

MULTICHANNEL CONTROLLER

UHP03 SMARTNET



TECHNICAL SPECIFICATIONS

USAGE

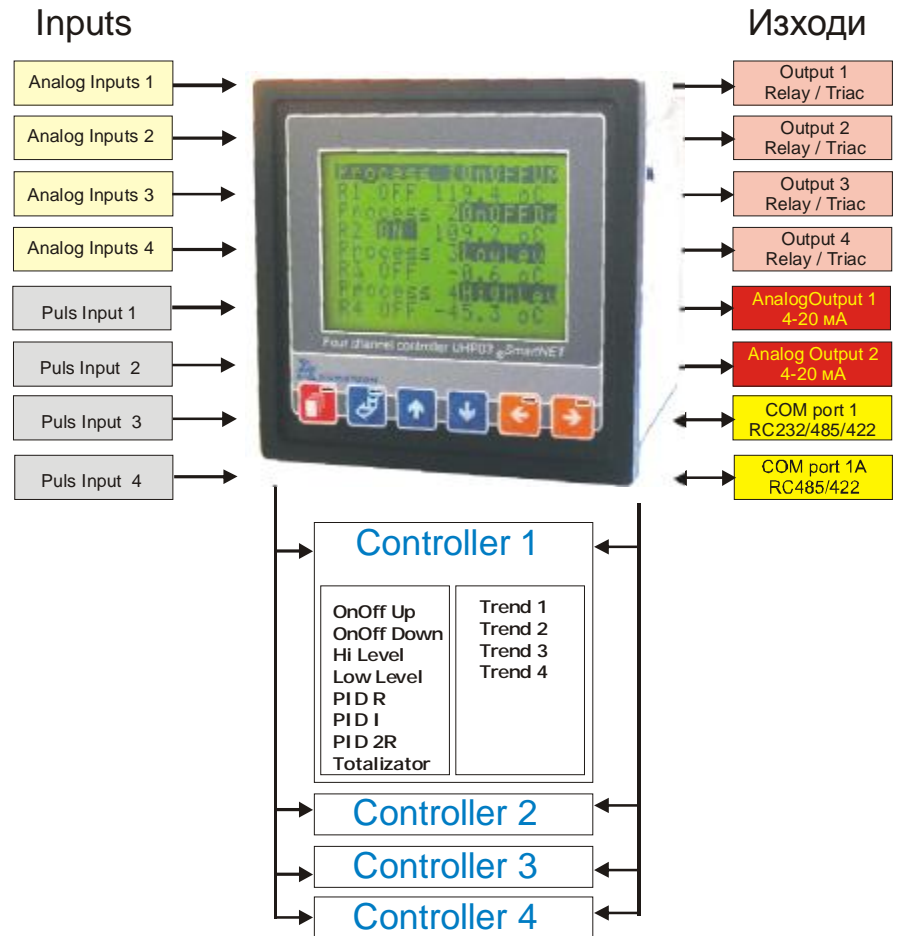
UHP03 SmartNET® is four channels controller, designed for engineering tasks of medium and high difficulty. It has many peripheral input/output ports, graphic display and easy operation interface. Besides configuration of device, the configuration of controller allows record of configuration and test of device. Controller is compatible with SCADA. Structure of device allows design of console of devices, number of which depends on the application.

INTERNAL STRUCTURE

The graphic scheme shows the structure of UHP03 SmartNET®. As you can see in the scheme, the core of the device consists of four independent channels, called Controllers with programmable function. The operator can use 10 functions, described in technical specifications chapter. The input/output periphery can easily be associated to the controllers, having build-in collision protection.


The device has a Real Time Clock and Auto-tuning function.


The copyright interface of the device consists of graphic monochrome LSD display with build-in backlight /green or blue/, resolution 128x64 dpi and six function buttons with LED indicators. The build-in function for contrast regulation allows precise adjustment of display for maximum quality. Operator can use 9 screens for process monitoring see in chapter Operation Interface. The device has two scalable analog outputs 4-20mA, which can work with internal and external power, depending on the output terminals used. The connection of device with other devices is by communication channel, hardware split in two outputs – 1 and 2. The physical standard is RS232/485/422. Communication protocol is Modbus RTU. The power supply is impulse, from 85 – 265 V AC/DC, **Power Integration** technology. It has power failure detector that switches the device to emergency regime for record of parameters used.





FUNCTION BUTTONS OF UHP03 SmartNET^â


There are six function buttons on front panel. They can be used alone or in combination for:


Button **Hold back /home/**  - for exit from menu. The build-in LED indicator is active when the device is in configuration regime.



Button **Enter**  - for entering menu, choice and confirmation of choice. The build-in LED indicator is active when the device is in



Button **Up**  - for going up in the navigation menu, when numbers used, one step up. Switches operation screens with a step up. The build-in left LED indicator shows that the out-going relay Controller 1 is switched on. The build-in right LED indicator shows that the out-going relay Controller 2 is switched on.



Button **Down**  - for going down in the navigation menu, when numbers used, one step up. Switches operation screens with a step down. The build-in left LED indicator shows that the out-going relay Controller 3 is switched on. The build-in right LED indicator shows that the out-going relay Controller 4 is switched on.

Button **Left**  - for going left in the navigation menu, when numbers used, one digit left. Switches operation screens with a step left. The build-in left LED indicator shows that the out-going relay Controller 1 is switched on.

Button **Right**  - for going right in the navigation menu, when numbers used, one digit right. Switches operation screens with a step right. The build-in left LED indicator shows that there is communication with external devices.

