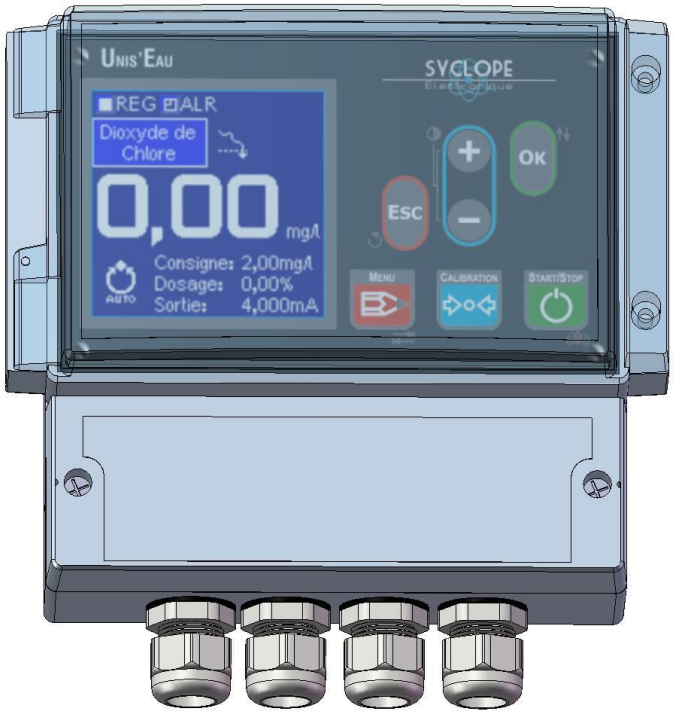
SYCLOPE UNIS'EAU® controller for industrial applications (Part 3)



Communication programming instructions

SYCLOPE Electronique

Reference : CEN0002 Rev : 3

Parts of the general documentation

Part 1: Installation and starting instructions
Part 2: Programming instructions
► Part 3: Communication programming instructions

General informations :

SYCLOPE Electronique 2015® Notice of 02/04/2015 Rev 3.1

Professional controller for industrial applications **UNIS'EAU®**

Part 3 : Communication programming instructions (Ref : DOC0100_en)

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Contents

I. Use of the document

Please read this entire document before starting to install, adjusting or commissioning your controller device, in order to ensure the safety of users, the processes and the equipment.

The information provided in this document must be strictly observed. SYCLOPE Electronique S.A.S. declines all responsibility in cases where failure to comply with the instructions of this documents is observed.

The following symbols and pictograms will be used to facilitate reading and understanding of these instructions.

- Information
- ► Action to be taken
- ➢ Item of a list or catalogue

1) Symbols and signs

Identification of a continue voltage or current

Identification of an alternative voltage or current

Protective ground

Functional ground

Risk of injury or accident. Identify a warning concerning a potentially dangerous risk. Documentation must be consulted by the user with each time the symbol is notified. If the instructions are not respected, that presents a risk of death, physical injuries or property damages.

Electric hazard. Identify a warning statement relative to a mortal electric danger. If the instructions are not strictly respected, that implies an inevitable risk of physical injuries or death.

Risk of incorrect operation or damage for the device.

Comment or particular information.

Recyclable element.

2) Storage, transport and packaging

It is important to store and transport your **SYCLOPE UNIS'EAU®** in its original packaging in order to minimize risk of damage.
Furthermore, the package must be stored in an environment that is protected against humidity and exposure to chemical products.

Environmental conditions for transport and storage:

Temperature: -10 °C to 70 °C
Air humidity: Maximum of 90% with no condensation

3) Packaging

The controller is delivered without electrical power cable.

The pre-holes of the box are drilled and equipped with according electrical glands in compliance with IP65 level protection. Cables must be adapted to the electrical glands to respect the level of protection.
Grounded cables for connecting pH and ORP (Redox) sensors are not provided.

Content of the packaging :

- ✓ One analyser/controller **SYCLOPE ODISEA®**
- ✓ Installation and starting instruction notice
- ✓ Programming notice
- ✓ Communication notice (Option)

4) Warranty

The warranty is provided according to the terms of our general conditions of sale and delivery as long as the following conditions are met:

- Use of the equipment according to the instructions of this notice
- No modifications of the equipment which may modify its behaviour and no incorrect manipulation
- Respect for the electrical safety conditions

Consumable material is no longer covered by the warranty when in use.

