MITSUBISHI

Mitsubishi Electric Air Conditioning Network System
Electric Amount Count Software
PAC-YG11CDA
Installation (Setup) Manual

Contents

Please read this manual before using the unit.
Please keep this manual for future use.

1. Safety Precautions

- Please read the Safety Precautions section very carefully before using the unit.
- The safety cautions provided here are very important for your safety. Please observe them at all times.
- The degree of danger involved with incorrect operation of the unit are indicated in this manual using the following symbols.

| ⚠ WARNING | Incorrect operation could result in death or severe injury. |
| ⚠ CAUTION | Incorrect operation could result in injury or damage to property. |

- After reading this information, please keep this manual in a location where the operator can see it.

> **Note : Refer to the warnings and cautions in the respective installation manuals and instruction manuals for the PLC, personal computer and software, etc.**

⚠ WARNING

The customer must not do any wiring or electrical work.
Have the dealer or a specialist do any wiring or electrical work. Do not do it yourself. Doing the work yourself may result in improper installation which may cause electric shock or fire.

Do not relocate the unit yourself.
Relocating the unit yourself may result in incorrect installation which may cause electric shock or fire. To relocate the unit, consult the company from which the unit was purchased.

Do not make any improvements or repairs for any reason.
Making improper improvements or repairs may cause electric shock or fire. For repairs, consult the company from which the unit was purchased.

Read the installation manuals and operation manuals for the computer, peripherals and other machines.
Improper operation could result in fire or damage to the computer or peripherals.

Stop operation if an error appears on the personal computer or PLC and operation cannot be continued or a fault occurs.
Continuing operation could result in fires or faults. Contact your dealer.

Always read the installation manual and instruction manual for the PLC.
Incorrect handling could result in PLC fires or faults, etc.

⚠ CAUTION

Do not use the product for any other purpose.
This product is for use with the Mitsubishi Electric Building Air Conditioning Control System. Do not use it with any other air conditioning control system or for any other application. Doing so may cause the unit to malfunction.

Keep children away from the unit.
Inspections and maintenance can be dangerous. Do not let children near the unit during these times.

Do not use with other applications.
Use the PC that uses this product with this product only. Using it with other applications may cause faulty operation.

Warning to all users (User Agreement)
This document is a contract between the customer and Mitsubishi Electric Corporation. By using this software, the user agrees to the conditions of the License.
- Mitsubishi Electric and associated suppliers are not responsible for any collateral, secondary, or special damages, even if notified by the distributor of the possibility of a certain type of damage. Mitsubishi Electric is not responsible for any rights claimed by a third party.

2. Introduction

2-1 Expressions in This Manual
- Unless designated, Windows® 95, Windows® 98, Windows® Me, Windows® NT Workstation, Windows® 2000 Professional and Windows® XP are expressed as [Windows].
  * Windows is a registered trademark or trademarks of Microsoft Corporation in the United States and/or other countries.
- PLC refers to the Programmable Logic Controller.

2-2 Software Tools Required for Installation Work
- The following tools are required to install this power rate pulse count software into the designated PLC.

Table 2-1   Tools required for installation

Item	Details
Required tools (Software)	GX Developer (MELSEC PLC programming software)
Connection cable	QC30R2 (RS-232-C cable for connecting personal computer and CPU)

* Contact Mitsubishi Electric or dealer to purchase GX Developer and QC30R2.

- The following personal computer working environment is required to run the GX Developer tool.

Table 2-2   Working environment

Item	Details
Computer unit	Pentium 133MHz or faster
Memory	32Mbyte or more (64Myte or more for Windows 2000)
Screen resolution	800×600 or more
Compatible OS	Windows® 95/98/Me/NT4.0/2000 Pro (English Version)
Drive	CD-ROM disk drive
Communication interface	RS-232-C port
Others	Pointing device, such as a mouse

* Refer to the GX Developer Operation Manual for the detailed working environment.

2-3 Applicable PLC Models
- The PLC models that can be used with this power rate pulse count software are shown below.

Table 2-3 Applicable PLC models

Item	Details	Notes
Maker	Mitsubishi Electric	
CPU module	Q02CPU	
Base unit	Q33B	
Power supply module	Q61P-A1 (A2)	A1: 100VAC, A2: 200VAC
Input module	QX40	* 24VDC/4mA plus common; up to two modules connectable * External power supply (24VDC) for input is required
Ethernet module	QJ71E71-100	* Use 10Mbps LAN

2-4 Watt-hour Meter with Pulse Transmitter
* This can also be used with the gas meter, water meter and calorimeter with pulse transmitter. Refer to Section 7.

- The watt-hour meter informations with pulse transmitter for measuring the power rate are shown below.

**Table 2-4 Applicable watt-hour meter models (recommended)**

Item	Details
Maker	-
Model	-
Output pulse method/pulse width	Semiconductor relay/0.1 to 0.3sec. (0.1sec. or more)
Output pulse unit	1kWh/pulse or less recommended
No. of connectable units	Max. 32 units * Two QX40 units can be connected

3. Checking the PLC Installation State

3-1 Check the PLC Module Installation

Check that the PLC system modules are arranged in the following order. The system will not operate if the modules are not installed in order.

