Please read this document carefully before using this product. The guarantee will be invalidated if the device is damaged by not following instructions detailed in the manual. The company shall not be responsible for any damage or losses however caused, which may be experienced as a result of the installation or use of this product.

**ENDA EUC9526 Series Universal Control Device**

Thank you for choosing EUC9526 series universal control device.

- 96x96mm sized.
- 3.5 inches TFT, graphic and 5 digit display.
- 2 sensor inputs selectable as TC, RTD, NTC, R, mA, V or mV.
- Input offset feature.
- 32 point linearization for analog inputs.
- Selectable relay, SSR or analog outputs.
- Selectable, input proportional transmitter output (mA or V).
- 50ms sampling time.
- PID control.
- PID setpoint.
- PID auto-tune.

**Self-tune automatic PID calculation or manually enter PID parameters if known.**

- Soft-Star feature.
- 24Vdc for sensor supply.
- In case of sensor failure, manually, periodical or auto-periodical control can be selected.
- Security levels for menu and configuration page.
- Programming with Key Pad and ModBus.
- Rs485 ModBus protocol communication feature (optional).

---

**Analog Inputs**

<table>
<thead>
<tr>
<th>Input Type</th>
<th>Range</th>
<th>Accuracy</th>
<th>Input Resist.</th>
<th>Cable Color</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC</td>
<td>B (Pt100-PtRh)</td>
<td>200.0 ... 1800.0°C</td>
<td>±0.1% (full scale) and ±0.2°C (0.0°F)</td>
<td>Ri &gt; 10k</td>
<td>EN 60751</td>
</tr>
<tr>
<td></td>
<td>E (NiCr-Ni)</td>
<td>-100.0 ... 900.0°C</td>
<td>±0.1% (full scale) and ±0.5°C (1°F)</td>
<td>Ri &gt; 10k</td>
<td>DIN43710</td>
</tr>
<tr>
<td></td>
<td>J (Fe-Fe)</td>
<td>-100.0 ... 900.0°C</td>
<td>±0.1% (full scale) and ±0.5°C (1°F)</td>
<td>Ri &gt; 10k</td>
<td>EN 60751</td>
</tr>
<tr>
<td></td>
<td>K (NiCr-Ni)</td>
<td>-100.0 ... 900.0°C</td>
<td>±0.1% (full scale) and ±1.5°C (2.7°F)</td>
<td>Ri &gt; 10k</td>
<td>EN 60751</td>
</tr>
<tr>
<td></td>
<td>L (Fe-Fe)</td>
<td>-100.0 ... 900.0°C</td>
<td>±0.1% (full scale) and ±0.5°C (1°F)</td>
<td>Ri &gt; 10k</td>
<td>EN 60751</td>
</tr>
<tr>
<td></td>
<td>N (NiCr-Ni)</td>
<td>-100.0 ... 900.0°C</td>
<td>±0.1% (full scale) and ±1.5°C (2.7°F)</td>
<td>Ri &gt; 10k</td>
<td>EN 60751</td>
</tr>
<tr>
<td></td>
<td>NiCr-Ni (Ni)</td>
<td>-100.0 ... 900.0°C</td>
<td>±0.1% (full scale) and ±0.5°C (1°F)</td>
<td>Ri &gt; 10k</td>
<td>EN 60751</td>
</tr>
<tr>
<td></td>
<td>N (Pt100-PtRh)</td>
<td>0.0 ... 1700.0°C</td>
<td>±0.1% (full scale) and ±1.0°C (1.8°F)</td>
<td>Ri &gt; 10k</td>
<td>DIN43710</td>
</tr>
<tr>
<td></td>
<td>S (Pt100-PtRh)</td>
<td>0.0 ... 1700.0°C</td>
<td>±0.1% (full scale) and ±1.0°C (1.8°F)</td>
<td>Ri &gt; 10k</td>
<td>DIN43710</td>
</tr>
<tr>
<td></td>
<td>T (Cu-Cu)</td>
<td>-250.0 ... 300.0°C</td>
<td>±0.1% (full scale) and ±1.0°C (1.8°F)</td>
<td>Ri &gt; 10k</td>
<td>EN 60751</td>
</tr>
<tr>
<td></td>
<td>Cu-Cu (Ni)</td>
<td>-250.0 ... 300.0°C</td>
<td>±0.1% (full scale) and ±1.0°C (1.8°F)</td>
<td>Ri &gt; 10k</td>
<td>EN 60751</td>
</tr>
<tr>
<td></td>
<td>Pt100</td>
<td>-200.0 ... 850.0°C</td>
<td>±0.1% (full scale) and ±0.5°C (1°F)</td>
<td>Ri &gt; 10k</td>
<td>Sensor current 250mA</td>
</tr>
<tr>
<td></td>
<td>NTC</td>
<td>160.00°C</td>
<td>±0.1% (full scale) and ±0.8°C (1.5°F)</td>
<td>Ri &gt; 10k</td>
<td>Sensor current 250mA</td>
</tr>
<tr>
<td>mA</td>
<td>0 - 20mA</td>
<td>-32768 ... 32767</td>
<td>±0.1% (full scale) and ±1 digit</td>
<td>Ri &gt; 10k</td>
<td>EN 60584</td>
</tr>
<tr>
<td></td>
<td>4 - 20mA</td>
<td>-32768 ... 32767</td>
<td>±0.1% (full scale) and ±1 digit</td>
<td>Ri &gt; 10k</td>
<td>EN 60584</td>
</tr>
<tr>
<td>mV</td>
<td>0 - 150mV</td>
<td>-32768 ... 32767</td>
<td>±0.1% (full scale) and ±20mV</td>
<td>Ri &gt; 10k</td>
<td>EN 60584</td>
</tr>
<tr>
<td>V</td>
<td>0 - 5V</td>
<td>-32768 ... 32767</td>
<td>±0.1% (full scale) and ±1 digit</td>
<td>Ri &gt; 10k</td>
<td>EN 60584</td>
</tr>
<tr>
<td></td>
<td>1 - 5V</td>
<td>-32768 ... 32767</td>
<td>±0.1% (full scale) and ±1 digit</td>
<td>Ri &gt; 10k</td>
<td>EN 60584</td>
</tr>
<tr>
<td></td>
<td>0 - 10V</td>
<td>-32768 ... 32767</td>
<td>±0.1% (full scale) and ±1 digit</td>
<td>Ri &gt; 10k</td>
<td>EN 60584</td>
</tr>
<tr>
<td>Ω</td>
<td>0 - 550</td>
<td>±0.2% (full scale) and ±0.1%</td>
<td>Ri &gt; 10k</td>
<td>Sensor current 250mA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 - 10k</td>
<td>±0.2% (full scale) and ±0.1%</td>
<td>Ri &gt; 10k</td>
<td>Sensor current 250mA</td>
<td></td>
</tr>
</tbody>
</table>

