

VRDC Evaluation Kit

AUA6900

AUA0290

Start-up Manual

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Introduction



Caution!

Be sure to read this document and specifications carefully before using the product. Incorrect use of the product may result in malfunction and damage to the product or equipment connected to the product in the worst case. Keep this manual in a safe place and read it again if you do not understand it.

Precautions for use

- The AUA0290 VRDC communication module, AUA6900 VRDC evaluation board, and evaluation software (AUA6900_GUI) are product for VRDC evaluation and are not intended to be used as part of a customer's system.
- The contents of this manual may be changed as necessary. Additionally, AUA6900_GUI may be updated without prior notice. Please contact our sales representative for the latest information.

Features

- Serial communication with VRDC is possible.
- Angle data/velocity data display function
- VRDC MTP memory setting change function
- VRDC error display and error reset operation
- Monitor test point for parallel output/encoder equivalent pulse output
- Power can be supplied to VRDC by USB bus power or external power connection

Evaluation configuration example

- AUA6900 VRDC Evaluation board
- AUA0290 VRDC Communication module
- USB cable (accessories)
- PC
- Resolver

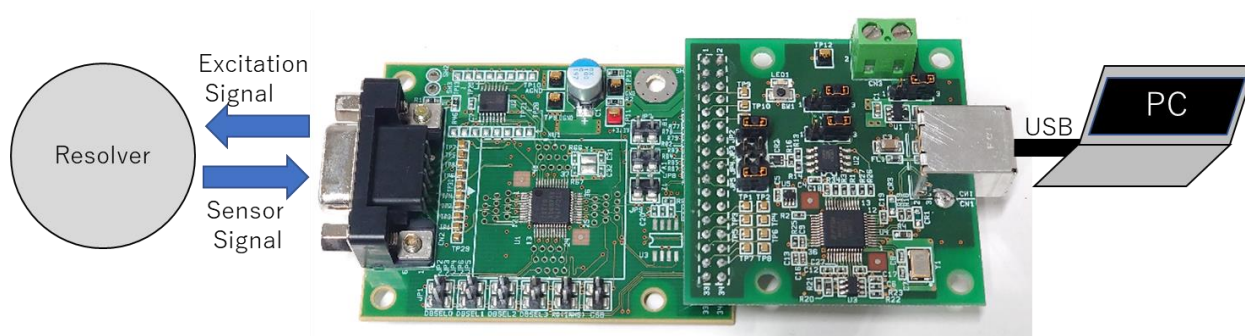


Fig 1. Typical evaluation configuration example

1. Software Installation

Please download and install the following software before using this product.

- AUA6900_GUI
- FTDI VCP Drivers

1.1 Installing AUA6900_GUI

Please access the software download page from the link below and download the latest version.
After unzipping the downloaded compressed file, please run AUA6900_GUI_v**.exe in the folder to install it.
*To download, you need to enter the user ID and password enclosed with AUA0290 (communication module).

Tamagawa seiki download page: <https://www.tamagawa-seiki.com/>

1.2 Installing FTDI VCP Drivers

Please download and install from the link below.

FTDI download page: <https://ftdichip.com/drivers/vcp-drivers/>

2. Hardware Setup

2.1 Basic hardware setup

- ① Connect AUA6900 and AUA0290 as shown in Figure 2.
- ② Set JP7, JP8, and JP9 of AUA6900 to open.
*As for serial communication default setting, only SILK-5Mbps setting can be used.
- ③ Check the model number of AUA6900 and set the jumper settings of AUA0290 as shown in Table 1.
- ④ Connect the resolver.