II. Environment and safety procedures

Please:

- Read this manual carefully before unpacking, installing or commissioning this equipment
- Take into account all the hazards and recommended precautionary measures

Failure to respect these procedures can result in serious injury to users or damage the device.

1) Use of the equipment

The **SYCLOPE UNIS'EAU®** system has been designed to measure and regulate temperature, pH, Redox potential, chlorine (or bromine), conductivity, etc… by means of sensors and controls of suitable actuators in the context of the possible uses described in this manual.

All other uses are considered to be non-conforming and must therefore be forbidden. SYCLOPE Electronique S.A.S. will not be responsible in any case for any damages that result from such uses.

Any use of sensors or interfaces not-in conformity to the features defined in this handbook must also be proscribed.

2) User obligations

The user undertakes not to allow its employees to work with the **SYCLOPE UNIS'EAU®** equipment described in this manual unless they:

- Are aware of the fundamental instructions relating to work safety and prevention of accidents
- Are trained in the use of the device and its environment
- Have read and understood these instructions, warnings and manipulation rules

3) Risk prevention

The installation and connection of the **SYCLOPE UNIS'EAU®** equipment should only be performed by personnel specialized and qualified for this task.
The installation must comply with current safety standards and instructions!

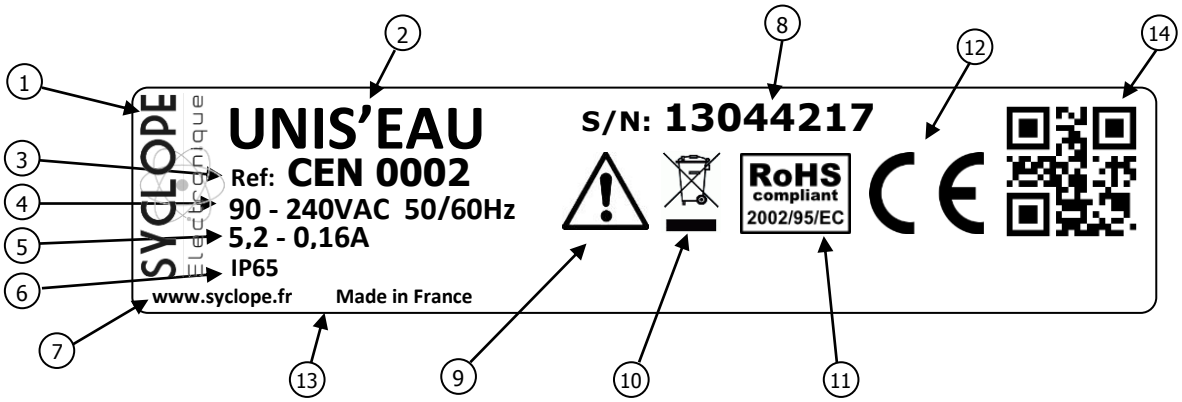
Before switching on the controller or manipulating the relay outputs, remember always to cut off the primary power supply!
Never open the controller when it is powered on!
Maintenance operations and repairs should only be performed by trained, specialized personnel!

Take care when choosing the location for installing the equipment according to the environment!
The **SYCLOPE UNIS'EAU®** electronic box should not be installed in a hazardous environment and should be protected against splashing with water or chemical products. It should be installed in a dry, well-ventilated location, isolated from corrosive vapours.

Make sure that the chemical sensors used with this device correspond well to the chemicals used. Refer to the individual technical note of each sensor. Chemistry of water is very complex, in case of doubt, contact immediately our engineering service or your approved installer/reseller.

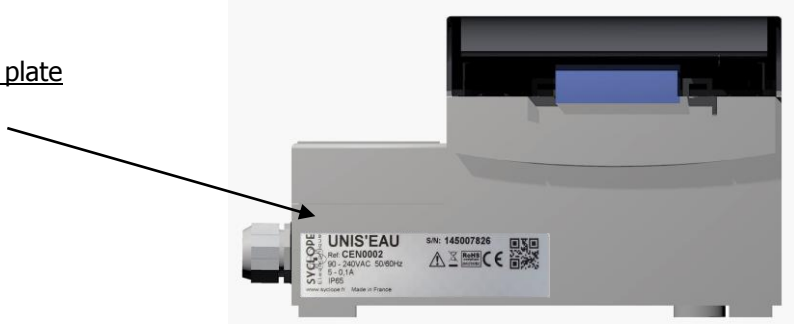
Chemical sensors are sensitive elements using consumable parts. They must be supervised, maintained and calibrated regularly using specific calibrator systems not-provided with this equipment. In the event of defect, a surplus possible hazard of chemical injections can be noted. In the doubt, a service contract must be taken near your reseller/installer or failing this near our engineering services. Contact your approved installer/reseller or our business service for more information.