**Fig. 3-1 PLC module layout drawing**
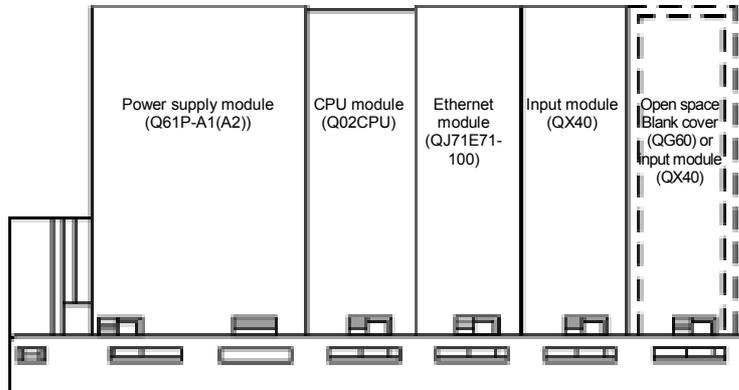
Lower view of PLC

3-2 Checking the Wiring Connections

Check the wires connected to the PLC.

Item	Confirmation details	Notes
Power cable	Confirm that the power cable is connected to the PLC power supply module.	
LAN	Confirm that the LAN cable is connected to the Ethernet module.	* This cable does not need to be connected to install this software.
Input cable	Confirm that the pulse output cable from the watt-hour meter is connected to the input module.	* This cable does not need to be connected to install this software.
Others	Confirm that the external input power supply (24VDC) is connected to the input module.	* This cable does not need to be connected to install this software.

* Refer to each PLC module instruction manual for details on the connected cable's specifications and connection methods, etc.
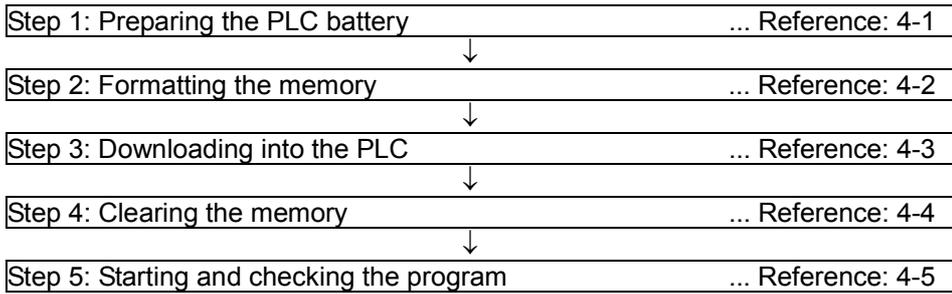
3-3 System Configuration Example
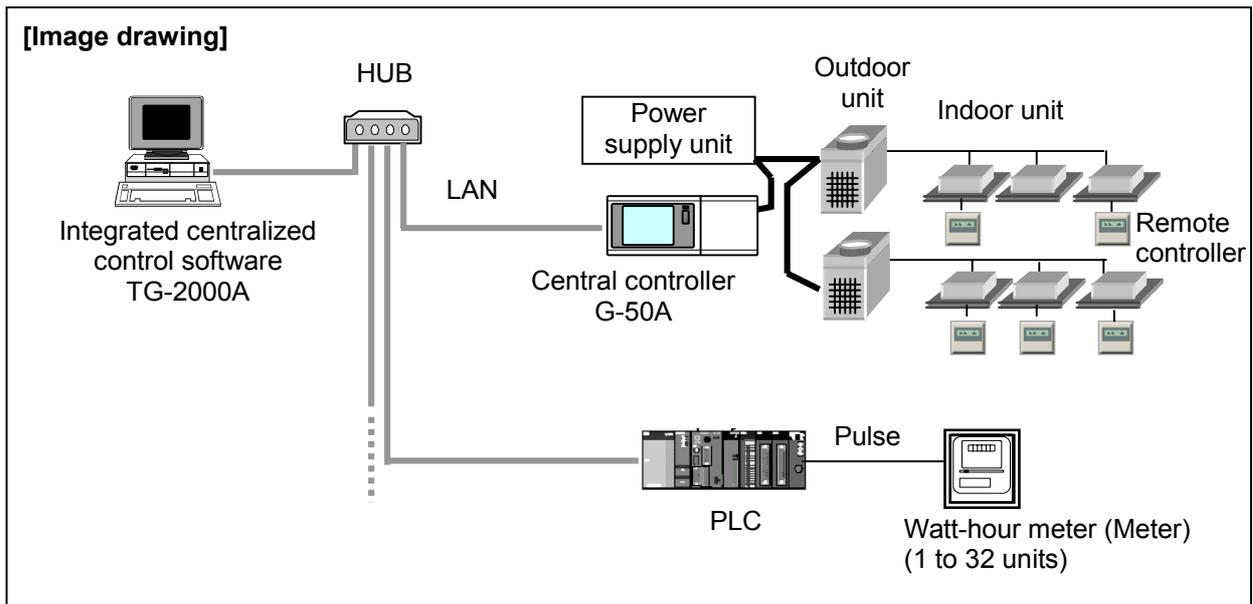
PLC: Programmable Logic Controller

3

4. Setting Up the PLC Software

This power rate pulse count software is set up in the PLC in the following order.