**Outputs**

- **Control / Alarm 1:** 250V AC, 2A, Selectable as NO+N, 10,000,000 switch without load and 200,000 switch under 250V AC 2A (resistive load).
- **Alarm 2:** 250V AC, 2A, Selectable as NO or NO-N, 10,000,000 switch without load and 200,000 switch under 250V AC 2A (resistive load).
- **SSR:** Max. 40 mA, 0 - 12 Volt, short-circuit protection.

**Electrical Characteristics**

- **Supply:** 90-250V AC, 50/60Hz
- **Power consumption:** Max. 7VA
- **Wiring:** 2.5mm² screw-terminal
- **EMC:** EN 61326-1:2013
- **Safety requirements:** EN 61010-1:2010 (Pollution degree 2, overvoltage category I)

**Environmental Conditions**

- **Ambient/storage temp.** 0 ... +50°C, 25°C (±2°C)
- **Max. Relative humidity:** 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.
- **Rated pollution degree:** According to EN 60529 - Front panel: IP65, Rear panel: IP20
- **Height:** Max. 2000mm

- Do not use the device in locations subject to corrosive and flammable gases.

**Housing**

- **Housing type:** Suitable for flush-panel mounting.
- **Dimensions:** G96x96x81mm
- **Weight:** Approx. 400g.
- **Enclosure material:** Self extinguishing plastics.

- While cleaning the device, solvents (thinner, gasoline, acid etc.) or corrosive materials must not be used.
**DIMENSIONS**

**PANEL CUT-OUT**

**CONNECTION DIAGRAM**

ENDA EUC9526 is intended for installation in control panels. Make sure that the device is used only for intended purpose. The electrical connections must carried out by a qualified staff and must be according to the relevant locally applicable regulations. During an installation, all of the cables that are connected to the device must be free of electrical power. The device must be protected against inadmissible humidity, vibrations, severe soiling and make sure that the operation temperature is not exceed. The cables should not be close to the power cables or components.

**SUPPLY VOLTAGE**

90-250V AC 50/60Hz, MAX. 7VA

+24V DC (max. 30mA)

+12V DC (max. 30mA)

Input1 mA/mV/V

TC

RTD

Input2 mA/mV/V

TC

RTD

ModBus

RS 485

**NOT**

1) Panel thickness should be maximum 10mm.
2) If there is no 60 mm free space at the back side of the device, it would be difficult to remove it from panel.

- Holding screw
  - 0.4-0.5Nm

- Equipment is protected throughout by DOUBLE INSULATION.

