



User Manual

Intelligent Digital Power Meter



SB-DN-PM1P03



SB-DN-PM3P01

buspro

www.hdlautomation.com

Document updates:

Version	Date	Description
V1.0	2015.01.23	Finish new document

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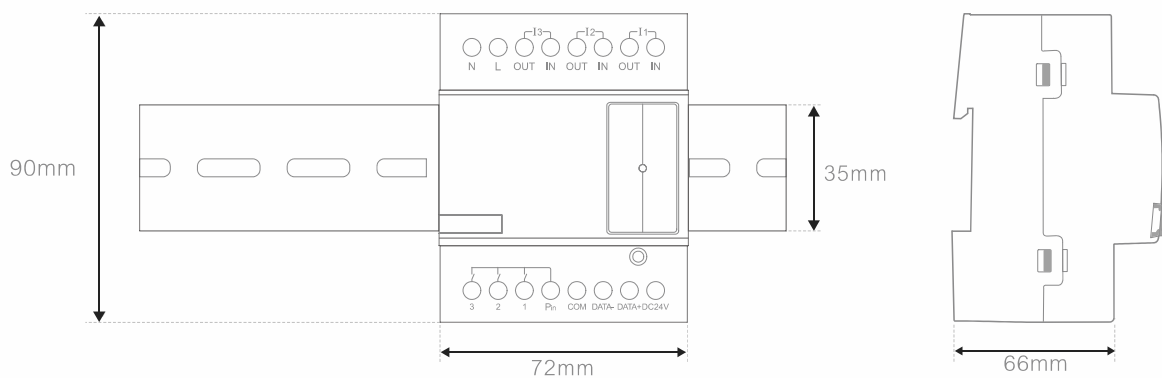
1. Overview

1.1 General Information

1.1.1 Description

The SB-DN-PM1P03 and SB-DN-PM3P01 are intelligent digital power meters, which are able to measure and record various electrical parameters. They are able to record the power consumption for 1 year, as well as the current, voltage, power, and power factor. The modules can also accept current, voltage, power consumption, time, UV switch, as logic inputs. An additional 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

