

# PM-213x Quick Start Guide

## 1. Introduction

### 1.1 Product Introduction

It's always difficult but crucial to the supervisors to figure out how much energy is consuming. ICP DAS brings the most powerful, cost effective, advanced Compact Power Meters, PM213X series, to the markets.

With its high accuracy (1%, PF=1), the PM213x series products can be applied both on low voltage primary side and/or medium/high voltage secondary side and enable the users to obtain in real time the reliable and accurate energy consumption readings from the monitored equipments while in operation. These compact size and cost effective Power Meters are equipped with revolutionary wired clip-on CT (various types support input current up to 200A) and standard Modbus communication RS-485 protocol for easy deployment. It works with input voltages ranging 10V ~ 500V, supporting a wide range of applications.

ICP DAS offers PM-213X family in a full range of Single-phase and Three-phase compact power meters for power monitoring. The products offer a rich feature set combined with easy-to-integrate communications.

### 1.2 Caution



#### **Danger**

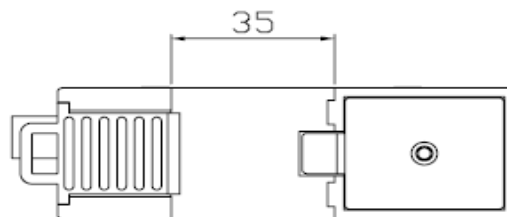
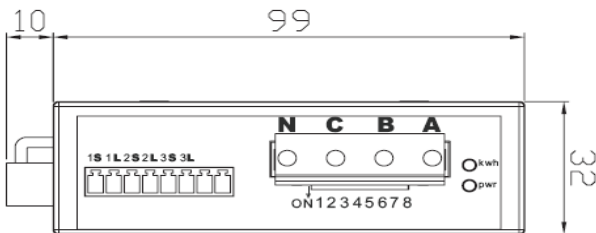
The meter contains hazardous voltages. The meter should never be disassembled. Failure to observe this practice can result in serious injury or death. Any work on or near energized meters, meter sockets, or other metering equipment can present a danger of electrical shock. It is strongly recommended that all work should be performed only by qualified industrial electricians and metering specialist. We assumes no responsibility if your electrical installer does not follow the appropriate national and local electrical codes.

## 2. Installation

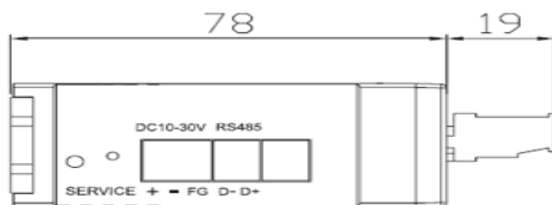
### 2.1 Dimension and Latch

#### Top View (mm)

#### Position of latch



#### Side View (mm)



- Dimension: 99mm (length) × 32mm (wide) × 78mm (high)
- Products come with external split type clip on CT's. Disconnect the CT's or use other CT's is highly prohibited.
- Please read this operation manual carefully before using ◦
- Please re-confirm the measure position ◦
- Reconfirm the RST(ABC) phase sequence of the power sys
- PM-213x series can be installed as rail mounting mode or embedded, no need to drill a hole or screw to fix it (rail mounting width can up to the length of 35 mm) ◦
- Meter auxiliary power for PM-213x series is DC+10~+30V ◦

### 2.2 Voltage Input

- PM-2134 series: Input Voltage up to 300V,  
PM-2133 series: Input Voltage up to 500V.

For any higher Input Voltage large than 500V, please add the PT(power transformer), and Change PT RATIO setup.

- Confirm the RST (ABC) phase sequence.