- Fuse should be connected.

- Cable size: 1.5mm²

Logic output of the instrument is not electrically insulated from the internal circuits. Therefore, when using grounding thermocouple, do not connect the logic output terminals to the ground.

- 10-11-12 inputs for 1. Analog Input, 7-8-9 inputs for 2. Analog Input

- In accordance with safety regulations, the power supply switch shall bring the identification of the relevant instrument and it should be easily accessible by the operator.

- 10-11-12 inputs for 1. Analog Input, 7-8-9 inputs for 2. Analog Input

**HOLDING SCREW**

For removing the device from panel:
- While pressing both flush mounting clamps of the device in direction 1, pull it in direction 2.

**Not:**
1) Panel thickness should be maximum 10mm.
2) If there is no 60 mm free space at the back side of the device, it would be difficult to remove it from panel.
Adjusting Device Set Values

If Set Key pressed once, SV1’s color will be green. In this case SV1 is adjusted by pressing Increase/Decrease keys.
If Set Key pressed again or by waiting 3 seconds, SV1’s color will be white on home screen.

If Back Key pressed once, SV2’s color will be green. In this case SV2 is adjusted by pressing Increase/Decrease keys.
If Back Key pressed again or by waiting 3 seconds, SV2’s color will be white on home screen.

NOTE: If Increase Key is held down while the device is powered up, factory parameters will be restored.
Main menu is opened and "Programming Mode" is started by pressing Enter Key for 2 seconds.

Desired sub menu is selected by pressing Increase/Decrease Keys.

Selected sub menu is opened by pressing Enter Key.

Selected sub menu can be opened if permission is given from “Security Configuration Page”.

If back Key is pressed or by waiting 10 seconds, parameters will be saved and device turns back to home screen.

**NOTE 1:** If power failure occurs while device is programming, parameters won’t be saved.

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**Programming Inputs (Input Configuration Page)**

Desired parameter is selected by pressing Increase/Decrease Keys. Background of selected parameter turns red.

If SET Key is pressed, background of selected parameter turns green and selected parameter can be adjusted to desired value.

If SET Key is pressed again, background of selected parameter turns red and exits from parameter adjustment.

If Back Key is pressed or by waiting 10 seconds, Input Configuration Page is closed and device turns back to main menu.

---

**Input 1 Type:**

B, E, J, K, L, N, R, S, T, U, Pt100, NTC, 0-20mA, 4-20mA, 0-5V, 1-5V, 0-10V, 0-150mV, 0-550Ω, 0-20mA, 4-20mA, 0-5V, 1-5V, 0-10V, 0-150mV, 0-550Ω.

**Scale (Scale Min./Max.):**

Adjustable between -32768 ... 32767.

(Just for mA, V, mV, Ω, %)

**Minimum Set Value:**

Adjustable between Scale Minimum and Minimum Set Value.

**Maximum Set Value:**

Adjustable between Scale Maximum and Minimum Set Value.

**Unit:**

°C, °F, bar, %RH, Hz, mA, A, mV, V, Ohm, kOhm, %, g, kg, cm, m, m/s, m/min, km/h, cm³/s, m³/h, l/s, l/min, l/h.

(Just for mA, V, mV, Ω, %)

**Linearization Table Conf:**

If input type is selected as mA, V, mV, Ω or %, linearization can be done at 32 points.

Use Linearization Table for 0-10 V.

Linearization Table can be activated by pressing keys respectively.

Corresponding values of input signals must be entered to table in order to linearize at 32 points.
**Programming Outputs (Output Configuration Page)**

- **Output Type**: Relay, SSR, 0-20mA, 4-20mA or 0-10V. If relay is not selected for output type, relay can be configured as Alarm 3.

- **Re-Transmission**: If output is selected as relay or SSR, re-transmission can be selected as 0/4-20mA or 0-10V. If output type is selected as a 0-20mA, re-transmission can be selected as a 0-10V. If output type is selected as a 0-10V, re-transmission can be selected as a 0/4-20mA.

- **Maximum Analog Output Value %**: Maximum analog output value.

- **Minimum Analog Output Value %**: % minimum analog output value.

- **Output Power Offset Around Set Point %**: Adjustable between Scale Minimum and Alarm 1 Low Limit.

- **Output Hysteresis %**: Adjustable between Alarm 3 Up Limit and Alarm 3 Low Limit.

- **Output Power During Prob Failure %**: Adjustable between %0...%100. Output will continue in case of prob failure.

- **Soft Start Time (sec)**: Adjustable between 0 ... 200 seconds. Device starts to control according to soft start time after device is powered on.

**Control Configuration**: Selectable as Cool/Heat control. The cooling control is only ON-OFF control (For Cooling control. Proportional Band must be 0.0).

