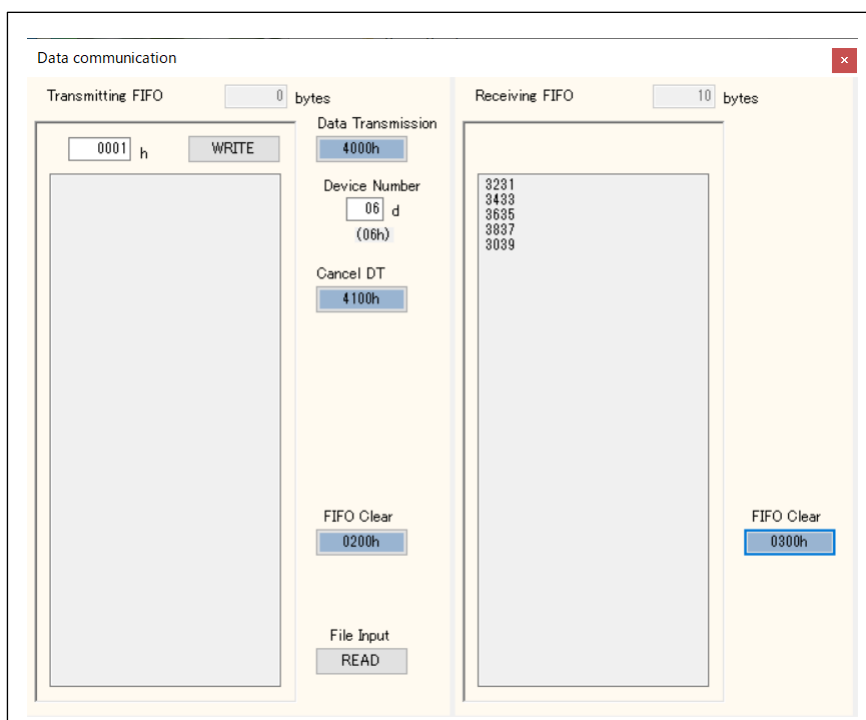
When receiving a message from the G9004A, port data No. 1-0 of the device number displays "4209" (data transmission request command (10h), data in local transmission FIFO, local transmission request interrupt). Input 4 digits of hexadecimal data "0001" (information command) in the data input column and click the "Write" button.



Data communication will be performed to the device specified in the device number when clicking the Data transmission "4000h" button. When data transmission is completed, the data displayed in the data display area will be erased.



When you click the "4000h" button to send a read command to the specified device, the "Read" button will be displayed in the receive FIFO.



Port data No. 1-0 of the device number becomes "4000" (local side message communication transmission processing in progress), and by clicking the "Read" button, the message is read from the receive FIFO and displayed.

Enter the 4-digit hexadecimal data of "0002" (information command) in the data input section and click the "Write" button. Data communication will be performed to the device specified in the device number when clicking the "4000h" button. When data transmission is completed, the data displayed in the data display area will be erased.

Port data No.1-0 of the device number will be "0000".

### 4.2.3.3 About "G9004A CPU emulation mode"

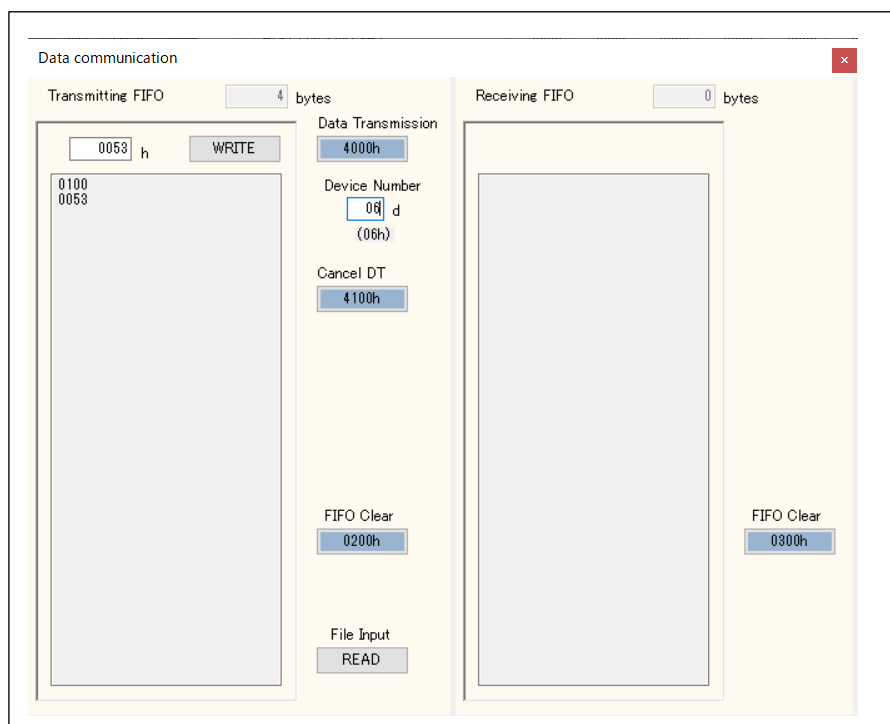
When sending a message to the G9004A, you can write a message of up to 128 words, including write commands, write data, and read commands.

Writes the write command and write data to the FIFO buffer and performs data communication to the device specified as the device number when clicking the data transmission "4000h" button. When data transmission is completed, the data displayed in the data display area will be erased.

"0003" (local side reception processing completion interrupt) will be displayed in port data No.1-0 of the specified device number.

By writing the reception processing completion interrupt reset command "0400" to the FIFO buffer and clicking the data transmission "4000h" button again, port data No. 1-0 will be set to "0000".

Example) Write command "0100" (address 0 write) and write data "0053" (X-axis start of PCL6125)



Write a read command to the FIFO buffer and perform data communication to the device specified as the device number when you click the data transmission "4000h" button.

When data transmission is completed, the data displayed in the data display area will be erased.

"0203" (local side transmit FIFO data available & receive processing complete interrupt) will be displayed in port data No.1-0 of the specified device number.

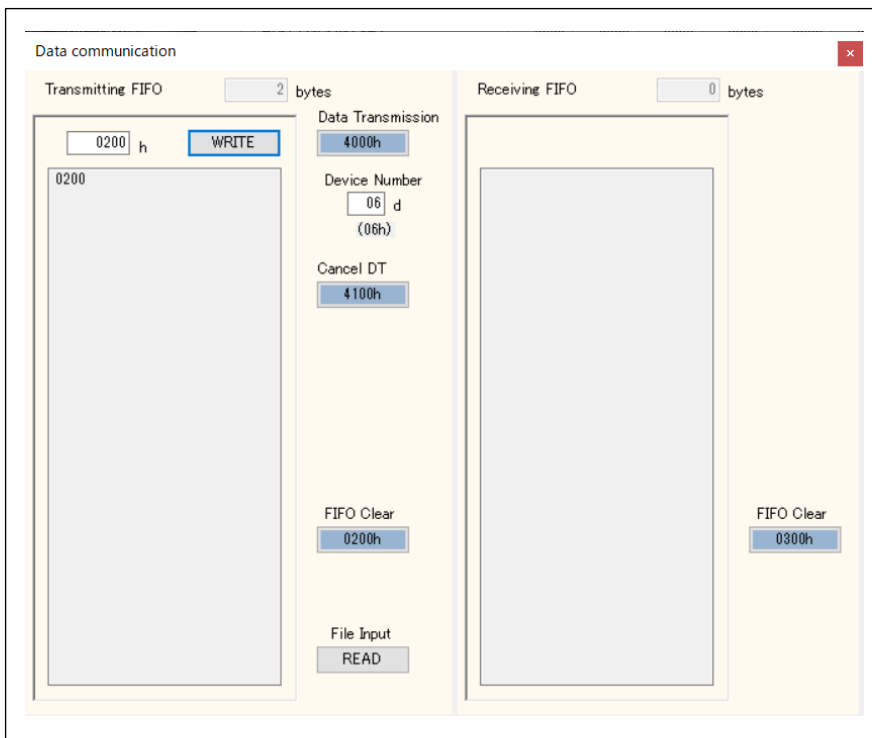
By writing the data transmission processing command "0300" to the FIFO buffer and clicking the data transmission "4000h" button again, the "Read" button will be displayed in the receive FIFO. Port data No.1-0 will be "0003".

By clicking the "Read" button on the receiving FIFO, the message is read and displayed from the receiving FIFO.

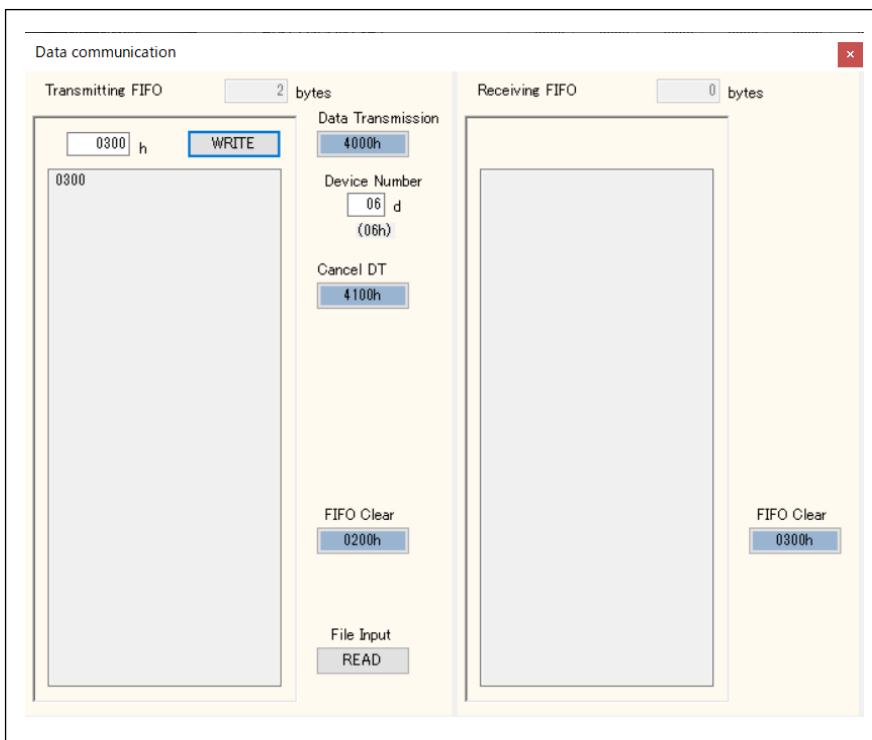
The "Read" button for receive FIFO will no longer be displayed.

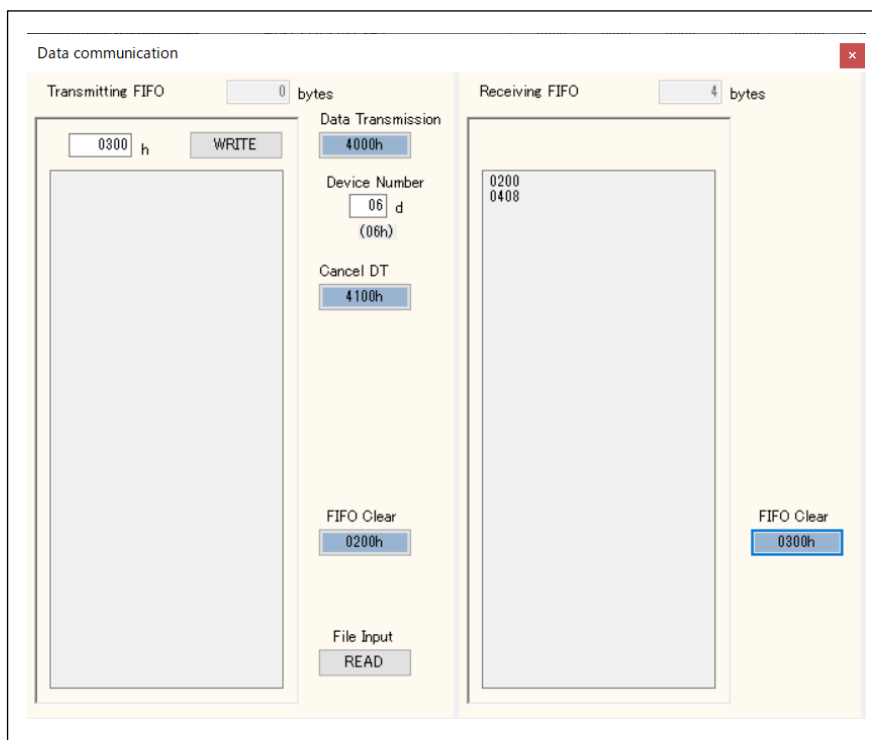
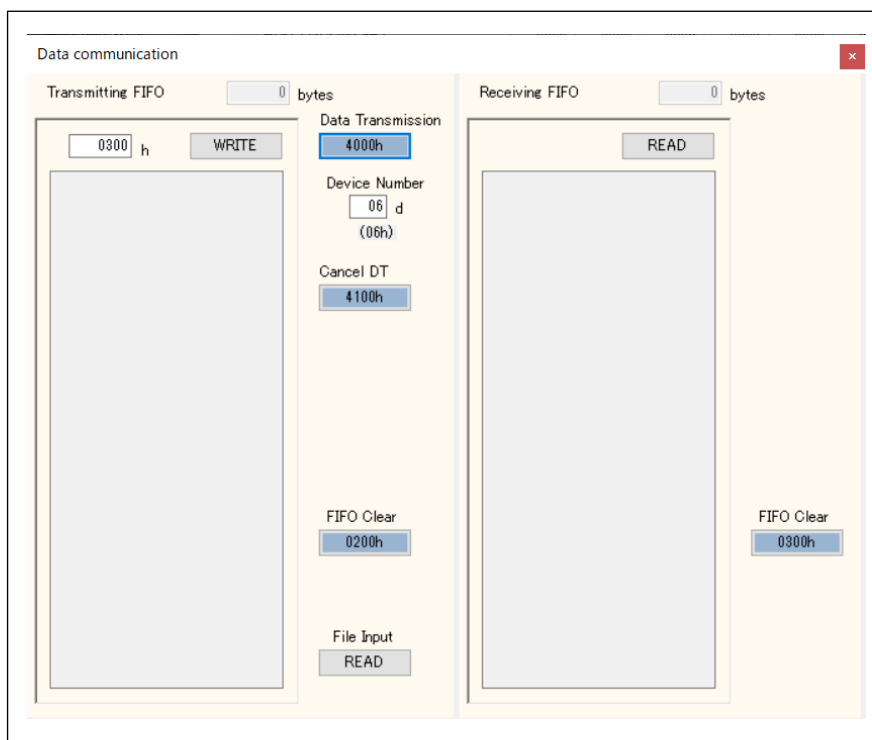
By writing the reception processing completion interrupt reset command "0400" to the FIFO buffer and clicking the data transmission "4000h" button again, port data No. 1-0 will be set to "0000".

