PROGRAMMABLE LOGIC CONTROLLER SMC TYPU

USER'S MANUAL

CONTENTS

1. APPLICATION AND DESIGN

The SMC programmable logic controller is the central decision module in *distributed measuring and control systems* with a quick MODBUS communication (up to 115.2 kbit/s). It can service remote analogue and logic input/output modules, measuring transducers, inverters, microcontrollers, recorders, display panels, HMI *touch screen* panels, etc. Thanks to the integration of various devices we can obtain a versatile and flexible dissipated system with a large application range.

- The SMC controller is programmed in the ST (Structured Text) language acc. to IEC 61131-3 standard. The ST language is the most versatile from among IEC languages and allows the implementation of any types of algorithms.
- The CPDev (control Program Developer) tool package, consisting of the CPDev compiler, CPSim program simulator, and CPCon communication configuration, serves for the SMC programming.
- The package includes libraries: IEC_61131, Basic_blocks and Complex_blocks.
- The system designer can create own libraries with functions, functional blocks and programs.
- Two serial ports are destined for communication. Port 1 with two RS-485 interface systems for the communication with devices working in the object. Port 2 with RS-485, RS-232C and USB interfaces for the communication with the Master system through wire links.
- The asynchronous character communication MODBUS protocol is implemented in ports.

Parameter set of the SMC controller serial link:

- address:	1...247
- baud rate:	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bit/s,
- working mode :	ASCII: 8N1, 7E1, 7O1, 7N2
	RTU: 8N2, 8E1, 8O1, 8N1

Exemplary network topology with the use of controllers is shown on the Fig.1,

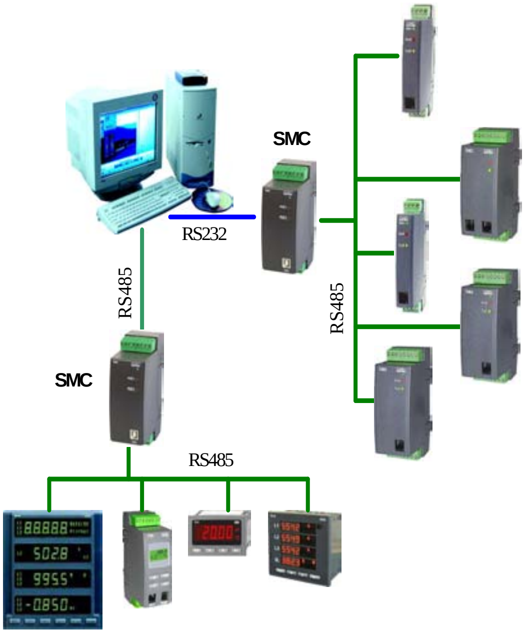


Fig. 1. Exemplary network topology with the application of SMC controllers

2. SET OF THE DELIVERED CONTROLLER

The SMC controller set includes:

- SMC controller	1 pc
- SMC user's manual	1 pc
- programming user's manual	1 pc
- guarantee card	1 pc
- CD disk with the tool program and controllers of the USB port	1 pc

When unpacking the SMC controller, please check whether the type and version code on the data plate correspond to the order code.

3. BASIC REQUIREMENTS, SAFETY SERVICE

Symbols located in this user’s manual mean:

WARNING!

Warning of potential, hazardous situations.
Especially important. One must acquaint with
this before connecting the SMC controller.
The non-observance of notices marked by these symbols
can occasion the damage of the instrument.

CAUTION!

Designates a general useful note. If you observe it,
handling of the controller is made easier.
One must take note of this, when the instrument
is working inconsistently to the expectations.
Possible consequences if disregarded !

Note: The removal of the controller housing during the guarantee contract period causes its cancellation.

In the security scope the controller meets the requirements of the EN 61010 -1 standard.

Remarks Concerning the Operator Safety Service:

- All operations concerning transport, installation, and commissioning as well as maintenance, must be carried out by qualified, skilled personnel, and national regulations for the prevention of accidents must be observed.
- Before switching the controller on, one must check the correctness of connection to the network.
- Do not connect the controller to the network through an autotransformer.
- Before removing the controller housing, one must switch the supply off and disconnect measuring circuits.
- One must remember that in the building installation a switch or a circuit-breaker should be installed. This switch should be located near the device, easy accessible by the operator, and suitably marked

4. DESCRIPTION OF THE DESIGN AND INSTALLATION

4.1. Design Description

The SMC controller is destined to be fixed on a 35 mm rail support (acc. to EN 60715) in the way shown on the fig. 2.

