

FR-A820/FR-A840/FR-A842/ FR-F820/FR-F840/FR-F842

Frequency Inverters

Beginner's Manual

FR Configurator2



**Beginner's Manual
FR Configurator2**

Version			Änderungen / Ergänzungen / Korrekturen
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About this Manual

The texts, illustrations, diagrams, and examples in this manual are only intended as aids to help explain the functioning, operation, use, and programming of FR-Configurator2 for FR-A820/FR-A840/FR-A842/FR-F820/FR-F840/FR-F842.

If you have any questions regarding the installation and operation of the software described in this manual, please do not hesitate to contact your sales office or one of your Mitsubishi distribution partners.

You can also obtain information and answers to frequently asked questions from our Mitsubishi website under <http://eu3a.mitsubishielectric.com>

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its products and/or the contents of this manual
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Typographic conventions

Use of notes

Notes containing important information are clearly identified as follows:

NOTE

| Note text

Use of examples

Examples containing important information are clearly identified as follows:

Example ▾

Example



Numbering in figures and illustrations

Reference numbers in figures and illustrations are shown with white numbers in a black circle and the corresponding explanations shown beneath the illustrations are identified with the same numbers, like this:

① ② ③ ④

Procedures

In some cases the setup, operation, maintenance and other instructions are explained with numbered procedures. The individual steps of these procedures are numbered in ascending order with black numbers in a white circle, and they must be performed in the exact order shown:

① Text

② Text

③ Text

Footnotes in tables

Footnote characters in tables are printed in superscript and the corresponding footnotes shown beneath the table are identified by the same characters, also in superscript.

If a table contains more than one footnote, they are all listed below the table and numbered in ascending order with black numbers in a white circle, like this:

① Text

② Text

③ Text

1 Introduction

This instruction manual gives handling information and precautions for the use of this software. Incorrect handling might cause an unexpected fault. Before using the software, please read this manual carefully to use the software to its optimum performance.

Please forward this manual to the end user.

When reading this manual, note the following:

Microsoft Windows and Excel are registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

- The formal name of Windows® XP is Microsoft® Windows® XP operating system.
- The formal name of Windows Vista® is Microsoft® Windows Vista® operating system
- The formal name of Windows® 7 is Microsoft® Windows® 7 operating system.
- The formal name of Windows® 8 is Microsoft® Windows® 8 operating system
- "FR Configurator2" is a registered trademark of Mitsubishi Electric Corporation.
- The copyright and other rights of this software all belong to Mitsubishi Electric Corporation.

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1.1 Before using this software

NOTES

If a file name or folder name is using Unicode, file writing or reading may not be performed correctly. Please use a file name and folder name without Unicode.

The following functions are not compatible with this software:

- Application starting with Windows® compatibility mode
- Starting using "Run As..."
- Fast User Switching
- Remote Desktop
- Large font size (Advanced setting of screen property)
- DPI setting other than the normal size (Advanced setting of screen property)
- Windows® XP Mode
- Windows® Touch.

A part of this software is using a function of Internet Explorer. This software may not operate properly depending on Internet Explorer setting.

FR Configurator2 is not available when inverter is activated with FR-PU07BB Battery mode. FR Configurator2 may not operate properly.

This manual is written on the basis that Windows® 7 Professional is the operating system.

**Warning!**

Although this product was manufactured under conditions of strict quality control, you are strongly advised to install safety devices to prevent serious accidents when it is used in facilities where breakdowns of the product are likely to cause a serious accident.

This product has not been designed or manufactured for the use with any equipment or system operated under lifethreatening conditions.

Please contact our sales office when you are considering using this product in special applications such as passenger mobile, medical, aerospace, nuclear, power or undersea relay equipment or system.

Check the settings before configuring the inverter

Check the following settings before configuring the inverter with this software. For the details of communication parameters, refer to chapter 1.4.

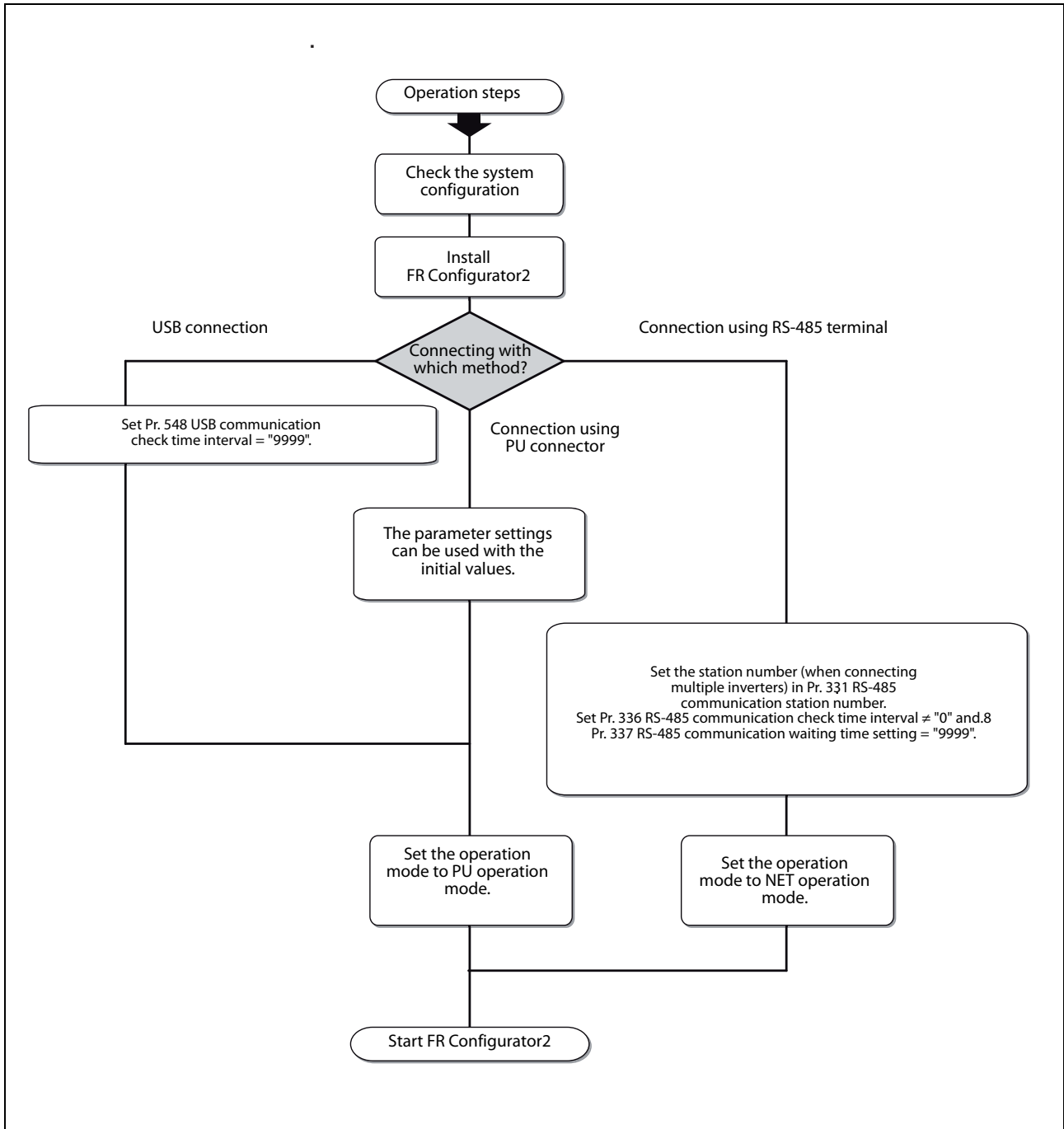


Fig. 1-1: Check the settings before configuring the inverter

1.2 System requirements

1.2.1 Minimum system requirements

Components	Description ^①	
PC ^②	IBM PC/AT compatible machine with DVD drive (for installation), USB port or serial port	
	OS ^③	Windows [®] 7, Windows [®] 8, Windows [®] 8.1/Pro/Enterprise (32-bit Edition and 64-bit Edition) Windows Vista [®] (32-bit Edition) Windows [®] XP Professional SP3 or later (32-bit Edition) Windows [®] XP Home Edition SP3 or later
	Processor	Desktop PC: Intel [®] Celeron [®] Processor 2.8 GHz or higher Laptop PC: Intel [®] Pentium [®] M Processor 1.7 GHz or higher
	Memory	1 GB or more (Windows [®] 7, Windows [®] 8, Windows [®] 8.1 32-bit Edition) 2 GB or more (Windows [®] 7, Windows [®] 8, Windows [®] 8.1 64-bit Edition) 512 MB or more (Windows Vista [®]) 128 MB or more (Windows [®] XP Professional, Windows [®] XP Home Edition)
	Hard disk	Free area of 1.5 GB or more
Software	Internet Explorer 5.0 or later	
Display	Applicable to display at resolution of 1024 ? 768 or more, and 256 colors or more. Compatible with the above personal computer.	
Keyboard	Compatible with the above personal computer.	
Mouse	Compatible with the above personal computer.	
Printer	Compatible with the above personal computer.	

Tab. 1-1: Minimum system requirements

- ① Windows is a registered trademark of Microsoft Corporation in the United States and other countries. Pentium is a registered trademark of Intel Corporation.
- ② FR Configurator2 may not function properly depending on the using personal computer, peripheral devices, and software.
- ③ Operation on an operating system not listed here is not guaranteed. Windows[®] ist eine registrierte Marke der Microsoft Corporation. Pentium[®] ist eine registrierte Marke der Intel Corporation.

1.2.2 System configuration

The following devices are required to use FR Configurator2. Set up the system in accordance with the instruction manual of each device.

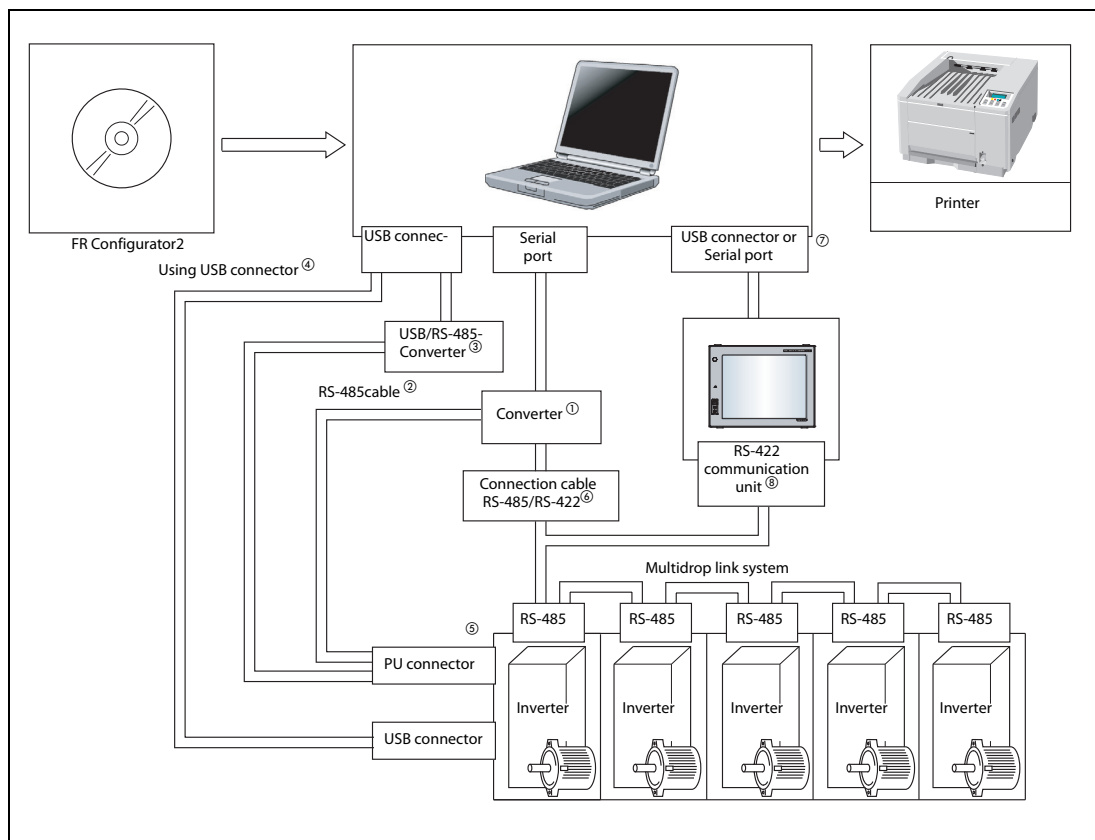


Fig. 1-2: System configuration

- ① When using serial port of a personal computer, a commercially available converter is required.
 Examples of product available on the market (as of November 2013)
 Model: DINV-CABV (with connectors and cable)
 Diatrend Corp.
 The converter cable cannot connect two or more inverters (the computer and inverter are connected on a 1:1 basis). This is a RS- 232C/RS-485 conversion cable with built-in converter. No additional cable or connector is required. Contact a manufacturer for details of the product.
- ② Connection cable
 Examples of product available on the market (as of November 2013)
 Connector: RJ45 connector
 Example: Tyco Electronics
 5-554720-3
 Cable: Cable in compliance with EIA568 (such as 10BASE-T cable)
 Example: Mitsubishi Cable Industries, Ltd.
 SGLPEV-T (Cat5e/300 m) 24 AWG ? 4 P
- ③ USB/RS-485 convert cable
 Examples of product available on the market (as of November 2013)
 Model: DINV-U4
 Diatrend Corp.
 Refer to page 38 for the communication setting with DINV-U4. When using USB/RS-485 convert cable, use the newest driver software. For a product details or the newest driver software, contact the cable manufacturer.
- ④ Recommended USB cable for computer-inverter connection
 MR-J3USBCBL3M Cable Length 3 m

- ⑤ Communication with PU connector, RS-485 terminal, or USB connector is available.
- ⑥ Maximum overall length of connection cable: 500 m
- ⑦ The USB or a serial port (one of ports 1 to 63) can be used as the communication port. Set the communication port in the Communication settings screen of FR Configurator2. (Multiple ports cannot be used at the same time.) One personal computer is connected to one GOT. When using the USB for connecting a GOT, use a dedicated cable, GT09-C30USB-5P or GT09-C20USB-5P. Only the USB connection is available for connecting the GOT2000 series to a personal computer. For the GOT1000 series, an RS-422 communication unit (GT15-RS4-9S) is required.
- ⑧ For the compatible version of GOT or details of the RS-422/485 connection, refer to the GOT1000/GOT2000 Series Connection Manual.

1.3 Installation and uninstallation

To use FR Configurator2, the software must be installed onto the personal computer.

1.3.1 Installation of FR Configurator2

Check the following points before the installation:

- Close any other applications that have already been running.
- For the installation, log on as an administrator (Administrator account) and start installation.
- If an inverter is connected by the USB cable, disconnect the USB cable.
- Installation files are compressed. Copying the files does not start FR Configurator2 yet. Install the software using the setup program.
- To install the software, follow the installation procedure in Windows screen.
- In an operation system with antivirus/security software, a warning may appear when installing FR Configurator2. If a warning appears, permit the installation of FR Configurator2 according to the setting procedure of your antivirus/security software.

1.3.2 Uninstallation of FR Configurator2

Open the [Start] menu of Windows, and then click [Control Panel]. Click "Programs" in the "Control Panel" window. When "Programs and Features" window is displayed, select "FR Configurator2" to start uninstallation.

NOTE

Uninstallation is unavailable while the application is running. Perform the uninstallation after closing the application.

1.4 Connection and parameter setting

1.4.1 Connection method

For FR Configurator2, communication via USB connector, PU connector, RS-485 terminal block, or GOT is available. USB connection is initially selected. The Developer function is available only during communication via the PU connector.

- **USB connection** (refer to chapter 1.4.2)
Connect to USB connector (mini B connector) of the inverter. 1:1 connection is supported. Connection with using USB hub is not supported.