Combination of buttons **Hold Back /Home/** and **Enter**   - for entering in the configuration menu of the device.

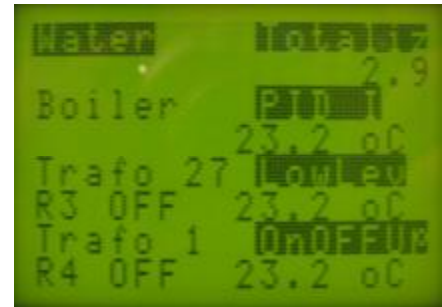
Combination of buttons **Hold Back /Home/** and **Left**   - for display contrast decrease.

Combination of buttons **Hold Back /Home/** and **Right**   - for display contrast increase.

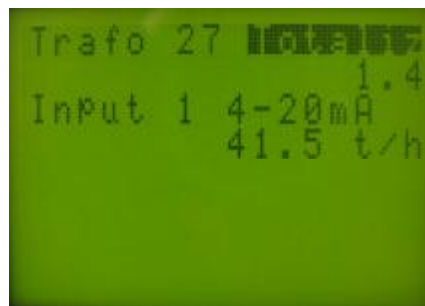
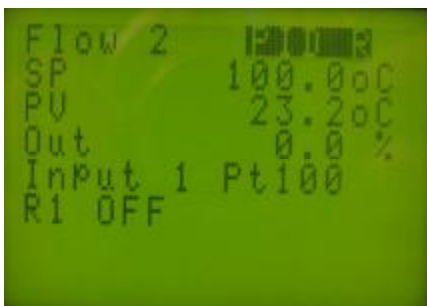
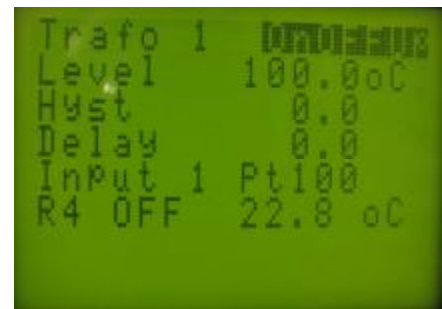
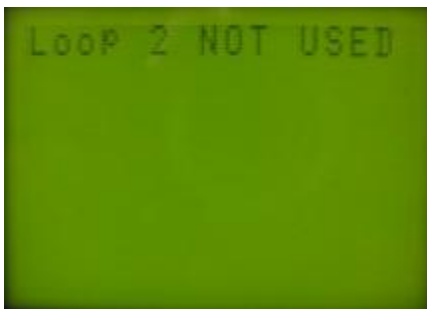
OPERATION SCREENS OF UHP03 SmartNET^â

There are nine operation screens for the Operator.

Main screen – general data for controllers can be seen on it. For every controller there are two rows for the name of the object, managed from controller, kind of the function, number of the connected relays, status of connected relay and current value.



Detailed screen of every controller – depending on the configuration the running values of each controller can be seen on it, status of the relay output (switched on/off). For every type of function there is different information. In the graphic application the following order of screens is set: **Not Used, Watch, ON/OFF, PID, Totalizer.**



The trend screens – every controller has a screen for trend. The display resolution is enough to visualize the tendency of the input parameter monitor. In the upper left corner connection between parameter and object can be seen; in the right current value of parameter; in the bottom the system time.



CONFIGURATION OF UHP03 SmartNET^â FROM OPERATION INTERFACE MENU

Entering the configuration menu is done by pressing button Hold Back /home/ and Enter simultaneously. List Settings VM 3.0 is displayed on the screen. The meaning of each position of the list is as follows:



- **Controllers** – menu of controllers setting
- **Set Points** – menu for setting value
- **Trend** – trends setting menu
- **Date and Time** – date and time setting menu
- **Modbus RTU** – communication setting menu
- **Analog outputs** – analog outputs setting menu
- **Analog inputs** - analog inputs setting menu
- **Loader Out**– output to program **Loader**

CONTROLLERS SETTINGS

A choice from list **Controllers** is made with navigation buttons. Controllers list is entered with **Enter** button. There are four controllers. We choose one of the controllers and press **Enter** again. A list of setting of the controller chosen 1 /2, 3 or 4/ is displayed. The list consists of the following setting positions:

- **Type Controller 1 (2, 3, или 4)** – list of the available functions of the controller. We choose one of them and confirm with **Enter**. We leave with **Hold back (Home)**.
- **Input** – list of inputs of UHP03 SmartNET. We can associate one of the four analog or the four impulse inputs to the controller. We leave with **Hold back (Home)**.
- **Relay Output** Output - list of relay outputs of UHP03 SmartNET or their combinations, as well as the two analog outputs, used at the choice of function PID I.

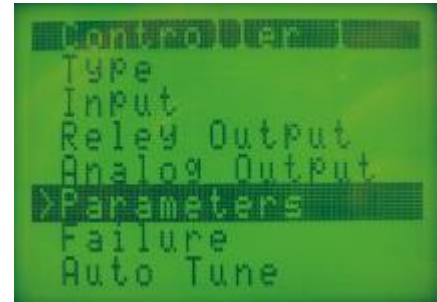
ATTENTION: a difference between Analog output for operation and Analog output – repeater of incoming parameter should be made.

When a position from list is defined, the type of function used by the controller is to be considered. The association is done by choosing a position of the list and confirming it with **Enter**. We leave with **Hold back (Home)**.

