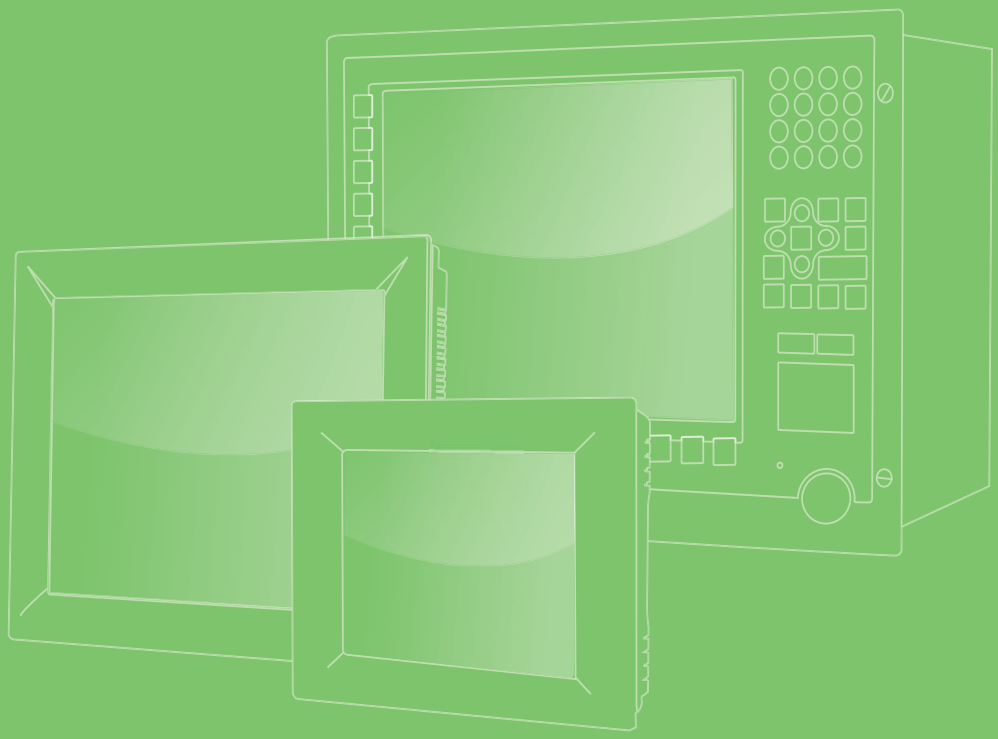


User Manual

WISE-M501

Multifunction Power Meter

ADVANTECH

Enabling an Intelligent Planet

Copyright

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Acknowledgements

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Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandize authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Part No. Edition 1

Printed in China June 2016

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from Advantech. Please contact your local supplier for ordering information.

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

Technical Support and Assistance

1. Visit the Advantech web site at http://support.advantech.com where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
   - Product name and serial number
   - Description of your peripheral attachments
   - Description of your software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wording of any error messages

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated into the equipment.
    - The equipment has been exposed to moisture.
    - The equipment does not work well, or you cannot get it to work according to the user's manual.
    - The equipment has been dropped and damaged.
    - The equipment has obvious signs of breakage.
15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -40° C (-40° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.
16. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

Battery Information

Batteries, battery packs, and accumulators should not be disposed of as unsorted household waste. Please use the public collection system to return, recycle, or treat them in compliance with the local regulations.







Manual Conventions

Warning! *Warnings indicate conditions, which if not observed, can cause personal injury!*



Caution! *Cautions are included to help you avoid damaging hardware or losing data. e.g.*



There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Note! *Notes provide optional additional information.*



Contents

Chapter 1 Product Overview 1

1.1 Introduction 2
1.2 Application 2

Chapter 2 Product Specifications 3

2.1 Product Specifications 4
Table 2.1: PARAMETERS 4
Table 2.2: Accuracy & Resolutions 4

Chapter 3 Hardware Installation 7

3.1 Dimensions 8
3.2 Mounting 8
3.3 Wiring & Connections 8

Chapter 4 System Configuration 11

4.1 Operational Processes 12
4.2 Setting & Display 13

Appendix A I/O Modbus Mapping Table 19

A.1 Modbus Function Code Introduction 20
A.2 I/O Modbus Mapping Table 20
Table A.1: RS485 communication parameters address table (Function code: 03h, 06h, 10h) 20

Chapter 1

Product Overview

1.1 Introduction

The WISE-M501 series Multifunction Power Meter provide high accuracy measurement, display and communication (Modbus RTU) of all electrical and power quality parameters, including harmonic measurement THD (Total Harmonic distortion) Provides electricity bill ratio (Cost) and carbon dioxide ratio (Co2) set can show cumulative electricity bills and carbon emissions, and suitable for the installation in the power management of remote communication, such as the use of demand.

1.2 Application

- Control panels and Motor
- Generator monitoring
- Switchgear distribution systems
- Energy Management
- Power quality analysis

Chapter 2

Product Specifications

2.1 Product Specifications

Table 2.1: PARAMETERS	
Voltage	V_{12} V_{23} V_{31} V_{LL_Avg} V_1 V_2 V_3 V_{LN_Avg}
Current	I_1 I_2 I_3 I_{Avg} I_N
Active Power	P_1 P_2 P_3 ΣP
Reactive Power	Q_1 Q_2 Q_3 ΣQ
Apparent Power	S_1 S_2 S_3 ΣS
Power factor	PF_1 PF_2 PF_3 PF_{Avg}
Frequency	Hz
Active Energy	Wh_{Total}
Reactive Energy	$Varh_{Total}$
THD for voltage	THD_{V12} THD_{V23} THD_{V31} THD_{V_Avg}
THD for current	THD_{I1} THD_{I2} THD_{I3} THD_{I_Avg}
RS485 Port	Modbus RTU mode
Cumulative electricity bills	Cost (Only a single rate)
CO2 emissions	CO_2
Date time	Year, Month, Day, Hour, Min, Sec.

