User manual

Intelligent Digital Power Meter

SB-DN-PM1P03

SB-DN-PM3P01

buspro

www.hdlautomation.com

INDEX

1. Overview

1.1 General Information

1.1.1 Description

Intelligent digital power meter which has the functions of electric parameter measurement and record. It can be used for power consumption recording and it can record one year power consumption. And the current, voltage, power and power factor can be also measured by the meter. The current, voltage, power consumption, time, UV Switch, etc can be set as the logic input. The extra current transformer can be added for high power detection.

1.1.2 Mounting
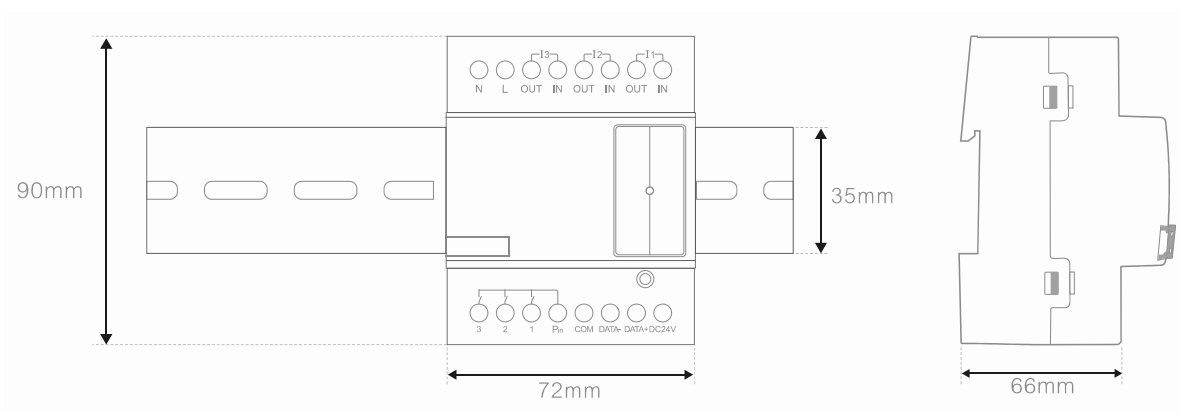
- Standard 35mm Din Rail Installation
- Inside Distribution Box (DB)