### 2.3 Current Input

- The external CT's are friable, please handle with care.
- The current input of PM213x series is in mA range. **Only the attached CT's can be used.** The other CT's, for example, from panel will damage the instrument due to its large current (around 5A)
- When more than one smart meters (PM-213x series) be installed, please do not disconnect the CT with its original meter and mix use with each other. Since each set of smart meter (PM213x series) and its attached split type clip-on CT are calibrated set by set. The mix use may cause the wrong measurements
- To install CT's correctly, please ensure the CT lines sequences is right before clip the CT's onto the power cable of the monitoring equipment. (Detail will be found in next section)
- **In any circumstance, please make sure the CT had been disconnected with the power cable of monitoring equipments before the CT lines detach from the terminals of the smart meter. Otherwise, the fatal damages maybe happened.**
- Please handle with extra care, especially when the operation space of CT's is limited.
- The current direction must follow K→L marked on CT's
- Please select the right size CT's for different size of monitoring equipment cables:  
power cable diameter <Φ10 use 60A CT , Φ10~Φ16 use 100A CT , Φ16~Φ24 use 200A CT .
- The maximum current value can not exceed the CT rating.
- For the consideration of accuracy, 3CT solution is highly recommended for the use in 3P3W compared with 2CT solution.

### 2.4 communication Formats

Transport specification , default is **19200, n, 8, 1**

### 2.5 Dip Switch ON /OFF : Modbus Address Setting, Wh pulse output and Wiring Setting.



Dip switch is used for Modbus address setting, default is 1 i.e. all OFF

**For example :** Modbus address is 10 , find the table of dip switch 1-6 is **on, off, off, on, off, off**

- **SW1 -6 setting the Modbus address of communication, 1-64**

| Modbus Address | 1   | 2   | 3   | 4   | 5   | 6   |
|----------------|-----|-----|-----|-----|-----|-----|
| 1              | OFF | OFF | OFF | OFF | OFF | OFF |
| 2              | ON  | OFF | OFF | OFF | OFF | OFF |
| 3              | OFF | ON  | OFF | OFF | OFF | OFF |
| 4              | ON  | ON  | OFF | OFF | OFF | OFF |
| 5              | OFF | OFF | ON  | OFF | OFF | OFF |
| 6              | ON  | OFF | ON  | OFF | OFF | OFF |
| 7              | OFF | ON  | ON  | OFF | OFF | OFF |
| 8              | ON  | ON  | ON  | OFF | OFF | OFF |
| 9              | OFF | OFF | OFF | ON  | OFF | OFF |
| 10             | ON  | OFF | OFF | ON  | OFF | OFF |
| 11             | OFF | ON  | OFF | ON  | OFF | OFF |
| 12             | ON  | ON  | OFF | ON  | OFF | OFF |
| 13             | OFF | OFF | ON  | ON  | OFF | OFF |
| 14             | ON  | OFF | ON  | ON  | OFF | OFF |
| 15             | OFF | ON  | ON  | ON  | OFF | OFF |

