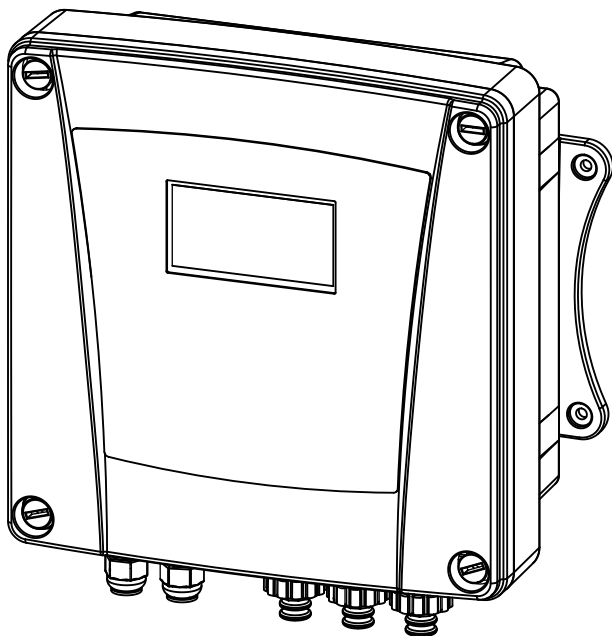


MEASURING AND CONTROL DEVICE USER MANUEL



1 INDEX

2	Introduction	5
2.1	Explanation of Safety Warnings	5
2.2	User Competence	6
3	Safety and Liability	7
3.1	General Safety Warnings	7
4	Description of Functions	8
4.1	Selectable Measurement Channel	8
4.2	Control Device Block Scheme	9
5	Assembly and Installation	10
5.1	Standard Package Contents	11
5.2	Mechanical Installation	11
5.2.1	Installation Hole Sizes	11
5.2.2	Wall Mounting	11
5.2.3	Panel Installation	12
5.2.4	Device Park Position	12
5.3	Electrical Installation	13
5.3.1	Motherboard Plan	14
5.3.2	Electrical Connection	14
5.3.3	Enabling Inductive Loads	15
5.3.4	Digital Inputs	17
6	Starting-up	18
6.1	Control Panel	19
6.1.1	General Device Outlook/Control Elements	19
6.1.2	Main display Components and Meanings	20
6.2	Usage	22
6.2.1	Starting Security Passwords	22
	Starting Security Passwords	22
6.2.2	Access to the Menu and Parameters	23
6.2.3	Programming Device Output Control Mode	24
6.3	Parameters	25

Introduction

6.3.1	Main Menu	25
7	User Menu	26
7.1	User Menu Access	26
7.1.1	Set Rly Out	27
7.1.2	Set An Out/Analog Output Settings	28
7.1.3	Date/Time	29
7.1.4	Language	29
7.1.5	Display	30
7.1.6	Alarm Limits	31
7.1.7	Log Limits	32
8	Calibration Menu	33
8.1	Calibration Menu Access	33
8.2	Cal.History/ Calibration History	34
8.3	Calibration Parameters Selection	34
8.3.1	Single Point and Dual Point Calibration	35
8.3.2	Automatic Calibration	35
8.3.3	Data Entry Calibration	35
8.3.4	Sample Calibration	35
8.4	New Calibration Process	36
8.4.1	Single Point Calibration Example for pH channel	36
8.4.2	Dual Point Calibration Example for pH channel	37
8.4.3	Automatic Calibration Example for pH channel	38
8.4.4	Data Entry Calibration Example for pH Channel	39
8.4.5	Sample Calibration Example for pH Channel	40
9	Installation Menu	41
9.1	Relay Out Mode Settings	41
9.1.1	Relay Output Run Mode/ Running Type Adjustment	42
9.1.2	Relay Output Function/ Function Type Adjustment	42
9.1.3	Device	52
9.1.4	Alarm Sens	53
9.1.5	InterRelay	54
9.1.6	CyclePrg	54

		Introduction
9.2	Analog Output Menu	55
9.3	Sensor Setup	63
9.4	Counter Settings	65
9.5	Communication Settings	66
9.5.1	Communication Configuration	66
9.5.2	Web Interface	70
9.6	Creating User Password	71
9.7	Factory Default	71
10	Maintenance	72
10.1	Control Device Fuse Change	72
11	Control Device Technical Specifications	73

Introduction

Figures

Figure 1 /Block Scheme	9
Figure 2 / 1010 Case Hole Sizes	11
Figure 3/1020 Case Hole Sizes	11
Figure 4/Wall Mount	11
Figure 5/Installation onto the panel	12
Figure 6/Opening Front Cover	12
Figure 7/Park Position	12
Figure 8/Motherboard Plan	14
Figure 9/Electrical Connection Scheme	14
Figure 10/90-260VAC Output Electrical Connection for Relay 1	15
Figure 11/Shutting-Down Process on Oscillogram	16
Figure 12/RC Protection Circuit for Relay Contacts	16
Figure 13/ IN1 Flow Sensor Connection	17
Figure 14/IN2-5 Connection of Digital Inputs	17
Figure 15/ General Screen Layout	19
Figure 16/ 1st Main display Page	20
Figure 17/ 2.Main display Page	20
Figure 18/ 3rd Main display Page	20
Figure 19/ F1 Button	21
Figure 20/ Time-Date Display	21
Figure 21/ F3 Button	21
Figure 22/ Alarm Display	21
Figure 23/ Menu Access	23
Figure 24/ F2,F3 Buttons	23
Figure 25/ F4 Button	23
Figure 26/ Calibration Display Example	23
Figure 27/ Output Mode Shortcut	24
Figure 28/ Menu Access	24
Figure 29/ Changing Relay Output Mode Example	25
Figure 30/ Main Menu	25
Figure 31/ User Menu	26
Figure 32/ User Menu Access	26
Figure 33/ Relay output Settings	27
Figure 34 / An Out Settings	28
Figure 35/ Date-Time Settings	29
Figure 36/ Setting Menu Language	29

Figure 37/ Display Settings.....	30
Figure 38/ Setting Alarm Limits	31
Figure 39/ Setting Log Limits.....	32
Figure 40/ Access to Calibration Menu.....	33
Figure 41/ Calibration History	34
Figure 42/ Calibration Parameters Selection	34
Figure 43/ Single Point Calibration Entry.....	36
Figure 44/ Dual Point Calibration Entry	37
Figure 45/ Automatic Calibration Entry	38
Figure 46/ Data Entry Calibration	39
Figure 47/ Sample Calibration	40
Figure 48/ P Control Graph	44
Figure 49/ PI Control Graph	44
Figure 50/ PID Control Graph.....	45
Figure 51/ Pre-Boost Control Graph.....	48
Figure 52/ Slave Relay Operational Graph.....	52
Figure 53/ Device Display.....	52
Figure 54/ Analog Linear Output Graph.....	56
Figure 55/ Analog Boosy Control Graph.....	57
Figure 56/ Analogue Reduce Control Graph	58
Figure 57/ Analog Limit Contact Graph	61
Figure 58/ Analog Pulse Output Graph.....	61
Figure 59/RS485-MODBUS RTU Slave	66
Figure 60/Ethernet-MODBUS TCO Slave	67
Figure 61/RS485-MODBUS RTU Master	67
Figure 62/RS485-Private Protocol.....	67
Figure 63/RS485-ASCII Printing.....	67
Figure 64/Internet-MODBUS TCP Slave/Internet Web Interface.....	67
Figure 65/LOGIN page	70
Figure 66/Status Page.....	70
Figure 67/Settings Page	70
Figure 68/Data Log Page	71
Figure 69/Password Page	71

2 Introduction

Please read the following information carefully and thoroughly. This information will help you benefit from the usage instructions best way possible.

These instructions define the technical features and functions of the device.

2.1 Explanation of Safety Warnings

These usage instructions provide information about technical features and functions of the device and detailed safety information.

Safety warnings and notes are categorized as below. Different, case-adapted pictograms are used here. These pictograms are only exemplary.



DANGER!

Type and source of danger

Consequence: Death or serious injury.

Necessary measures to eliminate the danger

Danger!

Defines a danger that causes a direct threat. Death or serious injury might occur if not prevented.



WARNING!

Type and source of danger

Possible Consequence: Death or serious injury.

Necessary measures to eliminate the danger

Warning!

Defines a possible dangerous situation. Death or serious injury might occur if not prevented.



WARNING!

Type and source of danger

Possible Consequence: Minor or trivial injuries, Material damage.

Necessary measures to eliminate the danger

Warning!

Defines a possible dangerous situation. Minor injuries might occur if not prevented. Can be used for material loss as well



NOTE!

Type and source of danger

Damage to the product or environment.

Necessary measures to eliminate the danger

Note!

Defines a possible detrimental situation. Products or surroundings can be damaged if not prevented.



CAUTION!

Usage hints and additional information

Source of information, additional measures

Caution!

Defines usage hints and other useful information. Not used for a dangerous or detrimental situation.

2.2 User Competence



WARNING!

Injury risk for incompetent personnel!

Manager/Operator of the facility/device is liable for conforming to competency.

Incompetent personnel working with the device or entering the device danger zone might result in serious injuries or material loss.

- All activities must be performed by competent personnel.
- Incompetent personnel must be kept out of danger zones.

Training	Definition
Informed Individual	An informed person is someone who is informed about the duties assigned to them, possible dangers of irregular activities, trained on necessary subjects and informed about necessary preventive systems and measures.
Trained User	Individuals who meet the needs of informed individuals and additionally trained at ENELSA Company or at another licensed marketing affiliate are defined as trained users.
Trained Expert	An individual who can evaluate the duties assigned to them and can foresee possible threats with their specialization training, knowledge and experience, as well as knowledge on related rules and regulations is defined as an expert. Long years of operation in related line of work can be taken into consideration for the evaluation of specialization training.
Expert Electrician	<p>An individual who can work in electricity facilities and who can foresee and prevent possible threats with their specialization training, knowledge and experience as well as knowledge on standards and regulations in power is defined as an expert electrician.</p> <p>Expert electricians are specially trained on their field of work and are knowledgeable about important standards and regulations.</p> <p>Expert electricians must implement legal provisions of regulations in power on prevention of accidents.</p>
Customer Services	Service technicians who go through certificated training and are authorized by ENELSA on facility works are called customer service.

3 Safety and Liability

3.1 General Safety Warnings



WARNING!

Electrified parts!

Possible Consequence: Death or serious injury

Unplug before opening the body.

Unplug damaged, broken devices to cut off power.



NOTE!

Usage

Damage to the product or the environment

The device is not equipped with an on/off button.

Device becomes operational when plugged into the grid.



WARNING!

Unauthorized Access!

Possible Consequence: Death or serious injury

Secure your device against unauthorized access.



WARNING!

Misuse!

Possible Consequence: Death or serious injury

Make sure your device is operated only by qualified and competent personnel.

The manager is liable for the competence of personnel.



WARNING!

Electronic Malfunction!

Possible Consequence: Material loss that could lead to the destruction of device.

Device should not be installed on faulty grid connection and data lines.

The manager is liable for taking necessary fault-correction precautions.



NOTE!

Suitable Usage

Damage to the product or the environment.

The device is designed to measure and control liquid flow.

Device can only be used according to the technical data and conditions specified in this operational manual and user manuals of individual components (sensors, dosing pumps, calibration tools etc.)



NOTE!

Trouble-free sensor function

Damage to the product or the environment.

Accurate measurement or dosing is possible only with flawlessly functioning sensors.

Sensors should be checked and calibrated regularly.



NOTE!

Trouble-free sensor function

Damage to the product or the environment.

Accurate measurement or dosing is possible only with flawlessly functioning sensors.

Operational manuals of sensors should be observed.

4 Description of Functions

Summarized Description of Device Functions:

Multiparameter measurement and control device is a measurement conversion and control device designed to continuously measure and control liquid analysis parameters, turning these into various output units.

Device is also used for water treatment processes in environmental technology and industry. One and two measurement-channeled models of the control device are available. Control device can function with conventional analogue sensors and actors.

Device is equipped to connect to digital sensors and actors over sensor/actor data bus.

Typical Applications

- Drinking water purification
- Sewage treatment
- Industrial and process water treatment
- Pool water circulation

Standard Hardware

- 22 selectable measurement variables and measurement channels.
- 4 programmable and 1 NO-NC (i.e. alarm) total 5 relay outputs including
- 2 digital input for dosing fluid level error sensing and pausing
- 1 digital input for liquid flow status error sensing and pausing
- 1 adjustable counter input for pausing or changing parameters
- 2 functionality languages
- Measurement value graph and list visible on device screen
- Membrane keypad
- Real time clock
- Retroactive measurement and error code registry memory

- Temperature compensation

Optional Hardware

- 4 programmable analogue output (depending on optional hardware)
- TCP IP
- Modbus RTU

4.1 Selectable Measurement Channel

- **Trained User:** See Chapter 2.2 “User Competence” page 7.

Selectable Channel Measurement can be carried out only if hardware control device has this feature.

Channel information can be accessed even if it is not available in the Hardware Control Device. Missing hardware can only be launched by the manufacturing company.

4.2 Control Device Block Scheme

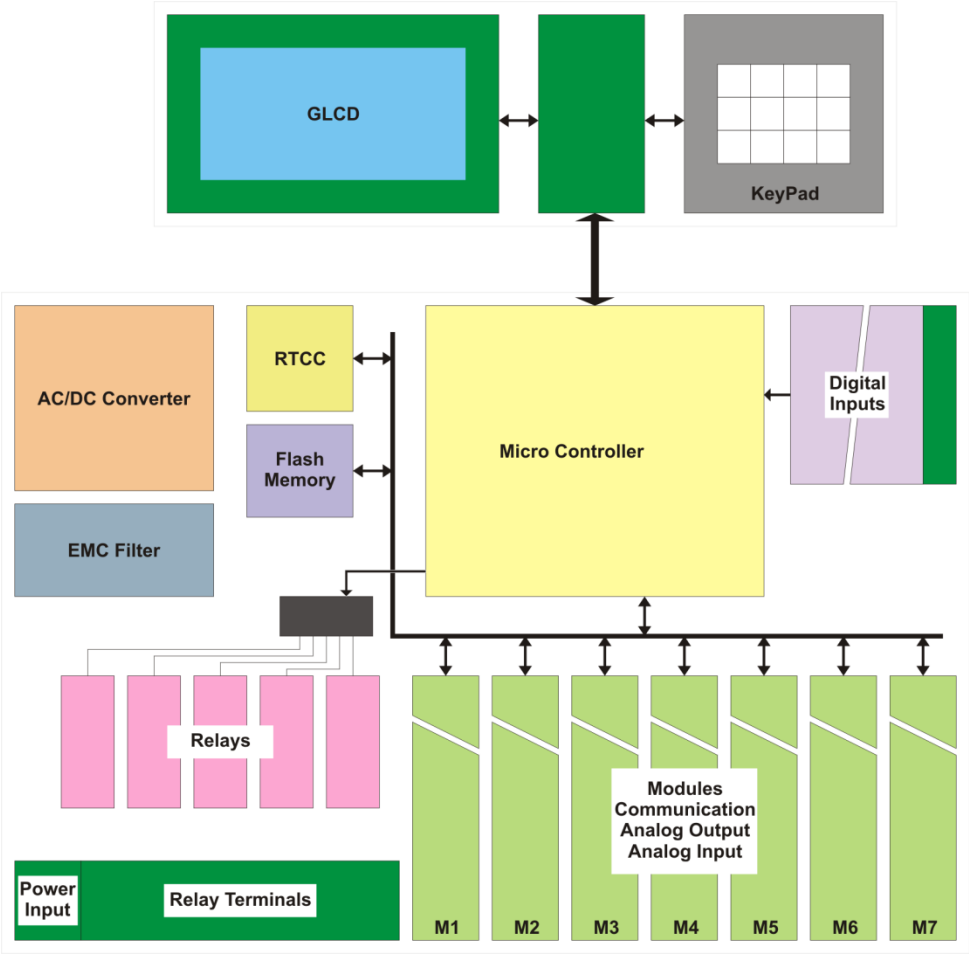


Figure 1 /Block Scheme

5 Assembly and Installation

- **User Competence, Mechanical Installation:** See Chapter 2.2 “User Competence” page 7.
- **User Competence, Electrical Installation:** See Chapter 2.2 “User Competence” page 7.