- **Analog Output** - list of analog outputs of UHP03 SmartNET. We can associate one of the two outputs in the way described above. We leave with **Hold back (Home)**.
- **Parameters** – a list of parameters associated to controller function chosen. This list is different for every function and will be described in a separate chapter Parameters. We leave with **Hold back (Home)**.
- **Failure** – list of the optional conditions of the input signal and behavior of output relays in any of the cases. We leave with **Hold back (Home)**.
- **Auto Tune** – procedure of automatic setting of parameters regulating PID functions. It starts with **Enter** and follows several steps, described in details in Autotuning chapter. We leave with **Hold back (Home)**.
- **Start/Stop** – menu for switching on and off the Controller. It is used when a temporary interruption of object's management is necessary. When the Controller is switched off it is measuring only the incoming values.

SETTING PARAMETERS IN MENU **Parameters**

In **Parameters** menu the parameters of the chosen function are set. UHP03 SmartNET has 10 functions for Controller configuration. Each function has a display with parameters. When configuration made you should first set the type of function then its parameters, because the configuration software of the device doesn't allow setting the parameters of any other function, but the chosen one. The functions and parameter screens are set as follows:



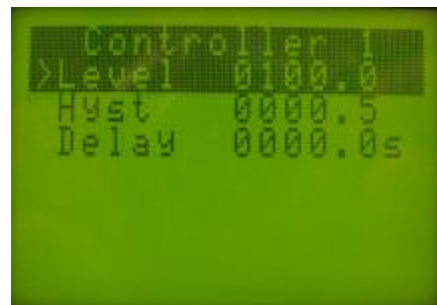
Not used – controller is switched off. When entering Parameters menu, a message for lack of parameters is displayed.

Watch – controller is working as a process controller without a set point. When entering Parameters menu, a message for lack of parameters is displayed.



ON/OFF Up – controller is working as ON/OFF regulator for management of warming up processes. When entering Parameters menu, a list of setting parameters is displayed:

- Level /Set point/ - point of regulation
- Hist – hysteretic of Controller
- Delay – delay of reaction of controller



ON/OFF Down – controller is working as ON/OFF regulator for management of cooling processes. When entering Parameters menu, a list of setting parameters is displayed:

- Level /Set point/ - point of regulation
- Hist – hysteretic of Controller
- Delay – delay of reaction of controller

Low Level – controller is working as ON/OFF regulator for lower limit level. When entering Parameters menu, a list of setting parameters is displayed:

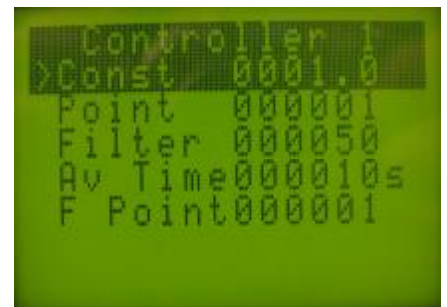
- Level /Set point/ - point of regulation
- Hist – hysteretic of Controller
- Delay – delay of reaction of controller

High Level – controller is working as ON/OFF regulator for upper limit level. When entering Parameters menu, a list of setting parameters is displayed:

- Level /Set point/ - point of regulation
- Hist – hysteretic of Controller
- Delay – delay of reaction of controller

Totalizer – controller works as Totalizer . In Parameters menu a list of setting parameters is displayed:

- **Totalizer const** – menu for setting the constant values of totalizer. List of setting parameters is shown in the graphic application, and their meaning is:
- **Const** – constant of totalizer. If Impulse input used, that is the weight of impulse. For Analog input – consumption per hour.
- **Point** – position of decimal point in the integrated value of totalizer.
- **Filter** – filter for incoming strays for Impulse input operation.
- **Av Time** – time for calculation of the moment consumption value.
- **F Point** – the position of decimal point in the moment value of totalizer.
- **Init value** – entrance for Totalizer register change. This menu can be entered with password. After that we can give new value to the Totalizer register. When button Enter is pressed, the content of totalizer register is cleared and the screen returns to Parameters menu.



PID R – controller works as PID regulator with SHIM. In the Parameters menu a list of setting parameters is displayed:

- PID P – proportion coefficient.
- PID I – integral time constant in seconds.
- PID D – differential time constant in seconds.
- D Zone – zone of non-sensitivity.
- T Cycle – cycle of Controller management.

PID I – controller works as proportional PID regulator. In the Parameters menu a list of setting parameters is displayed:

- PID P – proportion coefficient.
- PID I – integral time constant in seconds.
- PID D – differential time constant in seconds.



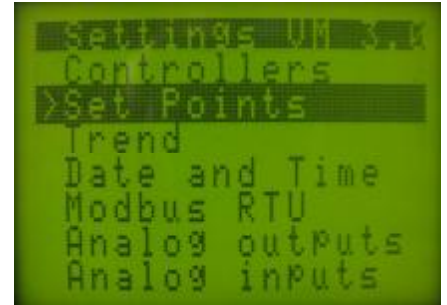
PIDV 2R – controller works as speed PID regulator. In the Parameters menu a list of setting parameters is displayed:

- PID P – proportion coefficient.
- PID I – integral time constant in seconds.
- PID D – differential time constant in seconds.
- D Zone – zone of non-sensitivity.
- T Cycle – cycle of Controller management.



SETTINGS OF SET POINT

The Set point regulating functions can be set with **Set Points** menu. The screen with entering point is displayed on the graphic application. The screens for each type of function are different, depending on regulation law.