Step 1: Preparing the PLC battery   ... Reference: 4-1
↓
Step 2: Formatting the memory   ... Reference: 4-2
↓
Step 3: Downloading into the PLC   ... Reference: 4-3
↓
Step 4: Clearing the memory   ... Reference: 4-4
↓
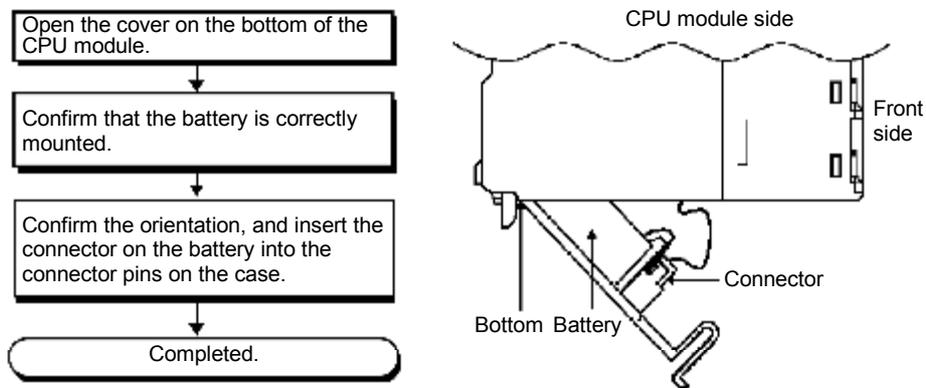Step 5: Starting and checking the program   ... Reference: 4-5

4-1   Preparing the PLC Battery (Step 1)

[Procedure 1]   Connect the battery

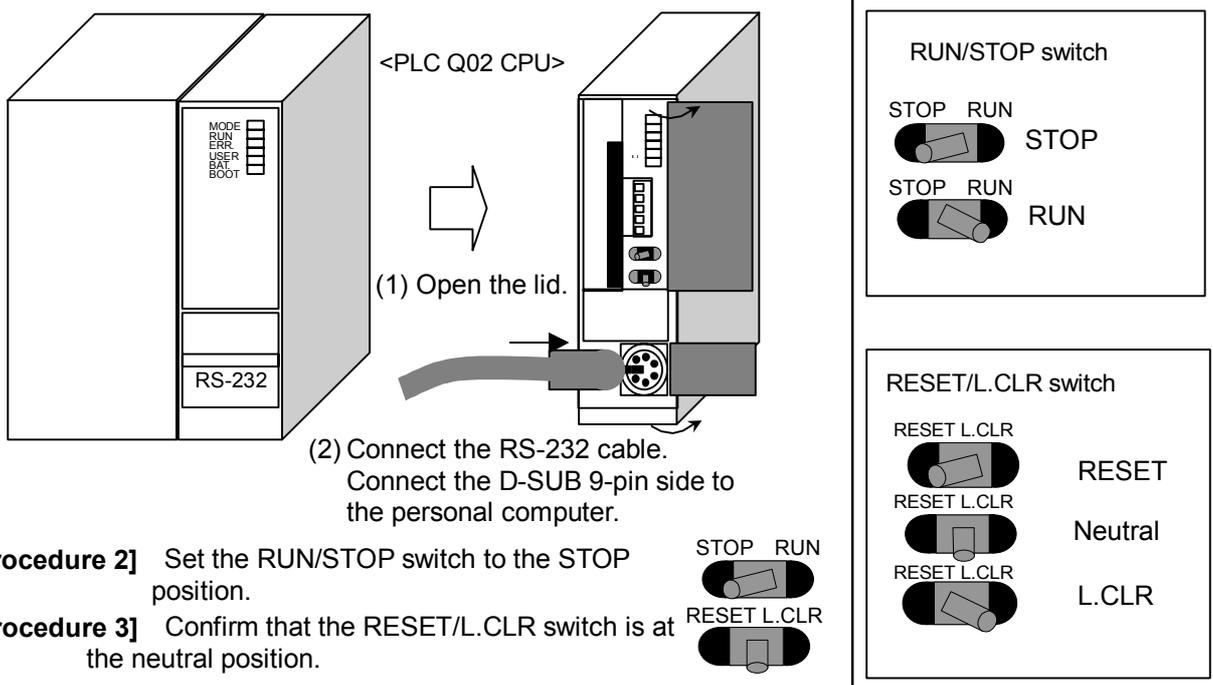Connect the CPU module's backup battery to run the PLC.

<u>Confirm that the PLC power is OFF</u>, and remove the CPU module from the base module. Connect the battery lead wires, and mount the battery onto the base.