NOTE!

Assembly Site and Conditions

- Control Device provides IP67 protection and tightness standards providing that all gaskets and screws are installed appropriately.
- Electrical installation of Control device should follow the mechanical installation.
- A site providing easy access to the control panel should be preferred for usage.
- Control device should not be exposed to direct sunlight.
- Operation ambient temperature of Control Device: -20/+60 °C, %90 relative humidity (without condensation)
- Allowed operating ambient temperatures of connected sensors and actors should be observed.
- Control device is designed for indoor use only. Device should be protected from elements in a panel for outdoor use.



Reading and Controlling Position!

For easy read and control, Install and position your device at eye level in a well-ventilated area with normal ambient temperature.



Installing Position!

Control Device is standardly designed to be used with a wall mount.

Always mount your device with cable inputs facing down.

Leave free space for cable connections.

Assembly and Installation

5.1 Standard Package Contents

Control Device
Calibration Fluid*
User's Manual



Calibration Fluid!

Calibration fluid varies depending on model type of control device.

5.2 Mechanical Installation

- **User Competence, Mechanical Installation:** See Chapter 2.2 “User Competence” page 7.

5.2.1 Installation Hole Sizes

5.2.1.1 1010 Case

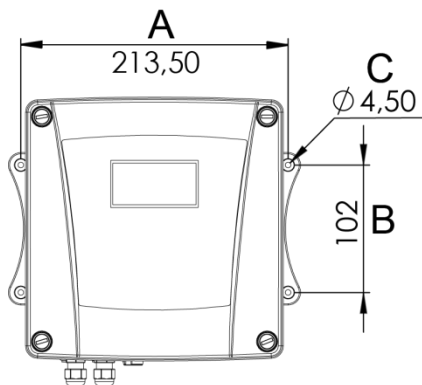


Figure 2 / 1010 Case Hole Sizes

- A. 213,5 mm
- B. 102 mm
- C. Ø 4,5 mm

5.2.1.2 1020 Case

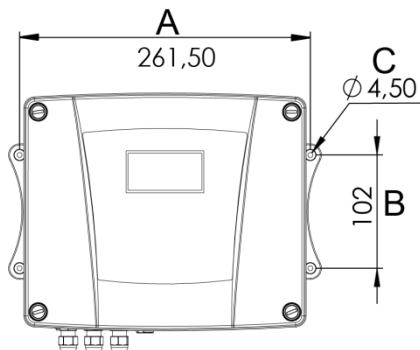


Figure 3/1020 Case Hole Sizes

- A. 261,5 mm
- B. 102 mm
- C. Ø 4,5 mm

5.2.2 Wall Mounting

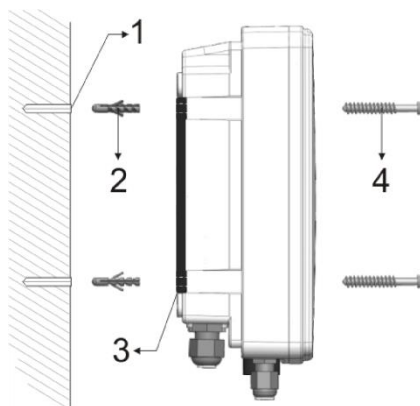


Figure 4/Wall Mount

- 1. Ø 8x50mm
- 2. 8mm Screw Anchor
- 3. Brackets
- 4. 4.2x50 Screw



NOTE!

Installation Area

Position your device with 110 mm clearance from all sides for a convenient use

1. Mark hole sizes on the installation surface.
2. Drill the holes (1).
3. Nail the screw anchor (2) into the holes.
4. Align the brackets (3) on the device with the holes.
5. Screw in and mount the device in place (4).

5.2.3 Panel Installation

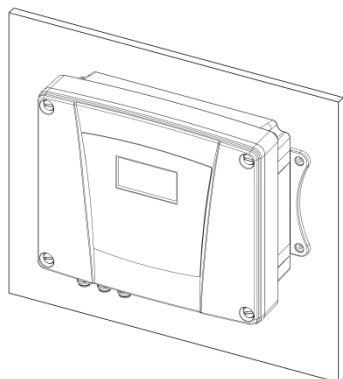


Figure 5/Installation onto the panel

1. Mark hole sizes on the installation surface.
2. Align the brackets on the device with marked spots.
3. Screw in and mount the device with 4,2x9,5 YSB lag screws.

5.2.4 Device Park Position



WARNING!

Connection to the control panel!

Possible Consequence: Material loss that could lead to the destruction of the device.

Pay attention not to fold the ribbon cable connecting control panel to the motherboard or jam it between motherboard and control panel.

- Open front cover of the device.

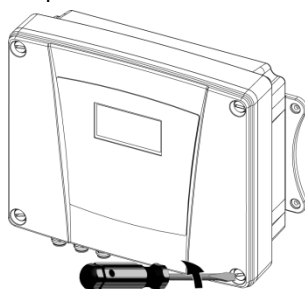


Figure 6/Opening Front Cover

- Remove front cover
- Place the cover on rails built for park position.

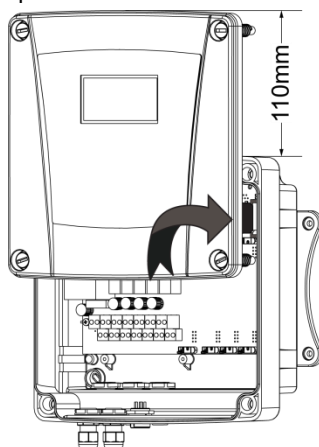


Figure 7/Park Position

5.3 Electrical Installation

- **User Competence, Electrical Installation:** See Chapter 2.2 “User Competence” page 7.



WARNING!

Electrified Parts!

Possible Consequence: Death or serious injury.

Unplug before opening the body.

Unplug damaged, broken devices to cut off power.



NOTE!

Damp Contact Points

Damp-proof electric socket, cable, and connection sockets with suitable design and technics. Damp contact points may damage the device.



Cable Channel!

Cables must be put in a cable tray in order to reduce tension.

5.3.1 Motherboard Plan

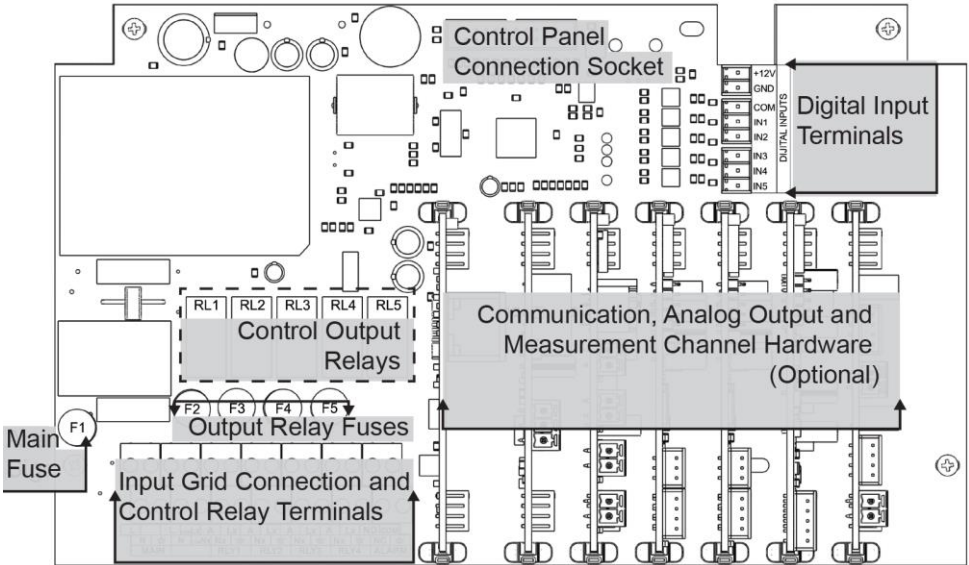


Figure 8/Motherboard Plan

5.3.2 Electrical Connection

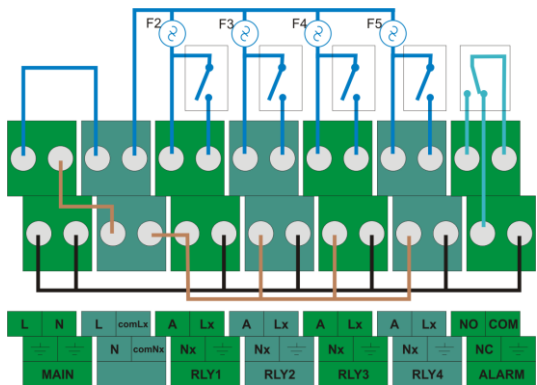


Figure 9/Electrical Connection Scheme

Control Device,

- Runs on 90-260 V, 50-60Hz AC / 12VDC current (depending on device type).
- **3A** max. fuse can be used for output
- **5A** max. load can be connected to the outputs.

Abbreviation	Meaning
L-Lx	Phase AC /+ DC
N-Nx	Neutral AC/-DC
⊥	Ground

Abbreviation	Meaning
NO	Normally open
NC	Normally closed
COM	Joint Relay Contact

Assembly and Installation

- There are 5 relay outputs, 4 programmable control and 1 NO-NC alarm, on Control Device.
- 5A max. load can be connected to the outputs.
- Electronic circuit and relay outputs are fuse-protected.
- Use 3A max. fuses for electronic circuit and 5A max. fuses for relay outputs. Terminal connection names are indicated in abbreviations on terminals and electronic board.
- While programmable control outputs yield 90-260 VAC output with fuse installed, alarm relay outputs depend on user preferences.

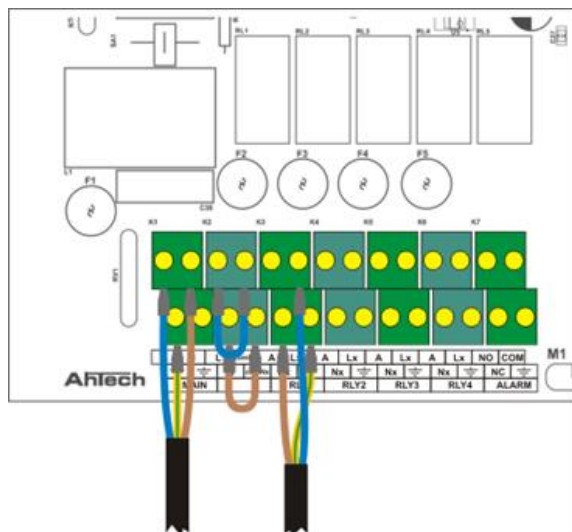


Figure 10/90-260VAC Output Electrical Connection for Relay 1

Given in Adjacent figure is the 90-260VAC output connection scheme for RL1 (Relay 1) with F2 fuse.

- L – comLx and N – comNx terminals are bridged.
- Supply cable of the device connected to RLY1 is connected as follows:

L(Phase) end to Lx end,
N(neutral) end to Nx end, and
E(Ground) end to \perp end

5.3.3 Enabling Inductive Loads



You must protect your device with a protective circuit when connecting an inductive load, that is, a client with a coil (like a motor-pump) to the device relay.

Consult to an expert electrician if you are uncertain.

Protective circuit with an RC element is simple but very effective circuit. This circuit is also called a “Snubber” or “Boucherot” element.

It is mainly used for the protection of circuit contacts.

Sequential current and condenser circuit creates a faded oscillation of current in shutting down process.

In starting-up process, voltage also performs a current limiting duty for charging-up of condenser.

RC element and protective circuit are also very suitable for alternating current.

R resistance of RC element is sized according to below formula:

$$R = U / I_L$$

(U = Voltage on load // I_L = Voltage current)

Size of condenser can be calculated via below formula:

$$C = k * I_L$$

$k = 0,1 \dots 2$ (depending on application).

Use only X2 class condenser

Units: R = Ohm; U = Volts; I_L = Amperes;

C = μF



If clients with a higher starting-up current (socket current power sources etc.) are added to the circuit, a limit for starting-up current should be set.

Shutting-down process can be confirmed and documented via an oscillogram. Terminal voltage of circuit contact is connected to the selected RC combination.

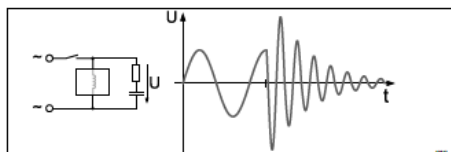


Figure 11/Shutting-Down Process on Oscillogram

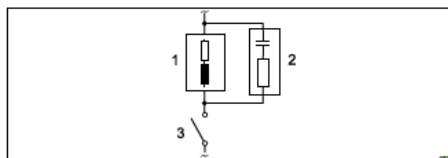


Figure 12/RC Protection Circuit for Relay Contacts.

Typical Alternating Current Applications with Inductive Loads:

- Load (motor-pump etc.)
 - RC Protection Circuit
- 230 V AC RC protection circuit example:

Condenser [0,22 μF /X2]

Resistance [100 Ohm / 1 W] (Metal oxide (with impulse resistance))

- Relay contacts (RLY1, RLY2, RLY3)

Assembly and Installation

5.3.4 Digital Inputs

5 digital inputs are placed on the device.

These are liquid level, flow, external alarm and counter inputs.

5.3.4.1 1. Flow Sensor

This is liquid flow control input. Alarm is active when flow stops.

If parameters are set, device can shut down requested output or outputs depending on alarm type.

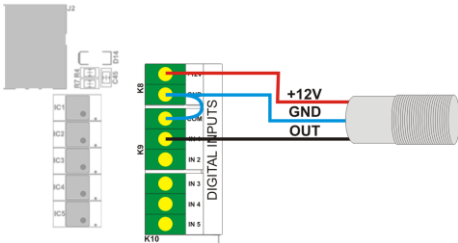


Figure 13/ IN1 Flow Sensor Connection

Example shows an Inductive Proximity Switch (PNP 12-24V DC Normally Open) connection.

Jumper cable GND end located on K8 terminal to COM end on K9 terminal as shown in the adjacent figure.

Connect flow sensor supply ends to + 12V and GND ends on K8 terminal and out end to IN1 input.

5.3.4.2 2. Tank1 Level Low

Chemical level control for channel 1. Alarm is active when liquid in tank is depleted.

If parameters are set, device shuts down requested output or outputs depending on alarm type.

5.3.4.3 3. Tank2 Level Low

Chemical level control for channel 2. Alarm is active when liquid in tank is depleted.

