sifam tinsley
PRECISION INSTRUMENTATION

User Manual

Issue 1.2

AP15-QUAD-RJ12
AP15-TRI-RJ12
AP15-DUA-RJ12

Quad/Tri & Dual Loads Multifunction Energy Meter

1. Introduction

AP15-****-RJ12 is a new multifunction energy meter designed by Sifam Tinsley for multi channels measurements.

The meter can work with 1p2w, 1p3w, 3p3w and 3p4w electricity grid, and it provides all important electrical parameters: voltage, current, power, PF, THD, frequency, demand, energy etc. By using plug-in connectors, the meter provides an easy click solution saving 80% installation time and avoiding wiring mistakes.

The AP15-****-RJ12 are of a compactly designed and can be used for up to 4x three phase energy meters or 12x single phase energy meters (depending on the selected model).

AP15-QUAD-RJ12 (Quad, 4 Channels) 4x three phase energy meters or 12x single phase energy meters

AP15-TRI-RJ12 (Tri, 2 Channels)) 3x three phase energy meters or 9x single phase energy meters

AP15-DUA-RJ12 (Dual, 2 Channels) 2x three phase energy meters or 6x single phase energy meters.

⚠ Warnings

Important Safety Information is conrained in the Maintenace section.

Familiarize yourself with this information before attempting installtion or other procedures.

1. To prevent the risk of electric shock, power supply to the equiptment must be kept OFF while doing the wiring arrangement.
2. Wiring shall ve done strictly according to the terminal layout.Confirm that all connections are correct.
3. Before attempting work on device, ensure absence of voltages using appropriate voltage detection device.
4. If this equipment is used in a manner not specified by the manufacturer, protection provided by the equipment may be impaired.

⚠ Caution

1. Read complate instructions prior or installation and operation of the unit.
2. Rish of electric shock.
3. The equipment in its installed state must not come in close proximity to any heating sources, oils, steam, caustic vapors or other unwanted process by products.

2. Product Characteristics

- 100mV/100mA CT connected
- Multiparameters measurement
- Plug-in solution
- LCD with white backlit, adjustable backlit time
- Quad loads measurement

3. Specifciation

3.1 Technical parameters

Voltage:

- Voltage AC (Un): 3x230/400VAC
- Voltage range: 50 ~ 600VAC
- Auxiliary power supply: 85 ~ 300VAC

Current input:

- Primary current input: 1~ 9999A
- Secondary current input: 100mV (optional: 100mA)
- Overcurrent withstand: 20Imax for 0.5s

Frequency:

- Rated value: 50/60Hz
- Range: 45 ~ 65Hz

Voltage withstand:

- AC voltage withstand: 4KV/1min
- Impulse voltage withstand: 6kV ~ 1.2μS waveform
- Power consumption: ≤ 2W/10VA
- Max. reading: 99999999 kWh/kVArh
- Display: LCD with white backlit

3.2 Accuracy

Voltage:	0.5%
Current:	0.5%
Frequency:	0.2%
Power factor:	1%
Active power:	1%
Reactive power:	1%
Apparent power:	1%
Apparent power:	1%
Active energy:	Class1
Reactive energy:	Class2

3.3 RS485 communication

Bus type:	RS485
Protocol:	Modbus RTU
Baud rate: 2400/4800/9600(default)/19200/38400bps	
Address range:	1-247
Max. Bus loading:	64pcs
Communication distance:	1000m
Parity:	EVEN/ODD/ NONE (default)
Data bit:	8
Stop bit:	1

* Note: AP15-****-RJ12 have 2 modes of communication address. The modes can be set by pressing the buttons on the meter or via RS485 Modbus.

Mode 1: Single communication address mode. Under this mode, the register address of different channels (CH01~CH04) will be showed in segments. Channel 1(CH01) will be matched to 0~2999; Channel 2(CH02) 3000~5999; Channel 3(CH03) 6000~8999, and Channel 4(CH04) 9000~11999.

