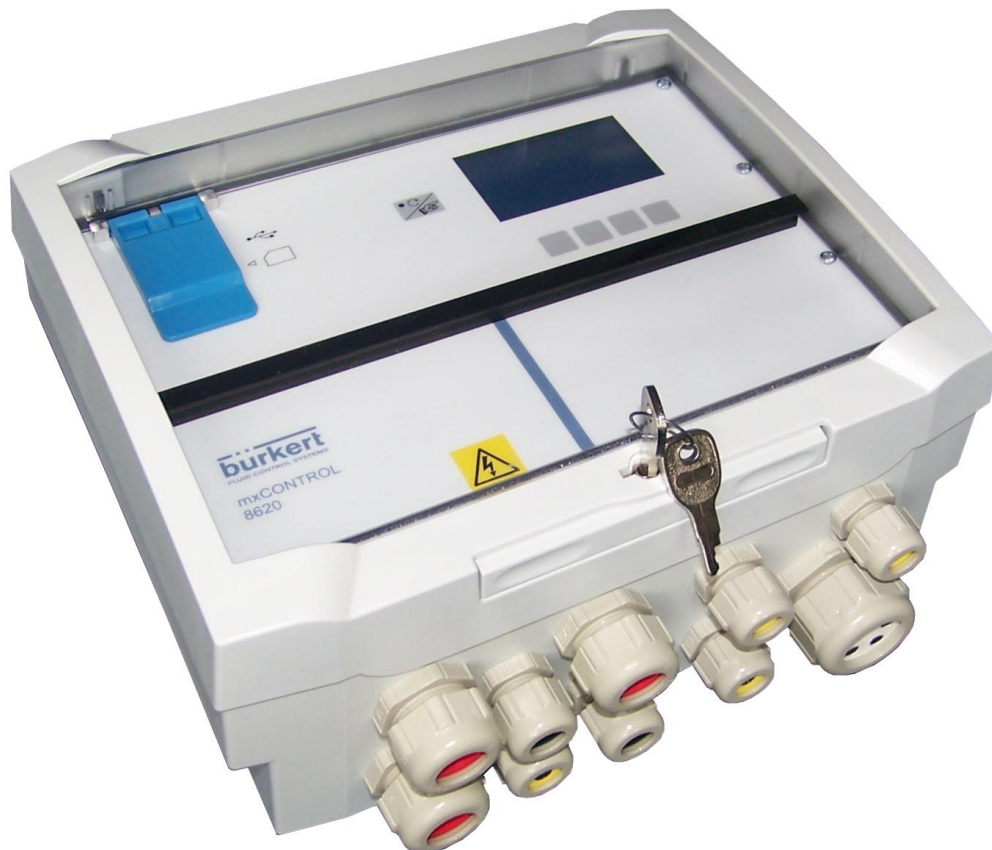


Operating Instructions

8620 mxCONTROL

Multifunction Water Treatment Controller with Ethernet

For RO Machines



MAN 1000384911 ML Version: - Status: RL (released | freigegeben) printed: 06.06.2019

Introduction

Dear Customer!

Congratulations on the purchase of your 8620 mxCONTROL Multifunction Controller.

Before installing or using this device, please read this manual thoroughly!
Keep it safe for further users!

This will enable you to benefit fully from all of the advantages the product can offer.

1.1 Unpacking and Inspection

Please verify that the product is complete and free from any damage and that you have received the following components:

- 1 x 8620 mxCONTROL Controller
- 1 x SD card (inserted in slot)

1.2 Warranty conditions

This product should only be installed and/or repaired by properly trained staff. If any difficulties occur with the product during installation, please contact your nearest SUEZ Sales/Service Office for assistance.

Warranty does not cover damage due to faulty operation!

1.3 User's Responsibility for Safety

SUEZ manufactures a broad range of Water treatment equipment to operate in a wide variety of applications. It is the customer's responsibility to select the appropriate 8620 mxCONTROL Multifunction Controller for their application, ensure that the unit is installed correctly, and maintain all of the components.



DANGER! Mains voltage!

It can cause serious injury or death! This symbol at the device front indicates that the device works also with mains voltage!



Make special attention if

these symbols appear. It indicates that special attention should be made to the instructions, as they may affect the safe installation, function and/or use of the system.

Read more in chapter 1.

1.4 Electromagnetic compatibility

This device conforms to the EMC Directive of the European Union, 2004/108/EC and LVD 06/95/EC. In order to comply with the above directive, the wiring instructions must be followed as instructed.

1.5 UL approvals

This device is designed to conform to standard UL61010-1 Second Edition "Process Control Equipment".

Warranty

The Company warrants that the equipment manufactured by it and delivered hereunder will be free of defects in material and workmanship for the following periods:

Twelve (12) months from the date of placing the Equipment in operation or eighteen (18) months from the date of shipment from the factory, whichever shall first occur.

The Purchaser shall be obligated to promptly report any failure to conform to this warranty, in writing to the Company in said period, whereupon the Company shall, at its option, correct such nonconformity, by suitable repair to such equipment or, furnish a replacement part F.O.B. point of shipment, provided the Purchaser has stored, installed, maintained and operated such Equipment in accordance with good industry practices and has complied with specific recommendations of the Company.

Accessories or equipment furnished by the Company, but manufactured by others, shall carry whatever warranty the manufacturers have conveyed to the Company and which can be passed on to the Purchaser. The Company shall not be liable for any repairs, replacements, or adjustments to the Equipment or any costs of labor performed by the Purchaser or others without Company's prior written approval.

The effects of corrosion, erosion and normal wear and tear are specifically excluded. Performance warranties are limited to those specifically stated within the Company's proposal. Unless responsibility for meeting such performance warranties are limited to specified tests, the Company's obligation shall be to correct in the manner and for the period of time provided above.

THE COMPANY MAKES NO OTHER WARRANTY OR REPRESENTATION OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY DISCLAIMED.

Correction by the Company of nonconformities whether patent or latent, in the manner and for the period of time provided above, shall constitute fulfillment of all liabilities of the Company for such nonconformities whether based on contract, warranty negligence, indemnity, strict liability or otherwise with respect to or arising out of such Equipment.

The purchaser shall not operate Equipment which is considered to be defective, without first notifying the Company in writing of its intention to do so. Any such use of Equipment will be at Purchasers sole risk and liability.

Note that this is SUEZ's standard warranty. Any warranty in force at the time of purchase of the equipment or negotiated as part of the purchase order may take precedence over this warranty.

Abbreviations used in Document and Software

Abbreviation	Full Description
A-	Lower alarm limit
A+	Upper alarm limit
AH	Higher Alarm Process Value
AL	Lower Alarm Process Value
AHyst	Alarm hysteresis in % of process value range
AnalogIn 1 to 4	Analog Input 1 to Analog Input 4
AnalogOut 1 to 4	Analog Output 1 to Analog Output 4
ASL	Acid (pump) stop limit set in engineering units
ASMTTP	Simple Mail Transfer Protocol (SMTP) with Authentication
Au	Automatic Mode
BINARY	Binary (digital) Input (0/24V DC)
BINARY_POTFREE	Binary (digital) Input, potential-free
ChemCtrl dur. Flush	Chemical Pump Control during Flush
CHEMPump	Chemical Pump / Chemical Pump Control Selector
CIP Pump	Clean-In-Process Pump / CIP Pump Control Selector
CM	Calibration mode
CO	Controller output to actuator (%) – proportional/integral
CO Acid	Controller Output - Acid
CO Caus	Controller Output - Caustic
Comm	Communication (log event)
CONC_F	Concentrate Flow
CONC PRS	High Concentration Pressure Alarm
CONCValve	Concentrate Valve
Cond	Conductivity
Dbd	Deadband
DHCP	Dynamic Host Configuration Protocol
DigIn 1 to DigIn 4	Digital Input 1 to 4
ErrorMsg	Error messages (log event)
EXT_CT	External Control
FA	AD-Fault
Fc	Calibration Data Fault
FC	Configuration Fault
fF	(active) Flow switch
FI	Input Fault
FILLTIME	Fill Timer done Alarm
Fil Fg	Filter frequency (Low Pass Filter setting for input in Hz)
fo	forced by other modules
FREQ	Frequency (digital) Input
Fr	Friday
fS	(active) System switch
FS	Sensor Fault; Full scale (in connection with Technical Specification)
FSizeLimit	Automatic log file size limitation
FSizeMax	Max. log file size
H_CONC	High Concentrate Pressure
HIGH_PH	High pH (set point or alarm)
HIGH_TEM	High Temperature (set point or alarm)
H_PERM	High Permeate Pressure
HP Pump	RO1 High Pressure Relay
H_PRMCON	High Permeate Conductivity (set point or alarm)
Hyst	Switching hysteresis set in engineering units
INL_PH	Inlet pH
Inv	Inverts the line of action (controller module) / the input signal (binary input)

Abbreviation	Full Description
IN Valve	RO Inlet valve
IP	IP (Internet Protocol) address
IS	Instrumentation Supply
kB	Kilobyte (1024 kB = 1 MB)
L_INLT	Low Inlet Pressure
LFI	Log file index
Lmt-	Lower actuator output limit in %
Lmt+	Upper actuator output limit in %
LOW_PH	Low pH (set point or alarm)
LPM	Litres per minute
Ma	Manual Mode
MAC	MAC (Media Access Control) address
MB	Megabyte (1 MB = 1024 kB)
Misc	Miscellaneous (log events)
Mo	Monday
Mode	Economy or Deluxe Mode
MONITOR_PV	Module - monitoring only a Process Value (data logging)
Mon PV	Module - monitoring only a Process Value (data logging) - short name
MOT	Maximum Output Timer
MPY	Mils Per Year
MTR FAUL	MRT Fault Alarm
µMPY	Micro Mils Per Year
nA	Input not active
N.C	Normally closed
N.O	Normally open
NOC	Number of changes
NOE	Number of events (per day)
O/O outputs	On / Off outputs (log event)
OF	Output Fault (4 ... 20 mA outputs)
OpMode	Operational Mode (log event)
ORP	Oxidising Redox Potential (Redox)
P_COND	Permeate Conductivity
PERM_F	Permeate Flow
PERM PRS	High Permeate Pressure Alarm
PH Pump	pH Pump
PMP_HRCT	Pump Hour Counter (for High Pressure Pump)
Port	TCP/IP Port number
Prb	Proportional band in % of full scale deflection
PRETRT	Pre-Treatment Lockout
PS	Power Supply
P_TANK	Permeate Tank Level
P_TEMP	Permeate Temperature
PulsDur	Pulse duration of the actuator output in milliseconds or seconds
PULSE	Pulse counter (digital input)
Puls/hr	Pulses per hour
PulsMax	Maximum actuator output pulse rate per minute or per hour
PV	Process value
PWM	Pulse Width Modulation
r	read (access via configuration menu or via XML-configuration or parameter file)
R-	Minimum value of (sensor) range in engineering units
R+	Maximum value of (sensor) range in engineering units
ReNotify	Renotification interval for email notification
RO_AUX	RO_AUX_CONTACT

Abbreviation	Full Description
RO pH	pH PI-Control Module (short name) with output for acid pump (or caustic pump) for RO machine
RO_PH_CONTROL	pH PI-Control Module with output for acid pump (or caustic pump) for RO machine
RO Status	Operating Status of the RO Machine
RO System	RO Control Selector
Rst	Reset time in seconds
rw	read and write (access via configuration menu or via XML-config. / parameter file)
Sa	Saturday
SD card	Secure Digital (memory) card
Sft	Safety output value is output if the input (as a rule 4...20 mA) lower than 3.5 mA or higher than 20.5 mA
Slp-	Set point slope - per minute falling
Slp+	Set point slope - per minute rising
SMTP	Simple Mail Transfer Protocol
SNM	(Ethernet) Subnet mask
SP	Set point
SPL-	Lower set point limit for pH-measuring
SPL+	Upper set point limit for pH-measuring
SPLim	Set point minimum (internal calculation for conductivity)
SP Limiter	Set point Limiter
SP Ramp	Set point ramp
Su	Sunday
TCP/IP	Transmission Control Protocol / Internet Protocol
Th	Thursday
Tu	Tuesday
Tperiod	Period duration
Tsample	Sampling Time for control circuits
TSample	Sample Time for Data Logging
w	write (access via configuration menu or via XML-configuration or parameter file)
WH	Higher warning process value
WL	Lower warning process value
We	Wednesday
YA	ASL-pump-stop
YF	Out fails (MOT is expired)
YS	YSafePos – Safety output value is active (due to input/sensor Fault)

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1 General Part

1.1 Presentation elements



DANGER!

Mains voltage! Immediate danger!
Death or serious injuries are the result of non-compliance with the safety instructions.



DANGER!

Immediate danger!
Death or serious injuries are the result of non-compliance with the safety instructions.



WARNING!

Potentially dangerous situation!
Serious injuries or death may result from non-compliance with the safety instructions.



CAUTION!

Potentially dangerous situation!
Medium or light injuries may result from non-compliance with the safety instructions.

CAUTION!

Potentially dangerous situation!
Likely property damages in case of non-compliance.



Designates important additional information, tips and recommendations important for your safety and the flawless function of the device.

→ Marks a section you have to carry out.

1.2 Intended Use

The 8620 mxCONTROL multifunction controller, is a microprocessor controller designed to automate the control of process variables within a water treatment system as a Reverse Osmosis Machine. Sophisticated electronics and state of the art control algorithms ensure that optimum process control is maintained at all times, with the minimum of operator intervention.

The 8620 mxCONTROL is capable to process up to four analog, four digital inputs (binary/frequency), four digital inputs (binary only) and two Pt100 inputs, five relay outputs, two transistor and two analog outputs simultaneously.

It is combined with an easy to read large graphic display backlighted in three languages: English, German and French - other languages on demand.

The controller is highly software based. All Standard Models can be easily loaded by SD card or USB. The operator can display and set all important variables and parameters by five soft keys.

The controller is delivered with the SD card containing all Standard Model configuration files and Instruction Manuals.

There are 3 levels of human-machine interface at access: Open, Operator Only, Specialist Only.

1.3 Safety Notes

These safety instructions do not take any

- Incidents and occurrences into account which may occur during assembly, operation and maintenance of the devices.
- Local safety regulations where the operating party is responsible for its compliance, also in regard to the installation staff.



DANGER!

Danger from electrical voltage

Reaching into the system presents an acute risk of injury.

Always switch off the power before beginning with the work activities and secure it against being switched back on inadvertently! Obey the applicable accident prevention and safety regulations for electrical devices!



WARNING!

Inadvertent operation or impermissible restrictions may cause general danger situations through the downstream actuators, including physical injuries.

Take proper precautions to prevent accidental actuation or inadmissible impeding.

Dangerous situations may develop during installation and repair activities. This type of work may only be carried out by authorized technical personnel and with suitable tools!

After an interruption of the electric supply, ensure a defined and controlled restart of the processes!



WARNING!

Personal injuries and damage to the system may occur following a system interruption or after manual operation through unwanted operation of output devices.

Before **changing the mode of operation** (Manual or Automatic), appropriate measures must be taken to prevent harm to personnel and the system due to unwanted actuation of an output device (e.g. chemical / CIP pump).

If the controller is part of a complex automation system, take care for a **defined and controlled restart of the processes**.

 **CAUTION!**

The general engineering rules apply to the deployment planning and operation of the device!

Disregarding these rules may result in injuries and/or damages to the device and possibly its environment.

Follow the general rules of engineering!

 **CAUTION!**

Electrostatically endangered components/modules

The device contains electronic components which may react sensitively against electrostatic discharges (ESD). Touching electrostatically charged persons or objects puts these components at risk. In the worst case, they will be destroyed or fail after startup.

Follow the requirements according to IEC 61340-5-1 to minimize or prevent the possibility of damage due to sudden electrostatic discharge!

Make also sure not to touch the electronic components if supply voltage is supplied!

CAUTION!

Hardware and Software modifications and changes

For safety reasons unauthorised modifications and changes of hardware and software are not allowed.

Make sure to comply with the notes, thresholds, operating modes and safety instructions given in this manual.

Non-compliance with this manual and operating sequence will void any liability claims.

CAUTION!

Temporary protection against overload and short circuit

Instrumentation Supply part (24 V DC): the device is protected against destruction by overload and short circuit. No safe function is ensured for the duration of such disturbance. After such a disturbance, the „8620 mxCONTROL“ automatically continues its normal operation.

The plant must be dimensioned so that the **sum of extracted current** of all actuators/sensors connected at the Instrumentation Supply side **never exceeds the value of 1.04 A**.



The „8620 mxCONTROL“ was developed on the basis of recognized technical safety rules and corresponds to the state of technology. Hazards may nonetheless develop. Operate the „8620 mxCONTROL“ only in flawless condition and in compliance with the operating instructions. Also make sure to **comply with the conditions of use according to the specifications** in chapter 1.5 “Technical Description of the 8620 mxCONTROL” and on the type plate of the device.

Non-compliance with these instructions and unauthorized tampering with „8620 mxCONTROL“ voids any liability by us; the warranty for the device and accessories also becomes void!

Comply with the notes in this operating instruction manual as well as the field conditions and allowed data specified in the technical data section of this manual and on the 8620 mxCONTROL type plate (see chapter 0) to ensure the correct functioning of the device and a long service life.

1.4 General Information

1.4.1 Unpacking and Inspection

We as manufacturer make an effort to completely compile and properly pack up all devices and parts delivered. Nevertheless, after unpacking, check the delivery for transport damages, completeness and conformity with the field conditions (type plate).

Return devices and parts **showing obvious damages** using the **original packaging**.

1.4.2 Maintenance, Cleaning, Storage, Transport, Disposal

Maintenance

If correctly used the 8620 mxCONTROL will work **without any maintenance**. Faults may occur by setting errors, improper line connections or defective components.

Required repair work for the exchange of defective components is only allowed to be carried out by **authorised personnel** using appropriate tools.

For the repair of the 8620 mxCONTROL contact your responsible SUEZ Service.

Cleaning

An 8620 mxCONTROL which is used daily may be contaminated, and if so it should be cleaned using an appropriate cleaning agent. Always use compatible cleaning agents and soft rags for cleaning.

Check the cleaning agents for compatibility **before using** them.

Prevent cleaning agent or other liquids from coming into the 8620 mxCONTROL, in particular into the non-protected plug-and-socket connections.

Storage

Always store the 8620 mxCONTROL in its original packaging within dry rooms at a max. storage temperature of +140 °F (+60 °C).

Transport

Always transport the 8620 mxCONTROL in its original packaging.

Keep the 8620 mxCONTROL original packaging and always return obviously damaged devices in their original packaging to avoid transport damages.

Disposal

When disposing of the 8620 mxCONTROL comply with local disposal regulations.

1.4.3 Service

If 8620 mxCONTROL's hardware does not work as expected, please check the electrical connections of the supply and signal lines in the 8620 mxCONTROL as well as on the connected devices.

In the case that such checks do not correct the condition, please contact the responsible SUEZ Service.

For service queries please state the data on the type plate as well as all parameters and values indicated on the display under the menu item "System settings" / "Device info". It would be of great advantage to send the configuration/parameter files.

1.4.4 Validity of Firmware and Hardware

These Operating Instructions are valid from Firmware Revision D.00.00.00 and from Hardware Revision C.

1.5 Technical Description of the 8620 mxCONTROL

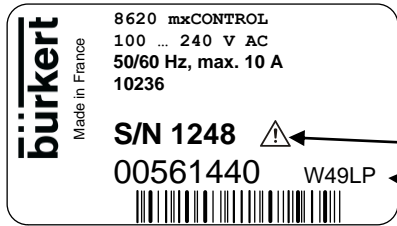
1.5.1 Technical Specifications

General Details of the Device			
Enclosure	with sealed keypad and display		
Enclosure outer dimensions L x W x H	230 x 204 x 116 mm without cable glands		
Housing material	PC (UL94) with a transparent door and snap lock		
Weight	1.8 kg		
Degree of protection	IP 65 according to IEC/EN60529 and NEMA/UL 50, Type No. 4X, with closed door and properly closed cable glands		
Graphic display, large and backlighted	128 x 64 dots, two coloured (blue and white)		
Keypads for manual operation	5 keys for user inputs		
Operating temperature	32 ... 122 °F (0 ... +50 °C)		
Storage temperature	-4 ... 140 °F (-20 ... +60 °C)		
Air humidity	< 80% not-condensing		
Height above sea level	2000m max.		
Installation category	Category I according to UL/EN 61010-1		
Pollution degree	Degree 2 according to UL/EN 61010-1		
Equipment mobility	Fixed		
Operation condition	Continuous		
Use	Indoor		
Electrical Data			
Mains voltage (power supply)	100 ... 240 V AC, 50/60 Hz, no adjustment necessary		
Power consumption (of mxCONTROL device)	max. 35 W (incl. sensor supply at instrumentation supply side)		
Total power consumption (using the internal power distribution)	max. 2400 W (at 240 V AC) or max. 1100 W (at 110 V AC) incl. connected actuators at power supply side		
Total input current I _{in} (using internal power distr.)	max. 10 A		
Total output current I _{out} (using the internal power distribution)	<10 A (incl. device power consumption of 35 W)		
Instrumentation supply for sensors / transistor outputs	24 V DC (±5 %), 1.04 A (25 W), short circuit and overload protected		
Fuse for device protection	internal: electronic fuse, recovers automatically after fault condition is removed		
Fuse for relay outputs	Relay outputs to be fused in external installation according to actuators		
Inrush current (typ.)	cold start 30 A / 230 V AC		
Electrical Connections			
Electrical connection Power Supply	push-in connector terminals, grid 5.0 mm, for wire gauges 0.2 ... 2.5/4.0 mm ² (AWG 24...12)		
Electrical connection Instrumentation Supply	push-in connector terminals, grid 3.5 mm, for wire gauges 0.2 ... 1.5 mm ² (AWG 24...16)		
Cable glands and cables		cable glands	for cables with recommended outer diameter:
	Power Supply side	3 x M20 (PG13)	10.5 ... 13.5 mm
		2 x M16 (PG9)	6.0 ... 9.5 mm
		1 x M16 (PG9)	4.0 ... 6.5 mm
	Instrument. Supply side	1 x M32 (PG21)	5 x 5.0 mm
3 x M16 (PG9)		4.0 ... 6.5 mm	
	For other diameters exchange seals!		
Thermal stability (cable material)	221 °F (105 °C)	for cables at power supply side	
	176 °F (80 °C)	for cables at instrumentation supply side	
Internal Equipment - Inputs			
Inputs	4 analog inputs (4...20 mA), 2 Pt100 inputs,		

	4 digital/frequency inputs (up to 2 kHz), 4 digital inputs
Analog Inputs - Characteristics	
Input resistance of 4...20 mA inputs	max. 300 Ω
Measuring error of 4...20 mA inputs	< 0.2 % FS
Temperature influence	0.3 % / 10 K FS
Nominal temperature	77 °F (25 °C)
Measuring error Pt100 inputs	max. ±0.25 K; 3 wire connection and software compensated wire resistance required
Range of Pt100 inputs	-4 ... 302 °F (-20 ... +150 °C)
Digital/Frequency Inputs - Characteristics	
Logical values binary inputs	High 13 ... 35 V; Low 0 ... 4.5 V
Input resistance of binary inputs	≥ 20 kΩ
Max. frequency	2 kHz
Duty factor frequency	1 : 1
Measuring error frequency	max. 0.2 % FS
Input accepts signals from	open collector; open emitter; push-pull output; hall effect; reed switch; micro switch
Internal Equipment - Outputs	
Outputs	5 relay outputs, 2 transistor outputs, 2 analog outputs 4...20 mA
Relay Outputs - Characteristics	250 V AC/DC, max. 10 A, potential free, two-way contacts, 2500 VA (AC), max. 40 W resistive load (DC), lifetime: 3 Million switching cycles at 1 A
Transistor Outputs - Characteristics	24 V DC, switching capacity max. 16 W each, pnp, max. 2200 Hz
Analog Outputs - Characteristics	max. 500 Ω load
Further Internal Equipment	
Micro-controller core	32 bit with integrated flash memory (512 kByte)
Slot for SD card (memory card)	can be used for data logging, up- and download of parameter and configuration files
Clock	real-time clock with calendar
Battery back-up for real-time clock	lithium battery, replaceable, approx. 10 years operation time
Internal extended flash memory	512 kByte for additional languages
Communication	
SD card	SD card size: minimal 64 MB, maximal 2 GB, formatted with FAT16 file system
Up-/download of configuration/parameters data	via USB or SD card
Data-logging	via SD card
Firmware update	via USB
USB slave interface	standard USB interface for PC communication
Ethernet interface	Ethernet interface for remote device access and email notification option
Extension bus interface	CAN-based bus for connection of extension units (e.g. I/O extensions)
Controller structure	
Number of control loops	max. 8 active control loops
Controller output	on/off; pulse (fixed pulse length, variable pauses); pulse width modulated; analog
Sample period	min. 100 ms
User configuration	parameter texts for inputs/outputs can be changed via file
Standard control / Supervisor functions	
RO Machine	
RO Alarms	
pH control features	PI control; continuous dosing through pulses
Further functionalities	password protection; filter; engineering units; alarm

Norms and standards	
Environment standards	IEC 68
EMC standards	EN 61000, EN 55011
CE mark	applicable tests resulting in CE mark
UL(for UL approved versions)	conform to Std. UL61010-1 Second Edition "Process Control Equipment"

1.5.2 Type Plate – Example



Device designation
Voltage and
Frequency range, admissible Current
Internal designation

Serial Number and ⚠ Attention! Consider the manual!
Order Number and Production Code



The UL Mark is necessary for marketing at the US and Canadian market.

