



MITSUBISHI Electronic Multi-Measuring Instrument

User's Manual (Simple version)

Types ME96NSR ME96NSR-MB

1. Safety Precaution

(Always read these instructions before using this equipment)
For personnel and product safety please read the contents of these operating instructions carefully before using.
Please save this manual to make it accessible when required and always forward it to the end user.

CAUTION
Indicates that incorrect handling may cause hazardous conditions.
Always follow the instructions because they are important to personal safety.
Otherwise, it could result in electric shock, fire, erroneous operation, and damage of the instrument.

■Normal service conditions

CAUTION
Use the instrument in an environment that meets the Normal service conditions as following points:

- Ambient temperature :>5 to 50°C, average day temperature exceeds 35°C
- Humidity :30~85%RH, non condensing.
- Altitude: 1000m or less
- Pollution Degree : 2
- Atmosphere without corrosive gas, dust, salt, oil mist.
- A place without excessive shocks or vibration.
- Do not expose to rain and water drips.
- Do not expose to direct sunlight.
- An area in where no pieces of metal and an inductive substance disperse.
- Do not expose to strong electromagnetic field and ambient noises.

■Installation instructions

CAUTION

- This instrument should be installed and used by a qualified electrician.
- The instrument must not be powered and used until its definitive assembly on the cabinet's door.
- Verify the following points:
 - Auxiliary power supply and measuring ratings

Auxiliary power supply	100-240V AC ^① 10~15%(50-60Hz) 8VA 100-240V DC ^② 10~30% 5W
Ratings	Voltage 277V AC phase-neutral / 480V AC phase-phase
	Current 5A (via current transformer)
	Frequency 50/60Hz

- Current circuits, C1, C2 and C3 are Measurement category I.
- Voltage circuits, P1, P2 and P3 are Measurement category III.
- The instrument is to be mounted on a panel. All connections must be kept inside the cabinet.
- Tighten the terminal screws with the specified torque and use the suitable pressure connectors and suitable wire size.
- When wiring the instrument, be sure that it is done correctly by checking the instrument's wiring diagrams.
- Be sure there are no foreign substances such as sawdust or wiring debris inside the instrument.
- Do not drop this instrument from high place. If you drop it and the display is cracked, do not touch the liquid crystal or get it in your mouth. If the liquid crystal is touched, wash it away at once.
- In order to prevent invasion of noise, do not bunch the control wires or communication cables with the main circuit or power wire, or install them close to each other.

The distance between communicational signal lines, input signal lines and power lines, high voltage lines running parallel to each other are shown below.

Conditions	Length
Below 600V, or 600A power lines	30cm or more
Other power lines	60cm or more

■Operation instructions

CAUTION

- When the external terminals are connected to the external equipments, the instrument and the external equipments must not be powered and used until its definitive assembly on the cabinet's door.
- The rating of the terminal of the external equipment should satisfy the rating of the external terminal of this instrument.

■Maintenance instructions

CAUTION

- Do not touch the terminals while all the circuits connected to this instrument are alive.
- Do not disassemble or modify the instrument.
- Do not contact a chemical dust cloth to the instrument for a long time, or do not wipe it with benzene, thinner, alcohol.

- Wipe dirt off the surface with a soft dry cloth.
- Check the following points, (at the cycle of six months to one year)
 - Condition of the appearance
 - Condition of the display
 - Unusual sound, a smell, and generation of heat
 - Condition of the wiring and the attachment

- Storage conditions
- Ambient temperature the :>20 to 60°C, average day temperature exceeds 35°C
 - Humidity range 30~85%RH, non condensing.
 - Atmosphere without corrosive gas, dust, salt, oil mist.
 - A place without excessive shocks or vibration.
 - Do not expose to rain and water drips.
 - Do not expose to direct sunlight.
 - An area in where are pieces of metal and an inductive substance disperse.

- Disposal
- When disposing of this product, treat it as industrial waste..
 - A battery is not used for this product.

- Guarantee
- The period of guarantee is earlier date of either 18 months from the manufacture date or 1 year from the sale date, except in the case that the failure has been caused by bad handling of the product, provided that it has been installed according to the manufacture's instructions.