1.1.3 Serial Numbers

SB-DN-PM1P03

SB-DN-MP3P01
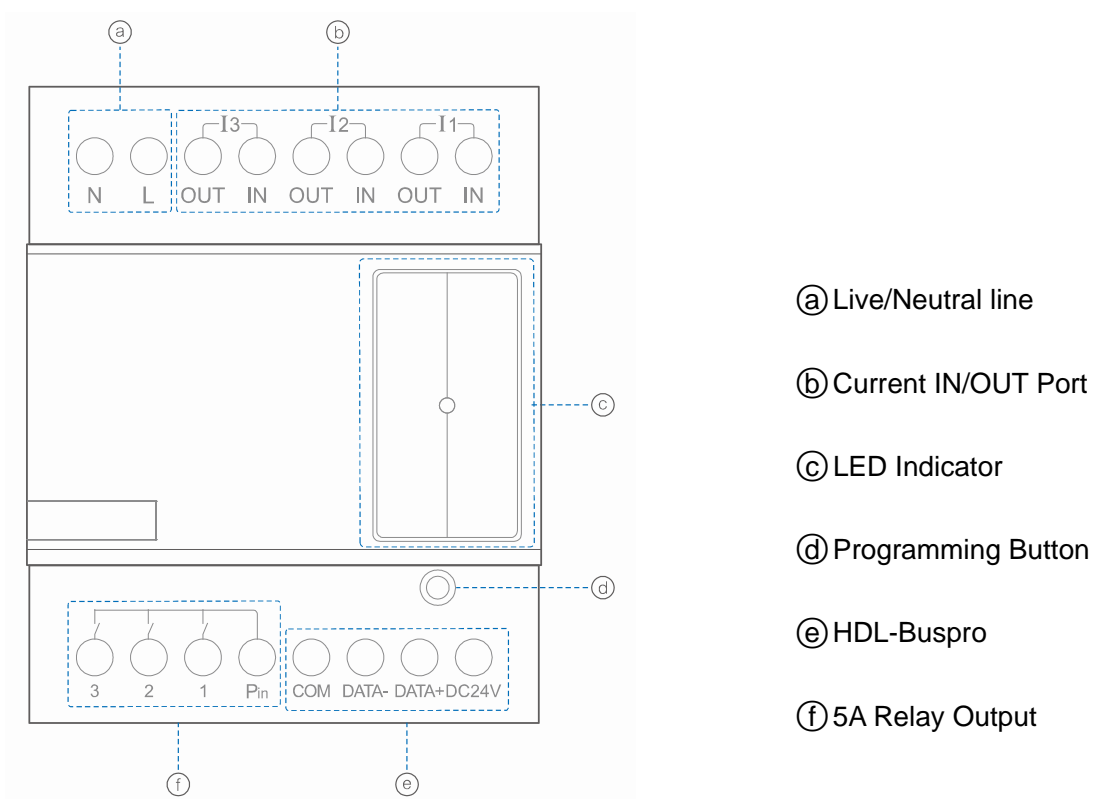
- Single phase

- 3 Separate Channels

- Max. 16A per channel

- Three phase

- 1 Channel per Phase

- Max. 10A per channel

1.2 Functionnalities Description

- Can measure the voltage, current, power, active power, reactive power, apparent power, power factor, etc.

- 24 Logic Blocks: The Phase voltage, current of each channel, time, channel electric degree in specified time interval, Universal Switch can be used as the logic inputs to trigger the control targets. The logic relation can be AND, OR.

- Recorded data can be stored for one year. The record can be checked by month, day, hour, minute from application software.

1.3 Device Description

ⓐ Live/Neutral line

ⓑ Current IN/OUT Port

ⓒ LED Indicator

ⓓ Programming Button

ⓔ HDL-Buspro

ⓕ 5A Relay Output

2. Safety Instructions

- Screw down strength is less than 0.4Nm

- Installation Position: Distribution Box (DB)

- Do not make wrong connection on Bus interface, it will damage the Bus interface of this module

- Never let liquids get into the module, it will damage this device

- Do not get AC power into Bus wire , it will damage all of devices in the system

- Avoid contact with liquids and aggressive gas

3. Technical Data

	SB-DN-PM1P03	SB-DN-PM3P01
Electric Parameters		
Working voltage	DC12~30V	
BUS power consumption	60mA/DC24V	
Measuring voltage	AC 0~250V	
Maximum current in each channel	16A	10A
Environmental Conditions		
Working temperature	0℃~45℃	
Working relative humidity	Up to 90%	
Storage temperature	-20℃ to +60℃	
Storage relative humidity	Up to 93%	
Approved:		
CE		
RoHS		
Production Information:		
Dimensions	72×90×66 (mm)	
Housing material	Nylon, PC	
Installation	35mm DIN rail installation	