This UL Mark certifies that the appropriate safety requirements are observed (for UL approved versions only).

1.5.3 Hardware Structure

This simplified block diagram shows the main hardware components of the 8620 mxCONTROL. The Pin assignment can be seen in the Appendices.

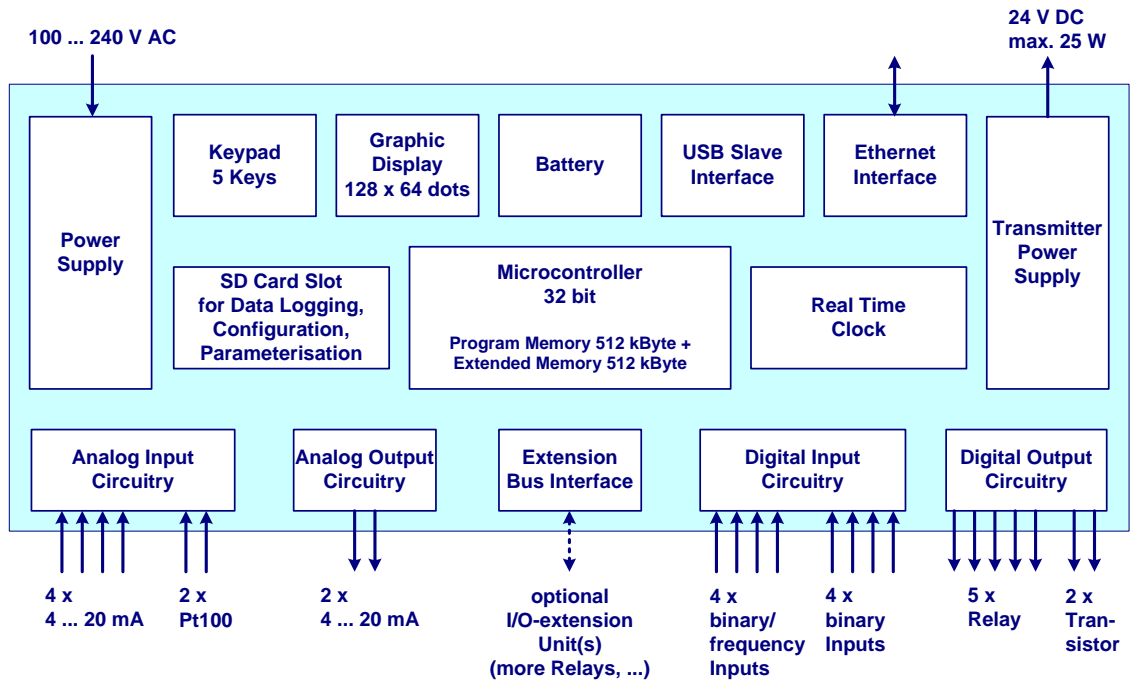


Figure 1: Block Diagram – Hardware Structure

2 Installation

2.1 Quick Start Guide



DANGER!

Danger from electrical voltage

Reaching into the system presents an acute risk of injury.

Always switch off the power before beginning with the work activities and secure it against being switched back on inadvertently! Obey the applicable accident prevention and safety regulations for electrical devices!



Obey the applicable accident prevention and ensure that **all electrical connections comply with local and plant regulations!**

Pay attention to **correct design of the fuse and/or the line safety switch** in the power supply line.

For dimensioning and installation of disconnecting switch, fuses etc. necessarily refer to the information in **chapter 2.3 “Electrical Connections”!**

- Install the **required sensors and other equipment**, according to the separate operating instructions.
- Prepare all **required wiring** according to the Pin assignment diagrams (see chapter 2.4 and appendix 11.1).
- Connect wiring as described in chapter 2.3.
- Switch on the voltage supply.
- **Load the configuration file** and the parameter file **from an SD card** (see chapter 6.2).
- **Set the clock** to local time (refer to the menu tree structure in chapter 11.4.7.).
- **Check/edit parameters and values** in the operating menu according to the menu description (see Chapter 4 and following) and module description (chapter 9).

2.2 Mechanical Installation

Open the cover by pressing with both thumbs the snap lock, then lift the cover.

For closing the cover press it down until you hear a click.

- 8620 mxCONTROL is designed for **wall mounting**. Figure 2 shows the preferred mounting position.



In North America, the device must not be installed directly at building walls! In this case use always appropriate backboards or switchboards/switching cabinets for mounting the device.

- **Direct sunlight** will reduce the **viewing contrast** at the display – although it is harmless to the display. Therefore find a **suitable location** before installing.
- The Controller is **not** designed to operate **below 32 °F (0 °C)**. If required it must be fitted into a thermostatically controlled cabinet to maintain the normal working temperature.
- Wall mounting is made possible by 4 holes, located one in each corner. Access to these holes is by opening the cover (see Figure 2).

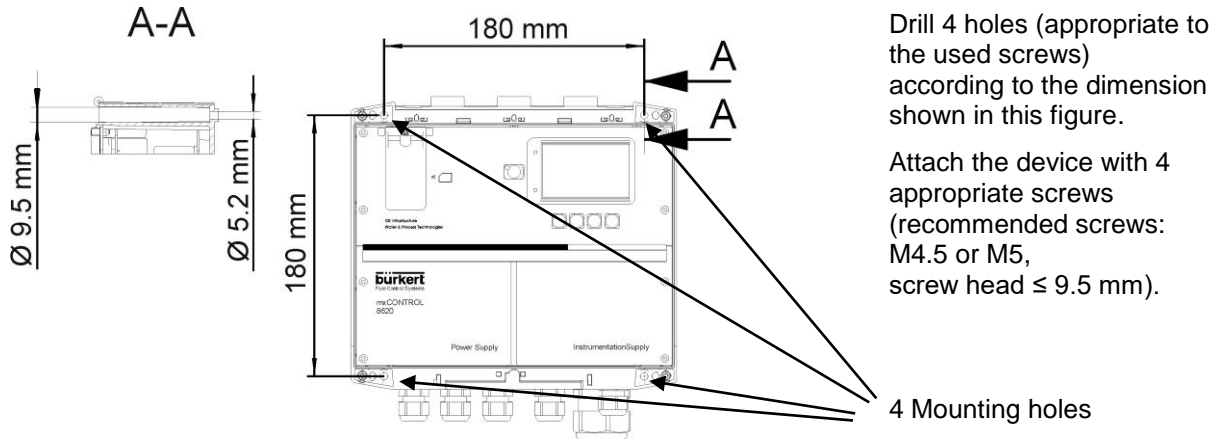


Figure 2: Mounting Dimensions

2.3 Electrical Connections



DANGER!

Danger from electrical voltage

Reaching into the system presents an acute risk of injury.

Always switch off the power before beginning with the work activities and secure it against being switched back on inadvertently!



Obey the applicable accident prevention and ensure that **all electrical connections comply with local and plant regulations!**

Dimensioning of fuses, line safety switches, overcurrent protection devices

Pay attention to correct design of the fuse and/or the line safety switch in the power supply line. The L- and N-conductors have to be protected with overcurrent protection devices (max. 10 A) as e.g. fuses, line safety switch etc.

Also install an **equipment for the disconnection of L- and N-conductors** from the power supply **near the 8620 mxCONTROL**. Therefor e.g. the above-mentioned overcurrent protection device or an appropriate disconnecting switch (110/240 V and with at least the size of current of the overcurrent protection device) can be used.

If the sum of extracted current of all connected actuators at the Power Supply side **exceeds the value of 10 A**, the actuators can be connected with a separate voltage supply for those actuators - please refer to the schemata in appendix 11.3.2.



In North America, devices with **UL certification** have to be used for these purposes.

The preferred position for the 8620 mxCONTROL is with the connectors downward facing. I.e. all the cable glands are located at the bottom of the controller.

- Access to the electrical connections is by removing the lower cover plate screws, and with the aid of the black shelf grip.
The push-in connectors for the power supply and the instrumentation supply are separated by an isolating plate (refer to the following figure).

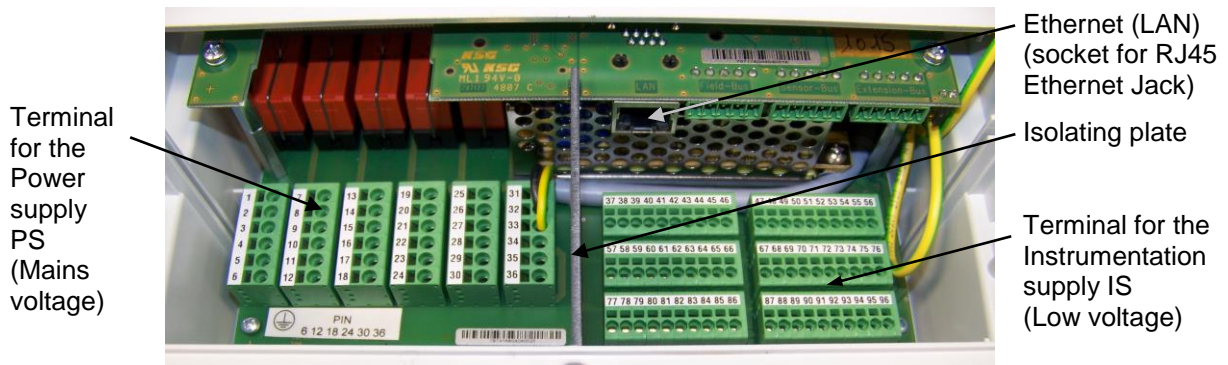


Figure 3: View of the 8620 mxCONTROL Terminal Compartment (cover removed)

- Use appropriate cables (with the recommended outer diameters for the different cable glands and the correct thermal stability (cable material) as described in the table in chapter 1.5.1).
- Unscrew the cable gland and remove the seal, then prepare the cables with end sleeves (see Figure 4) at the recommended length:
 - sleeve length for Power supply: 7 mm
 - sleeve length for Instrumentation supply: 5 mm.



Figure 4:
prepared cable with end sleeves

- Pass the prepared cable through the opening in the device and attach the cable at the push-in connector (see appendices for Pin assignment).
- After that screw the gland nut until it is tight and the cable is secure (clamping torque for cable gland M16: max. 6 Nm (clamping torque for cable gland M20: max. 8 Nm (clamping torque for cable gland M32: max. 10 Nm)).
- After clamping all required connections re-attach the plate and tighten the screws.



Important! Seal unused cable glands with **appropriate sealing bolts** – otherwise the **protection class** can't be guaranteed.

2.4 Pin Assignment for the Push-in Connectors

2.4.1 Power Supply (PS)



Figure 5:

Power supply terminal strip, with pin numbers indicated

PIN numbering	1 to 36
Terminal strips	push-in connector terminals
Terminal grid	5.0 mm, AWG 24 ... 12
Wire gauges - rigid wires	0.2 ... 4.0 mm ²
Wire gauges - flexible wires	0.2 ... 2.5 mm ²
PIN table	Table in appendix 11.1

Connect the cables as indicated in a chart in appendix 11.1 “Pin assignments for PS and IS” - see also chapter 8.

2.4.2 Instrumentation Supply (IS)

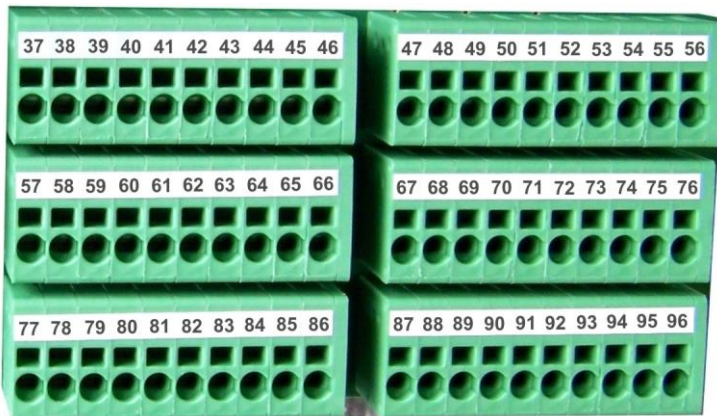


Figure 6:

Instrumentation supply terminal strip with pin numbers indicated

PIN numbering	37 to 96
Terminal strips	push-in connector terminals
Terminal grid	3.5 mm, AWG 24 ... 16
Wire gauges - rigid wires	0.2 ... 1.5 mm ²
Wire gauges - flexible wires	0.2 ... 1.5 mm ²
PIN table	Table in appendix 11.1

Connect the cables as indicated in a chart in appendix 11.1 “Pin assignments for PS and IS” - see also chapters 7 and 8.

For sensor inputs and analog 4...20 mA outputs **shielded cables** are recommended for best EMC. Connect the cable shields with the respective Pin “GND” for EMC.

2.5 Download of a Configuration and Parameter File

Before using the controller in an automation system for an RO Machine the appropriate configuration and parameter file has to be downloaded from the SD card delivered with the controller.

Downloading of configuration files is for the **Specialist Level only!**

Read chapter 3 (Description of Human-Machine Interface) and especially chapter 6.2 (Up- and Downloading of Configuration/Parameter Files) before.

3 Description of Human-Machine Interface

3.1 Operating and Display Elements

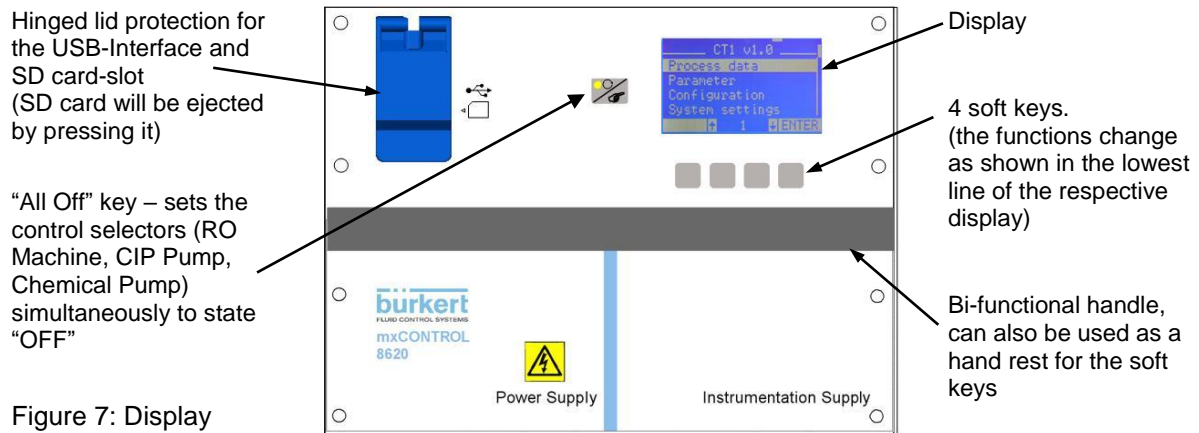


Figure 7: Display

Operating of the 8620 mxCONTROL is possible via 4 soft keys and the “All Off” key

The **brightness of the display** can be adapted in 10 steps to users needs in the main menu item “System settings”. The default brightness of “5” is recommended for increased display life time.

3.2 Operation Modes

The operation modes of the RO Machine are reflected in the controller.

The following table shows the available selections for the control selectors.

It is possible to change the operation mode of the control selectors “RO System”, “CIP Pump”, “Chem Pump” directly in the main menu item “Processdata”.

The “All Off” key sets the control selectors (RO Machine, CIP Pump, Chemical Pump) to state “OFF” simultaneously.

Process data (main menu item)		
RO System	OFF, AUTO, MANUAL, FILL, CIP	CIP is only selectable, if the parameter “Mode” is set to “Deluxe”
CIP Pump	OFF, AUTO, MANUAL	CIP is only visible/changeable, if the parameter “Mode” is set to “Deluxe”
Chem Pump	OFF, AUTO, MANUAL	
Parameter (main menu item)		
Mode	Economy; Deluxe	
Tanklevel Control	Discrete, Analog	
ChemCtrl dur. Flush	Enable, Disable	for “Chemical Pump Control during Flush”, if “Chem Pump” is set to “AUTO”

Chart 1: Operation Modes of control selectors

Yellow LED as part of the "All Off" key

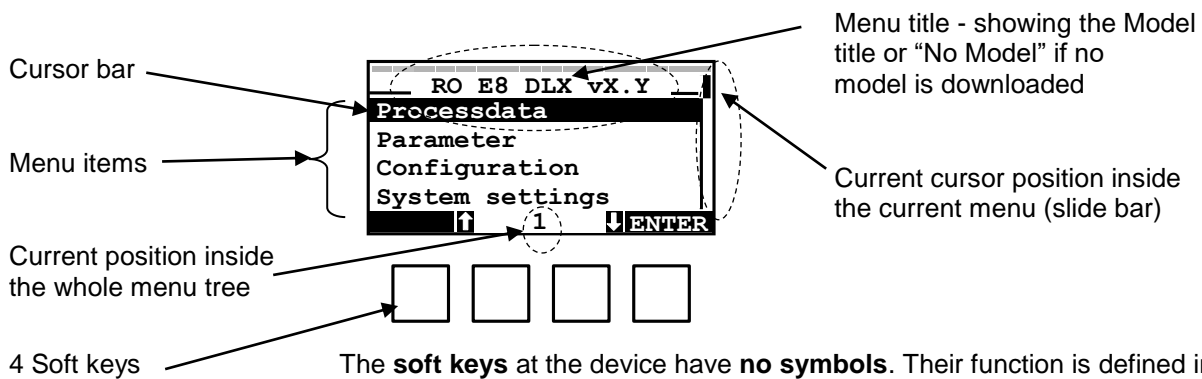


The "All Off" key sets the control selectors (RO Machine, CIP Pump, Chemical Pump) simultaneously to operation mode "OFF".

- | | |
|--------------|-------------------------------|
| LED on | → Controller ON, normal state |
| LED off | → Controller OFF |
| LED flashing | → ALARM (at least one alarm) |

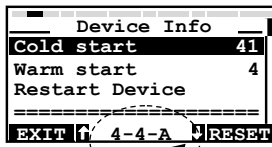
In **case of alarm** refer to chapter 10.1 "Alarm function" and following!

3.3 Layout of Menu Screens



The **soft keys** at the device have **no symbols**. Their function is defined in the bottom screen line, where the **current function of each key is displayed** as a text string or as a symbol.

For explanation of menu actions the keys have symbols/names, in the example above: *no function, Arrow up, Arrow down, ENTER*



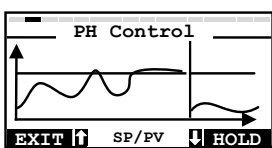
The **current position** inside the menu tree is shown in the middle of the bottom screen line.

The position is only visible if the user is scrolling through the menu. The soft keys "arrow up" and "arrow down" have up- / down-function.

The menu position/numeration can be shown up to depth of the **main menu and 4 submenus**, i.e. it is a 5-digit figure-letter combination and is displayed in the format: 4-4-A-1-7.

(The numeration of menu-item inside a menu goes from 1 to 9, higher positions are continued with large characters from "A" (=10), "B" (=11) to "Z" (=35) because of the limited space in display).

The font size of the current position string is adapted to current menu level depth.

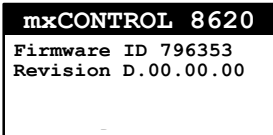


The **trend of the process value PV** from standard (4...20 mA) and frequency signal inputs is drawn into a chart and regularly updated.

A trend chart of set point and process value - the inscription ("SP/PV") only names the shown graph without identifying it to any soft key "HOLD" freezes the display.

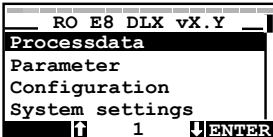
4 Menu Structure

4.1 Principle of Menu Tree Structure



This display – with the **actual revision No. of the software** - will be shown for approx. 4 seconds after powering up the 8620 mxCONTROL.

If the 8620 mxCONTROL is started for the first time the next display shows in the line “menu title” that “No Model” is loaded. In that case refer to chapter 6.2 about downloading of configuration and parameter files.



The main menu of 8620 mxCONTROL contains 7 menu items as starting points for displaying and setting of variables and parameters.

The first number in the bottom line of display is the number of the active main menu item (items 1 to 7).

The 8620 mxCONTROL has 4 digital (binary/frequency), 4 digital, 4 analog and 2 Pt100 inputs which can be configured to meet user’s needs.

The **configuration via the configuration file** is needed for enabling and labelling the desired inputs and outputs and for activation of special input functions. The scaling and filter settings can be done with the configuration file, too, but also directly at the 8620 mxCONTROL device.

The main menus items contain these submenus as listed below (for model RO E8 DLX vX.Y):

Main Menu	Submenus
1 Processdata	Displaying current configuration dependent process data: Inputs, Outputs and controller module specific process data views. 1-1 Inputs 1-2 Outputs 1-3 RO Machine 1-4 RO Alarms 1-6 PH Control 1-B Alarm Reset
2 Parameter (Operator level)	Access to parameters of configured controller modules. 2-1 RO Machine 2-2 PH Control
3 Configuration (Specialist level)	Access to configuration data of configured inputs, outputs and controller modules. Also access to Alarm Output, configuration and to Codes. 3-1 Inputs 3-2 Outputs 3-3 Control modules 3-4 Codes (for Password changing) 3-5 Communication
4 System settings	Language selection, Display settings, Factory Reset (Specialist level), Device information (Firmware Revision, Number of Restarts, Restart Device (Specialist level)). 4-1 Language 4-1-1 German 4-1-2 English 4-1-3 French 4-2 Display 4-2-1 normal 4-2-2 inverse 4-2-3 Brightness 4-3 Factory Reset (Specialist level) 4-4 Device Info 4-5 Network Info (Operator level)

5	Up/Download (Operator / Specialist level)	Upload / Download of Configuration file (Specialist level) Parameter file (Operator level) from / into 8620 mxCONTROL via SD card 5-1 Download 5-2 Upload
6	Data Logging (Operator level)	Start / Stop Data Logging on SD card, Setting of Data Logging Sample Time, Logfile settings (Specialist level required for some settings)
7	Calibration (Specialist level)	User calibration of 4-20mA outputs
8	Clock (Operator level)	Setting time and date.

All menu items are shown in the appendices (see appendix 11.3)

4.2 Setting numeric values

Numeric values can be set within predefined ranges for changing parameters - described in following chapters. Not all numeric values allow to move the decimal point.