If parameters are set, device shuts down requested output or outputs depending on alarm type.

5.3.4.4 4. External Alarm

General purpose alarm control.

If parameters are set, device shuts down requested output or outputs depending on alarm type.

5.3.4.5 5. Counter

This input is reserved for counter inputs.

Counter input connected to the channel is assigned to several relays and yields outputs depending on set value configuration.

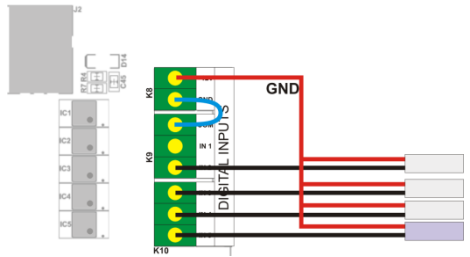


Figure 14/IN2-5 Connection of Digital Inputs

Jumper cable (additional cable) GND end located on K8 terminal to COM end on K9 terminal as shown in the adjacent figure.

Connect digital input supply ends to +12V end located on K8 terminal and out end IN2...IN5 input.

Counter input can only be connected to IN5.

6 Starting-up

- **User Competence:** See Chapter 2.2 "User Competence" page 7.

You have to integrate your control device to the measurement point after mechanical and electrical installation.



NOTE!

Trouble-free sensor function

Damage to the product or its surroundings.

Accurate measurement or dosing is possible only with flawlessly functioning sensors.

Sufficient amount of dosing fluid must be actively available for the sensors attached to the control device to perform. (For example 0,2ppm chlorine)

Sensors should be checked and calibrated regularly

Sensor operating manuals must be observed.

Operating a sensor might take a whole work day.

Starting-up Check-list

- Which process type is to be conducted?
- Which measuring range is available?
- What the process type will be? Transition, Batch or Circulation Process.
- On what mode should control device outputs be arranged? (Reduction control, Augmentation Control etc.)
- What are the measured parameters in the process?
- To which measurement parameters will control actor be connected? (dosing pump, valve, etc.)
- What should the ideal set values of controlled parameters be?

- What are the pressure and temperature values of measurement line in process?
- Will a time output be used in the process? How will the application be carried out?
- Will communication be used?
- Which communication protocol will be used?



NOTE!

Sensor Operation

Damage to the product or the environment

Flow rate and pressure values of measurement line must be adjusted according to technical data of sensors and sensor cases used.

Observe the use instructions of all auxiliary equipment (actors) used in the process.



Factory Settings

All changes you make on your control device might reset to factory settings.

You must have administrator password and authorization to access setup menu.

6.1 Control Panel

6.1.1 General Device Outlook/Control Elements

Control Device control panel consists of 128x64 Graphic LCD screen, alphanumeric membrane keypad, and 4 function buttons.

The line located on the lower part of the screen marked 2 on the figure indicates the functions of function buttons.

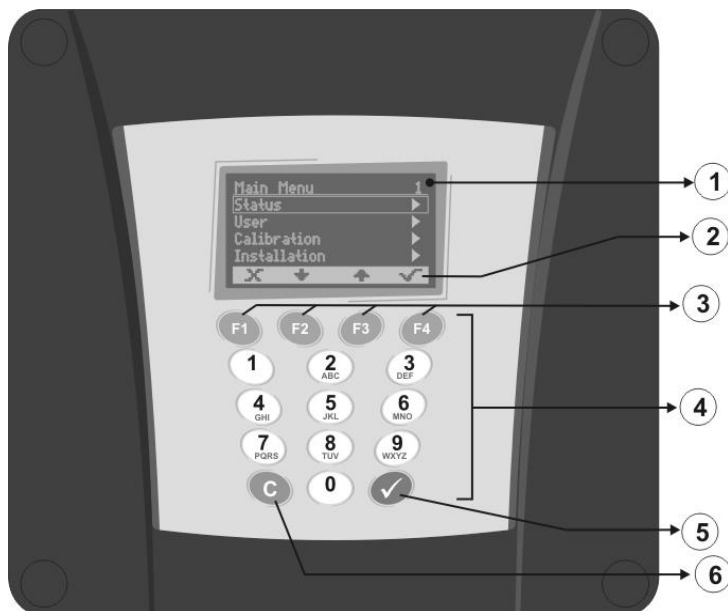


Figure 15/ General Screen Layout

1. Main display
2. Alphanumeric Keypad
3. Function Line
4. Enter(Approve) Button
5. Function Buttons
6. C (ESC/cancel) Button



Factory Setting

Control device's main display background light, contrast and volume is adjustable. See: Chapter 7.1.5 Display, Page 31

6.1.2 Main display Components and Meanings

Following figures show the main display displays of control device and their meanings. Pages (1), (2) and (3) can be shuffled through by pressing the  (F2) button.

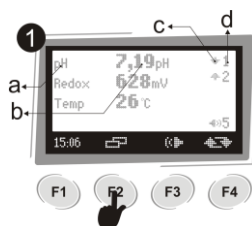


Figure 16/ 1st Main display Page

Channel name, values read in that channel, relays used and their functions are shown on page (1). See: Figure 16/ 1st Main display Page Figure 16



Figure 17/ 2nd Main display Page

Page (2) can be called relay status page. Channel name of the relay, set values, functions, operating status and quality is shown on that page. See: Figure 17/ 2nd Main display Page Figure 17.

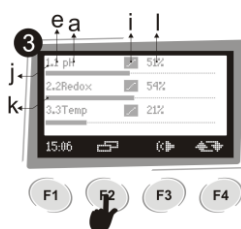


Figure 18/ 3rd Main display Page

Page (3) includes analog outputs information. This page is displayable only if analog outputs are active. Analog outputs for control device are functional. See: Figure 18/ 3rd Main display Page Figure 18.

- a. Channel Name
- b. Channel Read Values
- c. Relay Output Function
- d. Relay Number
- e. Channel Number
- f. Channel Set Values
- g. Relay Operating Status (Auto-on-off)
- h. Name of the chemical dosing pump assigned to the relay is pumping.
- i. Analog output number
- j. Analog output function
- k. Analog output operating status bar-graphic chart
- l. Analog output operating status in percentages (%)

Starting-up





Figure 19/ F1 Button

Time information is located on upper left corner of the main display. Press F1 button for time-date info display. See: Figure 19/F1 Button **Hata! Başvuru kaynağı bulunamadı.**




Figure 20/ Time-Date Display

You can return from Time-Date page to the previous one by pressing on  (F1) ,  (F4) or any button, See: Figure 20

The time-date page will automatically return to the previous screen if no button is pressed after being displayed on screen for 2 minutes.



Figure 21/ F3 Button

Alarm Status Page can easily be accessed by pressing  (F3) button on main display. See: Figure 21/F3 Button

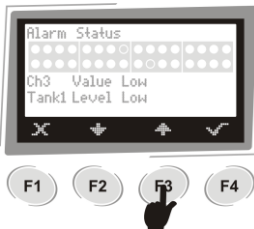





Figure 22/ Alarm Display

You can move Alarm status page with  ,  (F2, F3) buttons. Use  (F1) button to return to the main display. See: Figure 22/Alarm Display

Each circle symbolizes a possible alarm status parameter.

Full circles symbolize actualized alarm statuses.

6.2 Usage

- **User Competence:** See Chapter 2.2 “User Competence” page 7.

6.2.1 Starting Security Passwords



Starting Security Passwords

User Passwords are separated into three categories according to their authorization levels in order to prevent the use of control device by unauthorized individuals.

In order to reset passwords See: Chapter 9.6 “User Password Setup” Page 69

Authorization Level	Factory Settings
User	1111
Calibration	2222
Administrator	3333

6.2.2 Access to the Menu and Parameters

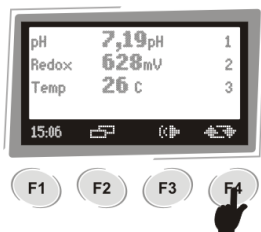



Figure 23/ Menu Access

Press  (F4) button on main display to access the menu and parameters. See: Figure 23/Menu Access

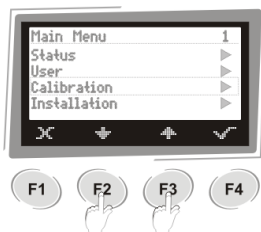




Figure 24/ F2,F3 Buttons

Use  ,  (F2, F3) buttons to shuffle through menus See: Figure 24/F2, F3 Buttons

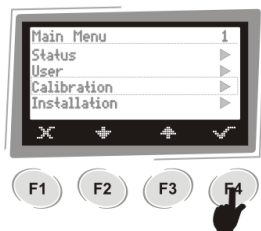


Figure 25/ F4 Button





Use  (F4) button to access sub menus and  (F1) button to access main display. See: Figure 25/ F4 Button



Figure 26/ Calibration Display Example

In the adjacent example is Calibration sub menu display. Use  (F4) button to access pH channel calibration parameters and  (F1) button to access main display. See: Figure 26/ Calibration Display Example

In all menu operations changes are made on active screen function line with related function buttons.

6.2.3 Programming Device Output Control Mode

There are 5 relay outputs and 3 operating types of these outputs on control device.

Operation Mode	Explanation
AUTO*	Relay output operates automatically according to set values
ON	Relay is always on.
OFF	Relay is always off.

i *Adjusting Set Values

In order to use the control device in AUTO mode, adjustment of set values suitable for the process must be done.
See: Chapter 7.1.1 Set Rly Out, Page 28

Relays from RL1 to RL5 are numbered corresponding to the numbers 1 to 5 on keypad.



Figure 28/ Menu Access

i *User Password

Only registered users are allowed to change device Relay type.

See: Chapter 6.2.1 Starting Security Passwords, Page 23

Choose user type on the opening screen using "←, →" (F2, F3) buttons, enter your password and approve with "✓" (F4) button.



Figure 27/ Output Mode Shortcut

A shortcut is designed to easily change relay output while on device main display.



Figure 29/ Changing Relay Output Mode Example

If entered password is correct, relay output type will change between AUTO-/ ON-/ OFF modes when you press [1] button successively.

Wait 2 seconds when desired operation type is on screen. Relay operation type screen will disappear.

6.3 Parameters

6.3.1 Main Menu

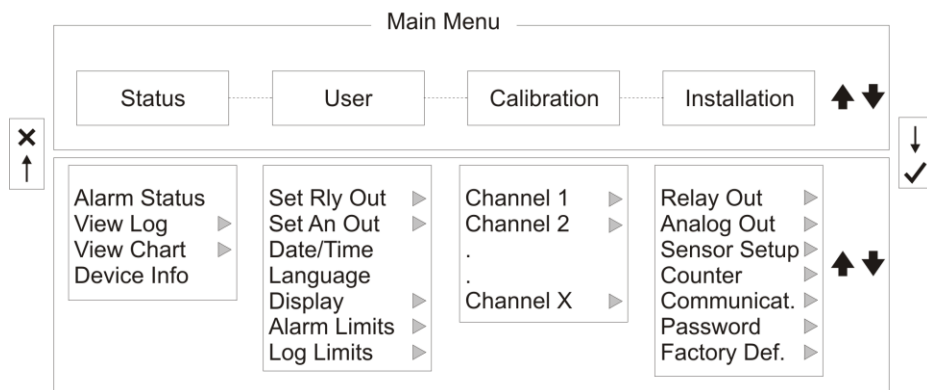


Figure 30/ Main Menu

Four main menu and sub menus control the control device. These menus are:

- Status
- User
- Calibration
- Installation

Access to these menus is authorization-categorized according to user needs.

This structure simplifies complicated and difficult user settings and highlights parameters that only require frequent adjustment, thus provides saving time.

7 User Menu

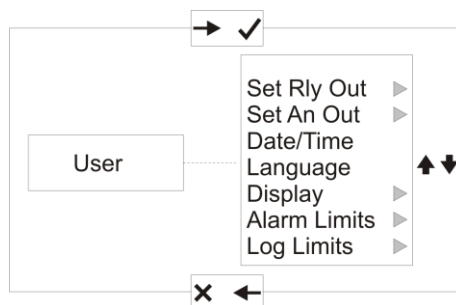


Figure 31/ User Menu

Parameters on User Menu include general usage settings of the device.

Parameters frequently needed by user (relay and analog output set points, date-time, menu language selection, display settings and alarm and graphic area limits) are located in this menu.

7.1 User Menu Access



*User Password

Only User or higher authorization level individuals can access to the menu. See: Chapter 6.2.1 Starting Security Passwords, Page 23

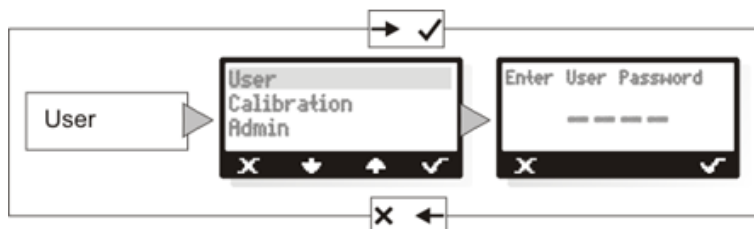







Figure 32/ User Menu Access

Press  (F4) Main Menu on the main display in order to access the main menu.

Using  ,  (F2, F3) buttons, highlight User Menu and press  (F4), enter your password level then your pre-generated password on the next screen and again press  (F4) button as shown above.

If entered password is correct, parameters of User Menu will be displayed on screen.

7.1.1 Set Rly Out

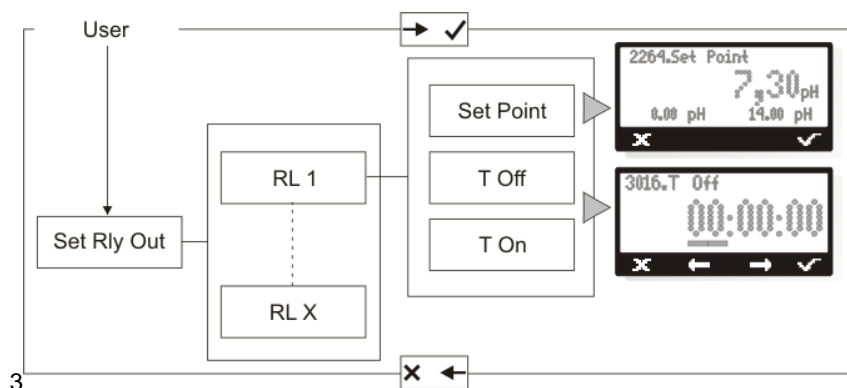


Figure 33/ Relay output Settings

Set points and on/off times of relays assigned to channels are displayed on Set Rly Out parameter. If output (for relay output settings **See: 7.1.1 “Set Rly Out, Page 28”**) is used as one of Periodic Reduce, Periodic Boost or Periodic Control, On or Off duration settings will be displayed.

In order to make changes in the parameters, highlight Set Rly Out parameter in User Menu using \leftarrow , \rightarrow (F2,F3) buttons, press \checkmark (F4) and highlight the relay whose parameters you want to change in the opening screen and press \checkmark (F4) button again.

In the opening screen, highlight one of “Set Point”, “T on” or “T off” parameters with \leftarrow , \rightarrow (F2,F3) buttons and open the window where you want to input parameters with \checkmark (F4) button.

Enter desired values by using keypad.

