

# Three phase Din-Rail kWh meter

Thank you for choosing the Din-Rail energy meter. Please read this manual carefully in order to use this instrument safely and correctly and pay attention to the following points when using it:

- The meter must be installed and repaired by trained electrician operator;
- Power must be disconnected when installing and wiring the meter;
- Check meter installation to ensure correct wiring and operation;

The following conditions can cause damage to the device or cause incorrect operation:

- Over/Under Voltage, incorrect frequency range;
- Reverse polarity of current or voltage input;
- Incorrect wiring, not according to wiring diagram;



**Warning!!** Do not touch the terminals when the device is working!

## 1. Introduction

The three-phase DIN-rail energy meter is an intelligent device for low voltage systems (400VAC). It integrates data collection and control functions, provides an LCD display showing three-phase AC power measurement parameters and energy consumption values. The meter also supports optional multi-tariff structures and Maximum Demand (kVA) information. The RS485 communications port supports the standard MODBUS-RTU communications protocol.

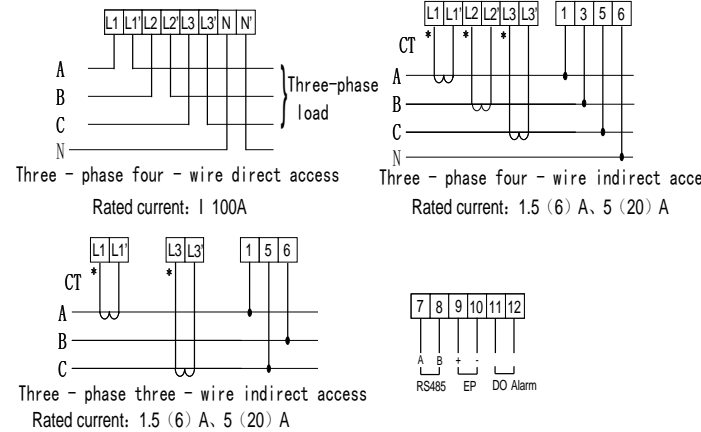
## 2. Panel & Screen Introduction

- Central display area displays the measurement data. Energy, current, voltage, power, power factor, frequency, timer (display parameters are dependent on meter model).
- The four LED indicators display the meter status and operation modes.
- Four key buttons are available for user set operation.

## 3. Meter Dimensions

Dimensions (L x W x H)	Din-rail	Notes
126.5x89.5x74.5(mm)	35mm	

## 4. Wiring Specification



### Wiring Notes!!

- Suitable cable sizes must be selected according to max current, please refer the meter measurement range and actual load condition.
- The communication wire must be single twisted pair Mylar screened cable (0.22 or 0.5mm).
- Communication line RS485+, RS485- cannot be reversed.
- Communication over long distances must be supported by parallel connected 100~120 ohm resistors.
- In 9600 baud rate, the cable length should less than 1000 meters.

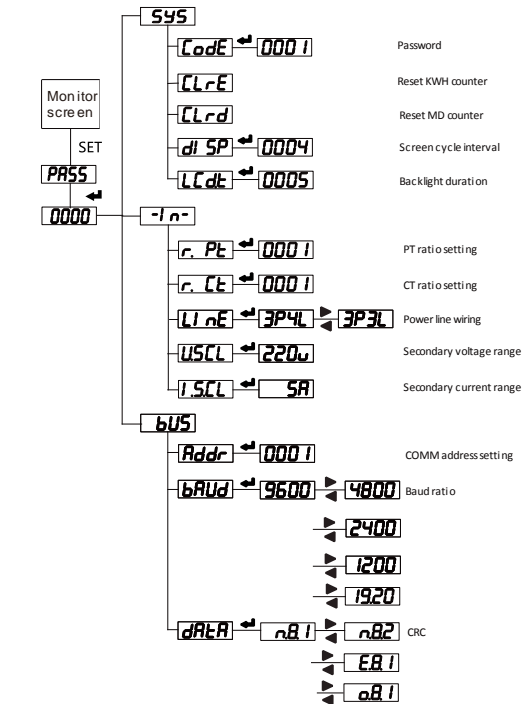
## 5. Menu Operation

The arrow keys are used to switch between screens and are used in the operation menu to move the cursor and set the variable values.

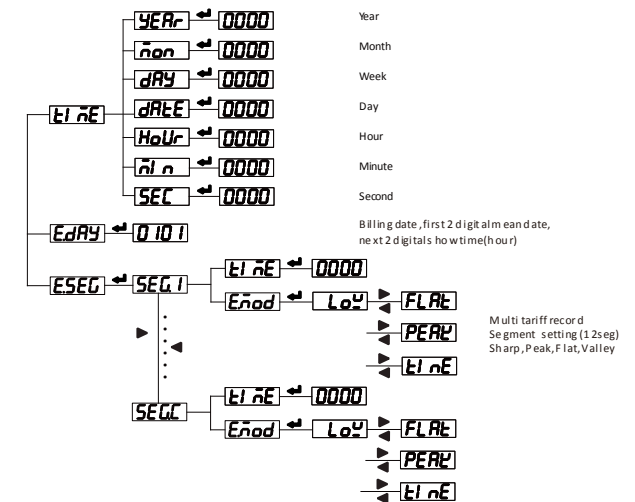
Use the key to confirm changed variables and press **SET** to exit the programming menu until the screen displays:

- (1) Save and exit: Press to save the changed parameters and return to the display screen "exit";
- (2) Exit without saving: press **SET** to directly return to display screen