Screen for fixing **Set Point** for functions of ON/OFF regulators, hysteretic and Delay of regulator's reaction.

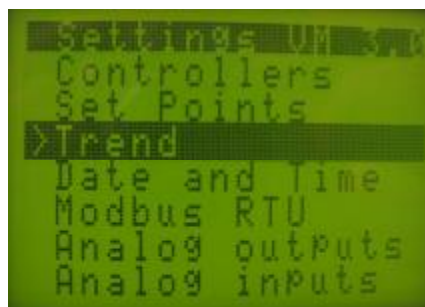


Screen for fixing **Set Point** for functions of PID regulators.

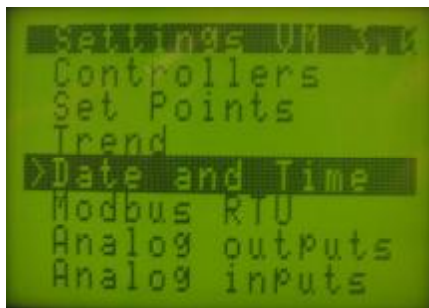


TREND SETTING

The device has four screens for trend setting, one for each controller. The enter point is **Trend**, as shown in the graphic application. We pass through a menu for choice of No of trend, then trend setting display. We set **Begin** and **End** for fixing the trend. The values are not necessarily equal to the measurement diapason. Their choice depends on the process, and is aimed at better visibility for the operational personnel. The time for graphic's refresh is set in **Time**. The minimum refresh time is 1 second. The settings are saved with **Enter** button.

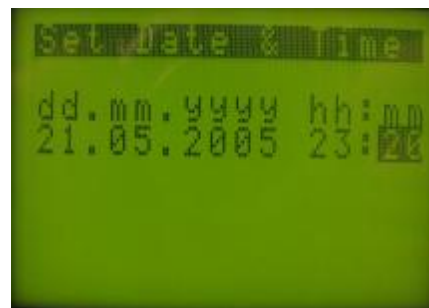


SETTING THE SYSTEM TIME

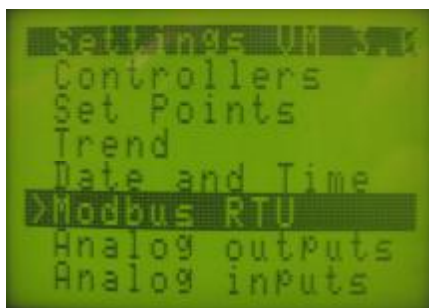


The entering point for System time setting of UHP03 SmartNET is **Date and Time** menu. The setting screen is shown in the second graphic application. On the first row the groups and their meaning are shown – **dd** /date/, **mm** /months/, **yyyy** /year/, **hh**/hour/, **mm** /minute/. The change is made with navigation buttons, having in mind that values change not by point but for the whole group. Inverse field

marks the group chosen. Example: if date is to be changed, we can change from 1 to 31 using the navigation buttons. For the rest of the groups: month – 1-12; year – 2000-2099, hour – 1-24, minute – 0-60. The changes made are recorded with **Enter** button.



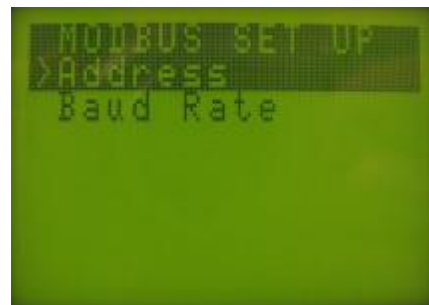
COMMUNICATION SETTING - MODBUS RTU



UHP03 SmartNET is communicating with other devices by integrated communication channel. The physical channel interface is RS232/ RS 485/ 422. The channel is positioned on the back panel of the device with two couplers RG45 – Com 1 and Com 2, as shown in the



graphic application. The two couplers are equal for RS 485/ 422 outputs. RS232 output is on the left coupler /see description of back panel/. Connection protocol is **Modbus RTU**. The entering point for parameter setting is **Modbus Set Up** screen. The setting is done by choice of address of device **Device Address** and communication – **Baud Rate**. Operator can choose addresses from 1 top 254.



ATTENTION: Address 255 is a service address and is not accessible. If used collisions appear leading to confusions in communicator's work.



The device has five communication speeds, which are set in the menu. The chosen speed is recorded with **Enter** button. It is marked. Button **Hold Back /Home/** is used for leaving the menu.



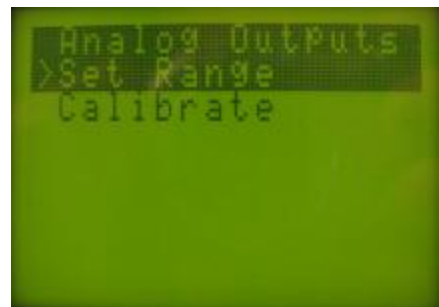
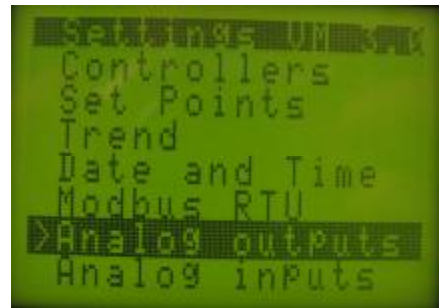
SETTING AND CALIBRATION OF ANALOG OUTPUTS



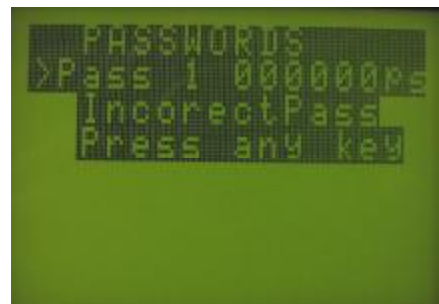
UHP03 SmartNET has two analog outputs on the rear panel, on two rows of terminals. Analog output 1 is linked to terminal Do1, analog output 2 to Do1. Depending on the power source, the connection is on the upper or lower terminals. When internal power source is used, connection is on lower terminals Ao1 and Ao2, when external on the upper. The setting point is menu **Analog Output**. Each **Analog output** can be scaled through **Set Range** by choosing **Analog range** screen. Giving initial values of range in **Begin** and final in **End** sets the scale. The range can be different to the range of the Analog input, associated to the output.