**Output Power During Prob Failure (%)**: Adjustable between %0...%100. Output will continue in case of prob failure.

**Soft Start Time (sec)**: Adjustable between 0 ... 200 seconds. Device starts to control according to soft start time after device is powered on.

**Programming Alarms (Alarm Configuration Page)**

- **Alarm 1 Set Value**: Adjustable between Alarm 1 Up Limit and Alarm 1 Low Limit.
- **Alarm 2 Set Value**: Adjustable between Alarm 2 Up Limit and Alarm 2 Low Limit.
- **Alarm 3 Set Value**: Adjustable between Alarm 3 Up Limit and Alarm 3 Low Limit.

**Alarm 1 Set Value**: Adjustable between Alarm 1 Up Limit and Alarm 1 Low Limit. (In order to use Alarm 3, **Output Type** parameter must be different from Relay otherwise Alarm 3 will be unavailable and Alarm 3 Conf page will be hidden.

**Alarm 1 Hysteresis %**: Adjustable between 0 ... 50.

- **Alarm 1 Status**: Independent alarm, Deviation alarm, Band alarm, Band Alarm with Inhibition can be selected.
- **Alarm 1 Status During Probe Failure**: For the alarm to be inactive in case of prob failure OFF must be selected.
- **Alarm Status During Probe Failure**: For the alarm to be active in case of prob failure ON must be selected. For the alarm to be inactive in case of prob failure OFF must be selected.

**Alarm 1 Low Limit**: Adjustable between Scale Maximum and Alarm 1 Low Limit.

**Alarm 1 Low Limit**: Adjustable between Scale Minimum and Alarm 1 Up Limit.

**Alarm 2 “Alarm 2 Conf”** and **Alarm 3 “Alarm 3 Conf”** are programmed in the same way.

**Band Alarm with Inhibition**

- **Alarm Status**: HIGH
  - ON
  - Alarm Status LOW
    - OFF
  - Alarm Status LOW
    - OFF

- **Alarm Status**: LOW
  - ON
  - Alarm Status LOW
    - OFF
  - Alarm Status LOW
    - OFF

**Band Alarm with Inhibition**

- **Alarm Status**: HIGH
  - ON
  - Alarm Status LOW
    - OFF
  - Alarm Status LOW
    - OFF

- **Alarm Status**: LOW
  - ON
  - Alarm Status LOW
    - OFF
  - Alarm Status LOW
    - OFF
**Programming PID Control (PID Control Configuration Page)**

- **Proportional Band (%):** Adjustible between %0.0 ... %100.0.  
  If proportional band is selected 0.0, ON-OFF control will be activated.
- **Integral Time (min):** Adjustible between 0.0 ... 100.0 minute.
- **Derivative Time (min):** Adjustible between 0.0 ... 25.0 minute.
- **Control Period (sec):** Adjustible between 0 ... 250 second.
- **Auto Tune:** Improve PID parameters while Self Tune is running. 
  If PV is oscillating while controller is running, auto tune improves PID parameters in order to best control. 
  It will be activated if ON selected.

**PID Self Tune:**

Self Tune is started by selecting with keys and pressing by key. **SELF TUNE IS STARTED** and **SELF TUNE IS RUNNING** messages is shown respectively.

When Self Tune process is successful:
- **SELF TUNE IS FINISHED** message is shown and continues to control.

In order to start Self tune process PV must be smaller than %60 of SV, otherwise **SELF TUNE IS STARTED** and **SELF TUNE IS STOPPED** messages are shown respectively and home screen returned.

User must wait until PV drops under %60 of SV and start self tune again.

If key is pressed, **SELF TUNE IS STOPPED** message is shown and self tune is stopped and device turns back to home screen.

**Programming ModBus (Communication Configuration Page)**

- **Modbus Communication:** If parameter is selected ON modbus will be active, otherwise will be inactive.
- **Device Address:** Adjustable between 1 ... 247
- **Baudrate:** 4800, 9600, 19200, 38400 or 57600.

**Programming Keypad Security Level(Security Configuration Page)**

- **Security Code:** In order to change security configuration, Security Code must be entered 123.
- **Input Configuration Page Visibility:** Yes, No or None.
- **Output Configuration Page Visibility:** Yes, No or None.
- **Alarm Group 1 Configuration Page Visibility:** Yes, No or None.
- **Alarm Group 2 Configuration Page Visibility:** Yes, No or None.
- **PID Control Configuration Page Visibility:** Yes, No or None.
- **Communication Configuration Page Visibility:** Yes, No or None.
- **Calibration Page Visibility:** Yes or None.

