

Sc994

Standard Controller USER GUIDE



ORDEL



- Read this user manual carefully before using the device. Responsibility for accidents and damages caused by non-compliance with the warnings in this manual belongs to the user.
- This device has been produced for use by educated people in industrial enterprises, it is not suitable for use in homes and similar places for safety reasons.
- Do not use this device in the presence of flammable and explosive gases. It may cause explosion or fire due to electric arc that may occur at the contact points.
- Liquid substances and metal parts must be prevented from entering the device. Otherwise, it may cause accidents such as fire and electric shock.
- There is no fuse and circuit breaker on the device, they must be connected externally by the user.
- In case of malfunction of the device, external measures should be taken to prevent accidents and damages that may occur in the system in which it is located.
- It should be ensured that the sensor and signal cables are away from power cables or switched inductive load cables, or it must be prevented from being electrically affected.
- Before making the device connections, it should be checked whether the supply voltage is suitable for the place where it will be used by looking at the product code.
- Do not energize the device before making the connections related to the device in accordance with the wiring diagram and do not touch the terminals while the device is energized.
- The factory configuration of the device is not suitable for every system, it must be changed by the user according to the needs of the current system.
- The useful life of the device as determined and announced by the Ministry is 10 years.
- Do not modify or try to repair the device, the device should be repaired by authorized

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SC994 Model devices are completely modular and each module can be configured independently, designed for the measurement and control of many process variables in industrial environments. In the design phase, compliance with international standards, reliability and ease of use are based. For this reason, they are ergonomic devices that can be used for very different controls in many sectors.

2 x 4 Digit Numeric Displays

4 LED Indicators

1 Transmitter Supply Output (24Vdc)

1 Universal Sensor Input (TC, RT, mA, mV, V)

1 Analog Output (0/4-20mA, 0/2-10V)

1 Piece RS485 Communication Unit

4 Relays or Logic Outputs (24V)

100-240Vac Universal or 24Vac/dc Supply

Isolation Between Input/Output Modules

Auto-Tuning (auto-tuning of PID parameters)

Sensor Troubleshooting

9 Different Relay Functions

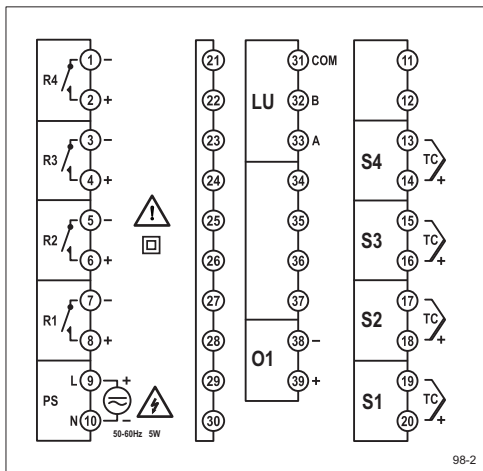
ON/OFF, P, PI, PD, PID Control

Linear and Time-Proportional Control Output

Before starting to use the device, make use of this user manual and perform the following operations in order.

- SC994 Model devices are completely modular devices, therefore, before using the device, check the product code to see if the supply voltage and input-output modules are suitable.
- Before making other connections of the device, only supply the supply voltage and enter the configuration page to make the most suitable configuration for your system.
- After the device is properly configured, set the set values and hysteresis of the relays you have selected as alarm on the operator page.
- Cut off the power of the device and make other connections according to the connection diagram.
- Make the system to be controlled ready for operation and re-energize the system with the device.
- If the control outputs of the device will work as PID and you have not entered the PID parameters manually, perform Auto-Tune for the device to calculate these parameters itself.
- In order to be sure that the PID parameters found by Auto-Tune are correct, enter a new set value to the device and watch its operation.
- Check all functions of the device during normal use.
- Finally, in order to prevent the intervention of unauthorized persons, enter the configuration page again and set the security-related parameters and return to the Process-Screen.