Press \checkmark (F4) button in order to save and return to previous screen or \times (F1) button to exit parameter without making any changes.

7.1.2 Set An Out/Analog Output Settings

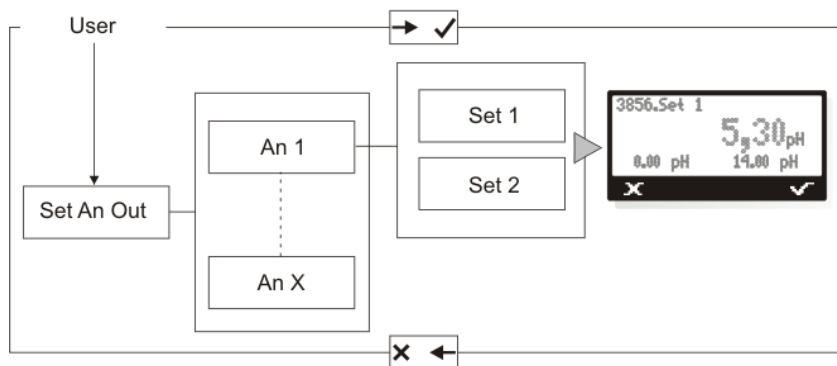


Figure 34 / An Out Settings

High and Low set points of analog outputs assigned to channels are adjusted on Set An Out/Analog Output Settings parameter. Device hardware must support analog output in order to use this parameter. *(For analog output settings See: **Chapter 7.1.2 “Set An Out, Page 29”**)*

In order to make changes in the parameters, highlight Set An Out parameter in User Menu using (F2,F3) buttons, press (F4) and highlight the analog output which parameters you want to change in the opening screen and press (F4) button again.

In the opening screen, highlight one of “Set 1”, “Set 2” parameters with (F2,F3) buttons and open the window where you want to input parameters with (F4) button. Enter desired values using keypad.

Press (F4) button in order to save and return to previous screen or (F1) button to exit parameter without making any changes.

User Menu

7.1.3 Date/Time

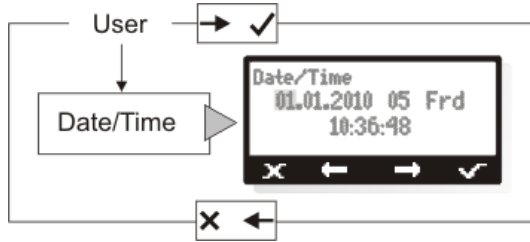


Figure 35/ Date-Time Settings

Date and time adjustments of the device are made on Date/Time parameter. Date/time information is required for logged history information, to use of timed programs and for the device to function properly.

In order to make changes in the parameters, highlight Date/Time parameter in User Menu using (F2, F3) buttons and open the window where you want to input values by pressing (F4) button.

In the opening screen, you can respectively set day, month, year, day of the week (1_Monday – 7_Sunday) information with keypad and (F2,F3) buttons.

Press (F4) button in order to save and return to previous screen or (F1) button to exit parameter without making any changes.

7.1.4 Language

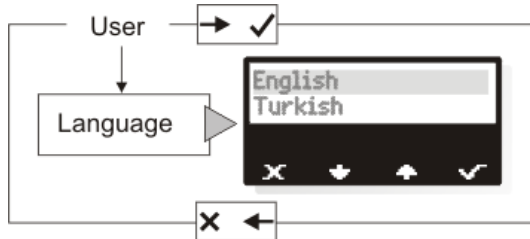


Figure 36/ Setting Menu Language

Language of the device is set on Language parameter. Menu can optionally be used in English or Turkish.

In order to make changes in the parameters, highlight Language parameter in User Menu using (F2,F3) buttons and open the selection window with (F4) button.

Make your selection in the opening screen using (F2, F3) buttons.

Press (F4) button in order to save and return to previous screen or (F1) button to exit parameter without making any changes.

7.1.5 Display

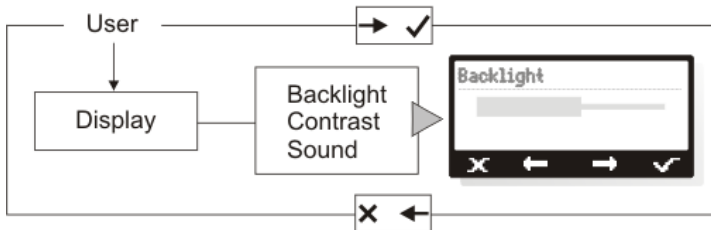


Figure 37/ Display Settings

Users adjust display and voice features of the device according to their preferences and the environmental conditions on Display parameter.

Screen backlight and contrast and volume can be adjusted.

In order to make changes in the parameters, highlight Display parameter in User Menu using (F2,F3) buttons and open the selection window with (F4) button.

Highlight the parameter you want to change using (F2, F3) buttons and approve selection with (F4) button.

In the opening screen, light, contrast and volume is shown in a bar graphic.

You can make adjustments using (F2, F3) buttons.

Press (F4) button in order to save and return to previous screen or (F1)button to exit parameter without making any changes.

7.1.6 Alarm Limits

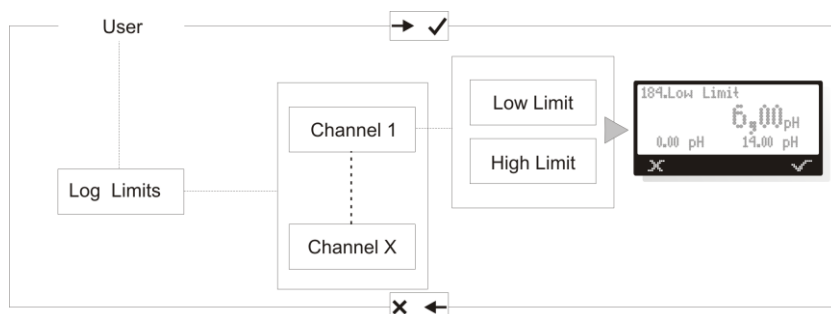


Figure 38/ Setting Alarm Limits

Limit values of alarm information of channels are adjusted on Alarm Limits parameter.

2 alarm limits -upper and lower limits- have been identified for each channel.

If data coming from channels are outside set limits alarm status is activated and these values can be observed on Alarm Status parameter in Status menu.

In order to set upper and lower limits of the channel, highlight Alarm Limits parameter in User Menu using \leftarrow , \rightarrow (F2,F3) buttons and press \checkmark (F4) button

In the opening screen highlight the channel you want to make changes using \uparrow , \downarrow (F2,F3) buttons and press \checkmark (F4) button.

In the opening screen, select one of "Low limit" and "High Limit" parameters using \leftarrow , \rightarrow (F2,F3) buttons and open the window you want to input value by pressing \checkmark (F4) button.

Enter desired values using keypad.

Press \checkmark (F4) button in order to save and return to previous screen or \times (F1) button to exit parameter without making any changes.

7.1.7 Log Limits

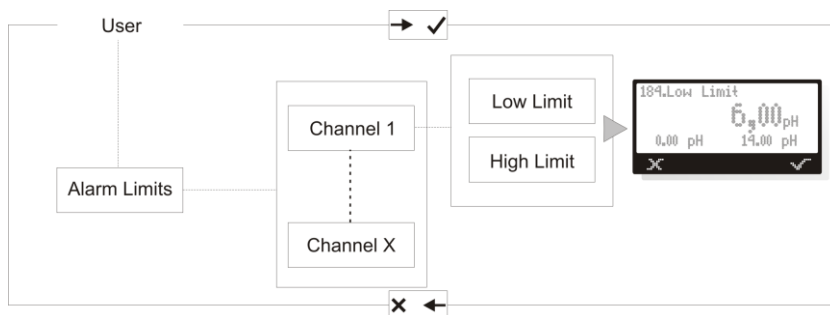


Figure 39/ Setting Log Limits

Upper and lower limits values of channel value graphics are adjusted on Log Limits parameter.

2 limits -upper and lower limits- have been identified for each channel graphic.

If data coming from channels are outside set limits graphic is displayed on screen.

These values can be observed on View Chart parameter in Status menu.

In order to set upper and lower limits of the channel, highlight Log Limits parameter in User Menu using \uparrow , \downarrow (F2,F3) buttons and press \checkmark (F4) button

In the opening screen highlight the channel you want to make changes using \uparrow , \downarrow (F2,F3) buttons and press \checkmark (F4) button.

In the opening screen, select one of "Low limit" and "High Limit" parameters using \uparrow , \downarrow (F2,F3) buttons and open the window you want to input value by pressing \checkmark (F4) button.

Enter desired values using keypad.

Press \checkmark (F4) button in order to save and return to previous screen or \times (F1) button to exit parameter without making any changes.

8 Calibration Menu

8.1 Calibration Menu Access

- **User Competence:** See Chapter 2.2 “User Competence” page 7.



User Password

Only Calibration or higher authorization level individuals can access to the menu.
See: Chapter 6.2.1 Starting Security Passwords, Page 23

Calibration menu access is subject to authorization and allows only authorized device users to make changes in parameters.

Press (F4) Main Menu on the main display in order to access the main menu.

Using , (F2, F3) buttons, highlight Calibration Menu and press (F4), enter your password level then your pre-generated password for calibration personnel on the next screen and again press (F4) button as shown below.

If entered password is correct, parameters of Calibration Menu will be displayed on screen.

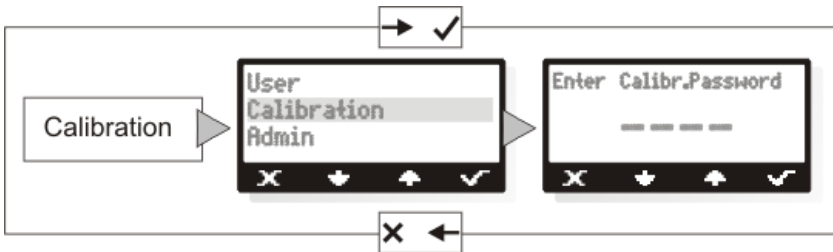


Figure 40/ Access to Calibration Menu

Calibration setting parameter and calibration data history can be accessed through Calibration Menu as well as new channel calibration data entry.

In order to access channel calibration parameters, highlight the channel where you want to make adjustments in Calibration Menu using , (F2, F3) buttons and press (F4) button.

In the opening screen highlight the parameter you want to change using , (F2,F3) buttons and press (F4) button.

In the opening screen, choose one of:

- **New Cal./New Calibration**
- **Cal.History/Calibration History** and
- **Parameters**

8.2 Cal.History/ Calibration History

Cal.History/ Calibration history holds last 3 calibration data.

As well as being used as data, this information allows use of an electrode without making another calibration with tampon fluids through **Data Entry** parameter if an electrode with known zero and span values is to be used in another control device.

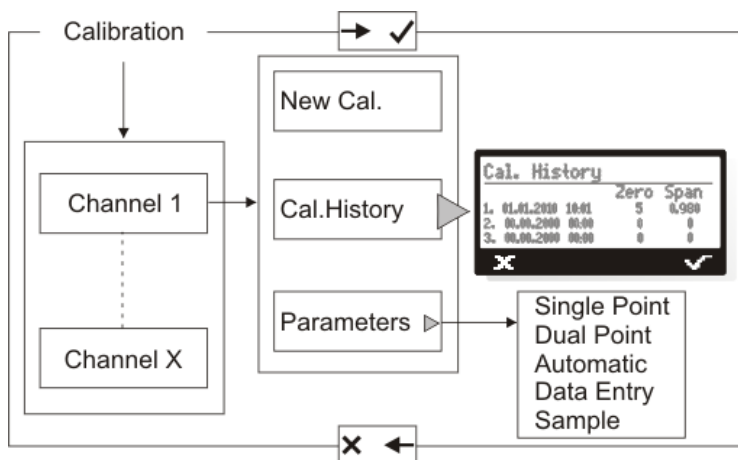


Figure 41/ Calibration History

8.3 Calibration Parameters Selection

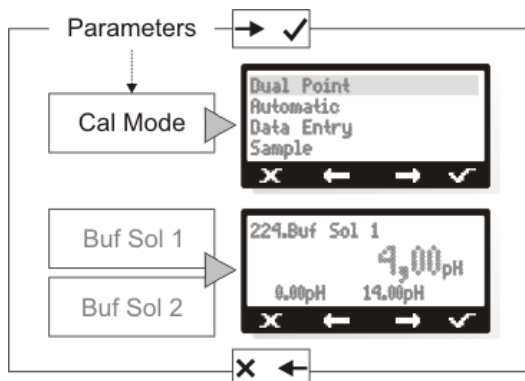










Figure 42/ Calibration Parameters Selection



Calibration Menu

Through **Parameters**, a sub menu is accessed where calibration mode of a channel and tampon fluid values suitably used for selected calibration mode can be adjusted.

In order to make changes in calibration mode or in used tampon fluid values, highlight your selection using  ,  (F2, F3) buttons in Calibration Menu and press  (F4) button.

In the opening screen highlight the channel you want to change using  ,  (F2,F3) buttons and press  (F4) button.

Enter desired values using  ,  (F2, F3) and keypad buttons.

Press  (F4) button in order to save and return to previous screen or  (F1) button to exit parameter without making any changes.

8.3.1 Single Point and Dual Point Calibration

Single Point and Dual Point calibration are the same in terms of usage.

However former is used when single point calibration is preferred.

Calibration is carried out using a determined tampon fluid.

Values of used tampon fluid are also adjusted through parameter menu.

8.3.2 Automatic Calibration

In Automatic calibration mode, device automatically senses tampon fluid values electrode is immersed and makes calibration through these values.

It is not different in quality than single point or dual point calibration, however provides flexibility in sorting used tampon fluids.

For example, three tampon fluid levels can be defined.

8.3.3 Data Entry Calibration



In Data Entry mode, an electrode with known zero and span values is calibrated without using tampon fluid. Transfer of an electrode to a different control device is simplified and time is saved with this mode.

8.3.4 Sample Calibration

In sample mode, calibration can be carried out with a sample fluid with known values instead of standard tampon fluid.

This mode is designed for situations where calibration cannot be carried out on the field due to unavailability of necessary equipment for calibration.

8.4 New Calibration Process

In order to make a new calibration, highlight the channel you want to adjust using  (F2, F3) buttons in Calibration Menu and press  (F4) button.

Calibration process menu suitable for selected calibration mode will be displayed on screen.

8.4.1 Single Point Calibration Example for pH channel

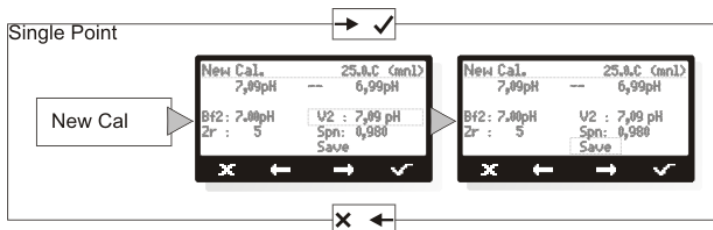
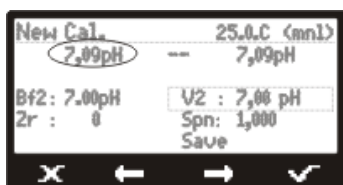

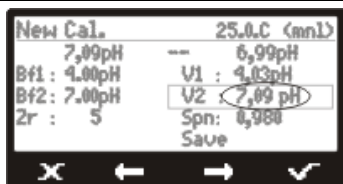


Figure 43/ Single Point Calibration Entry



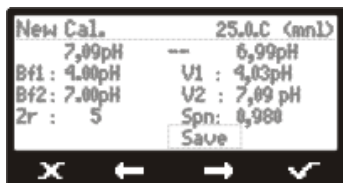
Step 1

Electrode is immersed in tampon solution indicated on Bf2 on screen. Circled area in adjacent figure shows electrode's value in tampon solution. Press  (F4) button after value stabilizes.