The operator has to select the variable or parameter he wants to change with the soft key "ENTER".

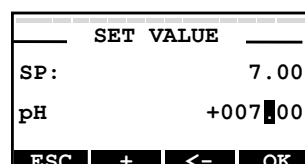
Before the operator can change the value of a parameter, he has to enter the **correct password**. For changing parameters in the parameter/configuration protection level the operator has to pass the password check only when entering the parameter/configuration protection level (see chapter **5 Password Protection**).

For changing parameters from process data level, the operator has to enter the correct password every time he wants to change a variable.

- If the password protection is passed, a special input screen is displayed. In this screen either the decimal point (if available) or the lowest numeral or character will be automatically selected as the first cursor position.
- The **current cursor position** is always displayed in **inverse colour**. It can be **changed step-by-step** by pressing the key "<-".
- If the **decimal point** is selected by the current cursor position, it can be moved step-by-step to the left by pressing the soft key "+".
- **Change the value** of a selected numeral/character by pressing the key "+".
- **Cancel** the whole setting process by pressing the key "ESC" (Escape).
- **Confirm** the whole setting process by pressing the key "ENTER".
- After **leaving** the setting process by pressing the key "ESC" or "ENTER" the original menu screen is shown again.

In this example soft key:

- 1 is "ESC",
- 2 is "+",
- 3 is "<-"
- 4 is "OK".



Soft key 1 2 3 4



Important!

The password protection is active again only after returning to the main menu!

5 Password Protection

There are 3 levels of human-machine-interface as a hierarchy design:
open access, **operator** access, **specialist** access.

A password is a 4 digit number. The operator has to enter the password of the **required protection level** in order to enter protected menus or menu items.
The specialist password also overrides the operator password.

Changing Passwords is described below.

Following user operations are **password protected** – see also table below:

- Editing parameters / configuration data
- Download/upload of parameter/configuration files
- Changing passwords
- Factory Reset
- Software Reset
- Data Logging
- Clock setting



Note! The “**Master Password**” cannot be changed and allows the user **access to all protected levels**. This Master Password is available at SUEZ Service.

Protection Level	Level name (Code)	Remarks
0	--	<p>Normal process level. Current process and control values are displayed. Following actions are allowed:</p> <ul style="list-style-type: none"> Acknowledgement of Alarms (e.g. Maximum Output Timer) and messages. Language Selection Display-Mode.
1	Operator (Factory set: 0001)	<p>In addition to protection level 0 the following actions are allowed:</p> <ul style="list-style-type: none"> Parameter access Up- and Download of parameter files Data Logging Setting Up Real Time Clock View of current basic network information
2	Specialist (Factory set: 0002)	<p>In addition to protection levels 0 and 1 the following actions are allowed:</p> <ul style="list-style-type: none"> Configuration access Up- and Download of configuration files User calibration of 4-20mA outputs Changing Passwords Factory Reset Software Reset View of current advanced network information

Changing Passwords

- Choose the main menu item "**Configuration**", enter with "ENTER".
- Input the **specialist code** by pressing the key "+" the required number of times (for multi-digit codes use also the key "<-"), then press "OK".
- Scroll for Menu item "**Codes**" with the "Arrow"-keys, enter with "ENTER".
- Choose the Operator or Specialist Level which shall be changed, then press key "INPUT".
- Input the **specialist code** by pressing the key "+" the required number of times, then press "OK".
- Set a **new value** for the code by pressing the key "+" (for multi-digit codes use also the key "<-"), then press "OK".
If the menu item was left by pressing key "ESC" the new value is not accepted!.
- Leave the menu item "Codes" by pressing "EXIT".

Refer also to the menu tree structure in chapter 11.4.3.

6 General Software Concept and Functions

6.1 Functional Overview

The 8620 mxCONTROL is a configurable multifunction controller. The functionality can be divided into 3 basic processing parts: the input, the control and the output processing part.

The **Input Processing Part** contains the reading of the enabled inputs and the processing from the raw value to the scaled process value. Also the alarm functionality for each of the inputs except binary and pulse inputs is processed in this part.

The **Control Processing Part** consists of 8 slots. Each **SLOT** can be configured to work as one of the 4 currently available **standard controller modules**. The modules RO_MACHINE and RO_ALARMS can be used only once in a configuration.

Each of the currently available controller modules has max. 2 process value inputs and max. 2 controller outputs, which are linked with the inputs and outputs as shown in the chart of the Pin assignments (in appendices 11.1)

The **Output Processing Part** is responsible for converting and transferring the virtual controller outputs to the configured real outputs. In doing so the outputs are controlled to output the configured output signal form.

For configuration and parameterization of these 3 basic processing parts refer to the following chapters.

6.2 Up-/Download of Configuration/Parameter Files

Download

Before using the controller in an automation system a (Standard Model) **Configuration File** has to be downloaded from the delivered SD card into the controller. **This is for the Specialist Level only!**

- Power up the 8620 mxCONTROL.
- Insert the SD card into the interface (SD-slot) under the hinged lid.
- Scroll in the main menu to the menu item “Up-/Download” and press key “ENTER”.
- Enter the **code** (operator code for parameter files or specialist code for configuration files).
- Select “Download” (by pressing “arrow”-keys), press key “ENTER”.
- Select (folder and) file:
 - Select folder “RO_Machine_vXXX”, press key “ENTER”.
 - Select one of the models (RO_E8_ECN_vXXX, RO_E8_DLX_vXXX, RO_E4H_vXXX), press key “ENTER”.
 - Select file “Cfg_RO_YYY_vXXX” for download into the 8620 mxCONTROL, press key “ENTER”
(in order to download a **new model** select first the configuration file “Cfg_RO_YYY_vXXX” of this model!).
 - Download of the configuration file is running. If download was successful the display shows the notification “Successful”, press key “EXIT”.
 - Select next file (e.g. Par_RO_YYY_vXXX), press key “ENTER”.
 - Download of the parameter file is running. If download was successful the display shows the notification “Successful”, press key “EXIT”. If necessary select next file, a.s.o.
- Leave the menu by pressing key “EXIT” (several times).

Refer to the menu tree structure in chapter 11.4.5.

Remove SD card by pressing – it will **eject!**

Upload

For saving parameter/configuration files use the function "Upload". Refer to the menu tree structure in chapter 11.4.6.



Note! Comments within a downloaded xml-file will not be stored in 8620 mxCONTROL – when uploading a file no comments are included!

- Power up the 8620 mxCONTROL.
- Insert an SD card into the interface (SD-slot) under the hinged lid.
- Scroll in the main menu to the menu item "Up-/Download" and press key "ENTER".
- Enter the code (operator level for parameter files or specialist level for configuration files).
- Navigate to the menu item "Upload", press key "ENTER".
- Confirm "Param-File" (operator level or "Config-File" for specialist level) by pressing key "START".
- Save the file to the current folder (marked with a single point ".") by pressing key "ENTER" or select another folder, press key "ENTER".
- If you want to save the file to a directory/folder, select "." inside the desired folder, press key "ENTER". 8620 mxCONTROL either uses the name of the last loaded file or creates an internal name for the file.
- If you want to overwrite an existing file with new data, select the desired existing file with "ENTER".
- If the file already exists, there will be a request for overwriting.
- Press "YES" for overwriting the file, press "NO" for creation of a new file name, whereas the file name is extended with "vXX". (XX is running from 01 to 99).
- Upload is running. ("EXIT" stops/cancels the upload process).
- If upload was successful the display shows the notification "Successful".
- Return to upload selection by pressing "EXIT".
- Select the next file for upload from 8620 mxCONTROL if desired.

6.3 Data Logging

The "Data Logging" function

- stores all important process values for **reading, checking and archiving**
- has to be **activated/enabled** for that functionality
- logs the data cyclically according to the set data logging sampling time "**Tsample**"
- logs the data event-triggered (for details refer to "Event Triggered Data Logging Function")

Each time the internal (volatile) 512-Byte-memory is filled, its content will be attached at the end of the datalog file on the SD card (formatted with FAT16) and will be saved then.

The Data Logging continues

- as long as the data logging function is activated
- as long as the SD card is filled - which causes an error message on the display
- as long data can be saved on the SD card - if the logged data cannot be written (anymore) to the SD card, data logging will be stopped and a corresponding error message is shown on the display.



The "**Tsample**" **sample time** has a factory setting of **3600 seconds**.

If the selected **sample time is too short**, an excessive data volume will be produced and may fill the memory capacity of the SD card very fast.

Therefore **select a sample time** that enables the SD card to be written with the data until the next change of the SD card or use an SD card with higher capacity (described in next section).

A **new set sample time gets active** when returning to the main menu.

No Up-/Download processes on SD-Card are possible if Data Logging was active.

The data is stored into the current log file "**8620-DEV_ID-DEV_SERIAL-INDEX.log**":

with:	DEV_ID	device ID number	(8 digits with leading zeros)
	DEV_SERIAL	device serial number	(7 digits with leading zeros)
	INDEX	log file index (00001...65535)	(5 digits with leading zeros)

The current log file name is displayed in the menu "Data logging\Logfile" under the item "Current".

The log file index "INDEX" can be increased manually by the operator in the same menu with the item "New logfile" (CodeLevel Operator) – in this case a new log file is started.

If data logging was disabled the log file index can be adjusted (CodeLevel: Specialist); e.g. in order to restore manually the old log file index after a firmware update or a factory reset.

The data can be selected, indicated, edited with PC and also archived externally if necessary.



Log files are stored in the root directory of the SD card. The root directory can contain approximately max. 100 entries (files and folders; each file / folder name has max. 31 characters).

The **layout of the data logging file**, the abbreviations and the coding used in the header are shown in an **example in appendix 11.5**.

Automatic log file size limitation (FSizeLimit = Yes)

A new log file is started automatically by increasing the log file index, if data logging was active **and** the current log file size exceeded the maximum log file size FSizeMax.



Back up older log files in time from SD card on PC.
If permitted, delete them afterwards on SD card.

Event Triggered Data Logging Function

An integrated **Event Triggered Data Logging Function** logs a complete set of process data with max. 10 s delay, after a specific event was triggered.

Such specific events are:

- Occurrence / Disappearance of an alarm.
- Occurrence of important error messages
 - Battery Failed / RTC Failed / Check Clock!
 - Eeprom Fault XXY
 - Error ISR timing!
 - Calibdata Fault 4-20mA In / Pt100 in / 4-20 mA Out
 - 4-20mA Out X failed
 - RO All Off
- Changing operational mode / RO Control selectors
- Switching on/off of an output, which is configured as an On/Off output
- Communication events and errors (devices with Ethernet only)
 - Start / end of incoming / outgoing connection
 - Changes of net link status
 - Important communication error messages
- Miscellaneous events
 - Start / end of user calibration of 4-20mA outputs
 - Changes of RO Status

The event triggered data logging function can be enabled / disabled and configured by means of configuration. For details refer to section "Configuration".

Parameter (CodeLevel: Operator)

Parameter	Access via Datalog-menu	Access via XML-Param.-File	Abbreviation (menu)	Range	Default values (after factory reset or at start of Param-File-Download)
Datalog Logging SD-Card	rw	--	--	enable/disable	Disable (only after factory reset)
Sample Time	rw	rw	Tsample	10 ... 99999sec	3600sec (*)
Logfile					
Current log file name	r	--	Current	--	--
Increase log file index by one (Creates new log file)	w	--	New Logfile	--	--
Automatic log file size limitation	rw	rw	FSizeLimit	Yes / No	No
Max. log file size	rw	rw	FSizeMax	0.1 ... 100.0 MB	1.0 MB

(*) Default value also after successful download of Cfg-File

Configuration (CodeLevel: Specialist)

Configuration	Access via Datalog-menu	Access via XML-Cfg.-File	Abbreviation (menu)	Value range	Default values (after factory reset or at start of Cfg-File-Download)
Log File					
Log file index (**)	rw	--	LFI	1 ... 65535	1 (only after factory reset)
EventLog					
Event Log function	rw	rw	EventLog	On, Off	On
Log Events (*)					
Alarms	rw	rw	Alarms	On, Off	On
Important error messages	rw	rw	ErrorMsg	On, Off	On
Switching Operational Mode	rw	rw	OpMode	On, Off	On
Switching of On/Off outputs	rw	rw	O/O outputs	On, Off	On
Communication events / errors	rw	rw	Comm	On, Off	On
Miscellaneous	rw	rw	Misc	On, Off	On

(*) Only displayed, if Event Log function was set to On.

(**) Only displayed, if Datalogging was disabled

6.3.1 Selection of SD card size for Data Logging purposes

The size required for one process data sample depends on the current configuration and the sample time. Every Tsample seconds a new sample of process data is written into the internal volatile Data Logging memory.

$$\text{Required free memory in [kByte]} = (\text{LogsPerDay} * \text{Days} * \text{SampleData}) + (\text{NOC} * \text{HeaderData}) + 1024 \text{ kByte}$$

with $\text{LogsPerDay} = \frac{86400\text{s}}{\text{Tsample}} + \text{NOE}$

NOE "Number Of trigger Events per day" which forces a new process data sample to be written.

For trigger events refer to above section "Event Triggered Data Logging Function".

Tsample Data Logging Sample Time in seconds

Days Number of Days to be logged

SampleData See below

NOC "Number Of Changes": Number of events requiring a new "header" in the data log file

HeaderData See below

86400 s = 24 h = 1 day

$$\text{Required free memory in [MByte]} = \text{Required free memory in [kByte]} * \frac{1\text{MByte}}{1024 \text{ kByte}}$$

It is:

SampleData - storage capacity required on the SD card to log 1 process data sample after Tsample has run down and

HeaderData - storage capacity required on the SD card to log 1 header + 1 process data sample.

That means, a **new header and a current process data sample** is written each time, when:

- enabling the Data Logging
- or if Data Logging already was enabled:
 - returning to the Main Menu after configuration and/or parameter were changed
 - the download is finished successfully / is cancelled / failed

SampleData in [kByte] = 0.15 kB
HeaderData in [kByte] = 1.20 kB + SampleData

Estimation for a blank SD card, formatted with FAT16 file system:

Required SD card size [MByte] $\geq \frac{\text{Required free memory [MByte]}}{0,9}$, resulting in:

Free SD card memory [MByte] = 0,9 * SD card size [MByte]

Estimation, how many days the SD card will suffice:

$$\text{Days} = \frac{\left(\text{Free SD card memory [MByte]} - 1\text{MByte} \right) * \frac{1024 \text{ kByte}}{1\text{MByte}} - (\text{NOC} * \text{HeaderData})}{\text{LogsPerDay} * \text{SampleData}}$$

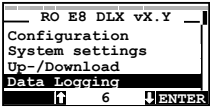
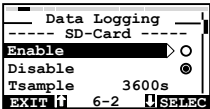

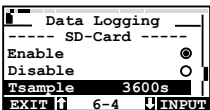
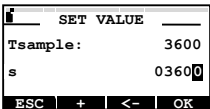

Example:


An **empty 64MByte SD card**, formatted with the FAT16 file system, with a free SD card memory of 0.9 * 64 MByte can receive the logging of process data of an usual RO Machine configuration (SampleData = 0.15 kB, HeaderData = 1.2 kB) at an estimated number of 1000 NOC (Number Of Changes = special events):

- with disabled event triggered datalog function:
 - approx. 43 days with TSample = 10 sec or
 - approx. 7 years with TSample = 600 sec = 10 min
- with enabled event triggered datalog function and estimated number of 1000 NOE (Number Of trigger Events per day – corresponds approx. with switching on and off each of 5 on/off outputs 4 times per hour):
 - approx. 39 days with TSample = 10 sec or
 - approx. 10 months with TSample = 600 sec = 10 min

6.3.2 Start of Data Logging (enabling)

To enable the Data Logging function proceed as stated below.
An example for the data logging layout can be seen in appendix 11.5.

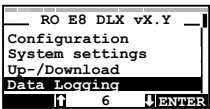
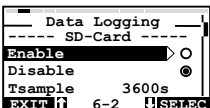

	→ Insert an SD card (formatted with FAT16) with enough free memory into the SD card slot under the hinged lid
	→ Scroll in the main menu to the menu item "Data Logging" (via "arrow" keys), press key "ENTER".
	→ Enter the operator or specialist password (via keys „+“ and „<-“)
	→ Select „Enable“ of Data Logging, press key "SELEC"
	 The Data Logging function is activated immediately! The active function is indicated by a symbol top left on the display . It is now possible to select another menu item (except Up-/Download) because the Data Logging function is running in the background until being disabled.
	Changing sample time: → Select „Tsample“ , press key "INPUT"
	→ Input a new value for „Tsample“ (via keys „+“ und „<-“), press key „OK“
	 New settings of Tsample apply when returning to the main menu!
	→ „ESC“ cancels the function of setting a new value for Tsample, the new value for Tsample will not be applied.
	→ Leave the submenu by pressing key "EXIT".

 **Do not remove the SD card** if the Data Logging function is active!
 Otherwise the logged data could be lost and the directory structure of the SD card could be damaged up to a non-readability of the SD card.

 When **changing the SD card** the Data Logging has to be enabled again (notice the symbol top left on display).

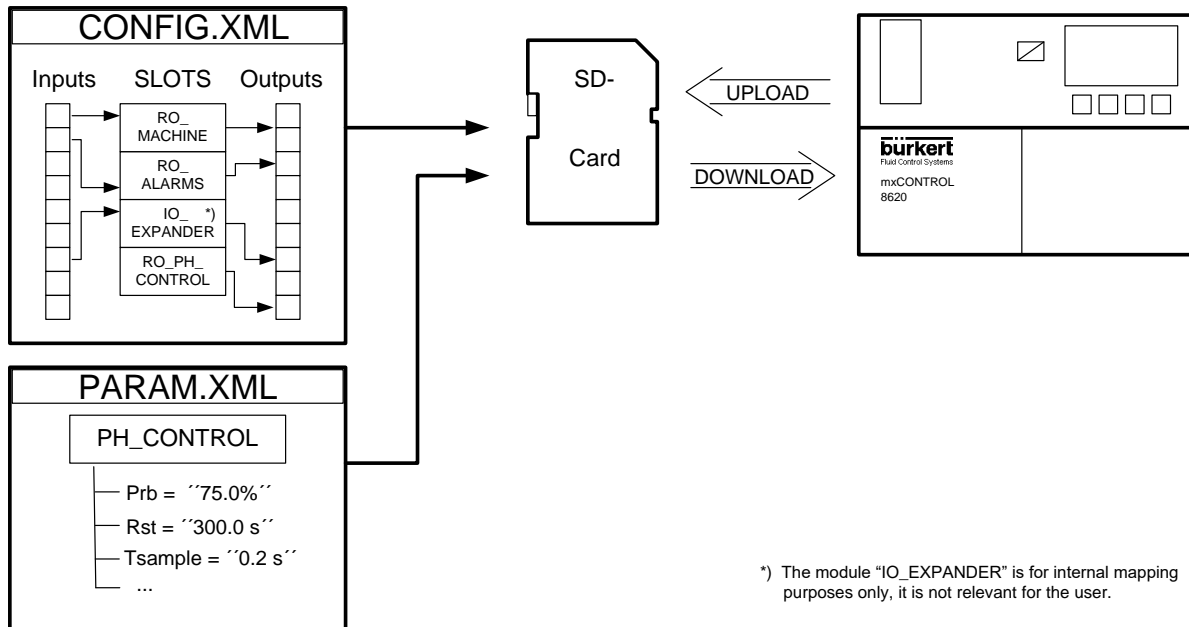
6.3.3 Stop of Data Logging (disabling)

To disable the Data Logging function proceed as stated below.

	→ Scroll in the main menu to the menu item "Data Logging" (via "arrow" keys), press key "ENTER".
	→ Enter the operator or specialist password (via keys „+“ and „<-“)
	→ Select „Disable“ of Data Logging, press key "SELEC"
	 The Data Logging function is deactivated immediately! The symbol top left on the display vanishes.
	→ Leave the submenu by pressing key "EXIT". Remove the SD card for processing of the file on a PC.

6.4 Configuration and Parameterization

The configuration (**Specialist Access only**) can be done with a **special configuration text file** (XML style), which can be downloaded into the device from an SD card or via USB.



This allows an identical **configuration** can be applied to more than one device. It is also possible to upload the current configuration file from the 8620 mxCONTROL.

The **parameterization** can be done separately in the same way. It is possible to change only the parameterization with one file, e.g. for optimizations and download it into the device. It is also possible to upload the current parameters from the 8620 mxCONTROL. Furthermore this device can be parameterized by using the soft keys.

Firmware updates are handled via USB.

6.4.1 Configuration and parameter text files (XML style)

The XML-style configuration and parameter text files are divided into different parts containing special information. Each part is marked with a **specific beginning tag** (<tagname>) and a **specific ending tag** (</tagname>). Each part can contain other complete parts. Therefore a special tree structure can be built with these tags.

So different configuration and parameterization information are placed in a **certain tree structure** in order to improve readability and comprehensibility of these files.

The main parts are:

- FILE with the part CONFIGFILE or PARAMFILE
- CONFIGFILE with the parts INFO, DEVICE_CFG, INPUTS, OUTPUTS, SLOTS
- PARAMFILE with the part SLOTS

For example: The part **INPUTS** begins with

<INPUTS> and ends with </INPUTS>.

Also the **configuration text file** itself is a big part and starts so after a short preamble for the used xml version with the beginning tag <FILE> and ends with the ending tag </FILE>.

```
<?xml version="1.0" ?>  
<FILE>  
<CONFIGFILE>  
<INPUTS>  
...  
</INPUTS>  
...  
</CONFIGFILE>  
</FILE>
```

Each part contains certain other parts and certain parameters. Values of parameters have to be set in the following form:

ParameterName="Value"



Note! The **number of characters** per line in the configuration text file is **restricted to 45!**

Each beginning/ending/comment **tag** and each parameter name has to start at the **beginning of a new line**.

One-line comments have to be created in the following way, whereas the line has to begin with "<!-- -" and has to end with "-->", e.g.:

```
<!-- - One line comment -->
```

Multi line comments have to have their start and ending tags in different lines:

```
<!-- First comment line  
Second comment line  
Third comment line  
-->
```

The configuration text file can be opened for **editing purposes** with any ordinary text editor (e.g. MS Windows: editor "Notepad").

For **verifying the completeness** and right order of beginning and ending-tags you can use e.g. the Internet Explorer (from Version 6.0).

6.4.2 Input-Controller-Output-Configuration with the configuration text file

CONFIGFILE

The configuration has to be adapted on the PC in the configuration text file in the part CONFIGFILE. Control functions are called "**SLOTS**" in the context of the configuration text file. **Each SLOT can contain one controller module**. Up to 8 slots are configurable.

The maximum number of realisable control functions depends on the **required input/output configuration** of the selected controller modules. The selected controller module defines the number of required inputs and outputs.

So the configuration file begins with the configuration of the **signal inputs** concerning signal source, naming, input type, filter, inversion and scaling.

The configuration of the **desired outputs** follows with activation, naming and mode settings (for relays: On/Off, PWM, or Pulse-output) for the outputs.

PARAMFILE

The **parameters** of the controller modules have to be set in the parameter text file in the part PARAMFILE slot by slot.



Note!

Using the available standard configuration and parameterization files enable a **simple default setup** of the 8620 mxCONTROL models. These files can be easily adjusted to special needs by using the device's keys and display.

6.4.3 Operating Language

Pre-selection of the operating language is done in the configuration file.

The language can also be changed by an operator in the **System settings menu** at the device. Available are the languages **English, German, French**.

6.4.4 Factory Setting of Parameters and Factory Reset

The command "**Factory Reset**" **deactivates (deletes) the current configuration and parameterization**. Also the all the **parameters** and the **codes are reset to default values**.

The continuation of the operating as controller is possible after downloading of a configuration and parameterization from the SD card!.

The command "**Factory Reset**" exists under the main menu item "System Settings". It is password protected (CodeLevel: Specialist).