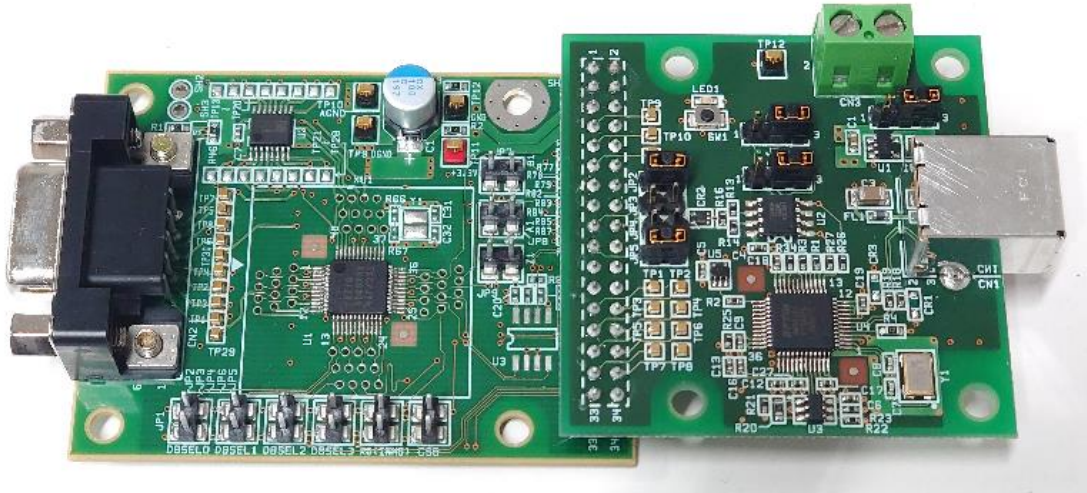


Fig 2. Connection between AUA6900 and AUA0290

Table 1. AUA0290 jumper setting list

AUA6900N0XYZ	Serial I/O	AUA0290 jumper setting						Remarks
		JP2	JP3	JP4	JP5	JP6	JP7	
Y = 1 or 3	Line driver	Open	Short	Short	Open	1-2pin Short	1-2pin Short	Default setting
Y = 2 or 4	Single end	Short	Open	Open	Short	2-3pin Short	2-3pin Short	-

2.2 When operating VRDC with USB bus power (default setting)

- ① Check the JP1 of AUA0290 is connected to **pin2-3 side**.

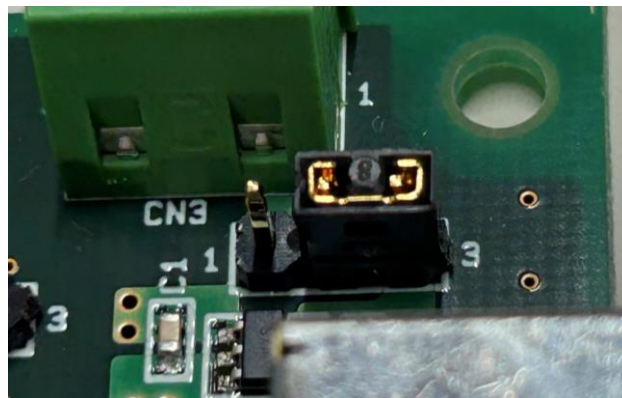


Fig 3. Checking JP1 settings (pin2-3 side) when operating USB bus power

- ② Connect the USB cable to AUA0290 and connect the USB cable to the PC.
- ③ Hardware setup is complete. Proceed to "3. Starting the software and connecting devices."

2.3 When operating VRDC with external power input

- ① Check that JP1 of AUA0290 is connected to **pin1-2 side**.
- ② Connect CN3 to the external stabilized power supply using a lead wire.
Connect pin 1 of CN3 to the +3.3V side of the power supply, and pin 2 of CN3 to the GND side of the power supply. Please note that incorrect polarity of the power supply may cause malfunction.

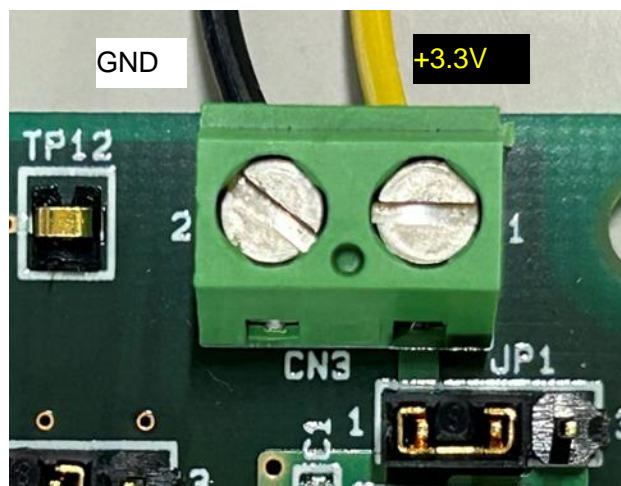


Fig 4. Checking the JP1 setting (pin1-2 side) and CN3 polarity during external power input operation