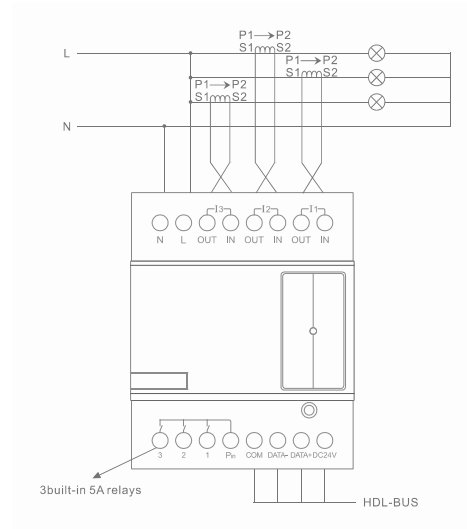| Protection degree	IP20

4. Installation
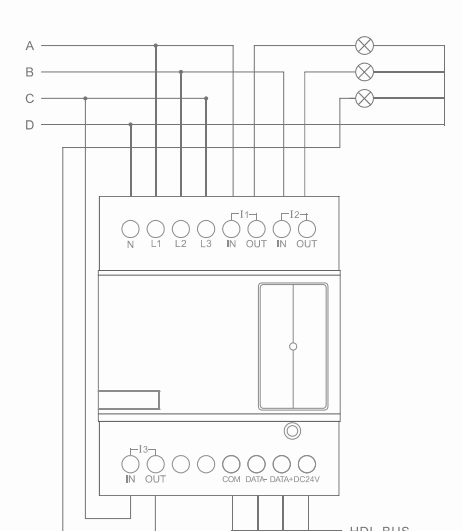
4.1 Wiring

SB-DN-PM1P03:
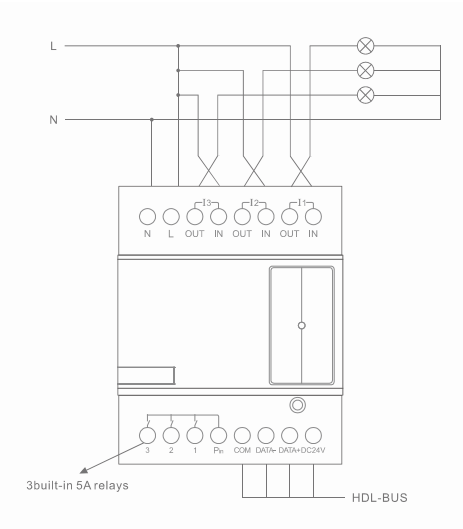
Connection for power meter
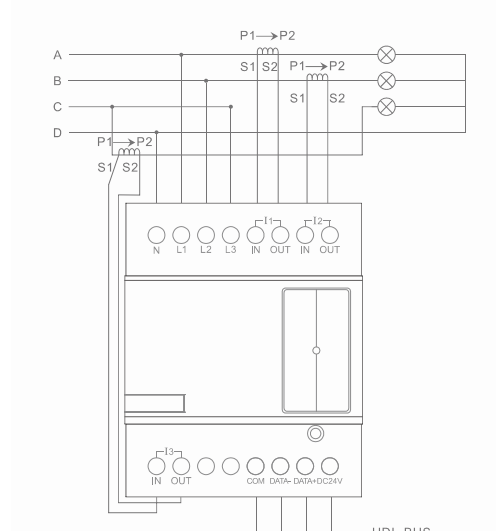
without current transformer

Connection for power meter

with current transformer

SB-DN-PM3P01:

Connection of 3 Phase – 4 wire

Power Meter without current transformer

Connection of 3 phase – 4 wire

Power Meter with current transformer

4.2 HDL Bus Pro Description

Connector Information

buspro	
DC24V	Red
COM	Black
DATA -	White
DATA +	Yellow

4.3 Commissioning

Method One:

a) open the HDL-BUS Pro Setup tool.

b) keep pressing the programming button for 3 seconds, it turns to red color.

c) on the software, click the "Address management", and select the "Modify address (when device button is pressed)", it will show a window like this:
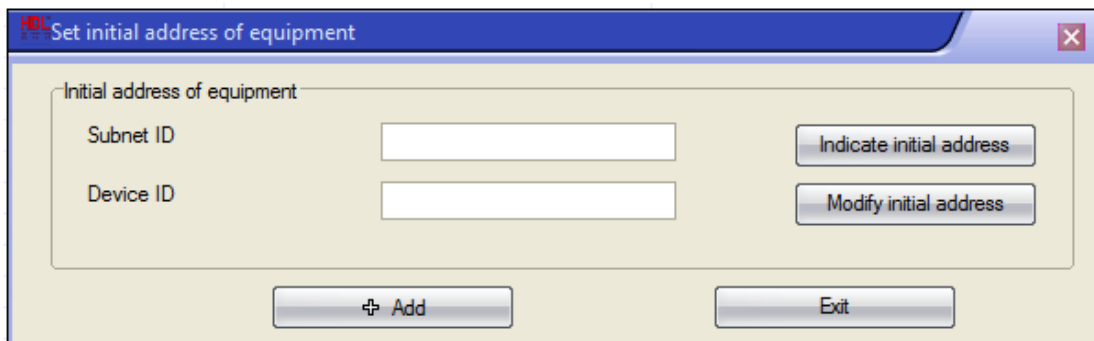
d) click the "Indicate initial address", then it will show the ID of this device. If you want to modify the address, fill in the new address, and click the "Modify initial address". Click the "+Add" button, the device will be add in "ON-line devices" list.