Example) Read command “0200” (address 0 read [PCL6125 status information])



Example) Data transmission processing command “0300”





By writing the reception processing completion interrupt reset command "0400" to the FIFO buffer and clicking the data transmission "4000h" button again, port data No. 1-0 will be set to "0000".

## 4.2.4 “Memory Access Command (D)” menu

Click this menu to open the following screen.

Enter the specified “Device Number”.

When clicking the “5000h” button, data in the I/O buffer is written to the specified device information area in the following steps:

- (1) If the data to the right and the device number are even numbers, write the next device data to the I/O buffer by 2 bytes. If they are odd numbers, write the previous device data to the I/O buffer by 2 bytes
- (2) The device number data  $((n/2) \times 2 \times 2)$  is added to the write command 5000h to “device information” and written.

Click the “5100h” button to write the data in the I/O buffer to the specified “I/O communication error flag” area in following steps:

- (1) Write the data on the right side to 1 bit of device numbers 0-15, 16-31, 32-47, 48-63.
- (2) Write 2-byte data to the I/O buffer
- (3) The device number data  $((n/16) \times 32)$  is added to the write command 5100h to “I/O communication error flag” area and written.

Click the “5200h” button to write the data in the I/O buffer to the specified “input change interrupt setting” area in the following steps:

- (1) Write the data on the right side to 4 bits of device numbers 0-3, 4-7, ..., 60-63.
- (2) Write 2-byte data to the I/O buffer.
- (3) The device number data  $((n/4) \times 8)$  is added to the write command 5200h to “input change interrupt setting” area and written.

Click the “5300h” button to write the data in the I/O buffer to the specified “input change interrupt flag” area in the following steps:

- (1) Write the data on the right side to 4 bits of device numbers 0-3, 4-7, ..., 60-63.
- (2) Write 2-byte data to the I/O buffer.
- (3) The device number data  $((n/4) \times 8)$  is added to the write command 5300h to “input change interrupt flag” area and written.

Click the “5400h” button to write the data to the specified “port data” area in the following steps:

- (1) Write the P0 data and P1 data on the right side to the I/O buffer by 2 bytes.
- (2) The device number data  $(n \times 2)$  is added to the write command 5400h to the “port data” area and written.
- (3) Write P2 data and P3 data to the I/O buffer by 2 bytes.
- (4) The device number data  $(n \times 2 + 1)$  is added to the “Port data” area write command 5400h and written.

Click the “6000h” button to read the 1-byte data corresponding to the device number and display on the right side in the following steps:

- (1) The device number data  $((n/2) \times 2 \times 2)$  is added to the read command 6000h in the “device information” area and written.
- (2) 2-byte data in the specified device information area is copied to the I/O buffer.

Click the “6100h” button to read 1-byte data corresponding to the device number and display on the right side in the following steps:

- (1) The device number data  $((n/16) \times 32)$  is added to the read command 6100h in the “I/O communication error flag” area and written.
- (2) 2-byte data in specified I/O communication error frag area is copied to the I/O buffer.

Click the “6200h” button to read 4-bit data corresponding to the device number and display on the right side in the following steps:

- (1) The device number data  $((n/4) \times 8)$  is added to the read command 6200h in the “input change interrupt setting” area and written.
- (2) 2-byte data in the specified input change interrupt setting area is copied to the I/O buffer,

Click the “6300h” button to read 4-bit data corresponding to the device number and display on the right side in the following steps:

- (1) The device number data  $((n/4) \times 8)$  is added to the read command 6300h in the “input change interrupt flag” area and written.
- (2) 2- byte data in the specified input change interrupt flag area is copied to the I/O buffer.

Click the “6400h” button to read out byte by byte and display on the right in the following steps:

- (1) The device number data  $(n \times 2)$  is added to the read command 6400h in the “port data” area and written.
- (2) 2-byte (P0 and P1 data) content in the specified port data area is copied to the I/O buffer.
- (3) The device number data  $(n \times 2 + 1)$  is added to the read command 5400h in the "port data" area and written.
- (4) 2-byte (P2 and P3 data) content in the specified “port data” area is copied to the I/O buffer.

## 4.2.5 “Register Access Command (E)” menu

Click this menu to open the following screen.

Register Access Command

RENV0 = 0000 h

MEND	1	<input type="checkbox"/>	Even if the CEND interrupt is masked with “1”, status changes
MBRK	1	<input type="checkbox"/>	Even if the BRKF interrupt is masked with “1”, status changes
MIOP	0	<input type="checkbox"/>	Even if the IOPC interrupt is masked with “1”, status changes
MEIE	0	<input type="checkbox"/>	Even if the EIOE interrupt is masked with “1”, status changes
MEDE	0	<input type="checkbox"/>	Even if the EDTE interrupt is masked with “1”, status changes
MERE	0	<input type="checkbox"/>	Even if the ERAE interrupt is masked with “1”, status changes
MOSE	0	<input type="checkbox"/>	Even if the CAER interrupt is masked with “1”, status changes
	0		
BKOF	0	<input type="checkbox"/>	“1” disables the automatic break function
MCLR	0	<input type="checkbox"/>	Select how to clear status bits (CEND, BRKF, EDTE, ERAE, CAER)
	0		

6500h RENV0 Read Command      5500h RENV0 Write Command

6503h 00 d Receive address register read command

6504h 00 Version information register read command

Click the “5500h” button to write the value in the I/O buffer to RENV0 register.

- (1) If the box to the right of the RENV0 bit is checked, the bit is set to “1” and 2-byte data is written in the I/O buffer. If the box is not checked, the bit is set to “0” and 2-byte data is written in the I/O buffer.
- (2) Write the RENV0 write command 5500h.

Click the “6500h” button to copy the value of the RENV0 register to the I/O buffer. The value is read and is displayed to the right of each bit.

Click the “6503h” button to copy the value of the received address register to the I/O buffer. The value is read and is displayed to the right side.

Click the “6504h” button to copy the value of the version information register to the I/O buffer. The value is read and is displayed to the right side.



## 4.2.6 “Counter (F)” menu

Click this menu to open the following screen.

Click the “6501h” button to copy the value of the error counter register to the I/O buffer. The value is read and is displayed on the right side.

Click the “0600h” button to clear the error counter register to zero. The displayed value becomes “0”.

If the “Timer” box is not checked, click the “6502h” button to copy a cyclic period register value to the I/O buffer. The value is read and displayed on the right side. The minimum and maximum cyclic cycle values are also displayed.

If the “Timer” box is checked, reading out is periodically performed using the interrupt timer in the main screen, and the data is displayed if it differs from the previous data. Clicking the “6502h” button is ignored.

## 4.2.7 “Broadcast command (G)” menu

Click this menu to open the following screen. (Broadcast communication to control G9103C)

Enter the specified “Group number”.

Group number (ggg): 0[000b] to 7[111b] (When the group number is 000b, all groups are subject to the command.)

To set the group number:

- (1) Use DSW3-6 (GRP0), 7 (GRP1), 8 (GRP2) on the board,
- (2) Use RENV2.GN2-0. However, the setting in RENV2.GN2-0 is limited to DSW3-6 (OFF), 7 (OFF), 8 (OFF) [group number 000].

Click the "2001h" button to write the start command (CMSTA substitute command for multiple axes) [0010 0ggg 0000 0001] and can operate multiple axes simultaneously. However, set "1" to RMD(PRMD).MSY and issue the start commands to the target axes.

Click the "2002h" button to write stop (CMSTP substitute command for multiple axes) [0010 0ggg 0000 0002] and stop multiple axes simultaneously. However, set "1" to RMD(PRMD).MSPE.

Click the "2003h" button to write the emergency stop commands (CMEMG substitute command for multiple axes) [0010 0ggg 0000 0003] and stop multiple axes simultaneously.

Click the "2004h" button to write the local LSI reset command (SRST substitute command for multiple axes) [0010 0ggg 0000 0004] and reset multiple axes simultaneously.

Click the "2005h" button to write the counter value latch command (LTCH substitute command for multiple axes) [0010 0ggg 0000 0005] and latch the counter values for multiple axes.

Click the "2006h" button to write an immediate stop command (STOP substitute command for multiple axes) [0010 0ggg 0000 0006] and stop multiple axes simultaneously.

Click the "2007h" button to write the deceleration stop command (SDSTP substitute command for multiple axes) [0010 0ggg 0000 0007] to decelerate and stop multiple axes simultaneously.

Click the "2008h" button to instantly change to the FL speed (FCHGL substitute command for multiple axes) [0010 0ggg 0000 0008] and make multiple axes to run at FL speed simultaneously.

Clicking the "2009h" button immediately changes to the FH speed (the FCHGH substitute command for multiple axes) [0010 0ggg 0000 0009] and writes the multiple axes to run at FH speed simultaneously.

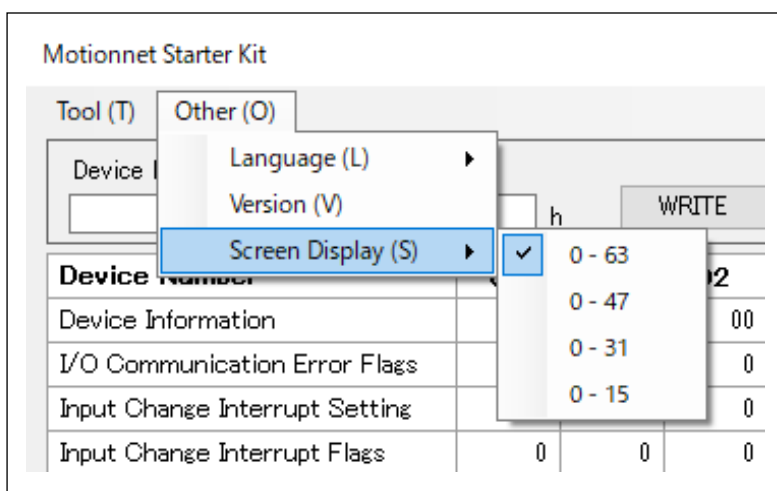
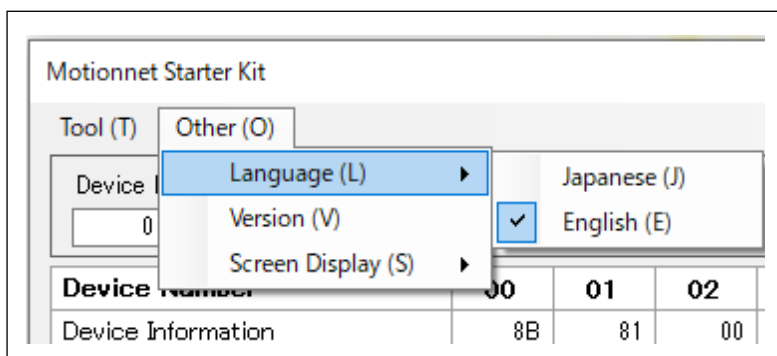
Click the "200Ah" button to write the deceleration command to the FL speed (FSCHL substitute command for multiple axes) [0010 0ggg 0000 000A] and decelerate multiple axes to run at FL speed simultaneously.

Click the "200Bh" button to write the acceleration command (FSCHH substitute command for multiple axes) [0010 0ggg 0000 000B] to the FH speed and accelerate multiple axes to run at FH speed simultaneously.

Click the "200Ch" button to copy the operation pre-register to the register (PRESHF substitute command for multiple axes) [0010 0ggg 0000 000C] and copy the operation pre-register to the registers of multiple axes (speed change, etc.) simultaneously.

## 4.3 “Other (O)” menu

Click "Other (O)" to switch language and to check the software version and the display settings of software.

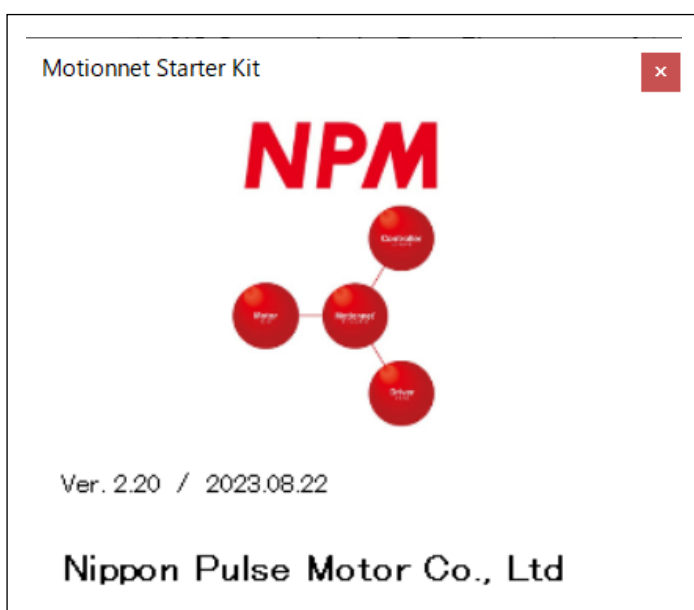


### 4.3.1 “Language (L)” menu

You can choose Japanese and English by default.