4) Identification and localization of the identification plate



(1) Label of the manufacturer	(9) Particular risks. Read the notice
(2) Model of the product	(10) Product which can be recycled
(3) Reference of the product	(11) Limitation of dangerous substances
(4) Range of power supply	(12) EC certified
(5) Values of the maximum current	(13) Country of origin
(6) Classify protection	(14) Manufacturer square code
(7) Identification of the manufacturer	
(8) Serial number	

Identification plate



5) Disposal and conformity

The recyclable packaging of the **SYCLOPE UNIS'EAU®** equipment must be disposed of according to current regulations.

Elements such as paper, cardboard, plastic or any other recyclable elements must be taken to a suitable sorting center.

According to European directive 2002/96/EC, this symbol means that as of 12 August 2005 electrical appliances cannot be thrown out together with household or industrial waste. According to current regulations, consumers within the European Union are required, as of this date, to return their used devices to the manufacturer, who will take care of disposing them at no extra expense.

According to European directive 2002/95/EC, this symbol means that the **SYCLOPE UNIS'EAU®** controller is designed in compliance with the restrictions on hazardous substances

According to low-voltage directive (2006/95/EC) and the electromagnetic compatibility directive (2004/108/EC), this symbol means that the device has been designed in compliance with the previously cited directives

III. Synoptic fundamental of communication

UNIS'EAU controllers are built to be connected together by a ModBus© protocol RTU or ASCII on RS485 communication port.

1) Local connection with a maintenance software

- Connecting on or more **UNIS'EAU** controller through the RS485 communication port.

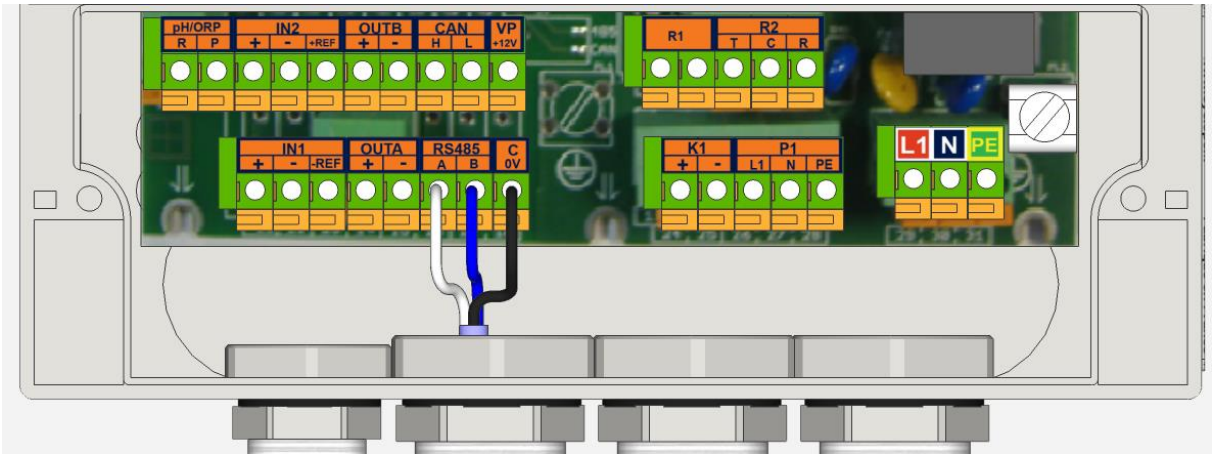
To connect the **UNIS'EAU** controller to your personal computer (PC), you must have a compatible USB/RS485 converter module.

Reference	Name
INF1021	Converter USB ⇔ 485

IV. Connections

1) Connecting the USB/RS485 converter on RS485 communication port

On the UNIS'EAU side, corresponding terminals for wiring are identified.