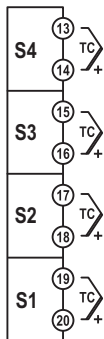
This user manual has been prepared in accordance with the above procedure. How to do these operations is given in detail in the relevant sections.



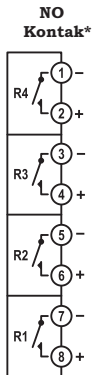
Shape-1

| Module | Explanation |
|-------------|--|
| S1,S2,S3,S4 | Sensor input modules. The content of these modules is determined by the parameters $\zeta 1t, \zeta 2t, \zeta 3t, \zeta 4t$ |
| R1,R2,R3,R4 | Relay output modules (The contents of these modules are determined by the product code, and their functions are determined by the "r 1F, r 2F, r 3F, r 4F" |
| PS | Supply voltage input (Supply voltage is determined by the product code). |

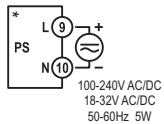
TC Input
(B,E,J,K,L,N,R,S,T,U)



Relay/SSR Outputs *



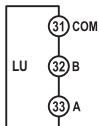
Supply Connection *



Analog Output Module *



RS485 Connection Module *



* It is optional. Please refer to the Device Type Label.

SC994 - / 0 / / /

PS
LU
O1
R1
R2
R3
R4
KS
ST

Operating Voltage:

0 = 100-240V AC/DC (Universal)
1 = 24V AC/DC

Communication Unit Output Module:

0 = None
3 = RS485 Communication Module

Analog Output Module:

0 = None
1 = 0/4-20mA Current Output
2 = 0/2-10V Voltage Output

R1,R2 Output Modules:

0 = None
1 = NO Contact
2 = 24V Logic Output (For Driving SSR)
2 = NO/NC Relay Output

R3,R4 Output Modules:

0 = None
1 = NO Contact
2 = 24V Logic Output (For Driving SSR)

Number of Channels:

2 = Two Channel Inputs
4 = Four Channel Inputs

Sensor Type:

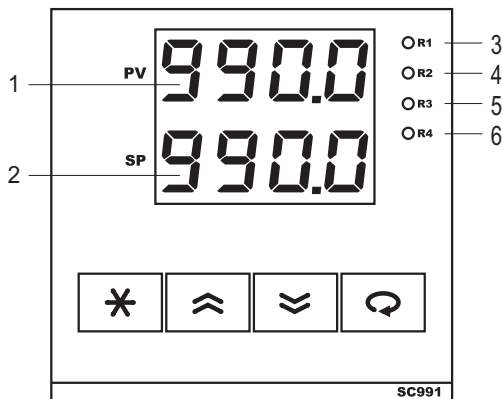
2 = -75...+75 mV Input
3 = -15...+15 V Input
4 = -20...+20 mA Input
5 = Thermocouple (B,E,J,K,L,N,R,S,T,U)

Note : When R1,R2 modules are coded as (3)
The R4 module must be coded as (0) none.

Relay output modules can be coded as contact or logic outputs in the product code, but only the term relay is used when talking about these outputs in this user manual.

| | | | |
|------------------------------------|--|--|---------------|
| Supply Voltage(PS) | 100-240Vac/dc : +%10 -%15 | 24Vac/dc : +%10 -%20 | |
| Power Consumption | 6W,10VA | | |
| Sensor Inputs (S1,S2,S3,S4) | Thermocouple : B,E,J,K,L,N,R,S,T,U | | |
| | Two Wire Transmitter : 4-20mA | | |
| | Resistance Thermometer : PT100 | | |
| | Current: 0/4-20mA | | |
| | Voltage : 0-50mV, 0/2-10V | | |
| Transmitter Supply (TX) | No | | |
| Analog Input Impedances | Thermocouple, mV : 10M Ω | | |
| | Current : 10 Ω | | |
| | Voltage : 1M Ω | | |
| Analog Output (O1) | Voltage : 0/4-20mA (RL \leq | Voltage : 0/2-10V (RL \geq 1M Ω) | |
| Relay Outputs (R1,R2,R3,R4) | Short : 250Vac, 5A | Logic Output: 24Vdc, 20mA | |
| Contact Life | Unladen : 10.000.000 switching | | |
| | 250V, 5A Resistive Load: 100,000 switching | | |
| Memory | 100 years, 100,000 renewals | | |
| Accuracy | +/- %0.2 | | |
| Sampling Time | 100ms | | |
| Ambient Temperature | Running : -10...+55C | Storage : -20...+65C | |
| Protection Class | Front Panel : | Body : | |
| Dimensions | Width : 96mm | Height: 96mm | Depth : 110mm |
| Panel Cut Dimensions | 92+/-0,5 mm x 92+/-0,5 mm | | |
| Weight | 430gr | | |