Table 2.2: Accuracy & Resolutions		
Parameters	**Accuracy**	**Resolution**
Voltage	0.25%	0.1V
Current	0.25%	0.001A
Neutral Current	1.0%	0.001A
Active Power	0.5%	1W
Reactive Power	0.5%	1Var
Apparent Power	0.5%	1VA
Power factor	0.5%	0.001
Frequency	0.2%	0.01Hz
Active Energy	0.5%	0.1kWh
Reactive Energy	0.5%	0.1kVarh
THD	1.0%	0.1%

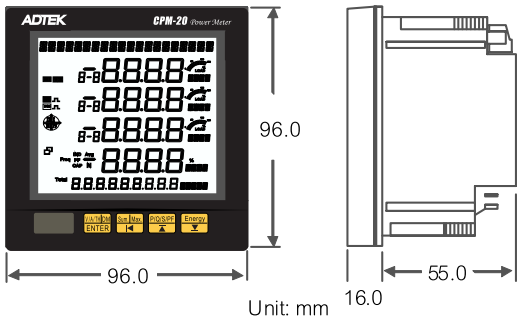
	Programmable by front buttons (Actual wiring must be same)
Input range:	Voltage: 40~400 V_{LN}; 60~600V_{LL}
	PT Primary range:100~500000V
	PT Secondary range:100~600V
	Current: 0~5A, (Optional:0~1A)
	CT Primary range: 5~9999A
	Frequency: 45~65Hz
Max. Input over capability:	Voltage:2 X rated continuous: 2500V, 1 sec
	Current: 2 X rated continuous: 20 X rated 1 sec
Input burden:	Voltage: < 0.2VA?Current: < 0.1VA
Power Quality	
THD:	Total harmonic distortion for Voltage and Current
RS485 communication (standard)	
Protocol:	Modbus RTU mode
Baud rate:	1200/2400/4800/9600/19200/38400
Data bits:	8 bits
Parity:	None / Even / Odd
Stop bits:	1 or 2
Address:	1~255
Wiring:	1200M max,
Termination Res.:	120~300Ω/0.25W (typical: 150Ω)

Back up memory:	FRAM
Digital Input:	2 DI; Opto couplers: 5Vdc, 20mA
	Reaction time:≤ 300ms; Isolation: 2000Vac
Digital Output	2 DO; Open collector: 40Vdc, 50mA
	Reaction time:≤ 300ms; Isolation: 2000Vac
Power	
Power supply:	AC 85~264V / DC 100~300V
Power consumption:	AC:≤ 10W / DC:≤ 3W @ 230V
Environmental	
Operating Temp.:	0~60 ˚C
Operating Hum(%RH):	5~95 %RH, non-condensing
Temp. Coefficient:	≤100 PPM/˚C
Storage Temperature:	-10~70 ˚C
Enclosure:	Front panel: IEC 529 (IP50): Housing: IP20
Input	
Measurement:	True RMS measurement
Sampling:	128 point / Cycle
Connection:	1P2W, 1P3W, 3P3W(2,3CT), 3P4W, Balanced/Unbalance

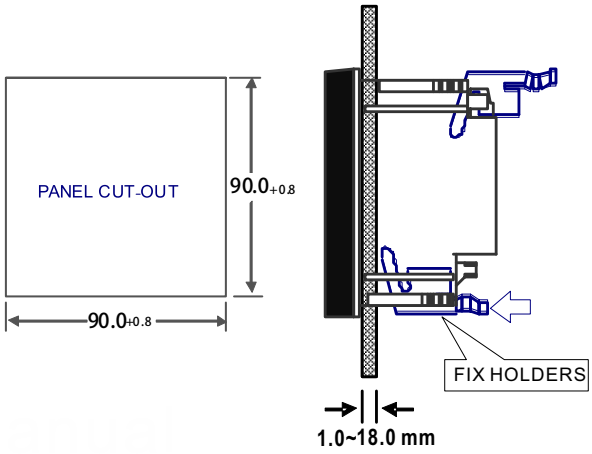
Chapter 3

Hardware Installation

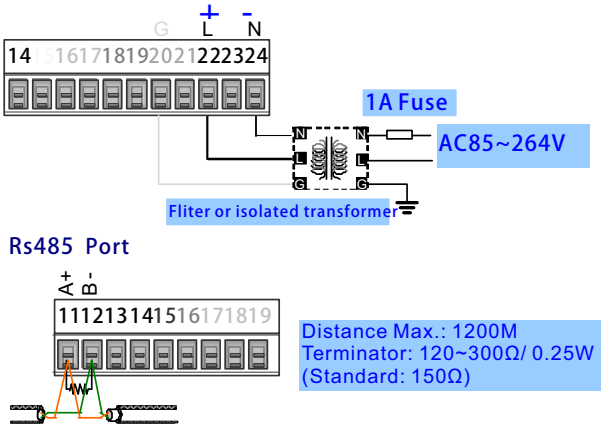
3.1 Dimensions



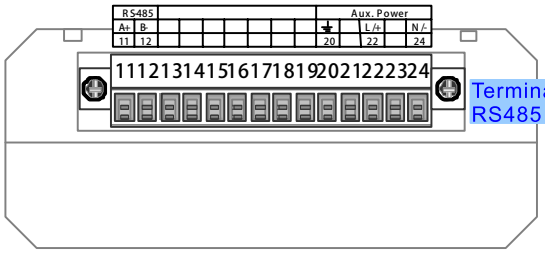
3.2 Mounting



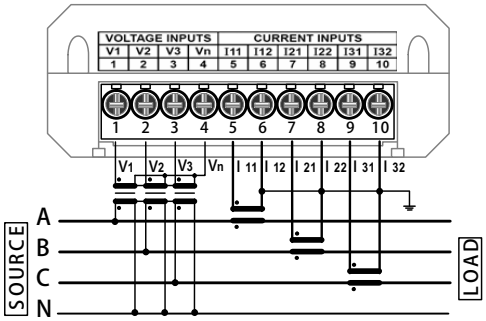
3.3 Wiring & Connections

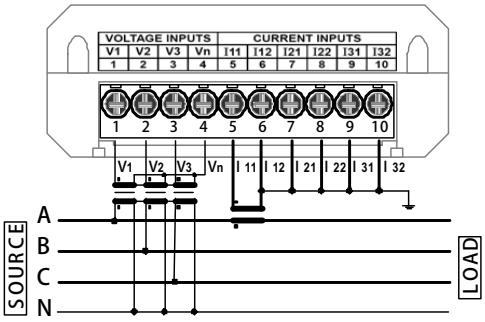


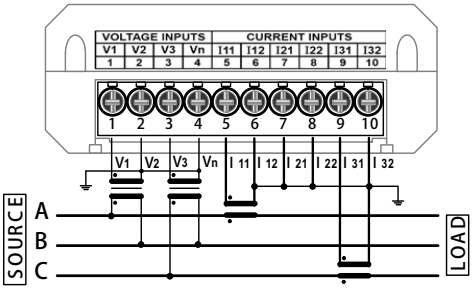
RS-485/(Terminal Block 2)



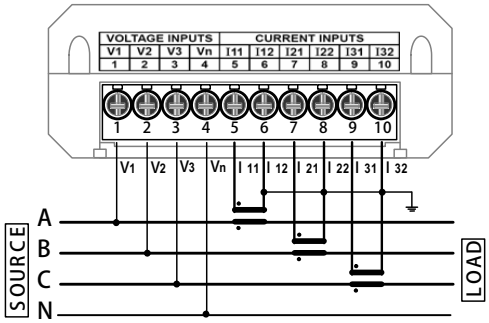
3P4W-3PT/3CT [SET : 3P4Y]