No: Page can be opened, parameters can not be changed.
Yes: Page can be opened, parameters can be changed. None: Page can not be opened.
<table>
<thead>
<tr>
<th>PARAMETER NAME</th>
<th>INFORMATION</th>
<th>DATA TYPE</th>
<th>REG. ADR.</th>
<th>MIN.</th>
<th>MAX.</th>
<th>DEF.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input1 Type</td>
<td>0 = B tipi Thermocouple 1 = E 2 = J 3 = K 4 = L 5 = N 6 = R 7 = S 8 = T 9 = U 10 = Pt100 11 = NTC 12 = 0-20 mA 13 = 4-20 mA 14 = 0-5 V 15 = 1-5 V 16 = 0-10 V 17 = 0-150 mV 18 = 0-550 Ohm 19 = 0-10 kOhm (For Input1)</td>
<td>Word</td>
<td>0</td>
<td>0</td>
<td>19</td>
<td>2</td>
</tr>
<tr>
<td>Scale Minimum</td>
<td>Can not be changed for Thermocouple and PT100 . Can be changed for Universal Inputs. Scale Minimum is -100 for PT100 XXX.XX. Low limit for Set Value parameter. (For Input1)</td>
<td>Word</td>
<td>1</td>
<td>-32768</td>
<td>32767</td>
<td>-1000</td>
</tr>
<tr>
<td>Scale Maximum</td>
<td>Can not be changed for Thermocouple and PT100 . Can be changed for Universal Inputs. Scale Maximum is 160 for PT100 XXX.XX. Up limit for Set Value parameter (For Input1)</td>
<td>Word</td>
<td>2</td>
<td>-32768</td>
<td>32767</td>
<td>9000</td>
</tr>
<tr>
<td>Unit</td>
<td>0 = °C 1 = °F 2 = Bar 3 = %RH 4 = Hz 5 = A 6 = V. (For Input1)</td>
<td>Word</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Input1 Offset</td>
<td>Offset added to Measurement. (For Input1)</td>
<td>Word</td>
<td>4</td>
<td>-99</td>
<td>99</td>
<td>0</td>
</tr>
<tr>
<td>Digital Filter Coefficient</td>
<td>1 = Fastest response time 32 = Slowest response time  Value of parameter should be increased in interference. (For Input1)</td>
<td>Word</td>
<td>5</td>
<td>1</td>
<td>32</td>
<td>4</td>
</tr>
<tr>
<td>Decimal Point</td>
<td>0 = XXX 1 = XXX.X 2 = XXX.XX 3 = XXX.XXX . According to Decimal Point parameter, modbus read/write data changed by 1,10,100,1000 linearly. (For Input1)</td>
<td>Word</td>
<td>6</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Minimum Set Value</td>
<td>Adjustable between Scale Minimum and Maximum Set Value parameters. (For Input1)</td>
<td>Word</td>
<td>7</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Maximum Set Value</td>
<td>Adjustable between Scale Minimum and Maximum Set Value parameters. (For Input1)</td>
<td>Word</td>
<td>8</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Input 2 Type</td>
<td>0 = B type Termokupl 1 = E 2 = J 3 = K 4 = L 5 = N 6 = R 7 = S 8 = T 9 = U 10 = Pt100 11 = NTC 12 = 0-20 mA 13 = 4-20 mA 14 = 0-5 V 15 = 1-5 V 16 = 0-10 V 17 = 0-150 mV 18 = 0-550 Ohm 19 = 0-10 kOhm (For Input2)</td>
<td>Word</td>
<td>9</td>
<td>0</td>
<td>19</td>
<td>2</td>
</tr>
<tr>
<td>Scale Minimum</td>
<td>Can not be changed for Thermocouple and PT100 . Can be changed for Universal Inputs. Scale Minimum is -100 for PT100 XXX.XX. Low limit for Set Value parameter. (For Input2)</td>
<td>Word</td>
<td>10</td>
<td>-32768</td>
<td>32767</td>
<td>-1000</td>
</tr>
<tr>
<td>Scale Maximum</td>
<td>Can not be changed for Thermocouple and PT100 . Can be changed for Universal Inputs. Scale Maximum is 160 for PT100 XXX.XX. Up limit for Set Value parameter (For Input2)</td>
<td>Word</td>
<td>11</td>
<td>-32768</td>
<td>32767</td>
<td>9000</td>
</tr>
<tr>
<td>Unit</td>
<td>0 = °C 1 = °F 2 = Bar 3 = %RH 4 = Hz 5 = A 6 = V. (For Input2)</td>
<td>Word</td>
<td>12</td>
<td>0</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Input2 Offset</td>
<td>Offset added to Measurement. (For Input2)</td>
<td>Word</td>
<td>13</td>
<td>-99</td>
<td>99</td>
<td>0</td>
</tr>
<tr>
<td>Digital Filter Coefficient</td>
<td>1 = Fastest response time 32 = Slowest response time  Value of parameter should be increased in interference. (For Input2)</td>
<td>Word</td>
<td>14</td>
<td>1</td>
<td>32</td>
<td>4</td>
</tr>
<tr>
<td>Decimal Point</td>