ATTENTION: A difference should be made between Analog output – repeater of incoming parameter and Analog output for operation – PID – I /proportional regulator/. The Analog outputs on the device are limited to two, no matter that each Controller can be configured to work as PID-I with Analog output – repeater of incoming parameter. In order collisions to be prevented some restrictions are put in the configuration software and operator's interface for setting, that display messages for unavailability of outputs. But besides this, operator should know the features of the device in order to make correct configuration.

The calibration menu of Analog outputs can be reached through **Calibrate** row. The procedure of calibration passes through **Password** menu. With **Enter** button the password is submitted in the device, after that, with **Hold back /Home/** button, we pass in the menu for choice of Analog output to be calibrated. If



password is not correct a message is displayed:



If password is correct, we continue with the choice of Analog output for calibration. When Analog output



chosen, with button **Enter** we enter the calibration menu **Set I out 1 /2/** with initial value 4mA:00050. We connect multi-meter to the Analog output to be calibrated. Using navigation buttons **Up** and **Down** we change the value of for 4mA in a way that multi-meter shows with maximum preciseness electricity of 4.000mA. We record it with **Enter** button and search for initial value for 20mA:04000. The procedure is just the same as for 4mA. The value is change to a point that multi-meter shows with

maximum preciseness electricity of 20.000mA. We record with **Enter** and leave the calibration menu. **Hold back /home/** buttons returns to the main menu.

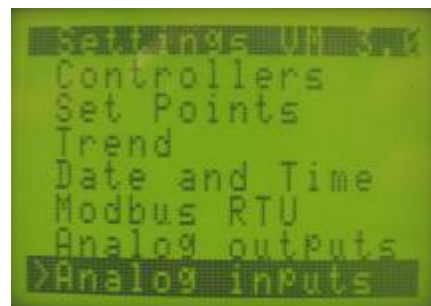
SETTING OF ANALOG INPUTS

UHP03 SmartNET has four Analog inputs, which can be configured according to the input signal. The following three groups of input signals are available:

- Current – 4-20mA
- Thermo resistor– Pt100, Cu50, Cu53
- Thermo couple – J, K, S, T

The entering point of configuration menu **Configure** is **Analog Inputs**. There are three choice options:

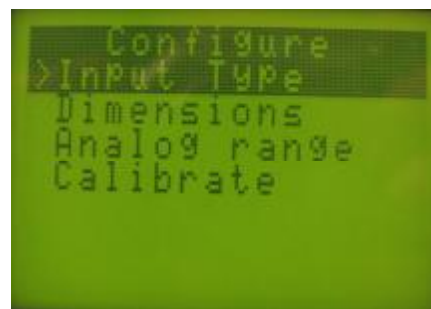
- Type of input signals – **Input type**
- Dimension of input signals – **Dimension**
- Range of Analog inputs – **Analog range**
- Analog inputs calibration procedure – **Calibrate**.



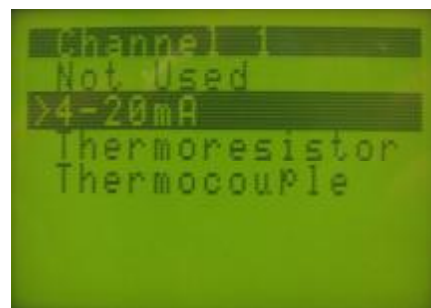
Choice of a type of input signal – we enter menu for choice of number of input channel /Analog input/ and then enter the menu of the channel chosen. We choose one of the groups in the menu.

- **Not used** – blocks the usage of channel. All channels are in that regime by default.

ATTENTION: I some of the Analog inputs are not used they are kept in Not Used regime. This is another contribution to device's stable work.



- **4 – 20 mA** – choice for work with current.
- **Thermo resistor** – through this menu we enter the thermo resistor list. We choose one of them and confirm with **Enter**.
- **Thermo couple** - through this menu we enter the thermo couple list. We choose one of them and confirm with **Enter**. This leads us to the choice of a method for compensation of the cold side. We choose one from the list and confirm with **Enter**, which puts a mark on the choice.



We leave with hold back. If compensation with fixed temperature is chosen, **Hold back** is leading us to menu for setting the value of compensation. We set it with navigation buttons and record it with **Enter**. **Hold Back** is leading us back to the main menu for Analog input choice.

Dimension choice – from Dimensions row, with **Enter**, through the Analog input choice menu we enter the dimension choice list. Using the navigation buttons we choose from the list and confirm with enter. We leave with **Hold Back**.