|    |     |     |     |     |     |     |
|----|-----|-----|-----|-----|-----|-----|
| 16 | ON  | ON  | ON  | ON  | OFF | OFF |
| 17 | OFF | OFF | OFF | OFF | ON  | OFF |
| 18 | ON  | OFF | OFF | OFF | ON  | OFF |
| 19 | OFF | ON  | OFF | OFF | ON  | OFF |
| 20 | ON  | ON  | OFF | OFF | ON  | OFF |
| 21 | OFF | OFF | ON  | OFF | ON  | OFF |
| 22 | ON  | OFF | ON  | OFF | ON  | OFF |
| 23 | OFF | ON  | ON  | OFF | ON  | OFF |
| 24 | ON  | ON  | ON  | OFF | ON  | OFF |
| 25 | OFF | OFF | OFF | ON  | ON  | OFF |
| 26 | ON  | OFF | OFF | ON  | ON  | OFF |
| 27 | OFF | ON  | OFF | ON  | ON  | OFF |
| 28 | ON  | ON  | OFF | ON  | ON  | OFF |
| 29 | OFF | OFF | ON  | ON  | ON  | OFF |
| 30 | ON  | OFF | ON  | ON  | ON  | OFF |
| 31 | OFF | ON  | ON  | ON  | ON  | OFF |
| 32 | ON  | ON  | ON  | ON  | ON  | OFF |
| 33 | OFF | OFF | OFF | OFF | OFF | ON  |
| 34 | ON  | OFF | OFF | OFF | OFF | ON  |
| 35 | OFF | ON  | OFF | OFF | OFF | ON  |
| 36 | ON  | ON  | OFF | OFF | OFF | ON  |
| 37 | OFF | OFF | ON  | OFF | OFF | ON  |
| 38 | ON  | OFF | ON  | OFF | OFF | ON  |
| 39 | OFF | ON  | ON  | OFF | OFF | ON  |
| 40 | ON  | ON  | ON  | OFF | OFF | ON  |
| 41 | OFF | OFF | OFF | ON  | OFF | ON  |
| 42 | ON  | OFF | OFF | ON  | OFF | ON  |
| 43 | OFF | ON  | OFF | ON  | OFF | ON  |
| 44 | ON  | ON  | OFF | ON  | OFF | ON  |
| 45 | OFF | OFF | ON  | ON  | OFF | ON  |
| 46 | ON  | OFF | ON  | ON  | OFF | ON  |
| 47 | OFF | ON  | ON  | ON  | OFF | ON  |
| 48 | ON  | ON  | ON  | ON  | OFF | ON  |
| 49 | OFF | OFF | OFF | OFF | ON  | ON  |
| 50 | ON  | OFF | OFF | OFF | ON  | ON  |
| 51 | OFF | ON  | OFF | OFF | ON  | ON  |
| 52 | ON  | ON  | OFF | OFF | ON  | ON  |
| 53 | OFF | OFF | ON  | OFF | ON  | ON  |
| 54 | ON  | OFF | ON  | OFF | ON  | ON  |
| 55 | OFF | ON  | ON  | OFF | ON  | ON  |
| 56 | ON  | ON  | ON  | OFF | ON  | ON  |
| 57 | OFF | OFF | OFF | ON  | ON  | ON  |
| 58 | ON  | OFF | OFF | ON  | ON  | ON  |
| 59 | OFF | ON  | OFF | ON  | ON  | ON  |
| 60 | ON  | ON  | OFF | ON  | ON  | ON  |
| 61 | OFF | OFF | ON  | ON  | ON  | ON  |
| 62 | ON  | OFF | ON  | ON  | ON  | ON  |
| 63 | OFF | ON  | ON  | ON  | ON  | ON  |
| 64 | ON  | ON  | ON  | ON  | ON  | ON  |

- SW7-8 : For Single-phase Meter(PM-2134 series): are used to select Wh pulse output  
For Three-Phase Meter(PM-2133 series): are used to select the way of wiring  
Single phase meter : Select Wh pulse output

| Wh pulse output | 7   | 8   |
|-----------------|-----|-----|
| Wh1             | OFF | OFF |
| Wh2             | ON  | OFF |

|     |     |    |
|-----|-----|----|
| Wh3 | OFF | ON |
| Wh4 | ON  | ON |

Three phase meter : Select the different wiring mode (please select the AUTO, if 1P2W or 1P3W are used)

| Wiring       | 7   | 8   |
|--------------|-----|-----|
| Automatic    | OFF | OFF |
| 3P3W and 2CT | ON  | OFF |
| 3P3W and 3CT | OFF | ON  |
| 3P 4W        | ON  | ON  |

### 3. Connection diagram

#### Single-phase Meter(PM-2134 series)

Please first check the current input terminal, and follow the white black, white black, white black, white black wired sequences (1S 1L 2S 2L 3S 3L 4S 4L) . After connect the CT's, clip on CT's. Make sure the arrow direction sign on CT's follows current flow direction (K→L) **Note: it must in same direction** .

Connect the voltage input terminal. For PM-2134, connect V2- V2+ and V1- V1+ .