6.5 Communication

6.5.1 USB

Device access via USB allows putting the 8620 mxCONTROL device easily into service. This functionality is available from Firmware Rev.D.00.00.00.

Functionality

Please refer to chapter 6.5.3 "(Remote) Device access via PC-Tool".

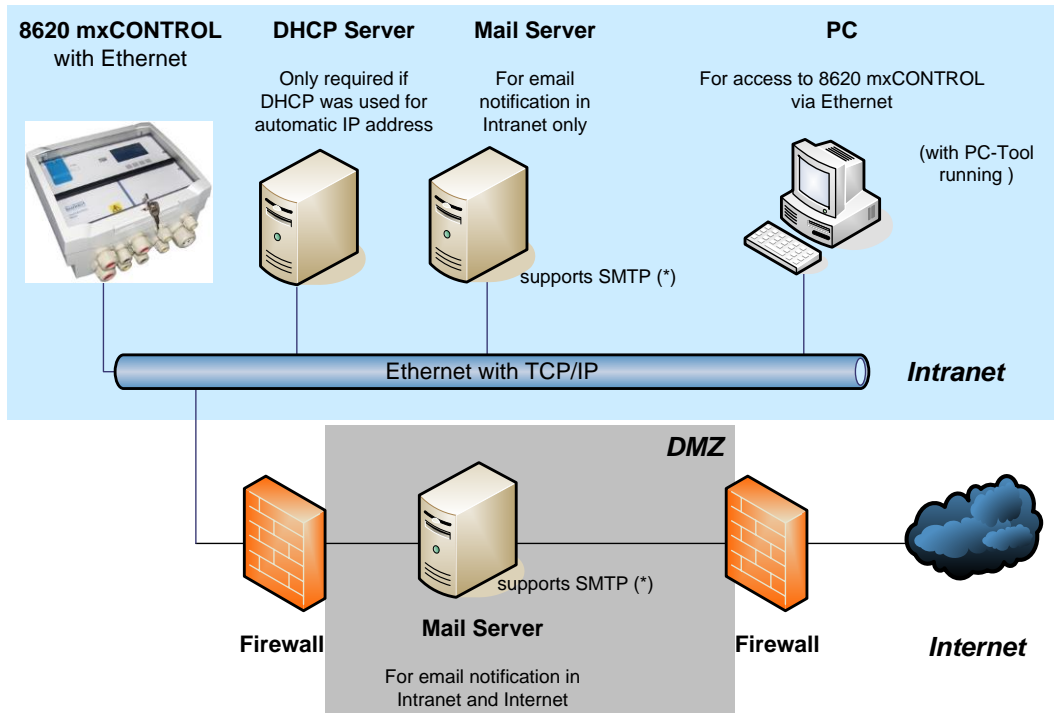
Configuration (CodeLevel: Specialist)

This configuration menu is located under the menu item "Configuration\Communication\USB".

Configuration	Access via Cfg.-menu	Access via XML-Cfg.-File	Abbreviation (menu)	Value range	Default values (after factory reset)
USB device access (via PC-Tool)	rw	--	PCTool Access	On, Off	On

6.5.2 Ethernet (only devices with Ethernet)

8620 mxCONTROL devices with Ethernet offer remote access and email notification possibilities.



(*) The 8620 supports following non-encrypted SMTP-Authentication methods: No Authentication, LOGIN, PLAIN.

Figure 8: Remote access and Email notification possibility (with Ethernet option)

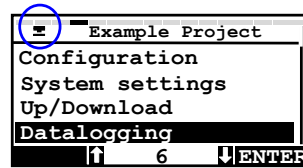
Features








Feature	
Operational Speed	10 / 100 Mbps (auto negotiation)
IP address assignment	Static (recommended) or dynamic (DHCP). A DHCP server is required for dynamic IP address.
Email notification	For alarm / warning / error and restart information. A SMTP mail server is required for sending emails to intranet and internet. The 8620 mxCONTROL supports the following unencrypted SMTP authentication methods: No authentication, LOGIN, PLAIN. (For details refer to "Email notification")
Device access	With PC-Tool via Serial Tunnel and TCP/IP over Port 10001. (For details refer to "Remote device access via PC-Tool")
Security	<ul style="list-style-type: none"> - Code protected device login via PC-Tool : CodeLevel + Code - Automatic logout after 5 minutes of no action (except if remote control was active) - Automatic disconnection after 5 minutes without login - No encryption of data transmitted over TCP/IP - DMZ (Demilitarized Zone) or VPN (Virtual Private Network) are not supported – therefore an external gateway with the necessary functionality is required.

Display of Ethernet state

The following list shows the displayed **symbols for the current ethernet state**.

The symbol for the Ethernet remote state is located in the upper left corner of the display, right beside the datalog symbol.



Symbol	Description
	Ethernet function disabled / not supported (devices without ethernet option)
	Ethernet function enabled, initializing / checking network status
	No network detected
	Ethernet ready
	Incoming connection (e.g. from PC-Tool)
	Outgoing connection (to SMTP mail server)
	Update mode active (e.g. for firmware update of ethernet component)

Following additional information can be found in the menu “System settings \ Network info” (CodeLevel Operator or Specialist required):

Device	- Current IP address and subnet mask - MAC address (*) - Firmware revision of ethernet module (*) - Update Mode (*)
Connection	- IP address which the device is currently connected with (0.0.0.0 if there is no connection or IP of incoming connection could not be detected) - Current Gateway IP address
Send test email	Initiates transmission of a test email (only visible, if email notification is enabled)
State (*)	of internal ethernet state machine

(*) only visible with CodeLevel Specialist

Email notification

Requirements

A mail server is required, that

- supports SMTP (Simple Mail Transfer Protocol) with one of the following unencrypted authentication methods: No authentication, PLAIN, LOGIN.
- is reachable by 8620 mxCONTROL from the Intranet

For transmission of emails outside the local network (e.g. to the Internet):

- Local network safety mechanism allows transmission of emails to the outside
- If a local SMTP mail server in the Intranet was used: This server has to be configured to allow email messages at least for these certain external addresses and to forward them to the outside.

Functionality

An email transmission is caused by a trigger event.

There are 3 kinds of email types which differ in the transmission trigger events - refer to the following table for details.

Email type	Trigger events
Email 1	Occurrence of a new alarm: <ul style="list-style-type: none"> - Input alarm - Module alarm - Output alarm
Email 2	Occurrence of a new warning <ul style="list-style-type: none"> - Input warning - Module warning Displayed important error messages: <ul style="list-style-type: none"> - Battery Failed / RTC Failed / Check Clock! - Eeprom Fault XXY - Error ISR timing! - Calibdata Fault 4-20mA In / Pt100 in / 4-20 mA Out - 4-20mA Out X failed - Datalog IS NOT ACTIVE SD errors during datalogging: <ul style="list-style-type: none"> - SD: Disk is full / Error Writing! / Error Open File / Error Sync / No SD-Card detected
Email 3	(Re)start of the device.
Test email	Initiated by operator from menu "System settings \ Network info \ Send test email" (CodeLevel Operator required)

Each email contains additional information on the device and the trigger event (for examples refer to "...Email examples"). Emails are created in English only.

The emails are always transmitted to all configured recipients (max. 2 recipients possible).

The priority and the subject of emails 1 - 3 are user configurable.

The transmission of not required email types can be deactivated by setting the corresponding Trigger parameter to Off.



! Emails will only be transmitted, if there is no remote device access via Ethernet (with the PC-Tool).

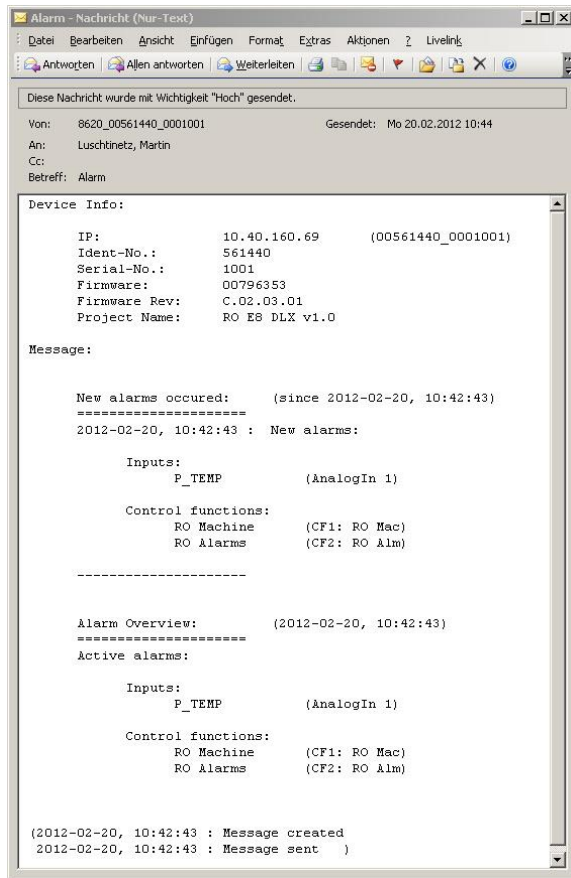
Up to 4 emails can be sent with one server connection. There is a 5 second mail server reconnection delay, in order to enable external device access in worse case of continuous new trigger events. The reconnection delay is set to 30 sec / 10 sec in case of failed mail server connection / communication.

If a connection to the mail server was delayed or failed the latest event information is kept and updated in a volatile memory – for a later reconnection. Refer to the following table for details.

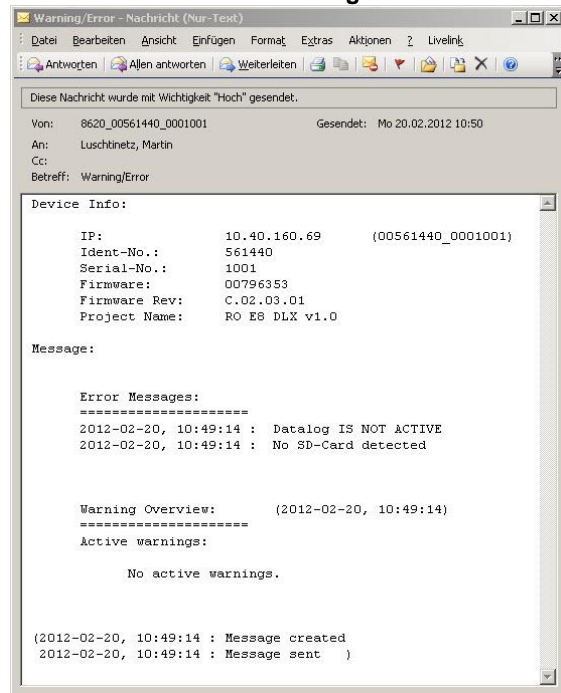
Email type	In case of failed / delayed connect to the mail server - stored for a reconnect
Email 1	- Last 5 alarms - Information, which former alarms occurred at least once since last transmitted email 1
Email 2	- Last 5 warnings - Information, which former warnings occurred at least once since last transmitted email 2 - Last 10 displayed important error messages
Email 3	- Device (re)start timestamp

Email examples

Email 1 – Alarm



Email 2 – Warning/Error



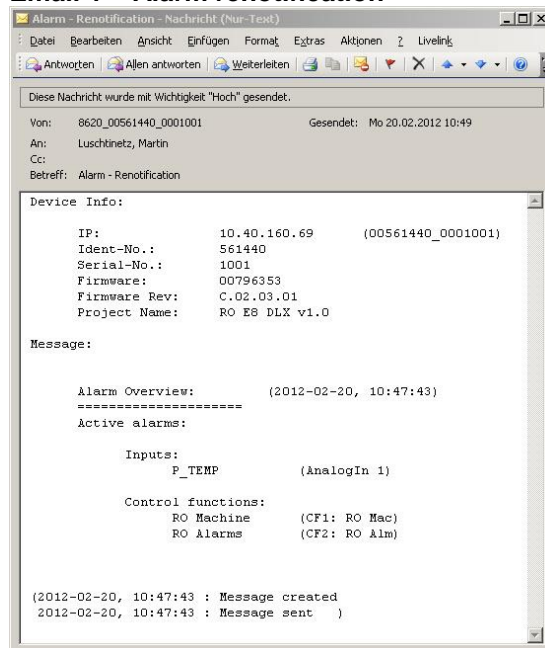
Renotification

A renotification interval can be configured for email 1 and email 2.

If at least one of the alarms (email 1) or warnings (email 2) is still active and the corresponding renotification timer expires, the corresponding email will be re-sent. A new trigger event resets the corresponding renotification timer.

The email contains information on the device and an overview of current active alarms (email 1) or warnings (email 2).

Email 1 – Alarm renotification



Remote device access via PC-Tool

Requirements

- Access to the local Ethernet network, in which the 8620 mxCONTROL device is located
- Network safety regulations allow traffic on TCP/IP port 10001
- IP address of 8620 mxCONTROL device is known
- Unique DHCP host name of 8620 mxCONTROL device is known (if Static IP = No)

Functionality

Please refer to chapter 6.5.3 (Remote) Device access via PC-Tool.

Datalogging

The datalog file of devices with Ethernet contains 2 additional columns: “Ethernet state” and “Ethernet event”.

Ethernet state

Ethernet state	Description															
-1	Ethernet function disabled															
0	Unknown state															
1	Ethernet module is initializing / periodically checking network status															
5	Ethernet function enabled, but no net link available															
9	Disconnecting a connection															
10 - 13	Ethernet ready <table border="1" data-bbox="395 1339 916 1514"> <thead> <tr> <th></th> <th>PC-Tool Access</th> <th>Email notification</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>off</td> <td>off</td> </tr> <tr> <td>11</td> <td>on</td> <td>off</td> </tr> <tr> <td>12</td> <td>off</td> <td>on</td> </tr> <tr> <td>13</td> <td>on</td> <td>on</td> </tr> </tbody> </table>		PC-Tool Access	Email notification	10	off	off	11	on	off	12	off	on	13	on	on
	PC-Tool Access	Email notification														
10	off	off														
11	on	off														
12	off	on														
13	on	on														
20	Outgoing connection to mail server															
30	Incoming connection (e.g. from PC-Tool)															
50	Ethernet module in update mode															

Ethernet event

The column “Ethernet event” contains e.g.

- the last displayed ethernet messages (max. 5)
- the email recipients, if emails were successfully sent
- start / end of incoming connection (PC-Tool access)

Configuration (CodeLevel: Specialist)

Configuration	Access via Cfg.-menu	Access via XML-Cfg.-File	Abbreviation (menu)	Value range	Default values (after factory reset or at start of Cfg-File-Download)
Ethernet functionality	rw	--	Ethernet	On, Off	On
Remote device access (via PC-Tool)	rw	--	PCTool Access	On, Off	On
Settings (#)					
Static IP address	rw	rw	Static IP	Yes, No	No
Device IP address (*)	rw	rw	IP	0.0.0.0 ... 255.255.255.255	0.0.0.0
Subnet mask (*)	rw	rw	SNM	255.0.0.0 ... 255.255.255.254	255.255.255.0
Gateway IP address (*)	rw	rw	Gateway IP	0.0.0.0 ... 255.255.255.255	0.0.0.0
DHCP host name (**)	rw	rw	DHCP host name	max. 16 characters [a-zA-Z0-9_-] - for default value leave string empty	ID_SERIAL with (****)
Notification					
Notification via email	rw	rw	Via email	Yes, No	No
SMTP mail server (#) (***)					
IP address of mail server	rw	rw	IP	0.0.0.0 ... 255.255.255.255	0.0.0.0
Port number for SMTP	rw	rw	Port	0 ... 65535	25
SMTP authentication method (ASMTMP)	rw	rw	ASMTMP	No, LOGIN, PLAIN	No
Email account: User name (**** *)	rw	rw	User name	max. 39 characters [a-zA-Z0-9_@.-]	
Email account: Password (**** *)	rw	rw	Password	max. 15 characters [a-zA-Z0-9_@.-]	
Email (***)					
Device's sender address (#)	rw	rw	From (sender)	max. 47 characters (**** *) [a-zA-Z0-9_@.-]	
Recipient 1	rw	rw	To (recipient 1)	max. 39 characters [a-zA-Z0-9_@.-]	
Recipient 2	rw	rw	To (recipient 2)	max. 39 characters [a-zA-Z0-9_@.-]	
Email 1, Email 2, Email 3 (***)					
Email Trigger	rw	rw	Trigger	On, Off	On
Email priority (for display in email program on PC)	rw	rw	Priority	1 (highest) ... 5 (lowest)	1
Renotification interval (****)	rw	rw	ReNotify	0 (off) ... 10800 min	0 min
Email subject	rw	rw	Subject	max. 23 characters [a-zA-Z0-9_./!+*-]	Email 1: Alarm 2: Warning/Error 3: Device Restarted

(#) Ask your local network administrator for the right settings.

(*) Only visible, if Static IP = Yes

(**) Only visible, if Static IP = No

(***) Only visible, if Via email = Yes

(****) Only available for email 1 and email 2

(*****) ID = Device ident no. (8 digits with ledig zeros),

SERIAL = Device serial no. (7 digits with ledig zeros)

(*****) Empty string activates default sender address: 8620_ID_SERIAL with (*****)


(*****) Only visible, if ASMTMP = LOGIN or ASMTMP = PLAIN


6.5.3(Remote) Device access via PC-Tool

Remote device access allows operating the controller via Ethernet (devices with Ethernet option only) or via USB.

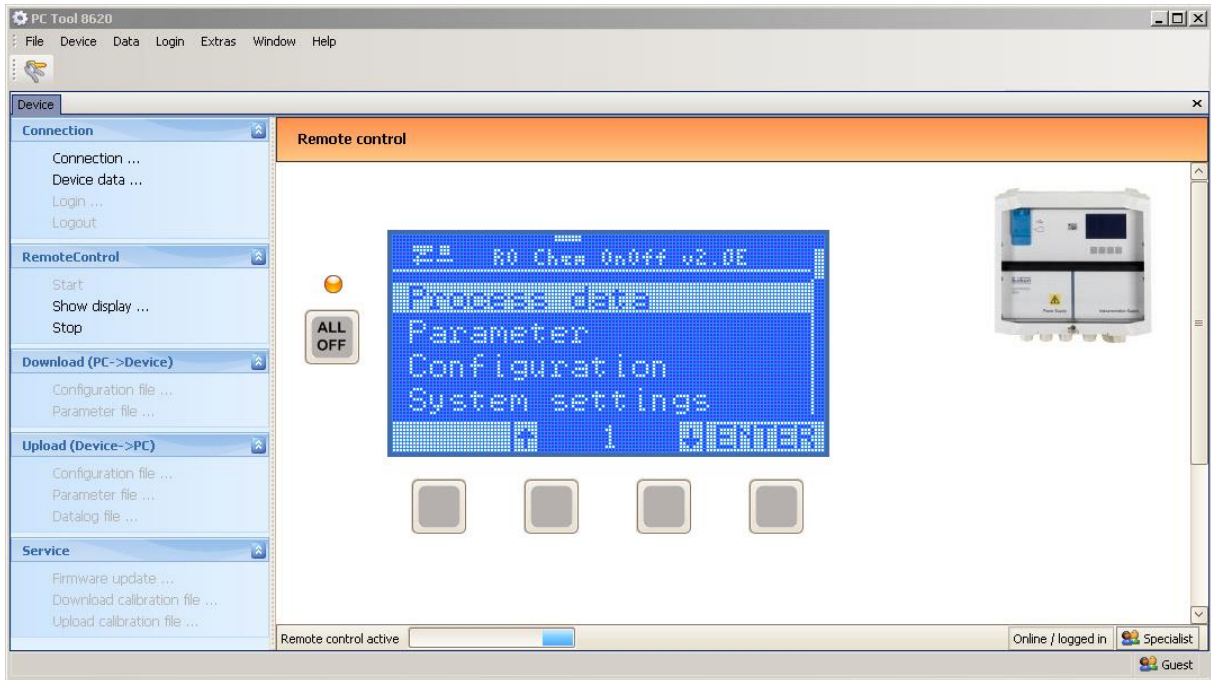
Remote device access can be disabled only directly at the device – in the configuration menu:

USB: Configuration \ Communication \ USB \ PCToolAccess On (default) / Off
 Ethernet: Configuration \ Communication \ Ethernet \ PCToolAccess On (default) / Off

 Configuration of PCToolAccess is not stored in the configuration file.
 The PCToolAccess has to be disabled manually again in case of factory reset.
 The device can handle only one remote device access at one time.

 For PCTool installation and operation please refer to chapter 12.

Function overview



PC Tool menu item	Explanation
Connection	One connection possible at one time.
Connection ...	Establishing / closing a connection to a device. Devices with Ethernet option: The user has to input IP address and the port number of the desired device. An integrated address book function supports easy device access.
Device data ...	Display of current device ID & serial number, Firmware ID & revision
Login	Device login window with selectable login level (Operator / Specialist / Master) and code input.
Logout	Device logout.

PC Tool menu item	Explanation
Remote Control	Current device display is shown in the PC-Tool, too. Navigation with keys like standing directly in front of the device, including code input for accessing code protected menus. Device keys have priority. Yellow LED displays operation mode / alarm status. Device login level Operator or higher required.
Download (PC-> Device)	Download corresponding file from PC into device. Corresponding device login level required:
Configuration file	Specialist or higher
Parameter file	Operator or higher
Upload (Device->PC)	Upload corresponding file from device to PC Corresponding device login level required:
Configuration file	Specialist or higher
Parameter file	Operator or higher
(Data)Log file	Operator or higher Upload of complete file or of a special time selection. Remote deletion of (data)log file on SD Card possible (CodeLevel: Specialist). For deletion of current datalog file, data logging needs to be disabled.
Service	PC-Tool login level Specialist or higher required for following sub items. Corresponding device login level required:
Firmware Update	Only via USB connection. Not available via Ethernet connection.
Download calibration file	Master
Upload calibration file	Master

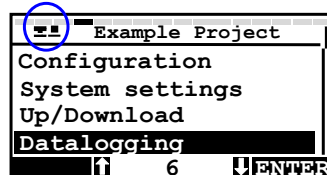
Display of current state








Do not change parameters / values, when remote upload or download is active.

The following list shows the displayed **symbols for the current remote state**.

The symbol for the remote state is located in the upper left corner of the display, right beside the Ethernet status symbol.



Symbol	Description
	Remote user is logged in
	Remote Download is active
	Remote Upload is active
	Remote Control is active
	Remote Access is active (reading log files on SD card)

7 Inputs

The 8620 mxCONTROL has 4 digital (frequency/binary), 4 digital (only binary), 4 analog (4...20 mA) and 2 Pt100 inputs which can be configured to users needs.

The **configuration via the configuration file** is needed for enabling and labelling the inputs and for activation of special input functions. The scaling and filter settings can be done with the configuration file, too, but also directly at the 8620 mxCONTROL device.

The input assignment is fixed as the following table shows:

Inputs	Tag	Abbreviation	Scaled Range	Remarks
DigIn 1 Digital Input (Frequency)	CONCENTRATE FLOW	CONC_F	0 ... (max.)125GPM	GPM = US gallons per minute The upper value of the scaled range is configurable.
DigIn 2 (Frequency)	PERMEATE_FLOW	PERM_F	0 ... (max.)250GPM	
DigIn 3 (Binary)	LOW INLET PRESSURE	L_INLT	--	
DigIn 4 (Binary)	HIGH CONCENTRATE PRESS	H_CONC	--	
DigIn 5 (Binary)	HIGH PERMEATE PRESS	H_PERM	--	
DigIn 6 (Binary)	RO AUX CONTACT	RO_AUX	--	
DigIn 7 (Binary)	EXTERNAL CONTROL	EXT_CT	--	Used, if Discrete Tanklevel Control selected
DigIn 8 (Binary)	PRE TREATMENT LOCKOUT	PRTRT_	--	
AnalogIn 1 (4-20 mA input)	PERMEATE CONDUCTIVITY	P_COND	0-200 µS	
AnalogIn 2 (4-20 mA)	INLET PH	INL_PH	0-14 pH	Not required in Economy Mode
AnalogIn 3 (4-20 mA)	PERM TANK LEVEL	P_TANK	0-100 %	Used, if Analog Tanklevel Control selected
AnalogIn 4 (4-20 mA)				spare - not included in current firmware
AnalogIn 5 (Pt100 input)	PERMEATE TEMP	P_TEMP	-4 ... +302 °F or -20 ... +150 °C	°F or °C selectable
AnalogIn 6 (Pt100 input)				spare - not included in current firmware

Chart 2: Input Assignment

See also the table "Pin assignment" in the appendices.