- Single phase
- 3 Separate Channels
- Max. 16A per channel



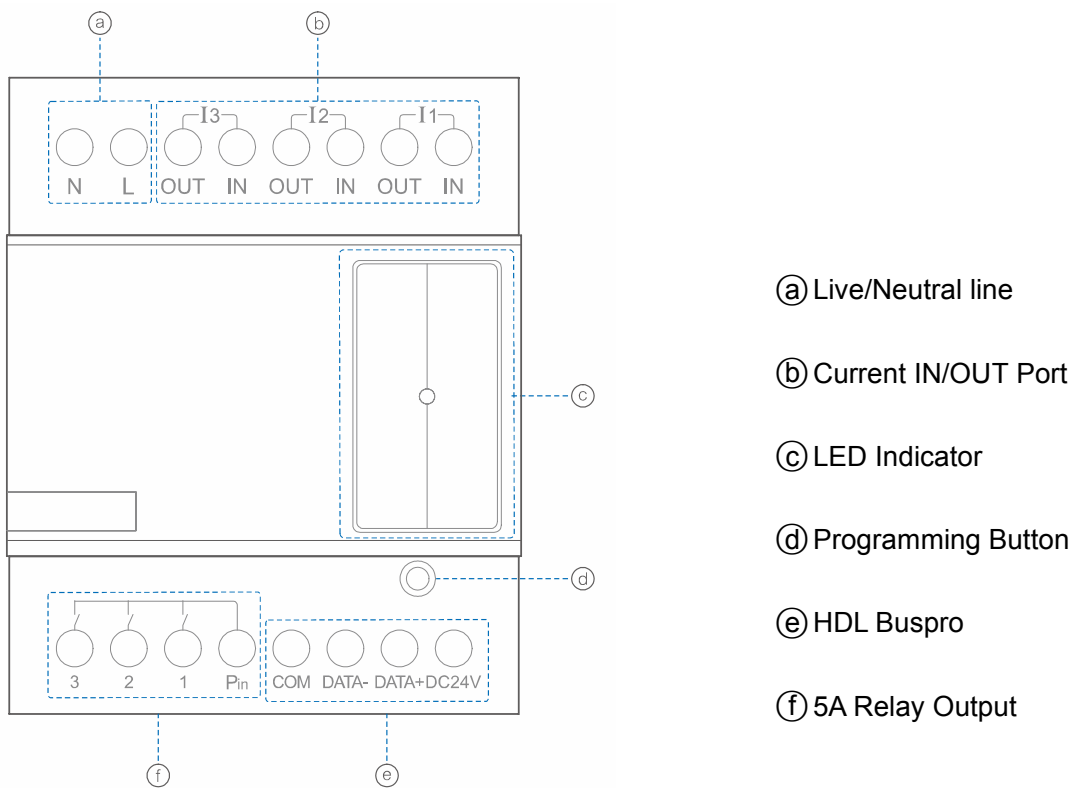
SB-DN-MP3P01

- Triple phase
- 1 Channel per Phase
- Max. 10A per channel

1.2 Functions

- 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, and Universal Switch can be used as 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, or minute from the application software.

1.3 Device Description



2. Safety precautions

- 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 connect the module to AC power as this will irreversibly damage all devices in the system.
- Avoid contact with liquids and aggressive gas

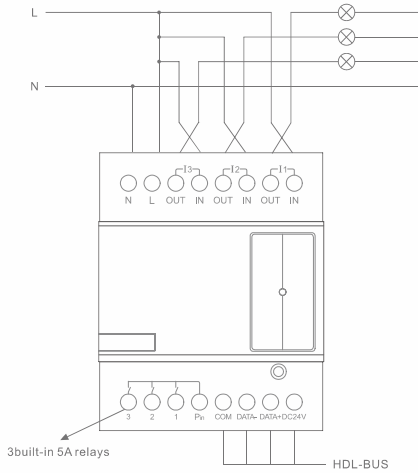
3. Technical Data

	SB-DN-PM1P03	SB-DN-PM3P01
Electric Parameters		
Working voltage	DC12~30V	
BUS power consumption	60mA/DC24V	
Measuring voltage	AC 100~250V	
Maximum current in each channel	16A	10A
Environmental Conditions		
Working temperature	0°C~45°C	
Working relative humidity	Up to 90%	
Storage temperature	-20°C to +60°C	
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	

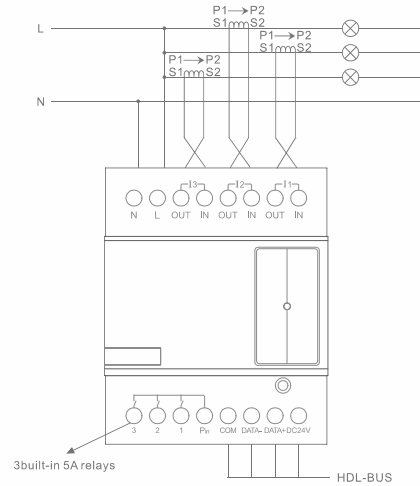
4. Installation

4.1 Wiring

SB-DN-PM1P03:

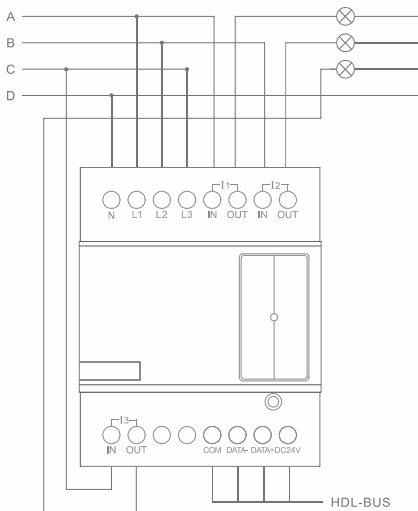


Connection for power meter
without current transformer

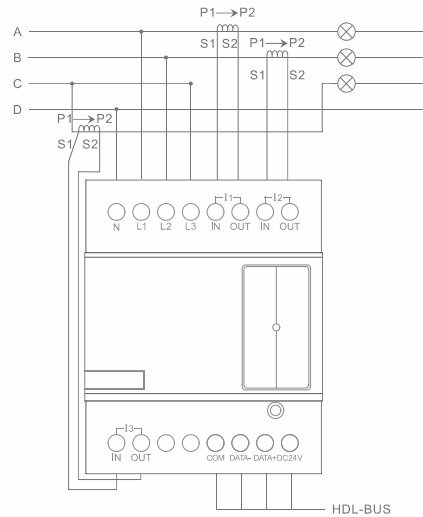


Connection for power meter
with current transformer

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 Commissioning

Method One:

- a) Open the HDL-BUS Pro Setup tool software.
- b) Press the programming button for 3 seconds, the LED status indicator will then turn red.
- c) Using the software, click the “Address management” tab, and select the “Modify address (when device button is pressed)”, the window shown below will then appear:



- d) Click on “Indicate initial address”, the device ID will then be shown. If you wish to change the address, enter your modification and click “Modify initial address”. Clicking on the “+Add” tab will include the device in the online devices list.