■Please contact the service network when the equipment has a breakdown or abnormality.

This manual is a simple version. Please contact our Service Network for a detailed version of User's Manual.

2. Content Poisonous Substance

- Environmental protection use time limit

Note: This symbol mark is for China only.

- Contained name of six hazardous substances

Parts name	Poisonous hazardous substance or element					
	Pb	Hg	Cd	Cr(VI)	PBB	PBDE
Printed wiring board	○	○	○	○	○	○
Electronic parts	×	○	○	○	○	○
Case	○	○	○	○	○	○
LCD	○	○	○	○	○	○
Terminal block	○	○	○	○	○	○
Contacts	○	○	○	○	○	○
Others	○	○	○	○	○	○

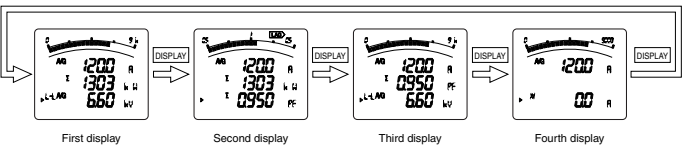
○: It means the content of a poisonous hazardous substance in all homogeneous materials of the corresponding material doesn't exceed the standard that provides.
×: It means the content of a poisonous hazardous substance in homogeneous materials of the corresponding parts exceeds the standard that provides.

4. Operation

4. 1 Display Change

By pressing **[DISPLAY]**, the measurement display will switch over.

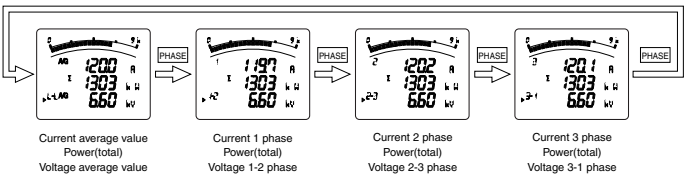
Example of display change (display pattern:P01/phase wire : 3P4W)



4. 2 Phase Change

By pressing **[PHASE]**, the current phase and the voltage phase will switch over.

Example of display change (phase wire : 3P3W)



4. 3 Bar Graph Display

Measurement item to be displayed on bar graph can be selected. By displaying others than the measurement items digitally displayed, 4 elements can be displayed at once.

- Explanation of bar graph

In the bar graph, measurement elements shown by “▶” or “↑” are displayed.

As for voltage, current, active power, reactive power, power factor, frequency, they can be displayed on the bar graph even if they are not set to display pattern.

- Selection of bar graph

Press **[+]** or **[]**, to select measurement elements to be displayed the bar graph.

4. 4 Maximum Value and Minimum Value Display

The maximum values and minimum values are displayed.

- Display of maximum value and minimum value

When **[MAX/MIN]** is pressed, the display is changed into the maximum value and minimum value display. And when **[MAX/MIN]** is pressed, the display changes back to the instantaneous value display.

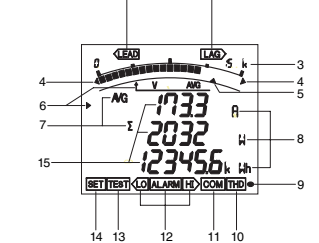
- Reset the maximum value and minimum value

When **[RESET]** is pressed for 2 seconds or more, the displayed maximum value and minimum value can be reset.

When **[RESET]** and **[+]** are pressed simultaneously for 2 seconds or more, all the maximum values and minimum values are reset.

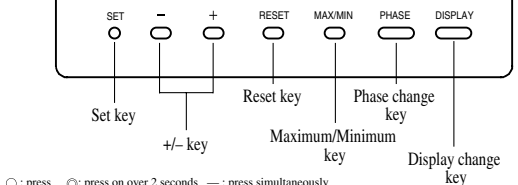
3. Display and Key Functions

- Display



1	LEAD status	9	Metering status
2	LAG status	10	Harmonics status
3	Scale of the bar graph	11	Communication status
4	Outside range	12	Alarm status
5	Index indicator	13	Test status
6	Bar graph status	14	Setup mode status
7	Digital status	15	Digital

- Function of operation key



Key	Function.
SET	Display changes.
+/-	Phase changes.
RESET	Mode changes to the max./min. display and the instantaneous display.
MAX/MIN	An alarm conditions is individually canceled.
PHASE	The item expressed with the bar graph is changed.
DISPLAY	All the alarm conditions is canceled.
	The display of Set-up mode appears.
	The display of Set value confirmation mode appears.