4-2   Formatting the Memory (Step 2)

(1) Connecting the RS-232-C connection cable

[Procedure 1]   Open the CPU module's lid, and connect the RS-232-C cable.

<PLC Q02 CPU>

(1) Open the lid.

(2) Connect the RS-232 cable.
Connect the D-SUB 9-pin side to the personal computer.

[Procedure 2]   Set the RUN/STOP switch to the STOP position.

[Procedure 3]   Confirm that the RESET/L.CLR switch is at the neutral position.

(2) Turning ON the PLC power

[Procedure 1]   Turn the PLC power ON.

Battery normal   : BAT LED is OFF
Battery abnormal : BAT LED is ON

* If the LED turns ON, there is a problem with the battery connection, so turn the power OFF
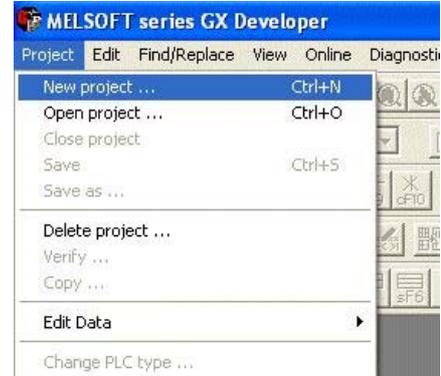and check the connection.

(3) Starting GX Developer and formatting

[Procedure 1]   Start the GX Developer application.

[Procedure 2]   Open a new project.

Select: [Project] – [New Project…]

The New Project screen will open.
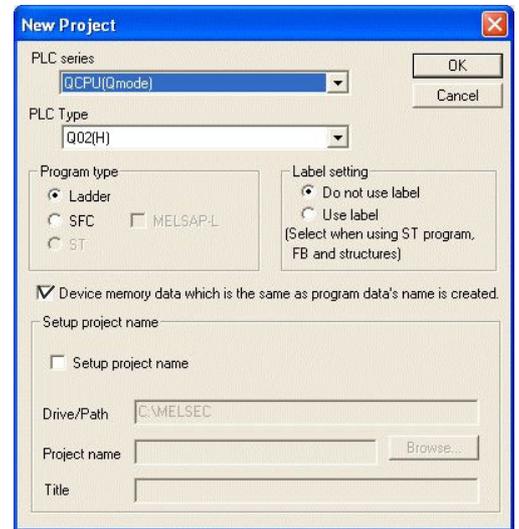
[Procedure 3]   Set the various items for creating a new
project.
– Setting details –
PC series   : QCPU (Q mode)
PC Type   : Q02(H)
Program type   : Ladder
Label setting   : Do not use label
Device memory data which is the same name
as program data's name is created
                              : Select
Setup project name   : Do not select
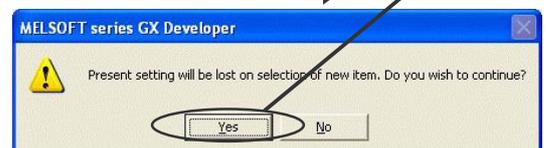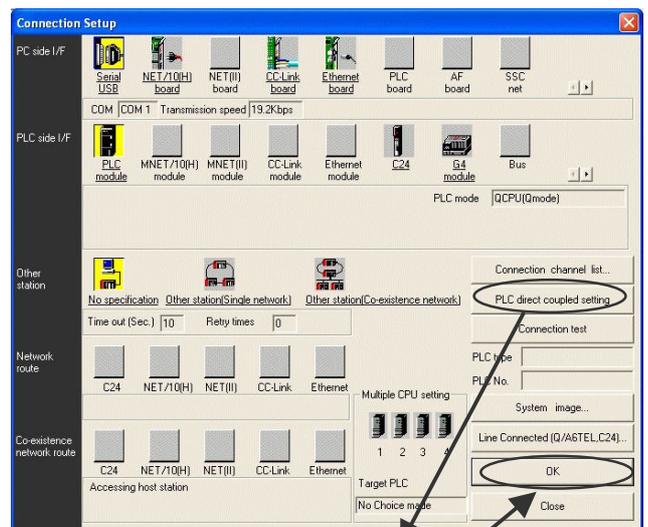
Set the above details, and then select [OK].

[Procedure 4]   Select the connection destination.

Select: [Online] –
               [Connection Setup]

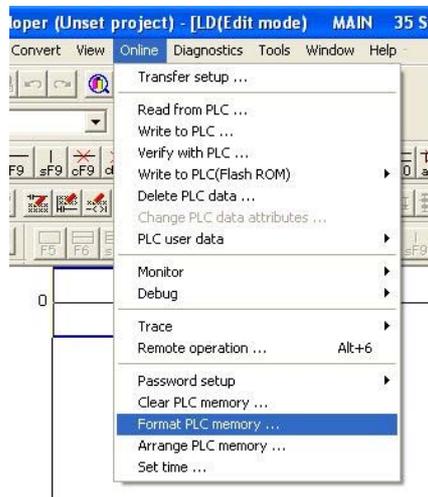**[Procedure 5]**   Select PC Direct Coupled Setting.