Method Two:

- a) Open the HDL-BUS Pro Setup tool software.
- b) Click the search button, and a new window will appear. From this window click “Search the online devices”, then click the “Add all” tab. The device will then be included in the online devices list.

5. Software Configuration

5.1 Basic Information

5.1.1 Changing the device ID

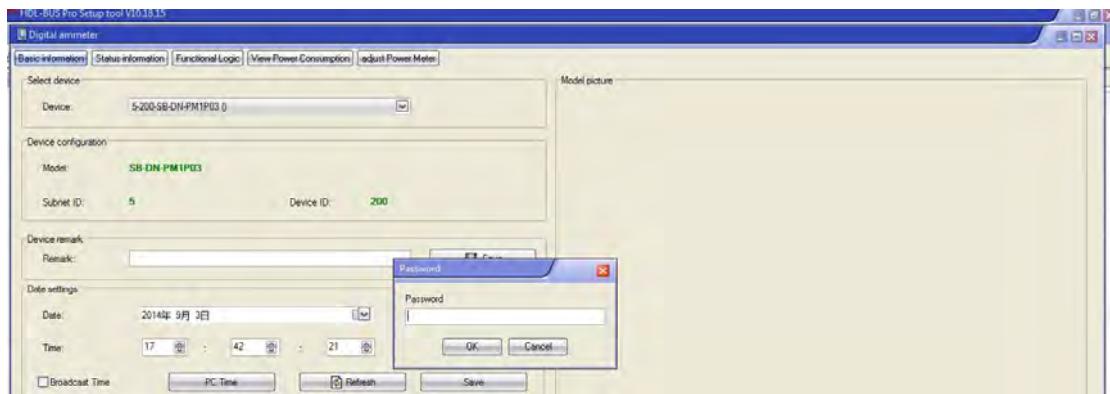
Every HDL Buspro device has one Subnet ID, and one Device ID. The device ID should be unique in its subnet, and be kept consistent with the Gateway (typically the SB-DN-11P

or HDL-MBUS01IP.431).

5.1.2 Setting the date

With the built in clock chip, the date and time can be set manually or automatically from a PC. The password to save modifications made to the date/time is 85521566. The time signal can also be broadcast to the system.

Warning: It is recommended that the time is set before the system is used. If changes are made while the system is in use the recorded data may be corrupted.



5.2 Status Information

5.2.1 Status Information

From the status information window, all of the data collected from the channels can be seen.



5.2.2 Other Information

- Setting Detect Interval Time

The interval time to refresh the information has a range from 1-60 seconds.

- Clear the Electricity Degree

Clear the active and inactive electricity degree to 0, a user must wait at least 13 seconds to ensure effective clearing.

Column 1: Clear channel1's active and inactive electricity degree to 0

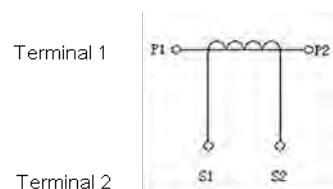
Column 2: Clear channel2's active and inactive electricity degree to 0

Column 3: Clear channel3's active and inactive electricity degree to 0

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

-Current and Power rate

When using a current transformer, the transformer should be connected as shown below:

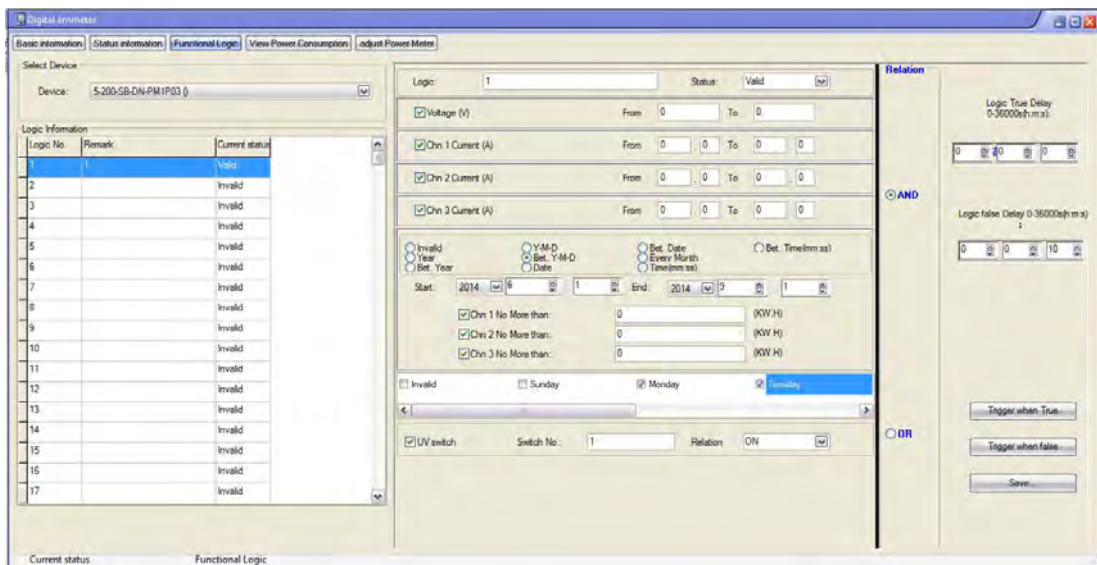


If the current transformation ratio is 10, then the detected current of power meter can reach $10 \times 16A = 160A$.

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

5.3 Logic functions

A user can set up to 24 logics, and in each logic 7 inputs (conditions) can be combined. From this 10 targets can be triggered when the logic is true, and another 10 when false.



5.3.1 Logic information

- Logic No.

Up to 24 logic blocks

- Remark

A comment can be made for each logic block

- Current Status

The current logic can be set to be valid or invalid

5.3.2 Logic Settings

There are 7 conditions available, allowing a user to select the ones required. The details of the conditions are as follows:

- Voltage (V)

This condition is satisfied when the voltage is in the range you set.

- Chn 1 Current (A)

This condition is satisfied when chn 1 current is within the range set by the user.

- Chn 2 Current (A)

This condition is satisfied when chn 2 current is within the range set by the user.

- Chn 3 Current (A)

This condition is satisfied when chn 3 current is within the range set by the user.

- Time Setting

A different time type can be set as a condition, some of these conditions allow the combination of channels and the measuring of their power consumption.

- Days of the Week

Each day of the week can be set as a condition.

- UV switch

This allows a UV switch to be used as a condition, the setting range is 1-254 and the status can either be on or off.

5.3.3 Relation

If more than one condition has been selected, the logic state between them can either be 'AND' or 'OR'.

- AND

When all the conditions are satisfied, the logic is 'true'.

- OR

When only one condition is satisfied, the logic is true.

5.3.4 Trigger targets

Regardless of if the logic is true or not, you can trigger the desired targets.

- Logic True Delay

When the logic is true, a user can choose to delay the triggering of targets. The delay range is 0-36000s.

- Trigger when True

When the logic is true, a user can trigger up to 10 targets.

- Logic False Delay

If the logic is false, a user can choose to delay the triggering of targets. The delay range is 0-36000 seconds.

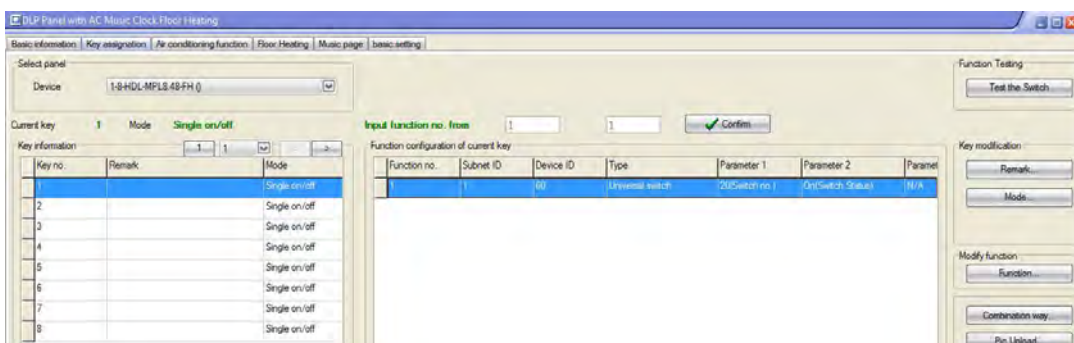
- Trigger when False

When the logic is false, a user can trigger up to 10 targets.