Setting Analog inputs range – when setting range, first maximum limits are defined /diapason/ of change of the measured parameter in that case. *ATTENTION: Before setting range fix properly its boarders. If range is beyond the fixed limits, Analog channel displays message **ERROR**, the outputs of controller will react within the default range and controller will stop working.*

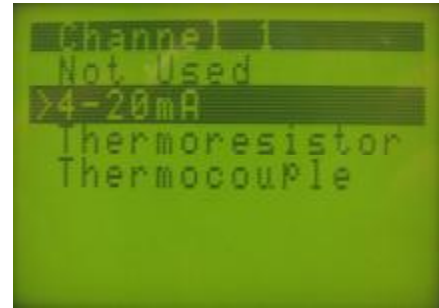
Range setting – from Analog range menu, through Analog input choice menu. We set the initial value in row Begin and final value in End. For entering and recording we use Enter. For parameters entering we use navigation buttons.

Calibration of input channels – calibration procedures are reached by Calibrate menu with a password. We choose Analog input for calibration and enter the type choice menu. Before choosing type for calibration we send to the entrance of the Analog channel



signal from:

- Current 4-20 mA – precise calibrator
- Thermo resistor – magazine /decade/ of sample resistors
- Thermo couple - precise calibrator



After switching on the calibration device we choose the type for calibration and enter with Enter button in dialog screen, in which, depending on type, the initial value of calibration signal is set. We send the value set and after the indicator stops, record with Enter.

This leads to the next parameter and we repeat the procedure. After all calibration parameters are set the device displays a message:

Press any key

Pressing any button we go back to the input channel choice menu and either proceed with the next channel or exit the menu with Hold Back.

Attention: Producer initially calibrates all channels of UHP03 SmartNET. In cases program Loader is used for applications loading, before usage, a procedure of calibration of all incoming channels to all types of incoming signals.

AUTOTUNING

Auto tuning is an auxiliary procedure for automatic defining of PID regulators, simplifying device setting for Operator. In order to start that function the Controller should be configured for PID regulators and connected to the object. If there are any working controllers they should be switched off till the end of operation. We choose **Auto Tune** from menu and pres **Enter**. We start the process with **Enter**. The controller of the object for **Auto Tune** is automatically switched off and a screen of all available data for the process is displayed, as well as the message:



Press HB to STOP!

With **Hold Back** we stop the process if necessary and exit the menu. The meaning of the rest of data is:

- SP** – Set point /level/ of regulated object
- PV** – variable value /current meaning/ of regulated object
- Out** – outgoing influence in %
- Step** – steps in auto tuning process
- I time** – time for finishing the oscillation process.



The Auto tuning process is fulfilled automatically in five steps and can be stopped if necessary at any stage by Operator. If channel is configured incorrectly, in the row PV the message **ERROR** is displayed, and 8 in row Step.

After the process is finished, a screen with results from Auto tuning is displayed by graphic application. We use **Hold Back** button to exit. At that point the numeric coefficients are transferred automatically to Parameters without starting the controller. In order to start the controller we go to **Start/Stop** menu / under **Auto Tune** menu/ and choose Start from the list. We start /stop/ controller and exit the menu with **Enter**.

ATTENTION: In some cases the process can lead to sufficient reconfiguration, that is why the process should be watched. Before starting Auto tune process, Operator should make sure that process would not damage the object. If object cannot be reconfigured $\geq 10\%$, coefficients should be set manually. Producer will not be held guilty for damages caused by ignorance or not knowing the instructions and alerts in this technical specification by Operator, by incorrect work of regulators of Controllers as a result of incompetent work with configuration and exploitation of UHP03 SmartNET.

ADDRESS SPACE MODBUS RTU

UHP03 SmartNET is compatible with SCADA and can exchange data with it. In the table below addresses, types of data and the registers for data access are displayed.

CONTR_1_INPUT	1000	Float	Value of controller's input parameter
CONTR_2_INPUT	1002	Float	If regarding to totalizer means moment consumption
CONTR_3_INPUT	1004	Float	
CONTR_4_INPUT	1006	Float	
CONTR_1_INP_ST	1008	Integer,	0: OK, 1: under the range,
CONTR_2_INP_ST	1009	Integer,	2: above the range, 3: damage,
CONTR_3_INP_ST	1010	Integer,	4: not ready, 5: time out – damage of ACP
CONTR_4_INP_ST	1011	Integer,	
CONTR_1_OUTPUT	1012	Float	Value of controller's output parameter
CONTR_2_OUTPUT	1014	Float	
CONTR_3_OUTPUT	1016	Float	
CONTR_4_OUTPUT	1018	Float	
TOTALIZER1	1020	Double	Totalizers
TOTALIZER2	1024		
TOTALIZER3	1028		
TOTALIZER4	1032		
PULSE_FLOW1	1036	Float	Moment consumption for each impulse input
PULSE_FLOW2	1038		
PULSE_FLOW3	1040		
PULSE_FLOW4	1042		
TOTALIZER1	1044	Float	Single format totalizers
TOTALIZER2	1046		
TOTALIZER3	1048		
TOTALIZER4	1050		
Data	1996	DD MM	Read/write***
Year	1997	YYYY	Read/write***
Hour	1998	HH:MM	Read/write***
Sek	1999	OO SS	Read/write***

*****ATTENTION:** Data is set in blocks of four registers, one by one, and the last one to be recorded is the seconds' register. The record in watch is made after the last register is recorded.

POWER DOWN FUNCTION

UHP03 SmartNET has inbuilt protecting against data loses from sudden power failures. The Power down detector detects such failures. If the failure is longer than 150 mS detector starts a procedure for recording the whole controller data in a power independent memory, displays a message Power Down and stops the process. After the power is back, using the Start Up procedure, the device recovers the data and starts again from the point of stopping. This improves the reliability of the device.