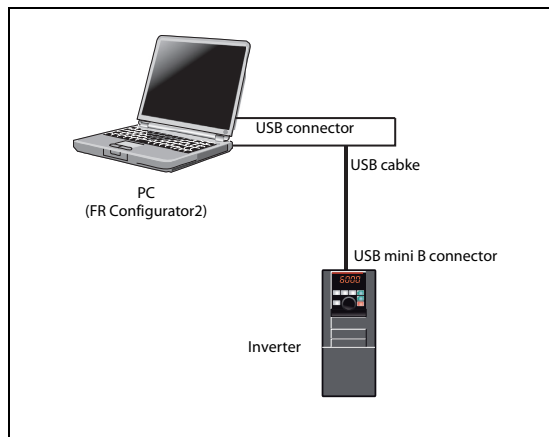


Fig. 1-3:
USB connection

- **Serial communication (PU connector)** (refer to chapter 1.4.3)
Connect to PU connector of the inverter. Serial port/RS-485 converter (cable) or USB/RS-485 converter (cable) is required.

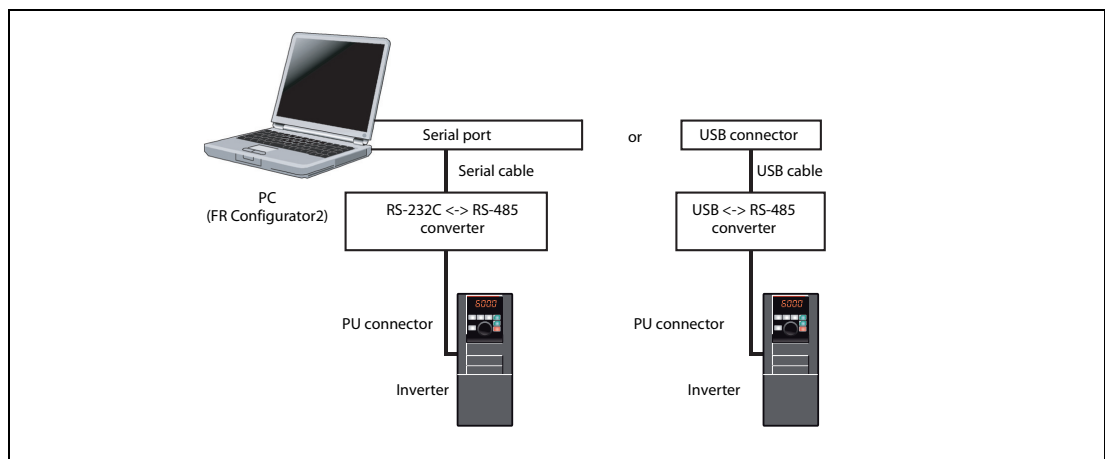


Fig. 1-4: Serial communication (PU connector)

- **Serial communication (RS-485 terminal)** (refer to chapter 1.4.4)
Connect to RS-485 terminal of the inverter. Up to 32 inverters can be connected.

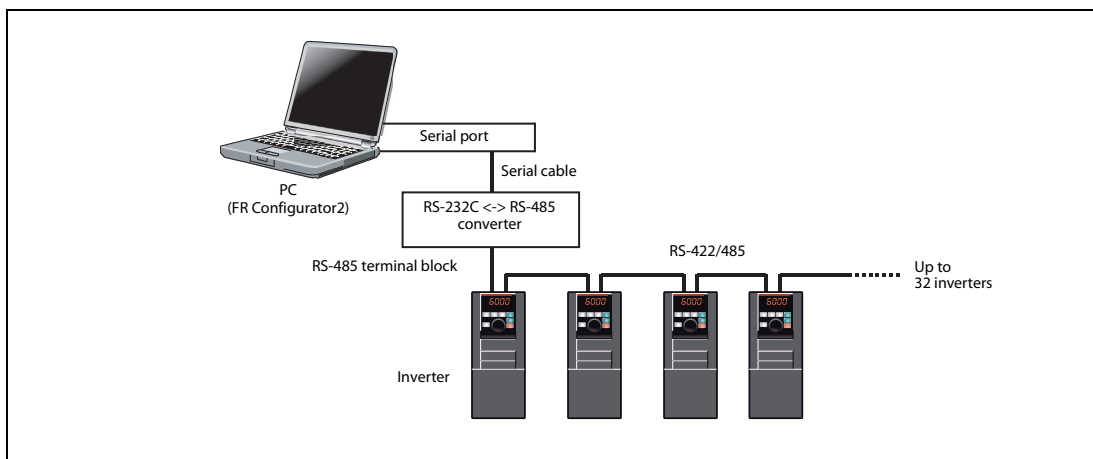


Fig. 1-5: Serial communication (RS-485 terminal)

- **Communication through GOT (USB / Serial communication)**, refer to chapter 1.4.5)
Through a GOT (Human Machine Interface), connection to the RS-485 terminal block is available. For the GOT1000 series, an RS-422 communication unit is required. For the compatible version of GOT or details of the RS-422/485 connection, refer to the GOT1000/GOT2000 Series Connection Manual.

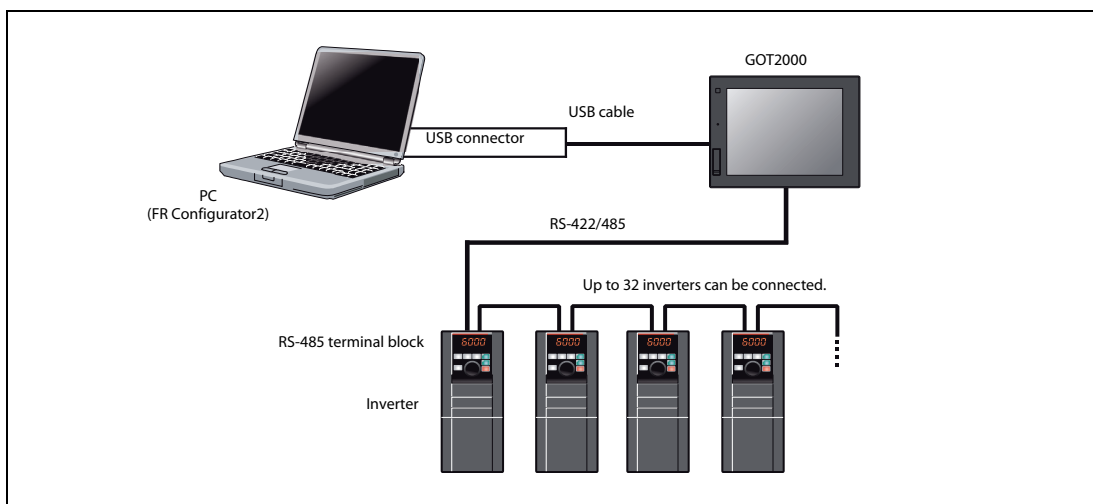


Fig. 1-6: Communication through GOT (USB / Serial communication)

NOTES

Inserting or pulling out a USB cable during FR Configurator2 operation may cause the inverter to be unrecognized. Insert and pull out the USB cable for several times, or reset the inverter with the USB cable connected to the personal computer.

If the Pr. 999 Automatic parameter setting setting is changed to "10 or 11" using the operation panel, parameter unit, etc. during FR Configurator2 operation, the inverter communication parameters will be changed, and such setting may disable the communication with FR Configurator2.

Do not set Pr. 999 while FR Configurator2 is used. (For Pr. 999, refer to the Instruction Manual (Detailed) of the inverter.)

Only the USB connection is available for connecting the GOT2000 series to a personal computer.

1.4.2 Connection using USB connector

To communicate with FR Configurator2 by the USB connection between the inverter and a personal computer, use the USB mini B connector at the inverter side. 1:1 connection is supported. Connection using USB hub is not supported.

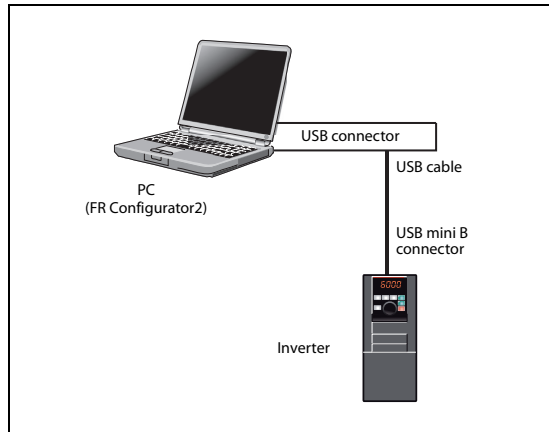


Fig. 1-7:
Connection using USB connector

USB mini B connector at the inverter side

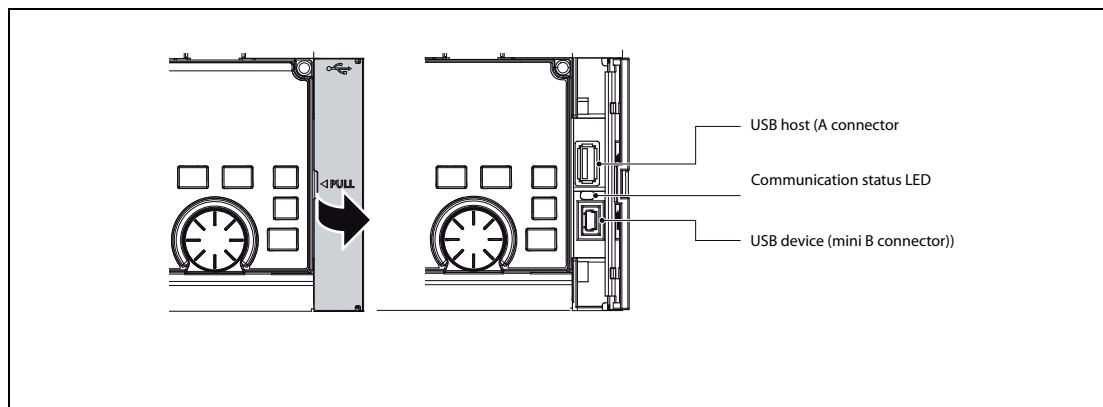


Fig. 1-8: USB mini B connector at the inverter side

Item	Description
Interface	USB1.1
Transmission speed	12 Mbps
Wiring length Maximum	5 m
Connector	USB mini B-connector (receptacle mini B type)
Recommended USB cable	MR-J3USBCBL3M (cable length: 3 m)

Tab. 1-2: Applicable cable

Related parameters for USB connection

Set the following communication parameter when connecting the USB connector of the inverter. When performing parameter writing or run command input, set the following command source parameters, and switch the operation mode to PU operation mode.

Inverter	Parameter setting		Operation mode
	Communication parameter	Command source parameter	
FR-A800/F800	Pr.548 USB communication check time interval = "9999 (initial value)"	Pr.551 PU mode operation command source selection = "3 or 9999" (initial value 9999)	PU

Tab. 1-3: Parameter settings for USB connection

NOTES

Switching of the operation mode is available using "test operation" (refer to chapter 3.7) or "parameter list" (refer to chapter 3.1) on the sub window.

Set a station number of the each inverter in Pr.547 USB communication station number. Perform inverter reset after setting the parameter.

Pr.	Name	Initial value	Setting range	Description
547 N040	USB communication station number ^①	0	0–31	Inverter station number specification.
548 N040	USB communication check time interval ^①	9999	0	USB communication is possible. Trips in the PU operation mode (E.USB)
			0.1–999.88 s	Sets the interval of communication check time. If a no-communication state persists for longer than the permissible time, the inverter trips (E.USB).
			9999	No communication check
551 D013	PU mode operation command source selection ^②	9999	1	Selects the RS-485 terminal as the PU operation mode command source.
			2	Selects the PU connector as the PU operation mode command source.
			3	Selects the USB connector as the PU operation mode command source.
			9999	USB automatic recognition Normally, operation panel (PU connector) is the command source. During USB connection, USB is the command source.

① Changed settings are enabled at the next power-ON or inverter reset.

② Pr. 551 is always write-enabled.

NOTE

Always reset the inverter after making the setting of the parameters. After you have changed the communication-related parameters, communication cannot be established until the inverter reset.

1.4.3 Connection using PU connector

PU connector is used for connecting with a computer. Serial port/RS-485 converter (cable) or USB/RS-485 converter (cable) is required. 1:1 connection is supported.

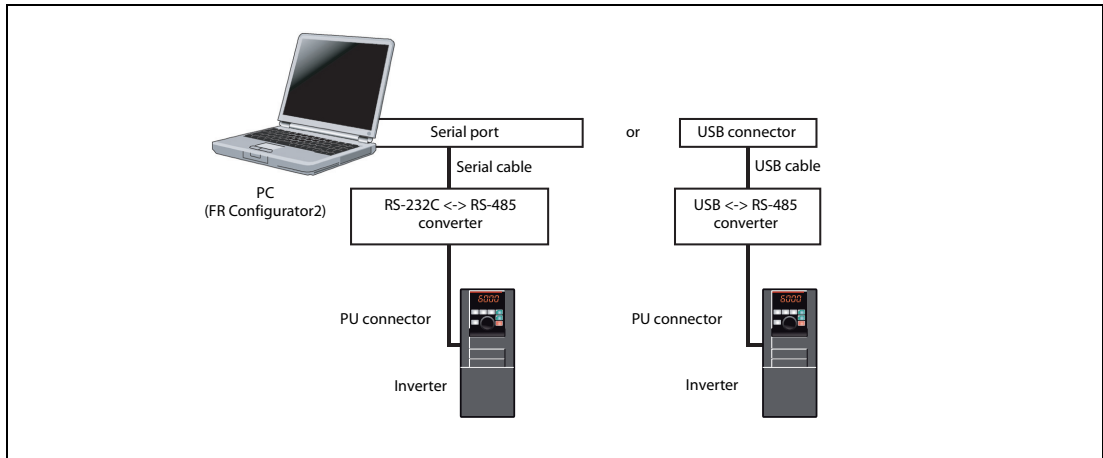


Fig. 1-9: Connection using PU connector

PU connector pin layout

Pin number	Name	Description
1)	SG	Earth (Ground) (Connected to terminal 5)
2)	—	Operation panel power supply
3)	RDA	Inverter receive+
4)	SDB	Inverter send-
5)	SDA	Inverter send+
6)	RDB	Inverter receive-
7)	SG	SG Earth (Ground) (Connected to terminal 5)
8)	—	Operation panel power supply

Tab. 1-4: PU connector pin layout

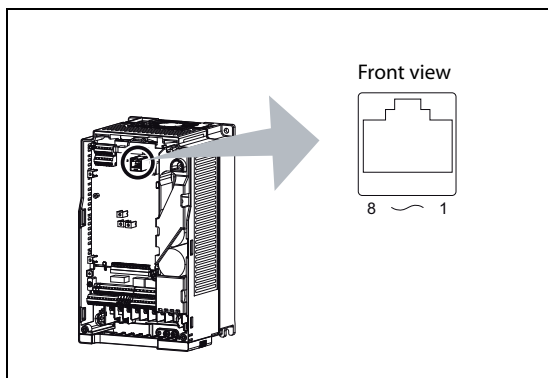


Fig. 1-10: Example with FR-A800

NOTES

Pins No. 2 and 8 provide power to the operation panel or parameter unit. Do not use these pins for RS-485 communication. (Refer to the inverter Instruction Manual for details.)

Do not connect the PU connector to the computer's LAN board, FAX modem socket or telephone modular connector. The product could be damaged due to differences in electrical specifications.

Related parameters for connection using PU connector

Set the following communication parameter when connecting PU connector of the inverter.

When performing parameter writing or run command input, set the following command source parameters, and switch the operation mode to the following operation mode.

Inverter	Communication option	Parameter setting		Operation mode
		Communication parameter	Command source parameter	
FR-A800/ F800	—	Pr.122 PU communication check time interval ? "0" Pr.123 PU communication waiting time setting = "9999 (initial value)"	Pr.551 PU mode operation command source selection = "2 or 9999" (initial value 9999)	PU

Tab. 1-5: Parameters for connection using PU connector

NOTES

Set 3 s or more (or 9999) in Pr.122 PU communication check time interval.