○ : press ⊙ : press on over 2 seconds — : press simultaneously

4. 5 Alarm Display and How to Cancel

- Display and Alarm output, How to cancel

Alarm condition:If a measurement value exceeds an alarm value, the parts of display blink and an alarm relay contact closed.

Alarm cancel method		Alarm condition	Normal condition	
Automatic (Auto)	Display	[ALARM], [H] or [LO] are blink	State usually	
	Output (Alarm relay contact)	Closed	Opened	
Manual (HoLd)	Display	[ALARM], [H] or [LO] are blink	[ALARM], [H] or [LO] are lighting	cancel → State usually
	Output (Alarm relay contact)	Closed	Closed	

- Alarm cancel

Automatic	If a measurement value falls below an alarm value, alarm is automatically canceled.
Manual (HoLd)	After the measurement value falls below an alarm value, alarm is maintained. The element of alarm is displayed and when [RESET] is pressed, alarm is canceled.

- Alarm delay time

If the condition that the limit was exceeded continues more than the delay time, it will be in the alarm condition.
The alarm output by rush current can be prevented.

4. 6 Harmonics Display

Harmonic RMS value and distortion ratio can be displayed.

- Measurement items

Harmonic total, 1st, 3rd, 5th, 7th, 9th, 11th, 13th

- Degree change

When **[+]** and **[]** are pressed, harmonic degree change.
When **[PHASE]** is pressed, harmonic phase change.

4. 7 Expanded Counting Display

Measurement value display and enlarged 3 digit figures of active energy and reactive energy can be displayed.

- Active energy and reactive energy display

Active energy and reactive energy are displayed on the lower stage.

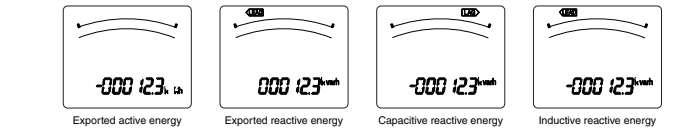
- Enlarged 3 digit figures

When **[+]** and **[]** are pressed simultaneously for 2 seconds, value of active energy and reactive energy are enlarged by 3 figures.

- Wh and varh zero reset

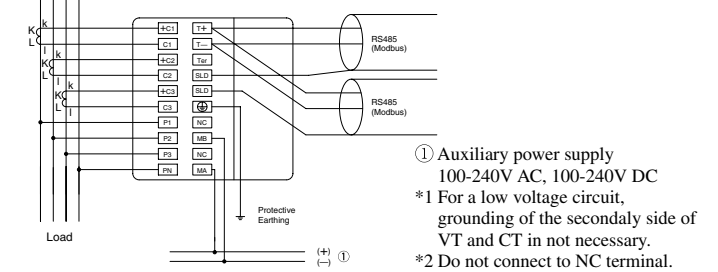
When **[SET]**, **[RESET]** and **[PHASE]** are pressed simultaneously for 2 seconds, the measurement value of active energy(Wh) and reactive energy(varh) are reset.
(This is effective only in the instantaneous value display.)