8 Outputs

The 8620 mxCONTROL has 5 relay outputs as well as 2 analog (4...20 mA) and 2 transistor outputs.

The **configuration via the configuration file** is needed for enabling and labelling the desired outputs. The other settings can be done with the configuration file, too, but also directly at the 8620 mxCONTROL device.

Also the output assignment is fixed as the following table shows:

Outputs	Tag	Abbreviation	Output-Type	Remarks
Relay 1	RO High Pressure Pump Command	HP Pump	On / Off	
Relay 2	CIP Pump Command	CIP Pump	On / Off	
Relay 3	RO Inlet Valve Open Command	IN Valve	On / Off	
Relay 4	Concentrate Valve Command	CONCValve	On / Off	
Relay 5	Chemical Pump Command	CHEMPump	On / Off	
Transistor 1	Common Alarm Output	ALARM	On / Off	
Transistor 2				spare
4..20mA-Output 1	Chemical Pump Speed	CHEMSpeed	analog	Analog output of Chemical Pump Speed (0 ... 100 %)
4..20mA-Output 2				spare

Chart 3: Output Assignment

9 Controller Modules

9.1 Module RO_MACHINE

There are several control selectors which will be used to set the operation mode.

These following tables show the available control selectors and setting possibilities in the main menu item "Process data" and "Parameter" with their available selections.

Process Data

Process data / RO Machine displayed data	Abbreviation (menu)	Available selections	Remarks
RO Control Selector	RO System	OFF, AUTO, MANUAL, FILL, CIP	CIP was only selectable, if the parameter "Mode" is set to "Deluxe"
CIP Pump Control Selector	CIP Pump	OFF, AUTO, MANUAL	CIP is only visible/changeable, if the parameter "Mode" was set to "Deluxe". If CIP Pump Selector is set to MANUAL and RO System Selector was set to OFF or to CIP, then the Inlet valve is opened additionally.
Chemical Pump Control Selector	Chem Pump	OFF, AUTO, MANUAL	
RO Status	RO Status	ALRES (Alarm Reset)	Displayed status: OFF, FILL, MANUAL, AUTO, CIP, ALARM, FLUSH, STAND-BY, PRETRT
Recovery ($\text{PERM_FLOW} * 100\% / (\text{PERM_FLOW} + \text{CONC_FLOW})$)	Recovery	--	shows recovery in "%"
Pump Hour Counter for High Pressure Pump (if RO_AUX_CONTACT = 1)	PMP_HRCT	--	shows the pump hours in "h", "Reset" possible (Specialist Level only), automatic reset after 26280 h = 3 years

Chart 4: Overview to the available control selectors and settings in main menu item "Process data"

Parameter

Parameter / RO Machine displayed data	Abbreviation (menu)	Range or Available selections	Remarks
Conc Flush Timer	Conc Flush Timer	FlushTime (0 ... 300 s)	
Economy - Deluxe Selector	Mode	Economy; Deluxe	
Tank Level Control	Tanklevel Control	Discrete, Analog	
Chemical Pump Control During Flush	ChemCtrl dur. Flush	Enable, Disable	for Chemical Pump Control during Flush, if "Chem Pump" is set to "AUTO"

Chart 5: Overview to the available control selectors in main menu item "Parameter"

Configuration

For controlling the RO Machine the following set points can be configured:

Name	Range	Abbreviation
RO SYSTEM HIGH PERM COND SETPOINT	as the range of 4-20mA input 1	H_PRMCON_SP
RO SYSTEM HIGH PH SETPOINT (*)	as the range of 4-20mA input 2	HIGH_PH_SP
RO SYSTEM LOW PH SETPOINT (*)	as the range of 4-20mA input 2	LOW_PH_SP
SYSTEM TANK RO ON SETPOINT	as the range of 4-20mA input 3	RO_ON_SP
SYSTEM TANK RO OFF SETPOINT	as the range of 4-20mA input 3	RO_OFF_SP
RO SYSTEM HIGH TEMPERATURE SETPOINT	as the range of PT100 input 1	HIGH_TEM_SP
FLUSH TIME	0 – 300 seconds	FLUSH_TIME
PH SETPOINT	as the range of 4-20mA input 2	PH_SP

(*) Only available in Deluxe Mode

Chart 6: Set points for controlling the RO Machine

Changed set points will get active when returning from the menu “Parameter” to the main menu again.

9.2 Module RO_ALARM

There is one generic input alarm, called IN_ALARM. This IN_ALARM will be active, if at least one of the following sub-alarms comes true:

- (1) LOW_INLET_PRESSURE_ALARM
- (2) HIGH_CONC_PRESSURE_ALARM
- (3) HIGH_PERM_PRESSURE_ALARM
- (4) HIGH_INLET_PH_ALARM (only in Deluxe Mode)
- (5) LOW_INLET_PH_ALARM (only in Deluxe Mode)
- (6) HIGH_TEMPERATURE_ALARM
- (7) HIGH_PERM_CONDUCTIVITY_ALARM
- (8) FILL_TIMER_DONE_ALARM
- (9) MTR_FAULT_ALARM
- (10) P_COND_TF_ALARM (Permeate Conductivity Transmitter Fault Alarm)
- (11) P_TEMP_TF_ALARM (Permeate Temperature Transmitter Fault Alarm)
- (12) P_TANK_TF_ALARM (Permeate (Tank)Level Transmitter Fault Alarm)
- (13) INL_PH_TF_ALARM (Inlet pH Transmitter Fault Alarm)

All sub-alarms are event- and time-based, that means, that the alarm condition has to be continuously active for a certain time (sub-alarm is timing) before the sub-alarm becomes true. The time is sub-alarm-specific.

All sub-alarms (1)-(13) and the included timers are reset, if the **alarm reset** is executed.

If the alarm condition for a sub-alarm is not valid anymore and the sub-alarm is not active, the timer of this sub-alarm will be reset automatically.

A transmitter fault is detected, if the measured

- input current of the 4-20mA input goes below approx. 3.5 mA or above approx. 20.5 mA.
- input temperature of the Pt100 temperature input goes below approx. -7,6°F (-22°C) or above approx. +311°F (+155°C).

	Sub-Alarm	Abbreviation	“sub-alarm is timing” time in sec
(1)	LOW_INLET_PRESSURE_ALARM	INLT PRS	15
(2)	HIGH_CONC_PRESSURE_ALARM	CONC PRS	0.1
(3)	HIGH_PERM_PRESSURE_ALARM	PERM PRS	0.1
(4)	HIGH_INLET_PH_ALARM	HIGH PH	60
(5)	LOW_INLET_PH_ALARM	LOW PH	60
(6)	HIGH_TEMPERATURE_ALARM	HIGH TEM	15
(7)	HIGH_PERM_CONDUCTIVITY_ALARM	H PRMCON	300
(8)	FILL_TIMER_DONE_ALARM	FILLTIME	300
(9)	MTR_FAULT_ALARM	MTR FAUL	10
(10)	P_COND_TF_ALARM	P_COND_TF	0 (not configurable)
(11)	P_TEMP_TF_ALARM	P_TEMP_TF	0 (not configurable)
(12)	P_TANK_TF_ALARM	P_TANK_TF	0 (not configurable)
(13)	INL_PH_TF_ALARM	INL_PH_TF	0 (not configurable)

Chart 7: Sub-alarm timing

9.3 Module RO_PH_CONTROL

This module works only in connection with model “RO_CHEM_PI”. It is active only if the output “Chem_Pump” is on.

The pH control function is designed for a PI control.

This control module realises a pH-Control via a “pH Pump”.

Set point Limiter

The set point limiter is used to limit the adjustable set point concerning minimum and maximum value, in order to **prevent wrong set point settings** outside the valid range of the application by the operator.

PI-Controller

The Proportional Integral (PI)-Controller is used to control e.g. (proportional) pumps by **outputting a signal 0 ... 100 %** as a pulse width modulated (**PWM**) signal, as a **pulse** signal or as an **analog 4...20 mA signal**. The controller output is limited only in automatic mode by the parameterized lower and upper output limit.

The **integral part** of the PI-Controller is usually used to **prevent a steady state deviation** from the desired set point.



The **integral part** of the PI-Controller can be **deactivated** by setting the reset time (Rst) to 9999.0 s.

A **deadband** can be parameterised in order to **prevent oscillation** of the connected outputs/actuators.

The controller line of action is reversible. **Usually** the line of action is normal (**not inverted**). The line of action can be changed in the configuration menu or with the configuration file.

Processdata

Displayed data	Abbreviation (menu)
Process value	
Controller Output pH Control	CO PH Pump
Set point	SP
Set point vs. Process value	SP/PV
Operation Mode (Status)	Auto/Manual

The operation mode AUTO / MANUAL can be displayed and set in the menu "Process data"/"PH Control", with a separate menu item only for this module "PH Control".

Parameter (Operator level)

Parameter	Abbreviation (menu)	Range	Default values (after successful download of Cfg-File or if enabled)
Sample Time	Tsample	0.05/0.1 ... 60.0 s	0.2 s
Set point	SP	R- ...R+ (range of assigned input) SPL- ... SPL+ (if set point limiter enabled)	middle of input range
Deadband	Dbd	0 ... 100.0 % of input range	1.0 %
Set point ramp			
Set point ramp	SP Ramp	on / off	off
Set point slope per minute rising	Slp+	0.1 ... 99999 pH/min	1 pH/min
Set point slope per minute falling	Slp-	0.1 ... 99999 pH/min	1 pH/min
pH Controller			
Proportional band	Prb	0.1 ... 1000.0 %	75.0 %
Reset time	Rst	0.1 ... 9999.0 s	300.0 s
Lower output limit	Lmt-	0.0 ... Lmt+	0.0%
Upper output limit	Lmt+	Lmt- ... 100.0 %	100.0 %
Safety output value	Sft	0.0 ... 100.0 %	0.0 %

Configuration (Specialist level)

Configuration	Access via Cfg.-menu	Access via XML-Cfg.-File	Abbreviation (menu)	Range	Default values (after factory reset or at start of Cfg-File-Download)
Line of action	rw	rw	line of action	normal/inverse	normal
Set point limiter	rw	rw	SP Limiter	on / off	off
Lower set point limit	rw	rw	SPL-	R- ... SPL+	R- of assigned input
Upper set point limit	rw	rw	SPL+	SPL- ... R+	R+ of assigned input

10 Alarm and Error Messages

10.1 Alarm function

The conditions for the Alarm function are listed in chapter 9.2 (Module RO_ALARMMS).

Configuration (Code Level: Specialist)

Configuration	Access via Cfg.-menu	Access via XML-Cfg.-File	Abbreviation (menu)	Value range	Default values (after factory reset or at start of Cfg-File-Download)
Alarm output function	rw	rw	Output	enable/disable	disable
Output used for alarm output	r	rw	Alarm output	depending on configured and activated outputs and adapted options: Relay 1 ... Relay 5, 4...20mA output 1, 4...20mA output 2, Transistor 1, Transistor 2, Not output	No Output

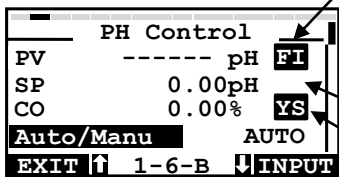
The output used as **alarm output** has to be a configured and enabled output, which is not used concurrently as output of another module.

The yellow LED indicates also in **case of disabled alarm output function** that an alarm occurs.

10.2 Displaying (Input-) Alarms and different (Output-) States

The input alarms and output states are displayed in the process data menu, in the input menu and in the corresponding specific controller module menus.

Display



Input-State			
AL	Lower Alarm	FS	Sensor Fault
AH	Higher Alarm	nA	Input not active
WL	Lower Warning	FA	AD-Fault
WH	Higher Warning	FC	Configuration Fault
FI	Input Fault	Fc	Calibration Data Fault
OK	OK		
Output is calculated / forced by			
Au	Automatic Mode	fo	other module
Ma	Manual Mode	fF	(active) Flow-Switch
YS	YSafePos (Input-/Sensor-Error)	fS	(active) System-Switch
YA	ASL-Pump-Stop		
YF	Out fails (MOT is expired)	Fc	Calibration Data Fault (only in menu Outputs for 4...20 mA Outputs)
OF	4 ... 20 mA Output Fault		

If there is an internal error while updating the configured 4...20 mA outputs (OF - 4 ... 20 mA Output Fault), the common alarm will also be actuated as long as this error occurs.

10.3 Error Messages and Warnings

Most of the error messages and warnings are displayed as a short message for approx. 2 seconds on the display. There is an internal display buffer for maximum 20 short messages. If one of the four soft keys is pressed while a short message is displayed, the short message will disappear.

A permanent message is displayed until the operator acknowledges the message with the OK-key. There is an internal display buffer for maximum 10 permanent messages.

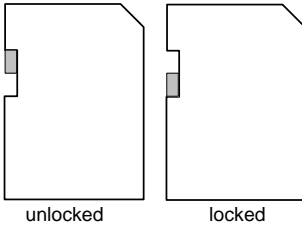
If a permanent message is already displayed and a new short message has to be displayed, then the short message will be displayed firstly and afterwards the permanent message will be displayed again until it is acknowledged by the operator.

Warning or Error message	Displayed as	Displaying interval	Cause	Remedy
4-20mA Out X failed	short message permanent message	once once	Internal communication with 4...20 mA Output X failed more than 3 times in series more than 20 times in series (After a successful communication the internal error counter is reset.)	Contact your local SUEZ Service. The device has to be replaced.
AD Fault (Input State: FA)	Icon in menu Processdata/ Inputs	as long as fault is not remedied	A/D-conversion failed	If this error occurred more than once, then contact local SUEZ Service. First: Download the Calibration file (Master code needed). If this did not function, the device has to be replaced.
Battery failed!	permanent message short message flashing message in menu 7 (Clock)	once after initialization every 60 seconds as long as clock is not set to valid date and internal real time clock has passed the 59th second	The back-up battery of the internal real time clock (RTC) failed. Year of internal clock is lower than 2007.	The back-up battery (Type CR 2032, 3V DC) on the reverse side of the printed circuit board needs to be replaced by qualified personnel. Set the clock to current date and time.
CalibFault 4-20mA In (Input State: Fc)	permanent message Icon in menu Processdata/ Inputs	once after init of config data	Defect Calibration data for at least one configured 4...20 mA / Pt100 Input. The concerned inputs will be treated as inputs with input fault.	Contact local SUEZ Service.
CalibFault PT100 In (Input State: Fc)	Icon/flashing message in full screen view of correspondent Process Value	as long as fault is not remedied		
CalibFault 4-20mA Out (Output State: Fc)	permanent message Icon in menu Processdata/ Outputs	once after init of config data as long as fault is not remedied	Defect Calibration data for at least one configured 4...20 mA Output. The concerned outputs will output 0 mA.	Contact local SUEZ Service.

Warning or Error message	Displayed as	Displaying interval	Cause	Remedy
CalibFault RTC	permanent message	once after init of config data	Defect Calibration data for the internal real time clock (RTC). Data is set to default values. This may lead to a non-accurate clock.	Contact local SUEZ Service.
Check Clock	permanent message	once	Clock time and date may be incorrect due to battery failure or due to too large difference between internal time and RTC time.	Check the clock (menu 7, Clock) concerning the right date and time and set it to the current date / time, if necessary.
Datalog IS NOT ACTIVE	permanent message	once	Data Logging was stopped due to fault whilst writing to SD card or due to removed SD card.	Check, if SD card was removed during data Logging - did Error message "No SD-Card detected" appear? If not check the free memory capacity. If the SD card memory is not full, the SD card has to be exchanged.
DigIn X is no BinInp	short message	once	A digital, but non-binary input was assigned as input to Flow / System Switch in the menu Flow Switch / System Switch. Therefore the current input choice for Flow / System Switch was reset to No Input.	Choose a digital and binary input as input for Flow Switch / System Switch, if available. Otherwise Flow Switch / System Switch cannot be used with the current configuration.
Download cancelled	short message	once	Download was cancelled by the operator. Previous data is restored.	--

Warning or Error message	Displayed as	Displaying interval	Cause	Remedy
EEPROM fault XXY	permanent message	once	<p>EEPROM data fault; Y = error number; XX = affected Eeprom data;</p> <p>Y = 1 - Error checksum 2 - Error Eeprom page 3 - Error write 4 - Error read write 5 - Error after download of Config/Param/Calib file 6 - Internal address error 7 - Error acknowledge (Communication with Eeprom) 8 - Error during Startup 9 - Error during Factory Reset</p> <p>XX = 00 - Config / Param file data 01 - Cyclically saved module ... specific data of control function 1 ... 8 19 - RO Pump Hour Counter 21 - Cold / warm starts 22 - User calibration data 23 - Factory calibration data 24 - Device base data</p> <p>The control selectors (RO Machine, CIP Pump, Chemical Pump) are simultaneously set to operation mode "OFF".</p> <p>XX = 01 ... 08, 19, 21, Y = 1: The cause is often a power-on-reset or software reset while updating Eeprom values.</p>	<p>If this fault occurred immediately after a firmware update, please ignore.</p> <p>For errors with: XX = 00, Y = 1: Try first a factory reset and restore the configuration and parameterization data via download; XX = 01 ... 08, 19, Y = 1: Check the corresponding module values in the process data menu and reset the cyclically saved parameters (e.g. Module RO Machine: Pump Hour Counter). XX = 21, Y = 1: Reset these counters in the Menu System settings. X = 22, Y = 1: Proceed as for XX = 00, Y = 1, afterwards the user calibration of the 4-20mA outputs has to be repeated. Y = 2, Y = 6: Report this error to your local SUEZ service.</p> <p>All other errors: Proceed as for XX = 00, Y = 1. If this error occurred more than once, then the device has to be replaced. Contact your local SUEZ service for replacement of this device.</p>
Email failed	short message		Error while communicating with SMTP server - transmission of email failed.	Refer to error message "SMTP Error X Y", which was displayed before.
Error ISR Timing X	permanent message	once	Internal Timing Error in cyclical executed function.	Contact your local SUEZ Service and provide the current configuration and parameter files.
False code	short message	once	Wrong code for current required code level. Access to target menu item(s) is denied.	Input the right code for the required code level.
Factory Reset	short message	once	All configuration and parameter data is reset to default values and the 8620 mxCONTROL can operate no longer as controller.	The continuation of the operating as controller is possible after the downloading of a new configuration and parameterization.

Warning or Error message	Displayed as	Displaying interval	Cause	Remedy
Fault Ethernet	permanent message	Once each minute - as long as fault is not remedied or Ethernet function is disabled	Communication with internal Ethernet module failed.	Contact local SUEZ Service if the error occurs more often.
Fault RTC	short message permanent message	once once	Communication with internal RTC failed. Time is generated internally. Initialization of RTC failed.	If fault occurs often, contact local SUEZ Service. Restart Device. If fault occurs again more than 3 times, contact local SUEZ service.
Input Fault (Input State: FI)	Icon in menu Processdata/ Inputs Icon/flashing message in full screen view of correspondent Process Value	as long as fault is not remedied	Analog input: 4...20 mA: current below approx. 3.5 mA Pt100: resistance < input range or Pt100 not connected	Check the wiring from the corresponding sensor to 8620 mxCONTROL.
Min.Value underflow	short message	once	The current set value is lower than the minimum value of this parameter. The value is set to the minimum value and can be edited before confirmation.	Edit the value, if required, and then confirm the new value by pressing ENTER. If the old value should be kept, press ESC.
Max.Value overflow	short message	once	The current set value is greater than the maximum value of this parameter. The value is set to the maximum value and can be edited before confirmation.	
MOT expired	permanent message	once	At least one of the maximum output timer has expired and the corresponding outputs are set to zero.	Check the controller modules in menu Processdata for the corresponding module. To enable the corresponding outputs again, the MOT alarm has to be confirmed in the corresponding controller module processdata menu.
No Permission	permanent message	once	A file is downloaded without the right authorization (current code level restricts the download of this file type). The downloaded data is not accepted.	If you are authorized, then go back into the Main menu and enter the menu Up/Download again, by entering the required code (Specialist / Master). Then start the download again.

Warning or Error message	Displayed as	Displaying interval	Cause	Remedy
No SD-Card detected	short message if Upload or Data Logging: permanent message	once once	No SD card detected.	Check, if the SD card is inserted correctly into the SD card slot. Return in the menu structure to the point, where the SD card is mounted and initialized and proceed from this point: Download: menu 5-1-1 .../ Download / SD-Card Upload: menu 5-2-1 .../ Upload / SD-Card Data Logging: menu 6-1 Data Logging / Enable
SD can be removed	short message	once	SD card has operated successfully and can be removed from the SD card slot.	--
SD-Card locked	short message	once	SD card is locked. No writing operation possible. 	If the writing should be allowed: Return in the menu structure to the point, where the SD card is mounted and initialized: Upload: menu 5-2-1 .../ Upload / SD-Card Data Logging: menu 6-1 Data Logging / Enable After the short message "SD can be removed" is displayed, remove the SD card. Set the switch of the SD card to the position "unlocked". Put the SD card into the SD card slot again. Retry the unsuccessful procedure.
SD: Disk is full!	permanent message	once	SD card memory capacity is totally allocated. No additional data can be written to SD card.	For Upload- / Data Logging Purposes the SD card has to be exchanged with an SD card with sufficient memory.
SD: Don't remove	short message	once	SD card is in operation and should not to be removed before the message "SD can be removed" appears. Otherwise an earlier removal may result in a fault of SD card operation up to data loss.	--
SD: Error ChDir!	short message	once	An error occurred during changing the directories on the SD card.	Try at least 3 times again. If error persists, try another SD card.

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Warning or Error message	Displayed as	Displaying interval	Cause	Remedy
SD: Error FileSystem	short message	once	The file system of the SD card could not be initialized. Only SD cards with FAT-16 file system can be accessed.	Check the file system of the SD card. Only FAT-16 is supported. If the SD card has another format, Save all the folders and files from SD card to your PC. Format the SD card with FAT-16 file-system. Restore the saved folders and files from PC to SD card.
SD: Error Open File	short message if Upload or Data Logging: permanent message	once once	File on SD card could not be opened. Current Operation failed.	Try again up to 3 times. If no success, then check the SD card with the program Chkdisk.exe (MS Windows only). If no success format the SD card as described for Error message "SD: Error FileSystem". If no success try another SD card.
SD: Error Partition	short message	once	The partition table of the SD card could not be initialized.	Refer to Remedy of error message "SD: Error Open File".
SD: Error Root Dir!	short message	once	An error occurred during reading the root directory of the SD card.	Refer to Remedy of error message "SD: Error Open File".
SD: Error Sync!	short message	once	An error occurred during synchronizing the SD card. The writing process is cancelled. The SD card may be ejected before finishing the synchronizing process.	If this happened after an file upload to SD card, repeat the last upload.
SD: Error Writing!	permanent message	once	An error occurred during writing to the SD card. The writing process is cancelled with the effect of data loss. The written file on the SD card is incomplete. If this error occurs during data logging, data logging is disabled automatically.	Check the free memory capacity. If the SD card memory is not full, the SD card has to be replaced.
SD: Timeout!	short message	once	No proper communication to SD card. Current Operation failed.	Try again. If error persists, try another SD card.
SD: Wrong File!	short message	once	The downloaded file is not a Configuration or Parameter file. No data is accepted by the device.	Check, whether the downloaded file was really a valid Configuration or Parameter file.
Sensor Fault (Input State: FS)	Icon in menu Processdata/ Inputs Icon/flashing message in full screen view of correspondent Process Value	as long as fault is not remedied	Analog inputs: 4...20 mA: current above approx. 20.5 mA Pt100: resistance > input range	Check the wiring from the corresponding sensor to 8620 mxCONTROL.