More controllers could be chained by respecting the same wiring from one to other one.

On the computer side, the wiring must be done through the USB/RS485 converter.

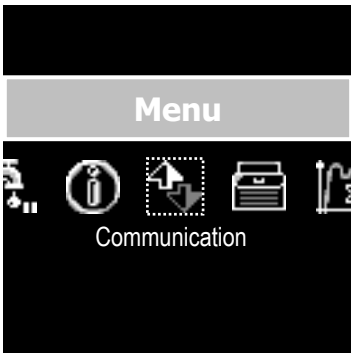
- Blue (Terminal n°3) : AA' RS485
- White (Terminal n°4) : BB' RS485
- Black (Terminal n°5) : GND RS485

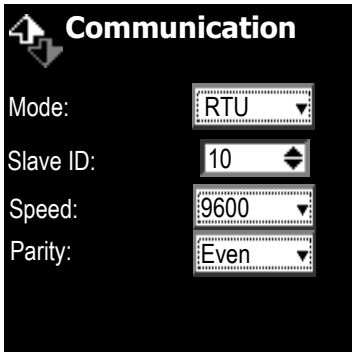
Configuration : All the switches are **ON**

The converter is delivered with an installation CDRom. You must install the converter drivers on your computer before using it.

V. Programming controller

1) Communication menu





Name	Significance	Range	Factory value
Mode	Communication protocol used by the controller on RS485 port.	RTU/ASCII	RTU
Slave ID	Slave ID of the controller.	1…247	10
Speed	Communication speed	300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200	9600
Parity	Communication parity	None, Even, Odd	Even

VI. Register of ModBus© protocol

1) Addresses of the registers

The registers are numbered according « HOLDING REGISTER » ModBus protocol, they used addresses from 40001 to 49999.

Note that other softwares/controllers used « addresses » and not « registers », in this case, numbering is used from 0 to 65535.
Register "40001" correspond to the address "0" … 40002 to the address "1" … and so on !

ModBus© Register	Sizes of register 16bits	Name	Attributes	Format	Description
Configuration					
40001	136	eeprom	rw	STRUCT	Memory
Entries interfaces					
41001	2	signal_J1	r	REAL	Value of the entry J1 in [mV]
41003	2	signal_IN1	r	REAL	Value of the entry IN1 in [mA]
41005	2	singnal_IN2	r	REAL	Value of the entry IN2 in [mA]
41007	2	signal_K1	r	REAL	Value of the entry K1 in [Hz]
41009	1	supply_IN	r	BOOL	0=12V 1=24V
41010	1	state_K1	r	BOOL	0=OPEN 1=CLOSE
41011	1	state_R1	r	BOOL	0=OPEN 1=CLOSE
41012	1	state_R2	r	BOOL	0=OPEN 1=CLOSE
41013	1	state_P1	r	BOOL	0=OPEN 1=CLOSE
41014	2	Current_IOUTA	r	REAL	Value of the output OUTA in [mA]
41016	2	current_IOUTB	r	REAL	Value of the output OUTB in [mA]
41018	2	timestamp	rw	DWORD	Real time machine in [s] reference from 1970, 1st January Time: 0h00
Values and states					
41101	1	param_state	rw	WORD	Bit 0 : Controller activated Bit 1 : Délais du capteur ou des capteurs Bit 2 : Stop all controls Bit 3 : Flow switch or flowmeter flag (true == flow active) Bit 4 : Maintenance is requested Bit 5: Dosing active Bit 6: Alarm active Bit 7: Timer affected to the control Bit 8: Disconnected of fail sensor Bit 9: Sensor out of range Bit 10: Value from a sensor unstable Bit 11: Low value passed Bit 12: High value passed Bit 13: Maximum dosing time over
41102	2	measure_value	r	REAL	Measured value in [unity of measure]
41104	2	control_w	rw	REAL	Set point in [unity of measure]
41106	2	dosage_u	r	REAL	Dosing power in [%]