Method Two:

a) open the HDL-BUS Pro Setup tool.

b) click the search button, it will show a new window, click fast search button,search the online devices. Click the "Add all"button, the devices which be searched will be added in "ON-line devices" list.

5. Software Configuration

5.1 Basic Information

5.1.1 Change the ID of the device

Every HDL-BUS device has one Subnet ID and one Device ID, the Device ID should be unique in its subnet and the Subnet ID should be kept consistent with the Gateway (typically the SB-DN-1IP or HDL-MBUS01IP.431).

5.1.2 Date Settings

Build-in clock chip, can set Date and Time manually or read it from PC, the password for save is 85521566. It also can broadcast time to system.
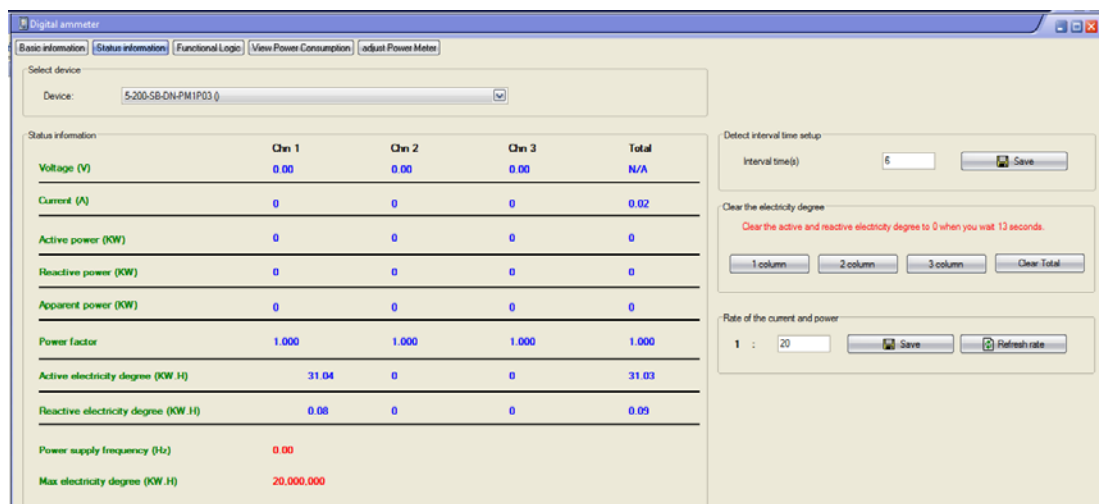
Warning: Recommend to set time before using, if change time when in use, the record data will be messed.
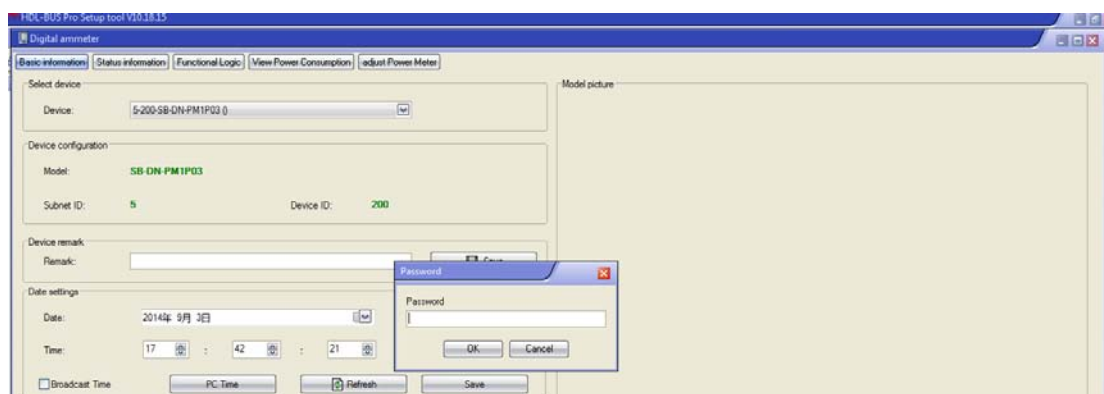
5.2 Status Information

5.2.1 Status Information

Can check each channel's information from this window

5.2.2 Other Information

- Detect Interval Time Setup

Interval time to refresh the information, setting range is 1-60s

- Clear the Electricity Degree

Clear the active and inactive electricity degree to 0, needs to wait for 13s when clearing.