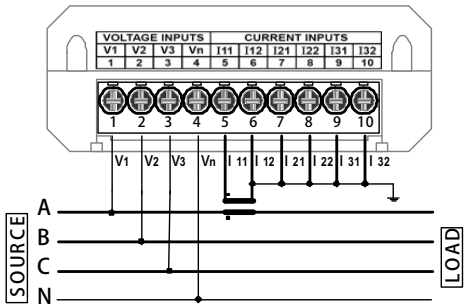


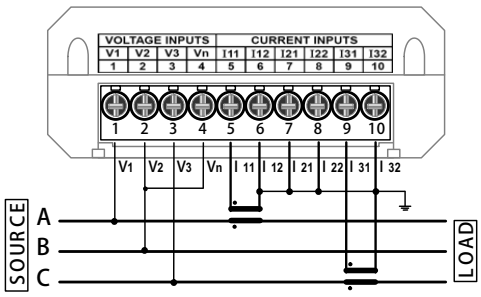




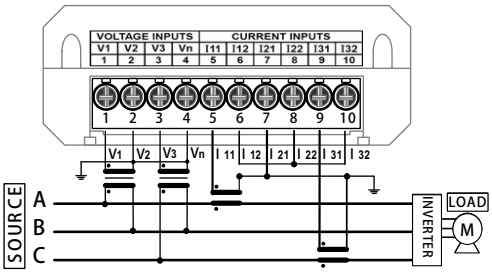
3P4W-Direct Voltage NOPT/3CT [SET : 3P4Y]

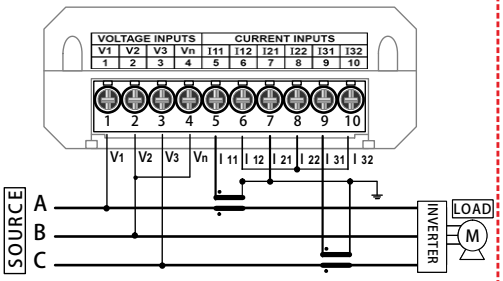


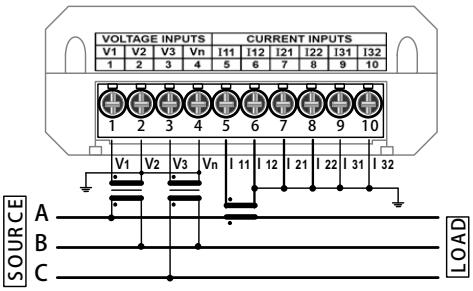


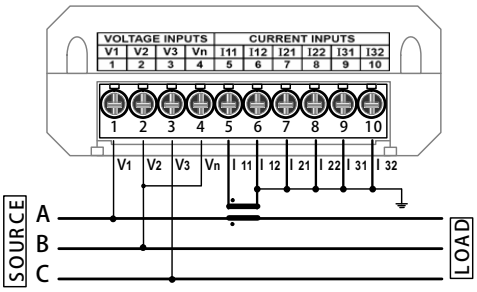


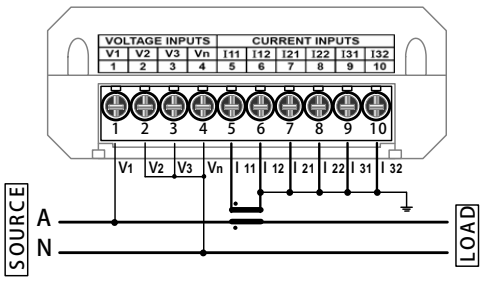
This CT wiring can be use for inverter load or any usual circumstances