Step 2

As shown in adjacent figure, value read by electrode is assigned to V2 area and zero and span values are calculated according to read value.



Step 3

Activate save area by pressing (F3) button. Press  (F4) button in order to save Calibration and return to previous screen or  (F1) button in order to exit calibration without making any changes.



Channel selection for Single Point calibration example described above is **pH** and **Bf2 7.00pH**.

8.4.2 Dual Point Calibration Example for pH channel

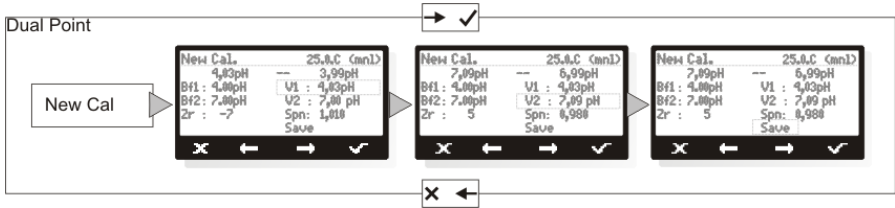
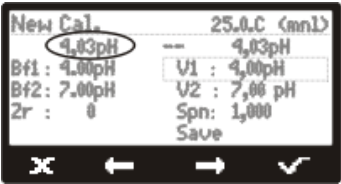
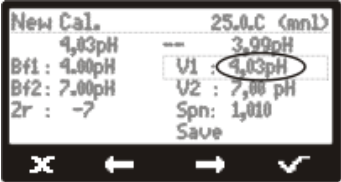


Figure 44/ Dual Point Calibration Entry



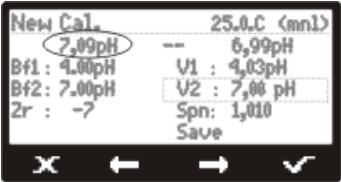
Step 1

Electrode is immersed in tampon solution indicated on Bf1 on screen. Circled area in adjacent figure shows electrode's value in tampon solution. Press (F4) button after value stabilizes.



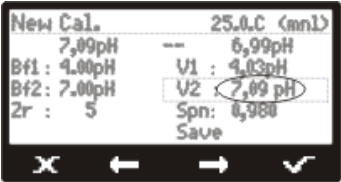
Step 2

As shown in adjacent figure, value read by electrode is assigned to V1 area and zero and span values are calculated according to read value.



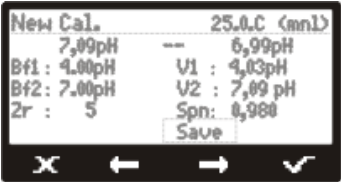
Step 3

➡ Activate V2 Area by pressing (F3) button. Take your electrode out of Bf1 tampon solution, clean and dry using fresh water. Immerse the electrode in pre-prepared Bf2 tampon solution. Press (F4) button after electrode value stabilizes.



Step 4

As shown in adjacent figure, value read by electrode is assigned to V2 area and zero and span values are calculated according to read value.



Step 5

➡ Activate save area by pressing (F3) button. Press (F4) button in order to save Calibration and return to previous screen or (F1) button in order to exit calibration without making any changes.



Channel selection for Dual Point calibration example described above is **pH** and bf1 **4.00pH** and **Bf2 7.00pH**.



For calibration mode and setting tampon fluids See: Chapter 8.3 "Calibration Parameters Selection, Page 35

8.4.3 Automatic Calibration Example for pH channel

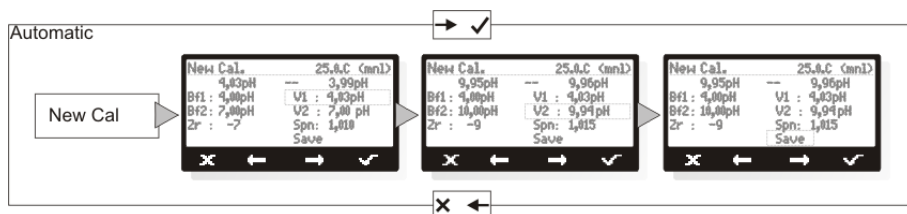


Figure 45/ Automatic Calibration Entry

In automatic calibration device compares tampon fluid value in which electrode is immersed during calibration to pre-defined tampon fluid values and automatically senses which fluid is used in which processes, carrying out activation through these values.

Complete the process following steps from 1 to 5 with tampon fluids selected for automatic calibration.

If tampon fluid value does not match Bf1 and Bf2 tampon fluid values, check to see whether used tampon fluid value is defined.

Channel selection in above example is pH and defined values are **4.00pH**, **7.00pH** and **10.00pH** for tampon fluids.

In the process, **4.00 pH for Bf1** and **10.00 pH for Bf2** tampon fluids are used. Because **7.00pH** is not used in calibration process, **Bf2** value is automatically changed to **10.00 pH** and process is completed according to this value.

8.4.4 Data Entry Calibration Example for pH Channel

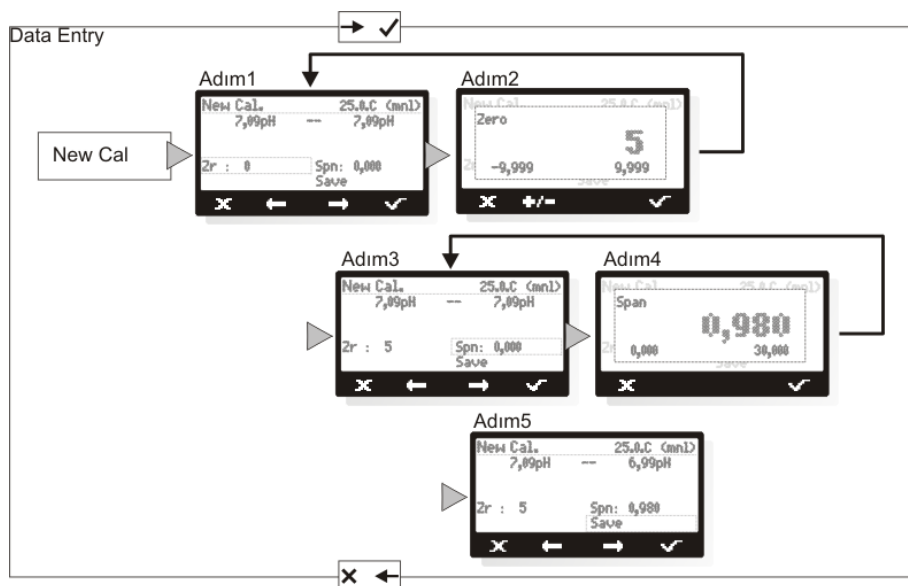


Figure 46/ Data Entry Calibration

In **Data Entry Calibration**, an electrode with known zero and span values is calibrated without using any tampon fluid. Data from the electrode is ignored during calibration. Follow above steps for calibration process.

Step 1: Press (F4) button to enter Zero value.

Step 2: Opening Screen is Zero value entry screen. Enter defined Zero value of your electrode using keypad and (F2) button. Then press (F4) button.

Step 3: Press (F4) button to enter Span value.

Step 4: Opening Screen is Span value entry screen. Enter defined Zero value of your electrode using keypad and press (F4) button.

Step 5: Press (F3) button in order to approve entered Zero and Span values and complete calibration. Then highlight Save and press (F4) button.

Press (F1) button in order to exit calibration without making any changes.

8.4.5 Sample Calibration Example for pH Channel

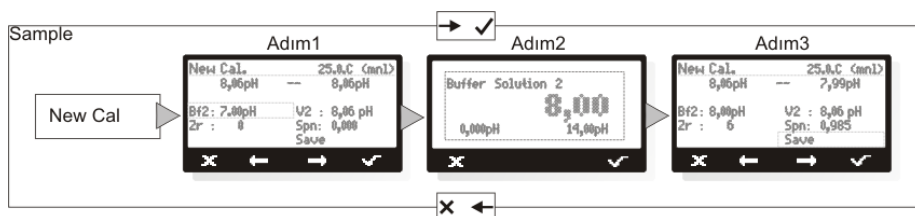


Figure 47/ Sample Calibration

In **Sample** calibration, calibration is carried out with a sample fluid with known value instead of standard tampon fluid.

Immerse your electrode in sample fluid with known defined value. Follow steps given in above figure for calibration process.

Step 1: Press (F4) button to enter sample fluid.

Step 2: Opening Screen is Sample fluid entry screen. Enter sample fluid value using keypad and press (F4) button.

Step 3: Fluid value you enter is assigned to Bf2 and V2 area matches with value electrode reads. Device also calculates Zero and Span values depending on entered sample fluid value.

Step 4: Press (F3) button in order to approve process and complete calibration, highlight Save and press (F4) button.

Press (F1) button in order to exit calibration without making any changes.

9 Installation Menu

- **User Competence:** See Chapter 2.2 “User Competence” page 7.



User Password

Only Administrator or higher authorization level individuals can access to the menu.
See: Chapter 6.2.1 Starting Security Passwords, Page 23

Installation Menu is where all configuration settings of the device are located. Relay Output, Analog Output, Sensor, Counter, Communication and Password adjustments are made here.

9.1 Relay Out Mode Settings

General Menu Outlook

RL 1 RL 2 RL 3 RL 4 RL 5	Run Mode	Auto: Relay operates automatically according to selected function and set values. On : Relay is always on Off : Relay is always off.
	Function	No Function Boost Control Reduce Control PID Boost Control PID Reduce Control Periodic Boost Periodic Reduce PreBoost Control (Biocide) PreReduce Control (Biocide) Proportional Control Counter Periodic Control Slave Relay Boost Feeder Slave Shaker Alarm
	Device	Acid Pump Base Pump Chlorine Pump Amine Pump Peroxide Pump Biocide Pump Solenoid Valve Electro Valve Reserved
	Alarm Sensor	

InterRelay	0 - 60sec	
CyclePrg	Prg 1 Prg 2	Cycle Range Current Week Cycle Week Day Time Duration

9.1.1 Relay Output Run Mode/ Running Type Adjustment

Defines running types of relays.

If Device is asked to control automatically according to measured parameter, relay assigned to the channel must be on **Auto** mode.

In **Auto** mode, Relay makes automatic control according to selected function and set values.

If preferred, relay can be switched to always on (**On**) or always off (**Off**).

- **Auto** : Relay operates automatically according to selected function and set values.
- **On** : Relay is always on.
- **Off** : Relay is always off.



In order to adjust Set value of channel See: Chapter 7.1.1 "Set Rly Out", Page 28

9.1.2 Relay Output Function/ Function Type Adjustment

This is the sub menu where control function of measured channel is selected.

9.1.2.1 No Function

Shows that relay is not assigned to any channel or with any function.

If preferred, a relay with no assigned function can be switched to always on (**On**) or always off (**Off**) (only through installation menu).

9.1.2.2 Boost Control

In this function, when the relay is under the set value, it opens the pump or solenoid and works continuously until the value is higher than set value.

When periodic boost control function is activated for the channel connected to the relevant relay, below mentioned periodic boost settings are necessary.

Boost Control/Settings

- **Source Ch**

Channel to be connected to the relay where boost control to be is done, is selected.

- **Set Point/Set Point**

Set value is entered. Yields out until relay is at this value.

- **Set Offset/Set Offset**

OfSet value is entered. If selected different than 0, relay yields out until relay is above (**Set + Offset**) value. When it is higher than it, and waits until it is under **Set-Offset** value.

- **Relay Sens**

Used in cases where relay(s) defined in this parameter is required to be waited just before the relay is switched on.

Controls the operational status of the relays sensitivity of which is switched on, and waits if they are operating. Switched on when the relay sensitivity of which is opened, is switched off.

- **Rly Delay**

Relay delay time is entered. If the value selected is different than 0, waits until this value before relay is switched on.

9.1.2.3 Reduce Control

In this function, if the relay goes above the set value, it opens the pump or solenoid and runs until the value falls below the set value.

When the drop control function is activated for the channel connected to the corresponding relay, the following upgrade control settings must be made.

Reduce Control/Settings

- **Source Ch**

Channel to be connected to reduce controlled relay.

- **Set Point**

Set value is entered. Relay yield out until reduced less than this value.

- **Set Offset/Set Offset**

OfSet value is entered. If selected different than 0, relay yields out until relay is under (Set + Offset) value. When it is lower than it, and waits until it is above Set-Offset value.

- **Relay Sens**

Used in cases where relay(s) defined in this parameter is required to be waited just before the relay is switched on.

Controls the operational status of the relays sensitivity of which is switched on, and waits if they are operating. Switched on when the relay sensitivity of which is opened, is switched off.

- **Rly Delay**

Relay delay time is entered. If the value selected is different than 0, waits until this value before relay is switched on.

9.1.2.4 PID Boost Control

PID (Proportional-Integral-Derivative) boost control.

To allow the system operate as desired, PID parameters is required to be adjusted.

The main purpose of using the PID control parameters is to reduce the error between the set point and the measurement and to reach the desired value (controlled variable).

A closed loop system is required for PID control. P, I, D parameters are adjusted to the set value of the controlled variable; at minimum time and over the minimum and maximum peak values (overshoot and undershoot).

Here, the parameters called P, I and D are the initials of the (P) roportional, (I), and (D) erivative.

P, in other words, the proportional band parameter is the inverse proportion to the amount of gain of the control mechanism within the control device.

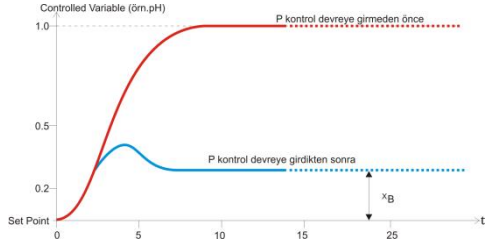
As explained $PB\% = 1/K \times 100$ equalization, K (gain) of a device whose proportional band is adjusted to 20% is 5. Since the gain will be very large when the proportional band is set too low, the processes controlled by this device will be unstable and the oscillation will be increasing in the quantity plus and minus.

When Integral and Derivative parameters are not relevant, it is possible to reach the balance only when the controls are made with P type control devices.

However, in such control systems where only P is active, even if it is low, value controlled with set value (measurement value) difference is different than zero + or - value, and it is possible to make it zero and this value is

named as standard deviation ($\%B$) in automatic control terminology.

P Control

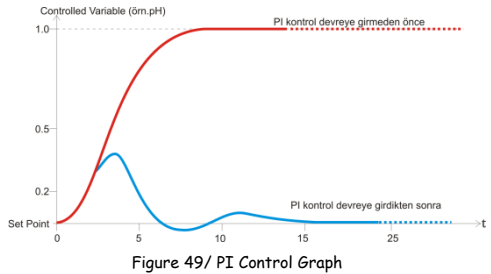


The addition of I (integral effect) to such a system controlled only by P is intended to remove the standard deviation.