<td>0 = XXX 1 = XXX.X 2 = XXX.XX 3 = XXX.XXX . According to Decimal Point parameter, modbus read/write data changed by 1,10,100,1000 linearly. (For Input2)</td>
<td>Word</td>
<td>15</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Minimum Set Value</td>
<td>Adjustable between Scale Minimum and Maximum Set Value parameters. (For Input2)</td>
<td>Word</td>
<td>16</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Maximum Set Value</td>
<td>Adjustable between Scale Minimum and Maximum Set Value parameters. (For Input2)</td>
<td>Word</td>
<td>17</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Linearization Table1 [0-31].Points</td>
<td>Linearization table , value of points from 0 to 31. (For Input1)</td>
<td>Word</td>
<td>[18-49]</td>
<td>-32768</td>
<td>32767</td>
<td>0</td>
</tr>
<tr>
<td>Linearization Table2 [0-31].Points</td>
<td>Linearization table , value of points from 0 to 31. (For Input2)</td>
<td>Word</td>
<td>[50-81]</td>
<td>-32768</td>
<td>32767</td>
<td>0</td>
</tr>
<tr>
<td>Output1 Type</td>
<td>0 = Relay 1 = SSR 2 = 0-20 mA 3 = 4-20 mA 4 = 0-10 V (For Output1)</td>
<td>Word</td>
<td>82</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Re-Transmission</td>
<td>0 = None 1 = 0-20 mA 2 = 4-20 mA 3 = 0-10 V (For Output1)</td>
<td>Word</td>
<td>83</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Maximum Analog Value</td>
<td>(For Output1)</td>
<td>Word</td>
<td>84</td>
<td>0</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Minimum Analog Value</td>
<td>(For Output1)</td>
<td>Word</td>
<td>85</td>
<td>0</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Output1 Hysteresis</td>
<td>Adjustable between 1 and 50 (For Output1)</td>
<td>Word</td>
<td>86</td>
<td>0</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>Output1 Power Offset Around Set Point(%)</td>
<td>Added offset(%) according to error around Set Value.(For Output1)</td>
<td>Word</td>
<td>87</td>
<td>0</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Output1 Power During Prob Failure(%)</td>
<td>Adjustable between %0 and %100 , output will continue in case of prob failure.(For Output1)</td>
<td>Word</td>
<td>88</td>
<td>0</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Soft Start Time(sec)</td>
<td>Adjustable between 0 and 200 seconds.(For Output1)</td>
<td>Word</td>
<td>89</td>
<td>0</td>
<td>200</td>
<td>10</td>
</tr>
<tr>
<td>Output2 Type</td>
<td>0 = Relay 1 = SSR(For Output2)</td>
<td>Word</td>
<td>90</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Output2 Hysteresis</td>
<td>Adjustable between 1 and 50. (For Output2)</td>
<td>Word</td>
<td>91</td>
<td>0</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>Output2 Power Offset Around Set Point(%)</td>
<td>Added offset(%) according to error around Set Value.(For Output2)</td>
<td>Word</td>
<td>92</td>
<td>0</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Output2 Power During Prob Failure(%)</td>
<td>Adjustable between %0 and %100 , output will continue in case of prob failure.(For Output2)</td>
<td>Word</td>
<td>93</td>
<td>0</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Soft Start Time(sec)</td>
<td>Adjustable between 0 and 200 seconds.(For Output2)</td>
<td>Word</td>
<td>94</td>
<td>0</td>
<td>200</td>
<td>10</td>
</tr>
<tr>
<td>Alarm 1 Set Value</td>
<td>Alarm Group1</td>
<td>Word</td>
<td>95</td>
<td>-32768</td>
<td>32767</td>
<td>1000</td>
</tr>
<tr>
<td>Alarm 2 Set Value</td>
<td>Alarm Group1</td>
<td>Word</td>
<td>96</td>
<td>-32768</td>
<td>32767</td>
<td>1000</td>
</tr>
<tr>
<td>Alarm 3 Set Value</td>
<td>Alarm Group1</td>
<td>Word</td>
<td>97</td>
<td>-32768</td>
<td>32767</td>
<td>1000</td>
</tr>
<tr>
<td>Alarm 1 Hysteresis</td>
<td>Alarm Group1</td>
<td>Word</td>
<td>98</td>
<td>0</td>
<td>50</td>
<td>0</td>
</tr>
</tbody>
</table>
### Measured PV, result must be divided by 10.