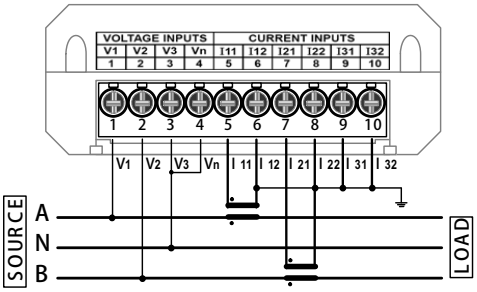








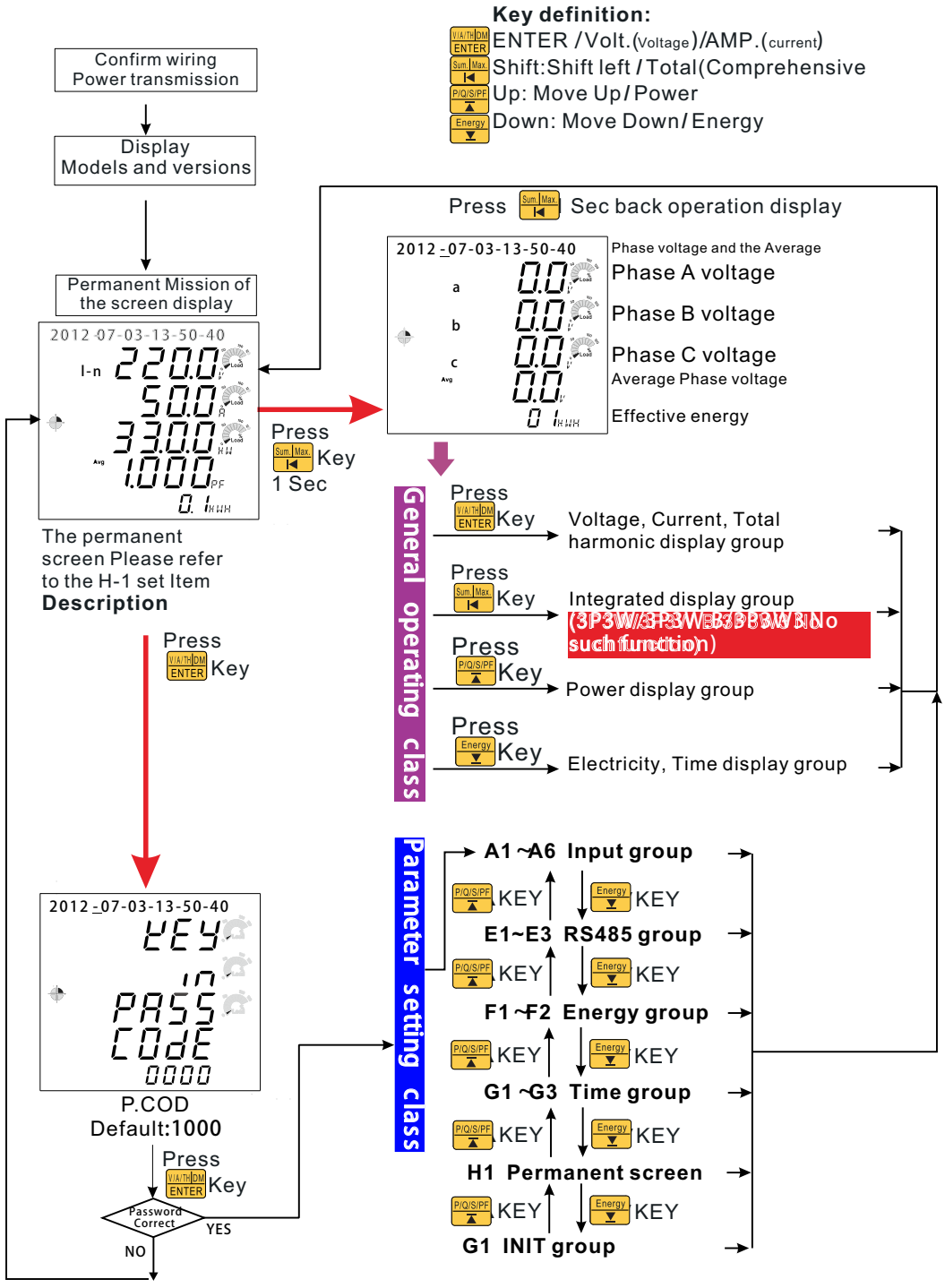




Chapter 4

System Configuration

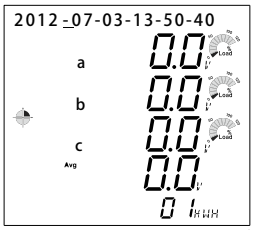
4.1 Operational Processes



4.2 Setting & Display

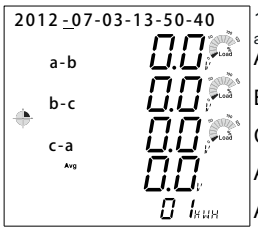
Press V/A/TH/DM ENTER Key (Voltage and Current harmonics screen)

Normal screen Sum/Max 1 seconds, first showed off the voltage value As follows



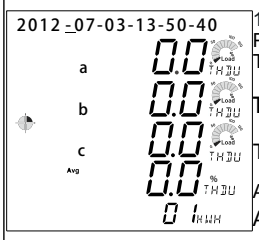
Phase voltage and the Average
Phase A voltage
Phase B voltage
Phase C voltage
Average Phase voltage
Active energy

Press V/A/TH/DM ENTER Key



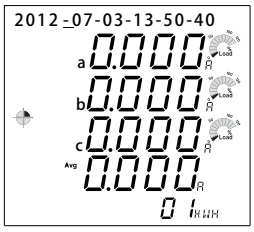
1.1.1- The Value of the Line voltage and the Average Line voltage
A-B Line Voltage
B-C Line Voltage
C-A Line Voltage
Average line voltage
Active energy

Press V/A/TH/DM ENTER Key

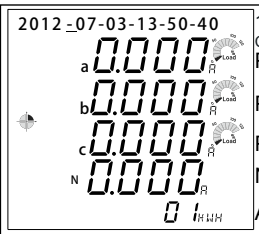


1.1.2-Voltage total harmonic distortion
Phase voltage total harmonic THDU/ Phase A THD
THDU/Phase B THD
THDU/Phase C THD
Average line voltage THD
Active energy

Press V/A/TH/DM ENTER Key

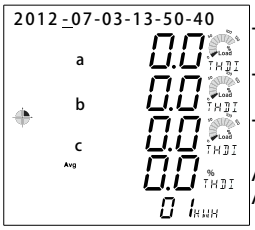


1.1.3-Phase current values and the average
Phase A current
Phase B current
Phase C current
Average current
Active energy



1.1.4- Phase Current and Neutral Current
Phase A current
Phase B current
Phase C current
Neutral Current
Active energy

Press V/A/TH/DM ENTER Key



1.1.5-Current harmonic distortion rate
THDI/Phase A Current THD
THDI/Phase B Current THD
THDI/Phase C Current THD
Average Current THD
Active energy

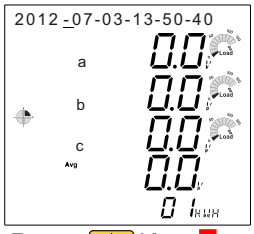
Press V/A/TH/DM ENTER Key

To 1.1.1 Display Or
Press Sum/Max Key1 Sec Back to Measurement screen

(3P3W/3P3W.B/3P3W3 No such function)

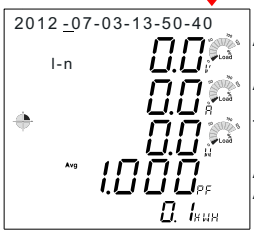
Press Sum. Max. Shift KEY (Comprehensive screen) Press P/Q/S/PF Up KEY (Power Parameters)

Normal screen Sum. Max. 1 seconds, first showed off the voltage value As follows



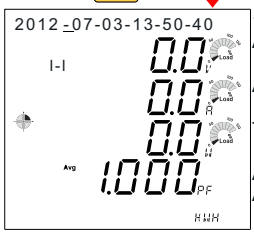
Phase voltage and the Average
Phase A voltage
Phase B voltage
Phase C voltage
Average Phase voltage
Active energy

Press Sum. Max. Key



1.2.1- 3-phase integrated display-1
Average Phase voltage
Average current
Total Active power
Average power factor
Active energy

Press Sum. Max. Key



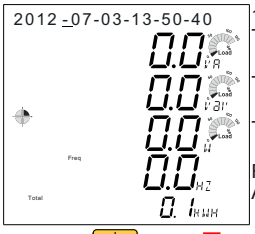
1.2.2- 3-phase integrated display-2
Average Line voltage
Average current
Total Active power
Average power factor
Active energy

Press Sum. Max. Key



1.2.3- 3-phase integrated display-3
Total Apparent Power
Total Reactive Power
Total Active power
Average power factor
Active energy

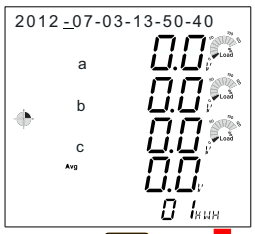
Press Sum. Max. Key



1.2.4- 3-phase integrated display-4
Total Apparent Power
Total Reactive Power
Total Aective power
Frequency
Active energy

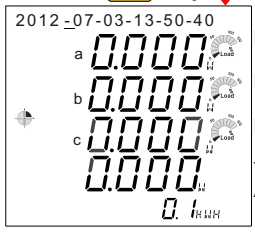
Press Sum. Max. Key To 1.2.1 Display Or Press Harmonic Key1 Sec Back to Measurement screen

Normal screen Sum. Max. 1 seconds, first showed off the voltage value As follows



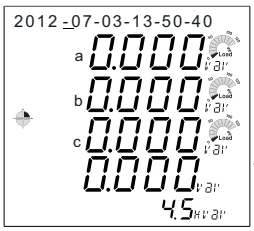
Phase voltage and the Average
Phase A voltage
Phase B voltage
Phase C voltage
Average Phase voltage
Active energy