Select: [PC Direct Coupled
               Setting] → [Yes] → [OK]

Note:
• "PC" indicated by GX Developer
refers to the PLC.

5

[Procedure 6] Select Format PC Memory …

Select: [Online] – [Format PC Memory]
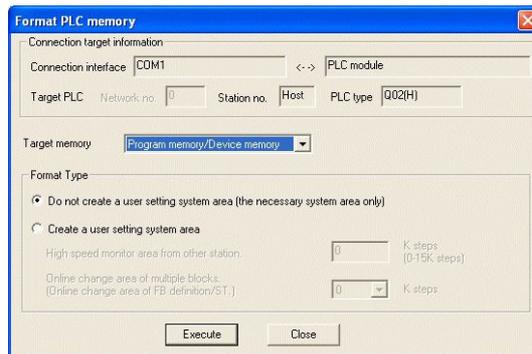The PC MEMORY FORMAT screen will
open.

[Procedure 7] Format the "Program Memory/
Device Memory" and "Standard RAM".

1) Check the setting value, and then select
[Execute].
Target memory: "Program Memory/
Device Memory"
Format type:
Do not create a user setting system area

When the confirmation screen opens,
select [Yes], and then select [OK] on
the completion screen.

2) Change the Target Memory to "Standard RAM",
and then format.
Target memory: "Standard RAM"
Format type:
Do not create a user setting system area

Set the target memory to "Standard RAM",
and then select [Execute]. When the
confirmation screen opens, select [Yes],
and then select [OK] on the completion screen.
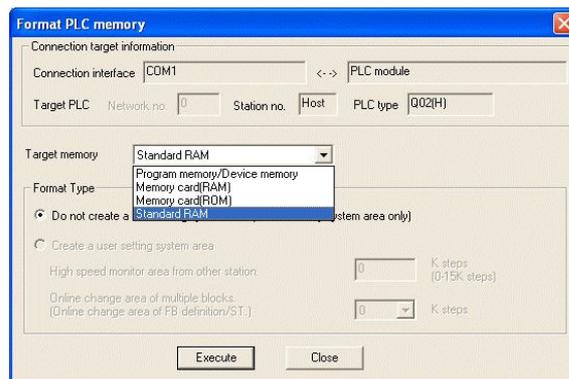
[Procedure 8] Close the FORMAT PC MEMORY screen.

Select: [Close]

6

4-3 Downloading into the PLC (Step 3)
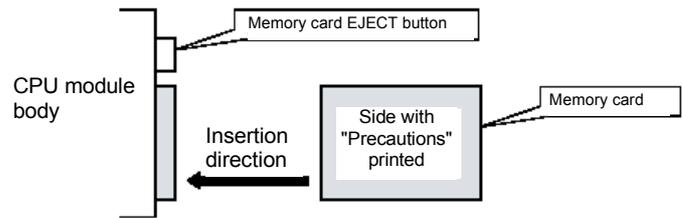### (Loading from memory card to PLC standard ROM)

[Procedure 1] Turn OFF the PLC power.
* Inserting the memory card while the power is ON will result in trouble.

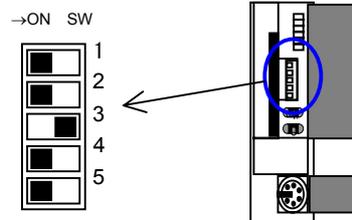**[Procedure 2]** Insert the memory card into the PLC.

> **Maintenance Tip:**
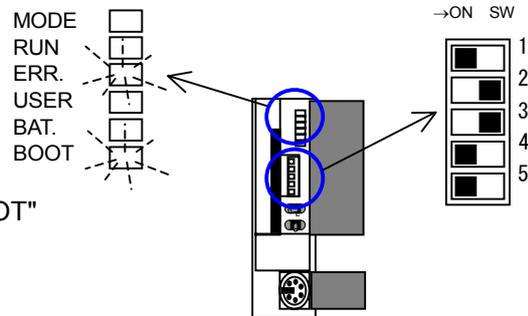> • Pay attention to the memory (ATA) card's insertion direction.

[Procedure 3] Turn ON DIP switch 3.
This sets the settings for the Flash/ATA card mounting.

[Procedure 4] Turn ON the PLC power.
Boot the memory card's file into the program memory. After booting, load the program memory contents into the standard ROM.

[Procedure 5] Confirm that the "ERR" LED and "BOOT" LED are flickering.
The "ERR" LED and "BOOT" LED flicker when automatic loading to the standard ROM is completed.

[Procedure 6] Turn OFF the PLC power.

[Procedure 7] Turn ON DIP switch 2.
(This sets the parameter valid drive to the standard ROM. SW2, 3 = ON)

4-4 Clearing the memory (Step 4)
Using GX Developer, clear the PLC memory so that the PLC can be run.

[Procedure 1] Turn ON the PLC power.