Mode 2: Multi communication addresses mode. Under this mode, each meter will have 4 different modbus addresses. Each channel (CH01~CH04) matches to one modbus address and all the channels share the same registers. The measurement data will be distinguished by different Modbus addresses. Therefore, each AP15-****-RJ12 can be used as 4 normal meters. Please check the protocol for detailed explanation of register codes.

3.4 Performance criteria

Operation humidity:	≤90%
Storage humidity:	≤95%
Operating temperature: -25°C~+55°C	
Storage temperature: -40°C~+70°C	
International standard:	GB-T 17215/ IEC62053-21/EN50470-1/3
Accuracy class:	Class 1
Installation category:	CATIII
Protection against penetration of dust and water:	IP51 (indoor)
Insulating encased meter of protective class:	II
Max tightening torque: -40°C~+70°C	
Altitude:	0.4Nm ≤2000m

4. Button Function

For AP15-****-RJ12

Button	Short Click		Long press (3s)	
	Display mode	Set-up mode	Display mode	Set-up mode
V/A ESC	Displays voltage line to neutral, line to line, current, neutral current, THD-I and THD-U	Return to previous menu		
MD PF Hz	Displays Frequency, Power Factor, Maximum demand of Current, Maximum demand of Power	Previous page or increase value	Check meter information (Address, Baudrate, Parity, CT1, Software version, Full Screen)	
P CH	Displays active power, reactive power, apparent power,total active power, total reactive power, total apparent power	Next page or decrease value	Change Channel (CH01~CH04)	
E	Displays active energy, reactive energy, Imp. active energy, Exp.active energy, Imp.reactive energy, Exp.reactive energy	Move to right side	Get into Setup mode	Confirm setting

5. Display Mode Screen Sequence

Click Button	3 Phase 4 Wire		3 Phase 3 Wire		1 Phase 3 Wire		1 Phase 2 Wire	
	Screen	Parameters	Screen	Parameters	Screen	Parameters	Screen	Parameters
V/A ESC	1	Voltage L1-N Voltage L2-N Voltage L3-N			1	Voltage L1-N Voltage L2-N	1	Voltage L1-N
	2	Voltage L1-L2 Voltage L2-L3 Voltage L3-L1	1	Voltage L1-L2 Voltage L2-L3 Voltage L3-L1	2	Voltage L1-L2 Voltage L2-L3		
	3	Current L1, L2, L3	2	Current L1, L2, L3	3	Current L1, L2	2	Current
	4	Current Neutral	3	Current Neutral	4	Current Neutral	3	Current Neutral
	5	THD% of Voltage L1 THD% of Voltage L2 THD% of Voltage L3	4	THD% of Voltage L1 THD% of Voltage L2 THD% of Voltage L3	5	THD% of Voltage L1 THD% of Voltage L2	4	THD% of Voltage
	6	THD% of Current L1 THD% of Current L2 THD% of Current L3	5	THD% of Current L1 THD% of Current L2 THD% of Current L3	6	THD% of Current L1 THD% of Current L2	5	THD% of Current
MD PF Hz	1	Frequency Total Power Factor	1	Frequency Total Power Factor	1	Frequency Total Power Factor	1	Frequency Total Power Factor
	2	PF L1, L2, L3	2	PF L1, L2, L3	2	PF L1, L2	2	PF
	3	Max.DMD of Current L1 Max.DMD of Current L2 Max.DMD of Current L3	3	Max.DMD of Current L1 Max.DMD of Current L2 Max.DMD of Current L3	3	Max.DMD of Current L1 Max.DMD of Current L2	3	Max.DMD of Current
	4	Max. DMD of kW	4	Max. DMD of kW	4	Max. DMD of kW	4	Max. DMD of kW
P CH	1	Active Power L1 Active Power L2 Active Power L3	1	Active Power L1 Active Power L2 Active Power L3	1	Active Power L1 Active Power L2	1	Active Power
	2	Reactive Power L1 Reactive Power L2 Reactive Power L3	2	Reactive Power L1 Reactive Power L2 Reactive Power L3	2	Reactive Power L1 Reactive Power L2	2	Reactive Power
	3	Apparent Power L1 Apparent Power L2 Apparent Power L3	3	Apparent Power L1 Apparent Power L2 Apparent Power L3	3	Apparent Power L1 Apparent Power L2	3	Apparent Power
	4	Total Active Power Total Reactive Power Total Apparent Power	4	Total Active Power Total Reactive Power Total Apparent Power	4	Total Active Power Total Reactive Power Total Apparent Power	4	Total Active Power
E	1	Total kWh	1	Total kWh	1	Total kWh	1	Total kWh
	2	Total kVArh	2	Total kVArh	2	Total kVArh	2	Total kVArh
	3	Import kWh	3	Import kWh	3	Import kWh	3	Import kWh
	4	Export kWh	4	Export kWh	4	Export kWh	4	Export kWh
	5	Import kVArh	5	Import kVArh	5	Import kVArh	5	Import kVArh
	6	Export KVArh	6	Export KVArh	6	Export KVArh	6	Export KVArh