| Sensor Type | Standard | Temperature Range | |
|--------------------------------|----------|-------------------|------------|
| | | (°C) | (°F) |
| Type-B Thermocouple (Pt%18Rh- | IEC584-1 | 60, 1820 | 140, 3308 |
| Type-E Thermocouple(Cr-Const) | IEC584-1 | -200, 840 | -328, 1544 |
| Type-J Thermocouple (Fe-Const) | IEC584-1 | -200, 1120 | -328, 1562 |
| Type-K Thermocouple (NiCr-Ni) | IEC584-1 | -200, 1360 | -328, 2480 |
| Type-L Thermocouple (Fe-Const) | DIN43710 | -200, 900 | -328, 1652 |
| Type-N Thermocouple (Nicrosil- | IEC584-1 | -200, 1300 | -328, 2372 |
| Type-R Thermocouple(Pt%13Rh- | IEC584-1 | -40, 1760 | 104, 3200 |
| Type-S Thermocouple (Pt%10Rh- | IEC584-1 | -40, 1760 | 104, 3200 |
| Type-T Thermocouple (Cu-Const) | IEC584-1 | -200, 400 | -328, 752 |
| Type-U Thermocouple(Cu-Const) | DIN43710 | -200, 600 | -328, 1112 |



PROCESS-SCREEN:

When the device is energized, the measured process value or error message is displayed on the "PV" display, and the control set value is displayed on the "SP" display, after the program version is displayed on the gesterages for about 2 seconds. This screen is called the **Process-Screen**. This screen is used continuously during normal operation.

| | | |
|---|---------------------|--|
| 1 | PV INDICATOR | It shows the process value or error messages of the selected channel on the Process-Screen, and the parameter name on the other screens. |
| 2 | SP INDICATOR | It shows the Control Set Value of the selected channel on the Process-Screen, and the parameter value on the other screens. |
| 3 | R1 LED | "R1" It lights when the relay module is energized. |
| 4 | R2 LED | It lights when the "R2" Relay module is energized. |
| 5 | R3 LED | It lights when the "R3" Relay module is energized. |
| 6 | R4 LED | It lights when the "R4" Relay module is energized. |





DISPLAY OF ALPHABETIC CHARACTERS

| A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | b | C | d | E | F | G | H | I | J | K | L | M |
| n | o | P | q | r | s | t | U | u | y | r | y | z |

ERROR MESSAGES

| | |
|---------------|---|
| <i>Err. 1</i> | The sensor at Input "S1" cannot be detected. |
| ---- | A value too high to be displayed on the screen. |
| ---- | A value too low to be displayed on the screen. |

KEY FUNCTIONS

| | |
|--|---|
|  | A short press on the Process screen displays the sensor information, while on other screens, a short press returns the page, and when pressed for 2 seconds, it returns to the Process-Screen. |
|  | Used to change parameter option or values. |
|  | Used to change parameter option or values. |
|  | A short press on any screen will move to the next parameter. It is used to enter control set values when pressed while on the Process-Screen. Press and hold for 2 seconds to confirm the conditions that require confirmation. |

Sc994 Series devices are controllers designed for multi-purpose use. For this reason, they are devices with input/output modules suitable for all kinds of processes and can be used in accordance with all operating conditions. These devices can work with many different sensors and input signals, and each output can be used for a separate control. Therefore, before the SC994 device can be used, the input/output types and functions, control type and usage features should be set in the most appropriate way.