CONFIGURATION SOFTWARE OF UHP03 SmartNET

Using the configuration software, shown in the graphic application below, we can fully configure the controller, print checklist of configuration and save controller's configuration on a disk.

Before configuration Operator should: Connect UHP03 SmartNET to PC with RS232 cable to a free COM; start configuration software Sigmatron UHP03 Configurator; in Comport field choose the **COM port** the device is connected to start the communication channel with **Open** button; activate **Auto scan** function.

ATTENTION: Auto scan is activated only in cases when we have only one device in the network or at primary configuration. When working in network, before opening of communication, we choose Communication Speed, COM and device address.

We wait for the Configurator to find the communication speed, Controller's address and current settings. During that process, in the Communication status field, the data transfer process can be monitored. After the end of process, Operator can change the settings by Configurator's parts of fields:

Controllers

Enable controller /x/

Switches on and off the chosen function of the Controller. It is used when the process has to be interrupted temporarily for repair, maintenance or other, without switches off the whole device any other processes active.

Name

Any of the four controllers has nine-digit field containing by default **Process 1 /2,3 or 4/**. Operator can change that sign, giving new name to the process, suitable for the situation.

Type

Function of Controller is chosen in that field. Operator can choose from a drop down menu:

Not used – no associated function

ATTENTION: if working with associated input to the controller that regime doesn't interfere its work /measurement regime/.

- **Watch** – controller works in Process indicator regime
- **OnOff Up** – thermo processes regulator
- **OnOff Down** – cooling processes regulator
- **Low Level** – lower limit level regulator
- **High Level** - upper limit level regulator
- **Totalizer** – function for consumption organization. It can work with Analog or Impulse input, depending on case. Data for moment and integral consumption is available for the user. Data has dual defense against from power failures and internal damages of the device.
- **PID R** – SIM Regulator with relay output
- **PID I** – proportional regulator with analog output
- **PIDV 2R** – velocity PID regulator

Input

The options for choice of input signal from drop down menu are:

Not used

Analog Inputs 1

Analog Inputs 2

Analog Inputs 3

Analog Inputs 4

LF Pulse 1

LF Pulse 2

LF Pulse 3

LF Pulse 4

HF Pulse

Relay

Choice of relay output from drop down menu:

Not used

Relay 1

Relay 2

Relay 3

Relay 4

Relay 1+2

Relay 3+4

Over

Behavior of relay output when incoming signal is over the defined range.

Relay is ON

Relay is OFF

Under

Behavior of relay output when incoming signal is under the defined range.

Relay is ON

Relay is OFF

Over

Behavior of relay output when Analog input damaged.

Relay is ON

Relay is OFF

Analog Output

Choice of Analog output from drop down menu.

Not used

Analog output 1

Analog output 2

Set point

Field for filling the value of regulated parameter. Minimum resolution 0.1.

Hysteresis

Field for filling the value of hysteresis. Minimum resolution 0.1. Obligatory field for all OnOFF regulators.

Delay

Field for filling the delay time of OnOff regulator in seconds. When 0 is displayed the delay is off. Obligatory field for all OnOFF regulators.

PID P Constant

Field for filling the proportion coefficient.

PID P Constant D.P.

Field for defining the place of decimal in the proportion coefficient. Important only when parameter displayed.

XXXXXX

XXXXXoX

XXXoXX

XXoXXX

XoXXXX

XoXXXXX

PID I constant

Field for defining the integral time contrast in seconds.

PID I constant D.P.

Field for defining:

XXXXXX
XXXXXoX
XXXoXX
XXoXXX
XoXXXXX

PID D constant

Field for defining the differential time contrast in seconds.

PID D constant D.P.

Field for defining the position of decimal in the differential constant:

XXXXXX
XXXXXoX
XXXoXX
XXoXXX
XoXXXXX

PID D Cycle

Field for defining the time for a cycle of regulator. When triac is used as management output the minimum time is 1 second. When relay output is used – 5 seconds. The type of management element should be considered for the correct time measurement, that is: if the management is not direct but with auxiliary relay or contactor.

PID D Dead Zone

Field for defining the insensibility zone /dead zone/ of PID regulator in %.

Trend time

Field for defining time for displaying the next parameter in the chart in seconds. If time properly set, the trend of process is clear enough for the tendency of development.

Trend begin

Field for defining the beginning of trend. That value, together with the previous one is scaling the graphics.

Trend end

Field for defining the end of trend. That value, together with the previous one is scaling the graphics.

Totalizer constant

Field for defining the constant of Totalizer when Analog input used.

Totalizer Dimension

Field for defining the dimension of integral value of Totalizer regardless of input chosen. A dimension can be chosen from the drop down menu. If the necessary dimension is not in the list, just fill the value in the field.

Totalizer constant D.P.

Field for defining the position of decimal in the totalizer constant. We choose one of the options from the drop down menu:

- XXXXXX
- XXXXXoX
- XXXoXX
- XXoXXX
- XXoXXXX
- XoXXXXX

Totalizer D.P.