Set a station number of the each inverter in Pr.117 PU communication station number when connecting multiple inverters. Perform inverter reset after setting the parameter.

Pr.	Name	Initial value	Setting range	Description
117 N020	PU communication station number	0	0–31	Inverter station number specification. Set the inverter station numbers when two or more inverters are connected to one personal computer.
118 N021	PU communication speed	192	48, 96, 192, 384, 576, 768, 1152	Set the communication speed. The setting value ? 100 equals the communication speed. For example, if 192 is set, the communication speed is 19200 bps.
E022	PU communication data length	0	0	Data length 8 bits
			1	Data length 7 bits
E023	PU communication stop bit length	1	0	Stop bit length 1 bit
			1	Stop bit length 2 bits
119	PU communication stop bit length / data length	1	0	Stop bit length 1 bit
			1	Stop bit length 2 bits
			10	Stop bit length 1 bit
			11	Stop bit length 2 bits
120 N024	PU communication parity check	2	0	Without parity check
			1	With parity check at odd numbers
			2	With parity check at even numbers
121 N025	Number of PU communication retries	1	0–10	Set the permissible number of retries for unsuccessful data reception. If the number of consecutive errors exceeds the permissible value, the inverter will trip.
			9999	If a communication error occurs, the inverter will not trip.
122 N026	PU communication check time interval	9999	0	RS-485 communication is enabled. Note that a communication fault (E.PUE) occurs as soon as the inverter is switched to the operation mode with control source.
			0.1–999.8 s	Communication check (signal loss detection) time interval. If a no-communication state persists for longer than the permissible time, the inverter trips (depends on Pr. 502).
			9999	No communication check (signal loss detection).
123 N027	PU communication waiting time setting	9999	0–150 ms	Set the waiting time between data transmission to the inverter and response.
			9999	Set with communication data.

Pr.	Name	Initial value	Setting range	Description
551 D013	PU mode operation command source selection ①	9999	1	Selects the RS-485 terminal as the PU operation mode command source.
			2	Selects the PU connector as the PU operation mode command source.
			3	Selects the operation panel as the PU operation mode command source.
			9999	USB automatic recognition Normally, operation panel (PU connector) is the command source. During USB connection, USB is the command source.

① Pr.551 is always write-enabled.

NOTES

Always reset the inverter after making the setting of the parameters. After you have changed the communication-related parameters, communication cannot be established until the inverter reset.

To change an inverter parameter value, use the operation panel or parameter unit. Only one of the operation unit and FR Configurator2 (personal computer) can be connected to the PU connector.

For details on each inverter communication parameter, refer to the Instruction Manual (Detailed) of the inverter.

Parameter clear/All parameter clear by the operation panel or the parameter unit clears communication parameter settings and disables the communication with FR Configurator2.

1.4.4 Connection of multiple inverters using RS-485 terminal

RS-485 terminal is used for connecting multiple inverters with Serial port of a computer. Up to 32 inverters can be connected. Serial/RS-485 converter is required.

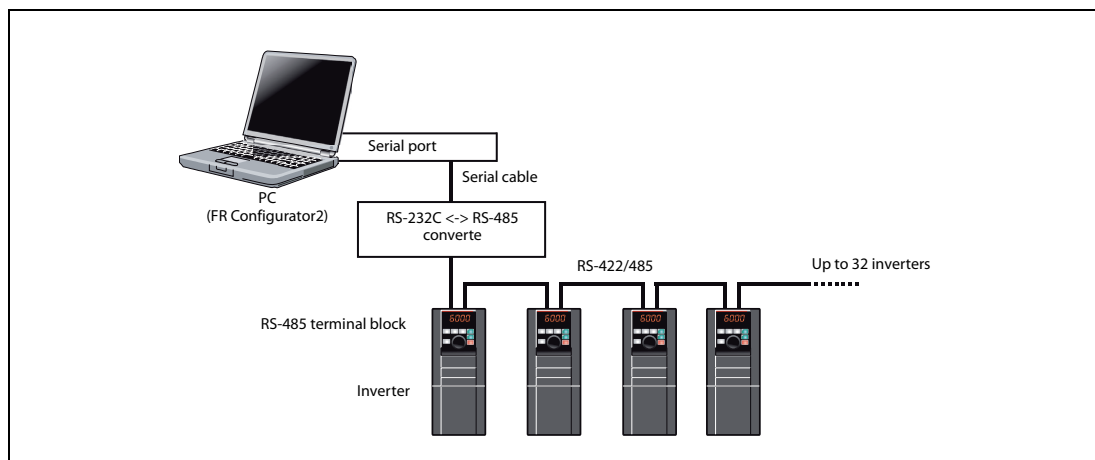


Fig. 1-11: Connection of multiple inverters using RS-485 terminal

Set the following communication parameter when connecting RS-485 terminal of the inverter. When performing parameter writing or run command input, set the following command source parameters, and switch the operation mode to the following operation mode.

Inverter	Communication option	Parameter setting		Operation mode
		Communication parameter	Command source parameter	
FR-A800/ F800	No	Set the station number of the each inverter in Pr.331 RS-485 communication station number (when connecting multiple inverters)	Initial value	NET
	Yes	Pr.336 RS-485 communication check time interval ? "0" (initial value 0) Pr.337 RS-485 communication waiting time setting = "9999 (initial value)"	Pr.551 PU mode operation command source selection = "1" (initial value 9999)	PU

Tab. 1-6: Parameters for multiple connection using RS-485 terminal

NOTES

- Always reset the inverter after making the setting of parameters. After you have changed the communication-related parameters, communication cannot be established until the inverter reset.
- For the details of wiring, refer to the Instruction Manual (Detailed) of the inverter.
- Set 3 s or more (or 9999) in Pr.122 PU communication check time interval, Pr.336 RS-485 communication check time interval.
- Set a station number of the each inverter in Pr.117 PU communication station number and Pr.331 RS-485 communication station number when connecting multiple inverters.

Pr.	Name	Initial value	Setting range	Description
331 N030	RS-485 communication station number	0	0–31	Set the inverter station number. Set the inverter station numbers when two or more inverters are connected to one personal computer.
336 N036	RS-485 communication check time interval	0s	0	RS-485 communication is enabled. However, the inverter trips if operation is changed to NET operation mode.
			0.1–999.8 s	Set the interval of communication check (signal loss detection) time. If a no-communication state persists for longer than the permissible time, the inverter trips.
			9999	No communication check (signal loss detection)
337 N037	RS-485 communication waiting time setting	9999	0–150 ms	Set the waiting time between data transmission to the inverter and response.
			9999	Set with communication data.
549 N000	Protocol selection	0	0	Pr.549 = "0" (Mitsubishi inverter (Computer link) protocol). Mitsubishi inverter protocol (computer link)
			1	Modbus-RTU protocol
			2	The setting is available only for the FR-F800 series.. BACnet MS/TP protocol
550 D012	NET mode operation command source selection	9999	0	The communication option is the command source when in the NET operation mode.
			1	The RS-485 terminals are the command source when in the NET operation mode.
			9999	Communication option is recognized automatically. Normally, the RS-485 terminals are the command source. When the communication option is mounted, the communication option is the command source.
551 D013	PU mode operation command source selection ^①	9999	1	Selects the RS-485 terminals as the PU operation mode command source.
			2	Selects the PU connector as the PU operation mode command source.
			3	Selects the USB connector as the PU operation mode command source.
			9999	AUSB automatic recognition. Normally, operation panel (PU connector) is the command source. During USB connection, USB is the command source.

① Pr.551 is always write-enabled.

1.4.5 Connection through GOT (FA transparent function)

Using the FA transparent function of GOT1000/GOT2000 series, connecting an inverter to FR Configurator2 is available through GOT.

The FA transparent function enables reading, writing and monitoring of a programmable controller of Mitsubishi Electric Corporation through GOT, while connecting the Mitsubishi programmable controller and a personal computer. A serial port or USB is used for connecting the personal computer and GOT. RS422/485 is used for connecting GOT and the inverter.

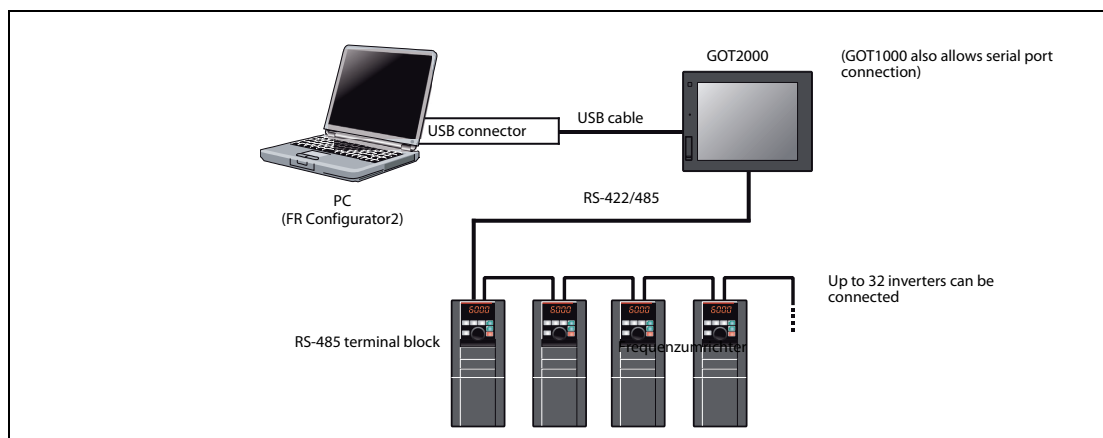


Fig. 1-12: Example of RS-485 terminal connection (GOT2000 connection)

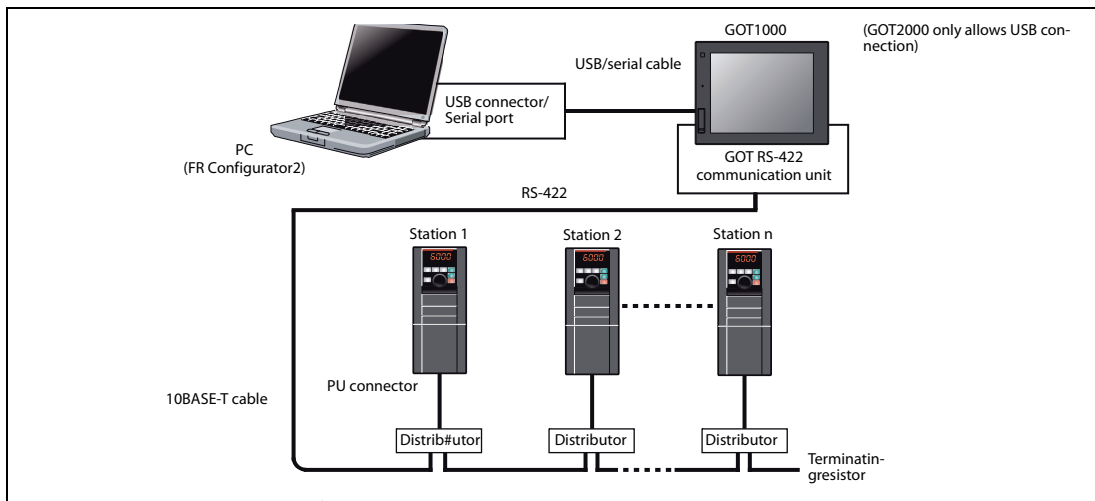


Fig. 1-13: Example of PU connector connection (GOT1000 connection)

For the GOT1000 series, an RS-422 communication unit (GT15-RS4-9S) is required. When using the USB for connecting a GOT, use a dedicated cable, GT09-C30USB-5P or GT09-C20USB-5P.

For the compatible version of the GOT or details of the RS-422/485 connection, refer to the GOT1000/GOT2000 Series Connection Manual.

NOTES

Do not perform the following operation while the FA transparent function is valid and FR Configurator2 is ONLINE.

- Online operation (project download, etc.) from GT Designer/GT Designer2 to GOT
- Online operation to programmable controller CPU by using FA transparent function of GX Developer or GX Works2

When using FA transparent communication, communication error (timeout) may occur when FR Configurator2 starts communication during timeout occurrence in GOT (when GOT is monitoring the inverter which is not connected). In that case, set the timeout time value more than the following.

Timeout value of GOT [s] ? (Retry count of GOT + 1)

If the value above is more than 30 [s], make adjustment to "Timeout value" [s] and "Retry count" of GOT to make the value above become less than 30 [s].

GOT2000 series automatic recognition

When the GOT2000 series is connected, the parameters required for the GOT connection are automatically changed by setting the automatic recognition on the GOT2000 series side.

Set the station number (Pr.117 or Pr.331) of the inverter before the automatic recognition is performed. Connect all the stations of inverters with GOT before the automatic recognition is performed. The inverter newly added after automatic recognition will not be recognized automatically. (When an inverter is added, perform the initial setting in Pr.999 Automatic parameter setting or set the automatic recognition on the GOT side again.)

Automatic change item	Automatic change parameter setting		Setting value after change
	PU connector	RS-485 terminal	
Communication speed	Pr. 118	Pr. 332	Depending on the setting of the connected device on the GOT side.
Data length/stop bit	Pr. 119	Pr. 333	
Parity	Pr. 120	Pr. 334	
Waiting time setting	Pr. 123	Pr. 337	
CR/LF selection	Pr. 124	Pr. 341	
Number of communication retries	Pr. 121	Pr. 335	9999 (fixed)
Communication check time interval	Pr. 122	Pr. 336	9999 (fixed)
Protocol selection	– (Pr.549 holds the value before the automatic recognition.)	Pr. 549	0 (fixed to Mitsubishi inverter protocol)

Tab. 1-7: Automatic change parameter setting

NOTES

| If the automatic recognition cannot be performed, initial setting in Pr.999 is required.

| For connection to a device other than the GOT2000 series, initial setting in Pr.999 is required.

| For details, refer to the GOT2000 Series Connection Manual (Mitsubishi Product).

Related parameters for connection through GOT

Set communication-related parameters automatically as follows. For connection through GOT, set Pr. 123 PU communication waiting time setting = "0", Pr. 337 RS-485 communication waiting time setting = "0". For connection to the PU connector, set Pr.999 Automatic parameter setting = "12". For connection to the RS-485 terminals, set Pr.999 = "13".

Pr.	Name	Initial value	Setting range	Description	
117 N020	PU communication station number	0	0–31	Inverter station number specification. Set the inverter station numbers when two or more inverters are connected to one personal computer.	
118 N021	PU communication speed	192	48, 96, 192, 384, 576, 768, 1152	Set the communication speed. The setting value ? 100 equals the communication speed. For example, if 192 is set, the communication speed is 19200 bps.	
E022	PU communication data length	0	0	Data length 8 bits	
			1	Data length 7 bits	
E023	PU communication stop bit length	1	0	Stop bit length 1 bit	
			1	Stop bit length 2 bits	
119	PU communication stop bit length / data length	1	0	Stop bit length 1 bit	Data length 8 bits
			1	Stop bit length 2 bits	
			10	Stop bit length 1 bit	Data length 7 bits
			11	Stop bit length 2 bits	
120 N024	PU communication parity check	2	0	Without parity check	
			1	With parity check at odd numbers	
			2	With parity check at even numbers	
121 N025	Number of PU communication retries	1	0–10	Set the permissible number of retries for unsuccessful data reception. If the number of consecutive errors exceeds the permissible value, the inverter will trip.	
			9999	If a communication error occurs, the inverter will not trip.	