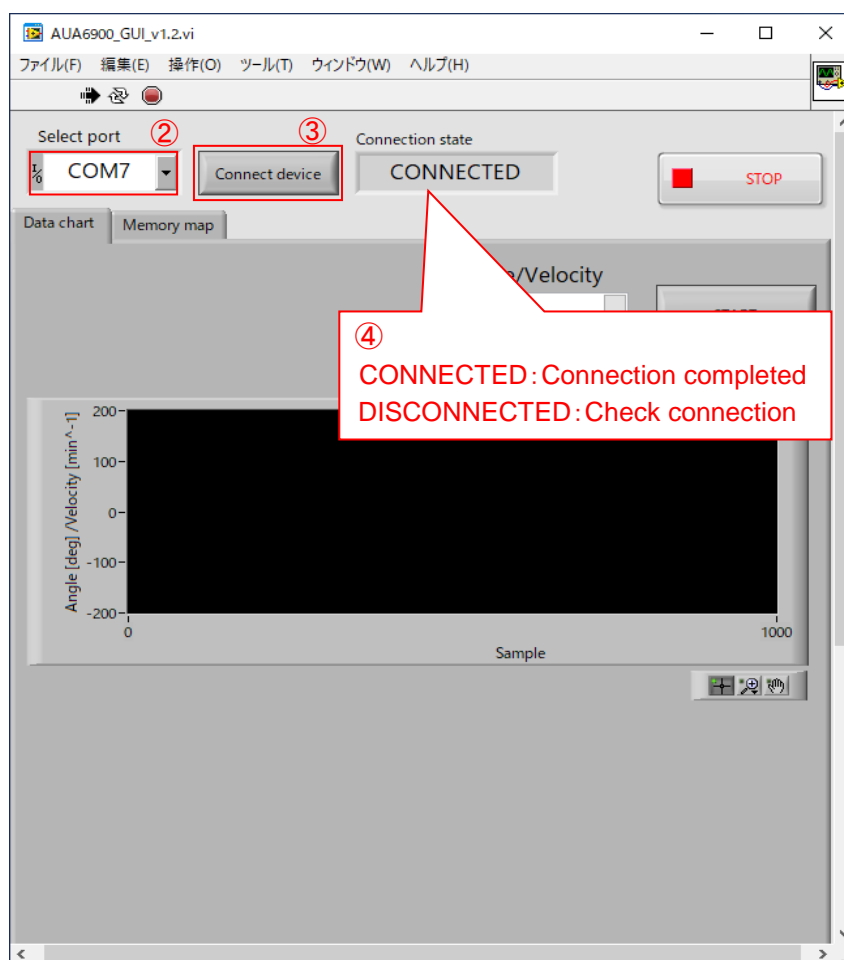
- ③ After setting the voltage of the stabilized power supply to +3.3V, turn on the power.
- ④ Connect the USB cable to AUA0290, and then connect the USB cable to the PC.
- ⑤ Hardware setup is complete. Proceed to "3. Starting the software and connecting devices."

3. Starting the software and connecting devices

- ① Start AUA6900_GUI.