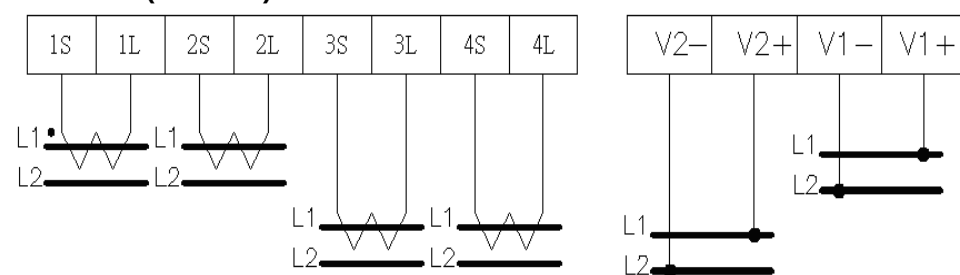
#### Three-phase Meter(PM-2133 series)

Please first check the current input terminal, follow on white black, white black, white black wire sequences (1S 1L 2S 2L 3S 3L) . After connect the CT's, clip on CT's. Make sure the arrow direction sign on CT's follows current flow direction (K→L) **Note: it must in same direction** .

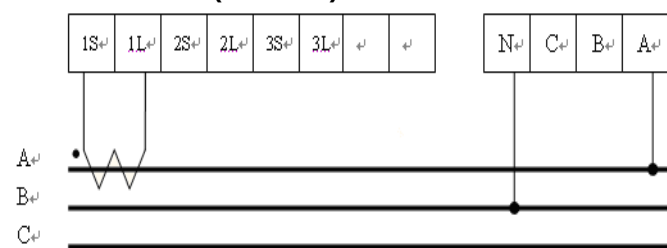
Connect the voltage input terminal. For PM-2133, three phase order on N C B A .

**Please attention!! For 3P3W , connect follow C A N phase , do not connect phase B (Check the diagram) .**

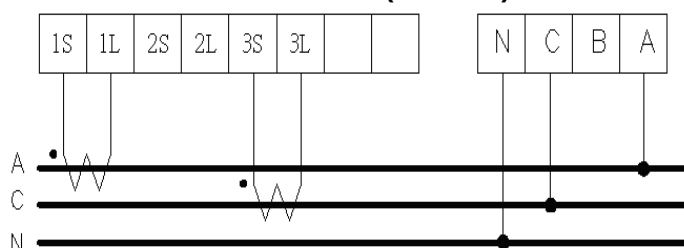
#### ● 1P4W(PM-2134)



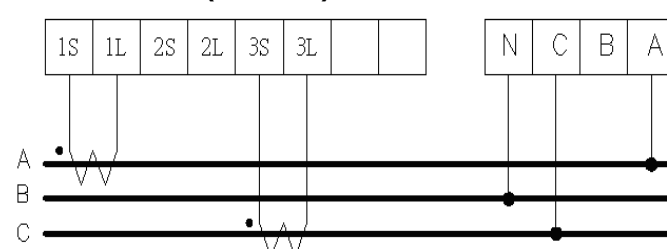
#### ● 1P2W -1CT(PM-2133)



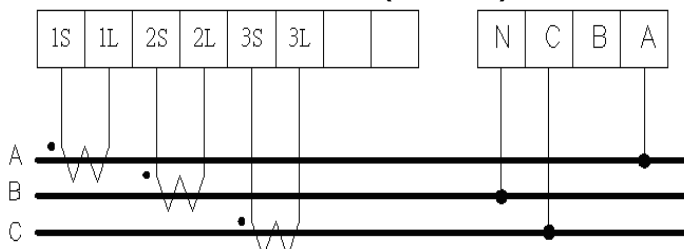
#### ● 1P3W-2CT (PM-2133)



#### ● 3P3W-2CT(PM-2133)



#### ● 3P3W-3CT(PM-2133)



#### ● 3P4W-3CT(PM-2133)

