1. Introduction

This document provides operating, maintenance and installation instructions of NDM 30 series. NDM 30 series measure and display the characteristics of single phase two wires (1g2w) network. The bi-directional measurements makes the meter suitable for active and reactive energy and power monitoring applications, and also perfect for solar PV measurements. With RS485 Modbus communication port, the meter is easy to remote communication with other AMR/SCADA systems. Multi tariff function helps you to count the energy consumed in different time periods.

1.1 Key Characteristics

- Bi-directional measure and display
- Multi-function measurements
- Two Pulse outputs
- RS485 Modbus / M-bus
- 10kA direct connection
- Two module size (35mm)
- Password protected set-up
- Backlighted LCD
- Multi-tariff

1.2 Pulse Output

The meter provides two pulse outputs. Both pulse outputs are passive type. Pulse output 1 can be set to generate pulses to represent total import/export kWh or kVarh. The pulse constant can be set to generate 1 pulse per: 0.001(default) / 0.01 / 0.1 / 1 / kW/h/Vah. Pulse width: 200/100/60/30ms. Pulse output 2 is non-configurable. It is fixed up with active kwh (imp). The constant is 1000imp/kWh.

1.3 RS485 Serial – Modbus RTU

RS485 serial port with Modbus RTU protocol to provide a means of remotely monitoring and controlling the unit. Set-up screens are provided for setting up the RS485 port.

1.4 4T by RTC for NDM 30-M

The internal clock circuit of this unit has time automatic adjusting function. Calendar, clock and rate can be set and adjustment through RS485, infrared interface. At least 4 tariffs and 10 time segments can be set within a natural day.

2. Operation

2.1 LCD Display

2.2 Initialization Display

Scroll display by buttons:

<table>
<thead>
<tr>
<th>No.</th>
<th>Picture</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Total active energy Example: 70.00kWh</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Total reactive energy Example: 5.00kVarh</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Import kVarh Example: 10.00kVarh</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Export kVarh Example: 5.00kVarh</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>T1 Max. Power Demand Example: 6938W</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>T2 Max. Power Demand Example: 20.00kWh</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>T3 Max. Power Demand Example: 50.00kWh</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>T4 Max. Power Demand Example: 4700W</td>
</tr>
</tbody>
</table>

**For NDM 30-M**


User Manual V2.0

---

**Warnings**

---

**Important Safety Information contained in the Maintenance section. Familiarize yourself with this information before attempting installation or other procedures.

Risk of Electric Shock: These instructions contain important safety information. Read familiarize with it before attempting installation or other procedures.

Caution: Risk of Electric Shock.

---

**1. Operation**

**2.1 LCD Display**

**2.2 Initialization Display**

**Scroll display by buttons:**

<table>
<thead>
<tr>
<th>No.</th>
<th>Picture</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Total active energy Example: 70.00kWh</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Total reactive energy Example: 5.00kVarh</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Import kVarh Example: 10.00kVarh</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Export kVarh Example: 5.00kVarh</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>T1 Max. Power Demand Example: 6938W</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>T2 Max. Power Demand Example: 20.00kWh</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>T3 Max. Power Demand Example: 50.00kWh</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>T4 Max. Power Demand Example: 4700W</td>
</tr>
</tbody>
</table>

**For NDM 30-M**


---

**Scroll display by buttons:**

<table>
<thead>
<tr>
<th>No.</th>
<th>Picture</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Total active energy Example: 70.00kWh</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Total reactive energy Example: 5.00kVarh</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Import kVarh Example: 10.00kVarh</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Export kVarh Example: 5.00kVarh</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>T1 Max. Power Demand Example: 6938W</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>T2 Max. Power Demand Example: 20.00kWh</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>T3 Max. Power Demand Example: 50.00kWh</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>T4 Max. Power Demand Example: 4700W</td>
</tr>
</tbody>
</table>

**For NDM 30-M**


---

2. Operation

2.1 LCD Display

2.2 Initialization Display

Scroll display by buttons:

<table>
<thead>
<tr>
<th>No.</th>
<th>Picture</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Total active energy Example: 70.00kWh</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Total reactive energy Example: 5.00kVarh</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Import kVarh Example: 10.00kVarh</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Export kVarh Example: 5.00kVarh</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>T1 Max. Power Demand Example: 6938W</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>T2 Max. Power Demand Example: 20.00kWh</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>T3 Max. Power Demand Example: 50.00kWh</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>T4 Max. Power Demand Example: 4700W</td>
</tr>
</tbody>
</table>

**For NDM 30-M**

### 2.4 Set-up Mode

To get into Set-up Mode, the user needs to press the “Enter” button in 3 seconds.

#### 3. Specifications

#### 3.1 Accuracy

- **Voltage:** 0.5% of range maximum
- **Current:** 0.5% of nominal
- **Frequency:** 0.2% of mid-frequency
- **Apparent power:** 1% of range maximum
- **Active energy:** Class 1 (E250/35-21)
- **Reactive energy:** 1% of range maximum

#### 3.2 General Specifications

- **Voltage AC (Un):** 230V
- **Voltage Range:** 178 to 276V AC
- **Base Current (Ib/IB):** 5A
- **Max. Current (I_max):** 100A
- **Min. Current (I_min):** 0.25A
- **Starting current:** 0.4% of Ib/Ib
- **Power consumption:** ≤ 2W
- **Frequency:** 50/60Hz (per MID version)
- **AC voltage withstand:** 6KV-1.2µs waveform
- **Over voltage withstand:** 6KV-1.2µs waveform
- **Pulse 1 output rate:** 30 impulses for 0.1 s
- **Pulse 2 output rate:** Non-configurable, default 1000 impulses
- **Display:** LCD with backlight
- **Max. Reading:** 9999.99kWh

#### 3.3 Environment

- **Operating temperature:** -25°C to +55°C
- **Storage/transportation temperature:** -40°C to +70°C
- **Reference temperature:** 23°C ± 2°C
- **Relative humidity:** 0 to 95%
- **Installation category:** Non-condensing
- **Mechanical Environment:** CAT (I)
- **Electromagnetic environment:** E2
- **Degree of pollution:** 2

- **Capacitive and storage temperatures are in the context of typical daily and seasonal variation.**

#### 3.4 Pulse Output

The pulse output can be set to generate pulses to represent total kWh, total kVARh, import kWh, export kWh, import kVARh, export kVARh.

- **Constant can be set to 1000/100/10 impulses per kWh or kVARh.**
- **Pulse width:** 200/100/60mS.
- **Non-configurable, default:** 1000 impulses per kWh.

#### 3.5 RS485 output for Modbus RTU

- **The meter provides a RS485 port for remote communication.**
- **Modbus RTU is the protocol applied.**
- **The following RS485 communication parameters can be configured from the Set-up menu.**
- **Baud rate:** 1200, 2400, 4800, 9600 bps
- **Parity:** NONE/EVEN/ODD
- **Stop bits:** 1 or 2
- **Modbus Address:** 1 to 247

#### 3.6 Mechanics

- **Input rail dimensions:** 35x52x95 (WxHxD)
- **Mounting:** Per DIN 43860
- **Sealing:** IP54 (indoor)
- **Material:** Self-extinguishing UL94-V

#### 4. Dimensions

#### 5. Installation and sealing