In other words, it is not the case that a standard controlled by a P + I controller will produce a standard deviation after seating under normal conditions.

Together with this, short time for integral period (I) may cause the process enter ocillation.

PI Control



Adding Derivative effect to P+I control mechanism helps shortening the time passing to reach the set value.

PID Control

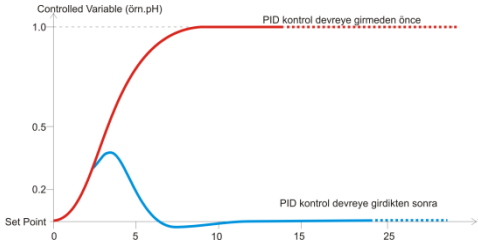


Figure 50/ PID Control Graph

Adjusting PID Parameters

The PID adjustment methods are the same for all processes, and the P, I, D values that will occur for each process will naturally be different, as the settlement time required, reaction time and optimum values of the upper and lower oscillations naturally vary from one process to another.

In other words, P, I, D parameters adjusted for any temperature process, may not be suitable for a pressure process.

The PID parameters are the values that are required to be set for optimum control during the first start-up, the effects of which, after the first starting, the measurement value set value is caught; either the set value is changed in accordance with the required minus or plus, or there is sudden effects due to processes in the parameter being controlled.

PID Boost Control Settings

- **Source Ch**

Channel to be connected to the relay where boost control to be is done, is selected.

- **Set Point/Set Point**

Set value is entered. Yields out using PID parameters until Relay gets to this value. .

- **Set Offset/Set Offset**

Offset value is entered. If selected different than 0, relay yields out until relay is above (**Set + Offset**) value. When it is higher than it, and waits until it is under **Set-Offset** value.

- **Kp**

It is the modulating gain. Any value can be entered between 0.00 and 100.00.

- **Ti (sec)**

Indicates integral time. To conclude into the calculation, should be given a value different than 0. Any value possible between 0 and 9.999.

- **Td (sec)/Td (sn)**

Indicates derivative time. To conclude into the calculation, should be given a value different than 0. Any value possible between 0 and 9.999.

- **Cont.Per(sec)**

Indicates sampling time. To conclude into the calculation, should be given a value different than 0. Any value possible between 0 and 9.999.

9.1.2.5 PID Reduce Control

PID (Proportional-Integral-Derivative) Reduce Control. To allow the system operate as desired, PID parameters is required to be adjusted.

PID Reduce Control Settings

- **Source Ch**

Channel to be connected to the relay where PID Reduce Control is applied.

- **Set Point**

Set value is entered. Yields out using PID parameters until Relay gets to this value.

- **Set Offset**

Offset value is entered. If selected different than 0, relay yields out until reduced less than (Set + Offset) value. When it is lower than it, and waits until it is above Set-Offset value.

- **Kp**

It is the modulating gain. Any value can be entered between 0.00 and 100.00.

- **Ti (sec)**

Indicates integral time. To conclude into the calculation, should be given a value different than 0. Any value possible between 0 and 9.999.

- **Td (sec)**

Indicates derivative time. To conclude into the calculation, should be given a value different than 0. Any value possible between 0 and 9.999.

- **Cont.Per(sec)**

Indicates sampling time. To conclude into the calculation, should be given a value different than 0. Any value possible between 0 and 9.999.

9.1.2.6 Periodic Boost

In this function, when the relay is above the set value, it yields out **T on** time and waits **T off** time.

When under the set value, opens the pump or solenoid and works continuously until the value is higher than set value.

When periodic boost control function is activated for the channel connected to the relevant relay, below mentioned periodic boost settings are necessary.

Periodic Boost/ Settings

- **Source Ch**

Channel to be connected to the relay where periodic boost control is done, is selected.

- **Set Offset**

Offset value is entered. If selected different than 0, relay yields out until boosted higher than (Set + Offset) value. When it is higher than it, works as T on and waits as T off, then again keeps continuing until it is above Set-Offset value.

- **T Off**

Above the set value, the time when outlet is off.

- **T On**

Above the set value, the time when the outlet is on.

- **Relay Sens**

Used in cases where relay(s) defined in this parameter is required to be waited just before the relay is switched on.

Controls the operational status of the relays sensitivity of which is switched on, and waits if they are operating. Switched on when the relay sensitivity of which is opened, is switched off.

- **Rly Delay**

Relay delay time is entered. If the value selected is different than 0, waits until this value before relay is switched on.

9.1.2.7 Periodic Reduce

In this function, when the relay is under the set value, it yields out **T on** time and waits **T off** time.

When above the set value, opens the pump or solenoid and works continuously until the value is lower than set value.

When periodic reduce control function is activated for the channel connected to the relevant relay, below mentioned periodic reduce settings are necessary.

Periodic Reduce/ Settings

- **Source Ch**

Channel to be connected to the relay where periodic reduce control is done, is selected.

- **Set Offset**

OfSet value is entered. If selected different than 0, relay yields out until drops less than (Set + Offset) value. When it is less than it, works as T on and waits as T off, then again keeps continuing until it is above Set-Offset value.

- **T Off**

Under the set value, the time when outlet is off.

- **T On**

Under the set value, the time when the outlet is on.

- **Relay Sens**

Used in cases where relay(s) defined in this parameter is required to be waited just before the relay is switched on.

Controls the operational status of the relays sensitivity of which is switched on, and waits if they are operating. Switched on when the relay sensitivity of which is opened, is switched off.

- **Rly Delay**

Relay delay time is entered. If the value selected is different than 0, waits until this value before relay is switched on.

9.1.2.8 PreBoost Control

Biocide dosing time control is done according to the program set as 1 day or 1 week (1-4 weeks) consisting of 10 different programs.

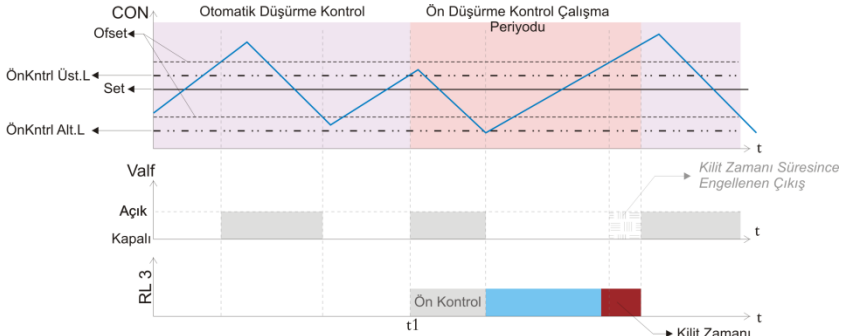


Figure 51/ Pre-Boost Control Graph

In the above example, the channel conductivity to be pre-inspected, the biocide to be dosed relay RL 3, and the output function is selected as Pre-Reduce Control. In accordance with the period program, the conductivity biocide program commences at t1. Conductivity value measured at time t1 Preliminary Control Upper Limit value is outside the specified level, so the conductivity value measured by opening the valve is bluffed until the value of Preliminary Control Lower Limit is reached.

After the PreControl process, valve is closed and during a period stated in period program, biocide dosing is performed. After biocide dosing, for a period stated in lock time, valve is held closed and blowdown is prevented.

As shown in the example, after the determined lock time, the conductivity check valve returns to the automatic operation mode until the next time to the next biocide period program to ensure that the conductivity value is maintained at the desired value.

If the conductivity value measured within the time specified in the Pre-Control Time-out parameter does not reach the Pre-Check Lower Limit value, the blowdown process is terminated at the end of the period and the biocide is dosed from RL 3 over this period.

PreBoost Control

- **Cycle Prg.**

Indicates the cycle program selected for the application.

- **Relay Sens**

Used in cases where relay(s) defined in this parameter is required to be waited just before the relay is switched on.

Controls the operational status of the relays sensitivity of which is switched on, and waits if they are operating. Switched on when the relay sensitivity of which is opened, is switched off.

- **Rly Delay**

Relay delay time is entered. If the value selected is different than 0, waits until this value before relay is switched on.

- **Pre Control**

May activates or deactivate pre-control function. When active, pre-control channel selection, pre-control relay selection and pre-control upper and bottom limit parameters are adjusted.

- **PreCtrl Ch**

Shows the channel for which pre-control is desired.

- **PreCtrl U.Lim**

Shows the up-limit value for the pre-control channel desired. If the value measured for the channel on which pre-control is desired is higher than the up-limit (such as the one selected for biocide application), works together with the relay selected for pre-control.

- **PreCtrl L.Limit**

Indicates the low limit value for the channel to be pre-controlled. If the value measured for the channel to be pre-controlled is below pre-control low limit value, relay (like the one selected for biocide application), if pre-control time-out is entered, waits until opening the relay selected, for a period as stated. After time-out period, closes the relay chosen for pre-control and works itself.

- **PreCtrl Relay**

Indicates the relay to which pre-control is wanted.

- **Pre C.Timeout**

Pre-control time-out period.

- **Lockout**

Lock relay function can be activated or deactivated. When active, lock time and lock relay parameters are regulated.

- **Lockout Time**

Indicates the lockout time of the relay to be locked when relay (such as the one selected for biocide) works.

- **Lockout Relay**

Indicates the relay to be locked when relay (such as the one selected for biocide) works.

9.1.2.9 PreReduce Control

Same as application with Pre Reduce Control, only the control direction option works as boost.

Developed to be used in conditions needing boost control depending on the type or implementation area of the chemical.

PreReduce Control

- **Cycle Prg/Period Prg.**

Indicates the period program selected for the application.

- **Relay Sens**

Used in cases where relay(s) defined in this parameter is required to be waited just before the relay is switched on.

Controls the operational status of the relays sensitivity of which is switched on, and waits if they are operating. Switched on when the relay sensitivity of which is opened, is switched off.

- **Rly Delay**

Relay delay time is entered. If the value selected is different than 0, waits until this value before relay is switched on.

- **Pre Control**

The pre-control function can be activated or deactivated. In case of activation, pre-control channel selection, pre-control relay selection, front control upper and lower limit parameters are regulated.

- **PreCtrl Channel**

Indicates the channel where pre-control is desired.

- **PreCtrl U.Lim**

It shows the upper limit value for the channel to be pre-controlled. If the measured value for the channel to be pre-inspected is above the pre-control upper limit value, the relay (eg selected for biocide application) works with the selected relay for pre-control.

- **PreCtrl L.Lim**

Indicates the low limit value for the channel to be pre-controlled. If the value measured for the channel to be pre-controlled is below pre-control low limit value, relay (like the one selected for biocide application), if pre-control time-out is entered, waits until opening the relay selected, for a period as stated. After time-out period, closes the relay chosen for pre-control and works itself.

- **PreCtrl Relay**

Indicates the relay to which pre-control is wanted.

- **Pre C.Timeout**

Pre-control time-out period.

- **Lockout**

Lock relay function can be activated or deactivated. When active, lock time and lock relay parameters are regulated.

- **Lockout Time**

Indicates the lockout time of the relay to be locked when relay (such as the one selected for biocide) works.

- **Lockout Relay**

Indicates the relay to be locked when relay (such as the one selected for biocide) works.

Installation Menu

9.1.2.10 Proportional Control Output Setting

Role-on time is proportionally controlled according to the ratio of the value read from the source channel to the "Set" values. Based on the control period.

Ratio = (Set2-Set1) / (ChannelValue-Set1)

Proportional Control Settings

- **Source Channel**

Source channel to read the value.

- **Set Point 1**

Enter the 1. set point value.

- **Set Point 1**

Enter the 2. set point value.

- **Control Period**

Total relay open and down time.

9.1.2.11 Counter

- **Counter Ch**

Indicates the number of counters where relay is to be connected.

- **T On**

Indicates relay on time.

- **Relay Sens**

Used in cases where relay(s) defined in this parameter is required to be waited just before the relay is switched on. Controls the operational status of the relays sensitivity of which is switched on, and waits if they are operating. Switched on when the relay sensitivity of which is opened, is switched off.

- **Rly Delay**

Relay delay time is entered. If the value selected is different than 0, waits until this value before relay is switched on.

9.1.2.12 Periodic Control

It was developed to perform time-dependent periodic checking. The relay to which the periodic control function is assigned, regardless of any channel

T on outputs

T off time to wait.

Periodic Control/ Settings

- **T Off**

Indicates the time when relay, to which periodic control is to be applied, is off. Any value between 00.00.00 and 99.59.59.

- **T On**

Indicates the time when relay, to which periodic control is to be applied, is on. Any value between 00.00.00 and 99.59.59.

- **Relay Sens**

Used in cases where relay(s) defined in this parameter is required to be waited just before the relay is switched on.

Controls the operational status of the relays sensitivity of which is switched on, and waits if they are operating. Switched on when the relay sensitivity of which is opened, is switched off.

- **Rly Delay**

Relay delay time is entered. If the value selected is different than 0, waits until this value before relay is switched on.

9.1.2.13 Slave Relay

Depending on the master relay between **T off** and **T on** time range, operates the relay defined as low relay.

The graph below shows the operating state of the lower relay selected for the master relay. When the relay assigned as the master relay is on the rising edge (active), the selected slave relay will wait for the specified time T off time first, T running for the specified period of time.

T On, the end of the on period the master relay waits until it is active.

If the master relay is active before the time specified in the T open and T closed time parameters has expired, the slave relay time-dependent operation starts over.

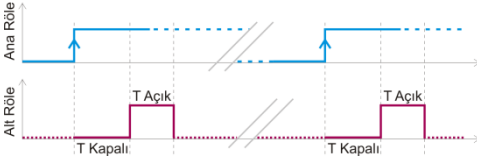


Figure 52/ Slave Relay Operational Graph

Slave Relay/ Settings

- **Master Relay**

The master relay where slave relay is to be connected.

- **T Off**

Indicates the time when slave relay is off when master relay is active. Any value between 00.00.00 and 99.59.59.

- **T On**

Indicates the time when slave relay is on when master relay is active. Any value between 00.00.00 and 99.59.59. .

9.1.2.14 Alarm

The output dedicated as alarm relay is active when alarm status selected for alarm sensitivity happens.

Thus, under desired conditions, output is possible from any relay requested.

Also, an appropriate device can be assigned from the Relay Device parameter assigned as alarm relay.

9.1.3 Device

If the function assigned relay is to be used in chemical dosing, the relay can be seen next to the relay type on the relay monitoring screen by selecting the appropriate chemistry below.


(On the main display,  push F2 button.)



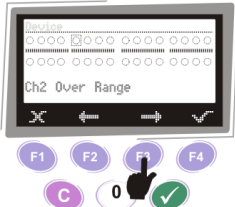
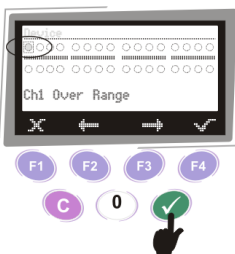

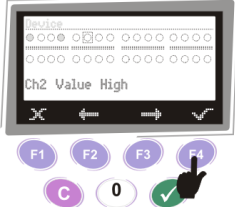
Figure 53/ Device Display

- Acid Pump
- Base Pump
- Chlorine Pump
- Amine Pump
- Peroxide Pump
- Biocide Pump
- Selenoid Valve
- Electro Valve
- Reserved

Installation Menu

9.1.4 Alarm Sens

It is used to connect the operating condition of the relay to the desired alarm condition. If any of the selected alarm conditions occurs, the corresponding relay output is turned off. The alarm waits until the situation is eliminated.