[Procedure 2] Select Clear PC Memory.
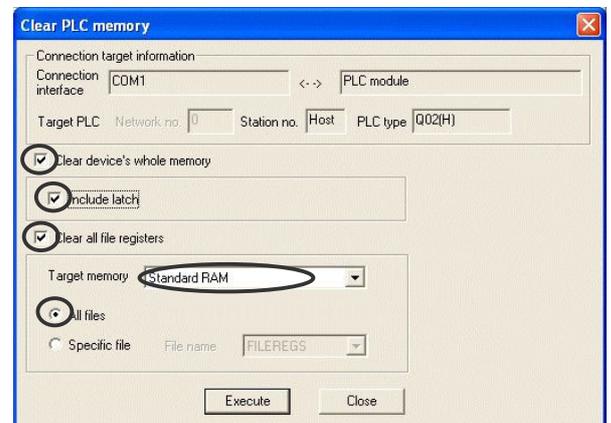
(Select: [Online] – [Clear PC Memory])

[Procedure 3] Set the following items, and then select [Execute].
– Setting details –
Clear device's whole memory: Select
Include latch : Select
Clear all file register : Select
Target Memory : Standard RAM
All Files/Specific file : All Files

Select the [OK] button on the completion screen that opens when the clearing process is completed.

[Procedure 4] Turn OFF the PLC power.

[Procedure 5] Quit the GX Developer application.

[Procedure 6] Disconnect the RS-232-C cable.

4-5   Starting and Checking the Program (Step 5)

Start the downloaded power rate count software with the PLC, and confirm that it runs.

[Procedure 1] Set the RUN/STOP switch to the RUN position.

[Procedure 2] Confirm that the RESET/L.CLR switch is set to the neutral position.

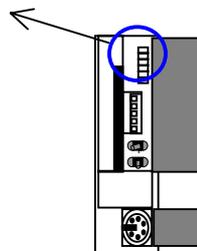**[Procedure 3]** Turn ON the PLC power.
The contents of the standard ROM are written to the program memory, and the PLC software starts up.

[Procedure 4] Confirm the PLC operation state.
Check the following details to confirm that the program is running correctly.

- MODE.LED is ON
- RUN.LED is ON
- ERR.LED is OFF
- USER.LED is OFF
- BAT.LED is OFF
- BOOT.LED is ON

MODE
RUN
ERR.
USER
BAT.
BOOT

Note:
- If the PLC operation state is not "correct", start again from the start.
- Leave DIP switch 2 and 3 set to ON.
- Before starting the power rate count operation with this power rate count software, the state must be initialized, etc., from the integrated software TG-2000A.
- Refer to Section 7 and the PLC Instruction Manual when the PLC does not operate correctly.
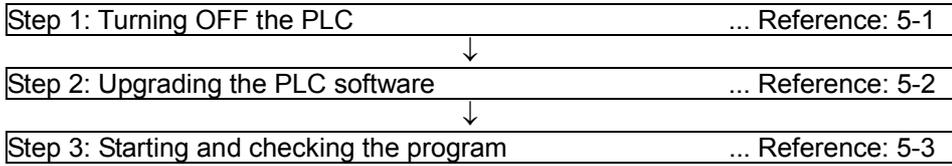
Maintenance Tip
- Do not turn the power OFF after starting operation with this power rate count software running. The power rate will not be counted while the power is OFF.

This section explains the methods of upgrading the software version when the power rate pulse count software is already in use. Refer to Section 4 when newly setting up the software.

The version of this power rate pulse count software is upgraded with the following steps.

Step 1: Turning OFF the PLC	... Reference: 5-1

↓

Step 2: Upgrading the PLC software	... Reference: 5-2

↓

Step 3: Starting and checking the program	... Reference: 5-3

5-1 Preparing to Turn OFF the PLC Power (Step 1)

[Procedure 1] Turn OFF the target main breaker or main tap for the watt-hour meter or meters.
The rates cannot be measured while upgrading the PLC software version, so leave the breaker or main tap for the measuring target set to OFF or closed.

> * This step is not required if the user understands that "Measuring is not possible while upgrading the version". The measuring target should be stopped while upgrading the version.

[Procedure 2] Turn OFF the PLC power.

5-2 Upgrading the PLC Software (Step 2)

[Procedure 1] Set the RUN/STOP switch to the STOP position.

[Procedure 2] Remove the PLC memory card.
Remove the memory card currently inserted.

[Procedure 3] Insert the memory card into the PLC.

> **Maintenance Tip**
> • Pay attention to the memory (ATA) card's insertion direction.

[Procedure 4] Turn ON DIP switch 3.
This sets the settings for the Flash/ATA card mounting.

[Procedure 5] Turn ON the PLC power.
Boot the memory card's file into the program memory. After booting, load the program memory contents into the standard ROM.