Depending on the order code, SC994 series devices can have 4 analog inputs, one analog output, one RS485 communication and four relay output modules. The types, functions and scales of these modules are determined by the parameters in the configuration page.

In addition, the basic parameters that determine the control type and operation of the device and the necessary settings for the control algorithm are also on the configuration page.

Before connecting an unconfigured device to your system, supply only the supply voltage and configure it according to the instructions below.

Entering the configuration page and setting the parameters:

- ◆ To enter the configuration page, press and hold both the “[*]” and “[◻]” keys together until the “[L2]” message appears on the “PV” indicator while the device is energized.
- ◆ While there is a “[L2]” message on the PV display, set the value in the “SP” display to the login password of the configuration page with the “[>]” and “[<]” keys (The factory setting of this password is “0”).
- ◆ If the password you entered is incorrect when you press the “[◻]” key, the Process-Screen is returned, and if it is correct, the first parameter on the configuration page is accessed.
- ◆ The name of the parameter appears on the “PV” display on the parameter screen, and the setting option of the parameter appears on the “SP” display.
- ◆ Now you can access the other configuration parameters in sequence by pressing the “[◻]” key.
- ◆ Use the “[>]” and “[<]” keys to change the setting option of the parameter, and the “[◻]” key to move to the next parameter. Pressing the “[*]” key for a short time will return to the beginning of the page, while pressing the “[*]” key for a long time will return to the Process-Screen.
- ◆ Figure-3 below is a graphical representation of these processes.

Note: Press the “[>]” ve “[<]” keys together to see the numbers of the parameters on the configuration page to move forward.

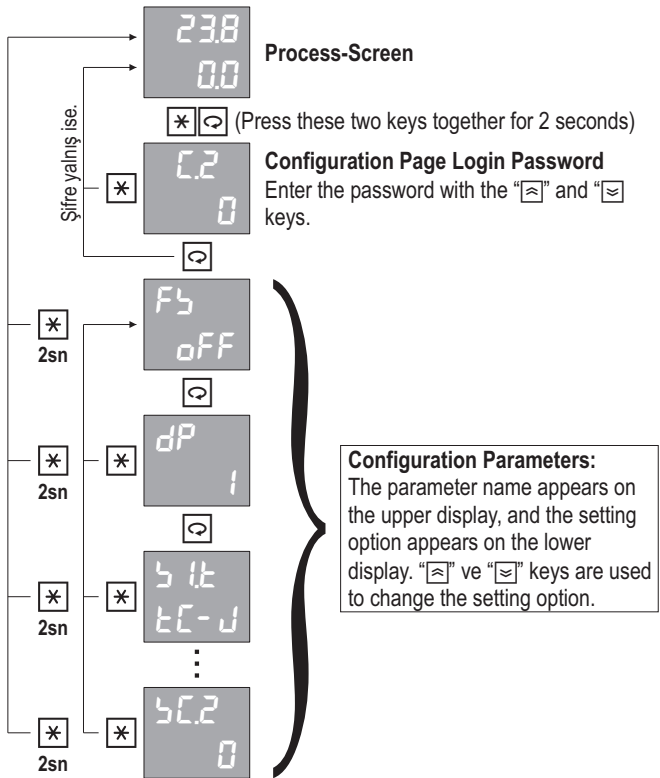





Figure-3


Detailed descriptions of the configuration page parameters are given in the next section.

Par. 01 —  To return to the factory settings, this parameter must be set to “00” and the “” key must be pressed for two seconds.
Setting Options : OFF, 00


Par. 02 —  It determines the decimal degree (number of digits after the dot) in the display of all parameters whose unit is “EU”.
Setting Range : 0 - 1


Warning: When this parameter is changed, all parameters with unit “EU” must be set again.


Note: “EU” is the temperature unit determined by the “HU” parameter for temperature measurements with a thermocouple or resistance thermometer. In other cases, it is the engineering unit of the variable being measured.