- Example for display

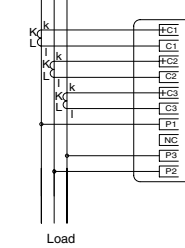


5. Wiring Diagram

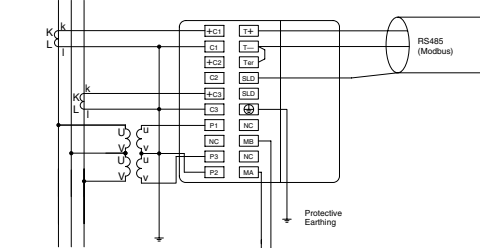
- 3P4W circuit / ModBus communication



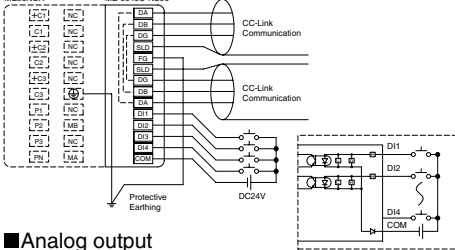
- 3P3W 3CT circuit



- 3P3W 2CT circuit / ModBus communication



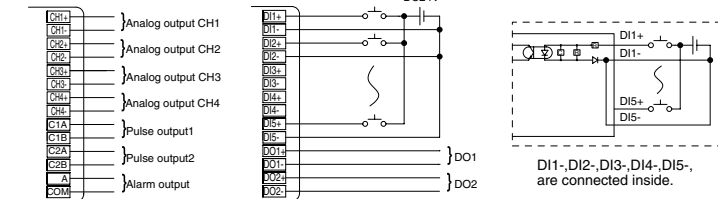
- CC-Link communication



- Analog output

- Pulse output

- Alarm output



CAUTION

1. Do not connect with hot-line.
2. Do not use in the condition that the secondary circuit of CT is opened.
3. Do not use in the condition that the secondary circuit of VT is short-circuited.
4. Wiring of the terminals have to be fastened.
(Fastening torque of instrument main body : 0.4N•m)
5. The wire size has to be suited for the rated current and rated voltage.
Terminals of instrument main body : AWG24~14
Terminals of option module : AWG24~14
When using a stranded wire, use a ferrule (AWG16).

6. Check on Your Delivery

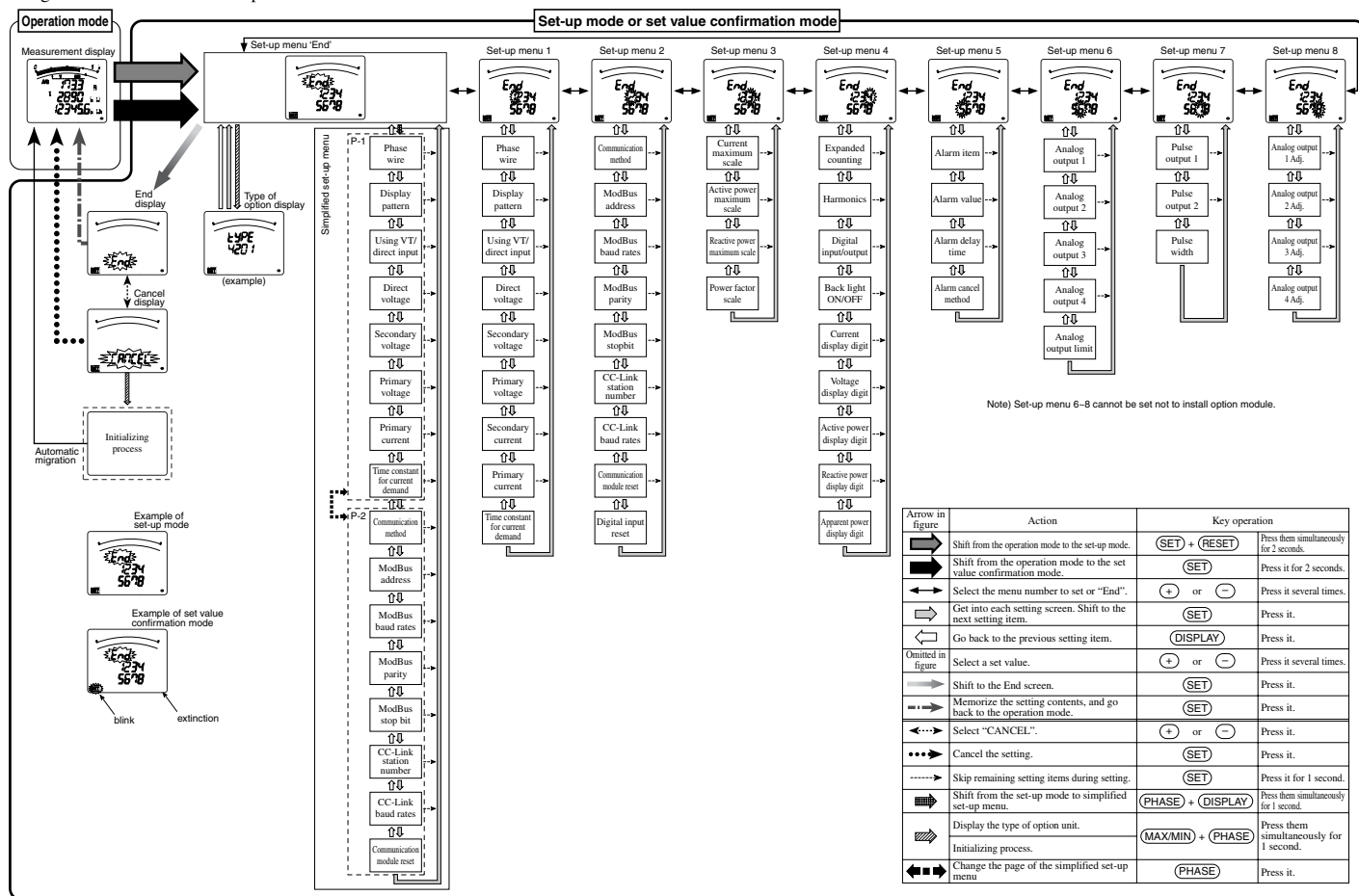
Parts name	Quantity	Specifications
User's manual (this document)	1	A3 size
Attachment lug (with screw)	2	