Pr.	Name	Initial value	Setting range	Description
122 N026	PU communication check time interval	9999	0	RS-485 communication is enabled. Note that a communication fault (E.PUE) occurs as soon as the inverter is switched to the operation mode with control source.
			0.1–999.8 s	Communication check (signal loss detection) time interval. If a no-communication state persists for longer than the permissible time, the inverter trips (depends on Pr. 502).
			9999	No communication check (signal loss detection).
123 N027	PU communication waiting time setting	9999	0–150 ms	Set the waiting time between data transmission to the inverter and response.
			9999	Set with communication data.
124 N028	PU communication CR/LF selection	1	0	Without CR/LF
			1	With CR
			2	With CR/LF
331 N030	RS-485 communication station number	0	0–31 (0–247)	Sets the inverter station number (the same specifications as Pr. 117).
332 N031	RS-485 communication speed	96	3 to 6, 12 to 24, 48, 96, 192, 384, 576 to 768, 1152,	Select the communication speed (the same specifications as Pr. 118).
N032	PU communication data length	0	0/1	Select the data length. (the same specifications as Pr. N022)
N033	PU communication stop bit length	1	0/1	Select the data length. (the same specifications as. N023)
333	Stoppbitlänge/Datenlänge (RS-485-Schnittstelle)	1	0/1/10/11	Select the stop bit length. (the same specifications as Pr. 119)
334 N034	RS-485 communication stop bit length / data length	2	0/1/2	Select the parity check specifications. (the same specifications as Pr. 120)
335 N035	RS-485 communication retry count	1	0–10/9999	Set the permissible number of retries for unsuccessful data reception. (the same specifications as Pr. 121)
336 N036	RS-485 communication check time interval	0s	0	RS-485 communication is enabled. However, the inverter trips if operation is changed to NET operation mode.
			0.1–999.8.9.0 s	Set the interval of communication check (signal loss detection) time. If a no-communication state persists for longer than the permissible time, the inverter trips.
			9999	No communication check (signal loss detection)
337 N037	RS-485 communication waiting time setting	9999	0–150 ms/ 9999	Set the waiting time between data transmission to the inverter and response. (the same specifications as Pr. 123)
341 N038	RS-485 communication CR/LF selection	1	0/1/2	Select presence/absence of CR/LF. (the same specifications as Pr. 124)
549 N000	Protocol selection	0	0 ^①	Mitsubishi inverter (computer link) protocol.
			1	Modbus-RTU protocol
			2 ^②	BACnet MS/TP Protocol
551 D013	PU mode operation command source selection ^③	9999	1	The RS-485 terminals are the command source when in the PU operation mode.
			2	The PU connector is the command source when in the PU operation mode.
			3	The USB connector is the command source when in the PU operation mode.
			9999	USB automatic recognition Normally, the operation panel (PU connector) is the command source. When the USB is connected, the USB connector is the command source.

Pr.	Name	Initial value	Setting range	Description	
999 E431	Automatic parameter setting	9999 ^④	1	Standard PID setting	
			2	Extended PID setting	
			10	GOT initial setting (PU connector)	GOT side model selection: FR 500/700/800, sensorless servo
			11	GOT initial setting (RS-485 terminals)	
			12	GOT initial setting (PU connector)	GOT side model selection: FR 800 Automatic setting
			13	GOT initial setting (RS-485 terminals)	
			20	50 Hz rated frequency	
			21	60Hz rated frequency	
			9999	No action	

- ① Set Pr.549 = "0" (Mitsubishi inverter (Computer link) protocol).
- ② The setting is available only for the FR-F800 series.
- ③ Pr.551 can be always written regardless of the operation mode.
- ④ The read value is always "9999".

NOTE

Always perform an inverter reset after performing the initial setting of each parameter. After changing the communication-related parameters, communication cannot be made until the inverter is reset.

1.5 Setting of operation mode of the inverter

The inverter has three operation modes:

- External operation mode: Operation and frequency commands are given by an external potentiometer and switches, via control circuit terminals.
- PU operation mode: Operation and frequency commands are given by the operation panel, parameter unit, or RS-485 communication, via the PU connector.
- Network operation mode (NET operation mode): Operation and frequency commands are given via the RS-485 terminals or a communication option..

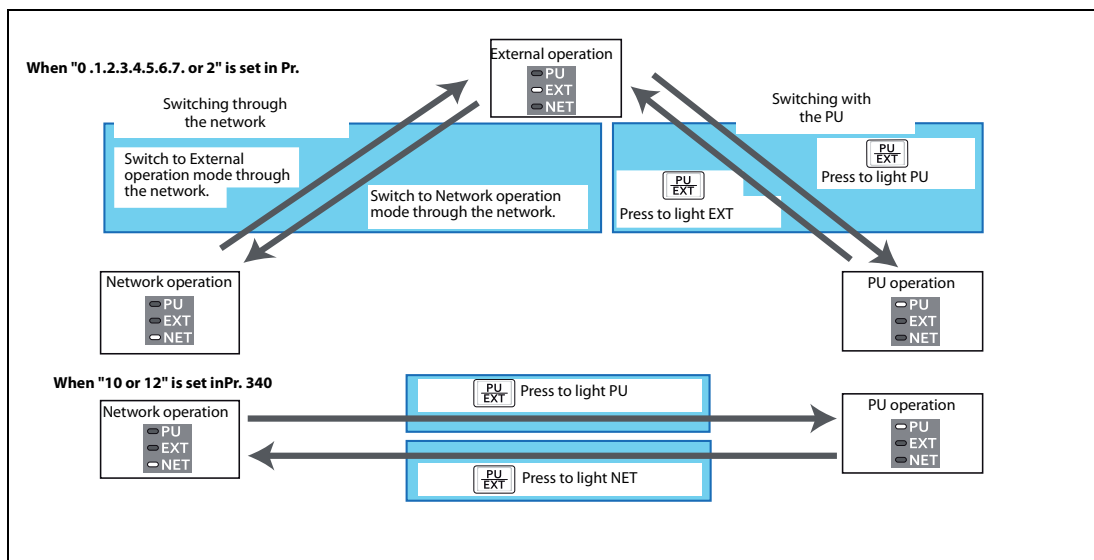


Fig. 1-14: Operation mode switchover

Pr. 79	Operation mode at power ON, at power restoration, or after a reset.	Operation mode switchover
0 (initial value)	External operation mode	Switching among the External, PU, and NET operation mode is enabled. Operation mode cannot be directly changed between the PU operation mode and Network operation mode.
1	PU operation mode	PU operation mode fixed.
2	External operation mode	Switching between the External and NET operation mode is enabled. Switching to PU operation mode is disabled.
3/4	External/PU combined operation mode	Operation mode switching is disabled.
6	External operation mode	Switching among the External, PU, and NET operation mode is enabled while running.
7	X12 (MRS) signal ON...External operation mode	Switching among the External, PU, and NET operation mode is enabled. Operation mode cannot be directly changed between the PU operation mode and Network operation mode.
	X12 (MRS) signal OFF...External operation mode	External operation mode fixed. (Forcibly switched to External operation mode.)

Tab. 1-8: Operation modes of the inverter

NOTE

When using USB connection, operation mode changing is available from FR Configurator2

Refer to the following table to select the appropriate operation mode for the connection. Switching of the operation mode is available using "test operation" or "parameter list" on the sub window. Refer to the Instruction Manual (Detailed) of the inverter for details of each parameter. Monitoring and parameter read can be performed from any operation regardless of the operation mode.

Operation location	Condition (Pr. 551 setting)	Item	Operation mode					
			PU operation	External operation	External/PU combined operation mode 1 (Pr. 79 = 3)	External/PU combined operation mode 2 (Pr. 79 = 4)	NET operation (when RS-485 terminals) ^⑥	NET operation (with communication option) ^⑦
Control by RS-485 communication via PU connector	2 (PU connector) 9999 (automatic recognition, without USB connection)	Run command (start)	✓	—	—	✓	—	—
		Run command (stop)	✓	◇ ^③	◇ ^③	✓	◇ ^③	◇ ^③
		Running frequency setting	✓	—	✓	—	—	—
		Monitor	✓	✓	✓	✓	✓	✓
		Parameter write	✓ ^④	— ^⑤	✓ ^④	✓ ^④	— ^⑤	— ^⑤
		Parameter read	✓	✓	✓	✓	✓	✓
		Inverter reset	✓	✓	✓	✓	✓	✓
	Other than the above	Run command (start)	—	—	—	—	—	—
		Run command (stop)	◇ ^③	◇ ^③	◇ ^③	◇ ^③	◇ ^③	◇ ^③
		Running frequency setting	—	—	—	—	—	—
		Monitor	✓	✓	✓	✓	✓	✓
		Parameter write	— ^⑤	— ^⑤	— ^⑤	— ^⑤	— ^⑤	— ^⑤
		Parameter read	✓	✓	✓	✓	✓	✓
Control by communication via RS-485 terminals	1 (RS-485 terminals)	Run command (start, stop)	✓	—	—	✓	—	—
		Running frequency setting	✓	—	✓	—	—	—
		Monitor	✓	✓	✓	✓	✓	✓
		Parameter write	✓ ^④	— ^⑤	✓ ^④	✓ ^④	— ^⑤	— ^⑤
		Parameter read	✓	✓	✓	✓	✓	✓
		Inverter reset	✓	✓	✓	✓	✓	✓
	Other than the above	Run command (start, stop)	—	—	—	—	✓ ^①	—
		Running frequency setting	—	—	—	—	✓ ^①	—
		Monitor	✓	✓	✓	✓	✓	✓
		Parameter write	— ^⑤	— ^⑤	— ^⑤	— ^⑤	✓ ^④	— ^⑤
		Parameter read	✓	✓	✓	✓	✓	✓
		Inverter reset	—	—	—	—	✓ ^②	—

Tab. 1-9: Select the appropriate operation mode for the connection

Operation location	Condition (Pr. 551 setting)	Item	Operation mode					
			PU operation	External operation	External/PU combined operation mode 1 (Pr. 79 = 3)	External/PU combined operation mode 2 (Pr. 79 = 4)	NET operation (when RS-485 terminals) ^⑥	NET operation (with communication option) ^⑦
Operation via the USB connector	3 (USB connector) 9999 (automatic recognition, with USB connection)	Run command (start, stop)	✓	—	—	✓	—	—
		Running frequency setting	✓	—	✓	—	—	—
		Monitor	✓	✓	✓	✓	—	✓
		Parameter write	✓ ^④	— ^⑤	— ^⑤	— ^⑤	— ^⑤	— ^⑤
		Parameter read	✓	✓	✓	✓	—	✓
		Inverter reset	✓	✓	✓	✓	—	✓
	Other than the above	Run command (start, stop)	—	—	—	—	—	—
		Running frequency setting	—	—	—	—	—	—
		Monitor	✓	✓	✓	✓	—	✓
		Parameter write	— ^⑤	— ^⑤	— ^⑤	— ^⑤	— ^⑤	— ^⑤
		Parameter read	✓	✓	✓	✓	—	✓
		Inverter reset	✓	✓	✓	✓	—	✓
Control by communication from communication option	—	Run command (start, stop)	—	—	—	—	—	✓ ^①
		Running frequency setting	—	—	—	—	—	✓ ^①
		Monitor	✓	✓	✓	✓	✓	✓
		Parameter write	— ^⑤	— ^⑤	— ^⑤	— ^⑤	— ^⑤	✓ ^④
		Parameter read	✓	✓	✓	✓	✓	✓
		Inverter reset	—	—	—	—	—	✓ ^②
External terminal at the control circuit	—	Inverter reset	✓	✓	✓	✓	✓	✓
		Run command (start, stop)	—	✓	✓	—	— ^①	—
		Running frequency setting	—	✓	—	✓	— ^①	—

Tab. 1-10: Select the appropriate operation mode for the connection

✓:Enabled, —:Disabled, ◇:Some are enabled

- ① As set in Pr.338 Communication operation command source, Pr.339 Communication speed command source.
- ② At occurrence of RS-485 communication error from PU connector, the inverter cannot be reset from the computer.
- ③ Enabled only when stopped by the PU. At a PU stop, PS is displayed on the operation panel. As set in Pr.75 Reset selection/disconnected PU detection/PU stop selection.
- ④ Some parameters may be write-disabled according to the Pr.77 Parameter write selection setting and operating status.
- ⑤ Some parameters are write-enabled independently of the operation mode and command source presence/absence. When Pr. 77 = "1", write is enabled. Parameter clear is unavailable.
- ⑥ BWhen Pr.550 NET mode operation command source selection = "1" (RS-485 terminals valid) or Pr.550 NET mode operation command source selection = "9999" and the communication option is not mounted.
- ⑦ When Pr.550 NET mode operation command source selection = "0" (communication option valid) or Pr.550 NET mode operation command source selection = "9999" and the communication option is mounted.

1.6 Start and close of FR Configurator2

1.6.1 Starting FR Configurator2

There are the following ways to start FR Configurator2.

- Start from Start menu
Click [Start] on the Taskbar of Windows, and point to [All Programs], [MELSOFT Application], [FR Configurator2], and select [FR Configurator2] in the sub menu to start FR Configurator2.
- Start from the project file (*.frc2)
(Refer to chapter 2.1)
Select the project file (*.frc2) and execute it (or press the Enter key). The project file settings will be read and FR. Configurator2 will be started. Drag and drop the project file to the execution file (FR2.exe) or to the shortcut icon of FR Configurator2. FR Configurator2 will be started.
- Start from Windows® Explorer
Select the executable file of FR Configurator2 (FR2.exe) by using Windows Explorer, and double-click (or hit Enter key) to start FR Configurator2.

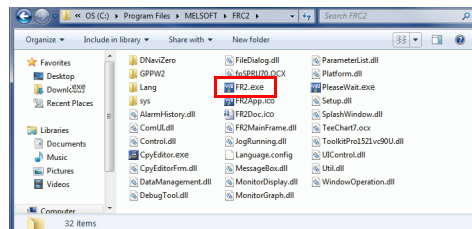


Fig. 1-15: Start from Windows Explorer

NOTES

The window „An unidentified program wants access to your computer“ may appear at the start up of FR Configurator2. If the window appears, select "Allow".

In an operation system with antivirus/security software, a warning may appear at starting FR Configurator2. If a warning appears, permit FR Configurator2 according to the setting procedure of your antivirus/security software.

If files shown in [Recent Items] of Windows Vista® and [Recent] of Windows® 7, Windows® 8 or Windows® 8.1 are stored in system folders (Program Files for example), the files may not be opened correctly.

1.6.2 Closing FR Configurator2

Close FR Configurator2 in the following procedure:

- Select [Exit] in [File] menu to close FR Configurator2. (Press Alt + P to open [Project] menu, and press Ctrl + F4 also to close FR Configurator2).

If a project file (*.frc2) is not saved yet when closing FR Configurator2, the dialog box is displayed to confirm the closing.

2 Project creation

2.1 Project file operation

2.1.1 Procedure to create a project

The following shows the procedure from creating project to operating the functions of FR Configurator2:

- Starting FR Configurator2
- Creating new project file (Window: System setting)
- Editing project data (Windows: Parameter list, Batch monitor, Graph, I/O terminal monitor, Test operation, Diagnostics)
- Use functions and tools (Windows: Developer, USB memory parameter copy file edit, Convert, Help)
- Saving project file.

2.1.2 Creating a new project file

Enter information required for creating a project file on the "System setting" window. Select [New] in the [Project] menu or click on the toolbar to display the "System setting" window.