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Warning or Error message	Displayed as	Displaying interval	Cause	Remedy																																																																																	
SMTP Error X Y	short message	once	<p>Communication with SMTP mail server failed</p> <p>X: Communication phase: CONNECT, HELO, MAIL, AUTH, USER, PWD, RCPT, RCPT 1, RCPT 2, DATA, QUIT</p> <p>Y: SMTP error code (see table below)</p>	<p>A: Check your configured email recipients.</p> <p>B: Check your configured mail server settings.</p> <p>C: Contact your local network administrator / email provider. Report this error message. Check, if the requirements for email notification were met.</p> <p>D: If this error occurred regularly, report this error message to your local SUEZ service.</p>																																																																																	
			<table border="1"> <thead> <tr> <th>Y</th> <th>Details</th> <th>Remedy</th> </tr> </thead> <tbody> <tr> <td>421</td> <td>Mail server service not available</td> <td>B, C</td> </tr> <tr> <td>450</td> <td>Recipient temporarily unavailable</td> <td>A, C</td> </tr> <tr> <td>451</td> <td>Mail server: local error in processing</td> <td>C</td> </tr> <tr> <td>452</td> <td>Mail server: insufficient system storage</td> <td>C</td> </tr> <tr> <td>454</td> <td>Mail server: authentication temporarily not available</td> <td>C</td> </tr> <tr> <td>455</td> <td>as 555, but only temporarily</td> <td>C</td> </tr> <tr> <td>500</td> <td>Syntax error, command unrecognized</td> <td>C</td> </tr> <tr> <td>501</td> <td>Syntax error in parameters or arguments</td> <td>C, D</td> </tr> <tr> <td>502</td> <td>Command not implemented</td> <td>C</td> </tr> <tr> <td>503</td> <td>Bad sequence of commands</td> <td>C, D</td> </tr> <tr> <td>504</td> <td>Command parameter not implemented If X = AUTH: mail server: configured authentication method is not supported</td> <td>C B, C</td> </tr> <tr> <td>521</td> <td>Mail server does not accept mail</td> <td>C</td> </tr> <tr> <td>530</td> <td>Mail server: Access denied. Authentication required.</td> <td>B, C</td> </tr> <tr> <td>534</td> <td>Mail server: Authentication method too weak. Use other authentication method.</td> <td>B, C</td> </tr> <tr> <td>535</td> <td>Mail server: Invalid user name or password for email account.</td> <td>B</td> </tr> <tr> <td>538</td> <td>Mail server: Encryption is required for current authentication method.</td> <td>B, C</td> </tr> <tr> <td>550</td> <td>Recipient unavailable</td> <td>A, C</td> </tr> <tr> <td>551</td> <td>Recipient not local</td> <td>A, C</td> </tr> <tr> <td>552</td> <td>Mail server: exceeded storage allocation</td> <td>C</td> </tr> <tr> <td>553</td> <td>Recipient not allowed</td> <td>A, C</td> </tr> <tr> <td>554</td> <td>Transaction failed</td> <td>C, D</td> </tr> <tr> <td>555</td> <td>Mail server cannot handle particular MAIL FROM or RCPT TO commands</td> <td>C</td> </tr> <tr> <td>900</td> <td>Connection to mail server failed</td> <td>B, C</td> </tr> <tr> <td>910</td> <td>No recipients configured</td> <td>A</td> </tr> <tr> <td>998</td> <td>Timeout error (after 60 sec) If X = CONNECT</td> <td>D B, C</td> </tr> <tr> <td>999</td> <td>Unknown error</td> <td>D</td> </tr> </tbody> </table>	Y	Details	Remedy	421	Mail server service not available	B, C	450	Recipient temporarily unavailable	A, C	451	Mail server: local error in processing	C	452	Mail server: insufficient system storage	C	454	Mail server: authentication temporarily not available	C	455	as 555, but only temporarily	C	500	Syntax error, command unrecognized	C	501	Syntax error in parameters or arguments	C, D	502	Command not implemented	C	503	Bad sequence of commands	C, D	504	Command parameter not implemented If X = AUTH: mail server: configured authentication method is not supported	C B, C	521	Mail server does not accept mail	C	530	Mail server: Access denied. Authentication required.	B, C	534	Mail server: Authentication method too weak. Use other authentication method.	B, C	535	Mail server: Invalid user name or password for email account.	B	538	Mail server: Encryption is required for current authentication method.	B, C	550	Recipient unavailable	A, C	551	Recipient not local	A, C	552	Mail server: exceeded storage allocation	C	553	Recipient not allowed	A, C	554	Transaction failed	C, D	555	Mail server cannot handle particular MAIL FROM or RCPT TO commands	C	900	Connection to mail server failed	B, C	910	No recipients configured	A	998	Timeout error (after 60 sec) If X = CONNECT	D B, C	999	Unknown error	D	
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502	Command not implemented	C																																																																																			
503	Bad sequence of commands	C, D																																																																																			
504	Command parameter not implemented If X = AUTH: mail server: configured authentication method is not supported	C B, C																																																																																			
521	Mail server does not accept mail	C																																																																																			
530	Mail server: Access denied. Authentication required.	B, C																																																																																			
534	Mail server: Authentication method too weak. Use other authentication method.	B, C																																																																																			
535	Mail server: Invalid user name or password for email account.	B																																																																																			
538	Mail server: Encryption is required for current authentication method.	B, C																																																																																			
550	Recipient unavailable	A, C																																																																																			
551	Recipient not local	A, C																																																																																			
552	Mail server: exceeded storage allocation	C																																																																																			
553	Recipient not allowed	A, C																																																																																			
554	Transaction failed	C, D																																																																																			
555	Mail server cannot handle particular MAIL FROM or RCPT TO commands	C																																																																																			
900	Connection to mail server failed	B, C																																																																																			
910	No recipients configured	A																																																																																			
998	Timeout error (after 60 sec) If X = CONNECT	D B, C																																																																																			
999	Unknown error	D																																																																																			

Warning or Error message	Displayed as	Displaying interval	Cause	Remedy
Used by SlotX	short message	once	The chosen alarm output in menu Configuration / Alarm is already used as an output by another control module in slot X. The current alarm output is set to No Output.	Choose another output if available. Otherwise Alarm Output can not be used with the current configuration.
User Calib failed	permanent message	once	User calibration of 4-20mA Output failed. Old user calibration values kept.	Check the wiring and make sure that you connected load and the ampmeter correctly. Try again. Refer also to Description of User Calibration in Chapter 11.4.2
Wrong ParamFile!	short message	once	The currently downloaded Parameter-File does not suit the current configuration. The old parameters are restored after the download has finished or has been cancelled.	Download the right parameter file. Usually the Parameter file has a similar file name like the configuration file, but begins with "Par" or "Param" instead of "Cfg".

The controller carries out a **self test** each time power is restored, including checking current date, calibration data and EEPROM data.

The analog inputs are checked periodically during the input-sampling process.

11 Appendices

11.1 Pin assignments for PS and IS

Power Supply			
Column	Pin-No.	Signal	Function
1	1	N.C (isolated)	Relay 1
	2	COM (isolated)	
	3	N.O (isolated)	
	4	LINE	
	5	NEUT	
	6	PE	
2	7	N.C (isolated)	Relay 2
	8	COM (isolated)	
	9	N.O (isolated)	
	10	LINE	
	11	NEUT	
3	12	PE	Relay 3
	13	N.C (isolated)	
	14	COM (isolated)	
	15	N.O (isolated)	
	16	LINE	
4	17	NEUT	Relay 4
	18	PE	
	19	N.C (isolated)	
	20	COM (isolated)	
	21	N.O (isolated)	
5	22	LINE	Relay 5
	23	NEUT	
	24	PE	
	25	N.C (isolated)	
	26	COM (isolated)	
6	27	N.O (isolated)	Internal Power Supply
	28	LINE	
	29	NEUT	
	30	PE	
	31	LINE	
6	32	NEUT	Power Supply (100-240 V AC, 50/60 Hz)
	33	PE	
	34	LINE	
	35	NEUT	
	36	PE	

Instrumentation Supply			
Position	Pin-No.	Signal	Function
1	37	+24V DC -INPUT	DC_Power_IN
	57	GND	
	77	PE	
2	38	+24V DC-INPUT	DC_Power_IN
	58	GND	
	78	PE	
3	39	+24 V DC (Transmitter-supply)	digital INPUT 1 (binary/frequency)
	59	Signal (INPUT)	
	79	GND	
4	40	+24 V DC (Transmitter-supply)	digital INPUT 2 (binary/frequency)
	60	Signal (INPUT)	
	80	GND	
5	41	+24 V DC (Transmitter-supply)	digital INPUT 3 (binary/frequency)
	61	Signal (INPUT)	
	81	GND	
6	42	+24 V DC (Transmitter-supply)	digital INPUT4 (binary/frequency)
	62	Signal (INPUT)	
	82	GND	
7	43	+24 V DC (Transmitter-supply)	digital INPUT 5 (only binary)
	63	Signal (INPUT)	
	83	GND	
8	44	+24 V DC (Transmitter-supply)	digital INPUT 6 (only binary)
	64	Signal (INPUT)	
	84	GND	
9	45	+24 V DC (Transmitter-supply)	digital INPUT 7 (only binary)
	65	Signal (INPUT)	
	85	GND	
10	46	+24 V DC (Transmitter-supply)	digital INPUT 8 (only binary)
	66	Signal (INPUT)	
	86	GND	
11	47	+24 V DC (Transmitter-supply)	4 ... 20 mA INPUT 1
	67	Signal (INPUT)	
	87	GND	
12	48	+24 V DC (Transmitter-supply)	4 ... 20 mA INPUT 2
	68	Signal (INPUT)	
	88	GND	
13	49	+24 V DC (Transmitter-supply)	4 ... 20 mA INPUT 3
	69	Signal (INPUT)	
	89	GND	
14	50	+24 V DC (Transmitter-supply)	4 ... 20 mA INPUT 4
	70	Signal (INPUT)	
	90	GND	
15	51	R1 (current-source)	3-wire-PT 100 INPUT 1
	71	R2 (INPUT)	
	91	Com (GND)	
16	52	R1 (current-source)	3-wire-PT 100 INPUT 2
	72	R2 (INPUT)	
	92	Com (GND)	
17	53	+24 V DC (Transmitter-supply)	4 ... 20 mA OUTPUT 1
	73	Signal return (OUTPUT)	
	93	GND	
18	54	+24 V DC (Transmitter-supply)	4 ... 20 mA OUTPUT 2
	74	Signal return (OUTPUT)	
	94	GND	
19	55	+24 V DC (PWM-Power)	Transistor OUTPUT 1
	75	PNP Signal return (OUTPUT)	
	95	GND	
20	56	+24 V DC (PWM-Power)	Transistor OUTPUT 2
	76	PNP Signal return (OUTPUT)	
	96	GND	

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11.2 Terminal Connection Information

TERMINAL CONNECTION - INPUTS

Power 100-240 V AC 50/60 Hz

34	LINE
35	NEUT
36	PE

Digital Input #1 Concentrate Flow (frequency) 0-125 GPM MAX

39	+24 V DC
59	Signal
79	GND

Digital Input #2 Permeate Flow (frequency) 0-250 GPM MAX

40	+24 V DC
60	Signal
80	GND

Digital Input #3 LO Inlet Pressure

41	+24 V DC
61	Signal
81	GND

Digital Input #4 HI Concentrate Pressure

42	+24 V DC
62	Signal
82	GND

Digital Input #5 HI Permeate Pressure

43	+24 V DC
63	Signal
83	GND

Digital Input #6 RO AUX Contact

44	+24 V DC
64	Signal
84	GND

Digital Input #7 External Control

45	+24 V DC
65	Signal
85	GND

Digital Input #8 Pre treatment Lockout

46	+24 V DC
66	Signal
86	GND

Analog Input #1 Permeate Conductivity 4-20mA

47	+24 V DC
67	Signal
87	GND

Analog Input #2 Inlet pH 4-20mA

48	+24 V DC
68	Signal
88	GND

Analog Input #3 Permeate Tank Level 4-20mA

49	+24 V DC
69	Signal
89	GND

Analog Input #4 Not Used

50	+24 V DC
70	Signal
90	GND

Temperature Input #1 Pt100 Permeate Temperature

51	R1	(Current Source)
71	R2	(Input)
91	Com	(GND)

Temperature Input #2 Pt100 Not Used

52	R1	(Current Source)
72	R2	(Input)
92	Com	(GND)

TERMINAL CONNECTIONS - OUTPUTS

Relay #1 RO High Pressure Pump Command

1	N.C (isolated)
2	COM (isolated)
3	N.O (isolated)
4	LINE
5	NEUT
6	PE

Same as main Power 100-240 V AC 50/60 Hz from pins 34, 35, 36
Jumper from pin 4 to 2 if line voltage is needed for common

Relay #2 CIP Pump Command

7	N.C (isolated)
8	COM (isolated)
9	N.O (isolated)
10	LINE
11	NEUT
12	PE

Same as main Power 100-240 V AC 50/60 Hz from pins 34, 35, 36
Jumper from pin 10 to 8 if line voltage is needed for common

Relay #3 RO Inlet Valve Open Command

13	N.C (isolated)
14	COM (isolated)
15	N.O (isolated)
16	LINE
17	NEUT
18	PE

Same as main Power 100-240 V AC 50/60 Hz from pins 34, 35, 36
Jumper from pin 16 to 14 if line voltage is needed for common

Relay #4 Concentrate Valve Command

19	N.C (isolated)
20	COM (isolated)
21	N.O (isolated)
22	LINE
23	NEUT
24	PE

Same as main Power 100-240 V AC 50/60 Hz from pins 34, 35, 36
Jumper from pin 22 to 20 if line voltage is needed for common

Relay #5 Chemical Pump Command

25	N.C (isolated)
26	COM (isolated)
27	N.O (isolated)
28	LINE
29	NEUT
30	PE

Same as main Power 100-240 V AC 50/60 Hz from pins 34, 35, 36
Jumper from pin 28 to 26 if line voltage is needed for common

Transistor 2 and 4-20mA output 2 are not used

4-20mA Output #1 Chemical Pump Speed

53	+24 V DC
73	Signal Return
93	GND

4-20mA Output #2 Not Used

54	+24 V DC
74	Signal Return
94	GND

Transistor Output #1 Common Alarm

55	+24 V DC
75	PNP Signal Return
95	GND

Attention, if inductive load is connected.
Refer to undermentioned notes.

Transistor Output #2 Not Used

56	+24 V DC
76	PNP Signal Return
96	GND

Attention, if inductive load is connected.
Refer to undermentioned notes.

! The transistor output itself does not output a negative voltage. But the transistor output circuit gets irreversibly damaged, if an inductive load (e.g. a magnetic valve) is connected without additional external protection.

If you connect an inductive load, add an external self-induction recuperation diode between transistor PNP output signal and transistor output ground terminals - refer also to the following figure!

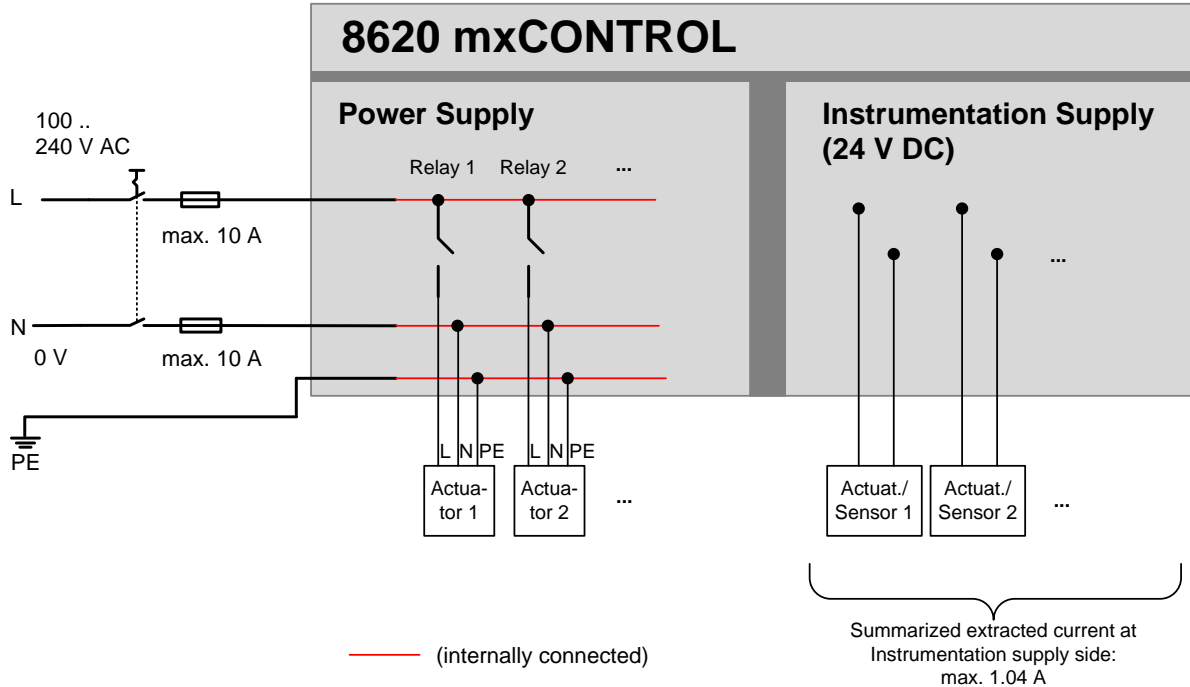
8620 mxCONTROL
Transistor Output:

PNP signal return (output) — Diode 1N4xxx e.g. 1N4002 — Inductive Load — GND

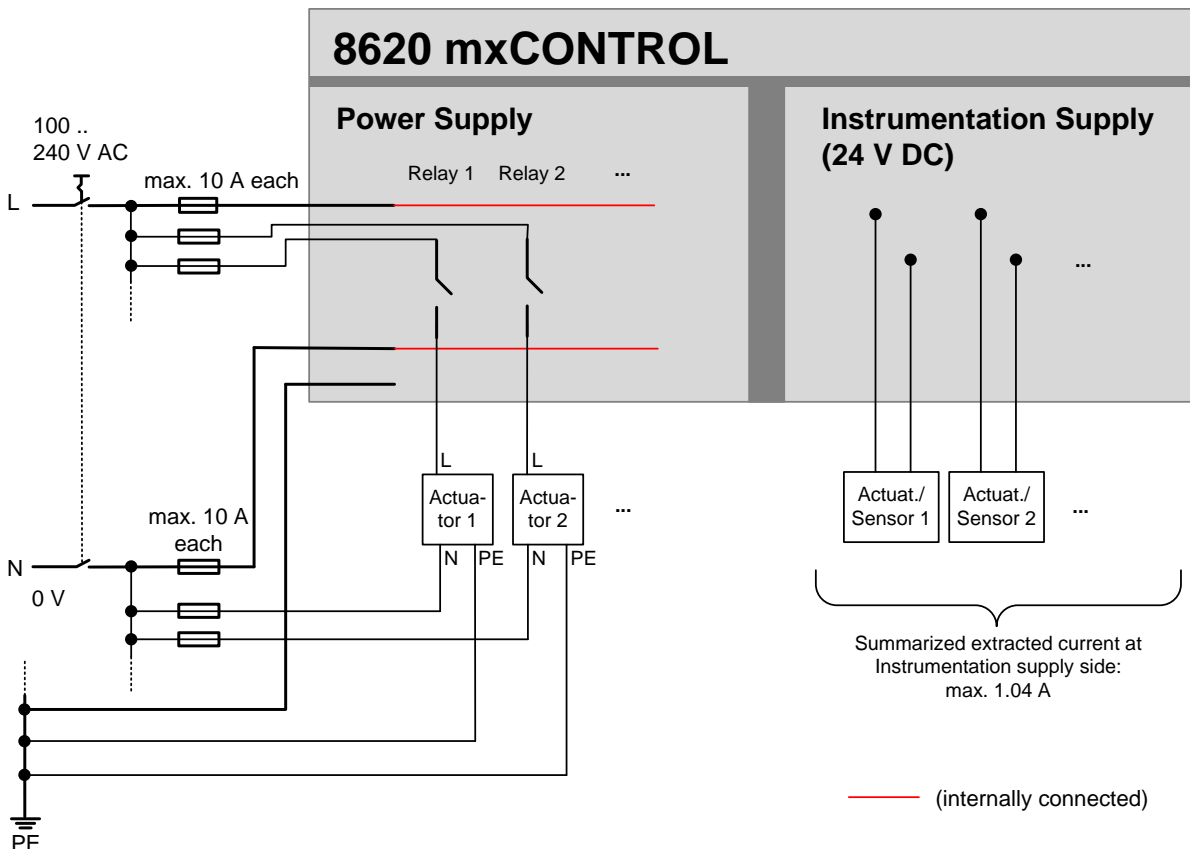
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11.3 Power Supply of Actuators/Sensors

11.3.1 Power Supply out of the 8620 mxCONTROL



11.3.2 Separate Power Supply



11.4 Main Menu Structure – Menu Tree

11.4.1 Processdata

Main Menu "RO MACHINE"
with following menu items:

- Processdata
- Parameter
- Configuration
- System settings
- Up/Download
- Datalogging
- Calibration
- Clock

Menu "Processdata":

- Inputs
- Outputs
- RO Machine
- RO Alarms
- PH Control
- Alarm Reset

Menu "Inputs":

```

CONC_F 100.00GPM
PERM_F 100.00GPM
INL_PH 14.00pH
P_COND 200.00uS
P_TEMP 150.00°F
P_TANK 100.00%
L_INLT 0
H_CONC 0
H_PERM 1
RO_AUX 0
EXT_CT 0
PRTRT_ 0
    
```

Menu "Outputs":

```

HP Pump 0
CIP Pump 0
IN Valve 0
CONCValve 0
CHEMPump 1
CHEMSpeed 100.00%
ALARM 0
    
```

Shows the state of the current outputs
If an output is configured as an On/Off-Output, 0/1 will be displayed for On/Off instead of 0.00/100.00%

Menu "RO Machine":

```

RO System AUTO
CIP Pump MANUAL
Chem Pump OFF
RO Status ALARM
Recovery 75.00%
PMP HRCT 26260h
    
```

For controlling the RO machine with the control selectors
CIP Pump Selector only visible, if Mode = Deluxe selected

PMP_HR_CT: Hour Counter from digital Input RO_AUX, including Softkey for Resetting the Counter

Menu "RO Alarms":

```

State ALARM
-----
IN PRS ALARM
CONC PRS OK
PERM PRS OK
HIGH PH OK
LOW PH OK
HIGH TEMP OK
H PRMCOND OK
FILLTIMER Timing
MTR FAULT Timing
P_COND TF OK
P_TEMP TF OK
P_TANK TF OK
INL_PH TF OK
    
```

Displaying Current Alarm state: OK or ALARM
Separate listing of the state of the different alarm sources: OK / Timing / ALARM
Only visible in Deluxe Mode
EACH menu item of this menu has one softkey assigned as ALARM RESET BUTTON (Abbreviation: ALRES)
Only visible, if analog tank level control enabled
Only visible in Deluxe Mode

Menu "PH Control":

The PH Control menu consists of several screens:

- Process Value (PV):** Shows INL_PH at 10.50 pH.
- Controller Output (CO):** Shows 100.00%.
- Set Point (SP):** Shows 7.00 pH.
- Trend Chart:** Displays a graph of process value and set point over time.
- Summary Overview:** Shows PV (10.50pH), SP (7.00pH), CO (100.00%), and Auto/Manu (AUTO).