Please see the back

7. Set-up Diagram

• How to access the set-up items.

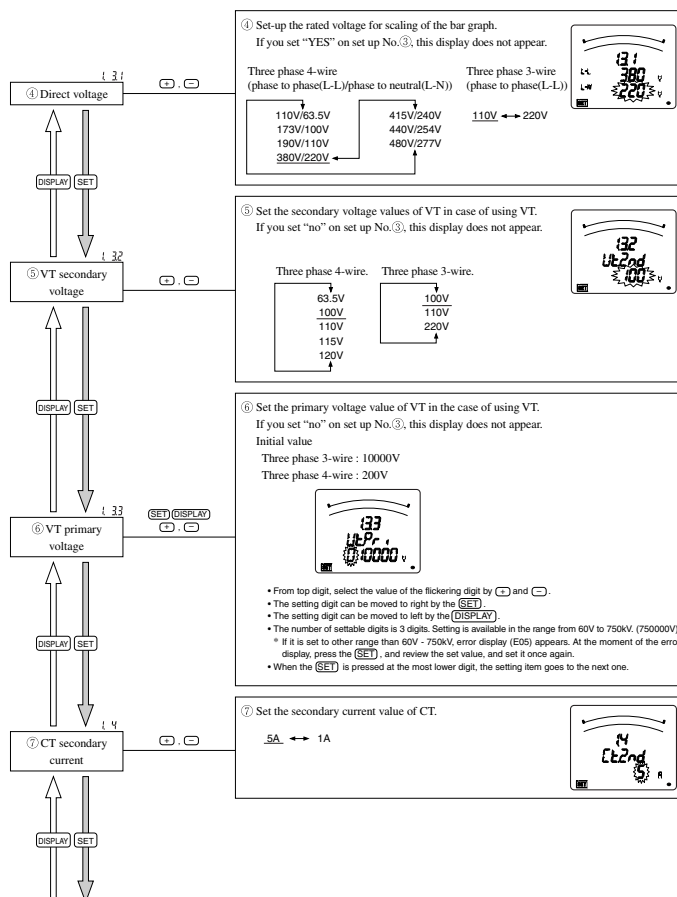
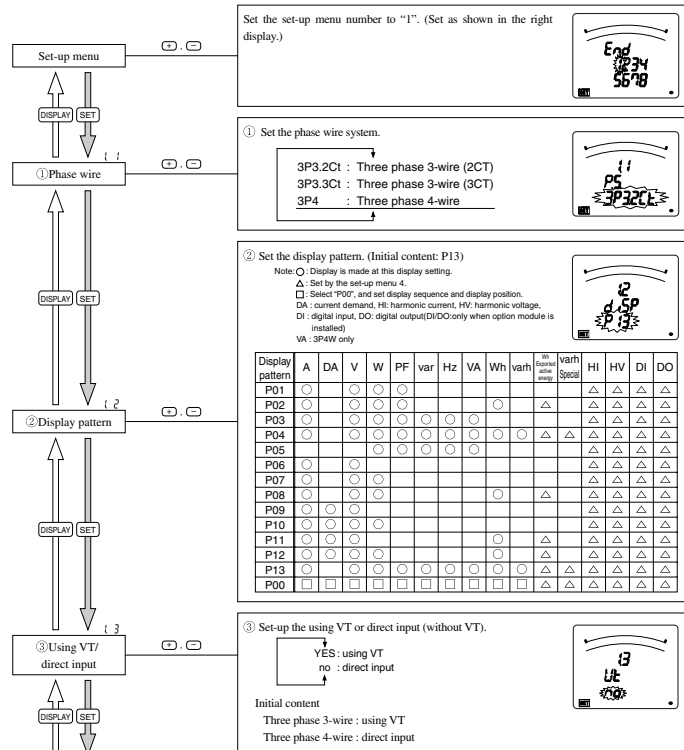
- Press the **(SET)** key and the **(RESET)** key simultaneously for 2 seconds to get in the set-up mode.
- Select a set-up menu number by **(+)** or **(-)** key.
- Change the contents in each set-up menu.
- After completion of set-up, select 'End' in the set-up menu and press the **(SET)** key.
- When the End display appears, press the **(SET)** key once again.