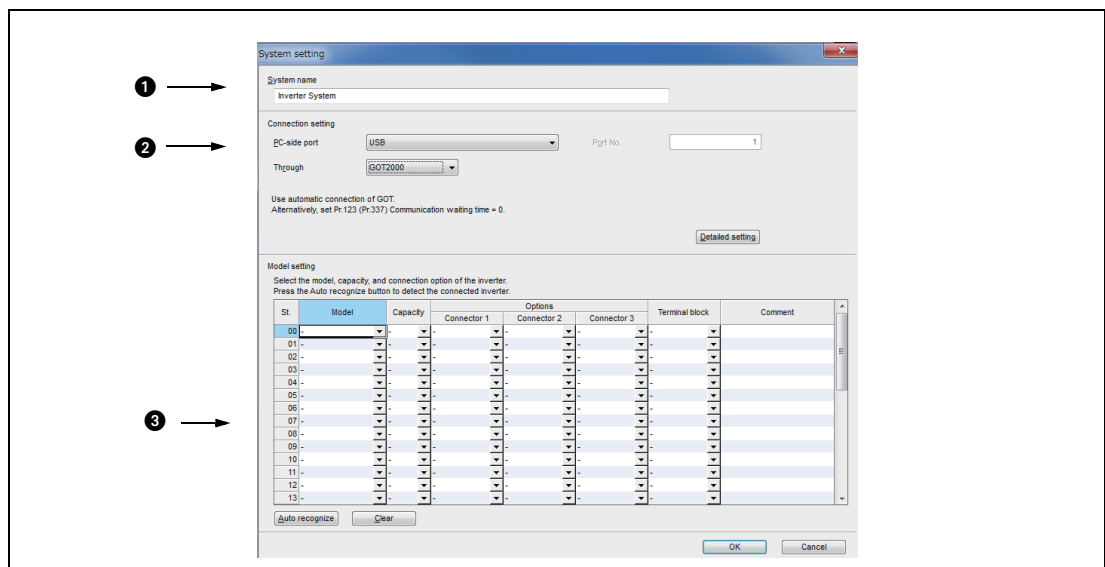


Fig. 2-1: Details of the "System setting" window

No.	Name	Function / description
1	System name	Enter the name of the system within 32 characters.
2	Connection setting	Set the connection type in [PC-side port], [Port No.], [Through], and [Detailed setting].
3	Model setting	For manual recognition: Select the model, capacity, and connection option of the inverter from the list. For automatic recognition: Select "Auto recognize" to enable FR Configurator2 to recognize the information about the connected inverter.

Tab. 2-1: Details of the "System setting" window

2.2 Explanation of the operating window

2.2.1 Main frame

The main frame (main screen) of FR Configurator2 consists of two areas:

- **Project tree area**
An area for showing information of the registered inverter, or for making settings. "System setting", "Graph", and "Batch monitor" are available in this area.
- **Sub-window area**
An area for showing obtained monitor data of the inverter. "Parameter list", "Graph", "Batch monitor", and "Faults history" are available in this area.

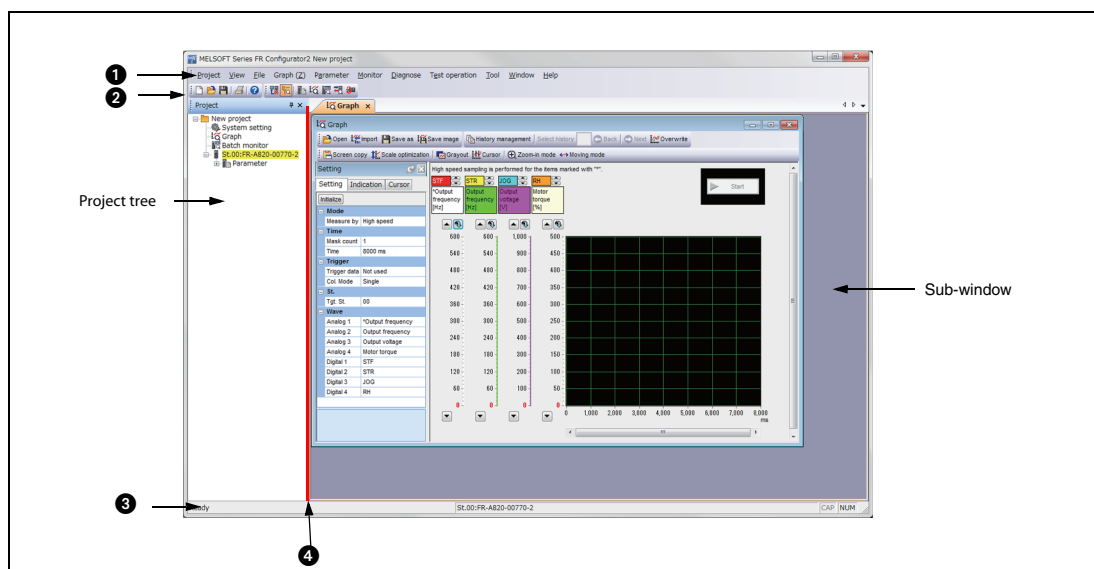


Fig. 2-2: Details of the main frame

No.	Name	Function / description	Refer to
1	Menu bar	The window of each function is displayed from the menu bar.	2.2.4
2	Toolbar	The window of each function is displayed in the sub-window area by selecting an icon on the toolbar.	2.2.4
3	Status bar	The model name, operating status, etc. are displayed.	2.2.5
4	Split line	Adjustment of the project tree area size and sub window area size is available. To resize the project tree area and sub window area to their original size, from [Window] of the menu bar, choose [Reset window layout].	—

Tab. 2-2: Details of the main frame

2.2.2 Project tree area

The project tree area displays a list of the project data including "Parameter list" of the inverters registered in the project, "System setting", "Graph", and "Batch monitor". Select such an item to display the window in the sub-window area.

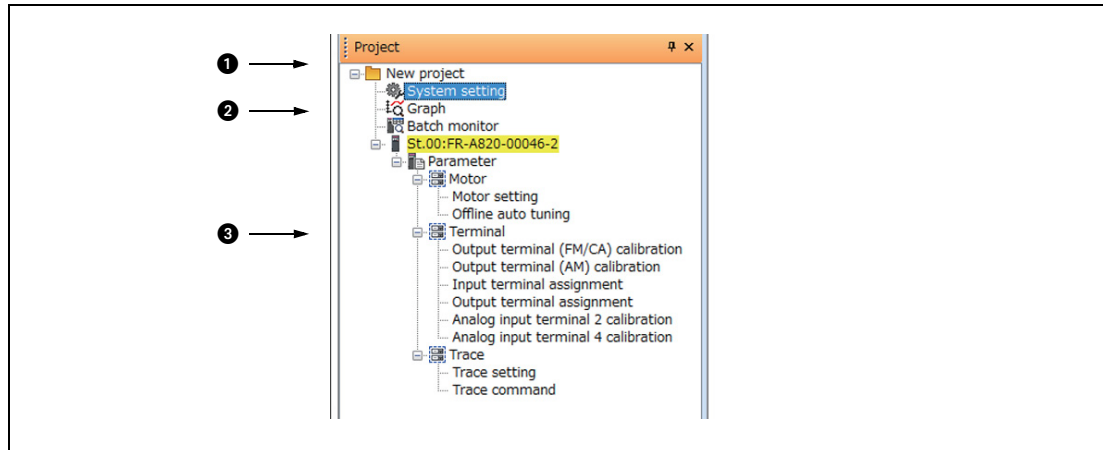


Fig. 2-3: Details of the project tree

No.	Name	Function / description
1	Project name	Displays the project name.
2	System setting	Displays the system setting window in the sub-window area.
	Graph	Displays the graph window in the sub-window area.
	Batch monitor	Displays the batch monitor screen in the sub-window area.
3	Station number: inverter mode	Displays the station number and the model of the inverter registered in the project. Click "Station number: inverter model" to select the corresponding station number. The selected "Station number: inverter model" is highlighted in yellow. (If the main frame is not selected, "Station number: inverter model" is displayed in gray.) Click "Plus" on the left of the icon to spread the tree view and display [Parameter].
	Parameter	Click [Parameter] to display the "parameter list" in the sub window area.
	Motor	Click [Motor] to select the window for motor setting or offline auto tuning.
	Terminal	Click [Terminal] to select the window for terminal calibration or function assignment.
	Trace	Click [Trace] to select the window for trace function setting or trace command execution.

Tab. 2-3: Details of the project tree

Display and switching of the project tree area

Select [Project window] from [Docking Window] in the [View] menu to switch the display of the project tree area among display and hidden.

2.2.3 Sub-window area

The sub-window area is for displaying, reading, and writing parameters, and for displaying the information read from the inverter. Select a function in the [Window] menu or click an icon on the toolbar to switch the windows in the sub-window area.

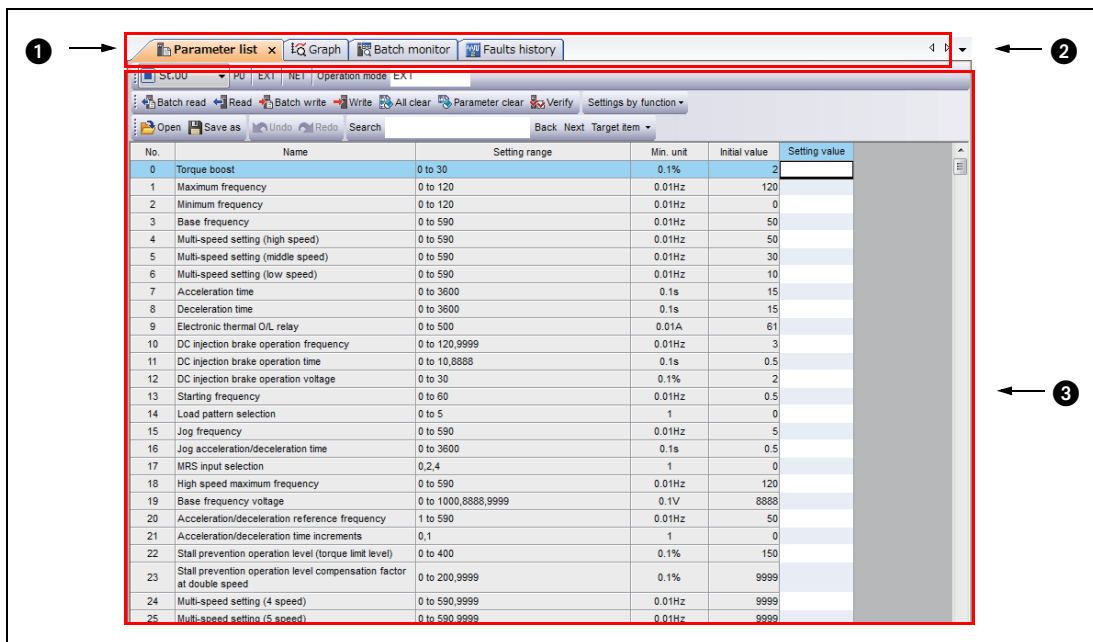











Fig. 2-4: Details of the sub-window area

No.	Name	Function / description
1	Tab	Displays the names of functions in tab format. Click a tab to move the corresponding sub window to the front and operate it. Drag a tab to change the order of the sub windows. Click the ? button on the tab to close the corresponding sub window. (When the window cannot display all the tabs, the tabs can be scrolled by the button.)
2	Sub-window selection button	Displays a list of the displayed sub windows. Select a sub window from the list to display it front.
3	Sub-window display area	Displays a function window of FR Configurator2.








Tab. 2-4: Details of the sub-window area

2.2.4 Menu bar and toolbar





















The window of a desired function can be displayed by selecting it from the menu or on the toolbar.

Menu	Pull-down menu	Toolbar icon	Function / operation
Project	<u>N</u> ew...		Displays the system setting window.
	<u>O</u> pen...		Opens a project file (*.frc2).
	<u>C</u> lose...	—	Closes the project file (*.frc2).
	<u>S</u> ave		Saves the project file (*.frc2). When the project file (*.frc2) has not been read or not created yet, the "Save As" window is displayed to save the project file.
	Save <u>A</u> s...	—	Names the current setting and saves it as a project file (*.frc2).
	<u>S</u> ystem setting	—	Used to check and change the system setting.
	<u>P</u> rint <u>p</u> review	—	Used to check the print screen of the selected sub window.
	<u>P</u> rint...		Prints the selected sub window.
	<u>E</u> xit FR Configurator2	—	Exits FR Configurator2.
View	<u>S</u> ystem	—	Shows or hides the system toolbar.
	<u>C</u> all function	—	Shows or hides the call function toolbar.
	<u>S</u> tatus bar	—	Shows or hides the status bar.
	<u>D</u> ocking Window/Project window		Shows or hides the project window.
File ^①	<u>O</u> pen...		Opens a file related to the function of the sub window that is displayed front.
	<u>I</u> mport...		Imports files (*.gp4 or *.st1) when the graph window is opened. Use this function to compare them with the previous waveform data by displaying them together.
	Save <u>A</u> s...		Saves the data related to the function of the sub window that is displayed front as new data with a name.
	Save <u>i</u> mage in file...		Saves the graph window as graph data (*.jpg or *.emf) when the graph window is opened.




Tab. 2-5: Menu/Toolbar list

Menu	Pull-down menu	Toolbar icon	Function / operation	
Parameter list (Z) ^①	PU	—	Activates the PU operation mode.	
	EXT	—	Activates the External operation mode.	
	NET	—	Activates the NET operation mode.	
	Batch read		Reads all the set values of the parameters of the selected inverter.	
	Read		Reads the set value of the selected parameter of the selected inverter.	
	Batch write		Writes all the parameter setting values entered in the setting field to the selected inverter.	
	Write		Writes the set value of the selected parameter to the selected inverter.	
	All clear		Returns all parameters which can be cleared including calibration parameters and terminal function selection parameters to their initial values.	
	Parameter clear		Returns parameters excluding calibration parameters and terminal function selection parameters to their initial values.	
	Verify		Verifies the set values of the parameters set in FR Configurator2 with those of the parameters written in the inverter.	
	Settings by function/ Motor	Motor setting	—	Displays the window for the motor and the control method setting
		Offline auto tuning	—	Displays the window to perform offline auto tuning.
	Settings by function/ Terminal	Output terminal (FM/CA) calibration	—	Displays the window to calibrate terminal FM/CA.
		Output terminal (AM) calibration	—	Displays the window to calibrate terminal AM.
		Input terminal assignment	—	Displays the window to assign functions to input terminals.
		Output terminal assignment	—	Displays the window to assign functions to output terminals.
		Analog input terminal 2 calibration	—	Displays the window to calibrate terminal 2.
		Analog input terminal 4 calibration	—	Displays the window to calibrate terminal 4.
	Settings by function/ Trace	Trace setting	—	Displays the window for the trace-related setting.
		Trace command	—	Displays the window to perform trace commands such as sampling start/end.

Tab. 2-5: Menu/Toolbar list

Menu	Pull-down menu	Toolbar icon	Function / operation
Graph (Z) ^①	S <u>creen copy</u>		Saves the entire sub window as image data (*.bmp) to the clipboard.
	S <u>cale optimization</u>		Adjusts the scale of the vertical axis and the position of zero so that the entire waveform of the selection history can be displayed in the window.
	<u>M</u> oving mode		Used to scroll the displayed waveform data.
	<u>Z</u> oom-in mode		Used to zoom in the specified area of a waveform.
	<u>C</u> ursor		Shows or hides the cursor on the screen.
	<u>G</u> rayout		Switches the display color (color or gray scale) of the waveform and the graph on the screen.
	<u>O</u> verwrite		Enables or disables overwriting for all the histories.
	<u>H</u> istory management...		Shows or hides the waveform history screen.
	Property window/ Setting	—	Shows or hides the setting tab.
	Property window/ Indication	—	Shows or hides the indication tab.
	Property window/ Cursor	—	Shows or hides the cursor tab.
Batch monitor (Z) ^①	<u>P</u> ause		Pauses the acquisition of the monitor data.
	<u>R</u> esume		Resumes the acquisition of the monitor data.
	<u>S</u> etting...		Sets the monitored item to be displayed.
I/O terminal monitor (Z) ^①	<u>P</u> ause		Pause the acquisition of the I/O terminal monitor data.
	<u>R</u> esume		Resumes the acquisition of the I/O terminal monitor data.
Faults history (Z) ^①	Faults history <u>c</u> lear		Clears the faults history of the inverter.
	Inverter <u>r</u> eset		Resets the inverter.
Operation mode (Z) ^①	<u>P</u> U	—	Activates the PU operation mode.
	<u>E</u> XT	—	Activates the External operation mode.
	<u>N</u> ET	—	Activates the NET operation mode.
Parameter	<u>P</u> arameter list...		Displays the "Parameter list" window in the sub-window area.
	<u>C</u> onvert...	—	Displays the "Convert" window in the sub-window area.
Monitor	<u>G</u> raph...		Displays the "Graph" window in the sub-window area.
	<u>B</u> atch-Monitor...		Displays the "Batch monitor" window in the sub-window area.
	<u>I</u> /O terminal monitor...		Displays the "I/O terminal monitor" window in the sub-window area.
Diagnose	<u>F</u> aults history...	—	Displays the "Faults history" window in the sub-window area.
	<u>S</u> erial number...	—	Displays the "Serial number" window in the sub-window area.
Test operation	<u>T</u> est operation...		Shows the command sending section of "Test operation".