Press P/Q/S/PF Key



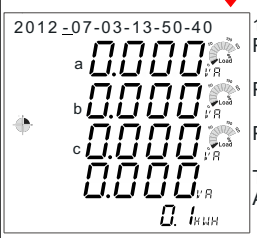
1.3.1- Effective power display
Phase A active power
Phase B active power
Phase C active power
Total Active power
Active energy

Press P/Q/S/PF Key



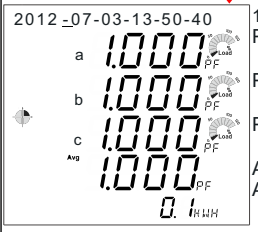
1.3.2- Reactive power display
Phase A reactive power
Phase B reactive power
Phase C reactive power
Total reactive power
Reactive electricity

Press P/Q/S/PF Key



1.3.3- Apparent power display
Phase A apparent power
Phase B apparent power
Phase C apparent power
Total Apparent Power
Active energy

Press P/Q/S/PF Key

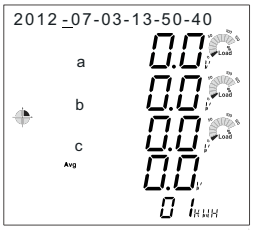


1.3.4- Power Factor display
Phase A power factor
Phase B power factor
Phase C power factor
Average Power factor
Active energy

Press P/Q/S/PF Key To 1.3.1 Display Or Press Harmonic Key1 Sec Back to Measurement screen

Press Energy Down KEY(Power parameters)

Normal screen Sum Max 1 seconds,
first showed off the voltage value As follows



Phase voltage and the Average
Phase A voltage
Phase B voltage
Phase C voltage
Average Phase voltage
Active energy

Press Energy Key



1.4.1- Power display-1
Total apparent power
Total reactive power
Total active power
Average power factor
Total Active energy

Press Energy Key



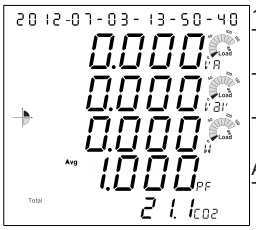
1.4.2- Power display-2
Total apparent power
Total reactive power
Total active power
Average power factor
Total reactive electricity

Press Energy Key



1.4.3- Total electricity bills display
Total apparent power
Total reactive power
Total active power
Average power factor
Total electricity bill

Press Energy Key



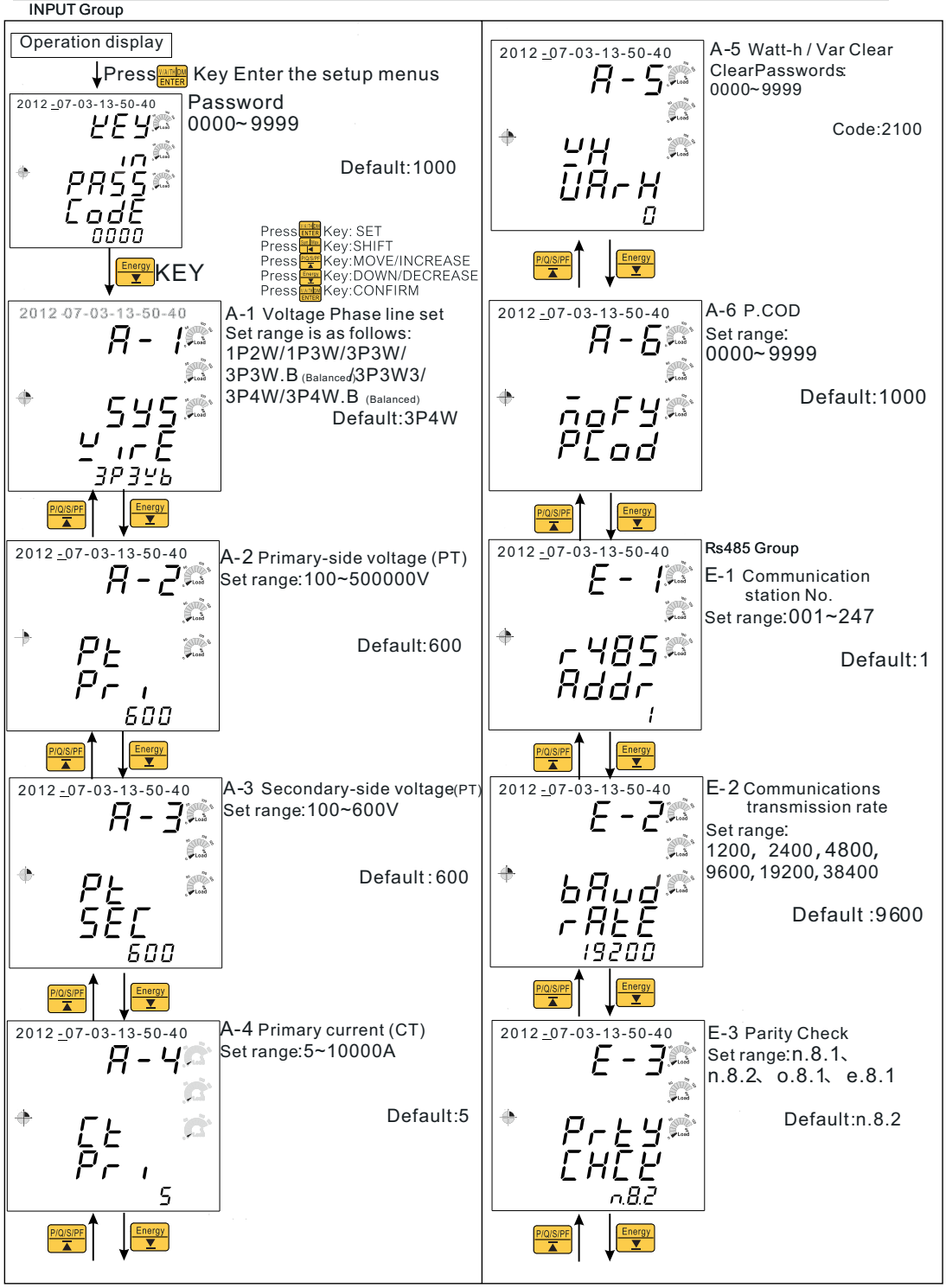
1.4.4- Carbon emissions
Total apparent power
Total reactive power
Total active power
Average power factor
Total carbon dioxide(kg)