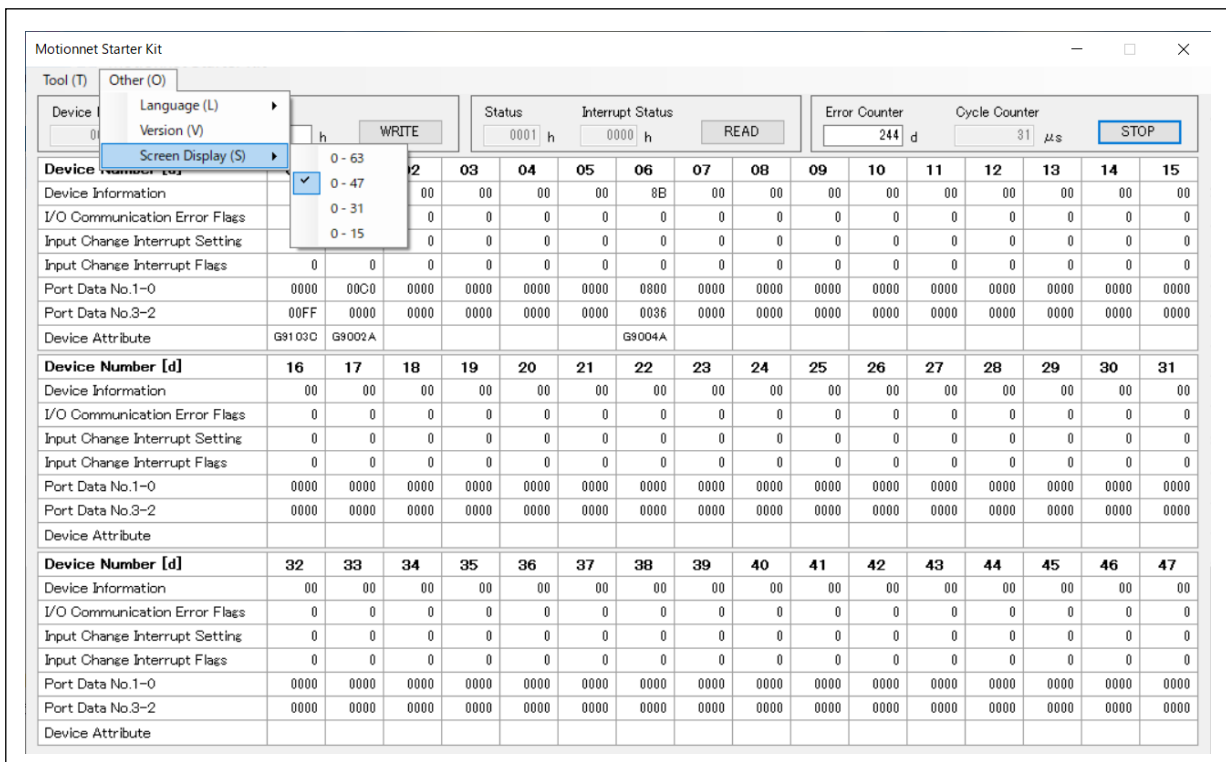
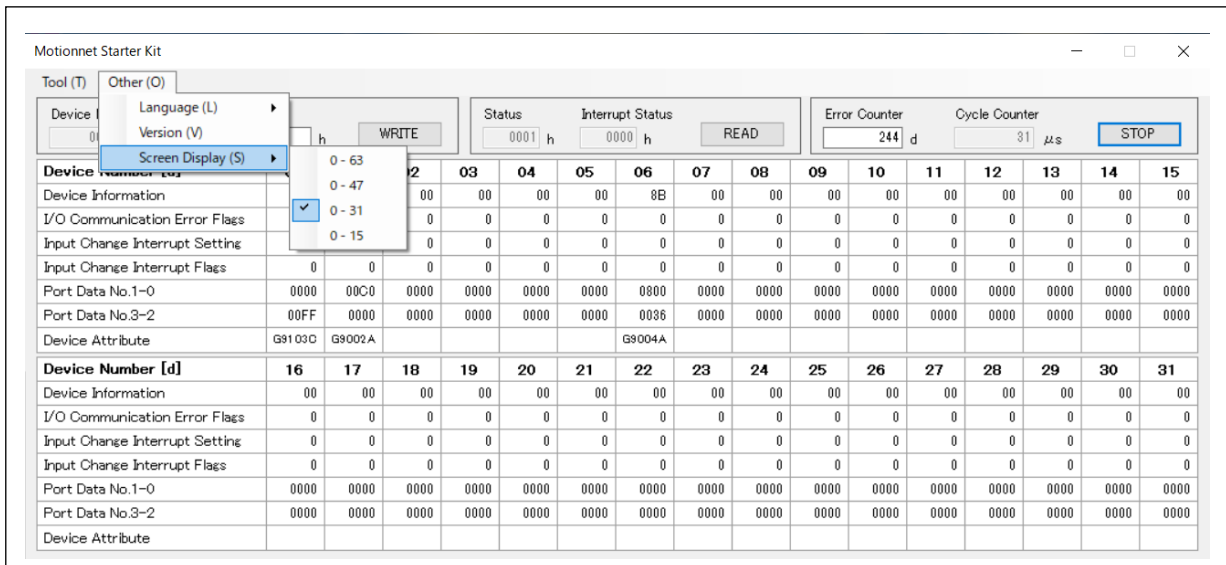
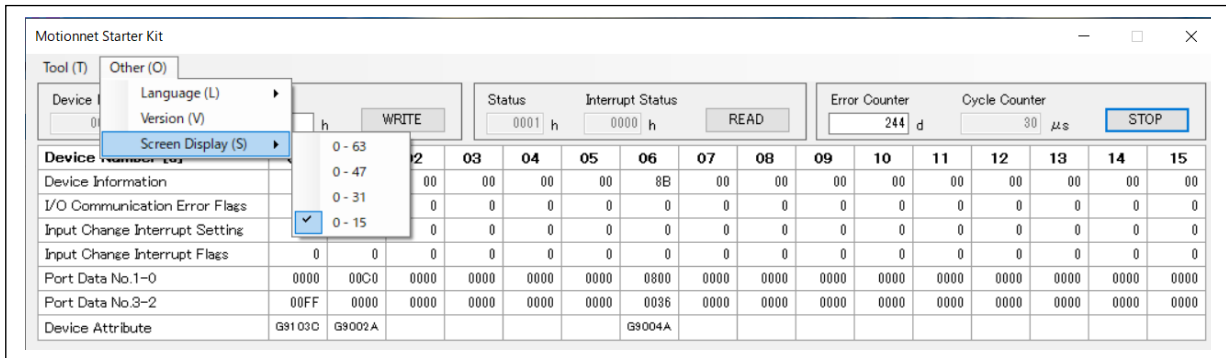
### 4.3.2 “Version (V)” menu

You can check the software version.



### 4.3.3 “Screen Display (S)” menu

You can select the display to show the device numbers 0-63, 0-47, 0-31 or 0-15 in the screen.



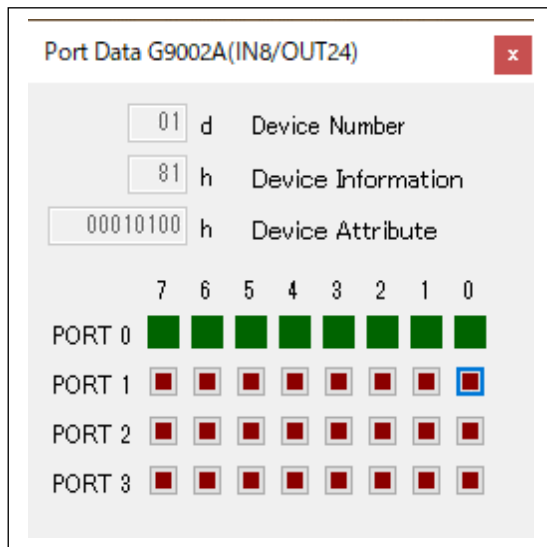
## 4.4 “Device Attribute” menu

This application supports four types of devices: “G9002A”, “G9205A”, “G9103C”, and “G9004A”. “G9006” is not supported.

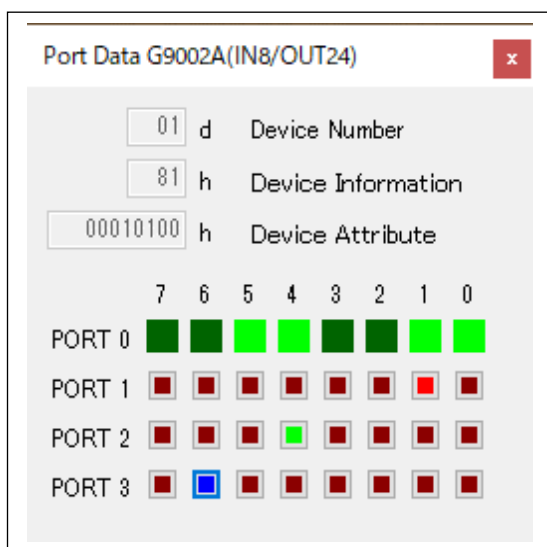
### 4.4.1 “G9002A”, “G9205A” menu

Double-click the device name “G9002A” in the device attribute of the main screen to display the screen corresponding to the I/O setting of the device information. “G9205A”, which has the same function as “G9002A”, is also supported.

The following screen is displayed on the local board (G9002A\_G9103C-EV) of the Motionnet starter kit (G9001A-EV, G9002A\_G9103C-EV).



The screen displays the device number, device information, and device attribute data of the selected “G9002A”. It also displays the 8-bit status of input port PORT0 and the output status of output ports PORT1, PORT2, and PORT3.



When switches 1, 2, 5, and 6 of DSW0 on the local board (G9002A\_G9103C-EV) are ON, bits 0, 1, 4, and 5 of input port PORT0 turn ON. Click the cursor on bit 1 of output port PORT1, bit 4 of PORT2, and bit 6 of PORT3 to show the ON statuses, and to illuminate red in AED02, green in LED05 and blue in LED07 on the local board (G9002A\_G9103C-EV).

At the same time, the port data No. 1-0 and the port data No. 3-2 are changed.

Motionnet Starter Kit

Tool (T) Other (O)

Device Number	Address Map	Data	
01 d	104 h	0233 h	WRITE

Device Number	00	01	02
Device Information	8B	81	
I/O Communication Error Flags	0	0	
Input Change Interrupt Setting	0	0	
Input Change Interrupt Flagg	0	0	
Port Data No.1-0	0000	0233	00
Port Data No.3-2	0000	4010	00
Device Attribute	G9103C	G9002A	

The screen corresponding to the I/O setting of “G9205A” information is displayed as follows .

Port Data G9205A(OUT16)

06 d Device Number  
 82 h Device Information  
 00F20200 h Device Attribute

7 6 5 4 3 2 1 0

PORT 3

PORT 2

Port Data G9205A(IN8/OUT8)

06 d Device Number  
 82 h Device Information  
 00C20200 h Device Attribute

7 6 5 4 3 2 1 0

PORT 1

PORT 2

Port Data G9205A(IN16)

06 d Device Number  
 82 h Device Information  
 00820200 h Device Attribute

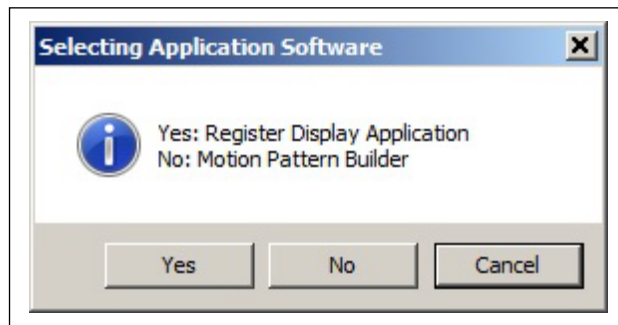
7 6 5 4 3 2 1 0

PORT 0

PORT 1

## 4.4.2 “G9103C” menu

When you double-click the device name “G9103C” displayed in “Device Attribute” on the main screen, the following screen will open.



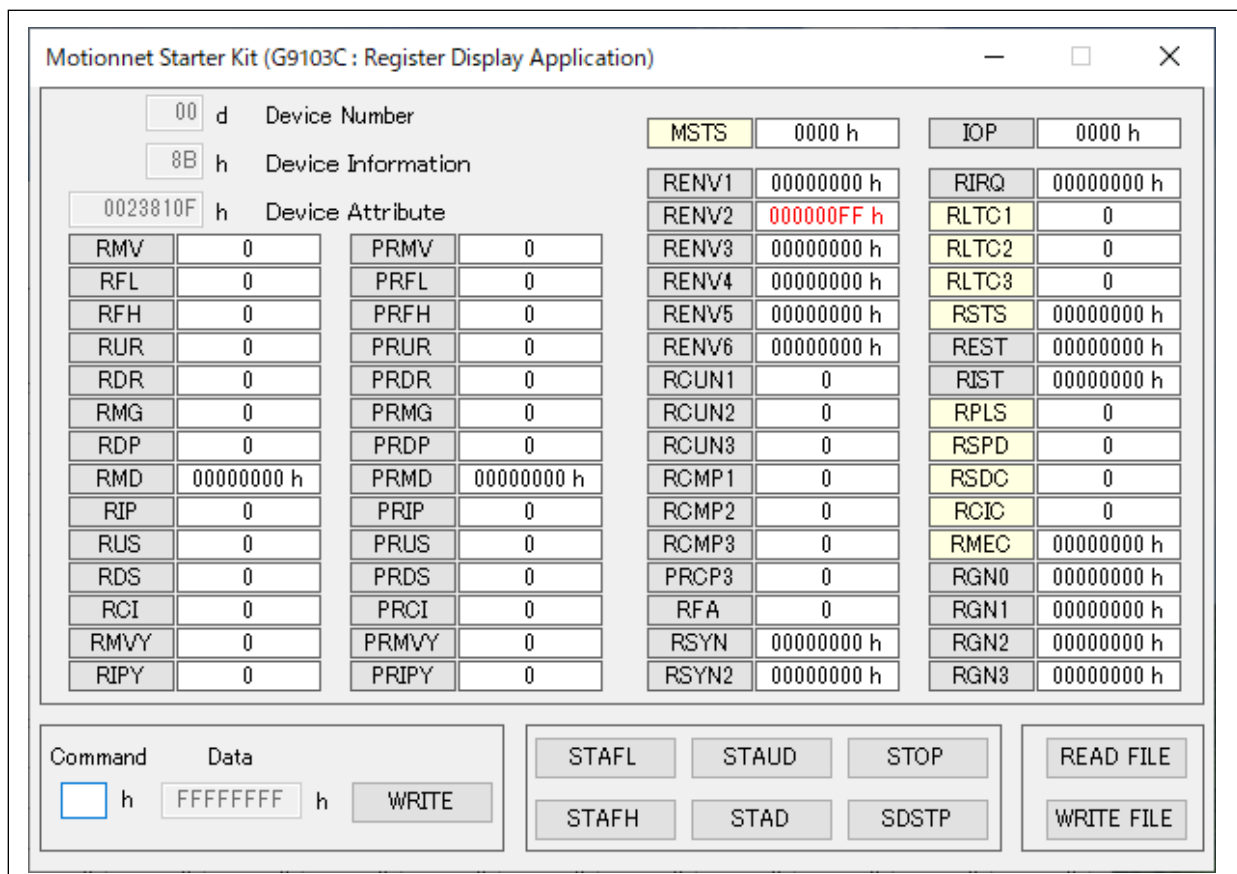
Click “Yes” to display “Register Display Application”.

Click “No” to display “Motion Pattern Builder”.

When “Motion Pattern Builder” is displayed, “Register Display Application”, or other device number’s “Register Display Application” and “Motion Pattern Builder cannot be displayed.

### 4.4.2.1 “Register Display Application” menu

This screen displays “Device Number”, “Device Information”, and “Device Attribute” data of the selected “G9103C”. Also, it displays each register value, “WRITE” to registers, “START” / “STOP” buttons, and “READ FILE” / “WRITE FILE”.





Due to the circuit configuration of the local device board (G9002A\_G9103C-EV), general-purpose input/output pins P0-P7 of G9103C are set to general-purpose output in the environment setting 2 (RENV2). They cannot be changed.

For IOP writing, the command (01h) is not required for I/O communication, but it is displayed for internal processing.

You can control the stepping motor driver IC (TB6608FNG) mounted on the local device board (G9002A\_G9103C-EV) to operate the accessory stepping motor PFCU30-24V4GM(1/12) connected to TB1.

Set "00000002h" to RENV1 (Environment setting 1).

The output pulse specification is set to the clock & direction input signals to meet with the stepping motor driver IC (TB6608FNG) mounted on the board.