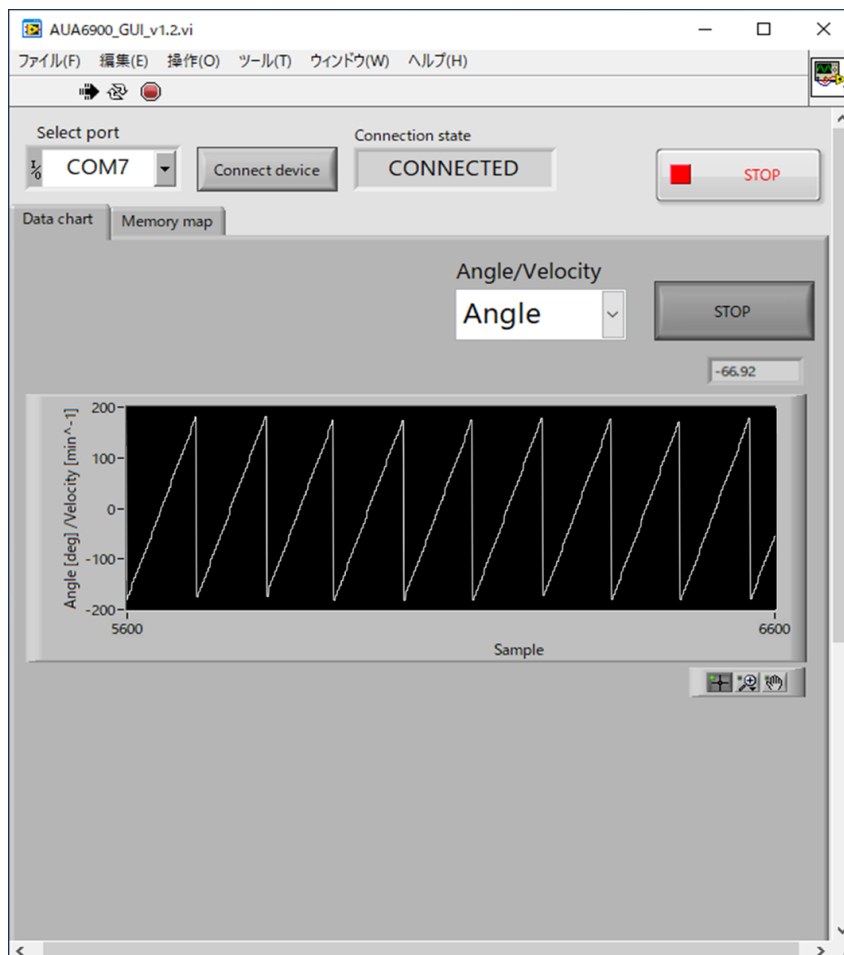


- ② Select port to connect.
- ③ Press the “Connect device” button.
- ④ When the Connection state shows CONNECTED, the connection is complete. If DISCONNECTED is displayed, check the connection between this product and the PC, and then try again from step ①.



4. Angle data/Velocity data chart

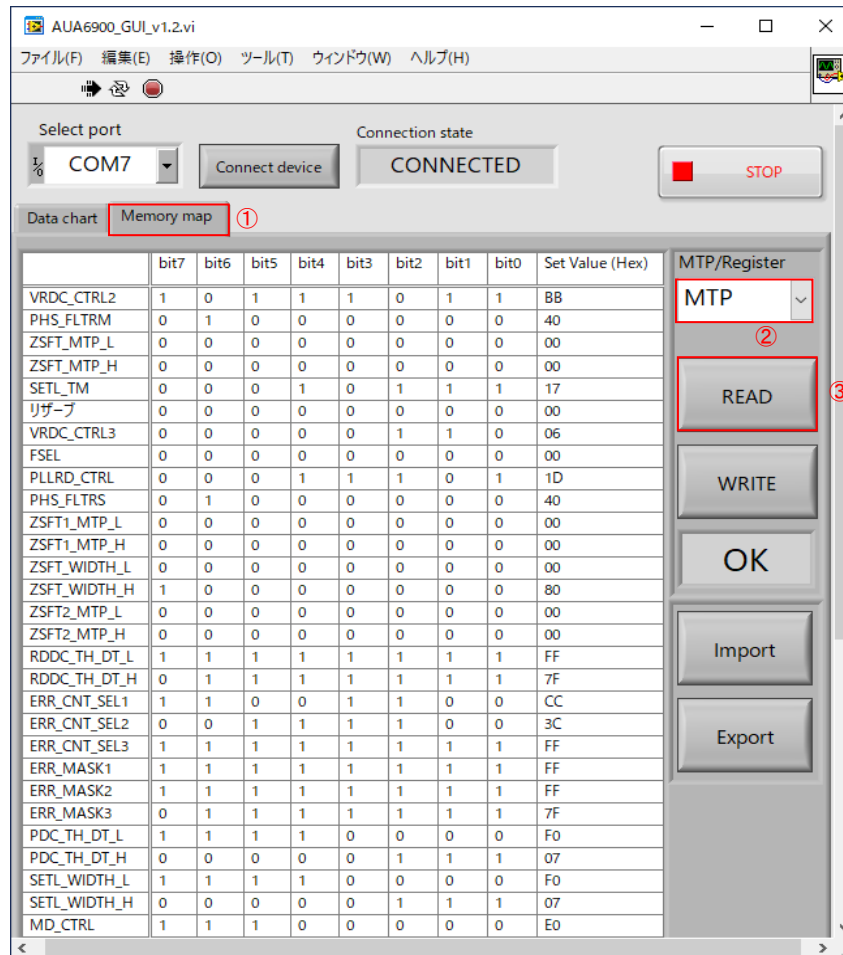
- ① After completing the device connection, select the “Data chart” tab and press the START button.
The chart displays the angle data obtained from VRDC.
*For details on how to connect devices, please see "3. Starting the software and connecting devices."
- ② By selecting “Velocity” from the “Angle/velocity” switching menu, the velocity data obtained from VRDC will be displayed.
- ③ Click the STOP button to stop data acquisition.
*■STOP button is a software stop button.