41108	2	alarm_high	rw	REAL	High threshold in [unity of measure]
41110	2	alarm_low	rw	REAL	Low threshold in [unity of measure]
41112	2	sensor_J1_value	r	REAL	Measurement from sensor on J1 in [unity of sensor J1]
41114	2	sensor_IN1_value	r	REAL	Measurement from sensor on IN1 in [unity of sensor IN1]
41116	2	sensor_IN2_value	r	REAL	Measurement from sensor on IN2 in [unity of sensor IN2]
41118	2	sensor_K1_value	r	REAL	Measurement from sensor on K1 in [unity of sensor K1]
Sensors					
41201	32	sensor_J1	r	STRUCT	State and value of sensor J1
41251	32	sensor_IN1	r	STRUCT	State and value of sensor IN1
41301	32	sensor_IN2	r	STRUCT	State and value of sensor IN2
41351	32	sensor_K1	r	STRUCT	State and value of sensor K1
Switches					
41401	10	switch_K1	r	STRUCT	State of switch K1
Relays					
41501	8	relay_R1	r	STRUCT	State of relay R1
41521	8	relay_R2	r	STRUCT	State of relay R2
41541	8	relay_P1	r	STRUCT	State of relay P1
Parameters					
41601	104	param	r	STRUCT	State and value of the measured parameter
0/4-20mA outputs					
41801	16	iout_A	r	STRUCT	State and value of analogical output OUTA
41821	16	iout_B	r	STRUCT	State and value of analogical output OUTB
Timer					
41901	12	calendar	r	STRUCT	State of timer
Display					
42001	2048	screen	r	STRUCT	Buffer of display 2bpp 128x128pix

2) Data formatting

BOOL type
"Bool" type is stored in 1 ModBus© register and it can take two values 0 either 1.

Example :
Register 41013 correspond to the state of P1.
REG(41013) = 0 : Open switch
REG(41013) = 1 : Closed switch

REAL type
"Real" type is stored in 2 registers and it allows to code decimal value with floating comma and 32bits.

Example :
Register 41102 has measured value. This value is converted in unity of measure selected in the "measure menu" of the controller.
Measured value is: 1.94ppm. The representation of the value in floating hexadecimal is 0x3FF851EC.
REG(41102) = 0x51EC
REG(41103) = 0x3FF8

WORD type
« Word » type is stored in 1 register and it allows to code decimal value without comma or 16bits alone.

Example (bits) :
Register 41101 has state bits of the controller. Each bit represent a state.
REG(41101) = b0000100001001001

REG(41101)(bit00) = 1 : Controller is active
REG(41101)(bit01) = 0 : No delay in progress
REG(41101)(bit02) = 0 : No pause
REG(41101)(bit03) = 1 : Flow is OK
REG(41101)(bit04) = 0 : No requested maintenance
REG(41101)(bit05) = 0 : No dosing
REG(41101)(bit06) = 1 : One alarm is active
REG(41101)(bit07) = 0 : No timer affected to the used parameter
REG(41101)(bit08) = 0 : No disconnected or out of order sensor
REG(41101)(bit09) = 0 : No sensor out of limits
REG(41101)(bit10) = 0 : No unstable sensor
REG(41101)(bit11) = 1 : Measurement value is under the low limit
REG(41101)(bit12) = 0 : No High value
REG(41101)(bit13) = 0 : No dosing time out
REG(41101)(bit14) = 0 : Not used
REG(41101)(bit15) = 0 : Not used

DWORD type
« Dword » type is stored in 2 registers and it allows to code decimal value without comma or 32bits alone.

Example :
Register 41018 has the real time of the controller in second referenced from 1970, 1th January.
When date is 2015/04/27 at 15h35mn19s, the timecode is 1430141719 means 0x553E3B17 in hexadecimal.
REG(41018) = 0x3B17
REG(41019) = 0x553E

STRUCT type (sensor)
This structure has the entire informations concerning a sensor.