1 column: clear channel1's active and inactive electricity degree to 0
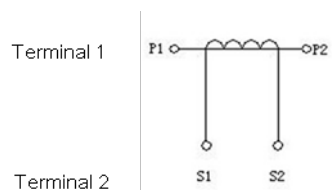
2 column: clear channel2's active and inactive electricity degree to 0

3 column: clear channel3's active and inactive electricity degree to 0

Clear total: clear all channels' active and inactive electricity degree to 0

- Rate of the Current and Power

The external current transformation ratio, when use current transformer, the transformer should be corrected as
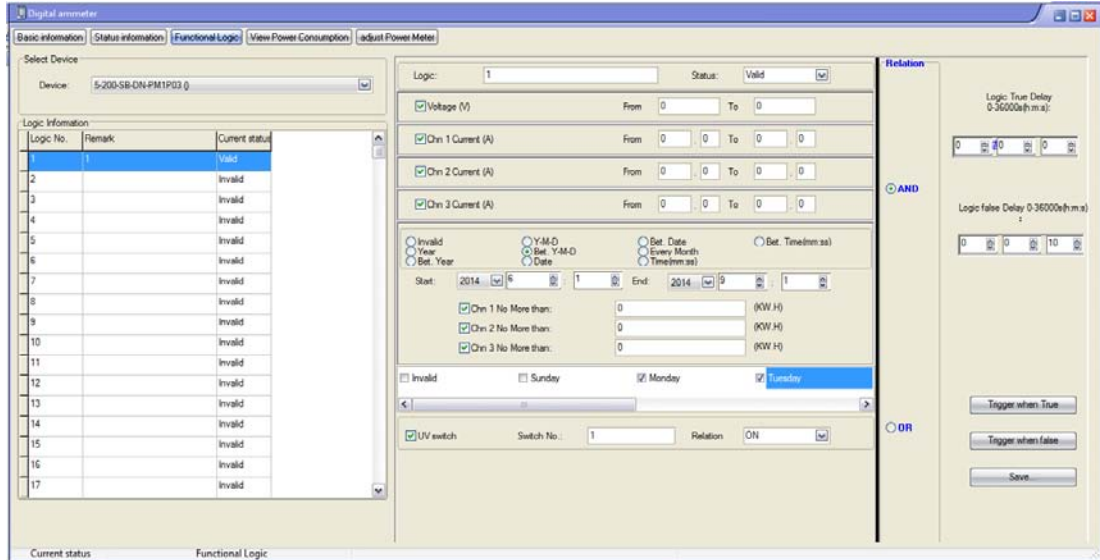

If the connected current transformation ratio is 10, then the detected current of power meter is up to 10*16A=160A .

When there is no current transformer, the rate should be 1.

5.3 Functional Logic

You can set up to 24 logics and in each logic you can combine up to 7 inputs (conditions), trigger up to 10 targets when the logic is true and another 10 targets when false.

5.3.1 Logic information

- Logic No.

Up to 24 logic blocks

- Remark

You can make some remarks for the logic blocks

- Current Status

You can set current logic to be valid or invalid

5.3.2 Logic Settings

There are 7 conditions, select the conditions you need. The details are as follows.

- Voltage (V)

Condition is satisfied when the voltage is in the range you set.

- Chn 1 Current (A)

Condition is satisfied when chn 1 current is in the range you set.

- Chn 2 Current (A)

Condition is satisfied when chn 2 current is in the range you set.

- Chn 3 Current (A)

Condition is satisfied when chn 3 current is in the range you set.

- Time Setting

Can set different time type as a condition, some of them can combine the power consumption of each channel together to be one condition.

- Days of the Week

Can set days of the week as a condition, they are: Sunday, Monday, Tuesday, Wednesday, Thursday, Friday and Saturday.

- UV switch

Use UV switch as a condition, setting range is 1-254, and the status can be on or off.