5. MTP Settings

5.1 MTP Settings READ execution

- ① After completing the device connection, select the “Memory map” tab.
*For details on how to connect devices, please see "3. Starting the software and connecting devices."
- ② Select “MTP” from the MTP/Register menu.
- ③ Press the READ button. If OK is displayed and the setting value is displayed in the VRDC setting value list, the acquisition of the MTP setting value is complete.
If NG is displayed, please execute READ again.




5.2 MTP settings WRITE execution

- ① After completing the device connection, select the “Memory map” tab.
*For details on how to connect devices, please see “3. Starting the software and connecting devices.”
- ② Select “MTP” from the MTP/Register menu.
- ③ Enter the setting values in the VRDC setting value list. Editing is possible from either the binary number notation field or the hexadecimal number notation field.
*We recommend that you first read the settings and then edit them.
Also, please check Section 5.4 for information on how to import setting values from a CSV file.
*For details on the setting values, please refer to the VRDC register specifications.
- ④ After entering the setting value, press the WRITE button.
- ⑤ If OK is displayed, the setting value writing is complete. After stopping the software with the ■STOP button, turn on the VRDC power again*1 to reflect the setting value to MTP.
If NG is displayed, execute WRITE again, confirm that OK is displayed, press the ■STOP button to stop the software, and then power on the VRDC again.

※1 When operating on USB bus power: Connecting and disconnecting the USB cable

When operating external power input: External power supply OFF⇒ON

- ⑥ Press the execution button  at the top left of the screen, connect the device according to the steps in section 3, and then execute READ for the MTP settings in section 5.1 to confirm that the information you have written is correct.

The screenshot shows the AUA6900 GUI software interface. The window title is "AUA6900_GUI_v1.2.vi". The interface includes a menu bar (File, Edit, Operation, Tools, Window, Help), a toolbar, and a main area with a "Select port" dropdown set to "COM7", a "Connect device" button, and a "CONNECTED" status indicator. A "STOP" button is visible. The "Data chart" tab is active, showing the "Memory map" tab. The Memory map table lists various registers with bit fields (bit7-bit0) and a Set Value (Hex) field. The MTP/Register dropdown is set to MTP. The WRITE button is highlighted with a red box and a circled 4. A callout box points to the Set Value (Hex) field and bit fields, stating: "Enter setting value. You can enter hexadecimal numbers in the Set Value (Hex) field or binary numbers in the bit0~bit7 fields."

	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0	Set Value (Hex)
VRDC_CTRL2	1	0	1	1	1	1	1	1	BF
PHS_FLTRM	0	1	0	0	0	0	0	0	40
ZSFT_MTP_L	0	0	0	0	0	0	0	0	00
ZSFT_MTP_H	0	0	0	0	0	0	0	0	00
SETL_TM	0	0	0	1	0	1	1	1	17
リザーブ	0	0	0	0	0	0	0	0	00
VRDC_CTRL3	0	0	0	0	0	1	1	0	06
FSEL	0	0	0	0	0	0	0	0	00
PLLRD_CTRL	0	0	0	1	1	1	0	1	1D
PHS_FLTRS	0	1	0	0	0	0	0	0	40
ZSFT1_MTP_L	0	0	0	0	0	0	0	0	00
ZSFT1_MTP_H	0	0	0	0	0	0	0	0	00
ZSFT_WIDTH_L	0	0	0	0	0	0	0	0	00
ZSFT_WIDTH_H	1	0	0	0	0	0	0	0	80
ZSFT2_MTP_L	0	0	0	0	0	0	0	0	00
ZSFT2_MTP_H	0	0	0	0	0	0	0	0	00
RDDC_TH_DT_L	1	1	1	1	1	1	1	1	FF
RDDC_TH_DT_H	0	1	1	1	1	1	1	1	7F
ERR_CNT_SEL1	1	1	0	0	1	1	0	0	CC
ERR_CNT_SEL2	0	0	1	1	1	1	0	0	3C
ERR_CNT_SEL3	1	1	1	1	1	1	1	1	FF
ERR_MASK1	1	1	1	1	1	1	1	1	FF
ERR_MASK2	1	1	1	1	1	1	1	1	FF
ERR_MASK3	0	1	1	1	1	1	1	1	7F
PDC_TH_DT_L	1	1	1	1	0	0	0	0	F0
PDC_TH_DT_H	0	0	0	0	0	1	1	1	07
SETL_WIDTH_L	1	1	1	1	0	0	0	0	F0
SETL_WIDTH_H	0	0	0	0	0	1	1	1	07
MD_CTRL	1	1	1	0	0	0	0	0	E0