OUT	DIR	Output pulse specification
	L	CW
	H	CCW

**CW:** Output shaft of the stepping motor PFCU30-24V4GM (1/12) rotates clockwise

To operate in CW direction, select "(+) direction constant operation by command control", "(+) direction origin return operation", or "positioning operation" with a positive value to "PRMV" for the operation mode of PRMD.MOD.

**CCW:** Output shaft of the stepping motor PFCU30-24V4 GM (1/12) rotates counterclockwise

To operate in CCW direction, select "(-) direction constant operation by command control", "(-) direction origin return operation", or "positioning operation" with a negative value to "PRMV" for the operation mode of PRMD.MOD.

When RENV2 (Environment setting 2) is set to "000000FFh", the outputs of general-purpose outputs P0 to P7 are L level outputs.

The P3-P7 pins are connected to each input pins of stepping motor driver IC (TB6608FNG).

P4	P3	Excitation mode
L	H	1-2 phase
H	L	W1-2 phase
L	L	2W1-2 phase

The default setting is 2W1-2 phase excitation mode.

P6	P7	P5	Mode
L	L	L	operable mode
H	L	L	initial mode
x	H	L	enable standby
x	x	H	standby mode

The default setting is operable mode.

To change the setting, write the output levels of general-purpose outputs P0 to P7 to the upper 8 bits of IOP.

In PRMV register, write the value to rotate the output shaft of a stepping motor PFCU30-24V4GM (1/12) once.

When the stepping motor is in 1-2 phase excitation, a shaft rotates once with 48 pulses and with 1/12 gear and 2W1-2 phase excitation mode, so that the value =  $48 \times 12 \times 4 = 2304$  pulses (CW). When driven with -2304 pulses (CCW), the shaft rotates in reverse.

Set the start speed; PRFL = 400, operation speed; PRFH = 1500, acceleration rate; PRUR = 908 (200 ms), speed magnification; PRMG = 199, and operation mode; PRMD = 00000041h.



Read the G9103C setting data file " G9103C\_Regiter\_Data.txt " for MNET-STK and set the data to operate a stepping motor PFCU30-24V4GM (1/12).

Motionnet Starter Kit (G9103C : Register Display Application)

00 d Device Number

8B h Device Information

0023810F h Device Attribute

RMV	2304	PRMV	2304
RFL	400	PRFL	400
RFH	1500	PRFH	1500
RUR	908	PRUR	908
RDR	0	PRDR	0
RMG	199	PRMG	199
RDP	0	PRDP	0
RMD	00000041 h	PRMD	00000041 h
RIP	0	PRIP	0
RUS	0	PRUS	0
RDS	0	PRDS	0
RCI	0	PRCI	0
RMVY	0	PRMVY	0
RIPY	0	PRIPY	0

MSTS	0000 h	IOP	0000 h
RENV1	00000002 h	RIRQ	00000000 h
RENV2	0000C6FF h	RLTC1	0
RENV3	00000000 h	RLTC2	0
RENV4	00000000 h	RLTC3	0
RENV5	00000000 h	RSTS	10000000 h
RENV6	00000000 h	REST	00000000 h
RCUN1	0	RIST	00000000 h
RCUN2	0	RPLS	2304
RCUN3	0	RSPD	0
RCMP1	0	RSDC	0
RCMP2	0	RCIC	0
RCMP3	0	RMEC	00000000 h
PRCP3	0	RGN0	00000000 h
RFA	0	RGN1	00000000 h
RSYN	00000000 h	RGN2	00000000 h
RSYN2	00000000 h	RGN3	00000000 h

Command Data

h  h

Write the start command 53h in the column "Command" and click the "WRITE" button.

The output shaft of the stepping motor PFCU30-24V4GM (1/12) rotates once in the clockwise direction.

Click the following buttons to start / stop operation displaying the start command in the column "Command".

"STAFI": FL constant speed start (50h)

"STAFH": FH constant speed start (51h)

"STAD": High-speed start 1 (52h)

"STAUD": High-speed start 2 (53h)

"STOP": Immediate stop (49h)

"SDSTP": Deceleration stop (4Ah)

Change the selection in the PRMD (operation mode), to check continuous operation or origin return operation, etc.

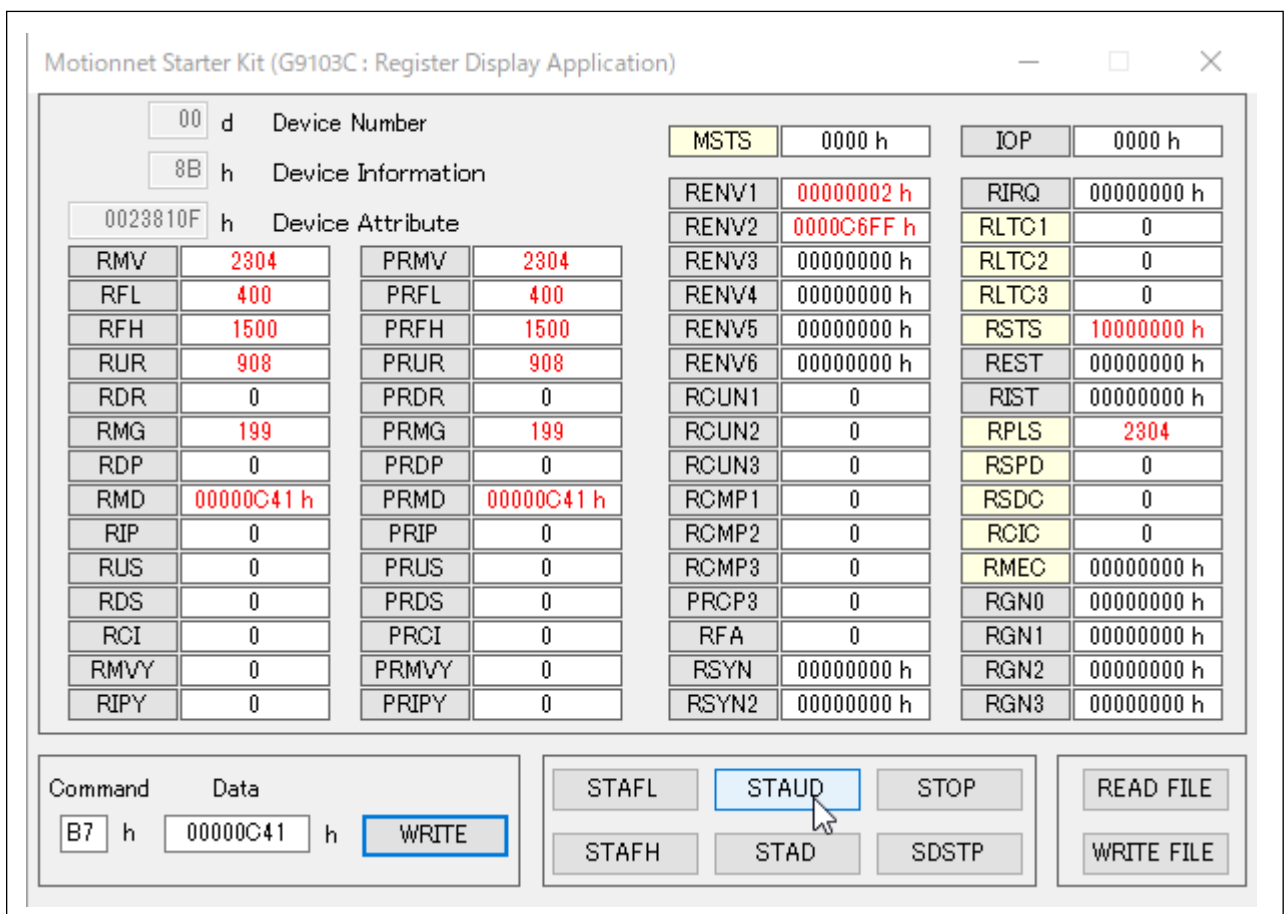
1. Continuous (+) rotation controlled by command control PRMD = 0000000h
2. Continuous (-) rotation controlled by command control PRMD = 0000008h
3. (+) rotation origin returns operation PRMD = 0000010h
4. (-) rotation origin returns operation PRMD = 0000018h
5. Positioning operation (specifies the target incremental position) PRMD = 0000041h

The maximum speed of a stepping motor PFCU30-24V4GM (1/12) is the value listed in the table below. If any larger values are set, “out-of-step” will occur.

P4	P3	Excitation mode	Maximum speed	Feeding amount per rotation
L	H	1-2 phase	375 pps	576
H	L	W1-2 phase	750 pps	1152
L	L	2W1-2 phase	1500 pps	2304

The contents of the set register can be saved with a file name by the “WRITE FILE” button. You can also load a saved file by the “READ FILE” button.

To start a simultaneous start in the broadcast communication, press a start button with setting PRMD.MSY, PRMD.MSPE to “1”.



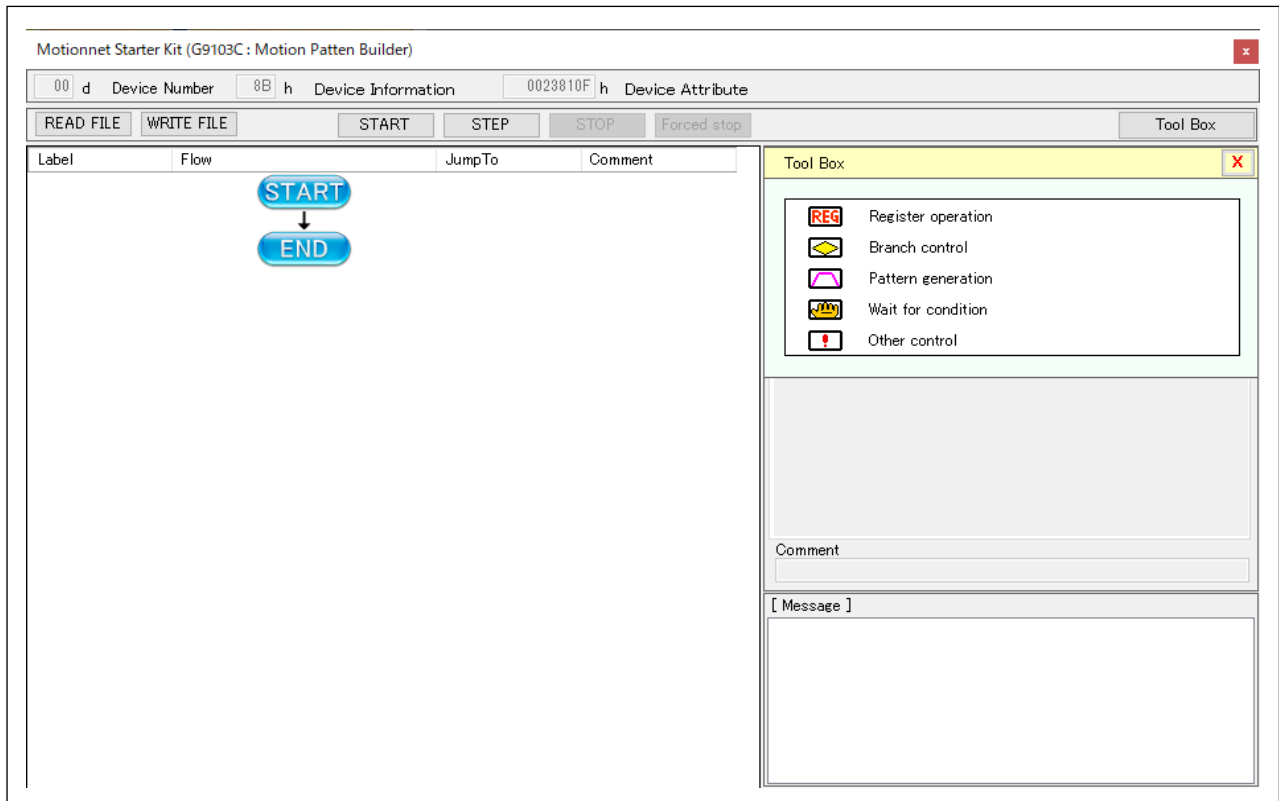
RSTS.CND3-0 become “0001 : Waiting for STA input”. Set other device numbers similarly. Open “Broadcast command” menu and click the “2001h” button to operate axes specified simultaneously.

When the software reset command (04h) is written, the G9103C is reset, and then RENV1 (environment setting 1) is set to “00000002h” and RENV2 (environment setting 2) is set to “000000FFh”.

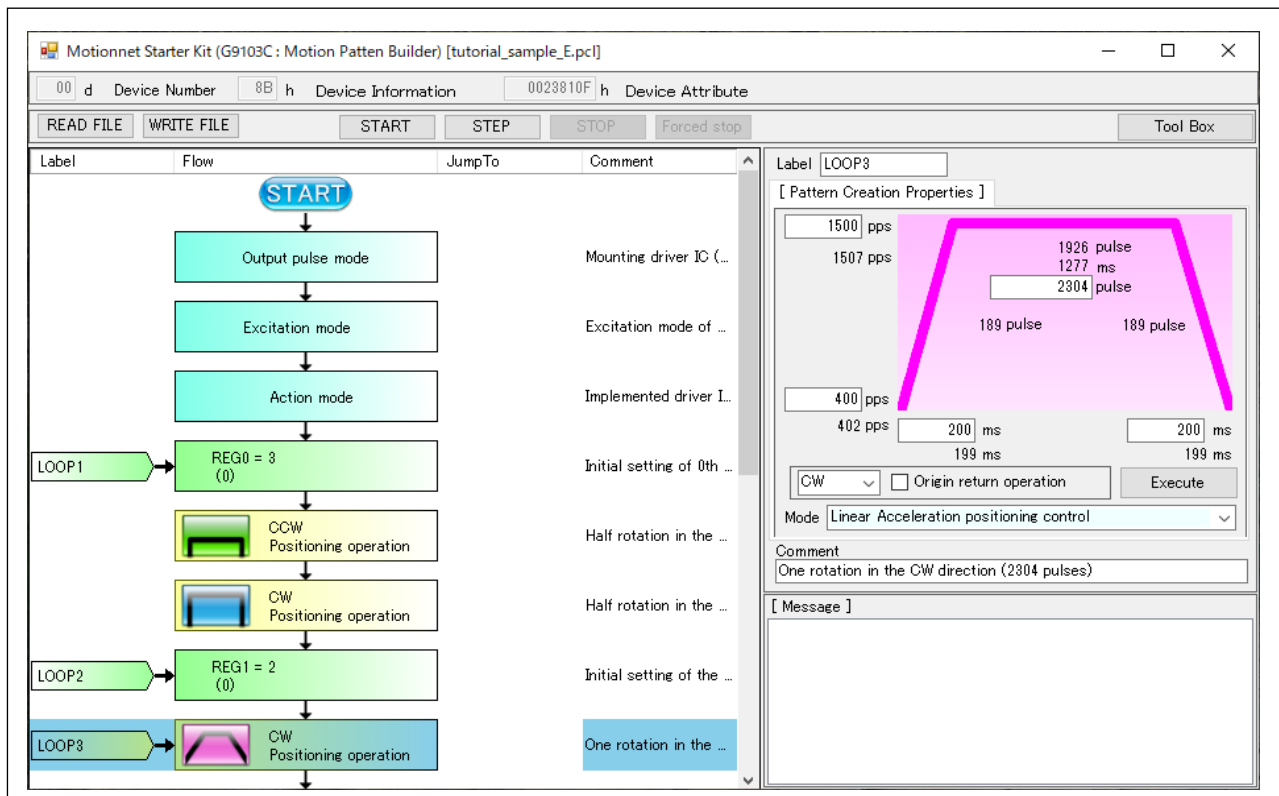
When the software reset command (04h) is written, the G9103C is reset, and then RENV1 (environment setting 1) is set to “00000002h” and RENV2 (environment setting 2) is set to “000000FFh”.