**For example:** If temperature is 32.5 °C, measured PV result must be divided by 10.

### Alarm Group1

**Word 32767**

**NONE**

**DATA**

**130**

**Alarm Group2**

**9000**

**-32768**

**100**

**MIN.**

**MAX.**

**0**

**Alarm Group2**

**0**

**Word 102**

**Word 32767**

**Word 10**

**Word 0**

**Word 134**

**Word 111**

**Word 0**

**Word 0**

**Alarm Group2**

**Adjustable between 0.0 and 25.0**

**Word 32767**

**Word 0**

**Word 32767**

**Word 0**

**Word 0**

**Word 4**

**Word 112**

**Word 9000**

**Alarm Group2**

**0**

**Word 108**

**Word 108**

**Word 101**

**Word 101**

**Word 102**

**Word 102**

**Word 103**

**Word 103**

**Word 104**

**Word 104**

**Word 105**

**Word 105**

**Word 106**

**Word 106**

**Word 107**

**Word 107**

**Word 108**

**Word 108**

**Word 109**

**Word 109**

**Word 110**

**Word 110**

**Word 111**

**Word 111**

**Word 112**

**Word 112**

**Word 113**

**Word 113**

**Word 114**

**Word 114**

**Word 115**

**Word 115**

**Word 116**

**Word 116**

**Word 117**

**Word 117**

**Word 118**

**Word 118**

**Word 119**

**Word 119**

**Word 120**

**Word 120**

**Word 121**

**Word 121**

**Word 122**

**Word 122**

**Word 123**

**Word 123**

**Word 124**

**Word 124**

**Word 125**

**Word 125**

**Word 126**

**Word 126**

**Word 127**

**Word 127**

**Word 128**

**Word 128**

**Word 129**

**Word 129**

**Word 130**

**Word 130**

**Word 131**

**Word 131**

**Word 132**

**Word 132**

**Word 133**

**Word 133**

**Word 134**

**Word 134**

**Proportional Band (%)**

If it is set to %0.0, ON-OFF control is activated. If it is set to different from %0.0, PID control is activated. In order to read/write from modbus multiple/divide with 10. For example: in order to set %5.5, 5.5x10=55 must be written to parameter. **(For PID1)**

**Integral Time (min)**

If it is set to 0.0, PD control is activated. In order to read/write from modbus multiple/divide with 10. For example: in order to set %5.5, 5.5x10=55 must be written to parameter. **(For PID1)**

**Derivative Time (min)**

Adjustable between 0.0 and 25.0.

**Control Period (sec)**

Adjustable between 1 and 250 second. **(For PID1)**

**Proportional Band (%)**

If it is set to %0.0, ON-OFF control is activated. If it is set to different from %0.0, PID control is activated. In order to read/write from modbus multiple/divide with 10. For example: in order to set %5.5, 5.5x10=55 must be written to parameter. **(For PID2)**

**Integral Time (min)**

Adjustable between 0.0 and 100.0.

**Derivative Time (min)**

Adjustable between 0.0 and 25.0.

**Control Period (sec)**

Adjustable between 1 and 250 second. **(For PID2)**

**Set Value1**

Word 133

**-32768**

**32767**

**2000**

**Set Value2**

Word 134

**-32768**

**32767**

**2000**

For example: When the value of the Decimal Point parameter is 1, it is 155.5 if the Set Value Parameter is written as 1555 via ModBus.


### INPUT REGISTERS

### PARAMETER NAME

<table>
<thead>
<tr>
<th>Measured Value1(PV1)</th>
<th>Measured PV, result must be divided by 10. For example: If temperature is 32.5 °C, 325 will be read over modbus.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured Value2(PV2)</td>
<td>Measured PV, result must be divided by 10. For example: If temperature is 32.5 °C, 325 will be read over modbus.</td>
</tr>
<tr>
<td>Internal NTC Temperature</td>
<td>Measured Internal NTC temperature, result must be divided by 10. For example: If temperature is 32.5 °C, 325 will be read over modbus.</td>
</tr>
<tr>
<td>Analog Output Percent</td>
<td>Output % for 0-10V, 0-20mA or 4-20mA (For Ouput1)</td>
</tr>
<tr>
<td>Analog Output Percent</td>
<td>Output % for 0-10V, 0-20mA or 4-20mA (For Ouput2)</td>
</tr>
</tbody>
</table>