Par. 03 —  It determines the type of the sensor connected to the “S1” sensor input. This sensor is used for process value measurement.
Setting Options : Table-1

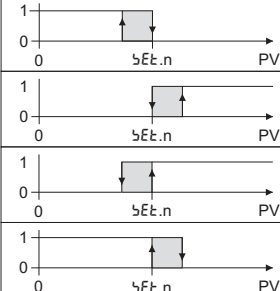
| Table-1 | No | Sensor Type |
|---------|----|--------------------------------------|
| EE-b | 0 | Type-B Thermocouple (Pt%18Rh-Pt) |
| EE-E | 1 | Type-E Thermocouple (Cr-Const) |
| EE-J | 2 | Type-J Thermocouple (Fe-Const) |
| EE-K | 3 | Type-K Thermocouple (NiCr-Ni) |
| EE-L | 4 | Type-L Thermocouple (Fe-Const) |
| EE-n | 5 | Type-N Thermocouple (Nicrosil-Nisil) |
| EE-r | 6 | Type-R Thermocouple (Pt%13Rh-Pt) |
| EE-S | 7 | Type-S Thermocouple (Pt%10Rh-Pt) |
| EE-t | 8 | Type-T Thermocouple (Cu-Const) |
| EE-U | 9 | Type-U Thermocouple (Cu-Const) |


Par. 04 —  It determines the type of the sensor connected to the “S2” sensor input. This sensor is used for process value measurement.
Setting Options : Table-1


Par. 05 —  It determines the type of sensor connected to the "S3" sensor input. This sensor is used for process value measurement.
Setting Options: Table-1


Par. 06 —  It determines the type of sensor connected to the "S4" sensor input. This sensor is used for process value measurement.
Setting Options: Table-1


Par. 07 —  It determines the function of "R1" Relay output module.
Setting Options: Table-2

| Table-2 | No | Relay Function | |
|---------|----|---------------------|--|
| OFF | 0 | No | |
| ULC | 1 | Upper limit Control | ALARMS  |
| LLC | 2 | Lower Limit Control | |
| ULA | 3 | Upper limit Alarm | |
| LLA | 4 | Lower Limit Alarm | |

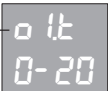
Par. 08 —  It determines the function of "R2" Relay output module.
Setting Options: Table-6

| | | |
|---------|--|---|
| Par. 09 |  | It determines the function of the "R3" relay output module. |
| | | <i>Setting Options: Table-6</i> |




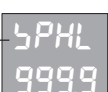


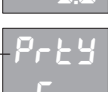

| | | |
|---------|---|---|
| Par. 10 |  | It determines the function of "R4" Relay output module. |
| | | <i>Setting Options: Table-6</i> |

| | | |
|---------|---|---|
| Par. 11 |  | It determines according to which input the analog output will work. |
| | | <i>Setting Options: Table-3</i> |

| Table-3 | No | Explanation |
|---------|----|--|
| oFF | 0 | Close |
| CH01 | 1 | The sensor works according to one (C1) |
| CH02 | 2 | The sensor works according to two (C2) |
| CH03 | 3 | It works according to sensor three (C3). |
| CH04 | 4 | The sensor works according to four (C4) |

| | | |
|---------|---|---|
| Par. 12 |  | (O1) It determines the type of analog output module |
| | | <i>Setting Options: Table-4</i> |

| Table-4 | No | Explanation |
|---------|----|-------------|
| 0-20 | 0 | 0...20 mA |
| 20-0 | 1 | 20...0 mA |
| 4-20 | 2 | 4...20 mA |
| 20-4 | 3 | 20...4 mA |
| 0-10 | 4 | 0...10 V |
| 10-0 | 5 | 10...0 V |
| 2-10 | 6 | 2-10 V |
| 10-2 | 7 | 10-2 V |