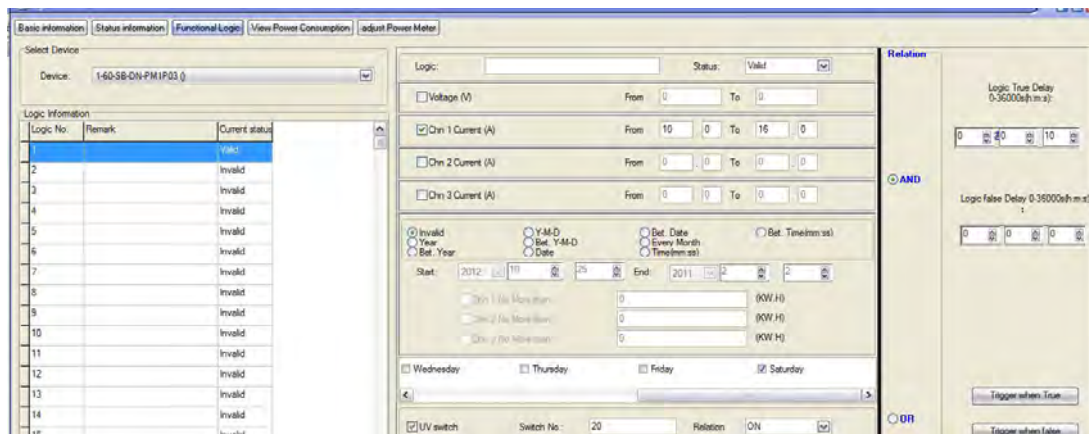
5.3.5 Application

One button can be used to enable or disable power saving mode. When in power saving mode and channel A's detected current is between 10A to 16A during weekend, lights and AC can be turned off.

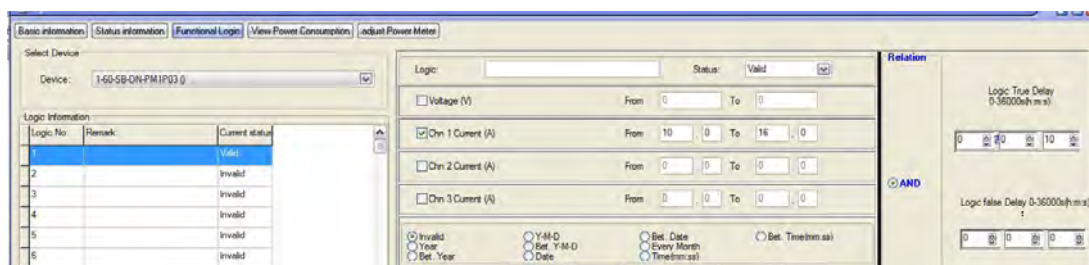
- a) One button can be used to send out the UV switch (No.20) to the power meter, this is for enabling/disabling the power saving mode, key mode 'single on/off', and the parameter1 '20', parameter2 'ON'.