#### 4.4.2.2 “Motion Pattern Builder”

Displays the device number, device information, and device attribute data of the selected “G9103C”, and displays the flowchart creation screen, “READ FILE” / “WRITE FILE” button, “START” / “STEP” / “STOP” / “Forced STOP” button, and “Tool box” button.



Click the “READ FILE” button to display a dialog box where you can select a file. A flowchart is created by reading the G9103C configuration data file “tutorial\_sample\_E.pcl” for MNET-STK.



Click the "WRITE FILE" button to display a dialog box to save the flowchart on the screen as a text file.

Click the "START" button to check the flow chart. If there is no error, the operation starts, and the ongoing operation being performed will be highlighted. During operation, the "START" and "STEP" buttons are disabled, and the "STOP" and "Forced STOP" buttons are enabled.

When stopped after execution, the "STEP", "STOP" and "Forced STOP" buttons will be enabled. Click the "STEP" button repeatedly to execute the next line.

When the "STOP" button is clicked, the execution of the flowchart stops when the ongoing operation in progress is completed. If a positioning control is in progress, it will take time to stop because of waiting until the positioning control is completed. When stopped, the "START" and "STEP" buttons are enabled, and the "STOP" and "Forced STOP" buttons are disabled.

When the "Forced STOP" button is clicked, execution of the flowchart stops without waiting for the completion of the ongoing positioning control.

When stopped, the "START" and "STEP" buttons are enabled, and the "STOP" and "Forced STOP" buttons are disabled.

Click the "Tool Box" button to display the toolboxes that contain any tools under the box.

If you place the mouse cursor on the stored tool and click the left mouse button, you can drag the tool (the cursor shape changes). Then, drag it to the flowchart side.

You can drag the tool to the flowchart side and release them to insert in sentences in green.

### 4.4.3 "G9004A" menu

Based on the data shown in port data No. 3-2 of the device name "G9004A" displayed in the device attributes of the main screen, local side operation mode setting (0: message communication 1: CPU emulation), local side CPU I/F mode (00: 16-bit I/F 2) 01: 16-bit I/F 1) 10: 8-bit I/F 2) 11: 8-bit I/F 1)), local side LCLK setting, local side LWT setting can be confirmed.

By double-clicking the device name "G9004A", the message communication screen is displayed. In the case of CPU emulation, the screen corresponding to each identification number is displayed.

G9004A-EX board DSW0-1 (MOD) setting is OFF (H: CPU emulation) / ON (L: message communication)

09	10	11	12	13	14	15
00	8B	00	00	00	8B	00
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0000	0000	0000	0000	0000	0000	0000
0000	0027	0000	0000	0000	0033	0000
	G9004A				G9004A	

#### 4.4.3.1 “CPU Emulation” compatible software

By setting the following identification number to the address 20h or 30h in the CPU emulation mode of G9004A, the corresponding LSI application software is displayed.

In addition, other than the following identification numbers (excluding 00h and 0FFh) are displayed on the address display screen.

Data	LSI	Product Name	CPU-I/F
11h	PCL6143	MNET-BCDC5030A4	16-bit
12h	PCL6143	MNET-BCD4020FUA4	16-bit
18h	PCL6125 + 2 Axis Driver	G9004A-EX	8/16-bit
19h	PCL6115 + IN8/OUT24	G9004A-EV(unfinished product)	16-bit
21h	PCL6045BL	MNET-M204-DUM	16-bit
41h	PCD4611A		8-bit
42h	PCD4621A		8-bit
43h	PCD4641A		8-bit
51h	PCL6115		8/16-bit
52h	PCL6125		8/16-bit
53h	PCL6145		8/16-bit
61h	PCL6025B		8/16-bit
62h	PCL6045BL		8/16-bit
63h	PCL6046		8/16-bit

In the CPU emulation mode of the G9004A-EX board, the PCL6125 is connected (8/16-bit\_I/F is available) and can drive a 2-axis stepping motor.

### 4.4.3.2 "CPU emulation" PCD46X1A compatible software

The G9004A CPU emulation expansion board (G9004A-Emulation\_Board) and PCD4611A, PCD4621A, and PCD4641A are connected by 8-bit I/F.

Motionnet Starter Kit (G9004A + PCD4611A: Register Display)

06 d Device Number    8B h Device Information  
0013813F h Device Attribute    41 h Service Number

X axis	
MSTS	07 h
RSTS	0080 h
RMV	2304
RFL	400
RFH	1500
RUD	446
RMG	600
RDP	0
RIDL	0
RENV	080A h
RCUN	169
RIDC	C9 h
RIOP	30 h
RSPD	0
RSPO	0
RSPM	0
START MODE	00 h
CONTROL	40 h
REGISTER	83 h
OUTPUT	FF h

Command    BUFW\_X    X axis    WRITE  
80 h    2304    d

PCD4611A [Service Number: 41h]

Motionnet Starter Kit (G9004A + PCD4621A: Register Display)

06 d Device Number    8B h Device Information  
0013813F h Device Attribute    42 h Service Number

X axis	
MSTS	07 h
RSTS	0080 h
RMV	2304
RFL	400
RFH	1500
RUD	446
RMG	600
RDP	0
RIDL	0
RENV	080A h
RCUN	169
RIDC	C9 h
RIOP	30 h
RSPD	0
RSPO	0
RSPM	0
START MODE	00 h
CONTROL	40 h
REGISTER	83 h
OUTPUT	FF h

Y axis	
MSTS	07 h
RSTS	0080 h
RMV	4608
RFL	500
RFH	2000
RUD	327
RMG	600
RDP	0
RIDL	0
RENV	080A h
RCUN	169
RIDC	C9 h
RIOP	30 h
RSPD	0
START MODE	00 h
CONTROL	40 h
REGISTER	83 h
OUTPUT	FF h

Command    BUFW\_X    X axis    WRITE  
80 h    2304    d

Command    BUFW\_Y    Y axis    WRITE  
80 h    4608    d

PCD4621A [Service Number: 42h]

Motionnet Starter Kit (G9004A + PCD4641A: Register Display)

06 d Device Number    8B h Device Information  
0013813F h Device Attribute    43 h Service Number

X axis	
MSTS	07 h
RSTS	0080 h
RMV	2304
RFL	400
RFH	1500
RUD	446
RMG	600
RDP	0
RIDL	0
RENV	080A h
RCUN	169
RIDC	C9 h
RIOP	30 h
RSPD	0
RSPO	0
RSPM	0
START MODE	00 h
CONTROL	40 h
REGISTER	83 h
OUTPUT	FF h

Y axis	
MSTS	07 h
RSTS	0080 h
RMV	4608
RFL	500
RFH	2000
RUD	327
RMG	600
RDP	0
RIDL	0
RENV	080A h
RCUN	169
RIDC	C9 h
RIOP	30 h
RSPD	0
START MODE	00 h
CONTROL	40 h
REGISTER	83 h
OUTPUT	FF h

Z axis	
MSTS	07 h
RSTS	0080 h
RMV	4608
RFL	500
RFH	2000
RUD	327
RMG	600
RDP	0
RIDL	0
RENV	080A h
RCUN	169
RIDC	C9 h
RIOP	30 h
RSPD	0
START MODE	00 h
CONTROL	40 h
REGISTER	83 h
OUTPUT	FF h

U axis	
MSTS	07 h
RSTS	0080 h
RMV	4608
RFL	500
RFH	2000
RUD	327
RMG	600
RDP	0
RIDL	0
RENV	080A h
RCUN	169
RIDC	C9 h
RIOP	30 h
RSPD	0
START MODE	00 h
CONTROL	40 h
REGISTER	83 h
OUTPUT	FF h

Command    BUFW\_X    X axis    BUFW\_Z    Z axis    WRITE  
80 h    2304    d     4608    d

Command    BUFW\_Y    Y axis    BUFW\_U    U axis  
80 h    4608    d     4608    d

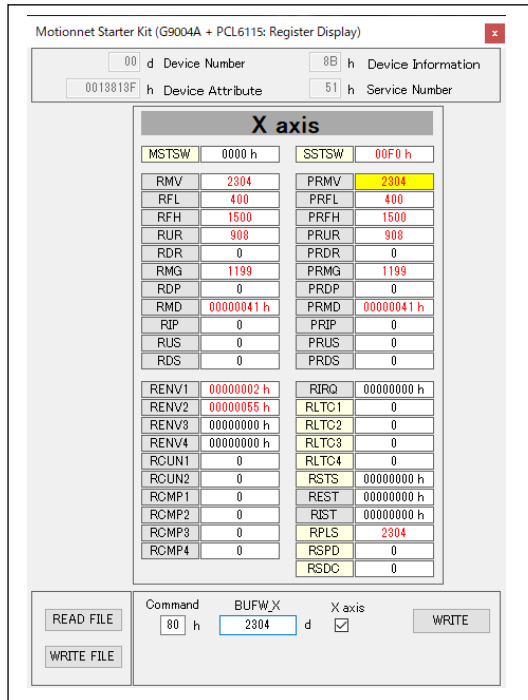
PCD4641A [Service Number: 43h]

### 4.4.3.3 "CPU emulation" PCL61x5 compatible software

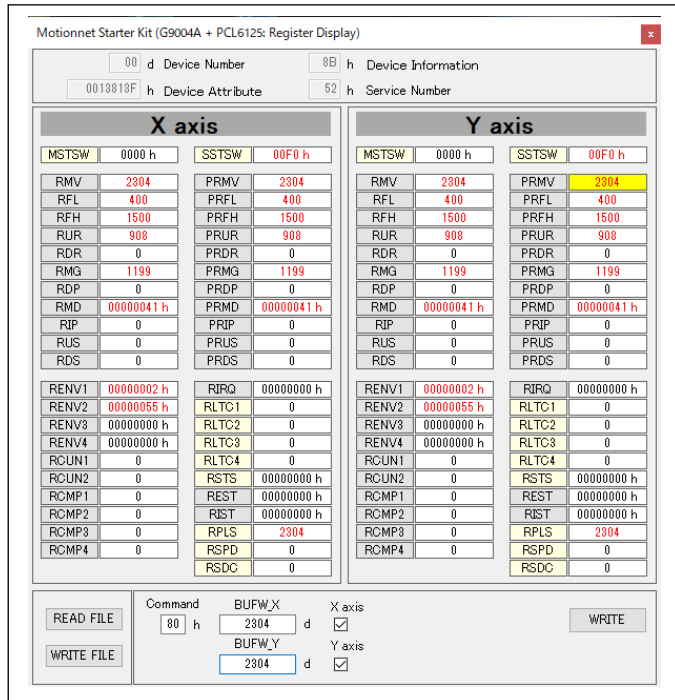
The G9004A CPU emulation expansion board (G9004A-Emulation\_Board) and PCL6115, PCL6125, and PCL6145 can be connected by an 8-bit I/F or a 16-bit I/F.

G9004A-EX (G9004A + PCL6125) is connected by 16-bit I/F.

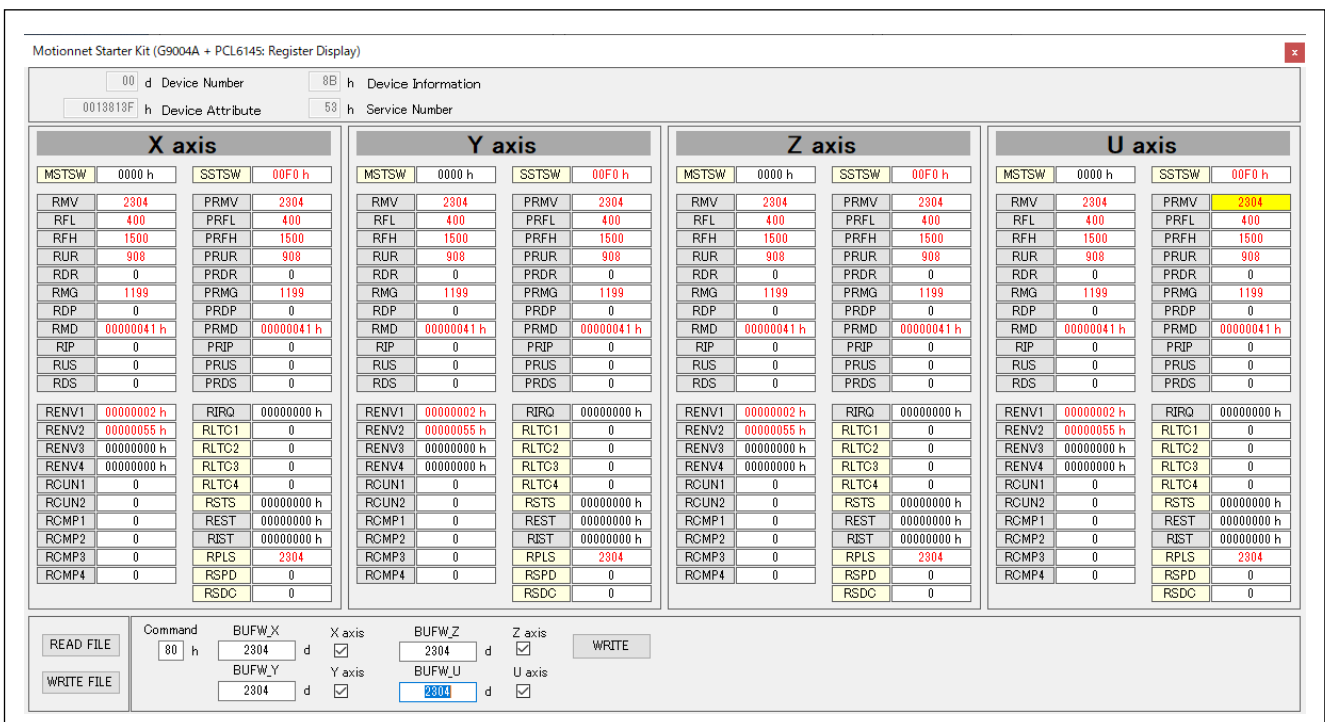
The products MNET-BCDC5030A4 (PCL6143), MNET-BCD4020FUA4 (PCL6143), and unfinished G9004A-EV (PCL6115) are connected by 16-bit I/F. PCL6143 displays the screen of PCL6145, but some registers do not work.