Name	Size in byte	Type	Description
sen	1	entire	ID of the sensor
ch	1	entire	ID of the entry where the sensor is connected
def	1	entire	ID of the sensor into the catalogue of std sensors.
align	1	--	internal
fd	4	entire	Memory file of the configuration
flag	1	bit	bit0 : Fault bit1 : Disconnected bit2 : Out of range bit3 : Low value of measurement bit4 : Max measurement value reached bit5 : Low measurement value reached bit6 : Unstable measurement value bit7 : maintenance or calibration requested
kind	1	entire	Type of sensor : 0 : None 1 : Free chlorine 2 : Active chlorine 3 : Total chlorine 4 : Chloramines 5 : Chlorite 6 : Chlorine dioxide 7 : Peroxide H2O2 8 : Bromine BCDMH 9 : Bromine DBDMH 10 : Free bromine 11 : Active bromine 12 : Total bromine 13 : Peracetic acid PAA 14 : Ozone 15 : Dissolved oxygen 16 : Nitrate 17 : PHMB 18 : Salinity 19 : TDS 20 : Turbidity 21 : Conductivity 22 : Temperature 23 : Flow 24 : pH 25 : RedOx 26 : Chloride 27 : Ammonia 28 : Fluoride 29 : ISE
unit	1	entire	Unity of the sensor: 0 : None 1 : Without unity 2 : Decade 3 : pH 4 : ppb 5 : ppm 6 : µg/l 7 : mg/l 8 : g/l

			9 : % 10 : µS/cm² 11 : mS/cm² 12 : NTU 13 : FNU 14 : °K 15 : °C 16 : °F 17 : °R 18 : mA 19 : mV 20 : Hz 21 : CPM 22 : ms 23 : sec 24 : min 25 : h 26 : l 27 : m3 28 : l/min 29 : l/h 30 : m3/h 31 :imp/l 32 :imp/m3
transducer	1	entire	Type of transducer : 0 : None 1 : 0…20mA 2 : 4…20mA 3 : pH -> 4…20mA 4 : RedOx -> 4…20mA 5 : pt100 -> 4…20mA 6 : fluoride -> 4…20mA 7 : fluoride (100) -> 4…20mA 8 : ISOCAP pH -> 4…20mA 9 : ISOCAP RedOk -> 4…20mA 10 : UNISO P -> 4…20mA 11 : UNISO R1 -> 4…20mA 12 : UNISO R -> 4…20mA 13 : UNISO B -> 4…20mA 14 : 0…2000mV 15 : 0…-2000mV 16 : (potentiometric) mV 17 : Pulse
fault_tick	1	entire	Delay of error of the sensor in ½ seconds
align	3	--	internal
min_value	4	real	Minimum value of measurement of the sensor
max_value	4	real	Maximum value of measurement of the sensor
cal_slope	4	real	Slope after calibration
cal_offset	4	real	Offset after calibration
std_slope	4	real	Std slope of the sensor before calibration
std_offset	4	real	Std offset of the sensor before calibration
z_dex	4	--	internal
interface	4	real	Value of selected measurement
signal	4	real	Raw value of sensor
std_value	4	real	Value before calibration
value	4	real	Value after calibration
next	4	--	internal

Example :
For reading sensor unity connected on IN1 entry: Base register is REG(41251), unity value is the 11th byte of the structure. They are 2 bytes where unity value is on the 6th register of the structure, means into REG(41256).
REG(41256) = 0x0502
Coding is into "Little endian" means unity value is into the high position: 0x05 corresponding to [ppm].

STRUCT type (switch)
This structure has the entire informations concerning a flow switch or a pause state.

Nom	Size in byte	Type	Description
sw	1	entire	ID of the switch
ch	1	entire	ID of the entry where the switch is connected
align	2	--	internal
fd	4	entire	Memory file of configuration
flag	1	bit	bit0 : Direction of the switch NO=0 ; NC=1 bit1 : internal bit2 : Switch closed bit3 : Switch closed after delayed value bit4 : Active state (Closed in NO et Opened in NC)
align	1	--	internal
delay	2	entire	Delay time of the contact in ½ seconds
tick	2	entire	Decrease counter of the delay
align	2	--	internal
next	4	--	internal

Example :
For reading the delay time of K1 switch: The base register is REG(41401), the delay time is into the 11th and the 12th byte of the structure into register REG(41406).
REG(41406) = 0x0A00
Coding is in "Little endian" means the value is 0x000A, 10 in decimal. Delay time is counted in ½ seconds and value is 10 x ½ s = 5 sec.

STRUCT type (relay)
This structure has entire informations concerning relay state (Alarm or dosing).