5.3 READ/WRITE execution of adjustment register

Writing to an MTP requires time to cycle the power, and there is a limit to the number of times an MTP can be written. If you need to finely adjust the setting values and rewrite them many times, we recommend using adjustment registers.

If you select “Register” from the MTP/Register menu in Sections 5.1 and 5.2, you can read/write the setting value of the adjustment register. After determining the adjustment value using the adjustment register, do not forget to write the setting value to the MTP.

*There is no need to turn on the power again when writing to the adjustment register.

Please note that the adjustment value of the adjustment register will be reset when the power is turned off.

*When writing to the adjustment register, LED1 for error display lights up, but this is normal operation.

5.4 Import/Export settings

•Import procedure

The following describes the steps to read the setting values from the specified csv file and reflect them in the memory map list on the screen.

① Press the Import button.

② A file selection window will open, so select the .csv file to import.

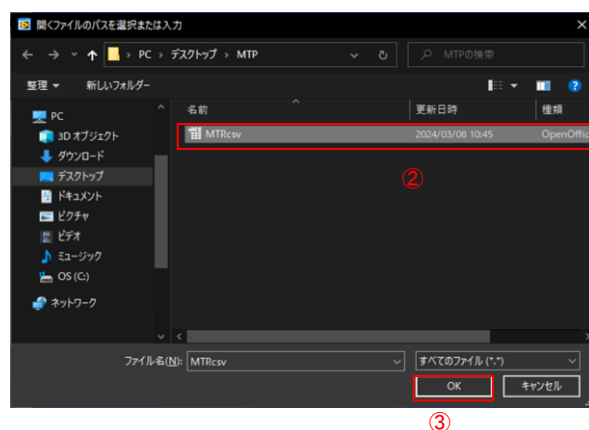
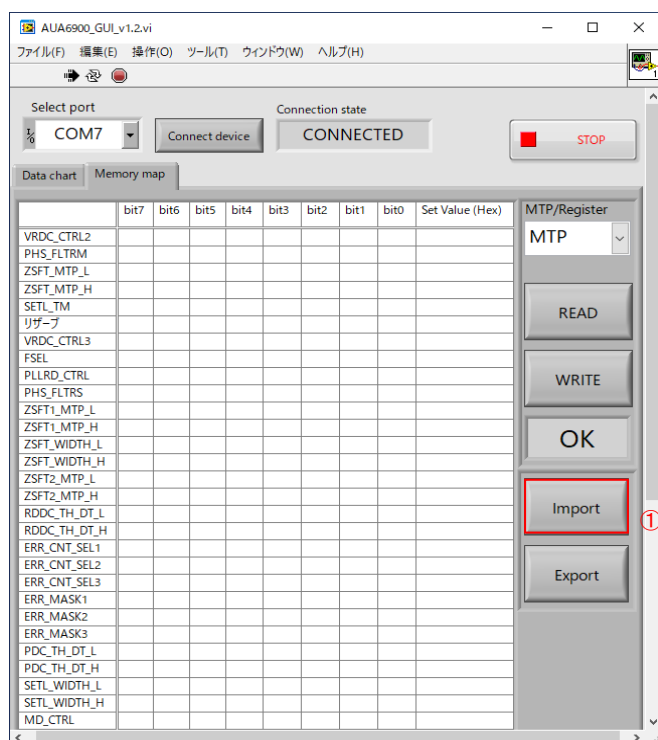
*Do not select files other than those with the .csv extension.

Additionally, the only csv file format that can be read is the csv file format exported using this software.