Large Displays for PH Control of
- Process value (PV)
- Controller Output (CO)
- Set point (SP)

In Manual mode of PH Control only:
Setting up the manual controller output by pressing the INPUT soft key

Trend chart of PH Control
Process value & set point and only Process value

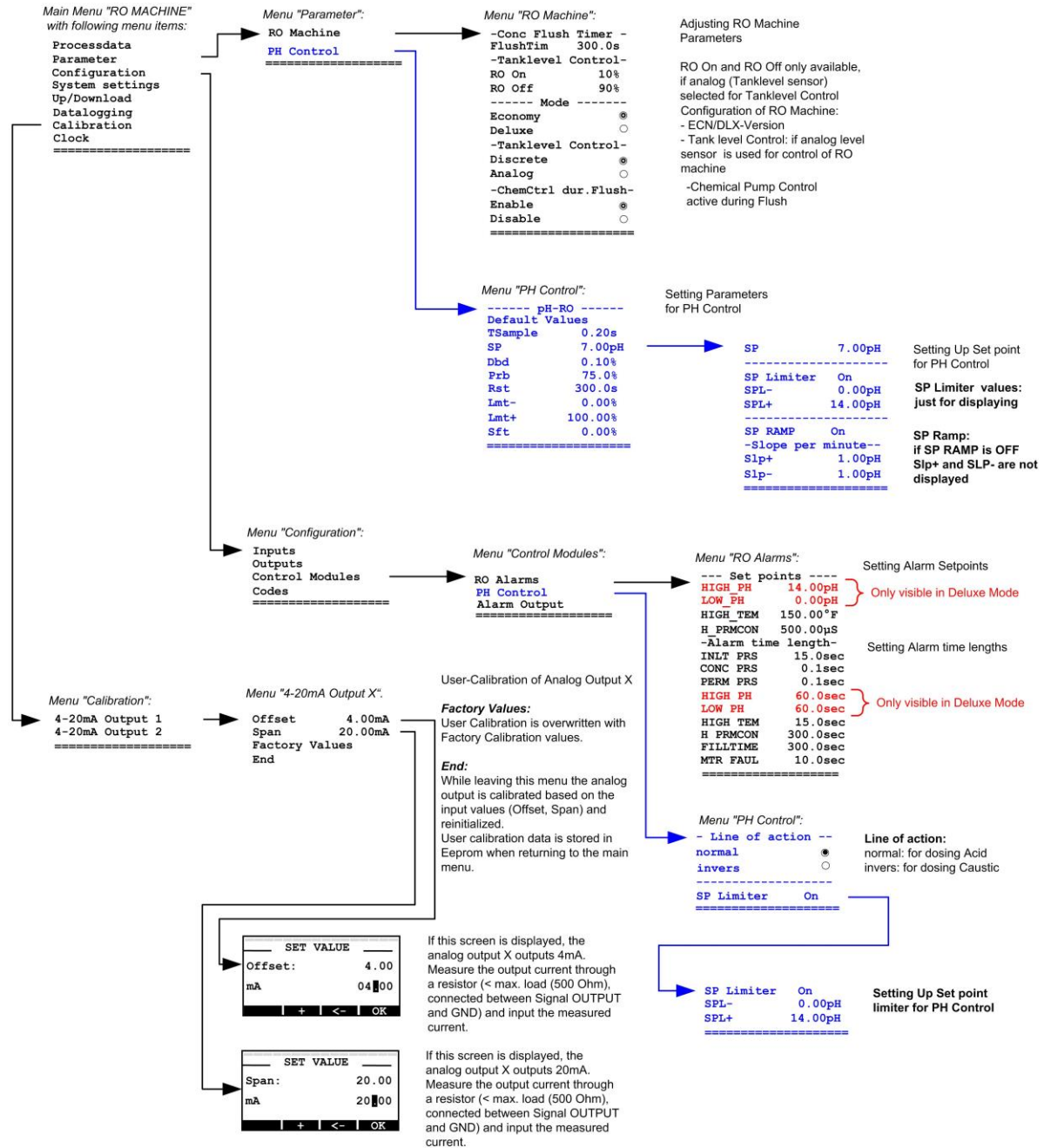
Summary overview of PH Control

Changing Automatic / Manual mode

Red font: only visible, if Deluxe Mode was selected

Blue font: only visible, if the configuration RO_E8_DLX_vX_Y or RO_E4H_vX_Y was applied

11.4.2 Parameter – Configuration



Red font: only visible, if Deluxe Mode was selected

Blue font: only visible, if the configuration RO_E8_DLX_vX_Y or RO_E4H_vX_Y was applied

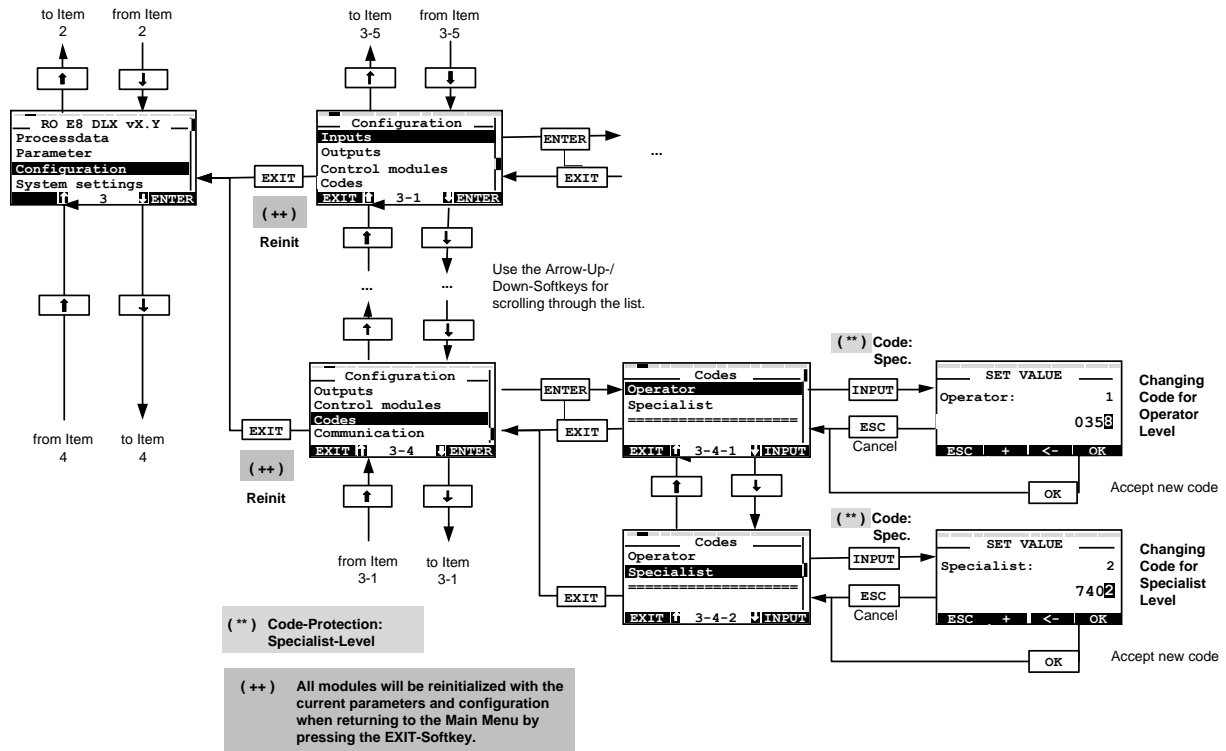
Changing the FLOW units from GPM to metric

1. Go to menu *Configuration*, press Enter, input Code (level 2)
2. Go to menu *Inputs*, press Enter, go to *DigIn1*, press Enter, scroll down to *Units*, press Enter
3. Press key "+" until you see "L/min, L/hr" etc., press Enter
4. Scroll up to *K-Factor* and adjust as needed
5. Repeat above steps for *DigIn2*

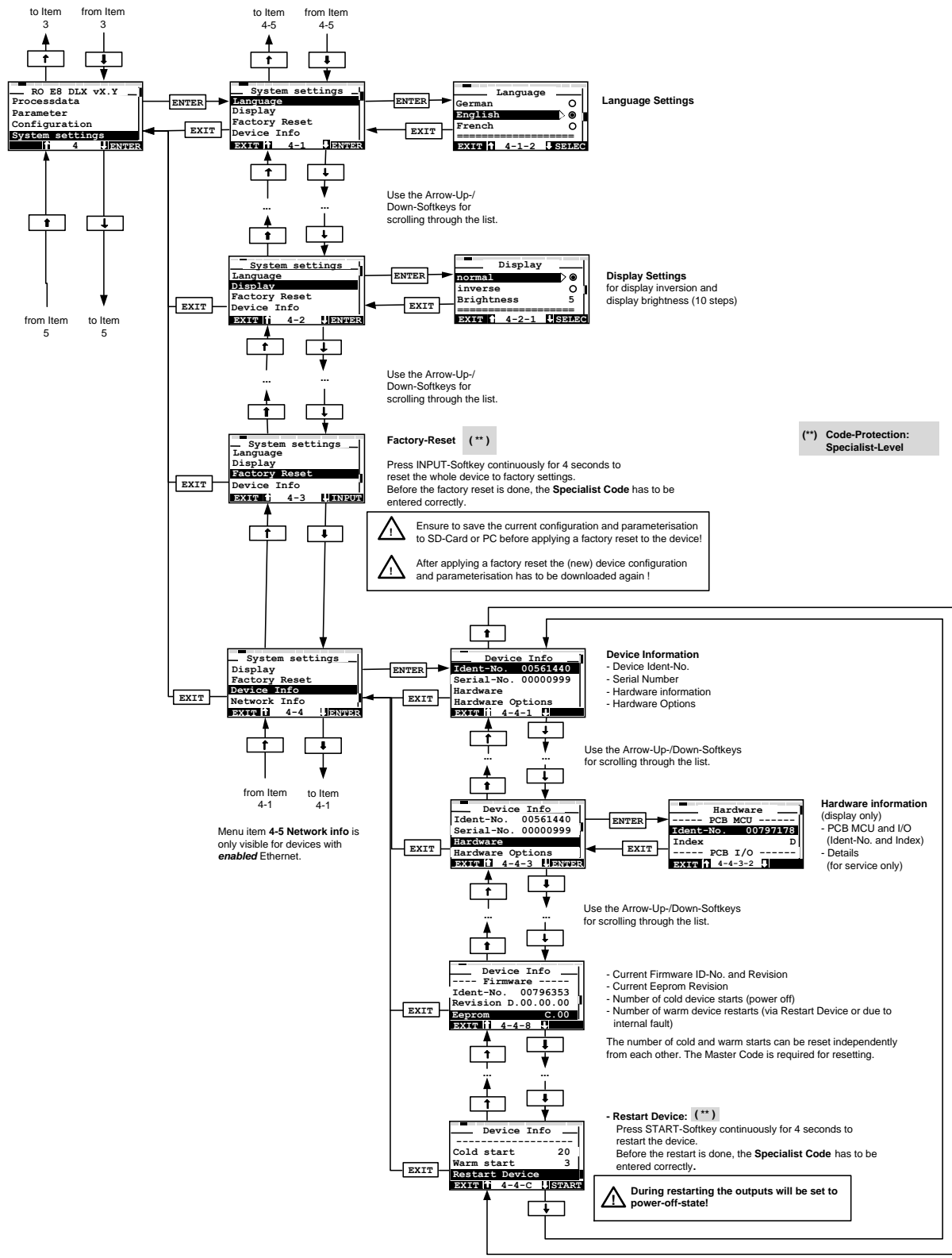
Changing the TEMPERATURE units from °F to °C

1. Go to menu *Configuration*, press Enter, input Code (level 2)
2. Go to menu *Inputs*, press Enter, go to *AnalogIn5*, press Enter, scroll down to *Units*, press Enter
3. Press key "+" until you see "°C", press Enter.

11.4.3 Configuration of the Codes (Password Protection)

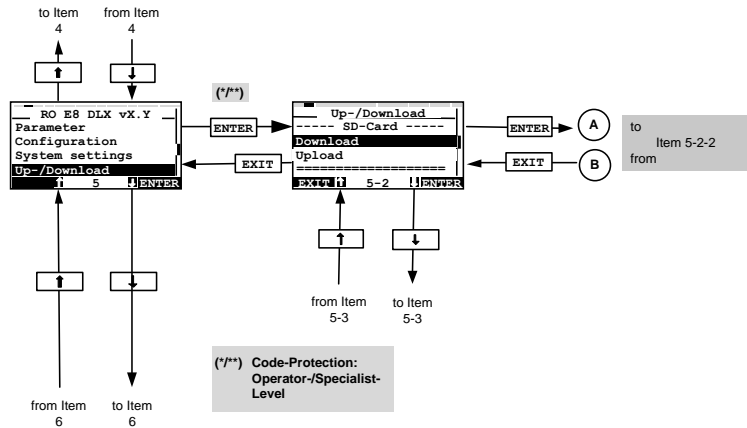


11.4.4 System Settings



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11.4.5 Up-/Download – Download

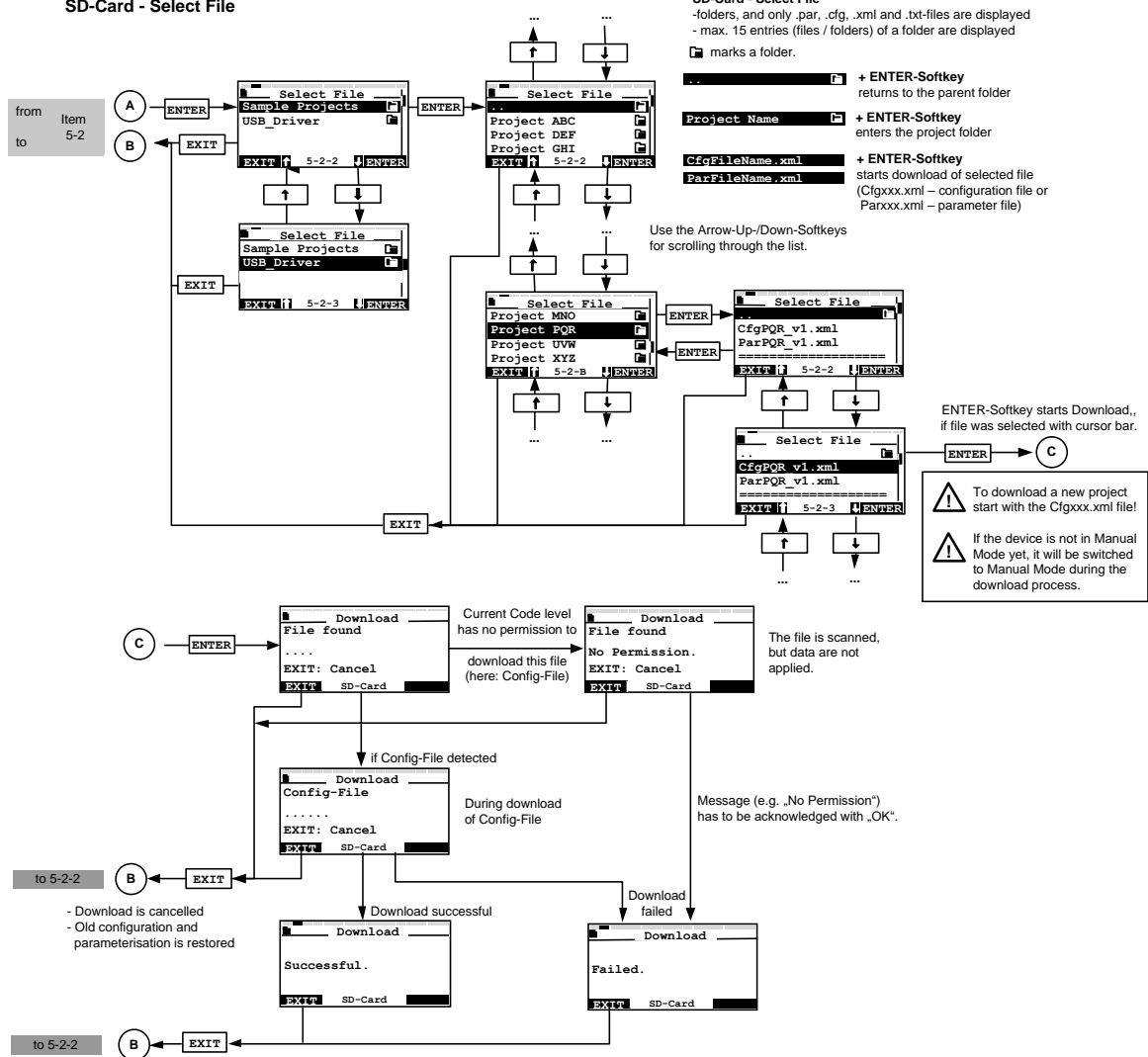


Up-/Download processes on SD-Card are only possible if Data Logging is disabled.

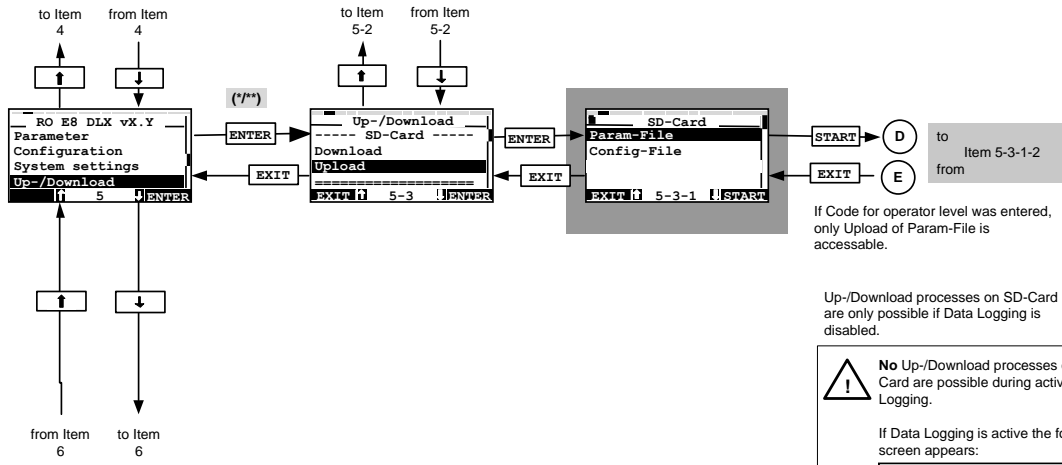
! No Up-/Download processes on SD-Card are possible during active Data Logging.

If Data Logging is active the following screen appears:

SD-Card - Select File



11.4.6 Up-/Download – Upload

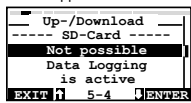


If Code for operator level was entered, only Upload of Param-File is accessible.

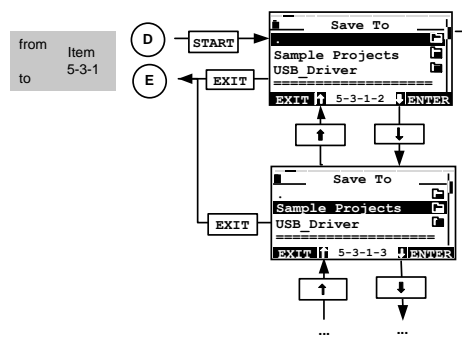
Up-/Download processes on SD-Card are only possible if Data Logging is disabled.

! No Up-/Download processes on SD-Card are possible during active Data Logging.

If Data Logging is active the following screen appears:



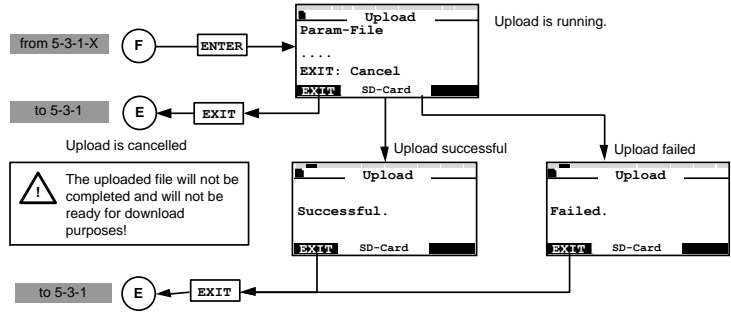
SD-Card - Save To



SD-Card - Save To
- folders, and only .par, .cfg, .xml and .txt-files are displayed
- max. 15 entries (files / folders) of a folder are displayed
[] marks a folder.

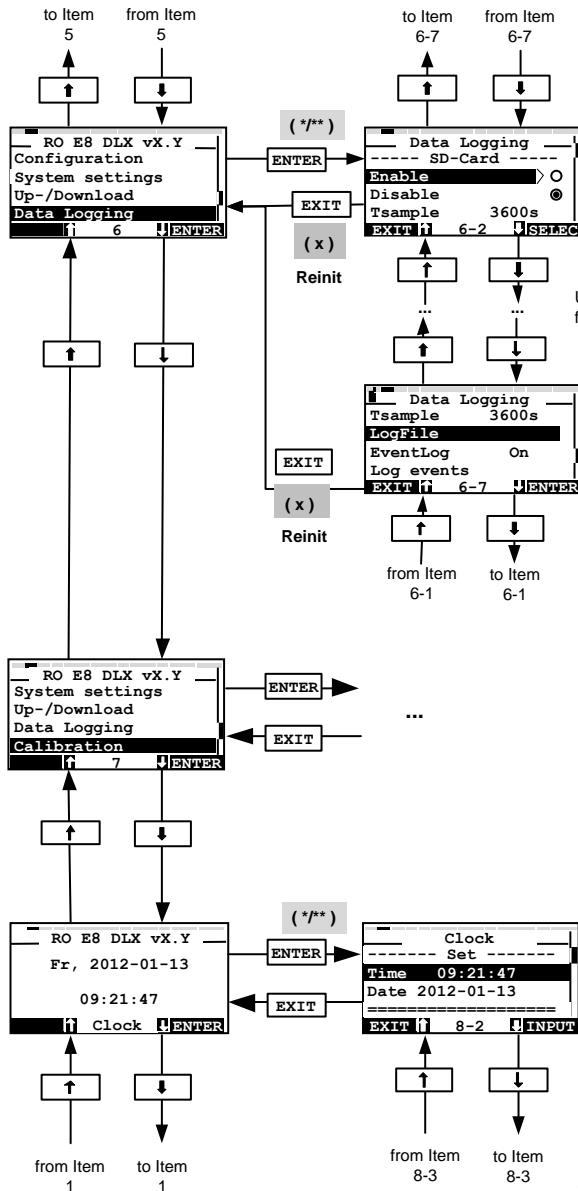
- Project Name** [] + ENTER-Softkey enters the project folder
- ..** [] + ENTER-Softkey returns to the parent folder
- .** [] + ENTER-Softkey saves the current file (with the saved name from the download) to the current folder
- CfgFileName.xml** + ENTER-Softkey starts upload of the current file to the selected file.
- ParFileName.xml**

! If a file in this folder already exists, the user will be requested, whether the existing file shall be overwritten or shall be kept. If the existing file shall be kept, the internally saved file name (from the download process) is extended with an ending „v00“ to „v99“.



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11.4.7 Data Logging / Calibration / Clock




Configuration Data Logging on SD-Card
 - Enable/Disable (immediately visible by the symbol top left on the display)

- Sample Time (e.g. each 3600s one data sample)

(*/**) Code-Protection: Operator or Specialist Level

(x) New settings of Tsample apply when returning to the Main Menu Level.


 No Up-/Download processes on SD-Card are possible during active Data Logging.

Use the Arrow-Up-/Down-Softkeys for scrolling through the list.

Submenu **LogFile** contains settings for current log file name and for Log File Size limitation.

Menu items „EventLog“ and „Log events“ are only visible with CodeLevel Specialist.

Internal Clock
 - Set Time
 - Set Date

 If the Internal Clock is set, the Biocid Dosing Module will be reinitialised. That means that all active dosing events of this module will be cancelled !!!

Use the Arrow-Up-/Down-Softkeys for scrolling through the list.