RUN/STOP switch

STOP   RUN

STOP

STOP   RUN

RUN

Memory card EJECT button

CPU module body

Insertion direction

Side with "Precautions" printed

Memory card

→ON   SW

1
2
3
4
5
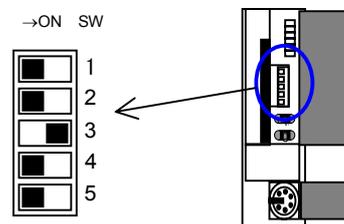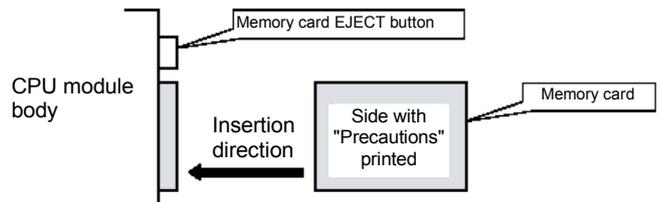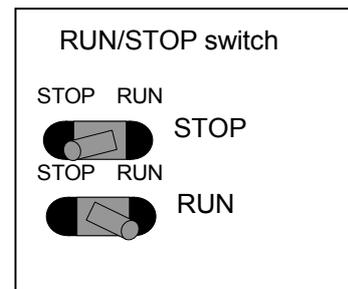
[Procedure 6] Confirm that the "ERR" LED and "BOOT"
LED are flickering.
The "ERR" LED and "BOOT" LED flicker
when automatic loading to the standard
ROM is completed.

[Procedure 7] Turn OFF the PLC power.

[Procedure 8] Turn ON DIP switch 2.
(This sets the parameter valid drive to
the standard ROM. SW2, 3 = ON)

5-3 Starting and Checking the Program (Step 3)

Start the downloaded power rate count software with the PLC, and confirm that it runs.

[Procedure 1] Set the RUN/STOP switch to the RUN position.
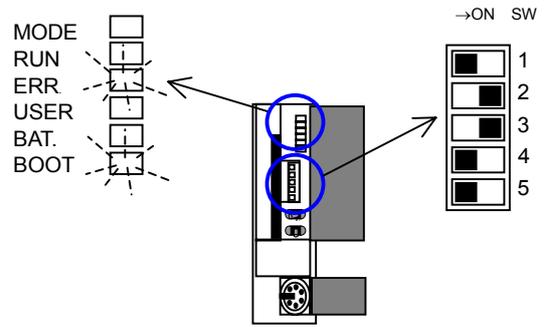Confirm that the RESET/L.CLR switch is set at the neutral position.

[Procedure 2] Turn ON the PLC power.
The contents of the standard ROM are written to the program memory, and the PLC software
starts up.

[Procedure 3] Confirm the PLC operation state.
Check the following details to confirm that the program is running correctly.

- MODE.LED is ON
- RUN.LED is ON
- ERR.LED is OFF
- USER.LED is OFF
- BAT.LED is OFF
- BOOT.LED is ON
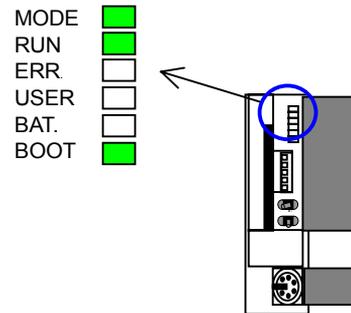
[Procedure 4] Turn ON the target main breaker or main tap for the watt-hour meter or meter.
Turn ON or open the watt-hour meter breaker or meter main tap turned OFF in step 1.

[Procedure 5] Check the PLC software version.
Select "Monitor" button on the " PLC set-up and Initial setting " screen in the integrated
software TG-2000A meter settings, and check the PLC software version (first four digits **.**).
(Example: 01.01)
* The PLC software version is indicated as "V*.**" on the ATA card case and ATA card.

> **Maintenance Tip:**
> - Never click the "Initiali Request" button on the "PLC set-up and Initial setting" screen. If this "Initial
>   Request" button is pressed inadvertently, all of the meter data will be lost.

[Procedure 6] Check the watt-hour meter or meter value.
Run the air conditioner to be measured, and check that the watt-hour meter value counts up.
* The air conditioner, etc., must be run during the trial operation after upgrading the version.

> **Note:**
> - Using the integrated software TG-2000A, confirm that the watt-hour meter counts up.
>   (Refer to Section 8.6 in the integrated software TG-2000A Instruction Manual/Management.)
>
> **Maintenance Tip**
> - Do not turn the power OFF after starting operation with this power rate count software running.
>   The power rate will not be counted while the power is OFF.

The precautions for running this power rate pulse count software with the PLC are given below. Always read through these precautions before starting use.

6-1 License

By using this power rate pulse count software, the user agrees to the conditions of this License. Always read through this License before starting use.

(1) License

This user is permitted to install this software into the user's PLC. This software may not be duplicated, leased, sold, rented, transferred or resold without permission from Mitsubishi Electric Corp.

(2) Property

This software and all copies authorized by Mitsubishi Electric Corp. are the property of Mitsubishi Electric Corp.

(3) Software Revisions

This software may be revised for improvements without prior notice.