We recommend that you edit and use the exported csv file.

③ Press the OK button. Please confirm that the contents are reflected in the memory map list on the screen.

*Since it will not be reflected in VRDC, please execute WRITE to MTP and adjustment register separately after checking the contents.



•Export procedure

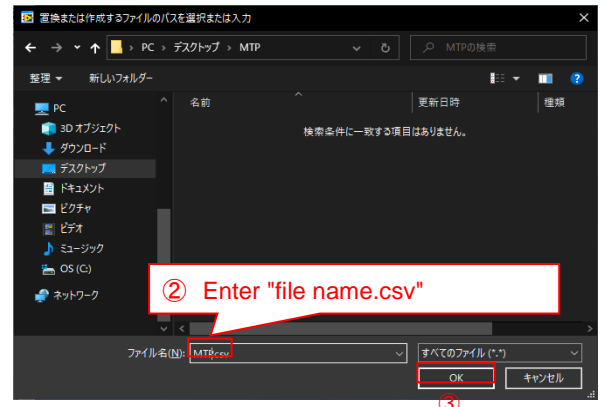
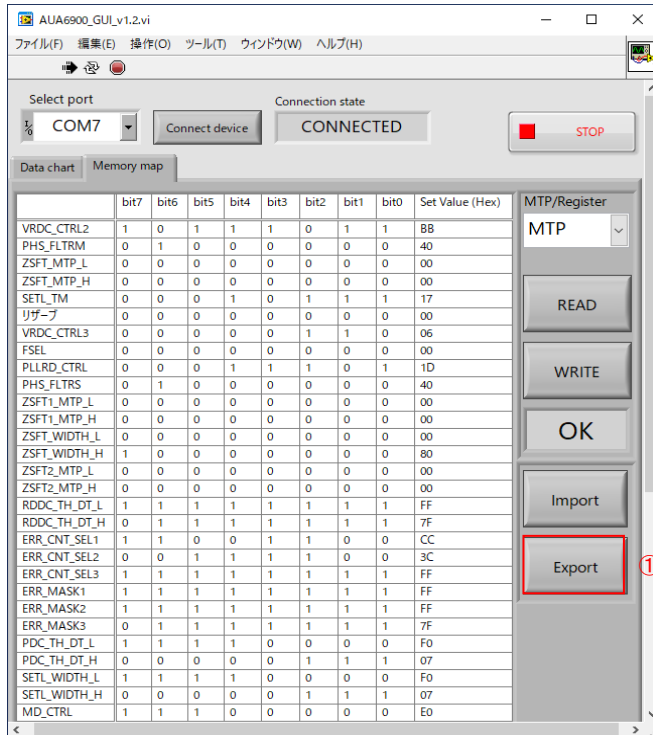
The following describes the procedure for saving the contents of the VRDC setting value list on the screen to the specified csv file.

① Press the Export button.

② A file selection window will open, so enter the file name to export.

*When entering the file name, **please be sure to include the extension ".csv"**.

③ Press the OK button. Please confirm that the settings are saved to the csv file with the specified name.



6. Other function

●Error display & Error reset

VRDC error display and error reset operations can be performed using LED1 and SW1 on the AUA0290 communication module.

Fig 2. Error display & error reset

Part name	Signal name of VRDC	Remarks
LED1	ERRHLD	Lights up: Error. Lights off: No error.
SW1	ERRSTB	Press the button to reset the error.

*For details on VRDC's anomaly detection function, please check the VRDC user's manual.

*When writing to the adjustment register, LED1 lights up, but this is normal operation.

●Monitoring of parallel output and encoder equivalent pulse output

You can monitor each corresponding signal from the test points below.

Fig 3. AUA0290 test points and VRDC signal correspondence table

AUA0290 Test points	Signal name of VRDC
TP1	D0
TP2	D1
TP3	D2
TP4	D3
TP5	D4
TP6	D5
TP7	D6
TP8	D7
TP9	B1
TP10	A1
TP11	Z1

※For parallel output settings, please check the VRDC user's manual and AUA6900 external connection diagram.

Revision Record (cont'd) 改訂履歴

Rev. No.	Date yyyy/mm/dd	Description 詳細				
		Page ページ番号	Changes 変更内容	Prepared 作成	Reviewed 点検	Approved 承認
0000	2024/5/7	-	Initial Issue 初版			