Tab. 2-5: Menu/Toolbar list

Menu	Pull-down menu	Toolbar icon	Function / operation
Tool	Developer...		Starts Developer.
	USB memory parameter copy file function edit		Starts the USB memory parameter copy file editor.
Window	Cascade	—	Cascades sub windows.
	Tile horizontally	—	Tiles sub windows horizontally.
	Tile vertically	—	Tiles sub windows vertically.
	Arrange icons	—	Arranges sub windows that are displayed as icons.
	Close all	—	Closes all the sub windows.
	Reset window layout	—	Resets the layout and the sizes of the toolbar, docking windows, and sub windows to each initial status.
	Opened sub window (Example) Parameter list 1	—	Select this item to display the opened sub window.
Help	FR Configurator2 help...		Starts the help.
	About...	—	Opens the "About" window.

Tab. 2-5: Menu/Toolbar list

- ① The function menu related to the front sub window is displayed. When no sub window is displayed in the sub-window area, these items are not displayed on the menu bar.

Communication management

Online/offline can be switched for communication between FR Configurator2 and the inverter from the menu on the toolbar.

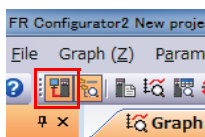




Fig. 6-5: Communication management

The online/offline condition of communication between FR Configurator2 and the inverter can be checked by the icon that is displayed.

Display	Status
	Offline
	Online

Tab. 2-6: Communication status

2.2.5 Status bar

The status bar displays the operation mode of the inverter, the model information etc.

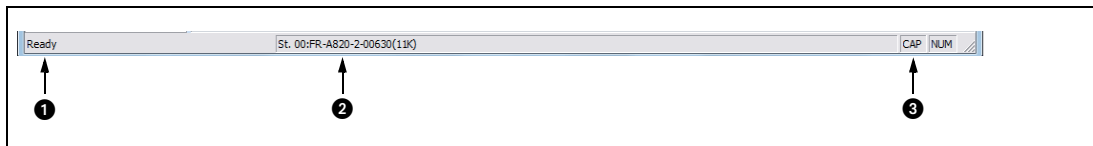


Fig. 2-6: Details in the status bar

No.	Name	Function / description
①	Window status display	Displays the function description when the mouse cursor is on an item on the menu bar or an icon on the toolbar.
②	Station information	Displays the model information of the inverter that is selected in the project tree. The display format is "Station number: Inverter model".
③	Keyboard status	„CAP“: Black = Caps Lock: ON, Gray = Caps Lock: OFF
		„NUM“: Black = Num Lock: ON, Gray = Num Lock: OFF

Tab. 2-7: Details in the status bar

2.3 File operation and print

2.3.1 List of file types

Extension	Description	Window	Open	Save	Import	Refer to
*.frc2	Manages the system setting, model information, parameter list, sampling data of graph, and data of the batch monitor with a single file.	All windows	✓	✓	—	2.1.2
*.gp4	Holds the waveform data sampled by the graph function. The saved waveform data can be displayed again by opening the file with the graph function.	Graph	✓	✓	✓	3.3
*.csv	Holds the waveform data sampled by the graph function in the text file format.		—	✓	—	
*.st1	Holds the operating status of the inverter in a USB memory tracing it.		✓	—	4	
*.jpg	Holds the waveform data of the displayed graph window as an image file.		—	✓	—	
*.emf			—	✓	—	
*.csv	Holds the acquired serial number of the inverter in the text file format.	Serial number	—	✓	—	3.6.2
*.pr4	Holds the parameter setting values set in FR Configurator2.	Parameter list	✓	✓	—	3.1
*.xls	Holds Parameter List data in Microsoft Excel format.		—	✓	—	
*.cp1	Holds the parameter setting that has been copied from the inverter to a USB memory device.	USB memory parameter copy file edit	✓	✓	—	3.9


Tab. 2-8: List of file types

✓: Available,
—: Unavailable)


2.3.2 Open the file

Opening a project file (*.frc2)

This function reads the information of each function window that is saved in a project file (*.frc2), such as model information and parameter setting values, and reflects it to the windows.


Select [Open] in the [Project] menu or click  on the toolbar to display the "Open the file" window. To read a saved file, select the target file, then press the [Open] button. Regardless whether each function window is shown or hidden, the information of the opened file is reflected to FR Configurator2.

Open the file of each function

The information of files having an extension *.gp4, *.pr4, or *.cp1 can be imported and displayed on the screen by clicking  on the toolbar of each function window while the corresponding function window is displayed.


2.3.3 Save the file

Projektdateien (*.frc2) speichern


Select [Save As] in the [Project] menu or the [File] menu or click  on the toolbar to display the "Save As" window. Check the save destination, name a file, and save it.

Select [Save] in the [Project] menu or the [File] menu to overwrite the file. When saving a file for the first time, "Save As" window is displayed.

2.3.4 Import the data (*.gp4)

By importing the saved data (*.gp4) of the "Graph", the information of the data can be displayed on the "Graph" sub window. Select [Import] in the [File] menu or click  on the toolbar to display a window for selecting the importing file.

2.3.5 Print

The windows of "Parameter List" or "Graph" can be printed. Select [Print...] in the [Project] menu or click  on the toolbar.

NOTES


The comments entered in the system setting window are printed in the comment field of the parameter list.

The graph drawing area is printed in black. To print the area in white, turn ON the grayout setting before printing.

The displayed position in the print preview may differ from the actual printed position on a print.

3 Function

3.1 Parameter list

To display the "Parameter list", select [Parameter list...] in the [Parameter] menu, or the "Parameter list" can be displayed by clicking  on the toolbar. "Parameter list" cannot be displayed if no project file has been created, or if no project file is open.

NOTES

FR Configurator2 parameter list supports the latest inverter at the time of FR Configurator2 upgrade. The setting range, initial value, number of parameters, etc., may be different with the inverter before upgrading (additional functions).

Although the parameter name of the instruction manual and the parameter name of FR Configurator2 may be different, there is no difference in the parameter function.

Pr.296 and 297 do not appear in the parameter list. Pr.296 and 297 will not change even if parameter settings of another inverter are read. Change Pr.296 and 297 from the operation panel or the parameter unit.

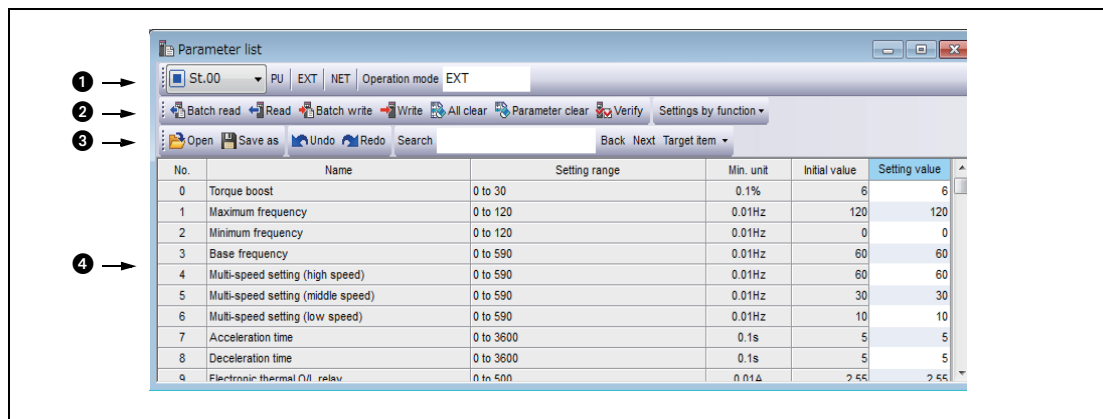


Fig. 3-1: Details in the window "Parameter list"

No.	Name	Function/description
①	St. No. (Station number)	Selects a station registered in the project.
	Operation mode switch	The inverter operation mode can be switched by selecting the operation mode button.
	Operation mode indication	Shows the operation mode.
②	Batch read	Selects a station registered in the project.
	Read	The inverter operation mode can be switched by selecting the operation mode button.
	Batch write	Writes all the selected parameter setting values in the setting value column to the selected inverter.
	Write	Writes all selected parameter setting values to the selected inverter.
	All clear	Returns all parameters which can be cleared including calibration parameters and terminal function selection parameters to their initial values.
	Parameter clear	Returns parameters excluding calibration parameters and terminal function selection parameters to their initial values.
	Verify	Verifies the parameter settings, initial values and parameter files (*.pr4) set in FR Configurator2 against such settings already written to the inverter.
	Settings by function	Perform motor, terminal, and trace settings by function.

Tab. 3-1: Details in the window "Parameter list"

No.	Name	Function/description
③	Open	Displays the "Open" dialog box for a parameter file (*.pr4) to be opened.
	Save as	Shows the "Save as" dialog box. Verifies the save location, and saves with the specified [File Name]. The extension for savable parameter information files is *.pr4. The parameter list data can also be saved in the Microsoft Excel file format (*.xls) by using "File Type" in the "Save as" dialog box.
	Undo	Returns the edited parameter setting value to the setting value before editing.
	Redo	Redoes the setting value changed by "Undo".
	Search	Searches for the input character string from within the parameter list.
	Back	Searches for the input character string in the downward direction.
	Next	Searches for the input character string in the upward direction.
	Target item	Specifies the column to search.
④	Number	Shows the parameter number. Calibration parameters (Pr.902, 903, 904, 905, etc.) will be shown with ().
	Name	Shows the parameter name.
	Setting range	Shows the setting range of the parameter setting value.
	Minimum setting unit	Shows the minimum setting unit of the parameter setting value.
	Initial value	Shows the factory default parameter setting values of the inverter.
	Setting value	Inputs the value to be written to the inverter. Selecting [Write] or [Batch write] will write the setting value field data to the inverter.

Tab. 3-1: Details in the window "Parameter list"

NOTE

To display the explanation about a parameter on the help window, double-click the parameter in the parameter list.

3.2 Convert

Parameter settings of the conventional models can be copied to the 800 series parameter settings in the "Convert" window. To display the "Convert" window, select [Convert...] in the [Parameter] menu.

Source	Target
FR-A700	FR-A800
FR-F700(P)	FR-F800

Tab. 3-2: *Models compatible with the convert function*

NOTES

Although the parameter name described in this instruction manual and the parameter name displayed in FR Configurator2 may be different, there is no difference in the parameter function.

If an option non-compatible with the target inverter is connected to the source inverter, if a unit for setting a parameter is fixed by the option while Pr.37 Speed display and Pr.144 Speed setting switchover of the source inverter are set to change the unit, the setting of the source inverter is copied unchanged to the target inverter.

(Example)

When the FR-A7NL option is connected to the source inverter FR-A720-0046, Pr.37 = "0" and Pr.144 = "104", and the target inverter is the FR-A820-0046-1, Pr.37 = "0" and Pr.144 = "104" are copied unchanged to the target inverter. Since the unit of the source inverter is "Hz" and the unit of the target inverter is "r/min", the parameter setting in Hz is copied unchanged to the target inverter.

3.3 Graph

The inverter output frequency, current, and other data is sampled, and the result is displayed in a graph (waveform). Sampled data can be saved to a file (*.jpg, *.emf, *.gp4, or *.csv file), and sampling data saved to a file can be read (*.gp4 file, or *.st1 import) and displayed.

The [Graph] window can be displayed by selecting [Graph] from the [Monitor] menu, or by clicking



on the toolbar. There are two types of sampling methods:

There are two types of sampling methods.:

- High speed sampling (available only during USB connection)
Data is collected with the shortest sampling interval, approx. 0.125 [ms]. The target station of the sampling is only 1 station.
- Monitor sampling
The sampling interval varies depending on communication settings (communication speed, communication port) and the number of sampling items.

Setting item	Specifications
Sampling interval	High speed sampling: Set to between approx. 1 [ms] (mask count: 1) and approx 20 [ms] (mask count: 30). Monitor sampling: Set to the range from 50 [ms] to 60000 [ms] (varies due to communication speed, communication port, and number of sampling items)
Sampling time [ms]	High speed sampling: Maximum = (mask count + 1) x 4000 Monitor sampling: Maximum = sampling interval x 4000
Analog data	Analog data for 4 channels can be sampled.
Digital data	Digital data for 4 channels can be sampled.

Tab. 3-3: Specifications

Trace data display

Displays in the graph window the trace data that is saved to the USB memory by the inverter.

Setting item	Specifications
Analog data	Analog data for 8 channels can be displayed in the graph window.
Digital data	Digital data for 8 channels can be displayed in the graph window.

Tab. 3-4: Specifications

NOTES

Running other applications during high speed sampling, or performing personal computer file operations during high speed sampling, etc., will cause communication errors (error code 0x80020007 or 0x80020008) or buffer overflow errors to occur, and data will not be able to be displayed correctly. In this case, execute such countermeasures as terminating the other applications, refraining from operation of FR Configurator2, and increasing the mask count setting of the sampling interval.

The sampling interval varies depending on the inverter control method and presence/absence of plug-in options.

Graph window

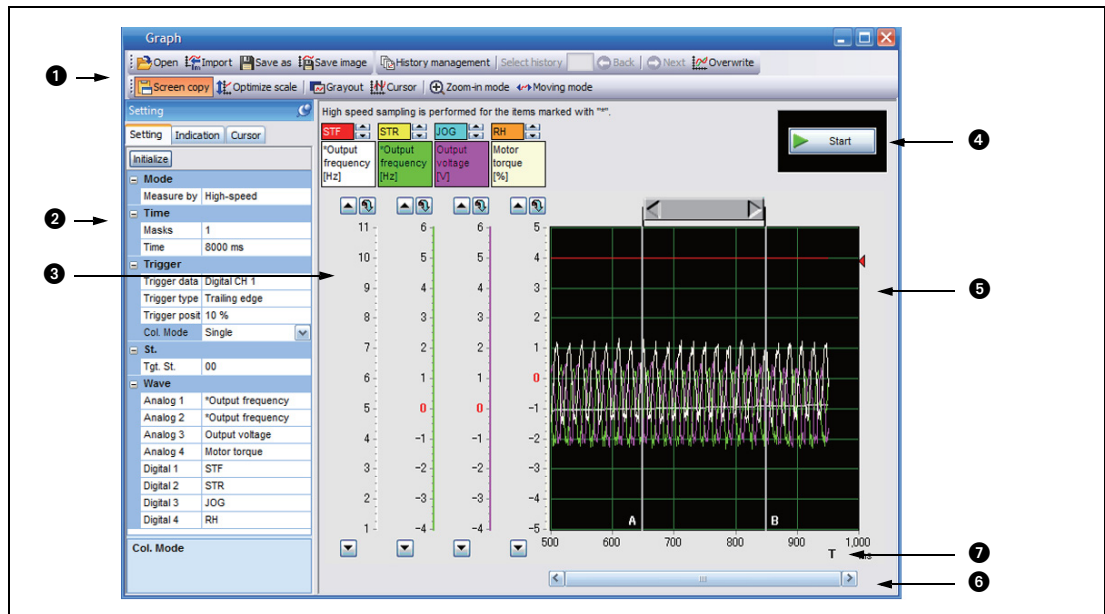


Fig. 3-2: Details in the window "Graph"

No.	Name	Function/description
1	Toolbar	Allows operation of the file, history control, and graph display settings.
2	Properties	Setting of the measurement conditions, display conditions, and cursor can be done in the properties.
3	Sampling item column	Displays the contents of the analog CH and digital CH set by [Waveform] in the settings tab of the condition properties.
4	Measurement start/stop button	Starts sampling.
		Stops sampling. This button only appears when operating.
5	Graph display area	Displays the sampled data in a graph.
6	Horizontal axis scrollbar	Allows scrolling of the displayed section in the graph display area.
7	Trigger position	Shows the position in which the trigger completes. "T" on the graph horizontal axis denotes measuring time period.