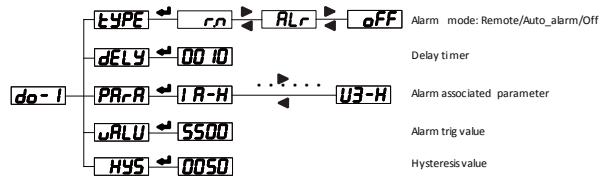
## Main menu



## Multi-tariff menu (optional)



### Digital output menu (optional)



### MODBUS register map

Primary Parameters (Read Holding Register CMD 03)				
Add.	Data	Byte		Instruction
001	Va	float	2	Phase to Line Voltage, Unit: V
003	Vb	float	2	
005	Vc	float	2	
007	Vab	float	2	Phase to Phase Voltage, Unit: V
009	Vbc	float	2	
011	Vca	float	2	
013	Ia	float	2	Three phase Current, Unit: A
015	Ib	float	2	
017	Ic	float	2	
019	Pa	float	2	Active power, Unit: kW
021	Pb	float	2	
023	Pc	float	2	
025	PΣ	float	2	Reactive power, Unit: kVAR
027	Qa	float	2	
029	Qb	float	2	
031	Qc	float	2	Apparent power, Unit: kVA
033	QΣ	float	2	
035	Sa	float	2	
037	Sb	float	2	Power factor, 0~1.000
039	Sc	float	2	
041	SΣ	float	2	
043	PFa	float	2	Frequency, Unit:0.01Hz
045	PFb	float	2	
047	PFc	float	2	
049	PFΣ	float	2	Positive active energy, Unit: kWh
051	FR	float	2	
053	Ep+	float	2	
055	Ep-	float	2	Negative active energy, Unit: kWh
057	Eq+	float	2	
059	Eq-	float	2	
Secondary Side value				
257	Ua	int	1	Phase to Line Voltage, Unit: 0.1V
258	Ub	int	1	
259	Uc	int	1	
260	Uab	int	1	Phase to Phase Voltage, Unit: 0.1V
261	Ubc	int	1	
262	Uca	int	1	
263	Ia	int	1	Three phase Current, Unit: 0.001A
264	Ib	int	1	

265	Ic	int	1	Active power, Unit: W
266	Pa	int	1	
267	Pb	int	1	
268	Pc	int	1	Reactive power, Unit: VAR
269	PΣ	int	1	
270	Qa	int	1	
271	Qb	int	1	Apparent power, Unit: VA
272	Qc	int	1	
273	QΣ	int	1	
274	Sa	int	1	Power factor, 0~1.000
275	Sb	int	1	
276	Sc	int	1	
277	SΣ	int	1	Frequency, Unit:0.01Hz
278	PFa	int	1	
279	PFb	int	1	
280	PFc	int	1	Positive active energy, Unit: Wh
281	PFΣ	int	1	
282	FR	int	1	Negative active energy, Unit: Wh
283	Ep+	int	2	
284	Ep-	int	2	Inductive reactive power, Unit:VARh
285	Eq+	int	2	
286	Eq-	int	2	Capacitive reactive power

### Other data in RS485 register

Meter status					
Add.	Data	Byte		Instruction	
513	DO	int	1	Digital output: Bit0~1 for channels 1~2	
523	TIME. Year	int	1	Internal RTC real time clock: Year - Month - Day - Time - minutes - seconds	
524	TIME. Month	int	1		
525	TIME. Date	int	1		
526	TIME. Hour	int	1		
527	TIME. Minute	int	1		
528	TIME. Second	int	1	Advanced electrical parameter	
529	TIME. Day	int	1		
769	Pde	float	2		Active power demand, Unit: W
771	Qde	float	2		Reactive power demand, Unit: VAR
773	Sde	float	2		Apparent power demand, Unit: VAR
775	Pdmax	float	2		active power demand in this month
777	Qdmax	float	2		reactive power demand in this month
779	Sdmax	float	2		apparent power demand in this month
781		float	2		active power demand in last month
783		float	2		reactive power demand in last month
785		float	2		apparent power demand in last month
787		float	2	active power demand in month before last month	
789		float	2	reactive power demand in month before last month	
791		float	2	apparent power demand in month before last month	

### Multi- tariffs ratio data(secondary side)

1025	Cumulative_tot(Total)	long	2	The total energy
1027	Cumulative_T1(Sharp)	long	2	The total sharp energy
1029	Cumulative_T2(Peak)	long	2	The total peak energy
1031	Cumulative_T3(Flat)	long	2	The total flat energy
1033	Cumulative_T4(Vally)	long	2	The total valley energy
1035	Current_tot(Total)	long	2	Total energy of this month
1037	Current_T1(Sharp)	long	2	Sharp energy of this month
1039	Current_T2(Peak)	long	2	Peak energy of this month
1041	Current_T3(Flat)	long	2	Flat energy of this month
1043	Current_T4(Vally)	long	2	Valley energy of this month
1045	Prior_tot(Total)	long	2	Total energy of last month
1047	Prior_T1(Sharp)	long	2	Sharp energy of last month
1049	Prior_T2(Peak)	long	2	Peak energy of last month
1051	Prior_T3(Flat)	long	2	Flat energy of last month
1053	Prior_T4(Vally)	long	2	Valley energy of last month
1055		long	2	Total energy of the month before last month
1057		long	2	Sharp energy of the month before last month
1059		long	2	Peak energy of the month before last month
1061		long	2	Flat energy of the month before last month
1063		long	2	Valley energy of the month before last month

### DO relay setting

ValueLU Unit of Relay associated parameter	
Voltage parameter	Unit 0.1V
Current	Unit 0.01A
Active power	Unit 0.01kW
Reactive power	Unit 0.01kvar
Apparent power	Unit 0.01kVA
Power factor	Unit 0.001
Frequency	Unit 0.01Hz

**Notes:** Above parameters are secondary side values for CT access sub-model, and Primary side value for power line direct access sub-model.

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