	To select alarm status to add sensitivity, use ←, → (F2, F3)
	After choosing alarm status to add sens, push ✓ Enter (Approve) in alphanumeric keypad and approve.
	To cancel an alarm status approved before, push ✓ Enter (Approve) again to cancel.
	Use ✓ F 4 button to return to the previous screen saving the changes made after marking the alarm conditions or states for which sensitivity is desired. To exit the Alarm Sens parameter without making any changes, press ✕ F1 button.

9.1.5 InterRelay

It was developed to prevent sudden load increases and failures that could occur due to this rise, which the relays could commission at the same time and create on the line they are connected to.

At the same time, it adds time to the relay, which will be commissioned. A value between 0 and 60 seconds can be entered.

9.1.6 CyclePrg

The period program to be used in the pre-check function is regulated by this parameter. 2 different programs can be edited.

Prg 1 Prg 2	Period Interval	
	1 Day 1 Week 2 Week 3 Week 4 Week	Repeating cycle times of the Created Periods are selected.
	Period 1 Period 10	10 different Periods can be adjusted.
	Week*	To select which week of the program.
	Day*	Monday.....Sunday
	Time	The start time of the Pre-Control period is entered in hours/minutes/seconds.
	Period	The duration of the relay used in the pre-check period is entered. Any value between 00.00.00 and 99.59.59.
	* Activated when Weekly Period is selected.	
	** Activated when 2, 3 or 4 week periods selected.	

9.2 Analog Output Menu



INFO!

The analog output option can only be performed when the hardware control device is present.


The channel information can be opened even if it is not found on the hardware controller. Commissioning the missing equipment can only be carried out by the manufacturer.

If the controller supports hardware, 4 analog outputs can be programmed for your device.

If the analogue output is assigned a function, the parameter settings of the selected function are listed.

- | | |
|-------------|----------------------|
| AN 1 | • No Function |
| AN 2 | • Linear |
| AN 3 | • Boost Control |
| AN 4 | • Reduce Control |
| | • PID Boost Control |
| | • PID Reduce Control |
| | • Limit Contact |
| | • Pulse Length |
| | • Alarm |

9.2.1.1 Analog No Function

Indicates that no channel or function is assigned to the analogue output. Functionally assigned analogue outputs can be monitored by pressing  F2 on the main display.

9.2.1.2 Analog Linear

In this function, the analog output outputs linearly from the Set Point1 to the Set Point2, from the minimum to the maximum.

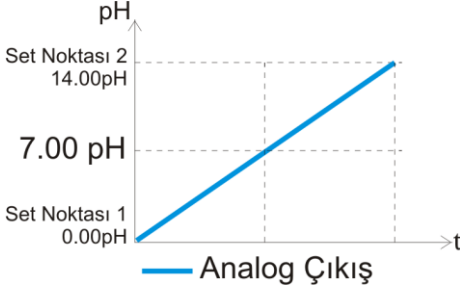


Figure 54/ Analog Linear Output Graph

- Acid Pump
- Base Pump
- Chlorine P
- Amine Pump
- Peroxide P
- Biocide P.
- Selenoid V.
- Electro V.
- Reserved

• Alarm Sens

Used to connect the working condition of the analogue output, to the desired alarm status. In the event that any selected alarm status takes place, relevant analogue output is off. Waits until the alarm status is eliminated.

Analog Linear/ Output Settings

• Source Ch

Channel to be connected to the analogue outlet where linear control to be is done, is selected.


• Set Point1/Set Point1

Set value1 is entered. Analogue output is minimum at this value.

• Set Point2

Set value2 is entered. Analog output gives max output in this value.

• Device

If the analogue output, to which function is dedicated, is to be used for chemical dosing, a proper one from the following chemicals is selected and on the analogue output monitoring screen, can be seen next to analogue output %. (On the main display,  push F2 button.)

9.2.1.3 Analog Boost Control

In this function, when analogue output is below the dedicated Set Point2 – Set Point1 value, works as linear by opening the pump or solenoid until the value is above the Set Point2 value.

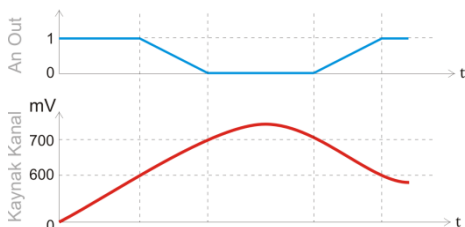


Figure 55/ Analog Boost Control Graph

“In the example above, analogue output function Boost control, channel Redox, Set Point1: 100mV, Set Point 2: 700mV, Set offset 0.”

Analogue Output Boost Control/Settings

- **Source Ch**

Channel to be connected to the analogue outlet where boost control to be is done, is selected.

- **Set Point1/Set Point1**

Set value1 is entered. Control device calculates the difference between Set Point2 and this value, and the value found is accepted as linear output start point.

- **Set Point2/Set Point2**

Set value2 is entered. The value entered indicates the end point of the linear output.

- **Device**

If the analogue output, to which function is dedicated, is to be used for chemical

dosing, a proper one from the following chemicals is selected and on the analogue output monitoring screen, can be seen next to analogue output %.

(On the main display,  push F2 button.)

- Acid Pump
- Base Pump
- Chlorine Pump
- Amine Pump
- Peroxide Pump
- Biocide Pump
- Solenoid Valve
- Electro Valve
- Reserved

- **Alarm Sens**

Used to connect the working condition of the analogue output, to the desired alarm status. In the event that any selected alarm status takes place, relevant analogue output is off. Waits until the alarm status is eliminated.

9.2.1.4 Analog Reduce Control

If the analog output falls below the set Point2 value, the pump or solenoid is turned off and the value runs linearly until it falls below **Set Point2 - Set Point1**.

The following Reduce Control settings must be made when the Reduce Control function is activated for the channel connected to the corresponding analogue output.

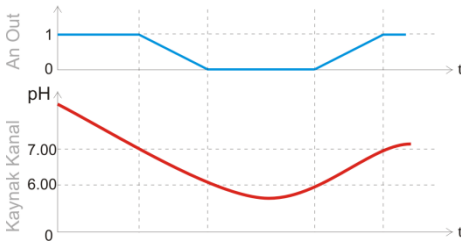


Figure 56/ Analogue Reduce Control Graph

“In the example above, analogue output function Reduce Control, channel pH, Set Point1: 1.00pH, Set Point 2: 7.00pH, Set offset 0.”

Analog Reduce Control

- **Source Ch**

Channel to be connected to the analogue outlet where reduce control to be is done, is selected.

- **Set Point1**

Set value1 is entered. Control device calculates the difference of this value from Set Point 2, and the value found is accepted as linear output end point.

- **Set Point2/Set Point2**

Set value2 is entered. The value entered shows the linear output start.

- **Device**

If the analogue output, to which function is dedicated, is to be used for chemical dosing, a proper one from the following chemicals is selected and on the analogue output monitoring screen, can be seen next to analogue output %.

(On the main display,  push F2 button.)

- Acid Pump
- Base Pump
- Chlorine Pump
- Amine Pump
- Peroxide Pump
- Biocide Pump
- Selenoid Valve
- Electro Valve
- Reserved

- **Alarm Sensitive**

Used to connect the working condition of the analogue output, to the desired alarm status. In the event that any selected alarm status takes place, relevant analogue output is off. Waits until the alarm status is eliminated.

9.2.1.5 Analog PID Boost Control Output

PID (Proportional-Integral-Derivative) analog boost control.

To allow the system operate as desired, PID parameters is required to be adjusted. *For PID control settings See Section PID Boost Control "Page 44*

Analog PID Boost Control

- **Source Ch**

Channel to be connected to the analogue outlet where PID boost control to be is done, is selected.

- **Set Point1**

Set value1 is entered. Analogue output gives minimum output at this value.

- **Set Point2/Set Point2**

Set value2 is entered. Analogue output gives maximum output at this value.

- **Kp**

It is the modulating gain. Any value can be entered between 0.00 and 100.00.

- **Ti (sec)/Ti (sn)**

Indicates integral time.

A value different than 0 is necessary to include in the calculation.

Any value between 0 and 9.999 is possible.

- **Td (sec)/Td (sn)**

Indicates derivative time.

A value different than 0 is necessary to include in the calculation.

Any value between 0 and 9.999 is possible.

- **Device**

If the analogue output, to which function is dedicated, is to be used for chemical dosing, a proper one from the following chemicals is selected and on the analogue output monitoring screen, can be seen next to analogue output %.

(On the main display,  push F2 button.)

- Acid Pump
- Base Pump
- Chlorine Pump
- Amine Pump
- Peroxide Pump
- Biocide Pump
- Selenoid Valve
- Electro Valve
- Reserved

- **Alarm Sensitive**

Used to connect the working condition of the analogue output, to the desired alarm status. In the event that any selected alarm status takes place, relevant analogue output is off. Waits until the alarm status is eliminated.

9.2.1.6 Analog PID Reduce Control

PID (Proportional-Integral-Derivative) analog Reduce Control.

To allow the system operate as desired, PID parameters is required to be adjusted. *For PID control settings See Section "PID Boost Control" Page 44*

Analog PID Reduce Control

- **Source Ch**

Channel to be connected to the analogue outlet where reduce control to be is done, is selected.

- **Set Point1/Set Point1**

Set value1 is entered. Control device calculates the difference between Set Point2 and this value, and the value found is accepted as linear output start point.

- **Set Point2/Set Point2**

Set value2 is entered. The value entered indicates the end point of the linear output.

- **Device**

If the analogue output, to which function is dedicated, is to be used for chemical dosing, a proper one from the following chemicals is selected and on the analogue output monitoring screen, can be seen next to analogue output %.

(On the main display,  push F2 button.)

- Acid Pump
- Base Pump
- Chlorine Pump
- Amine Pump
- Peroxide Pump
- Biocide Pump
- Selenoid Valve
- Electro Valve
- Reserved

- **Alarm Sensitive**

Used to connect the working condition of the analogue output, to the desired alarm status. In the event that any selected alarm status takes place, relevant analogue output is off. Waits until the alarm status is eliminated.

Installation Menu

9.2.1.7 Analog Limit Contact

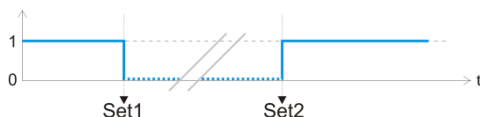


Figure 57/ Analog Limit Contact Graph

Analog Limit Contact

- **Source Ch**

Channel to be connected to the analogue outlet where linear control to be is done, is selected.

- **Set Point1/Set Point1**

Set value1 is entered. Indicates where analogue output is minimum.

- **Set Point2/Set Point2**

Set value2 is entered. Indicates where analogue output is max.

- **Device**

If the analogue output, to which function is dedicated, is to be used for chemical dosing, a proper one from the following chemicals is selected and on the analogue output monitoring screen, can be seen next to analogue output %.

(On the main display,  push F2 button.)

- Acid Pump
- Base Pump
- Chlorine Pump
- Amine Pump
- Peroxide Pump
- Biocide Pump
- Selenoid Valve
- Electro Valve
- Reserved

- **Alarm Sensitive**

Used to connect the working condition of the analogue output, to the desired alarm status. In the event that any selected alarm status takes place, relevant analogue output is off. Waits until the alarm status is eliminated.

9.2.1.8 Analog Pulse Length

When the analogue output function is set to pulse width, analogue output is given in accordance with the minimum and maximum pulse width determined when the measured value of the analogue output is outside the set values.

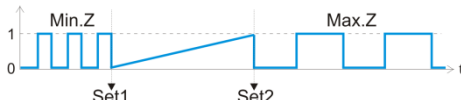


Figure 58/ Analog Pulse Output Graph

Analog Pulse Length/ Settings

- **Source Ch**

Channel to be connected to the analogue outlet where linear control to be is done, is selected.

- **Set Point1/Set Point1**

Set value1 is entered. When measured value is Set Value1, linear analogue output starts.

- **Set Point2/Set Point2**

Set value2 is entered. When measured value is Set Value2, linear analogue output ends.

- **Min Length**

The pulse width indicates the minimum time interval value. If the measured value is below the Set Point1 value, the analog output at the specified minimum time interval.

- **Max Length**

The pulse width indicates the minimum time interval value. If the measured value is above the Set Point2 value, the analog output at the specified max time interval.

- **Device**

If the analogue output, to which function is dedicated, is to be used for chemical dosing, a proper one from the following

chemicals is selected and on the analogue output monitoring screen, can be seen next to analogue output %.

(On the main display,  push F2 button.)

- Acid Pump
- Base Pump
- Chlorine Pump
- Amine Pump
- Peroxide Pump
- Biocide Pump
- Selenoid Valve
- Electro Valve
- Reserved

- **Alarm Sensitive**

Used to connect the working condition of the analogue output, to the desired alarm status. In the event that any selected alarm status takes place, relevant analogue output is off. Waits until the alarm status is eliminated.

9.2.1.9 Analog Alarm Output

The analog output assigned as alarm output is maximum if the selected alarm conditions occur in the alarm sensitivity parameter.

This ensures that any desired analog output is activated in the desired conditions.

It also has an analog output assigned as alarm relay;

An appropriate device can be assigned from the Device parameter.

9.3 Sensor Setup

9.3.1 Sensor

The sensor to be adjusted is selected. If no setting is required for the sensor connected to the corresponding channel, it will not be displayed in the sensor setting parameter.

9.3.2 Parameter

It is adjusted if any parameter is selected for the relevant sensor.

A device with conductivity channel can be configured with TDS (Total Dissolved Solids) different from EC (Electrical Conductivity) parameter, if requested.

Proper sensor is chosen from the ones giving analogue output for GP model control devices; pH, Redox, EC, TDS, CL Free, CL Total, CL Dioxide, Ozone, Hydro. Peroxide, Paracetic Acid, Oxygen, CL Combined, Temperature, Humidity, Pressure, Flow Meter, Ratio is selected to configure the device.

9.3.3 Range

In order to increase the measurement accuracy in EC and TDS devices, the range to be measured must be determined.

Range	EC	TDS
Low	0,0 uS – 200,0 uS	0,0 ppm – 200,0 ppm
Medium	0 uS – 20,000 uS	0,0 ppm – 20,000 ppm
High	0,0 mS – 200,00 mS	0,00 ppt – 200,00 ppt

9.3.4 Con Sens.Type

The appropriate sensor type is selected for the conductivity sensor used. There are 2 sensor types.

2 pole
4 pole

9.3.5 TDS Factor

TDS factor entry is made from this parameter. A value between 0,00 and 2,00 can be entered.

9.3.6 Cell Const

The cell constant input of the conductivity sensor used is regulated by this parameter. A value between 0.000 and 20.000 can be entered.

9.3.7 Unit

One of the units proper to sensor type is selected: pH, mV, uS, mS, ppm, ppt, mg/L, C, F, rh%, Bar, %, Hr, Min, Sec, Lt, m³, PCs.