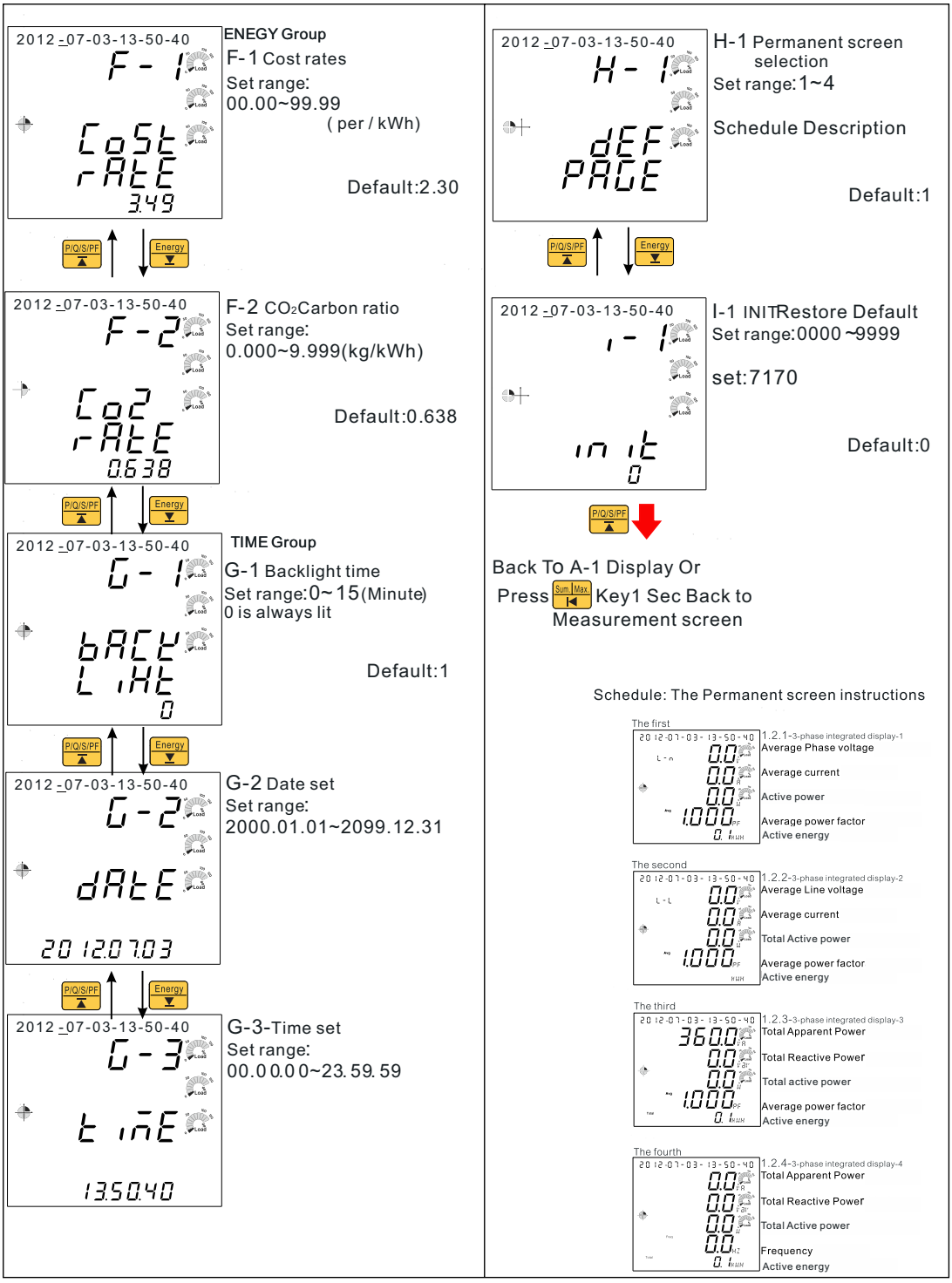
Press Energy Key

To 1.4.1 Display Or
Press Sum Max Key1 Sec Back to Measurement screen

*Engineers set class, non-personnel do not arbitrarily enter the change, in order to avoid abnormal。

INPUT Group




2012 -07-03-13-50-40
F - 1
CoSt
rAtE
3.49
ENEGY Group
F-1 Cost rates
Set range:
00.00~99.99
(per / kWh)
Default:2.30
P/Q/S/PF
Energy
2012 -07-03-13-50-40
F - 2
Co2
rAtE
0.638
F-2 CO2Carbon ratio
Set range:
0.000~9.999(kg/kWh)
Default:0.638
P/Q/S/PF
Energy
2012 -07-03-13-50-40
G - 1
bACK
LiHt
0
TIME Group
G-1 Backlight time
Set range:0~15(Minute)
0 is always lit
Default:1
P/Q/S/PF
Energy
2012 -07-03-13-50-40
G - 2
dAtE
2012.07.03
G-2 Date set
Set range:
2000.01.01~2099.12.31
P/Q/S/PF
Energy
2012 -07-03-13-50-40
G - 3
tiME
13.50.40
G-3-Time set
Set range:
00.00.00~23.59.59
2012 -07-03-13-50-40
H - 1
dEF
PAGE
H-1 Permanent screen selection
Set range:1~4
Schedule Description
Default:1
P/Q/S/PF
Energy
2012 -07-03-13-50-40
i - 1
init
0
I-1 INITRestore Default
Set range:0000 ~9999
set:7170
Default:0
P/Q/S/PF
Back To A-1 Display Or
Press Sum. Max. Key1 Sec Back to
Measurement screen
Schedule: The Permanent screen instructions
The first
1.2.1-3-phase integrated display-1
Average Phase voltage
Average current
Active power
Average power factor
Active energy
The second
1.2.2-3-phase integrated display-2
Average Line voltage
Average current
Total Active power
Average power factor
Active energy
The third
1.2.3-3-phase integrated display-3
Total Apparent Power
Total Reactive Power
Total active power
Average power factor
Active energy
The fourth
1.2.4-3-phase integrated display-4
Total Apparent Power
Total Reactive Power
Total Active power
Frequency
Active energy

Appendix A

I/O Modbus Mapping Table

A.1 Modbus Function Code Introduction

Code(Hex)	Name	Usage
03	Read Holding Registers	Read 16-bit register. Used to read integer or floating point process data.
06	Preset Single Register	Write data in 16-bit integer format
10	Preset Multiple Registers	Write multiple data in 16-bit integer format

A.2 I/O Modbus Mapping Table

Table A.1: RS485 communication parameters address table (Function code: 03h, 06h, 10h)