| | | |
|---------|--|---|
| Par. 13 |  | <p>(O1) It determines the lower limit scale of the analog output.</p> <p><i>Setting Range : -9999 - 9999</i> <i>Unit : EU</i></p> |
| Par. 14 |  | <p>(O2) It determines the upper limit scale of the analog output.</p> <p><i>Setting Range : -9999 - 9999</i> <i>Unit : EU</i></p> |
| Par. 15 |  | <p>It determines the lower limit of all set values.</p> <p><i>Setting Range : -999.9 - [bPHL]</i> <i>Unit : EU</i></p> |
| Par. 16 |  | <p>It determines the upper limit of all set values.</p> <p><i>Setting Range : [bPLL] - 999.9</i> <i>Unit : EU</i></p> |
| Par. 17 |  | <p>It determines serial communication address of the device. Connected to a serial communication line should be selected differently from each other.</p> <p><i>Setting Range : 0FF (Close), 1 - 255</i> <i>Unit : EU</i></p> |
| Par. 18 |  | <p>Specifies the serial communication speed.</p> <p><i>Setting Options : 9.6, 19.2, 38.4</i> <i>Unit : Kbps</i></p> |
| Par. 19 |  | <p>It determines the parity type in serial communication.</p> <p><i>Setting Options : nonE (None), odd (Odd), Eun (Double)</i></p> |
| Par. 20 |  | <p>Sets the login password of the configuration page.</p> <p><i>Setting Range : -9999 - 9999</i></p> |

In order to watch which channel will be displayed and other channel information on the process screen, by pressing the **[*]** key, the following parameters appear in order. To exit the menu here, it is enough to press and hold the **[*]** key for 2 seconds.

dSP
0.0

It determines which channel will display the process information on the process screen. It shows the process value on the upper screen, and the set value of that channel on the lower screen.

| Tablo-2 | No | Sensor Type |
|---------|----|------------------------|
| Ln 1 | 0 | S1 sensor information. |
| Ln 2 | 1 | S2 sensor information. |
| Ln 3 | 2 | S3 sensor information. |
| Ln 4 | 3 | S4 sensor information. |

Ln 1
0.0

Input S1 displays sensor information.

Ln 2
0.0



Input S2 displays sensor information.

Ln 3
0.0

Input S3 displays sensor information.

Ln 4
0.0

Input S4 displays sensor information.

When you press the  key while on the process screen, the following parameters appear. To exit the menu here, it is enough to press and hold the  key for 2 seconds.

| | |
|---------------------------------|---|
| SEt.1 0.0 | It determines the set value of "R1" Module. In order for this parameter to appear, "r 1F" parameter must be ALARM selected. |
| Setting Range : [5PLL] - [5PHL] | |
| Unit : EU | |

| | |
|---------------------------------|---|
| SEt.2 0.0 | It determines the set value of the "R2" Module. In order for this parameter to appear, "r 2F" parameter must be ALARM selected. |
| Setting Range : [5PLL] - [5PHL] | |
| Unit : EU | |

| | |
|---------------------------------|---|
| SEt.3 0.0 | It determines the set value of the "R3" Module. In order for this parameter to appear, "r 3F" parameter must be ALARM selected. |
| Setting Range : [5PLL] - [5PHL] | |
| Unit : EU | |

| | |
|---------------------------------|---|
| SEt.4 0.0 | It determines the set value of the "R4" Module. In order for this parameter to appear, "r 4F" parameter must be ALARM selected. |
| Setting Range : [5PLL] - [5PHL] | |
| Unit : EU | |

| | |
|-----------------------------|--|
| HY5.1 0.1 | It determines the hysteresis value of the "R1" Module. In order for this parameter to appear, "r 1F" parameter must be ALARM selected. |
| Setting Range : 0.1 - 100.0 | |
| Unit : EU | |

| | |
|-----------------------------|--|
| HY5.2 0.1 | It determines the hysteresis value of the "R2" Module. In order for this parameter to appear, "r 2F" parameter must be ALARM selected. |
| Setting Range : 0.1 - 100.0 | |
| Unit : EU | |

| | |
|-----------------------------|--|
| HY5.3 0.1 | It determines the hysteresis value of the "R3" Module. In order for this parameter to appear, "r 3F" parameter must be ALARM selected. |
| Setting Range : 0.1 - 100.0 | |
| Unit : EU | |

| | |
|-----------------------------|--|
| HY5.4 0.1 | It determines the hysteresis value of the "R4" Module. In order for this parameter to appear, "r 4F" parameter must be ALARM selected. |
| Setting Range : 0.1 - 100.0 | |
| Unit : EU | |

SC994 Model devices are designed to be able to establish serial communication in slave mode with the standard MODBUS RTU protocol. With this communication, all parameters and variables in the device can be accessed. These parameters can be read and set.