PCL6115 [Service Number: 51h]

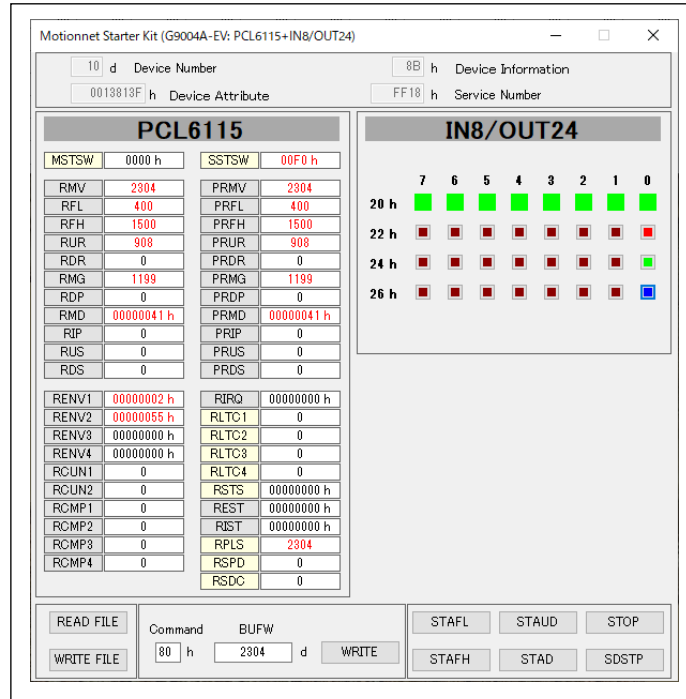


PCL6125 [Service Number: 52h]  
G9004A-EX [Service Number: 18h]



PCL6145 [Service Number: 53h]

MNET-BCDC5030A4(PCL6143) [Service Number: 11h]  
 MNET-BCD4020FUA4(PCL6143) [Service Number: 12h]

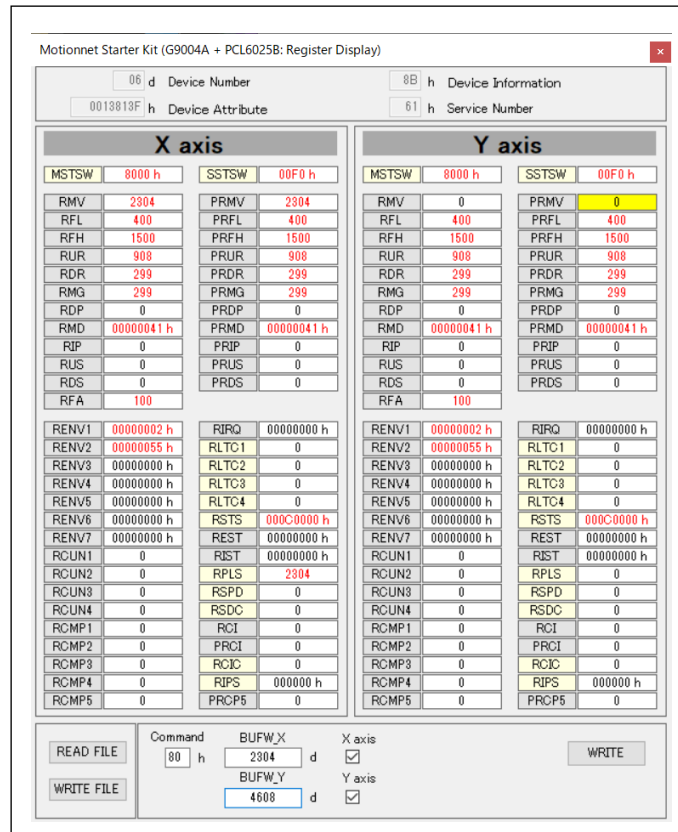


G9004A-EV (PCL6115 + IN8/OUT24) [Service Number: 19h] (unfinished product)

#### 4.4.3.4 "CPU emulation" PCL60xx compatible software

The G9004A CPU emulation expansion board (G9004A-Emulation\_Board) and PCL6025B, PCL6045BL, and PCL6046 can be connected by 8-bit I/F or 16-bit I/F.

The product MNET-M204-DUM (PCL6045BL) is connected by 16-bit I/F.



PCL6025B [Service Number: 61h]



Motionnet Starter Kit (G9004A + PCL6045BL: Register Display)

06 d Device Number      8B h Device Information  
 0013813F h Device Attribute      62 h Service Number

X axis		Y axis		Z axis		U axis	
MSTSW	8000 h	SSTSW	00F0 h	MSTSW	8000 h	SSTSW	00F0 h
RMV	0	PRMV	0	RMV	0	PRMV	0
RFL	400	PRFL	400	RFL	400	PRFL	400
RFH	1500	PRFH	1500	RFH	1500	PRFH	1500
RUR	908	PRUR	908	RUR	908	PRUR	908
RDR	0	PRDR	0	RDR	0	PRDR	0
RMG	299	PRMG	299	RMG	299	PRMG	299
RDP	0	PRDP	0	RDP	0	PRDP	0
RMD	00000041 h	PRMD	00000041 h	RMD	00000041 h	PRMD	00000041 h
RIP	0	PRIP	0	RIP	0	PRIP	0
RUS	0	PRUS	0	RUS	0	PRUS	0
RDS	0	PRDS	0	RDS	0	PRDS	0
RFA	100			RFA	100		
RENV1	00000002 h	RIRQ	00000000 h	RENV1	00000002 h	RIRQ	00000000 h
RENV2	00000055 h	RLTC1	0	RENV2	00000055 h	RLTC1	0
RENV3	00000000 h	RLTC2	0	RENV3	00000000 h	RLTC2	0
RENV4	00000000 h	RLTC3	0	RENV4	00000000 h	RLTC3	0
RENV5	00000000 h	RLTC4	0	RENV5	00000000 h	RLTC4	0
RENV6	00000000 h	RSTS	000C0000 h	RENV6	00000000 h	RSTS	000C0000 h
RENV7	00000000 h	REST	00000000 h	RENV7	00000000 h	REST	00000000 h
RCUN1	0	RIST	00000000 h	RCUN1	0	RIST	00000000 h
RCUN2	0	RPLS	0	RCUN2	0	RPLS	0
RCUN3	0	RSPD	0	RCUN3	0	RSPD	0
RCUN4	0	RSDC	0	RCUN4	0	RSDC	0
RCMP1	0	RCI	0	RCMP1	0	RCI	0
RCMP2	0	PRCI	0	RCMP2	0	PRCI	0
RCMP3	0	RCIC	0	RCMP3	0	RCIC	0
RCMP4	0	RIPS	000000 h	RCMP4	0	RIPS	000000 h
RCMP5	0	PRCP5	0	RCMP5	0	PRCP5	0

Command: 80 h      BUFW\_X: 2304 d      X axis:  BUFW\_Z: 2304 d      Z axis:  WRITE  
 BUFW\_Y: 4608 d      Y axis:  BUFW\_U: 4608 d      U axis:

PCL6045BL [Service Number: 62h]  
 MNET-M204-DUM (PCL6045BL) [Service Number: 21h]

Motionnet Starter Kit (G9004A + PCL6046: Register Display)

06 d Device Number      8B h Device Information  
 0013813F h Device Attribute      63 h Service Number

X axis		Y axis		Z axis		U axis	
MSTSW	8000 h	SSTSW	00F0 h	MSTSW	8000 h	SSTSW	00F0 h
RMV	0	PRMV	0	RMV	0	PRMV	0
RFL	400	PRFL	400	RFL	400	PRFL	400
RFH	1500	PRFH	1500	RFH	1500	PRFH	1500
RUR	908	PRUR	908	RUR	908	PRUR	908
RDR	0	PRDR	0	RDR	0	PRDR	0
RMG	299	PRMG	299	RMG	299	PRMG	299
RDP	0	PRDP	0	RDP	0	PRDP	0
RMD	00000041 h	PRMD	00000041 h	RMD	00000041 h	PRMD	00000041 h
RIP	0	PRIP	0	RIP	0	PRIP	0
RUS	0	PRUS	0	RUS	0	PRUS	0
RDS	0	PRDS	0	RDS	0	PRDS	0
RFA	100			RFA	100		
RENV1	00000002 h	RIRQ	00000000 h	RENV1	00000002 h	RIRQ	00000000 h
RENV2	00000055 h	RLTC1	0	RENV2	00000055 h	RLTC1	0
RENV3	00000000 h	RLTC2	0	RENV3	00000000 h	RLTC2	0
RENV4	00000000 h	RLTC3	0	RENV4	00000000 h	RLTC3	0
RENV5	00000000 h	RLTC4	0	RENV5	00000000 h	RLTC4	0
RENV6	00000000 h	RSTS	000C0000 h	RENV6	00000000 h	RSTS	000C0000 h
RENV7	00000000 h	REST	00000000 h	RENV7	00000000 h	REST	00000000 h
RCUN1	0	RIST	00000000 h	RCUN1	0	RIST	00000000 h
RCUN2	0	RPLS	0	RCUN2	0	RPLS	0
RCUN3	0	RSPD	0	RCUN3	0	RSPD	0
RCUN4	0	RSDC	0	RCUN4	0	RSDC	0
RCMP1	0	RCI	0	RCMP1	0	RCI	0
RCMP2	0	PRCI	0	RCMP2	0	PRCI	0
RCMP3	0	RCIC	0	RCMP3	0	RCIC	0
RCMP4	0	RIPS	000000 h	RCMP4	0	RIPS	000000 h
RCMP5	0	PRCP5	0	RCMP5	0	PRCP5	0

Command: 80 h      BUFW\_X: 2304 d      X axis:  BUFW\_Z: 4608 d      Z axis:  WRITE  
 BUFW\_Y: 2304 d      Y axis:  BUFW\_U: 4608 d      U axis:

PCL6046 [Service Number: 63h]

#### 4.4.3.5 "CPU emulation" Number corresponding software other than the identification number set

Motionnet Starter Kit (G9004A: Local Data Display) x

10 d Device Number    8B h Device Information

0013813F h Device Attribute

	0	2	4	6	8	A	C	E
00	0000	00FF	0000	0000	0000	00FF	0000	0000
10	0000	00FF	0000	0000	0000	00FF	0000	0000
20	FFFF	FFFF	FFFF	FFFF	FFFF	FFFF	FFFF	FFFF
30	FF68	FF68	FF68	FF68	FF68	FF68	FF68	FF68

Local Address    Data

00 h    0000 h    WRITE     Timer

The display screen will be displayed for numbers other than the identification numbers set so far.  
The same screen display is obtained with 8-bit I/F or 16-bit I/F connection.

#### 4.4.3.6 "G9001A Message communication" supported software

DSW0-1 (MOD) on the G9004A-EX board is set to ON (L: message communication)

03	04	05	06	07	08	09
00	00	00	8B	00	00	00
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0000	0000	0000	0000	0000	0000	0000
0000	0000	0000	0036	0000	0000	0000
			G9004A			

Double-click the device name "G9004A" to display the message communication screen.

Transmitting message column: The maximum number of characters that can be entered in transmitting messages (alphanumeric characters) is limited to 254 bytes.

The number of characters entered is displayed below the transmitting message column.

Message "CLEAR" button: Clears all the characters entered in transmitting message column and sets the number of characters entered to "0".

Message "WRITE" button: Converts the entered characters to ASCII code and writes them to the transmitting FIFO column every 2 bytes. The first 2 bytes are displayed by the information command "0001".

Transmitting FIFO column: Displayed every 2 bytes. If the number of characters in the message is an odd number, add "00" to the last character and display it.

FIFO Clear "0200h" button: Deletes the data written in the transmitting FIFO column and resets the transmitting FIFO buffer.

FIFO clear check box: By sending the contents of the FIFO buffer with , the data written in the transmission FIFO frame is deleted and the transmission FIFO buffer is reset.

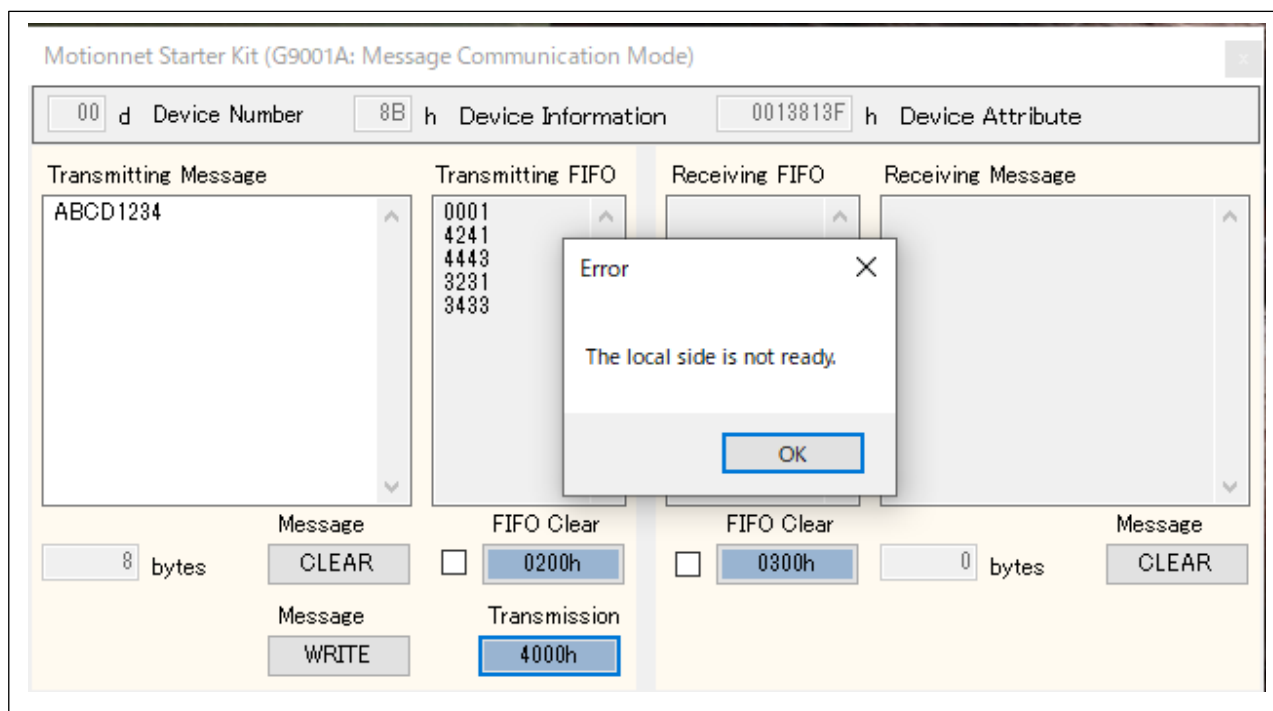
Transmission "4000h + hexadecimal device number" button:

Sends the contents of the Transmitting FIFO column. Maximum number of messages sent is 254 bytes. (FIFO buffer maximum 256 bytes: 2 bytes is reserved at the top of system.)