11.5 Data Logging File – Example

```
#HEADER
DatalogFile Rev A.00
              Source DEVICE
Device ID 561440
              Serial 999
Firmware ID 796353
              Rev D.00.00.00
Project Name RO E8 ECN v1.0
Cfg-File Name Cfg_RO_E8_ECN_v1_0.xml
              Applied 13.01.2012 09:21:47
Param-File Name Par_RO_E8_ECN_v1_0.xml
              Applied 13.01.2012 09:21:59
```

#PROCESSDATA

```
line 1: RO Machine
line 2: RO Mac
line 3: 0-0-1 0-0-2 0-1-1 0-1-2 0-3-1 0-5-1 0-5-2 1-15-100 1-15-101 1-15-102 1-15-103 1-15-104 1-15-105 1-15-106 1-15-107 1-15-108 1-15-109 1-15-110 1-15-111
line 4: date time hex str fl fl str fl fl fl fl fl fl fl str fl str fl str
line 5: Date Time LogEvent Event Common Ethernet Ethernet HOA HOA RO PumpHour DigIn-1 DigIn-2 4-20mA- State 4-20mA- State PT100-In-1 State
              Alarm State Event ROSystem ChemPump Status Meter In-1 In-2 In-1 In-2 INL_PH P_TEMP
line 6:
line 7: YYYY-MM-DD HH:MM:SS h gal/min gal/min uS/cm pH °F
2012-01-13 09:27:35.0 00010080 0 13 1 0 1 0.10 0.00 0.00 0.00 OK 7,14 OK 153.95 OK
2012-01-13 09:27:39.0 00001000 0 20 1 0 1 0.10 0.00 0.00 0.00 OK 7,14 OK 153.95 OK
2012-01-13 09:27:40.4 01010000 RO: ALL OFF! | 0 20 0 0 0 0.10 0.00 0.00 0.00 OK 7,14 OK 153.95 OK
2012-01-13 09:27:45.0 00000080 0 20 0 0 0 0.10 0.00 0.00 0.00 OK 7,14 OK 153.95 OK
and so on ...
```

Legend

Line 1: (User defined) names of Control Functions
Line 2: Configured modules (short module name)
Line 3: Internal code for PC-Tool
Line 4: Data format
Line 5: Internal names of the monitored variables
Line 6: User defined name of assigned input/output
Line 7: Units of observed variables

HOA RO System/Chem Pump/RO Status

0	OFF	3	FILL	6	FLUSH
1	AUTO	4	CIP	7	STANDBY
2	MANUAL	5	ALARM	8	PRETRT

State PV (English)

FA Internal AD-Fault
Fc Calibration Data Fault
FC Configuration Fault
FI Input Fault
FS Sensor Fault
nA Input not active
OK Value OK

State Y (English)

Au Automatic Mode - the output is calculated by assigned controller
CM Calibration mode: 4-20mA output is currently calibrated
Fc Calibration Data Fault (only 4...20 mA Outputs)
fo Output value is forced/controlled by another module
Ma Manual Mode - the output has to be controlled by the operator
OF Output Fault (4...20mA-Outputs)
YS Output is set to the value of "YSavePos" - Cause: Input or sensor error on at least one assigned module input

12 Quickstart PC Tool 8620 for SUEZ

12.1 Installation guide

12.1.1 System requirements

➤ **Minimum hardware requirement**

• Intel CPU with minimum 1,7 GHz or comparable processor
• 512 MB RAM
• Approximately 50 MB free hard disk space

➤ **Minimum software requirement**

• OS Microsoft Windows 2000 / Windows XP
• Microsoft .Net Framework 2.0
• Microsoft Windows Installer 3.1 (see paragraph 12.1.2)

12.1.2 Details for installation

➤ **Hardware**

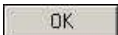




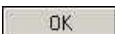
• You may need more free hard disk space for installing further Device Descriptions.

➤ **Software**

• Windows Vista / Windows 7 may be possible, but currently there is no official release.
• If Microsoft .NET Framework 2.0 doesn't exist on your computer, you have to install this software first. You can find Microsoft .Net Framework 2.0 on the official Microsoft homepage.
• For installing Microsoft .NET Framework 2.0 you need minimum Microsoft Windows Installer 3.1. You can find Microsoft Windows Installer 3.1 also on the official Microsoft homepage.

12.1.3 Installing PC Tool

➤ **Proceeding**

• Execute setup file You can find the setup file on the delivered SD card in the folder PCTool_8620 .
• Choose setup language and confirm with 
• Manage installation dialog with   
• Select installation directory
• Choose components for installation
• Select startup entry
• Start installation by click at 
• Finish installation with 

12.2 Working with the PC Tool

12.2.1 Program overview

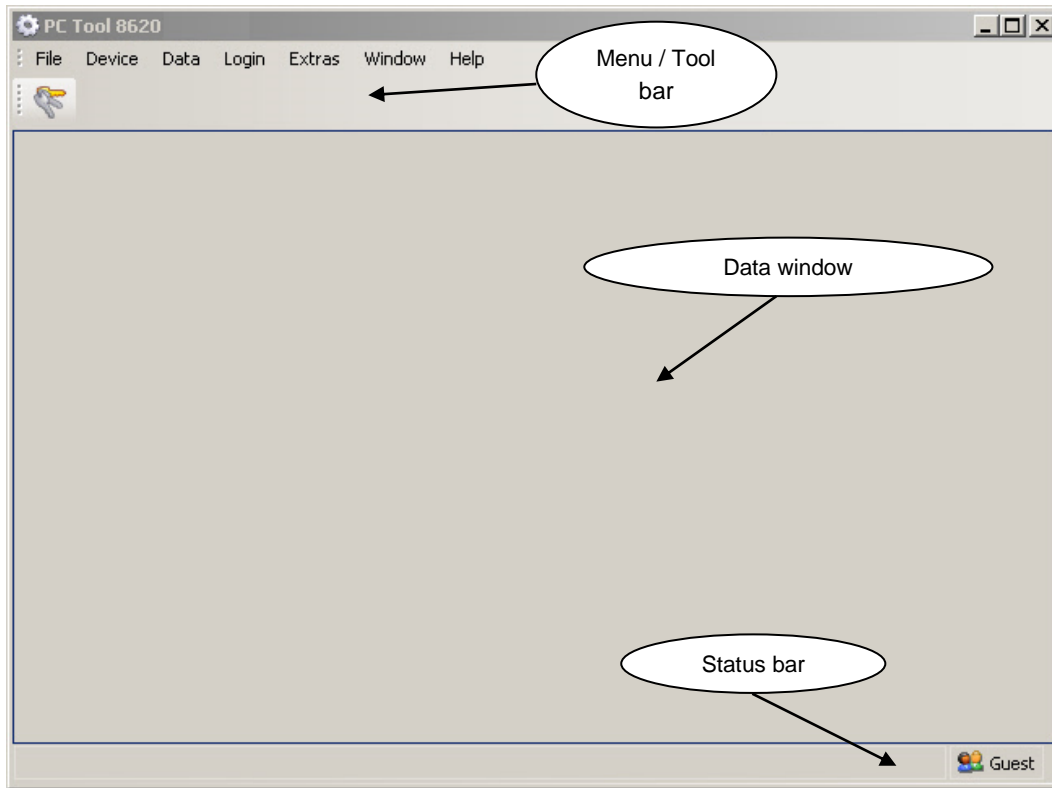



Figure 1: Screenshot PC Tool 8620 after start

► Description of highlighted fields in Screenshot


<i>Menu / Tool bar</i>	Used reference in Quickstart: → menu item → menu sub item
<i>Data window</i>	Display of the selected functionalities in different tabs
<i>Status bar</i>	Display of current PC Tool login level

12.2.2 Before starting to work


► Change program language by menu item

→Extras	→Language / Sprache	- Select program language
 - The new language will only be activated after next restart of application.		

► Select login level with icon or by menu item

→Login	→Login ...	- Select login level Operator / Specialist / Master - Insert associated code (by default: Operator 0001 / Specialist 0002) - Confirm with  Login
--------	------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Current login level is shown in the status bar.

 - Without login you are logged as guest. - If login level is insufficient, unavailable functions or input boxes will be grayed (font and / or background).	
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12.3 Communication PC Tool <--> Device

12.3.1 Device preconditions

- Device with one of the following configurations

Device type	Connection	Serial	TCP/IP (Ethernet)
8620 mxCONTROL with Ethernet		⊙	⊙

- PC (depending on connection) with following equipment

Serial	<ul style="list-style-type: none"> • USB Port (Driver installation for COM port necessary)
TCP/IP (Ethernet)	<ul style="list-style-type: none"> • Ethernet Network Connection, TPC/IP port 10001 not locked by firewall(s).

12.3.2 Establishing a connection via ...

- Serial Interface

<ul style="list-style-type: none"> • The virtual COM port driver "PL-2303" is already installed ¹ on the PC • The device is already powered up • PC and device are connected via USB connection cable • Start PC Tool (from Version V.1.0.0)
→ Device → New device connection Select tab 'Serial'



Figure 2: Main menu

- Select virtual USB COM port
If 'AUTO' was selected, PC Tool tries to identify a single USB-connected 8620 mxCONTROL device by requesting all available COM ports. Therefore firmware from Rev. C.00 is required.
- Checkbox 'Standard settings' should be selected
- Establish communication via 'Connect'
- Login for further functionality (refer to chapter 12.3.3)

- TCP/IP (Ethernet)

<ul style="list-style-type: none"> • The device and the PC are connected to the net work. • The device is powered up and the Ethernet function is enabled. • Start PC Tool (from Version V1.0.0)
→ Device → New device connection Select tab 'TCP/IP'

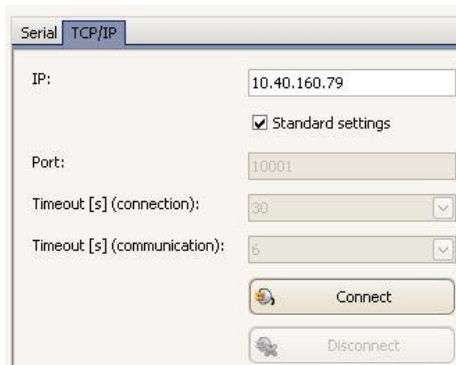


Figure 3: TCP/IP connection settings

- Input device IP.
In case of using a non-static IP:
Input the configured DHCP host name.
Therefore a DHCP server is required in the network. This DHCP server has to be configured to accept the device's DHCP host name transmitted by the device (host) during IP address allocation.
- Enable Standard settings
- If Standards settings were disabled:
Set timeouts for Connection und Communication
- Establish Communication with 'Connect'
- Login for further functionality (refer to chapter 12.3.3)

¹ If not, follow instructions in Chapter 12.3.4 "Installation of virtual COM-Port"

12.3.3 Navigation with established device connection

After successful device login the following options are selectable in the navigation area.




Figure 4: Navigation area for device connection.



> Connection

Connection ...	Communication settings
Device data ...	Display of device and protocol information
Login ...	Change device login level.
Logout	Logout from current device login level.



> Remote Control

Start / Stop	Start / Stop of remote control
Show display ...	Displays the active remote control screen, if another screen was selected in between.
	

> Download (PC -> Device)

Configuration file ...	Select file with  and then 
Parameter file ...	

> Upload (Device -> PC)

Configuration file ...	 . Afterwards select storage location on PC.
Parameter file ...	
Datalog file ...	Update datalog file list. Select datalog file and desired time range, afterwards start upload. Selected datalog file can be individually deleted from SD Card – online login level 'Specialist' is required.
	 Upload and store datalog files on PC before deleting from SD Card.

> Service

Firmware update ...	via USB connection only. - Use setting "Don't Establish Serial connection" for updating devices that have a firmware revision less than C.00
Download / Upload calibration file	- for service purposes only (device login level 'Master' required)

12.3.4 Installation of virtual COM port

- Start installation of driver 'Prolific USB PL 2303'. You can find the corresponding setup file on the delivered SD card in the folder **USB_Driver**.
- Follow the instruction manual and finish the installation process.

Connection settings for the COM port are set directly in the PC Tool (refer to chapter 12.3.2).

12.3.5 Device management

Integrated device management simplifies remote device access by supporting a list of devices for establishing a new connection and an auto password function.

Therefore the following data can be stored:

- Master data: Device location, device name, device ID, device serial, comments.
- Connections: Settings for serial and / or TCP/IP (Ethernet) access
- Passwords: For operator, specialist and master (stored encoded).

➤ Enhancing / editing device management

- Login into PC-Tool with code level 'Operator' (read only) or 'Specialist' (for editing)

→ *Device* → *Open device management* | Select tab 'Device management'

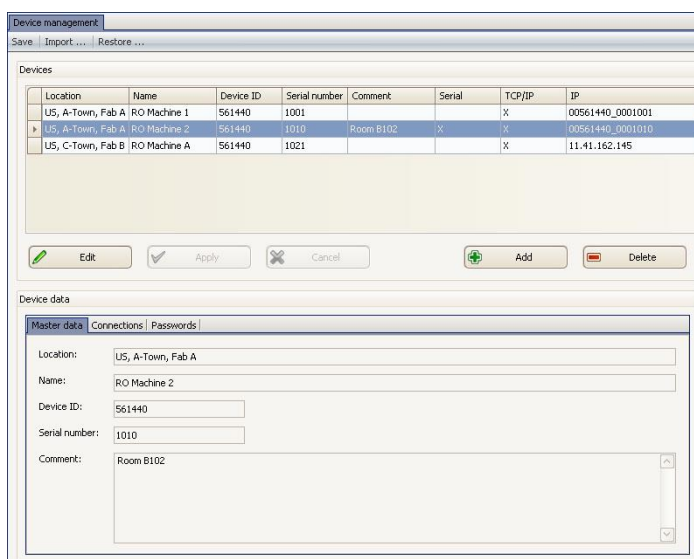


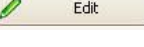


Figure 5: Device management.


 **Add** Adds a new device to device management.

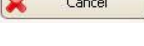
The currently selected device is ...

 **Delete** deleted from device management.


 **Edit** edited.
Edit data in the tabs Master data, Connections, Passwords.




In editing mode ...

 **Apply** apply changes to device management and exit editing mode.

 **Cancel** reject changed data and exit editing mode.


After editing ...


 **Save** Save device management changes. Each saving creates a separate backup file in the PC-Tool folder \AutoBackup with the current content for later restoring.

Restore an old version	Import an existing version
<p> Restore ...</p> <p>Restores an older auto backup version of the device management. Select the file to be restored. Auto backup files are labelled with their saving time stamp (YYYY-MM-DD hh:mm:ss).</p>	<p> Import ...</p> <p>Imports an existing device management file, e.g. - from an older PC-Tool version (after an update) - from a colleague. Select the file to be imported and choose one of the import options.</p>
<p> All changes since the last saving will be lost when restoring / importing a device management file!</p>	

➤ Adding data from an existing connection to device management

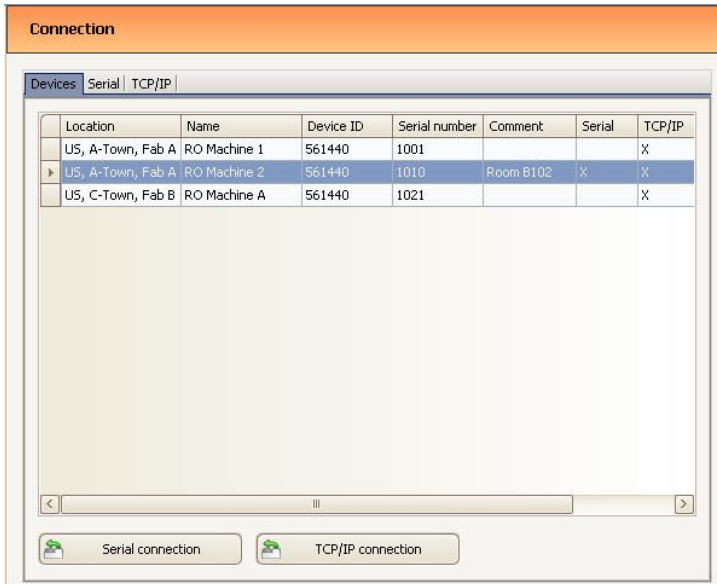
- Login into PC-Tool with code 'Specialist'
- Establish a connection to a device.
- Go to item 'Connection \ Device data ...' in the navigation bar and choose one of the following possibilities:

 **Add as a new device to device management** Adds a new device to device management with the current connection settings.

 **Copy connection data to device management** Copies the current connection data to the identified device in the device management. Existing data is overwritten. Check changes and press button 'Apply'. A device is identified by combination of device ID and serial number.

➤ **Establishing a connection via device management**

- Start PC Tool (from Version V.1.0.0)
 - Login into PC-Tool with at least code level 'Operator'
- *Device* → *New device connection* Select tab 'devices'



- Select the device you want to connect with
- Depending on device management data for the selected device, choose one of offered connections.
- PC-Tool opens the corresponding tab and automatically fills the input boxes with settings from device management.
- Select manually (last settings are kept):
'Serial connection':
- COM-Port
- Start the connecting process with 'Connect'
- For connection details refer to chapter 12.3.2, Establishing a connection via ...

Figure 6: Connection: List of devices.

➤ **Auto password function**

The auto password function copies the corresponding password into the login window after a connection was established and the login level was selected.

- Preconditions:**
- the identified device exists only one time in the device management
 - and the corresponding password exists in the device management
 - and the application login level is higher than or equal to the desired device login level.

MAN 1000384911 ML Version: - Status: RL (released | freigegeben) printed: 06.06.2019

12.4 Data evaluation

The datalog file has to comply to datalogfile format Rev A.00 or higher for using the data evaluation functionality.

12.4.1 Datalog file selection

- Start PC Tool (from Version V.1.0.0)

→ **Data** → **New data evaluation** Select tab 'File selection'

- Add logfile(s) to Logfile selection with "Add ..."
- If the logfile(s) can be processed, the list items 'Datasets', 'Start' and 'End' are filled with the corresponding values.
- The data range for data display in tables and charts can be limited by setting the data range with 'From' and 'To' to the desired range.
- For a new logfile selection clear the logfile selection list with "Remove all".

Figure 7: Logfile selection

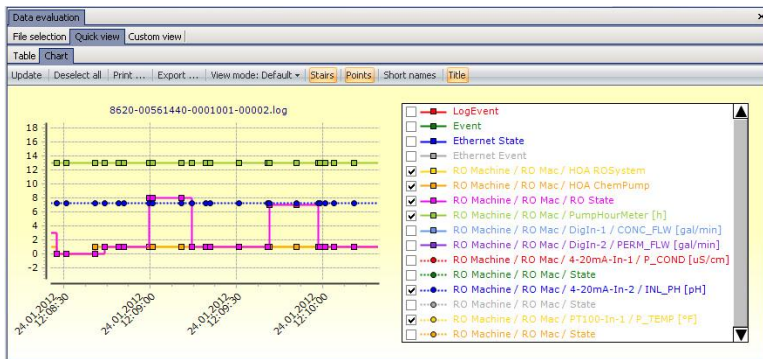
12.4.2 Quick view

► **Table**

- Table view** of the read process data sets. Data sets are sorted according to ascending time stamp.
- '**Short names**' enables [Default] / disables short names for column labels in the table head

Figure 8: Quick view Table

► Chart



- **Overview chart**
of all read process data sets.
Both axes are auto scaled.
- **Reducing displayed data curves** by
deselecting the corresponding curve in the
explanation box.
- For **further chart functionality** refer to
chapter 12.4.4.

Figure 9: Quick view Chart

12.4.3 Custom view

► Designer

Data point	Data type	Table	Chart 1	Chart 2	Chart 3	Chart 4
LogEvent	Hex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Event	String	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Ethernet State	Float	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ethernet Event	String	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
RO Machine / RO Mac / HOA ROSystem	Float	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RO Machine / RO Mac / HOA ChemPump	Float	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RO Machine / RO Mac / RO State	Float	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RO Machine / RO Mac / PumpHourMeter [h]	Float	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RO Machine / RO Mac / DigIn-1 / CONC_FLW [gal/min]	Float	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RO Machine / RO Mac / DigIn-2 / PERM_FLW [gal/min]	Float	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RO Machine / RO Mac / 4-20mA-In-1 / P_COND [uS/cm]	Float	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
RO Machine / RO Mac / State	String	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RO Machine / RO Mac / 4-20mA-In-2 / INL_PH [pH]	Float	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
RO Machine / RO Mac / State	String	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RO Machine / RO Mac / PT100-In-1 / P_TEMP [°F]	Float	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RO Machine / RO Mac / State	String	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 10: Custom view Designer

Design several customized charts.

- Select data points to be displayed in a separate data point table.
- Add / delete designed charts.
- Select for each chart the desired data points to be displayed.
- Data point table and charts are displayed on separate tabs.

Template

Save current assignment of data points to table and charts in a file.
Or load saved assignment of data points.

Add chart

Adds an additional chart to the designer.

Delete chart

Deletes the chart, which is selected in the left hand selection box.

Short names

enables [Default] / disables display of short names in the column 'Data point'

► Table

Displays the data points, selected with the Designer in column "Table", in list form.
Data sets are sorted according to ascending time stamp.

► Chart X

Displays the data points, selected with the Designer in column "Chart X".
Axes are auto scaled. For further chart functionality refer to chapter 12.4.4.

► All charts

All charts are displayed with their individual settings on one tab. If the mouse was moved over one of these charts, a vertical time bar indicates the current time position in the other charts.

12.4.4 Chart functionality

➤ Zoom

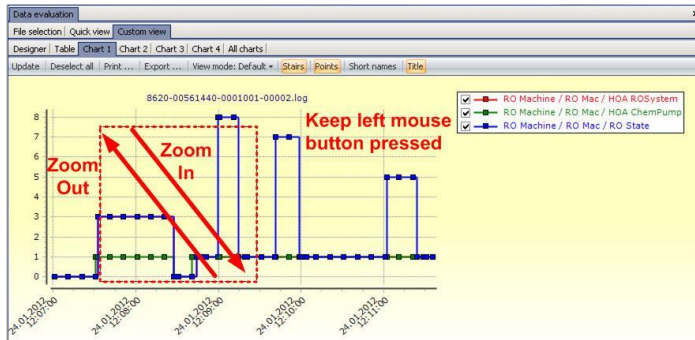


Figure 11: Zoom In / Zoom out.

Zoom In

Mark the desired 'zoom in area' with drawing a rectangle from the left upper corner to the bottom right corner while keeping the left mouse button pressed.

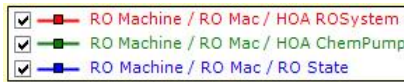
Zoom Out

Reset all 'zoom in' steps with drawing a line from the bottom right corner to the left upper corner while keeping the left mouse button pressed.

➤ Move

Move the displayed data area by keeping the right mouse button pressed and moving the mouse to the desired direction.

➤ Change number of displayed data curves



(De) select the corresponding data curve(s) in the explanation box.

Figure 12: Explanation box.

➤ Display options

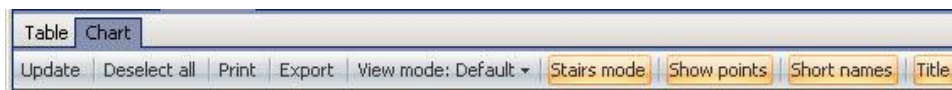


Figure 13: Chart menu..

Menu item	Functionality
Update	Selects all data curves in the explanation box
Deselect all	Deselects all data curves in the explanation box – for easy selection of desired data curves.
Print	Opens a dialog for printing the current chart.
Export	Opens a dialog for exporting the chart as a picture. Use the picture export only. Other offered export opportunities are senseless and might cause the PC Tool to shut down.
Stairs mode	Enabled [Default]: Forces the data points to be connected stairs like. Disabled: Otherwise data points are connected by simple connection lines.
Show points	Enables [Default] / disables the display of each data point with a marker.
Short names	Enables [Default] / disables short names for the different data in explanation box.
Title	Enables [Default] / disables the display of the processed log file names as chart title.