General class information

Register Name	Register address	Data Format	Data Length	Measurement range	Unit	R/W	Default	Description
Frequency	0000h	XXXX	2	45.00 ~65.00	Hz /100	R		Frequency (high word)
	0001h	XX.XX						Frequency (low word)
Average phase voltage	0002h	XXXX	2	0~500000.0	V/10	R		Average phase voltage (high word)
	0003h	XXX.X						Average phase voltage (low word)
U l lavg	0004h	XXXX	2	0~500000.0	V/10	R		Average line voltage (high word)
	0005h	XXX.X						Average line voltage (low word)
I avg	0006h	XXXX	2	0~10000.000	A /1000	R		Average current (high word)
	0007h	X.XXX						Average current (low word)
In	0008h	XXXX	2	0~10000.000	A /1000	R		Neutral current (high word)
	0009h	X.XXX						Neutral current (low word)
Psum	000Ah	XXXX	2	-199999999 ~999999999	W	R		Total effective power (high word)
	000Bh	XXXX						Total effective power (low word)
Qsum	000Ch	XXXX	2	-199999999 ~999999999	VAR	R		Total reactive power (high word)
	000Dh	XXXX						Total reactive power (low word)
Ssum	000Eh	XXXX	2	-199999999 ~999999999	VA	R		Total apparent power (high word)
	000Fh	XXXX						Total apparent power (low word)
PF avg	0010h	XXXX	2	-1.000 ~1.000	PF /1000	R		Average power factor (high word)
	0011h	X.XXX						Average power factor (low word)
Ea	0012h	XXXX	2	0~99999999.9	kWh /10	R/W		Effective energy (high word), over 99999999.9 auto Zero
	0013h	XXX.X						Effective energy (low word), over 99999999.9 auto Zero
Er	0014h	XXXX	2	0~99999999.9	kVARh /10	R/W		Invalid electricity (high word), over 99999999.9 auto Zero
	0015h	XXX.X						Invalid electricity (low word), over 99999999.9 auto Zero
Cost	0016h	XXXX	2	0~99999999.9	$/10	R		Total electricity bill (high word), over 99999999. 9 auto Zero
	0017h	XXX.X						Total electricity bill (low word), over 99999999.9 auto Zero
CO 2	0018h	XXXX	2	0~99999999.9	kg/10	R		The total carbon dioxide(high word),over 99999999.9 auto Zero
	0019h	XXX.X						The total carbon dioxide (low word) over 99999999.9 auto Zero
UA	001Ah	XXXX	2	0~500000.0	V/10	R		Phase A voltage (high word)
	001Bh	XXX.X						Phase A voltage (low word)
UB	001Ch	XXXX	2	0~500000.0	V/10	R		Phase B voltage (high word)
	001Dh	XXX.X						Phase B voltage (low word)
UC	001Eh	XXXX	2	0~500000.0	V/10	R		Phase C voltage (high word)
	001Fh	XXX.X						Phase C voltage (low word)
UAB	0020h	XXXX	2	0~500000.0	V/10	R		AB line voltage (high word)
	0021h	XXX.X						AB line voltage (low word)

UBC	0022h	XXXX	2	0~500000.0	V/10	R		BC line voltage (high word)
	0023h	XXX.X						BC line voltage (low word)
UCA	0024h	XXXX	2	0~500000.0	V/10	R		CA line voltage (high word)
	0025h	XXX.X						CA line voltage (low word)
IA	0026h	XXXX	2	0~10000.000	A/1000	R		Phase A current (high word)
	0027h	X.XXX						Phase A current (ow word)
IB	0028h	XXXX	2	0~10000.000	A/1000	R		Phase B current (high word)
	0029h	X.XXX						Phase B current (low word)
IC	002Ah	XXXX	2	0~10000.000	A/1000	R		Phase C current (high word)
	002Bh	X.XXX						Phase C current (low word)
PA	002Ch	XXXX	2	-199999999 ~999999999	W	R		Phase A active power (high word)
	002Dh	XXXX						Phase A active power (low word)
PB	002Eh	XXXX	2	-199999999 ~999999999	W	R		Phase B active power(high word)
	002Fh	XXXX						Phase B active power (low word)
PC	0030h	XXXX	2	-199999999 ~999999999	W	R		Phase C active power (high word)
	0031h	XXXX						Phase C active power (low word)
QA	0032h	XXXX	2	-199999999 ~999999999	VAR	R		Phase A reactive power (high word)
	0033h	XXXX						Phase A reactive power (low word)
QB	0034h	XXXX	2	-199999999 ~999999999	VAR	R		Phase B reactive power (high word)
	0035h	XXXX						Phase B reactive power (low word)
QC	0036h	XXXX	2	-199999999 ~999999999	VAR	R		Phase C reactive power(high word)
	0037h	XXXX						Phase C reactive power (low word)
SA	0038h	XXXX	2	-199999999 ~999999999	VA	R		Phase A apparent power (high word)
	0039h	XXXX						Phase A apparent power (low word)
SB	003Ah	XXXX	2	-199999999 ~999999999	VA	R		Phase B apparent power (high word)
	003Bh	XXXX						Phase B apparent power (low word)
SC	003Ch	XXXX	2	-199999999 ~999999999	VA	R		Phase C apparent power(high word)
	003Dh	XXXX						Phase C apparent power (low word)
PFA	003Eh	XXXX	2	-1.000 ~1.000	PF/ 1000	R		Phase A Power Factor (high word)
	003Fh	X.XXX						Phase A Power Factor (low word)
PFB	0040h	XXXX	2	-1.000 ~1.000	PF/ 1000	R		Phase B Power Factor (high word)
	0041h	X.XXX						Phase B Power Factor (low word)
PFC	0042h	XXXX	2	-1.000 ~1.000	PF/ 1000	R		Phase C Power Factor (high word)
	0043h	X.XXX						Phase C Power Factor (low word)
LT	0044h	XX	1	82=R, 76=L, 67=C		R		R: Resistive, L: Inductive, C:Capacitive
THDUA	0045h	XXX.X	1	0~100.0	%/10	R		Phase A voltage total harmonic(3P3W,THDUAB)
THDUB	0046h	XXX.X	1	0~100.0	%/10	R		Phase B voltage total harmonic (3P3W,THDUBC)
THDUC	0047h	XXX.X	1	0~100.0	%/10	R		Phase C voltage total harmonic (3P3W,THDUCA)
THDUavg	0048h	XXX.X	1	0~100.0	%/10	R		Average voltage total harmonic
THDIA	0049h	XXX.X	1	0~100.0	%/10	R		Phase A current total harmonic
THDIB	004Ah	XXX.X	1	0~100.0	%/10	R		Phase B current total harmonic
THDIC	004Bh	XXX.X	1	0~100.0	%/10	R		Phase C current total harmonic
THDIavg	004Ch	XXX.X	1	0~100.0	%/10	R		Average total harmonic current