5.3.3 Relation

If more than one conditions are selected, you can set the logic relationship between them as 'AND' or 'OR'

- AND

Only when all the conditions are satisfied, the logic is 'true'

- OR

Once one condition is satisfied, the logic is 'true'

5.3.4 Trigger targets

No matter the logic is true or not, you can trigger the targets you want

- Logic True Delay

When the logic is true, you can choose to delay some certain time before triggering targets. Setting range: 0-36000s

- Trigger when True

When the logic is true, you can set up to 10 targets to trigger

- Logic False Delay

When the logic is false, you can choose to delay some certain time before triggering targets. Setting range: 0-36000s
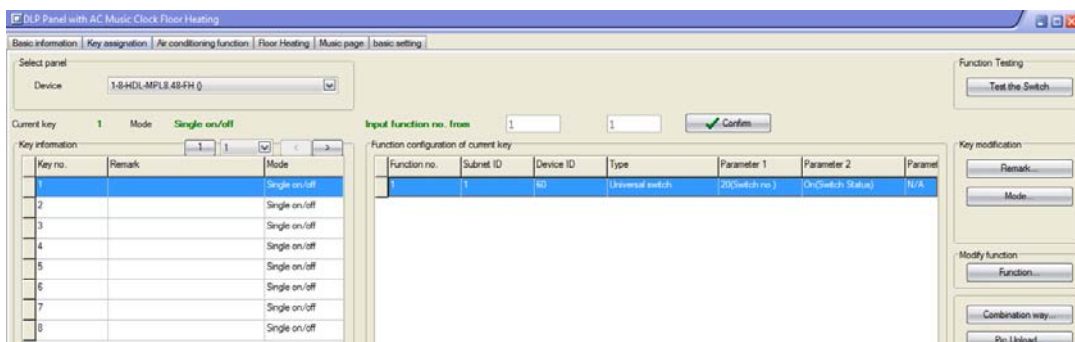
- Trigger when False

When the logic is false, you can set up to 10 targets to trigger

5.3.5 Application

Use one button to enable/disable the power saving mode, when in power saving mode, if channel A's detected current is between 10A to 16A during weekend, turn off some lights and AC.
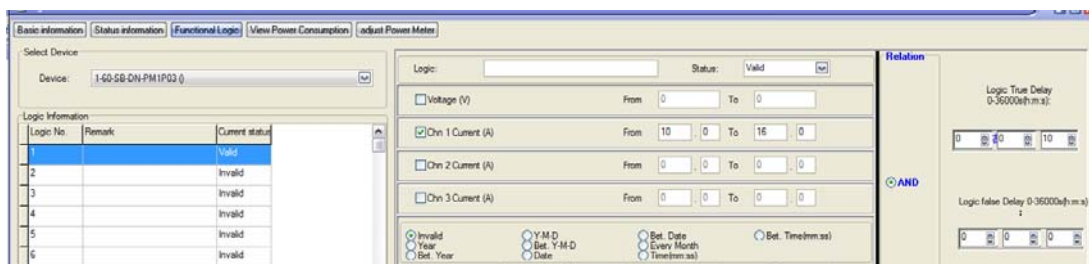
a) Use one button to send out UV Switch No.20 to power meter module to enable/disable the power saving mode, key mode 'single on/off', parameter1 '20', parameter2 'ON'.
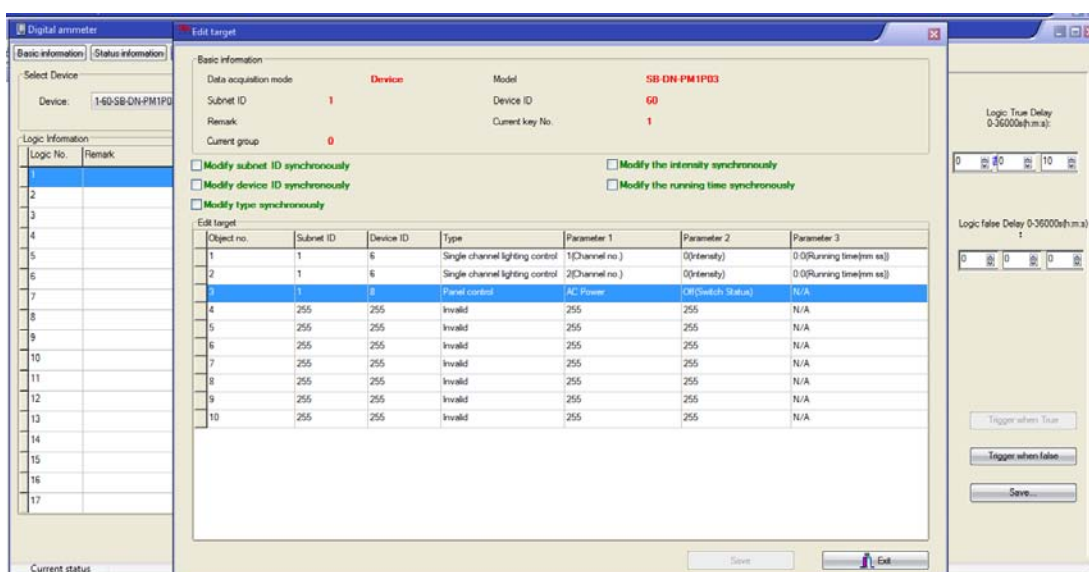