Tab. 3-5: Details in the window "Graph"


NOTES

If a fault occurs during sampling, sampling continues. If a normal communication with inverter is not maintained (communication error, etc.), the sampling stops.

During sampling, other communication tasks such as parameter reading are unavailable.

When parameter write is performed during measurement of graph, waveform data may be incorrect.

3.4 Batch monitor

"Batch monitor" monitors more than one inverter monitored item at a time. To show the "Batch monitor" window, select [Batch monitor (D)] in the [Monitor] menu, or select [Batch monitor] from the project tree or click  on the toolbar.

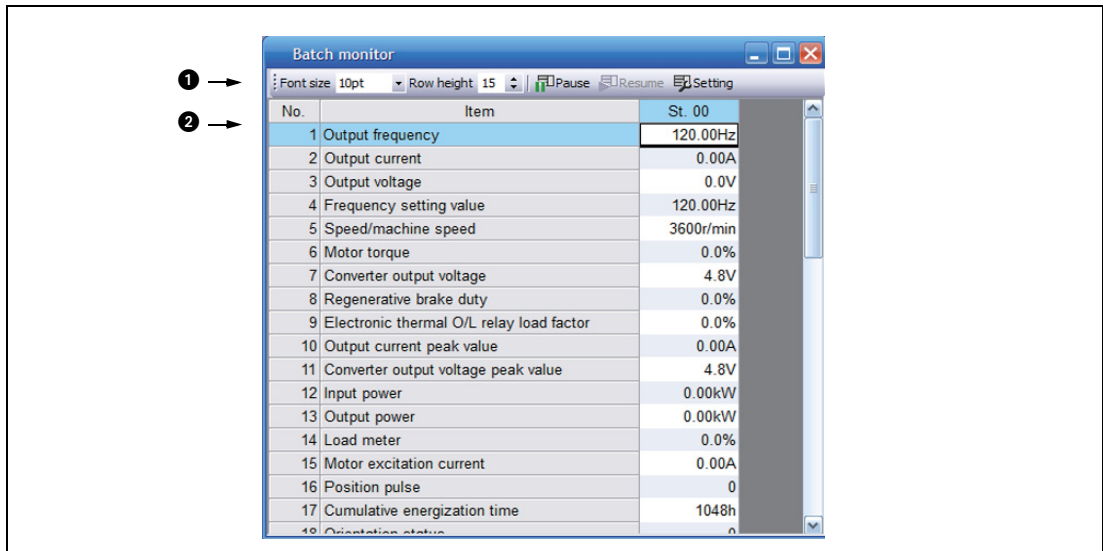



Fig. 3-3: Details in the window "Batch monitor"

No.	Name	Function/description
①	Font size	Changes the size of monitor item characters.
	Pause	Pauses acquisition of monitor data.
	Resume	Resumes acquisition of monitor data.
	Setting	Sets the monitor items to display.
②	No.	Shows the monitor item number.
	Item	Shows the monitor item.
	St. No. (Station number)	Shows the acquired data of the corresponding station.

Tab. 3-6: Details in the window "Batch monitor"

3.5 I/O terminal monitor

The "I/O terminal monitor" window shows the signals assigned to the I/O terminals of the control circuit and the ON/OFF status of the signals. To display the "I/O terminal monitor" window, select [I/O terminal monitor...] in the [Monitor] menu, or click  on the toolbar.

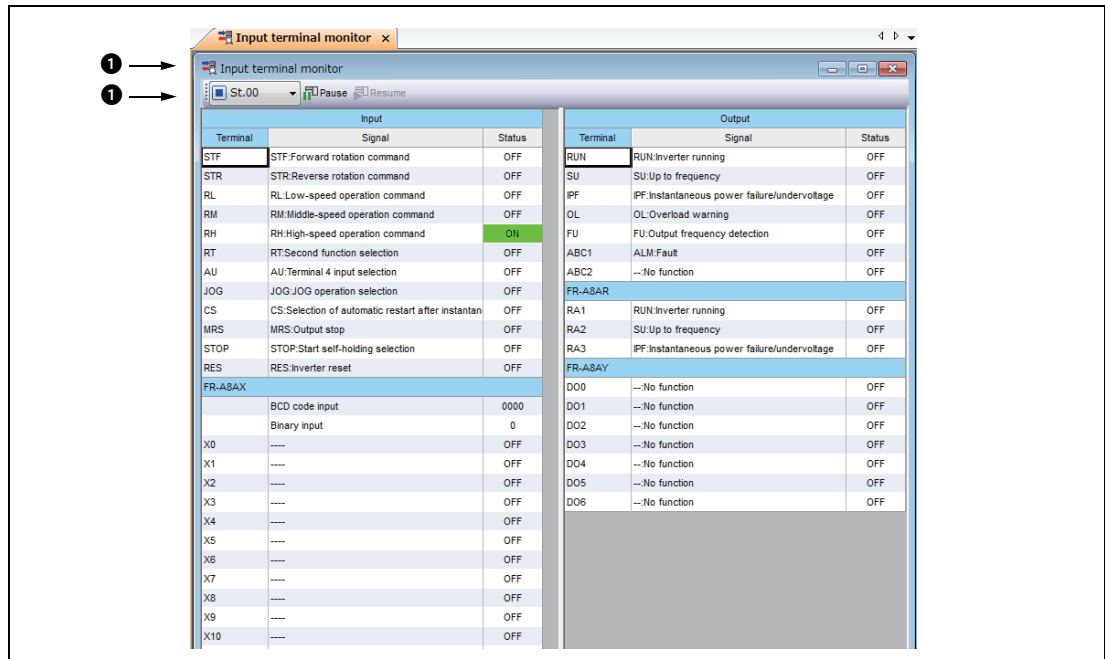


Fig. 3-4: Details in the window "I/O terminal monitor"

No.	Name	Function/description
1	St. No. (Station number)	Select a station to display its I/O terminal monitor data.
	Pause	Temporarily stop the acquisition of the I/O terminal monitor data.
	Resume	Resumes the acquisition of the I/O terminal monitor data.
2	Input Terminal	All the input terminals are displayed.
	Input Signal	Signal names assigned to the input terminals are displayed.
	Input Status	Input terminal status are displayed.
	Output Terminal	All the output terminals are displayed.
	Output Signal	Signal names assigned to the output terminals are displayed.
	Output Status	Output terminal status are displayed.

Tab. 3-7: Details in the window "I/O terminal monitor"

3.6 Diagnostics

3.6.1 Faults history function

Select [Faults history...] in the [Diagnosis] menu to display "faults history" in the sub-window.

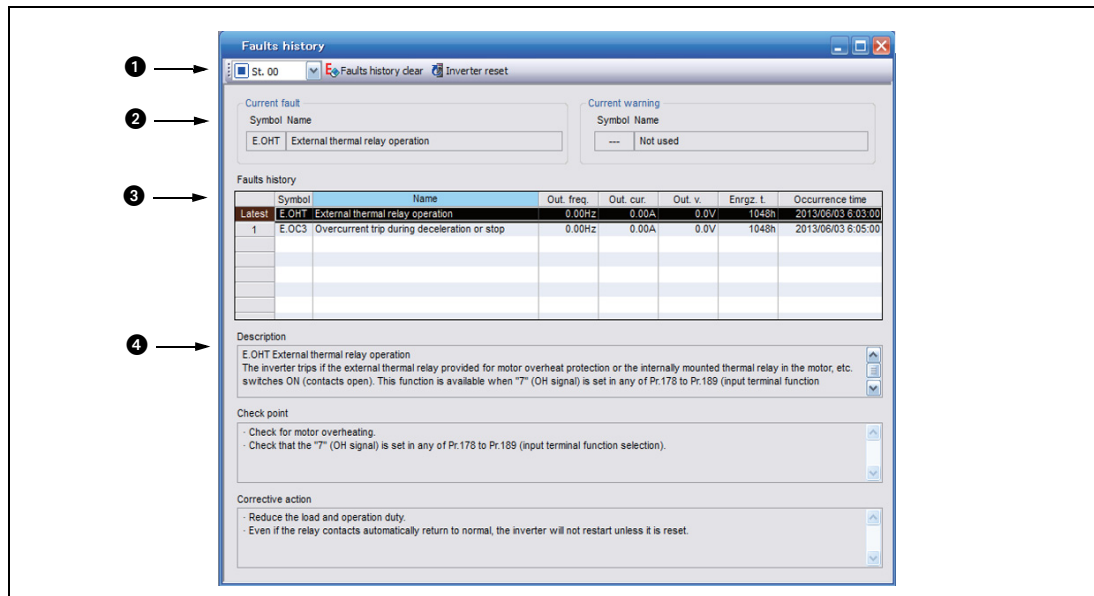


Fig. 3-5: Details in the window "Faults history"

No.	Name	Function/description
①	St. No. (Station number)	Selects a station of which fault history is to be displayed.
	Faults history clear	Clears the selected station's faults history. When selected, the confirmation window appears. Select [Yes] to clear the faults history.
	Inverter reset	Resets the selected station's inverter. When selected, the confirmation window appears. Select [Yes] to clear the faults history.
②	Current fault	Shows the current fault.
	Current warning	Shows the current warning.
③	Faults history	Shows a list of the faults history read from the inverter. The output frequency, output current, output voltage, energization time, and occurrence time at the fault are displayed together.
④	Fault details	Shows explanations of selected fault details, check points, and corrective actions.

Tab. 3-8: Details in the window "Faults history"

3.6.2 Serial number function

Select [Serial number...] in the [Diagnose] menu to display the "Serial number" window as a sub window.

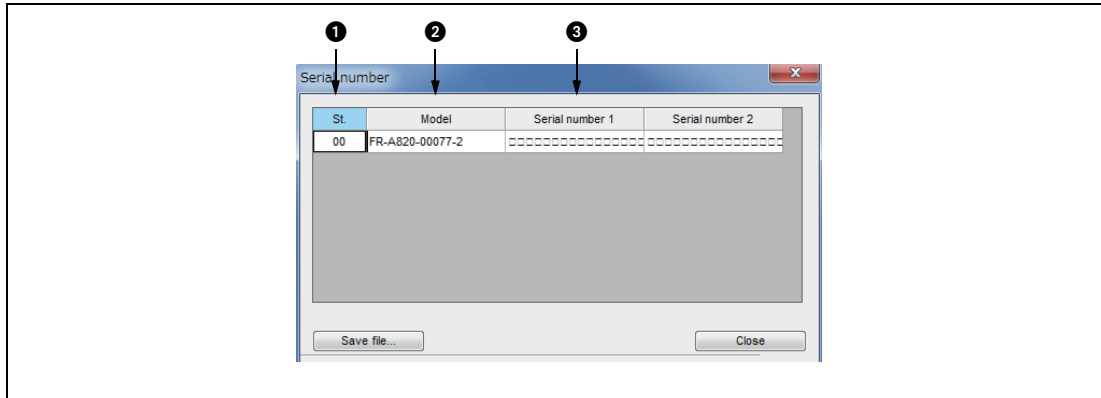



Fig. 3-6: Details in the window "Serial number"

No.	Name	Function/description
①	Station number	All the stations set in the project are displayed.
②	Model	Models of the connected inverters are displayed.
③	Serial number	Serial numbers of the connected inverters are displayed.

Tab. 3-9: Details in the window "Serial number"

3.7 Test Operation



Warning!

If communication fails (due to, for example, cable disconnection), the inverter cannot be stopped from the personal computer. This may cause hazardous conditions, resulting in death or severe injury.

Ensure safety by, for example, enabling signal loss detection (Pr.122, Pr.336, or Pr.548) or externally setting a stop device.

Select [Test operation...] in the [Test operation] menu to display the test operation window.

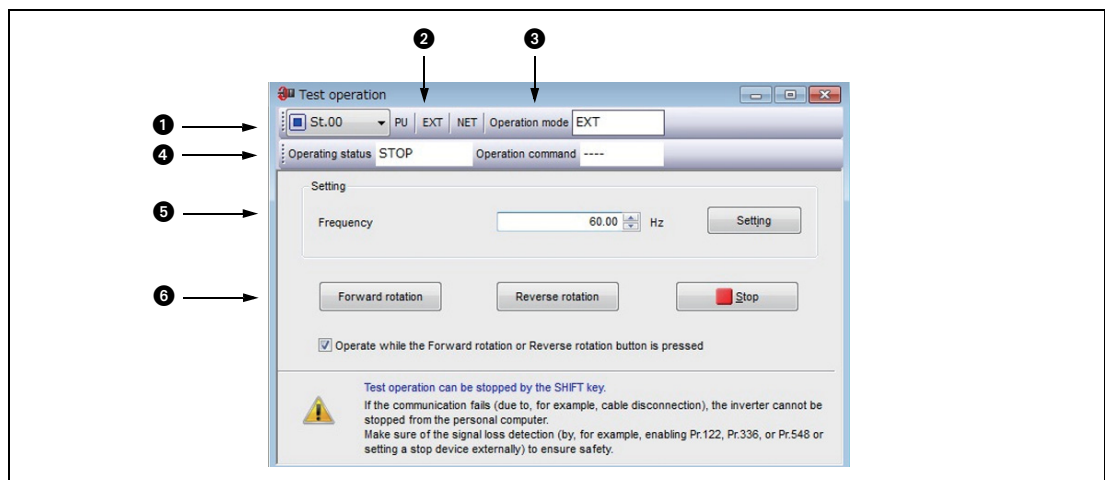


Fig. 3-7: Details in the window "Test operation"

No.	Name	Function/description	
1	ST. (Stationsnummer)	Selects a station to perform test operation with.	
2	PU, EXT, NET (Operation mode switch)	Switches over the inverter's operation mode.	
3	Operation mode	PU	PU operation mode
		EXT	External operation mode
		NET	NET operation mode
		PU + EXT	External/PU combined operation mode
		—	Indicates that the operation mode information was not acquired properly.
	No display	Nothing is displayed when offline.	

Tab. 3-10: Details in the window "Test operation"

No.	Name	Function/description	
④	Operating status	FWD	Rotating forward
		REV	Rotating reversely
		STOP	Stopped
		ALARM	Being stopped by the fault
		—	Appears when operating status information acquisition fails.
		No display	Nothing is displayed when offline.
	Operation command	STF	During forward rotation command
		STR	During reverse rotation command
—		Indicates that the operating status information was not acquired properly.	
No display		Nothing is displayed when offline.	
⑤	Setting	Set the running frequency.	
⑥	Run/Stop command buttons	Sends the run/stop commands.	

Tab. 3-10: Details in the window "Test operation"

NOTES

Open the batch monitor window to check the output frequency during test operation.

If FR Configurator2 had to be terminated, stop the operation by sending an operation stop command to the inverter.

Do not press an individual operation button, such as [Forward rotation] or [Reverse rotation], repeatedly. Doing so may make the FR Configurator2 operation unstable. If operation continues unintentionally, press [Stop] to stop operation.

When the following action is performed due to the Windows operation method, operation may continue without the [Forward rotation] or [Reverse rotation] button being held down. Press the [Stop] button to stop operation. Drag the mouse cursor off the button while holding down the [Stop] button.

3.8 Developer (PLC function)

Developer is used for creating sequence programs and writing them to the inverter to enable the use of the PLC function of the inverter.

Select [Developer] in the [Tool] menu to start "Developer" in a new window.

PLC function is used for customizing inverter operation to meet the machine specifications. PLC function operates the inverter according to the input signals, or outputs signals and monitored values according to inverter operation.