Serial communication is via Half-Duplex RS485 line. 32 devices can be connected on a line.

The cable used in the communication line must be a shielded data cable suitable for Half-Duplex RS485 communication and this cable is connected to all devices in parallel as a single line. There must be a suitable terminating resistor at the beginning and end of the line. The length of a line that is prepared properly and has sufficient 9600 bps communication can be extended up to 1000 meters.

Each of the devices on the serial communication line must be given a separate communication address between 1 and 255, but the communication speed and parity type of all devices on a line must be the same. The communication address, communication speed and parity type of these devices are determined by the "Addr", "Baud" and "PRTY" parameters in the configuration page.

Supported functions, parameter addresses and other information required for communication in the standard MODBUS RTU protocol are given in the tables below.

Supported Standard MODBUS RTU Functions:

Function 01 = Read Coils

Function 03 = Read Holding Registers

Function 05 = Write Single Coil

Function 06 = Write Single Register

Function 16 = Write Multiple Registers

BIT Type Parameters (COILS)

| Adres | Explanation (1 / 0) | Writing Perm. |
|-------|--------------------------------|---------------|
| 1 | ERR1 Error (Yes / No) | |
| 2 | ERR2 Error (Yes / No) | No |
| 3 | ERR3 Error (Yes / No) | No |
| 4 | ERR4 Error (Yes / No) | No |
| 5 | "R1" relay module (ON / OFF) | No |
| 6 | "R2" relay module (ON / OFF) | No |
| 7 | "R3" relay module (ON / OFF) | No |
| 8 | "R4" relay module (ON / OFF) | No |

REGISTER Type Parameters (REGISTERS)

| Adres | Explanation | Setting Range | | Factor | Unit | Writing Perm |
|-------|--|---------------|------|--------------------|------|--------------|
| 65 | Current decimal degree | 0 | 3 | 1 | | No |
| 10 | S1 input measured process value | -1999 | 9999 | 10 [^] DP | EU | No |
| 11 | S2 input measured process value | -1999 | 9999 | 10 [^] DP | EU | No |
| 12 | S3 input measured process value | -1999 | 9999 | 10 [^] DP | EU | No |
| 13 | S4 input measured process value | -1999 | 9999 | 10 [^] DP | EU | No |
| 20 | S1 input sensor type | 0 | 9 | 10 [^] DP | | Yes |
| 21 | S2 input sensor type | 0 | 9 | 10 [^] DP | | Yes |
| 22 | S3 input sensor type | 0 | 9 | 10 [^] DP | | Yes |
| 23 | S4 input sensor type | 0 | 9 | 10 [^] DP | | Yes |
| 61 | Relay 1 function | 0 | 4 | 10 [^] DP | | Yes |
| 62 | Relay 2 function | 0 | 4 | 10 [^] DP | | Yes |
| 63 | Relay 3 function | 0 | 4 | 10 [^] DP | | Yes |
| 64 | Relay 4 function | 0 | 4 | 10 [^] DP | | Yes |
| 73 | Lower limit of all set values | -1999 | 9999 | 10 [^] DP | EU | Yes |
| 74 | Upper limit of all set values | -1999 | 9999 | 10 [^] DP | EU | Yes |
| 92 | Relay 1 setpoint | -1999 | 9999 | 10 [^] DP | EU | Yes |
| 93 | Relay 2 setpoint | -1999 | 9999 | 10 [^] DP | EU | Yes |
| 94 | Relay 3 setpoint | -1999 | 9999 | 10 [^] DP | EU | Yes |
| 95 | Relay 4 setpoint | -1999 | 9999 | 10 [^] DP | EU | Yes |
| 75 | Relay 1 hysteresis value | 0 | 1000 | 10 [^] DP | EU | Yes |
| 76 | Relay 2 hysteresis value | 0 | 1000 | 10 [^] DP | EU | Yes |
| 77 | Relay 3 hysteresis value | 0 | 1000 | 10 [^] DP | EU | Yes |
| 78 | Relay 4 hysteresis value | 0 | 1000 | 10 [^] DP | EU | Yes |
| 70 | Serial communication address of the device | 1 | 255 | 10 [^] DP | | Yes |
| 71 | Serial communication speed | 0 | 2 | 10 [^] DP | | Yes |
| 72 | The parity type in serial communication. | 0 | 2 | 10 [^] DP | | Yes |