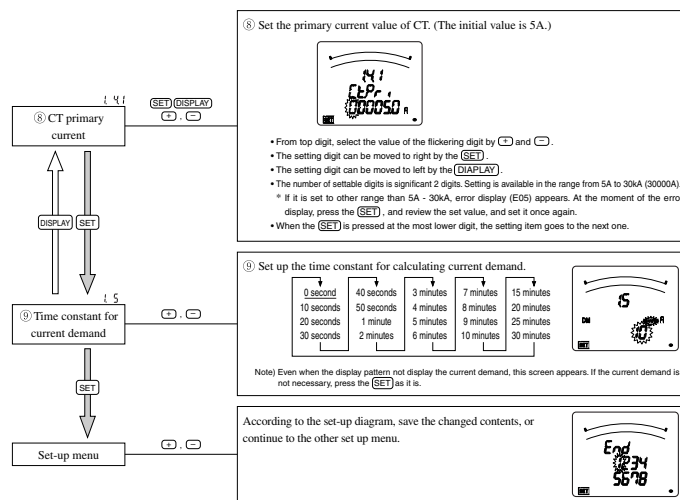
8. Set-up

8.1 Set-up Menu 1

In this set-up menu 1, set-up the basic contents as following for correct measurement . In the operation mode, after pressing the **(SET)** and the **(RESET)** simultaneously for 2 seconds or more, the following operation becomes available. An underline shows the initial value.