When using Developer, enable the PLC function of the inverter (Pr.414 PLC function operation selection $\neq 0$). When Pr.414 = "2", the sequence start (SQ) signal from the external input terminal is valid regardless of the Pr.338.

Switch the execution key (RUN/STOP) of the sequence program by turning the SQ signal ON/OFF. The sequence program can be executed by turning the SQ signal ON. To input the SQ signal, set "50" in any of Pr.178 to Pr.189 (input terminal function selection) to assign the function to a terminal.

Use the help function of Developer to refer to the contents of the manuals relevant to Developer. Refer to the contents of the manuals from [Help] in the Developer menu.

NOTES

Developer cannot be used if a communication speed setting of 4800 bps or less is set for PU connector communication (Pr.118) or RS-485 communication (Pr.332). To use Developer, set 9600 bps or more.

To use the USB/RS-485 conversion cable DINV-U4, set RS-232C (initial setting) in the PC side I/F in the Developer Connection Destination setting window.

A file created by GX Developer or GX Works2 cannot be used by Developer of FR Configurator2. Conversely, a file created by Developer of FR Configurator2 cannot be used for GX Developer or GX Works2.

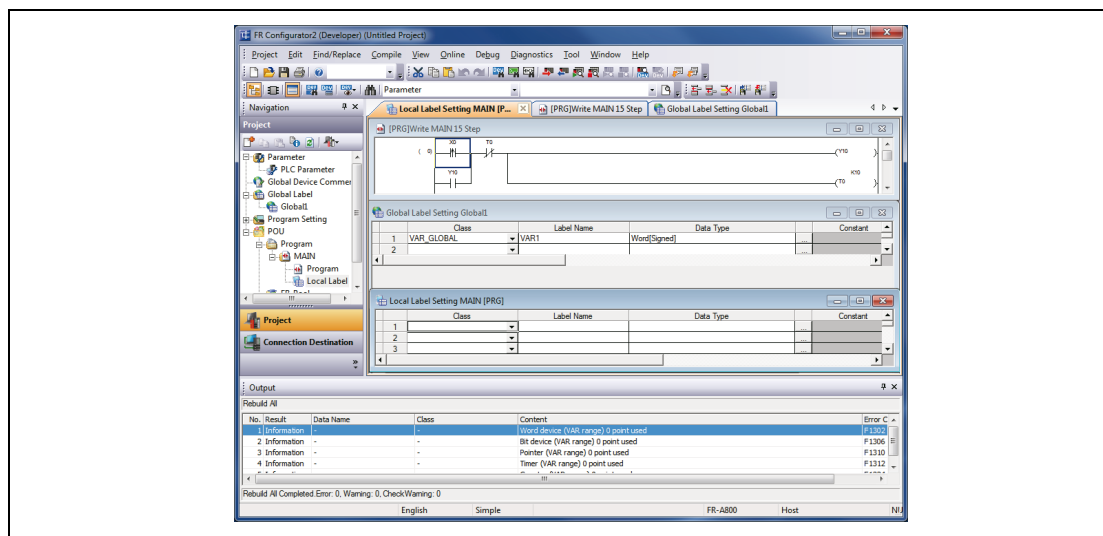


Fig. 3-8: The window "Developer"

3.9 USB memory parameter copy file edit function

The USB memory parameter copy file editor is a dedicated software for editing setting values of USB memory parameter copy files of the FR Configurator2 compatible models.

To start the USB memory parameter copy file editor, choose [USB memory parameter copy file edit] in the [Tool] menu.

Open a copy of the parameter file to display the parameter list in the sub-window area. The parameter list shows the parameter names, setting ranges and initial values. You may edit the values that have been read from the USB memory and write the values into the inverter.

To display the explanation about a parameter on the help window, double-click the parameter in the parameter list.

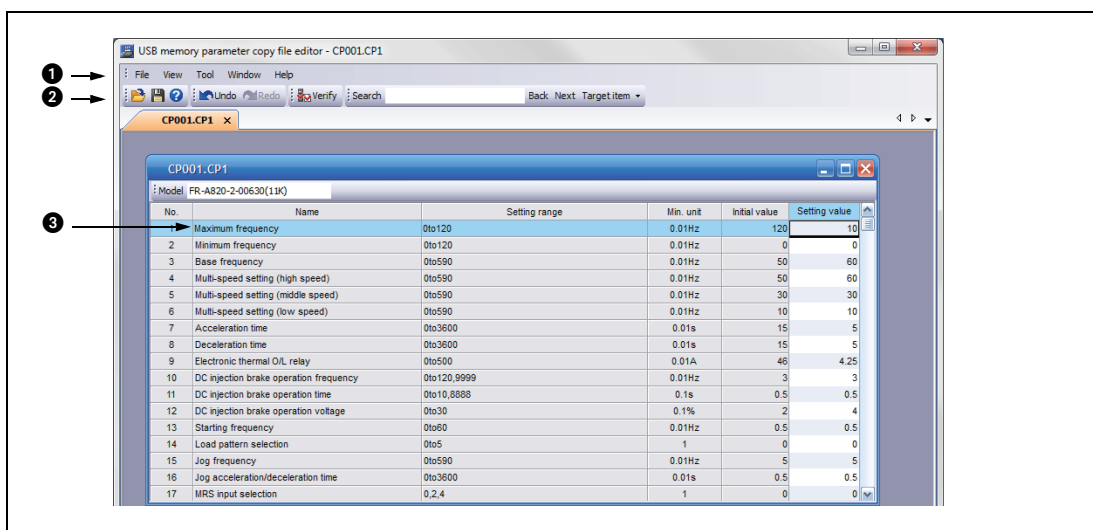


Fig. 3-9: Details in the window "Editor"

No.	Name	Function/description	
1	Menu	File	Open, close or save the USB memory parameter copy file (*.cp1).
		View	Switches between show/hide of the "System", "Edit", "Search" or "Verify" toolbar.
2	Toolbar	Tool/Verify	A list of differences between the USB memory parameter copy file to verify (*.cp1) and the parameter initial values or the parameter setting values of the verify destination file (*.cp1) can be displayed. Parameter setting values cannot be input to the verify source and verify destination cells.
		Undo	Returns the edited parameter setting value to the setting value before editing.
		Redo	Redoes the setting value changed by "Undo".
		Search	Inputs the character string, and searches for a matching character string from within the parameter list.
		Verify	Verifies the setting value in the USB memory parameter copy file (*.cp1) with the initial value or setting values in other USB memory parameter copy files (*.cp1)
		Back	Locations that contain the matching character string will be selected from the selected parameter list search column from the bottom.
		Next	Locations that contain the matching character string will be selected from the selected parameter list search column from the top.
3	Parameter list and setting values	Target item	Specifies the column to search
		Shows the parameter setting values saved to the USB memory parameter copy file, and inputs the setting values to be written to the inverter. Setting values cannot be set as blank.	

Tab. 3-11: Details in the window "Editor"

NOTES

Edited setting values are not checked when saving the USB memory parameter copy file or when writing to the inverter. Therefore, even values that cannot normally be set to the inverter (setting range, write-limited values) are written to the inverter. In this case, because operation of the inverter cannot be guaranteed, change setting values with extreme caution.

Changing a parameter by FR Configurator2 may affect other parameter settings.

When using the FR-A820-55K (03160) or FR-A840-55K (01800), do not change Pr.570 Multiple rating setting from SLD or LD rating (Pr.570 = "0 or 1") to ND or HD rating, or vice versa.

Do not change the Pr.71 Applied motor and Pr.450 Second applied motor settings from an induction motor to a PM motor or vice versa.

Calibration parameters cannot be set.

Parameter setting values cannot be input to the verify source and verify destination cells.

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HEADQUARTERS		EUROPEAN REPRESENTATIVES		EUROPEAN REPRESENTATIVES		EURASIAN REPRESENTATIVES	
Mitsubishi Electric Europe B.V. Mitsubishi-Electric-Platz 1 D-40882 Ratingen Phone: +49 (0)2102 / 486-0 Fax: +49 (0)2102 / 486-1120	EUROPE	GEVA Wiener Straße 89 A-2500 Baden Phone: +43 (0)2252 / 85 55 20 Fax: +43 (0)2252 / 488 60	AUSTRIA	INTEHSIS SRL bld. Traian 23/1 MD-2060 Kishinev Phone: +373 (0)22 / 66 4242 Fax: +373 (0)22 / 66 4280	MOLDOVA	TOO Kazpromavtomatika UL. ZHAMBYLA 28, KAZ-100017 Karaganda Phone: +7 7212 / 50 10 00 Fax: +7 7212 / 50 11 50	KAZAKHSTAN
Mitsubishi Electric Europe B.V. Pekařská 621/7 CZ-155 00 Praha 5 Phone: +420 255 719 200 Fax: +420 251 551 471	CZECH REP.	000 TECHNIKON Prospect Nezavisimosti 177-9 BY-220125 Minsk Phone: +375 (0)17 / 393 1177 Fax: +375 (0)17 / 393 0081	BELARUS	Fonseca S.A. R. João Francisco do Casal 87/89 PT-3801-997 Aveiro, Esqueiro Phone: +351 (0)234 / 303 900 Fax: +351 (0)234 / 303 910	PORTUGAL	MIDDLE EAST REPRESENTATIVE	
Mitsubishi Electric Europe B.V. 25, Boulevard des Bouvets F-92741 Nanterre Cedex Phone: +33 (0)1 / 55 68 55 68 Fax: +33 (0)1 / 55 68 57 57	FRANCE	INEA RBT d.o.o. Stegne 11 SI-1000 Ljubljana Phone: +386 (0)1 / 513 8116 Fax: +386 (0)1 / 513 8170	BOSNIA AND HERZEGOVINA	SIRIUS TRADING & SERVICES SRL Aleea Lacul Morii Nr. 3 RO-060841 Bucuresti, Sector 6 Phone: +40 (0)21 / 430 40 06 Fax: +40 (0)21 / 430 40 02	ROMANIA	EIM Energy 3 Roxy Square ET-11341 Heliopolis, Cairo Phone: +202 24552559 Fax: +202 245266116	EGYPT
Mitsubishi Electric Europe B.V. Westgate Business Park, Ballymount IRL-Dublin 24 Phone: +353 (0)1 4198800 Fax: +353 (0)1 4198890	IRELAND	AKHNATON 4, Andrei Ljapchev Blvd., PO Box 21 BG-1756 Sofia Phone: +359 (0)2 / 817 6000 Fax: +359 (0)2 / 97 44 06 1	BULGARIA	INEA SR d.o.o. Ul. Karadjordjeva 12/217 SER-11300 Smederevo Phone: +386 (026) 461 54 01	SERBIA	SHERF Motion Techn. Ltd. Rehov Hamerkava 19 IL-58851 Holon Phone: +972 (0)3 / 559 54 62 Fax: +972 (0)3 / 556 01 82	ISRAEL
Mitsubishi Electric Europe B.V. Viale Colleoni 7 Palazzo Sirio I-20864 Agrate Brianza (MB) Phone: +39 039 / 60 53 1 Fax: +39 039 / 60 53 312	ITALY	INEA CR Losinjska 4 a HR-10000 Zagreb Phone: +385 (0)1 / 36 940 - 01 / -02 / -03 Fax: +385 (0)1 / 36 940 - 03	CROATIA	SIMAP SK (Západné Slovensko) Dolné Pažite 603/97 SK-911 06 Trenčín Phone: +421 (0)32 743 04 72 Fax: +421 (0)32 743 75 20	SLOVAKIA	CEG LIBAN Cebaco Center/Block A Autostrade DORA Lebanon-Beirut Phone: +961 (0)1 / 240 445 Fax: +961 (0)1 / 240 193	LEBANON
Mitsubishi Electric Europe B.V. Nijverheidsweg 23C NL-3641RP Mijdrecht Phone: +31 (0) 297 250 350	NETHERLANDS	AutoCont C. S. S.R.O. Kafkova 1853/3 CZ-702 00 Ostrava 2 Phone: +420 595 691 150 Fax: +420 595 691 199	CZECH REPUBLIC	INEA RBT d.o.o. Stegne 11 SI-1000 Ljubljana Phone: +386 (0)1 / 513 8116 Fax: +386 (0)1 / 513 8170	SLOVENIA	AFRICAN REPRESENTATIVE	
Mitsubishi Electric Europe B.V. ul. Krakowska 48 PL-32-083 Balice Phone: +48 (0) 12 347 65 00 Fax: +48 (0) 12 630 47 01	POLAND	HANS FØLSGAARD A/S Theilgaardstr. Torv 1 DK-4600 Køge Phone: +45 4320 8600 Fax: +45 4396 8855	DENMARK	OMNI RAY AG Im Schörl 5 CH-8600 Dübendorf Phone: +41 (0)44 / 802 28 80 Fax: +41 (0)44 / 802 28 28	SWITZERLAND	ADROIT TECHNOLOGIES 20 Waterford Office Park 189 Witkoppen Road ZA-Fourways Phone: + 27 (0)11 / 658 8100 Fax: + 27 (0)11 / 658 8101	SOUTH AFRICA
Mitsubishi Electric (Russia) LLC 2 bld. 1, Letnikovskaya st. RU-115114 Moscow Phone: +7 495 / 721 2070 Fax: +7 495 / 721 2071	RUSSIA	Electrobit OÜ Pärnu mnt. 160i EST-11317, Tallinn Phone: +372 6518 140	ESTONIA	CSC- AUTOMATION Ltd. 4 B, Yevhena Sverstyuka Str. UA-02002 Kiev Phone: +380 (0)44 / 494 33 44 Fax: +380 (0)44 / 494-33-66	UKRAINE		
Mitsubishi Electric Europe B.V. Carretera de Rubi 76-80 Apdo. 420 E-08190 Sant Cugat del Vallés (Barcelona) Phone: +34 (0) 93 / 5653131 Fax: +34 (0) 93 / 5891579	SPAIN	UTU Automation Oy Peltotie 37i FIN-28400 Ulvila Phone: +358 (0)207 / 463 500 Fax: +358 207 / 463 501	FINLAND				
Mitsubishi Electric Europe B.V. (Scandinavia) Hedvig Möllers gata 6, SE- 223 55 Lund Phone: +46 (0) 8 625 10 00	SWEDEN	UTECO A.B.E.E. 5, Mavrogenous Str. GR-18542 Piraeus Phone: +30 (0)211 / 1206-900 Fax: +30 (0)211 / 1206-999	GREECE				
Mitsubishi Electric Turkey Elektrik Ürünleri A.Ş. Fabrika Otomasyonu Merkezi Serifali Mahallesi Kale Sokak No:41 TR-34775 Ümraniye-İSTANBUL Phone: +90 (216) 969 25 00 Fax: +90 (216) / 661 44 47	TURKEY	MELTRADE Kft. Fertő utca 14. HU-1107 Budapest Phone: +36 (0)1 / 431-9726 Fax: +36 (0)1 / 431-9727	HUNGARY				
Mitsubishi Electric Europe B.V. Travellers Lane UK-Hatfield, Herts. AL10 8XB Phone: +44 (0)1707 / 28 87 80 Fax: +44 (0)1707 / 27 86 95	UK	OAK Integrator Products SIA Ritasmašs iela 23 LV-1058 Riga Phone: +371 67842280	LATVIA				
Mitsubishi Electric Corporation Tokyo Building 2-7-3 Marunouchi, Chiyoda-ku Tokyo 100-8310 Phone: +81 (3) 3218-2111 Fax: +81 (3) 3218-2185	JAPAN	Automatikos Centras, UAB Neries krantinė 14A-101 LT-48397 Kaunas Phone: +370 37 262707 Fax: +370 37 455605	LITHUANIA				
Mitsubishi Electric Automation, Inc. 500 Corporate Woods Parkway Vernon Hills, IL 60061 Phone: +1 (847) 478-2100 Fax: +1 (847) 478-0328	USA	ALFATRADE Ltd. 99, Paola Hill Malta-Paola PLA 1702 Phone: +356 (0)21 / 697 816 Fax: +356 (0)21 / 697 817	MALTA				