(4) Limitation of Liability

In no event will Mitsubishi Electric Corp. or its dealers be liable to the user for any damages whatsoever or any consequential, secondary, special damages, even if a Mitsubishi dealer has been advised of the possibility of such damages.

Mitsubishi will also not be liable to any claims by any third party.

6-2 Applicable System

This power rate count software is applicable only with the "G-50A + TG-2000A" system.

6-3 Precautions for Operation

(1) PLC power supply

- When using this software, always leave the switch set to "RUN" after the trial operation, and leave the power ON at all times. The power rate will not be counted while the power is OFF, or when "STOP" or "RESET" is set.

(2) Battery

- Always connect a battery while using this software. (Refer to Section 4-1.) If the battery is not connected during a power failure, all of the saved power rate data will be lost.
- If the battery voltage low detection is indicated, replace the battery with a new one as soon as possible.

(The battery voltage low alarm can be confirmed on the integrated software's screen or by the lighting of the CPU module's indicator LED "BAT.".)

(3) ATA card

- Leave the memory (ATA) card containing the software installed in the CPU module memory slot. The data is saved in the memory (ATA) card.

(4) Precautions for starting operation

- The power rate count software will not count the power rate correctly just by carrying out the matters explained in this installation manual. The system must be initialized, and settings related to charging must be set before starting operation. These are set from the integrated software TG-2000A.
- The pulse unit of the watt-hour meter being used should be 1kWh/pulse or less. Note that the apportioning error will increase if a watt-hour meter with large pulse unit is used.
- This power rate count software can be used with some pulse type meters, but is not compatible with level output type meters. An external circuit must be incorporated to use a level output type meter.

(5) Miscellaneous

- The functions and specifications may be changed for improvements without prior notice.
- The liability for the defect of a PLC simple substance etc. cannot be taken.

6-4 Precautions for Expansion

Observe the following matters when expanding the watt-hour meter or meters.

- The power must be turned OFF while expanding the units. The power rate will not be counted while the power is OFF.
- After expanding the units, change the system settings with the integrated software TG-2000A, check the settings, and test the operation.

7. Troubleshooting

The causes of trouble that may occur when installing this electric amount count software into the PLC, and the countermeasures to be taken are explained below.

Table 6-1 Troubleshooting

Details of trouble	Speculated cause	Countermeasures
The "ERR." LED turns ON or flickers when the power rate count software is started.	The PLC module layout is incorrect.	Turn the PLC power OFF and arrange the modules as shown in section 3-1.
	The program is not installed correctly.	Turn all of the CPU module switches OFF, and start again from 4-2 "Formatting the Memory".
The "BAT. (ARM)" LED turns ON.	The battery is not mounted.	(1) Connect the connector installed on the battery. (2) Reset with the RESET/L.CLR switch.
	Battery voltage low	(1) Replace with a new battery. (2) Reset with the RESET/L.CLR switch.
Error appears when accessing PLC even from GX Developer.	The PLC power is not ON.	Turn the PLC power ON, and access the PLC from the GX Developer.
	The RS-232-C cable is not connected.	Check the RS-232-C cable connection to the personal computer and PLC, and reconnect if necessary.
The power rate pulses are not counted after starting.	The external power supply for input is OFF.	Turn ON the external power supply (24VDC) for input.
	The external power supply for input is incorrectly connected.	Check that the plus side of the external power supply (24VDC) for input is connected to the No. 17 terminal (COM) on the input module (QX40), and that the minus side wire is connected to the watt-hour meter. Correct if the wiring is incorrect.
	The "STOP/RUN" switch is set to "STOP".	Set the "STOP/RUN" switch to "RUN".
After starting, the counted value is smaller than the actual amount used.	The PLC power is not ON at all times.	Make sure that the PLC power is ON at all times.
	The pulse unit setting is incorrect.	Using the integrated software "TG-2000A", check the amount measured for each pulse unit, and correct if incorrect.

* Refer to the PLC Instruction Manual for trouble not listed above.

Q&A regarding this power rate pulse count software is given below.

Table 6-1 Power rate pulse count software Q&A

Question	Answer	Notes
What is the PLC's IP address?	The IP address is shown below as basic. 　PAC-YG11CDA: 192. 168. 1. 151 　*A label indicating the IP address is attached to the memory card (ATA card).	*The IP address may differ according to the site.
Are there any precautions for connecting to an existing LAN?	A router should be connected to prevent unnecessary data so that the PLC does not receive large volumes of data.	
How do we check the software version?	Check with Step 2 for setting the watt-hour meter (meter) with the integrated centralized control software TG-2000A.	**(Maintenance Tip)** Never select the "Initial Request" button.
Can a water meter, gas meter and calorimeter also be connected?	A pulse type water meter, gas meter and calorimeter can be connected. 　0.01 to 100,000 [m^3/pulse] [MJ/pulse] Note that this system is not compatible with level type meters, so an external circuit must be protected.	* The minimum values in the range shown on the left are recommended for each meter's working pulse unit.

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