Input group setting class								
Register Name	**Register address**	**Data Format**	**Data Length**	**Measurement range**	**Unit**	**R/W**	**Default**	**Description**
Voltage wiring Wire-U	004Dh	X	1	0~6		R/W	5	0:1P2W4:3P3W.3 1:1P3W5:3P4W 2:3P3W6:3P4W.B 3:3P3W.B
PT- Pri	004Eh	XXXX	2	100~500000	V	R/W	600	PT Primary side voltage setting(high word)
	004Fh	XXXX						PT Primary side voltage setting(low word)
PT- Sec	0050h	XXXX	1	100~600	V	R/W	600	PT Secondary voltage settings
CT- Pri	0051h	XXXXX	1	1~10000	A	R/W	5	CT Primary current setting
P.code	0052h	XXXX	1	0000~9999		R/W	1000	Clearance password change

RS485 communication group settings class								
Register Name	**Register address**	**Data Format**	**Data Length**	**Measurement range**	**Unit**	**R/W**	**Default**	**Description**
Addr	0053h	XXX	1	1~247		R/W	1	The Communication Station No. setting
Baud	0054h	X	1	0~5		R/W	3	0:1200, 1:2400, 2:4800, 3:9600, 4:19200, 5:38400
Parity	0055h	X	1	0~3		R/W	1	0:N81, 1:N82, 2:O81, 3:E81

Cost group setting class								
Register Name	**Register address**	**Data Format**	**Data Length**	**Measurement range**	**Unit**	**R/W**	**Default**	**Description**
Cost	0056h	XX.XX	1	00.00~99.99		R/W	2.30	kWh the cost ratio setting
CO2	0057h	X.XXX	1	0.000~9.999		R/W	0.638	kWh of CO2 ratio setting

Time group setting class								
Register Name	**Register address**	**Data Format**	**Data Length**	**Measurement range**	**Unit**	**R/W**	**Default**	**Description**
Back- Light	0058h	XX	1	0~15		R/W	1	0~15Minute, 0 is Steadily lit
Year	0059h	XX	1	0~99		R/W		0~99 = 2000~2099
Month	005Ah	XX	1	1~12		R/W		
Day	005Bh	XX	1	1~31		R/W		
Time	005Ch	XX	1	0~23		R/W		
Minute	005Dh	XX	1	0~59		R/W		
Second	005Eh	XX	1	0~59		R/W		

Permanent screen group setting class								
Register Name	**Register address**	**Data Format**	**Data Length**	**Measurement range**	**Unit**	**R/W**	**Default**	**Description**
Def.Page	005Fh	X	1	1~4		R/W	1	1: 1.2.1: Average phase voltage (T/L-n/V) / Average current (A)/Total active power (kW)Average power factor (PF/IND/Avg) /Total active energy (kWh)
								2: 1.2.2: Average line voltage (T/L-L/V) / Average current (A)/Total active power (kW)Average power factor (PF/IND/Avg) /Total active energy (kWh)
								3: 1.2.3: Total apparent power (T/kVA) / Total reactive power (kvar)/ Total active power (kW)/Average power factor(PF/IND/Avg) / Total active energy(kWh)
								4: 1.2.4: Total apparent power (T/kVA) /Total reactive power (kvar)/ Total active power(kW)/Frequency (Hz) /Total active energy (kWh)
INIT	0060h	XXXX	2	0000~9999		R/W	0	Set:7170,Restore Default

Client Custom class								
Register Name	**Register address**	**Data Format**	**Data Length**	**Measurement range**	**Unit**	**R/W**	**Default**	**Description**
Client Custom1	5000h	XX	1	0~76(0x4c)		R/W	0x0000 h	This regional data to set the following 20 addresses (5014h~5027h) content of the information, That is redefining 5014h~5027h address information significance Address correspondence to: 5000h set 5014h corresponding address data content. Address correspondence to: 5001h set 5015h corresponding address data content. Address correspondence to: 5013h set 5027h address data corresponding to content. Example: 1: 5000h address data = 0000h, 5001h address data = 0001h. Then the corresponding address 5014h ,5015h addresses are mapped to the content of 0000h, 0001h, according to the table, 5014h ,5015h address data for the frequency content high byte and low byte (Setting range 0 ~ 0x4c, read the corresponding region RS485 Data Sheet)
Client Custom 2	5001h	XX	1	0~76(0x4c)		R/W	0x0001 h	
Client Custom 3	5002h	XX	1	0~76(0x4c)		R/W	0x0002 h	
Client Custom 4	5003h	XX	1	0~76(0x4c)		R/W	0x0003 h	
Client Custom 5	5004h	XX	1	0~76(0x4c)		R/W	0x0004 h	
Client Custom 6	5005h	XX	1	0~76(0x4c)		R/W	0x0005 h	
Client Custom 7	5006h	XX	1	0~76(0x4c)		R/W	0x0006 h	
Client Custom 8	5007h	XX	1	0~76(0x4c)		R/W	0x0007 h	
Client Custom 9	5008h	XX	1	0~76(0x4c)		R/W	0x0008 h	
Client Custom 10	5009h	XX	1	0~76(0x4c)		R/W	0x0009 h	
Client Custom 11	500Ah	XX	1	0~76(0x4c)		R/W	0x000A h	
Client Custom 12	500Bh	XX	1	0~76(0x4c)		R/W	0x000B h	
Client Custom 13	500Ch	XX	1	0~76(0x4c)		R/W	0x000C h	
Client Custom 14	500Dh	XX	1	0~76(0x4c)		R/W	0x000D h	
Client Custom 15	500Eh	XX	1	0~76(0x4c)		R/W	0x000E h	
Client Custom 16	500Fh	XX	1	0~76(0x4c)		R/W	0x000F h	
Client Custom 17	5010h	XX	1	0~76(0x4c)		R/W	0x0010 h	
Client Custom 18	5011h	XX	1	0~76(0x4c)		R/W	0x0011 h	
Client Custom 19	5012h	XX	1	0~76(0x4c)		R/W	0x0012 h	
Client Custom 20	5013h	XX	1	0~76(0x4c)		R/W	0x0013 h	

Custom the output 1	5014h		1			R		Meaning of the data subject 5000h~5013h address control, data format and the unit and the actual output data format to match the format, see the table RS485
Custom the output 2	5015h		1			R		
Custom the output 3	5016h		1			R		
Custom the output 4	5017h		1			R		
Custom the output 5	5018h		1			R		
Custom the output 6	5019h		1			R		
Custom the output 7	501Ah		1			R		
Custom the output 8	501Bh		1			R		
Custom the output 9	501Ch		1			R		
Custom the output 10	501Dh		1			R		
Custom the output 11	501Eh		1			R		
Custom the output 12	501Fh		1			R		
Custom the output 13	5020h		1			R		
Custom the output 14	5021h		1			R		
Custom the output 15	5022h		1			R		
Custom the output 16	5023h		1			R		
Custom the output 17	5024h		1			R		
Custom the output 18	5025h		1			R		
Custom the output 19	5026h		1			R		
Custom the output 20	5027h		1			R		

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