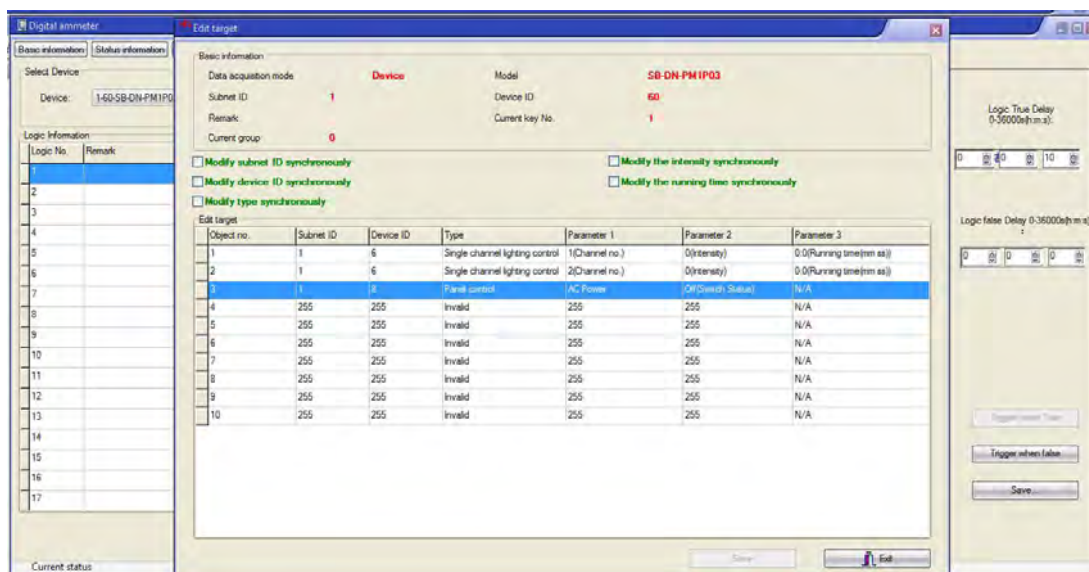
- b) Change the current of channel 1 from 10 A to 16A, then select both 'Sunday' and 'Saturday'. Then click on the UV switch box, and enter 20 as the switch number.



- c) Select the logic relation as 'AND', it is advised to set a delay, the delay set here is 10 seconds.



- d) Turn off the channel 1 and channel 2 relay modules, then turn off the AC in the 'Trigger when true' window.

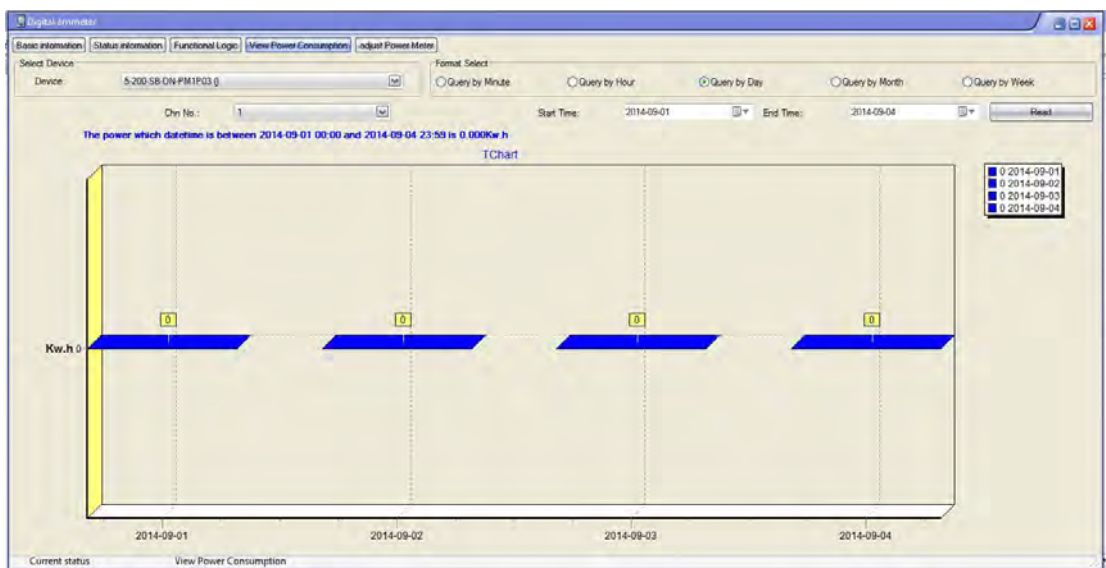


5.4 View Power Consumption

Each channel's power consumption can be checked every 5 minutes, every hour, every day, every month, and every week using the HDL BUS setup tool. (The consumption can also be checked from the iLife application.)

To check the daily power consumption from the 2014-09-01 to 2014-09-04, the following steps must be taken:

- a) Select Channel No.1
- b) Select 'Query by Day' in the 'Format Select' line
- c) For the start time select 2014-09-01, and for the end time select 2014-09-04.
- d) Click 'Read'
- e) View the power consumption of channel 1 on the TChart, the total power consumption can also be seen on the TChart.



5.5 Adjust Power Meter

Use a special equipment to adjust the parameters, do not allow to modify them when the power meter is in use. The password is: 85521566.

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