9.3.8 Decimal Point	The unit of decimal place entry for the type of sensor used is the parameter. A value from 0 to 3 can be selected.	
9.3.9 Min Value	In the GP controller, the lower limit of the appropriate measurement range is defined by this parameter after the selection of the sensor. (+/- 327.67)	
9.3.10 Max Value	The upper limit of the appropriate measurement range of the sensor after selection of the sensor in the GP controller is defined by this parameter. (+/- 327.67)	
9.3.11 Temp.Comp.	This parameter is used to make heat compensation in measurements. Enabled / Disabled.	
9.3.12 Temp.Source/ IsI Channel	If the measured channel supports temperature compensation and the Temp.Comp parameter is activated, this parameter is used to select the heat channel.	
	Manuel	It is used to make temperature compensation according to constantly entered temperature value.
	Local	The measuring sensor also performs temperature measurement and is used when it is desired to use local measurement as a source of heat compensation.
	Channel1 – Channel 8	It is used as a source of heat compensation when it is desired to use an external temperature sensor connected to the channel.
9.3.13 Comp.Temp.	If the temperature channel parameter is set manually, the temperature value to be compensated is entered from this parameter. A value between 0,00 ° C and 100,00 ° C can be entered.	
9.3.14 Temp.Coeff.	This parameter is used when it is necessary to add a coefficient to the measured temperature value. A value between 0.00 and 0.200 can be entered. Used if the temperature compensation parameter is active.	

9.4 Counter Settings

If there is a Counter active on the channel, the parameters become adjustable. The counter can only be connected to IN5 (Digital Input 5).

See Section 5.3.4.5 [5. Counter](#) Page 18

Counter Parameter Settings

- **Unit**

By selecting the unit of the counter to be used, the quality of the counter used can be displayed on the screen.

- Liter
- m3
- Item/ PCs

- **Divider**

Set value1 is entered. The linear analog output starts when the measured value reaches Set Value1.

- **Multiplier**

The number of units can be multiplied by the usage area. A value between 1 and 1,000 can be entered. If a value other than 1 is entered, it is included in the calculation.

- **Set/Set Point**

Set Point of the counted unit amount can be adjusted from this parameter.

9.5 Communication Settings

The controller supports 2 RS485 or 1 Ethernet 1 RS485 port.

PLC, building automation, SCADA, cloud etc. by using MODBUS RTU Slave and MODBUS TCP Slave protocols over these ports. systems.

With MODBUS RTU Master protocol, it can receive and process information from external slave devices. OmniCon can send information to the information panels via the Visio Interface.

The printer can be connected via RS485. It may send Direct information to the information panels.

Provides remote control and monitoring with Web Interface via TCP/IP.



NOT!

- RS 485 line must not exceed 1000 mt.
- On RS 485 line, if there are more than one serial connected control device and sensor internal unit, the terminating resistor on the last device must be commissioned.



NOT!

- Distance between Ethernet Switch and control devices should not exceed 100mt.

9.5.1 Communication Configuration

The controller can be programmed to meet a wide range of communication needs. Some of these configuration scenarios are illustrated below.

RS485-MODBUS RTU Slave

With MB RTU Communication program, Communication between controllers and control devices is shown, such as computer, PLC etc.

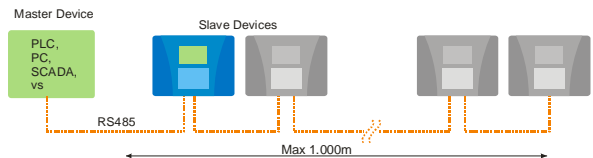


Figure 59/RS485-MODBUS RTU Slave

Ethernet-MODBUS TCP Slave

Communication between computer and control devices is shown with MB TCP Communication protocol. Multiple controllers can be connected to the master device using the Ethernet Switch

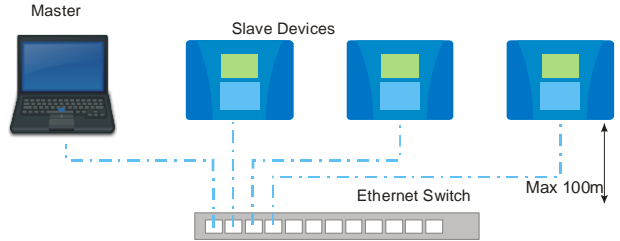


Figure 60/Ethernet-MODBUS TCO Slave

Ethernet-Web Interface

By accessing the web server on the controller, some settings of the device can be changed remotely, measurement information can be monitored.

RS485-MODBUS RTU Master

The controller can also use the control information of the channel by receiving it from external devices with MB RTU Communication protocol.

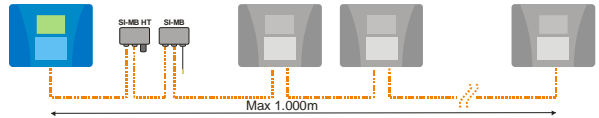


Figure 61/RS485-MODBUS RTU Master

RS485-Private Protokol

Can display control device Channel information to Direct InfoPanele.

Display ID 0802 (64x16px display)

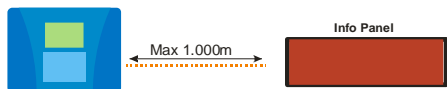


Figure 62/RS485-Private Protocol

RS485-ASCII printing

Control device can send channel information directly to the printer.

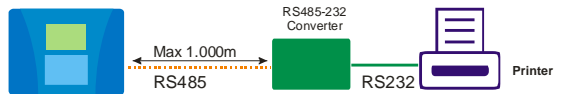


Figure 63/RS485-ASCII Printing

Internet-MODBUS TCP Slave

Internet-Web interface

MODBUS TCP and Web interface features can also be monitored over the internet.

It can be integrated into the SCADA system from distant points.

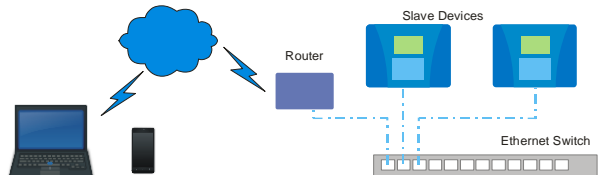


Figure 64/Internet-MODBUS TCP Slave/Internet Web Interface

9.5.1.1 Ethernet Configuration

- **User Authorization, Network Configuration:** See. Section 2.2 “User Authorization” Page 7.

The device supports 1 Ethernet module; it must be placed in the M1 slot of the Ethernet module to connect using the Ethernet port (MODBUS TCP, web Interface, etc.).

To activate Ethernet module:

Configuration/Communication/Cards/Port1: “Ethernet” must be selected.

If MODBUS TCP Slave protocol is to be used:

Configuration/Communication/P1 Haber.Tipi: “MB Slave” must be selected. (If only the web interface is to be used, this step is not necessary.)

In order for the device to be used on an Ethernet network, the IP address must be set to match the network in question.

For example: For a network configured with the 192.168.0.x IP group, an empty IP address from that group must be defined to the controller.

These settings are done:

Configuration/Communication/Ethernet

<i>IP Address</i>	<i>Device IP adres</i>
<i>Mask</i>	<i>Network Mask</i>
<i>Gateway</i>	<i>Gateway Address</i>
<i>Primary DNS</i>	<i>Primary DNS sunucu adresi</i>
<i>Secondary DNS</i>	<i>Secondary DNS sunucu adresi</i>
<i>HTTP Port</i>	<i>http port (web interface port)</i>
<i>MODBUS Port</i>	<i>MODBUS portu</i>
<i>Com. WDT</i>	<i>Communication WDT: when activated, if no query comes for a while, the device restarts itself.</i>

Installation Menu

9.5.1.2 RS485 Configuration

The device supports 2 items of RS485 modules, the modules are placed in M1 and M2 slots. The corresponding module is set to RS485 to activate the modules.

Configuration/Communication/Cards/Port1: "RS485"

Configuration/Communication/Cards/Port2: "RS485"

The communication type of the module placed in the M1 slot is set from the "P1 News Type" parameter, the communication type of the module placed in the M2 slot "P2 News Type".

Communication Options are as follows.

M1	MB Closed	MODBUS Communication closed	
	MB Slave	MODBUS communication in Slave Mode	Device responds to queries made by a Master device. The Device Communication Speed is selected from the "P1 Speed" parameter.
	MB Master	MODBUS Communication Master Modunda	Reserved for Visio Models. It is not used in Control model.
M2	Info	Direct Info Panel Connection	It reflects the channel values on the screen to the Info panel screen. The Device Communication Speed is selected from the "P2 Speed" parameter. The Info Panel supports "115200 bps".
	Printer	Direct Printer Connection	It prints the channel values on the screen to the printer with date and time information. The Device Communication Speed is selected from the "P2 Speed" parameter.
	MB Master	MODBUS communication in Master Mode	It receives information from external devices for channels set as external parameters. The Device Communication Speed is selected from the "P2 Speed" parameter. The external device address and parameter number are set in the Sensor setting menu connected on the respective channel. <i>Configuration/SensörX/Cihaz Adr</i> <i>Configuration/SensörX/Cihaz Parametre No</i>

9.5.2 Web Interface

To access the web interface, you may simply enter the IP address of the device from any web browser.

LOGIN:

The first page loaded is the sign-in page. If only the device information is to be tracked, the status page can be accessed by clicking on the STATUS link without entering any password.

If a setting is to be changed on the device, you need to enter the web password of the device here. The default value is "0000".

Figure 65/LOGIN page

STATUS:

This is the page where device information can be viewed.

Gives information on measured channel values, Role outputs, and status of Analog outputs.

CH VALUE					
CH 1	pH	14,01	pH		
CH 2	Redox	1076	mV		
CH 3	Sıcaklık	-5,1	-C		
CH 4	Kapalı	0,0	-C		
CH 5	Kapalı	0,00	pH		
CH 6	Kapalı	0	Close		

RELAYS									
	Function	Out	Channel	Set	TON	TOFF	Mode	Device	
RL 1	Duvarme	●	pH	7,20	pH		Auto		
RL 2	Yüksekte	●	Redox	650	mV		Auto		
RL 5	Alarm	●	Sıcaklık	7,20	pH		Auto		

ANALOG OUTPUTS							
	Function	Out	Channel	Set1	Set2	Device	
AN 1		%100.0	pH	0.00	14.00		
AN 2		%71.7	Redox	0	1500		
AN 3		%8.8	Sıcaklık	-25.0	200.0		

Figure 66/Status Page

SETTINGS:

The page where the device parameters can be changed.

The new value of the parameter to be changed is written in the N.Value section or the option is selected. The change is applied to the device with the APPLY button.

The CLEAR button clears only the changes made on the screen.

RELAYS												
	Function	Out	Channel	Set	N.Value	TON	New TON	TOFF	N.TOFF	Mode	N.Mode	Device
RL 1	Duvarme	●	pH	7,20	pH					Auto	▼	
RL 2	Yüksekte	●	Redox	650	mV					Auto	▼	
RL 5	Alarm	●	Sıcaklık	7,20	pH					Auto	▼	

ANALOG OUTPUTS								
	Function	Out	Channel	Set1	N.Value	Set2	N.Value	Device
AN 1		%100.0	pH	0.00	pH	14.00		
AN 2		%71.7	Redox	0	mV	1500		
AN 3		%8.8	Sıcaklık	-25.0	-C	200.0		

Figure 67/Settings Page

DATA LOG:

It is the screen where information recorded in device memory can be monitored.

Records can be seen as lists.

Records can be seen as graph.

Record list is printable.

Records can be filtered.

Records can be copied from that page to paste other programs such as Excel.

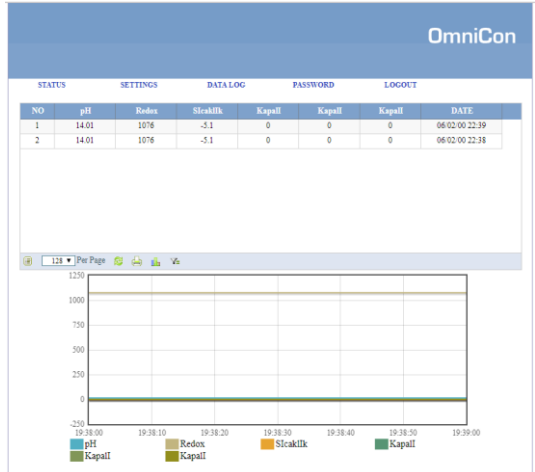


Figure 68/Data Log Page

PASSWORD:

Web password can be changed from this screen.

Old password is entered to the first line and new password to the second and third lines, then push CHANGE button.

Figure 69/Password Page

9.6 Creating User Password

To change user password, please select password parameter from configuration menu. Get on the area you need to change and push (F4).

- Define your new 4-digit password and save it after pushing (F4).
- New password is dedicated.

9.7 Factory Default

Used to go factory default settings. The window opens is approved by (F4) button and device turns back to factory default.

10 Maintenance

- **User Authorization, Mechanical Mounting:** See Section 2.2 “User Authorization” Page 7.
- **User Authorization, Electrical Mounting:** See Section 2.2 “User Authorization” Page 7

10.1 Control Device Fuse Change



WARNING!

Pieces Under Electric Voltage!

Potential Result: Death or Serious Injury.

Unplug before opening the casing.

Unplug the mains plug of the faulty or broken devices to make them potential-free.



NOTE!

Choosing Proper Fuse.

Only “PROTECT TH FUSE 3A TR5” fuse is used for main input.

Only “PROTECT TH FUSE 5A TR5” fuse is used for outputs.

Contact authorized company for supply of fuse.

Control Device Technical Specifications

11 Control Device Technical Specifications

SN	Measurement Channel Type	Explanation	Parameter	Unit	Min	Max	Accuracy
1	pH		pH		0.00	14.00	0.25%
2	Redox		ORP		0	1500	0.25%
3	Conductivity	EC	EC Low	uS	0.0	200.0	1%
			EC Med	uS	0	20000	1%
			EC High	mS	0.00	200.00	2%
		TDS	TDS Low	ppm	0.0	200.0	1%
			TDS Med	ppm	0	20000	1%
			TDS High	ppt	0.00	200.00	2%
4	OFCL	Open Cell Type	FCL	ppm	0.00	10.00	0.5
5	DO	Galvanic	DO	mgL	0.00	20.00	2%
6	GP (General Parameter)	for 4-20mA Sensors	aa	bb	cc	dd	%0.25
7	Combined Chlorine	=Total Cl - Free Cl*	CCL	ppm	0.00	10.00	%0.25
8	Temperature		Temp NTC 10K	°C	-5.0	80.0	1%
			Temp NTC 30K	°C	-5.0	80.0	1%
			Temp Pt100	°C	-25.0	200.0	1%
			Temp Pt1000	°C	-25.0	200.0	1%



INFO!

* Excludes Free Chlorine Channel value from Total Chlorine Channel value. on the device, there must be at least one TCL and one FCL.

aa	bb	cc	dd
Freely Selectable form table Par.List	Freely Selectable form table Par.Unit	according to sensors	according to sensors
Par.List	Par Unit		
pH, Redox, EC, TDS, CL CL CL Ozone, Hydrogen Paracetic Oxygen, Cl Temperature, Humidity, Pressure, FlowMeter, Ratio, Turbidity, Fouling, Product, Corrosion, Weight	Free, Total, Dioxide, Preoxide, Acid, Combined, pH mV uS mS ppm ppt mgL ~C ~F rh% Bar % Hr Min Sec Lt m^3 PCs Lt/h NTU MPY Gr	-32767 32767	-32767 32767