- Receiving FIFO column: Receives message communication from G9004A-EX and displays ASCII code every 2 bytes.
- Receiving Message column: The data displayed in the received FIFO column is converted into a message and displayed.  
(Maximum number of display characters: 32767 bytes)  
Displays the number of displayed characters at the bottom of the receiving message column.
- FIFO Clear "0300h" button: Clears the received data in the receiving FIFO column and resets the receiving FIFO buffer.
- FIFO clear checkbox: By reading the contents of the FIFO buffer with , the received data in the receive FIFO frame is deleted and the receive FIFO buffer is reset.
- Message "CLEAR" button: Clears all the characters displayed in the receiving message column and sets the number of displayed characters to "0".
- Message "Read" button: Usually not displayed but displayed by receiving message communication from G9004A-EX (port data No. 1-0 "4209h"). By pressing this button, the FIFO buffer is read, and the received data is displayed in the receive FIFO frame and receive message frame. After reading all the received data, it is no longer displayed.

If the message data is sent before the local side is ready, the data in port data No. 1-0 of the device name "G9004A" in the device attribute on the main screen will be "0900" that means an error.

03	04	05	06	07	08	09
00	00	00	8B	00	00	00
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0000	0000	0000	0900	0000	0000	0000
0000	0000	0000	0036	0000	0000	0000
			G9004A			



#### 4.4.3.7 Sending "G9001A message communication"

The interface consists of two main sections: 'Transmitting Message' and 'Transmitting FIFO'. At the top, there are input fields for 'Device Number' (00) and 'Device Information' (8B). Below the 'Transmitting Message' section, there is a text input field containing 'ABCD1234' and a 'Message' label with a 'CLEAR' button. Below this, there is a 'Message' label with a 'WRITE' button and a 'bytes' field set to 8. The 'Transmitting FIFO' section has a list of hexadecimal values: '0001', '4241', '4443', '3231', and '3433'. Below this list is a 'FIFO Clear' label with a '0200h' button and a 'Transmission' label with a '4000h' button. In the second screenshot, the message is 'ABCD12345', the FIFO values include '0035', and the 'WRITE' and '4000h' buttons are highlighted.

The characters entered with the Message "WRITE" button are converted to ASCII code and written to the transmitting FIFO column every 2 bytes. The first 2 bytes are displayed by the information command "0001".

If the number of characters in the message is an odd number, add "00" to the last character and display it.

If the number of characters in the transmitting message (alphanumeric characters) entered in the transmitting message column is an odd number, "00" is added to the last character and displayed.

The contents of the transmitting FIFO column are transmitted with the transmission "4000h + hexadecimal device number" button. The maximum number of messages that can be sent is 254 bytes.

Once you have sent the message, use the message "WRITE" button to write to the transmitting FIFO column again.

#### 4.4.3.8 Receiving "G9001A message communication"

The interface consists of two main sections: 'Receiving FIFO' and 'Receiving Message'. At the top, there are input fields for 'Device Number' (0013813F) and 'Device Attribute' (h). Below the 'Receiving FIFO' section, there is a list of hexadecimal values: '3130', '3332', '4134', and '4342'. Below this list is a 'FIFO Clear' label with a '0300h' button and a 'bytes' field set to 8. The 'Receiving Message' section has a text input field containing '01234ABC' and a 'Message' label with a 'CLEAR' button. In the second screenshot, the FIFO values include '0044' and the message is '01234ABCD'. The 'FIFO Clear' and '0300h' buttons are highlighted.

By receiving message communication from G9004A-EX using the G9004A-EX send command (10h) (port data No. 1-0 "4209h"), the message "Read" button will appear. By pressing the "Read" button, check the status input change interrupt <bit 2=1> reset the bit, write an information command (0001h: send message) to the transmit FIFO buffer, and send a data communication command ("4000h + hexadecimal device number") to the G9004A-EX.

Confirm the status input change interrupt <bit 2 = 1> by the transmission command (10h) of the G9004A-EX, reset the bit, write the information command (0001h: message transmission) to the transmitting FIFO buffer, and send the data communication command ("4000h + hexadecimal device number") to the G9004A-EX. After reading all message communication from the G9004A-EX, write the information command (0002h: reset processing flag for transmission) to the transmitting FIFO buffer, and send the data communication command ("4000h + hexadecimal device number") to the G9004A-EX. (This is to let the center know that the data has been successfully received by the local side.)

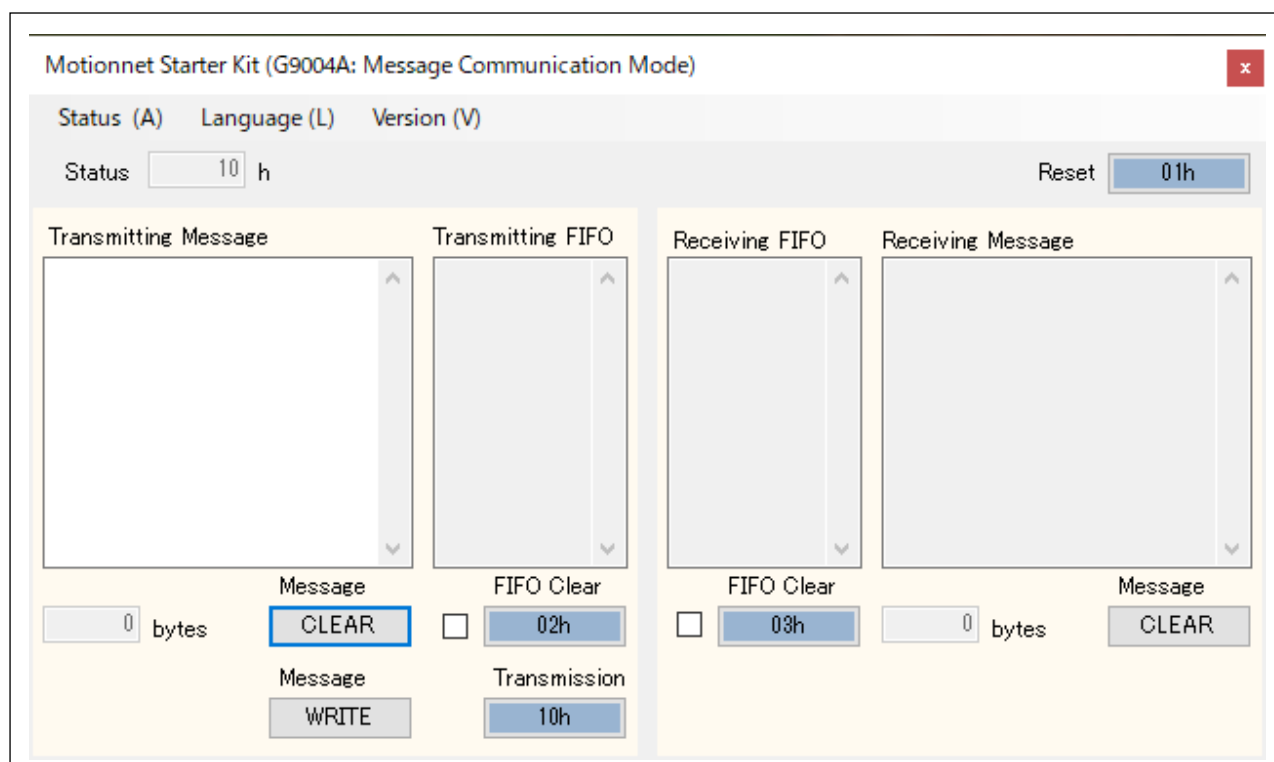
In the receiving FIFO column, the message communication from the G9004A-EX is read from the receiving FIFO buffer and displayed in ASCII code every 2 bytes. Then display the converted message in the received message column. However, if there is "00h" at the end, that data will not be displayed.

Received messages will be displayed up to a maximum of 32767 bytes unless the "Clear" button is pressed.

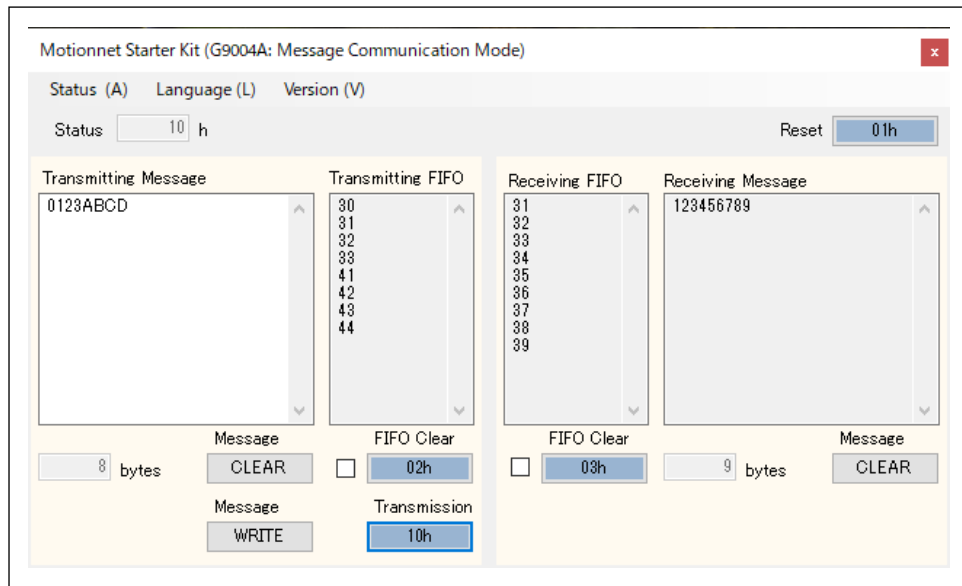
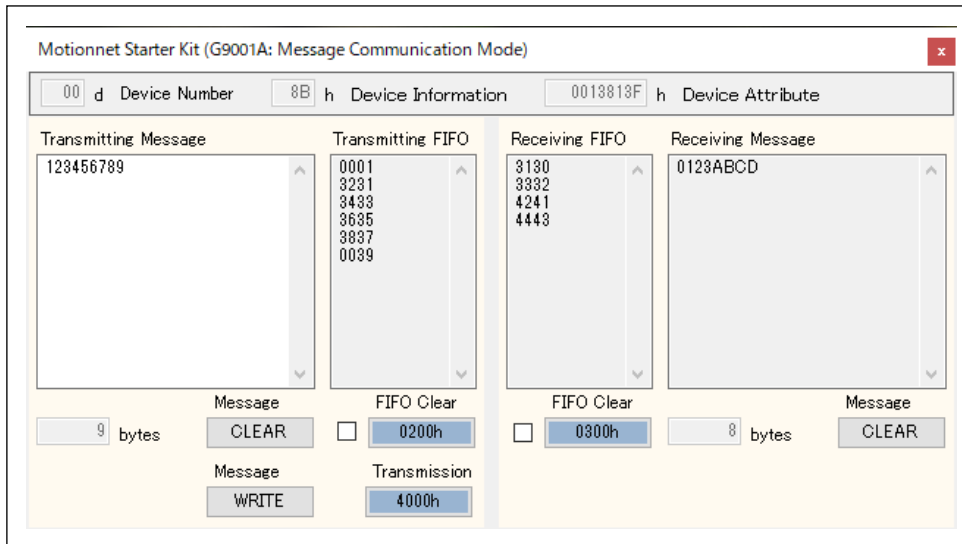
#### 4.4.3.9 "G9004A message communication" supported software

By using the G9004A message expansion board (G9004A-Message\_Board) and launching the supported software (MNET-STK\_Message.exe), the G9004A displays the message communication mode screen with the G9001A.

For details, please refer to the Motionnet starter kit G9004A-EX Message user's manual (application software).



This is the display screen when the G9001A-EV and G9004A-EX send and receive messages.

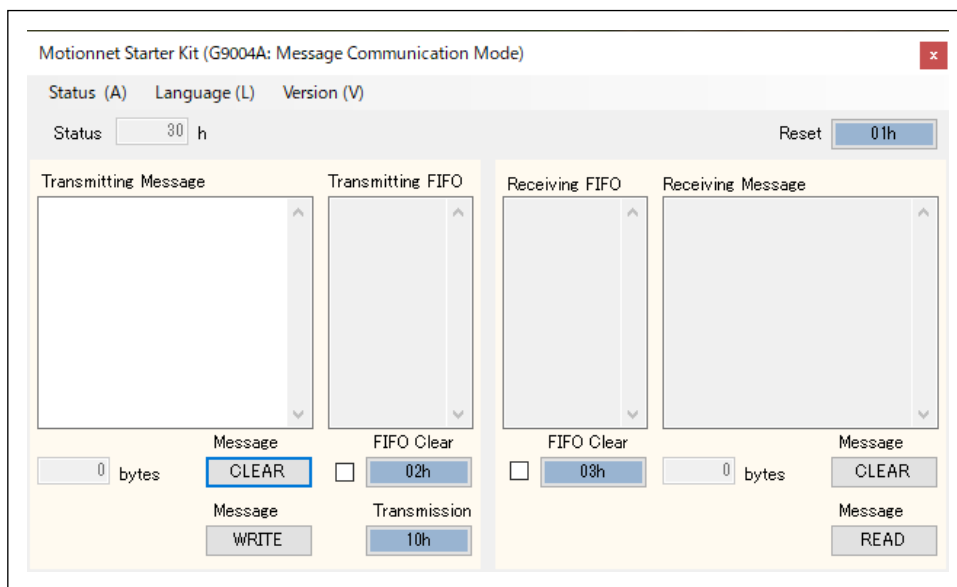
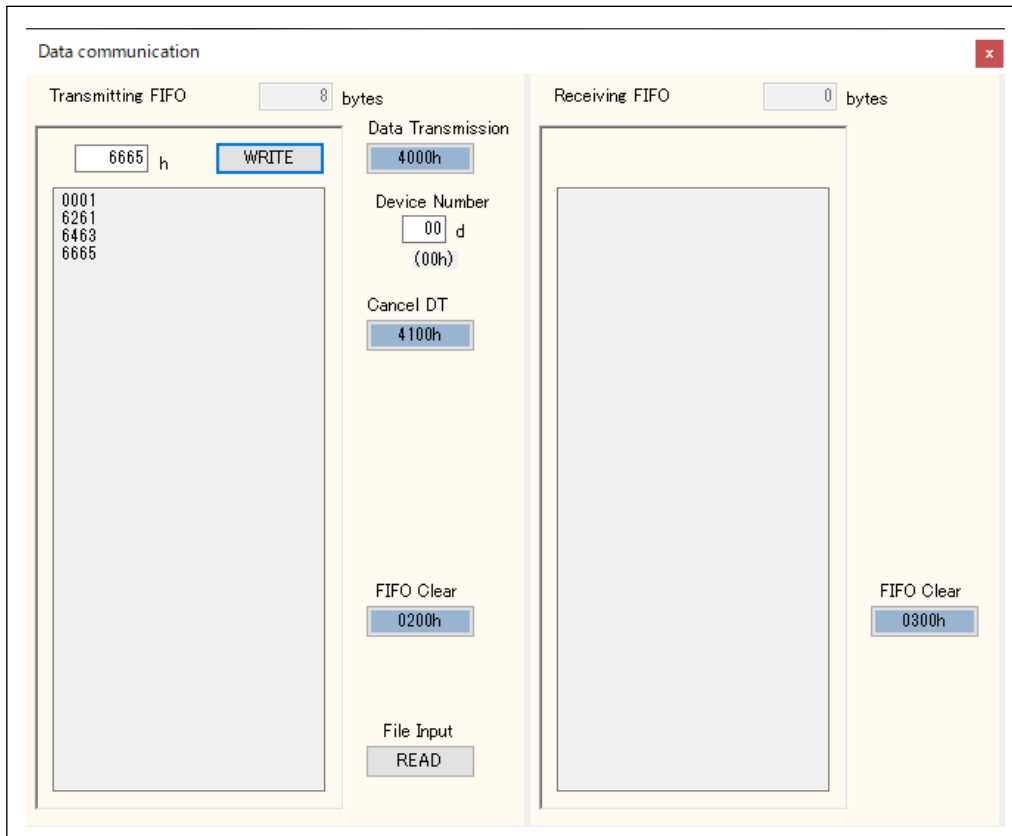


#### 4.4.3.10 Message Communication with G9004A Using "Data Communication"

4.2.3 You can perform message communication with the G9004A using the "Data communication (C)" menu.

Transmission procedure from G9001A to G9004A:

First, write the 2-byte information command "0001" with the "Write" button, and then write the message every 2 bytes. Set the device number that displays "G9004A" in the device attribute and press the data transmission "4000h" button.