Name	Size in byte	Type	Description
rel	1	entire	ID of the relay
ch	1	entire	ID of the output where relay is connected
align	2	--	internal
fd	4	entire	Memory file of the configuration
flag	1	bit	bit0 : Direction of the switch NO=0 ; NC=1 bit1 : Switch closed bit2 : Active state (Closed in NO et Opened in NC) bit3 : internal
align	3	--	internal
next	4	--	internal

Example :
For reading state of P1 relay: The base register is REG(41541). The state of the relay is represented in bit 2, means the 9th byte of the structure corresponding to the register REG(41545).
REG(41545) = 0x0600. The flag byte is equal to 0x06 in binary code: 0b00000110
The bit2 is 1 means relay activated.

STRUCT type (param)
This structure has entire informations concerning measurement parameter, the control and the alarms.

Nom	Size in byte	Type	Description
par	1	entire	ID of the parameter
align	3	--	internal
fd	4	entire	Memory file of the configuration
flag	2	bit	bit0 : Control and alarms activated bit1 : Delay value to activate sensors bit2 : All controls stopped bit3 : Flow activated bit4 : Maintenance requested bit5 : dosing in progress bit6 : alarm on bit7 : timer activated bit8 : Sensor disconnected or out of order bit9 : Sensor saturated bit10 : Sensor unstable bit11 : Low threshold reached bit12 : High threshold reached bit13 : Dosing time reached
measure_delay	2	entire	Delay time to start controls in ½ seconds
measure_tick	2	entire	Decrease counter for putting on
align	2	--	internal
measure_sensor	12	--	internal
measure_kind	1	entire	Type de measure : 0 : None 1 : Free chlorine 2 : Active chlorine 3 : Total chlorine 4 : Chloramines 5 : Chlorite 6 : Chlorine dioxide 7 : Peroxide H2O2 8 : Bromine BCDMH 9 : Bromine DBDMH 10 : Free bromine 11 : Active bromine 12 : Total bromine 13 : Peracetic acid PAA 14 : Ozone 15 : Dissolved oxygen 16 : Nitrate 17 : PHMB 18 : Salinity 19 : TDS 20 : Turbidity 21 : Conductivity 22 : Temperature 23 : Flow 24 : pH 25 : RedOx 26 : Chloride 27 : Ammonia 28 : Fluoride 29 : ISE
measure_unit	1	entire	Measurement unity of the parameter

			0 : None 1 : Without unity 2 : Decade 3 : pH 4 : ppb 5 : ppm 6 : µg/l 7 : mg/l 8 : g/l 9 : % 10 : µS/cm² 11 : mS/cm² 12 : NTU 13 : FNU 14 : °K 15 : °C 16 : °F 17 : °R 18 : mA 19 : mV 20 : Hz 21 : CPM 22 : ms 23 : sec 24 : min 25 : h 26 : l 27 : m3 28 : l/min 29 : l/h 30 : m3/h 31 :imp/l 32 :imp/m3
align	2	--	
measure_min_value	4	real	Low range value of measurement
measure_max_value	4	real	High range value of measurement
measure_value	4	real	Measurement value of the parameter
measure_m_factor	4	real	Modification factor of the measurement value
measure_t_factor	4	real	Modification factor of the temperature
alarm_relay	4	--	internal
alarm_pending	1	bit	Bits of alarms in progress bit0 : No flow bit1 : Low threshold reached bit2 : High threshold reached bit3 : Sensor disconnected or out of order bit4 : Sensor out of scale bit5 : Dosing time reached
alarm_enable	1	bit	Bits of alarms activated bit0 : No flow bit1 : Low threshold reached bit2 : High threshold reached bit3 : Sensor disconnected or out of order bit4 : Sensor out of scale bit5 : Dosing time reached
alarm_threshold_delay	1	entire	Delay time of low and high alarms
alarm_threshold_tick	1	entire	internal
alarm_threshold_hyst	4	real	Hysteresis value of tow and high alarms

