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ModBus pulse counter **PCM- D** **ModBus Series**

User manual

PCM- D is a multi channel microcontroller pulse counter with LCD display, RS-485 modbus interface and embedded real time clock. It can read up to 8 tariff or other instruments with pulse output (like water meters). Its mounting is made in industrial enclosure or on a wall using standard M35 DIN-bus. PCM-8D supports up to four different tariffs for every input.

1. Main technical parameters

- number of pulse inputs	–
- power supply	– 55-250 Vac/ 80-350 Vdc
- maximum consumption	– < 2 W
- display	– LCD, 2 rows with 16 symbols each
- keyboard	– 4 membrane buttons
- pulses max. frequency	– 5/10/20/50/100 Hz
- input cables length and type	– up to 20 m twisted pair
- max. resistance of closed switch	– 1 kOhm
- min. resistance of open switch	– 1000 kOhm
- storage temperature	– -50÷+90 °C
- humidity	– 40÷90 %
- dimensions (H/W/D)	– 90/105/76 mm
- serial interface	– RS-485 Modbus
- data transmission speed	– 300/1.2k/4.8k/9.6k/19.2k/38.4k bps
- initial setting of serial port	– 19.2kbps, even parity, 8 bit data, 1 stop
- own weight	– 400 g
- embedded battery	– $LiMnO_2$ 60mAh (~7 days)

2. Normal mode of operation of PCM-XD

PCM-XD is turned on when power supply detected. First thing user will see is the name of manufacturer and software revision. Date becomes 01.01.2010, time is 00:00h, pulse counters and tariff information are zeroed – initial state. The device enters normal mode – i.e. starts counting pulses on each input. Settings can be made/changed in service menu. If power supply fails PCM-8D continues normal work in decreased consumption mode, counting pulses until the reserved battery is fully discharged (about 7 days if battery is fully charged), the display does not work. When power supply comes again the display is turned on and the battery is recharged.

Pulse counters are overloaded at value of 99999999, then continuing to count from 0. Values for the measured quantity are calculated real time on the basis of pulses accumulated, pulse constant and initial value entered for that quantity (if nothing entered initial value is 0), including each tariff separately.

Normal mode

In normal client mode device display shows consequently device info (network address, battery voltage, date and time) and information for every pulse input (input number, input user number – 0 to 999, input description – free text up to 10 symbols, measured quantity in m3, kWh, J or none, with accuracy of 0.1).

```
Addr: 112    Bt: 3.0V
28-01-2010    18:53
```

```
4 -   21 - Hot    Water
          3173.3      m3
```

Information is changed consecutively every 6 seconds. If the user presses button "arrow up" or "arrow down" he will select quicker desired information. On the above figure is shown example display text, data meaning is the following: „4" – pulse input number; „ 21" – user number (number 0-999); "Hot Water" - free text up to 10 symbols. Free text can be programmed either from the counter (only English language) or using our software (English and Bulgarian languages).

If the user wants to see pulse counts instead of measured quantity he must press button "OK" when display shows information about this input. Returning back from seeing pulse count is made by pressing button "NO". What shows the display in pulse count information mode is shown on the figure:

```
4 -   21 - Hot    Water
P             3656.96
```

When display shows total pulses count for particular input (after pressing button "OK"), pressing arrows (up or down user can see tariff pulses information for every active tariff. If this is the case, PCM shows on the second display row consequently pulse count for each tariff, starting and ending time of this particular tariff, measured quantity in m3, kWh, J or none, with accuracy of 0.1. Exiting this mode is done by pressing button "NO". If none of the tariffs is set active the user can only see total accumulated pulses. If user has entered extended tariff showing mode and for 60s does not press any button, PCM returns to normal mode, showing measured quantity for each pulse input consecutively. The described process visualization can be seen on the following figure:

```
4 -   21 - Hot    Water
P  T2:        1169.96
```

```
4 -   21 - Hot    Water
T2    22h - 06h
```

```
4 -   21 - Hot    Water
T2            1169.6    m3
```

Mounting and electrical wiring

Mounting, electrical wiring and set up must be done by qualified personnel, familiar with safety instructions and mounting and wiring instructions of PCM.

The description of all terminal blocks is shown in the table:

No. TB	Description
1+, 2- *	Non-potential pulse input 1 (if not used – N.C.)
3+, 4- *	Non-potential pulse input 2 (if not used – N.C.)
5+, 6- *	Non-potential pulse input 3 (if not used – N.C.)
7+, 8- *	Non-potential pulse input 4 (if not used – N.C.)
9, 20-30	Not used, N.C.
10+, 11- *	Non-potential pulse input 5 (if not used – N.C.)
12+, 13- *	Non-potential pulse input 6 (if not used – N.C.)
14+, 15- *	Non-potential pulse input 7 (if not used – N.C.)
16+, 17- *	Non-potential pulse input 8 (if not used – N.C.)
18, 19 **	Power supply input 220V (55-250 Vac/ 80-350 Vdc)
31	RS-485 Modbus common (0)
32	RS-485 Modbus – B (-)
33	RS-485 Modbus – A (+)
34, 35	RS-485 Modbus line termination (if necessary)

* - polarity do have significance when connecting opto- output (usually electricity meters)
** - polarity does not matter with DC power supply

3. Warranty

The warranty of the device is limited to 3 years from the date of sale. If the device shows any defect or malfunctions during that period, the manufacturer is obligated to repair the device in its own service for manufacturer's expense, or, if the repair is impossible, to replace the device with new one. The transportation costs to the manufacturer's service are due to the client. The warranty voids if this manual's instructions are not met, warranty seals are removed or the device was opened by unauthorized by the manufacturer personnel.

Serial number:..... Sale date:.....

Sign:.....

(if no date of sale, date sale becomes production date, coded in device serial number. If no serial number – no warranty)

4. The package contains

- PCM- D - 1 pcs.
- User manual - 1 pcs.

5. Manufacturer

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