6. Channel Description

For AP15-QUAD-RJ12

Channel	12 Channel Meter	4 Channel Meter
CH01	Sub-1, Sub-2, Sub-3 in CH01	1st, 2nd and 3rd phase of CH01
CH02	Sub-1, Sub-2, Sub-3 in CH02	1st, 2nd and 3rd phase of CH02
CH03	Sub-1, Sub-2, Sub-3 in CH03	1st, 2nd and 3rd phase of CH03
CH04	Sub-1, Sub-2, Sub-3 in CH04	1st, 2nd and 3rd phase of CH04

For AP15-TRI-RJ12

Channel	9 Channel Meter	3 Channel Meter
CH01	Sub-1, Sub-2, Sub-3 in CH01	1st, 2nd and 3rd phase of CH01
CH02	Sub-1, Sub-2, Sub-3 in CH02	1st, 2nd and 3rd phase of CH02
CH03	Sub-1, Sub-2, Sub-3 in CH03	1st, 2nd and 3rd phase of CH03

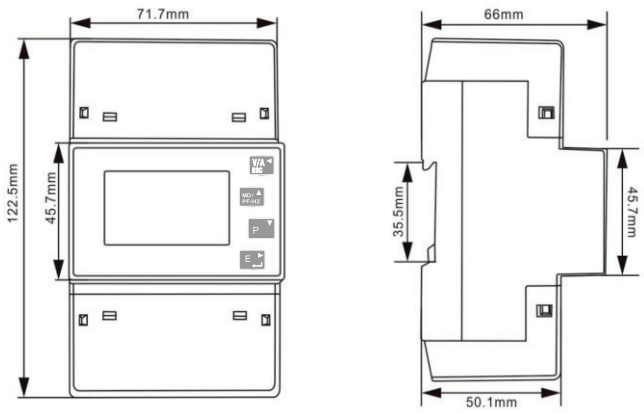
For AP15-DUA-RJ12

Channel	6 Channel Meter	2 Channel Meter
CH01	Sub-1, Sub-2, Sub-3 in CH01	1st, 2nd and 3rd phase of CH01
CH02	Sub-1, Sub-2, Sub-3 in CH02	1st, 2nd and 3rd phase of CH02