alarm_threshold_low	4	real	Value of low threshold
alarm_threshold_high	4	real	Value of high threshold
flow_sensor	4	--	internal
flow_switch	4	--	internal
flow_unit	1	entire	Unity of flowrate : 28 : l/min 29 : l/h 30 : m3/h
align	3	--	
flow_threshold	4	real	Flow threshold value for activation
flow_q_min	4	real	Maximum flowrate value for control calculation
flow_q_max	4	real	Minimum flowrate value for control calculation
flow_value	4	real	Flowrate value
control_flag	1	bit	bit0 : 0 = First level controlling 1 = Second level controlling bit[1~2] : Control mode 0 = hysteresis 1 = Proportional 2 = PI 3 = PID bit3 : Hold function activated
align	1	--	
control_time	2	entire	Maximum dosing time in ½ seconds
control_tick	2	entire	Dosing time in progress ½ sec
align	2	--	
control_w	4	real	Set point
control_x_dead	4	real	Dead band or hysteresis
control_xp	4	real	Reciprocal proportional value
control_ki	2	entire	Integral factor
control_kd	2	entire	Derivative factor
control_kb	2	entire	Saturate factor
align	2	--	
control_z_y	4	real	Delay time of the control calculation value
control_z_ex	4	real	Delay of error or entry (According to the level of control)
control_z_dex	4	real	Delay of the derivative error
control_sum_e	4	real	Integral error value
dosage_relay	4	--	internal
dosage_flag	1	bit	bit[0~1] : Dosing mode 0 = On/Off 1 = PWM 2 = Pulsed 3 = 3 points (for modular valve) bit[2~3] : Direction of control 0 = Up 1 = Down 2 = neutralisation bit4 : Dosing is combined with flowrate value bit5 : Pause of the dosing element bit6 : Dosage activated
align	3	--	
dosage_u_bias	4	real	Basic added value of dosage value in %
dosage_u	4	real	Command of dosing element
dosage_period	4	entire	Cycle period or pulse in ms
dosage_min_width	2	entire	Minimum time for a pulse duration
align	2	--	
dosage_compute_time	4	--	internal

dosage_tilt_time	4	--	internal
dosage_ref_time	4	--	internal
dosage_delay	4	--	internal
dosage_timer	20	--	internal
next	4	--	internal

Example :
For reading flowrate value: The base register is REG(41601) and the element is flowrate value. This value is a real, means 4 bytes used. This element is into REG(41649) and REG(41650).
REG(41649) = 0xA470
REG(41650) = 0x4541
Coding is in "Little endian" means value is: 0x414570A4, 12,34 really.

STRUCT type (iout)
This structure has entire informations concerning analogical outputs 0/4…20mA.

Nom	Size in byte	Type	Description
out	1	entire	ID of the output
ch	1	entire	0 = IOUTA, 1 = IOUTB
align	2	--	
param	4	--	internal
fd	4	entire	Memory file of the configuration
flag	2	bit	bit0 : Output type 0 : 4…20mA 1 : 0…20mA bit[1~2] : Value of current when error 0 : 0mA 1 : 0 or 4mA according type 2 : 2,6mA bit[3~4] : Current value when inhibited 0 : No current of inhibition 1 : 0mA 2 : 0 or 4mA according type 3 : 3,4mA bit[5~6] : Current value when over range 0 : 21,7mA 1 : 20mA 2 : 20,8mA bit7 : Mode 0 : Transfer of measured value 1 : Control bit8 : Inhibited output bit9 : Output paused
align	2	--	
point_0_4mA	4	real	Value for 0 or 4mA current
point_20mA	4	real	Value for 20mA current
current	4	real	Value of current being transmitted
next	4	--	internal

STRUCT type (calendar)
This structure has entire informations concerning calendar.

Name	Size in byte	Type	Description
cld	1	entire	ID of the calendar
align	3	--	Internal
param/relay	4	--	internal
fd	4	entire	Memory file of the configuration
flag	1	bits	bit0 : Calendar activated bit[1~2] : Calendar using 0 : None 1 : Relay command 2 : Control or alarm authorisation bit3 : Repeat cycle 0 : Week 1 : Day bit4 : Calendar paused
enable	1	bits	Intervals or authorized days: bit0 : Interval 1 or Monday bit1 : Interval 2 or Tuesday bit2 : Interval 3 or Wednesday bit3 : Interval 4 or Thursday bit4 : Interval 5 or Friday bit5 : Interval 6 or Saturday bit6 : Interval 7 or Sunday
active	1	bits	Intervals or activated days : bit0 : Interval 1 or Monday bit1 : Interval 2 or Tuesday bit2 : Interval 3 or Wednesday bit3 : Interval 4 or Thursday bit4 : Interval 5 or Friday bit5 : Interval 6 or Saturday bit6 : Interval 7 or Sunday
repeat_cycle	1	entire	Number of days or weeks for repeating cycle
repeat_ref	4	entire	Timestamp hour for repeating
next	4	--	internal

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