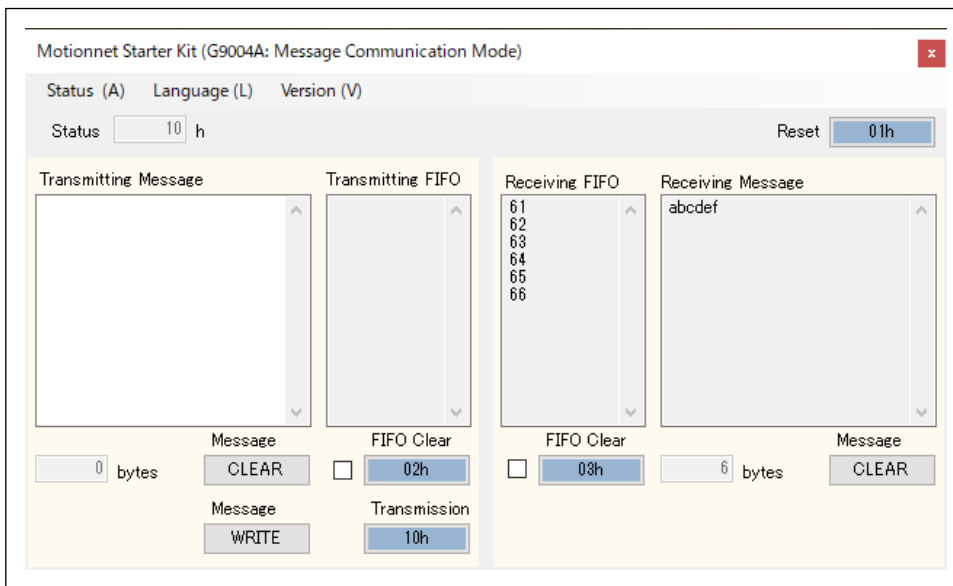


Displays port data No.1-0 "0100h" of G9001A.

Display the G9004A Status "30h" and display the message "Read" button. Read the received data by pressing the "Read" button.

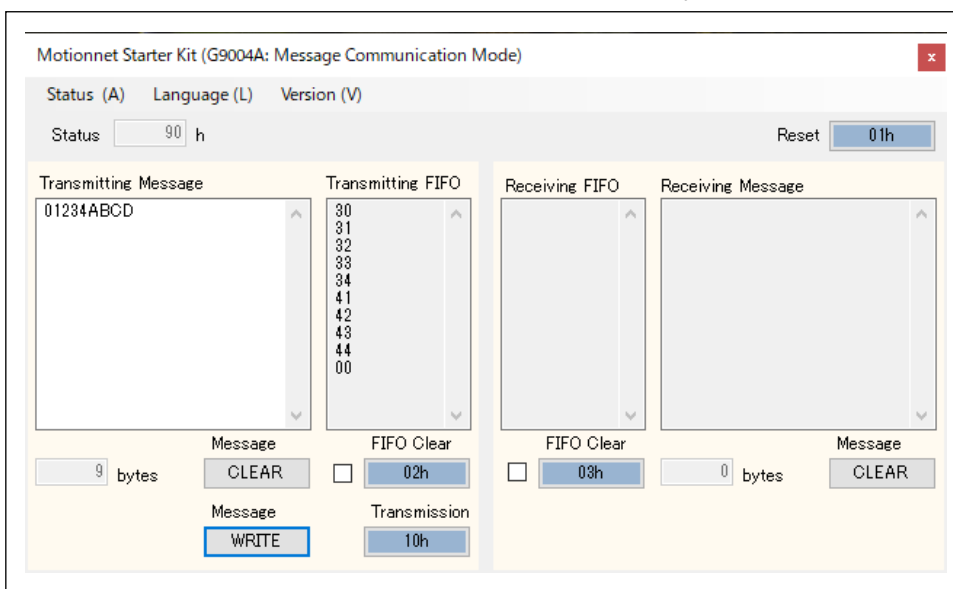
Display G9004A Status "10h" and G9001A port data No.1-0 "0000h".



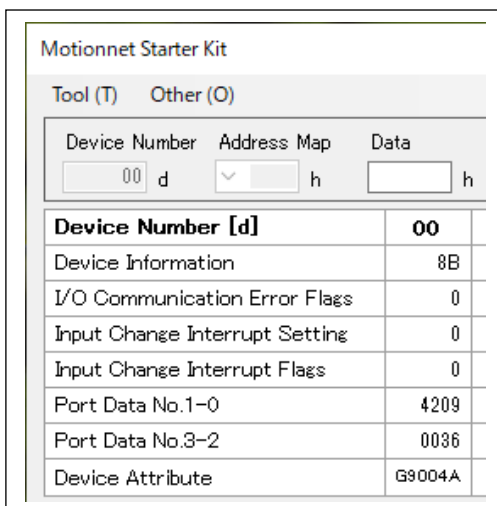


Transmission procedure from G9004A to G9001A:

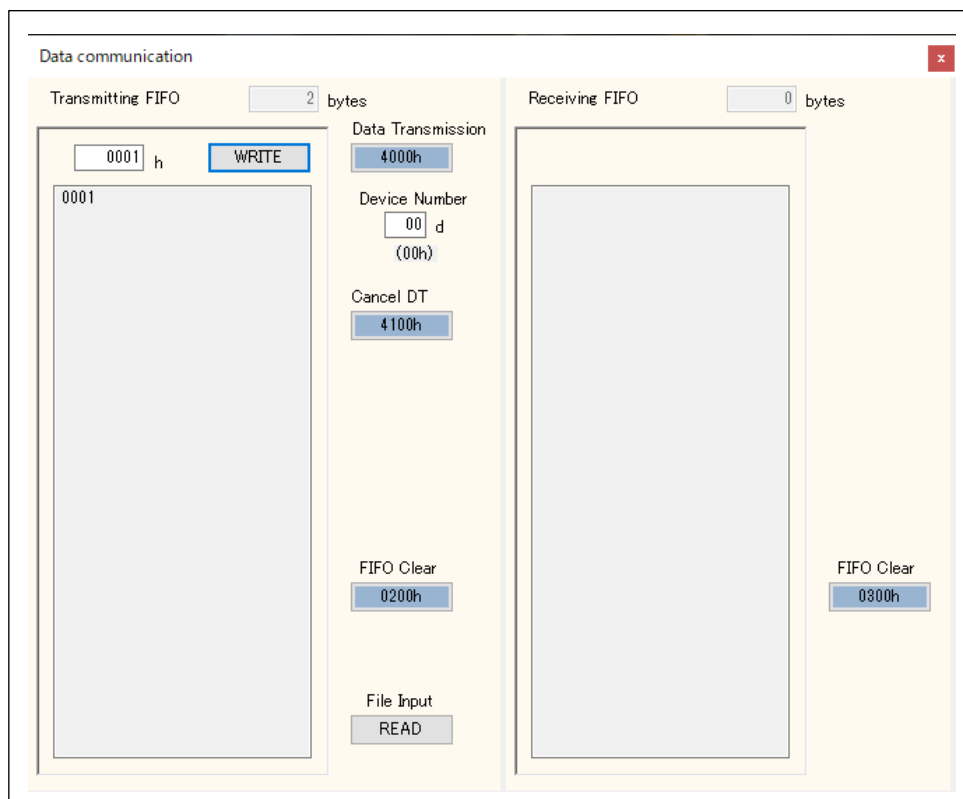
By writing data in the transmission message frame of G9004A and pressing the message "write" button, writing is performed in the transmission FIFO buffer and G9001A port data No. 1-0 "0200h" is displayed.



By pressing the transmission "10h" button of G9004A, port data No. 1-0 "4209h" of G9001A is displayed.

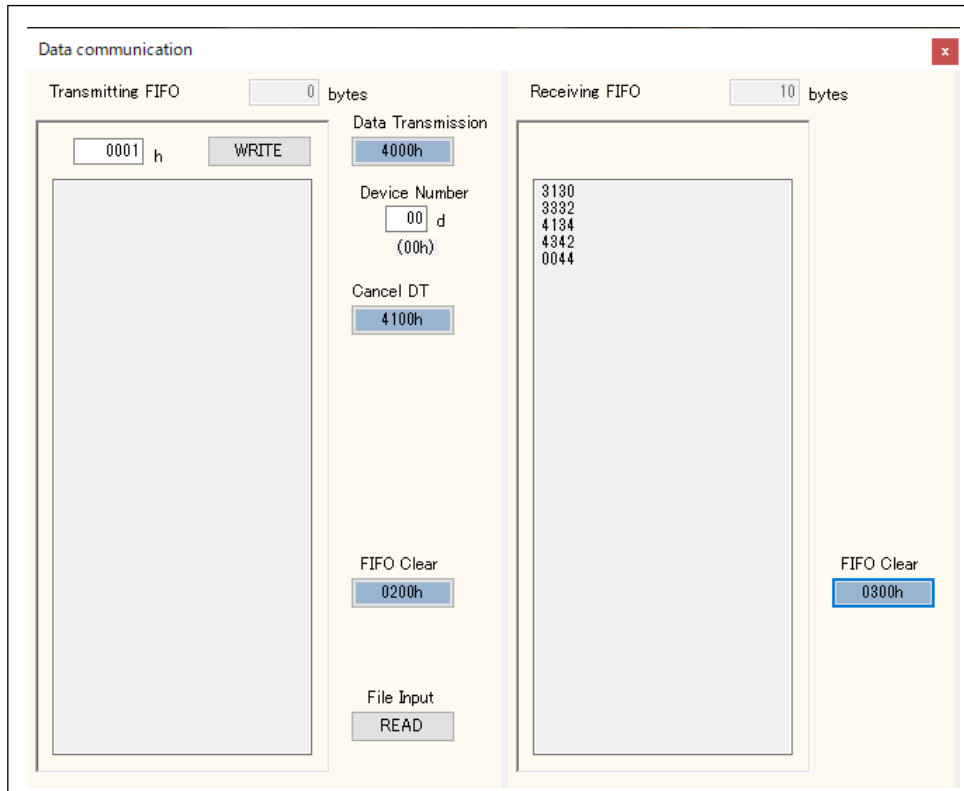


Write the 2-byte information command "0001h" with the "Write" button and press the data transmission "4000h" button.



G9001A port data No.1-0 "4000h" is displayed, and the "Read" button is displayed on the upper right of the reception FIFO frame.

The message data is read by pressing the "Read" button.



Since the G9001A port data No.1-0 "4000h" is still displayed, write the 2-byte information command "0002h" with the "Write" button and press the data transmission "4000h" button. By doing so, G9001A port data No.1-0 "0000h" will be displayed.

## Revision

Revision	Date	Contents
1st	January 29, 2020	Initial Release
2nd	May 15, 2020	<ol style="list-style-type: none"> <li>1. Click [Register] name in "Register Display Software" to display the description</li> <li>2. "Register" name of "Register Display Software" is changed to MSTSW → MSTS / IOPW → IOP</li> <li>3. When the "Register Display Software" is initialized, the registers that can be displayed in decimal are displayed in decimal.</li> <li>4. Added RMVY / PRMVY, RIPPY / PRIPPY, RCI / PRCI registers to "Register Display Software"</li> </ol>
3rd	April 8, 2021	<ol style="list-style-type: none"> <li>1. Reset environment settings 1 and 2 for reset command 0x04 in "register display software"</li> <li>2. Added RCIC, RSYN, RSYN2, RMEC registers to "Register Display Software"</li> </ol>
4th	May 31, 2023	<ol style="list-style-type: none"> <li>1. Added "register display software" that supports G9004A-EX CPU emulation mode</li> <li>2. "Message display software" compatible with the G9004A-EX message mode has been added to send and receive data with the message application software.</li> <li>3. Device number display on the main screen (switching between decimal and hexadecimal numbers)</li> </ol>
5th	October 11, 2023	<p>Display screen and item addition</p> <ol style="list-style-type: none"> <li>1. P36 4.4.3.2 "CPU emulation" PCD46X1A compatible software</li> <li>2. P37 4.4.3.3 "CPU emulation" PCL61x5 compatible software</li> <li>3. P38 4.4.3.4 "CPU emulation" PCL60xx compatible software</li> <li>4. P40 4.4.3.5 "CPU emulation" Software for numbers other than the set recognition number</li> </ol> <p>Display screen and item change</p> <ol style="list-style-type: none"> <li>5. P41 4.4.3.2 → 4.4.3.6 "G9001A message communication" compatible software Additional explanation of FIFO clear checkbox</li> <li>6. P43 4.4.3.3 → 4.4.3.7 Transmission of "G9001A message communication" 4.4.3.4 → 4.4.3.8 Receipt of "G9001A message communication"</li> <li>7. P44 4.4.3.5 → 4.4.3.9 "G9004A message communication" compatible software</li> </ol> <p>addition</p> <ol style="list-style-type: none"> <li>8. P46 4.4.3.10 "Data communication" Use message communication with G9004A</li> <li>9. P12 4.2.3.1 "Data communication other than G9004A message communication"</li> <li>10. P15 4.2.3.2 About "G9004A message communication mode"</li> <li>11. P17 4.2.3.3 About "G9004A CPU emulation mode"</li> </ol>



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