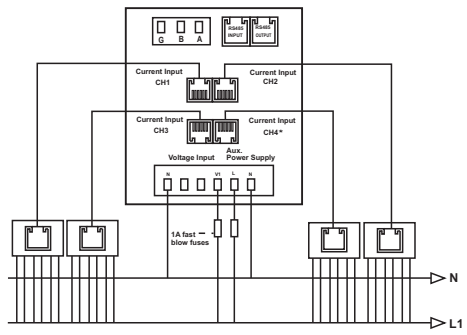
7. Setup Mode

Screen	Function	Range Selection	Factory Setting
	Password	0001~9999	1000
1	Address		
1.1	Communication address modes(quantity)	1	1 means Single communication address. There is only 1 address for the whole meter, and all channels use the same communication address.
		4	4 means multi communication addresses. It can be 2 or 3 or 4. It depends on the meter you have is for dual loads, or tri-loads or qual loads.
1.1.1	Single communication	001 ~ 247	001
1.1.2	Multi communication	001 ~ 247	001
2	Baud rate	2.4, 4.8, 9.6,19.2,38.4k bps	9.6k bps
3	Parity	NONE, EVEN, ODD	NONE
4	Stop bits	1, 2	2 * Only when the parity is set to None, the stop bits can be 2.
5	CT2	0.1V	AP15-****-RJ12 DUA : DUAL LOAD, 2 CHANNEL (CH01, CH02) TRI : TRI LOAD, 3 CHANNEL (CH01, CH02, CH03) QUAD : QUAD LOAD, 4 CHANNEL (CH01, CH02, CH03, CH04)
6	CT1	0001~9999A	100A * Please choose the right channel (CH01~CH04) firstly and then the phase (L1, L2, L3), before setting the CT1
7	Demand Interval Time	0, 5, 8, 10, 15, 20, 30, 60	60
8	Backlit Power Time	ON, OFF, 05, 10, 30, 60,120	60
9	System Type	3P4, 3P3, 1P2, 1P3	3P4
10	Password Modification	0000~9999	1000
11	CT Reverse Connect Correction	FRD(forward) REV (reverse)	FRD * Please choose the right channel (CH01~CH04) firstly and then the phase (L1, L2, L3), before setting adjustment
12	Reset	Max. demand, Max. value and Min. value	* Please choose the right channel (CH01~CH04) firstly, before resetting the data type.

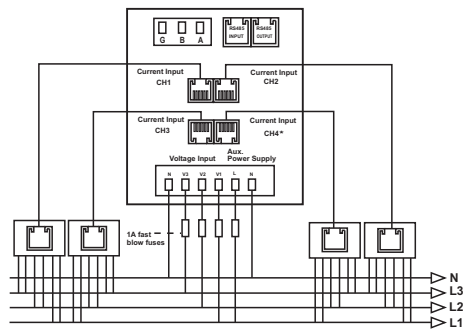
8. Dimensions



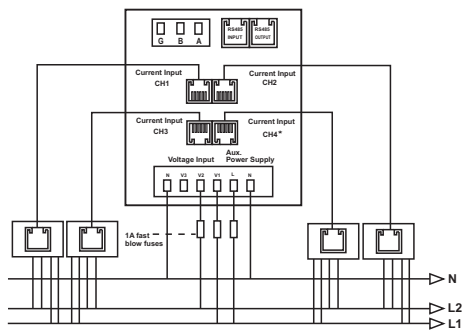
9. Installation



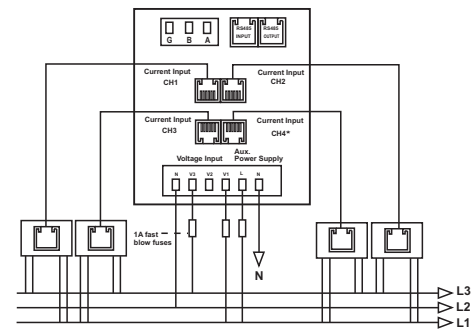
Single phase two wires (1P2W)



Three phase four wires (3P4W)



Two phase three wires (2P3W)



Three phase three wires (3P3W)

***Note :CH3 is not available for AP15-DUA-RJ12**
***Note :CH4 is not available for AP15-DUA-RJ12 & AP15-TRI-RJ12**

10. Document Links

11. Model Options

AP15— **** RJ12

- Dua 2 Channels
- Tri 3 Channels
- Quad 4 Channels
- 100mA

Contact

Sifam Tinsley Instrumentation Ltd
1 Warner Drive
Springwood Industrial Estate
Braintree
Essex
CM7 2YW

Tel: 01376 335271
Email: sales@sifamtinsley.com
www.sifamtinsley.co.uk