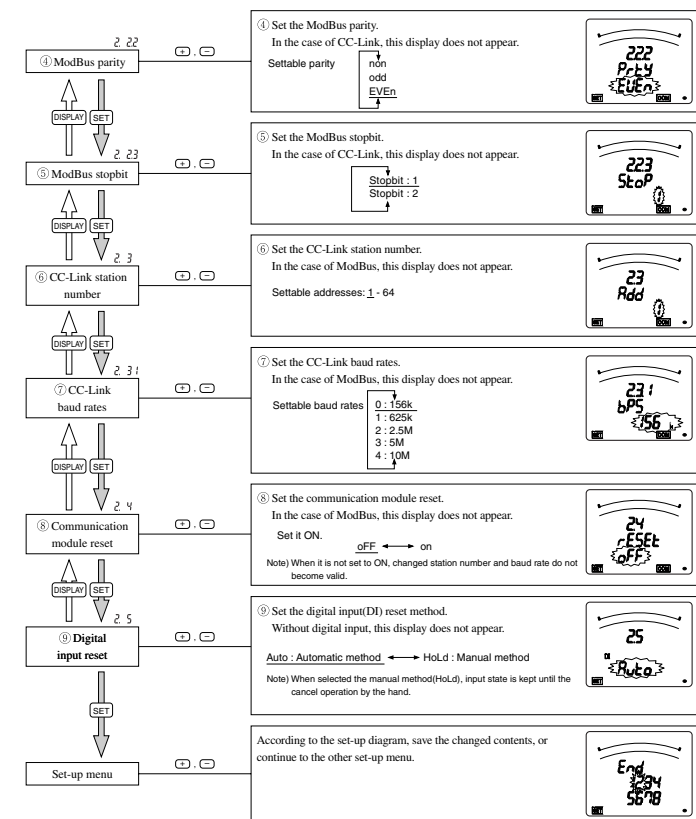
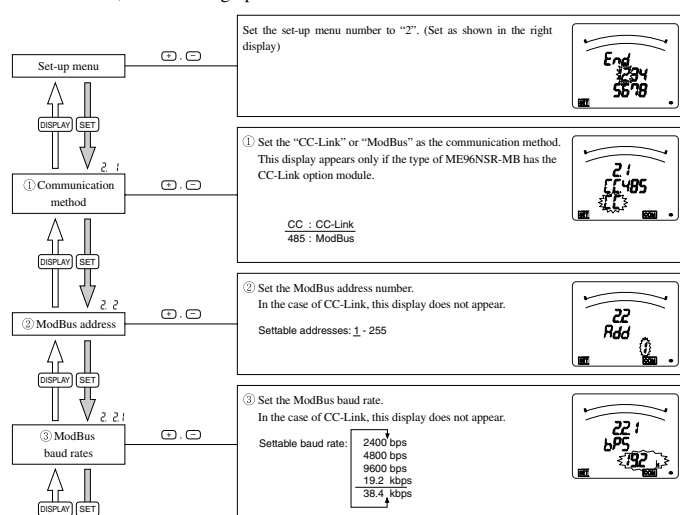


8. Set-up (continued)



8.2 Set-up Menu 2

In the operation mode, after pressing the **(SET)** and the **(RESET)** simultaneously for 2 seconds or more, the following operation becomes available.



9. Optional Plug-in Modules

	Type name of option module		
	ME-4201-NS96	ME-0052-NS96	ME-0040C-NS96
Analog output	4ch	—	—
Pulse output	2ch	—	—
Digital input	—	5ch	4ch
Digital output	1ch	2ch	—
Communication	—	—	CC-Link

10. Installation

Installation on panel

- The attachment lug is installed in four holes of the top and bottom of the main body.
- The screw of the attachment lug is tightened, and it fixes to the panel.

Installation of option module

- The option cover is removed.
- The option module is installed.

Note : Install the option module after it turns off power.

11. Service Network

Country/Region	Company	Address	Telephone
China	Mitsubishi Electric Automation (Shanghai) Limited	17/F., ChuangXing Financial Center, No.288 West Nanjing Road, Huang Pu district, SHANGHAI 20003 P.R.CHINA	+86-(0)21-2322-3030
Indonesia	P.T.SAHABAT INDONESIA.	J.L Muara Karang Selatan Blok A/Utara No.1 kav. NO.11 P.O. Box 5045/Jakarta/11050. Jakarta Indonesia.	+62-(0)21-6621780
Korea	MITSUBISHI ELECTRIC AUTOMATION KOREA CO., LTD.	2 Fl. Dong Seo Game Channel Bldg., 1F 660-11 Deungchon-Dong, Kangseo-Ku, Seoul, 157-030 Korea	+82-2-3668-6567
Philippines	EDISON ELECTRIC INTEGRATED, INC.	24th Fl. Galleria Corporate Center Edsa Cr, Ortigas Ave. Quezon City, Metro Manila. Philippines.	+63-(0)2-643-8691
Taiwan	Setsuyo Enterprise Co., Ltd.	6F, NO. 105 Wu-Kung 3rd rd., Wu-Ku Hsiang, Taipei Hsien Taiwan	+886-(0)2-2298-8889
Thailand	UNITED TRADING & IMPORT CO. LTD.	77/12 Bumrungruang Road, Klong Mahanak, Pomprab Bangkok 10100.	+66-223-4220-3
Vietnam	SA GIANG TECHNO CO., LTD.	47-49 Hoang Sa St., Da Kao Ward, D.1, HCMC	+84-8-910 4763 / 4758 / 4759