### INFORMATION

<table>
<thead>
<tr>
<th>DATA TYPE</th>
<th>REG. ADR.</th>
<th>MIN.</th>
<th>MAX.</th>
<th>DEF.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word 0</td>
<td>NONE</td>
<td>NONE</td>
<td>NONE</td>
<td>NONE</td>
</tr>
<tr>
<td>Word 1</td>
<td>NONE</td>
<td>NONE</td>
<td>NONE</td>
<td>NONE</td>
</tr>
<tr>
<td>Word 2</td>
<td>NONE</td>
<td>NONE</td>
<td>NONE</td>
<td>NONE</td>
</tr>
<tr>
<td>Word 3</td>
<td>NONE</td>
<td>NONE</td>
<td>NONE</td>
<td>NONE</td>
</tr>
<tr>
<td>Word 4</td>
<td>NONE</td>
<td>NONE</td>
<td>NONE</td>
<td>NONE</td>
</tr>
</tbody>
</table>
MODBUS ADDRESS MAP

COIL REGISTERS

<table>
<thead>
<tr>
<th>PARAMETER NAME</th>
<th>INFORMATION</th>
<th>DATA TYPE</th>
<th>REG. ADR.</th>
<th>MIN.</th>
<th>MAX.</th>
<th>DEF.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use Linearization Table 1</td>
<td>Disable/Enable Linearization table. Can not be used for Thermocouple , PT100 and NTC. Can be used for Universal Inputs.</td>
<td>Bit</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Use Linearization Table 2</td>
<td>Disable/Enable Linearization table. Can not be used for Thermocouple , PT100 and NTC. Can be used for Universal Inputs.</td>
<td>Bit</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Control Configuration</td>
<td>0=ON-OFF COOLING 1=ON-OFF HEATING</td>
<td>Bit</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Alarm Status 1
- 0= LOW 1= HIGH | Alarm Group 1
- Bit 0 | 1 | 1 | 1
- Bit 1 | 1 | 1 | 1

Alarm Status 2
- 0= LOW 1= HIGH | Alarm Group 1
- Bit 0 | 0 | 1 | 1
- Bit 1 | 0 | 1 | 1

Alarm Status 3
- 0= LOW 1= HIGH | Alarm Group 1
- Bit 0 | 1 | 1 | 1
- Bit 1 | 1 | 1 | 1

Alarm Status 4
- 0= LOW 1= HIGH | Alarm Group 1
- Bit 0 | 1 | 1 | 1
- Bit 1 | 1 | 1 | 1

Alarm Status 5
- 0= LOW 1= HIGH | Alarm Group 1
- Bit 0 | 1 | 1 | 1
- Bit 1 | 1 | 1 | 1

Alarm Status 6
- 0= LOW 1= HIGH | Alarm Group 1
- Bit 0 | 1 | 1 | 1
- Bit 1 | 1 | 1 | 1

Alarm Status 7
- 0= LOW 1= HIGH | Alarm Group 1
- Bit 0 | 1 | 1 | 1
- Bit 1 | 1 | 1 | 1

Alarm Status 8
- 0= LOW 1= HIGH | Alarm Group 1
- Bit 0 | 1 | 1 | 1
- Bit 1 | 1 | 1 | 1

Auto Tune
- 0 = OFF 1 = ON | Improve PID parameters while selftune is running. | Bit 16 | 0 | 1 | 0

MODBUS ERROR MESSAGES

Modbus protocol has two types error, communication error and operating error. Reason of the communication error is data corruption in transmission. Parity and CRC control should be done to prevent communication error. Receiver side checks parity and CRC of the data. If they are wrong, the message will be ignored. If format of the data is true but function doesn’t perform for any reason, operating error occurs. Slave realizes error and sends error message. Most significant bit of function is changed “1” to indicate error in error message by slave. Error code is sent in data section. Master realizes error type via this message.

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Name</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>ILLEGAL FUNCTION</td>
<td>The function code received in the query is not an allowable action for the slave. If a Poll Program Complete command was issued, this code indicates that no program function preceded it.</td>
</tr>
<tr>
<td>02</td>
<td>ILLEGAL DATA ADDRESS</td>
<td>The data address received in the query is not an allowable address for the slave.</td>
</tr>
<tr>
<td>03</td>
<td>ILLEGAL DATA VALUE</td>
<td>A value contained in the query data field is not an allowable value for the slave.</td>
</tr>
</tbody>
</table>

Message example:

<table>
<thead>
<tr>
<th>Device Address</th>
<th>Function Code</th>
<th>Beginning address of coils</th>
<th>Number of coils</th>
<th>CRC DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>[0A]h</td>
<td>[01]h</td>
<td>[04]h</td>
<td>[A1]h</td>
<td>[4C]h</td>
</tr>
<tr>
<td>[0B]h</td>
<td>[09]h</td>
<td>[06]h</td>
<td>[53]h</td>
<td>---------</td>
</tr>
</tbody>
</table>