Field for defining the position of decimal in totalizer. We choose one of the options from the drop down menu:

- XXXXXX
- XXXXXoX
- XXXoXX
- XXoXXX
- XXoXXXX
- XoXXXXX

Analog inputs

Type

Field for defining the type of analog input. We choose one of the options from the drop down menu:

- Not used
- 4-20 mA
- Thermo resistor Pt100
- Thermo resistor Cu 50
- Thermo resistor Cu 53
- Thermo couple J
- Thermo couple K
- Thermo couple S
- Thermo couple T

Dimension

From the drop down menu we choose one of the dimensions. If the necessary dimension is not in the list, just fill the value in the field. When Totalizer function is used, dimension is valid for moment consumption.

Begin

Field for defining the initial value of transformation range of Analog input.

ATTENTION: Value should not exceed the range of sensor chosen .

End

Field for defining the final value of transformation range of Analog input.

ATTENTION: Value should not exceed the range of sensor chosen

Digital Inputs

Dimension

A dimension for moment consumption for impulse input can be chosen from the drop down menu in that field.

Filter time x 4mS

Field for defining the time for filtering multiplied by 4 mS. If value correctly set, it helps the maximum filtration of noises carried by impulse signals.

Mean time

Field for defining the time for leveraging the index when impulse signal used.

Moment flow D.P.

We choose the position of decimal of the moment consumption index for impulse signal from the drop down menu.

XXXXXX
XXXXXoX
XXXXoXX
XXoXXX
XXoXXXX
XoXXXXX

Analog outputs

Begin

Field for defining the initial value of Analog output range.

ATTENTION: Initial value should not be lower then the initial value set for the Analog input.

End

Field for defining the final value of Analog output range.

ATTENTION: Initial value should not be lower then the initial value set for the Analog input.

В това поле се записва времето за добавяне на следващата стойност в графиката в секунди. При правилен разчет на времето, тренда на процеса е достатъчно четлив за показване тенденцията на развитие.

Clock Settings

Date

We choose date, month and year fom the drop down menu.

Time

We set the time by pressing Now button.

Service functions

Button Modbus Settings

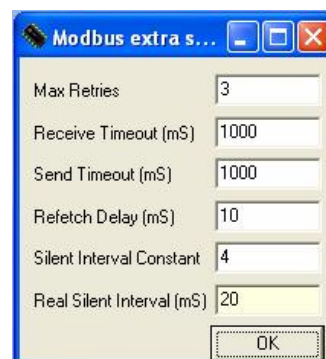
This button opens a window for setting the Modbus RTU communication.

Max retries – number of tries if no answer from device

Receive timeout /mS/ - time for waiting for an answer

Receive timeout /mS/ - time for waiting when request is sent

ATTENTION: Operator with good knowledge of Modbus RTU protocol can change Setting, if necessary. The last three fields, not described above, are for special settings and Configuration software doesn't require their change.



Button **Device settings**

That function opens communication menu for setting the communication speed and address of device.

In order to change the speed we have to mark the desired speed in New port speed field and confirm with Change port speed button.

In order to change the Modbus address of the device we have to type the new address in New device address field and confirm with Change device address.



Button **Modbus tester**

That function opens the Modbus tester application. With it we can test the device for correct settings and if it's ready to work with SCADA or other system of upper hierarchy level.

Button **Open/Close**

That function opens and closes the communication port. It should be open before communication. It can be closed either from Open/Close button or with Exit button.

Button **Auto scan**

Function for automatic definition of device address, communication speed and reading of configuration data.

ATTENTION: can be used only when device is independently connected to PC.

Button **Save File**

Function for recording the configuration parameters in a file after device configuration. The name of file is optional.

Button **Read file**

Function for opening file with configuration parameters. After reading it, data is distributed to the appropriate fields in configuration software.

Button **Print**

Function for printing the configuration parameters distributed by Controllers. The print has all features of a document and can be used officially.

Button **Read All**

Function for reading the configuration data of the Device, after fixing the address.

Button **Write all**

Function for group record of configuration data in the device, after fixing the address.

Button **Exit**

Function for leaving the configuration software.

TECHNICAL DATA

Controllers	4 independent with build-in Auto tuning
Controllers' functions	10 programmable
Not used	Switched off
Watch	Process indicator
On/Off Up	On/Off regulator for thermo processes
On/Off Down	On/Off regulator for cooling processes
Low level	Regulator of lower limit level
Hi level	Regulator of upper limit level
Totalizer	Consumption measurement
PID R	SIM regulator with relay output
PID I	Proportional regulator with analog output
PID 2R	Speed PID regulator
Number of operator screens	9
Main operator screen	1
Individual controller screen	4
Trend operation screen	4
Analog inputs	4 – line function –16 bit ACP
Analog inputs error	0.1%
Repetitions	0.01%
Type of analog inputs	4-20 mA Pt100, Cu50, Cu 53 TC – J,K,S,T
Currency	
Pt 100	
Cu 50, Cu 53	GOST
TC – J,K,S,T	BS EN 60584-1:1996
Correction of TC	Pt100, constant internal, running on Modbus RTU
Impulse Inputs	4 LF /low frequency/ +1HF /high frequency/
Analog outputs	2 scalable with internal and external power supply
Analog output error	0.5%
Relay /triac/ outputs	4 - 250 V 6A /600V 2A/
Display	LCD 128x64, background light /green, blue/
Communication inputs	2 RS232/485/422 and RS 485/422 – corrector RG45
Communication protocol	Modbus RTU
Power supply	85 –265 V AC/DC
Data loss prevention	Power down detector and Shut down procedure
Power consumption of device	7 VA
Operating temperature	0 – 60°C
Real time clock	Lithium battery – 3 V
Battery exploitation period	Up to 10 years
Dimensions	96x96x119
Mounting hole	91x91
Mounting method	Shield with spring braces