b) Enable Chn1 current from 10 to 16A, 'Sunday' and 'Saturday' , and UV Switch 20 'ON' as three input conditions

c) Select the relation between them as 'AND', better to set some delay, here is 10s.

d) Turn off relay module's chn1 and chn2, turn off AC in 'Trigger when true' window


5.4 View Power Consumption

Can check each channel's power consumption every 5 minutes, every hour, every day, every month and every week in HDL BUS setup tool. Also can check the power consumption from the application software, e.g iLife.

Here check channel1's power consumption by Day, from 2014-09-01 to 2014-09-04.

a) Select Channel No.1

b) Select 'Query by Day' in 'Format Select' line

c) Select 2014-09-01 for 'Start Time', 2014-09-04 for 'End Time'

d) Click 'Read'

e) View channel1's day power consumption from the TChart, also the total power

consumption upon the TChart.
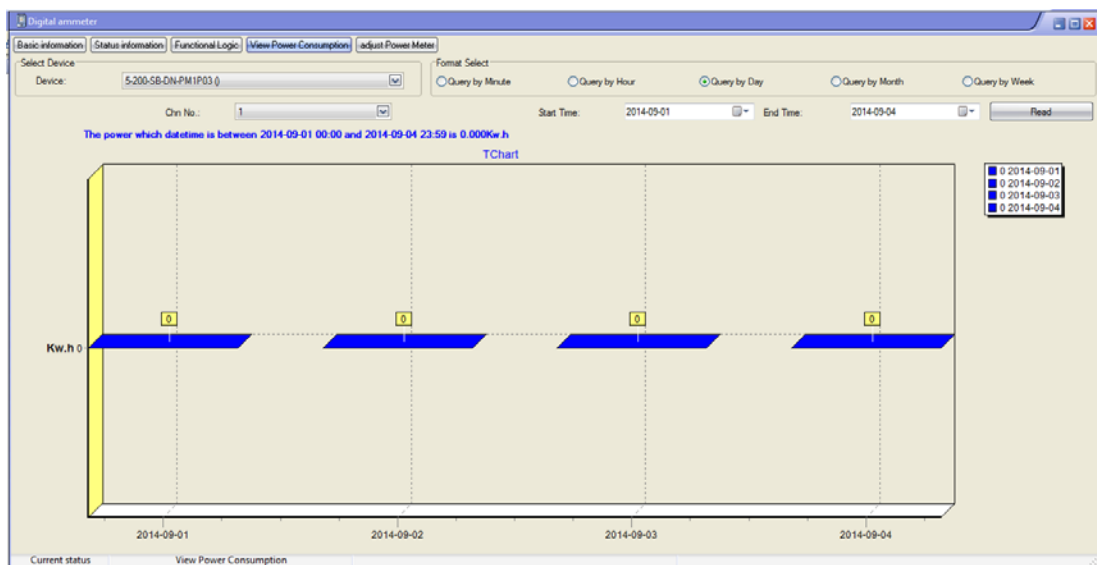
5.5 Adjust Power Meter

Use special equipment to adjust the parameters when in factory, the password: 85521566.

Do not allow to modify them when the power meter is in use.

6. Note