Before starting to use the device, be sure to do the following operations in order by making use of this user manual.

- Since you have selected the S1 parameter in accordance with the type of sensor you want to use (S1 Universal Sensor Input is in Table-1 on Page 15).
- Since you have specified the lower scale value of the data coming from the sensor connected to the S1 input for the application you want to make in the L1 parameter,
- Since you have specified the upper scale value of the data coming from the sensor connected to the S1 input for the application you want to make in the H1 parameter,
- Since you have selected the $\text{r1F}, \text{r2F}, \text{r3F}, \text{r4F}$ parameters according to the function you want to install on each relay, (The number of relay outputs is optional, it may differ. Relay Functions can be found in Table-6 on page 17 and page 18. takes.)
- Since you have selected the $\text{o1F}, \text{o2F}$ parameters according to the function you want to load to each output, (The number of analog outputs is optional, it may differ. Analog Output Functions are listed in Table-4 on Page 16.)
- Since $\text{o1k}, \text{o2k}$ parameter is selected in accordance with the current/voltage output type specified on the device label (The number of analog outputs is optional, it may differ. Analog Output Type is in Table-5 on Page 17.)
- Since you have specified the lower scale value you want the analog output module to output in the $\text{o1L}, \text{o2L}$ parameter (The number of analog outputs is optional, it may differ.)
- Since you have specified the upper scale value that you want the analog output module to output in the $\text{o1H}, \text{o2H}$ parameter (The number of analog outputs is optional, it may differ.)

To make PID Control:

- If you want to use a Relay Output Module, select the Relay function of the relay output you want to use for PID control, from the $\text{r1F}, \text{r2F}, \text{r3F}, \text{r4F}$ parameters, from the $\text{P1o}, \text{r1o}, \text{P2o}, \text{r2o}, \text{P3o}, \text{r3o}, \text{P4o}, \text{r4o}$ options in the Relay Function table. you choose the one that is suitable for the application you want to make,
- If you want to use an Analog Output Module, select the output module you want to use for PID control from the $\text{o1F}, \text{o2F}$ parameters, the one suitable for the application you want to make from the $\text{P1o}, \text{r1o}$ options in the Analog Output Function table,

You can use the following two methods to control PID with our device:

- It specifies the PID control output proportional band value (P_{PB}) in the positive direction, the PID control output proportional band value in the negative direction (n_{PB}), the integral time clock (I_{T}), the differential time constant (d_{T}), and the duration of a control cycle (C_{P}) parameters manually,
- By performing the Auto-Tune process, by enabling our device to automatically calculate the PID Control Parameters of the system to be used,

To start the Auto-Tune Process:

- Enter the temperature set value at which the Auto-Tune operation will be made into the R_{LSP} parameter. This value should come up to the middle of the full power of the process to be made.
- Enter the hysteresis value used during Auto-Tune to the R_{LSP} parameter. (This value adjusts the sensitivity of the Auto-Tune operation of the device.)
- Set the at parameter to on

When the device is on the main standby screen, it is sufficient to press and hold the " \square " key for 5 seconds. While the Auto-Tune operation is being performed, the phrase R_{LSP} lights up and goes off on the device display. This expression disappears from the screen when Auto-Tune is finished. Auto-Tune operation can be canceled by pressing " \square " button while Auto-Tune operation is in progress.

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