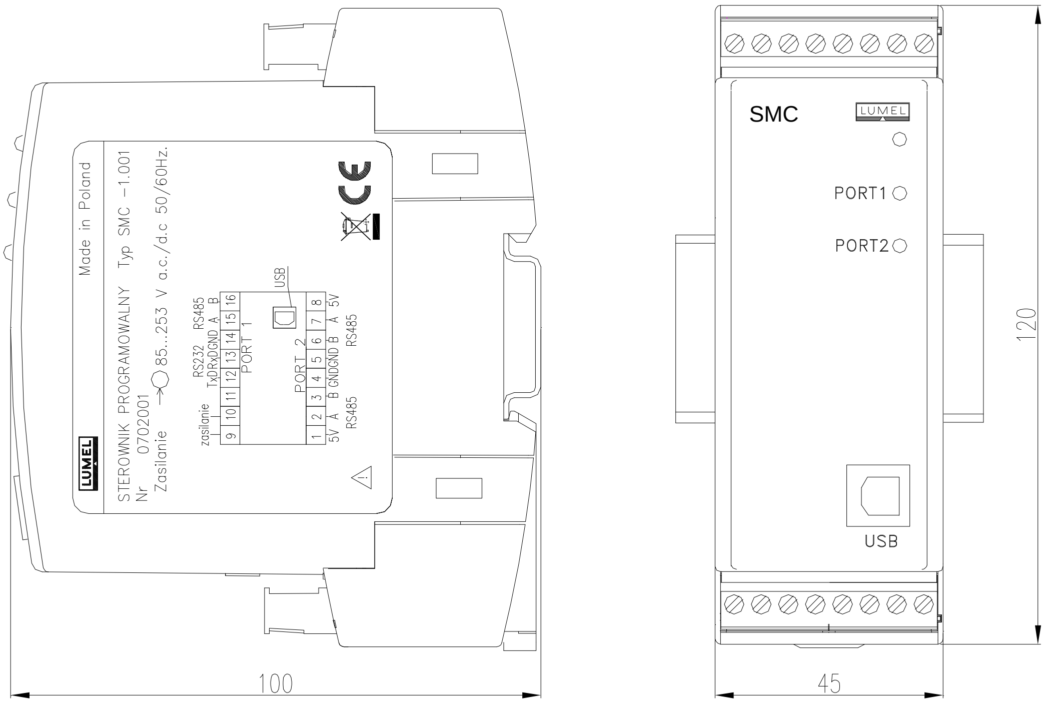


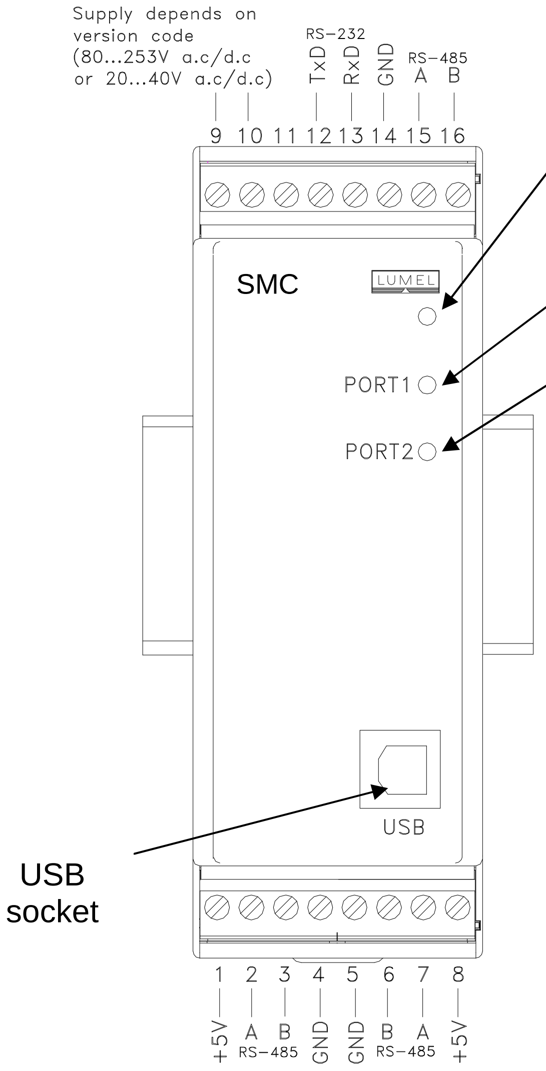
Fig. 2. Fixing way of the SMC controller

4.2. Terminal Description

The supply and external signals must be connected in accordance with the fig. 3.
Individual outlets have been described in the table 1.

Caution:

One must pay a particular attention on the correct connection of external signals (see table 1)



There are 3 signalling diodes on the frontal plate

D1 **Two-colour diodes**.

Green colour – continuous lighting – signals a correct controller work.

Green colour – pulsating – signals the work in the configuration mode.

Red colour – signals a configuration error.

D2 **Green diode**

Signals the data transmission from the side of a slave device type.

D3 **Yellow diode**

Signals the data transmission from the side of a master device type.

Table 1. Description of SMC Controller Outlets

Terminal	Terminal description
1	Output +5 V (for bus bias)
2	Line A of the first RS-485 interface of Port 1
3	Line B of the first RS-485 interface of Port 1
4	Line GND of the RS-485 interface of Port 1
5	Line GND of the RS-485 interface of Port 1
6	Line B of the second RS-485 interface of Port 1
7	Line B of the second RS-485 interface of Port 1
8	Output + 5V (for bus bias).
9, 10	**Lines of controller supply**
11	Not used
12	Output TxD of the RS-232 interface of Port 2
13	Input RxD of the RS-232 interface of Port 2
14	Line GND of the RS-232 and RS-485 interfaces of Port 2
15	Line A of the RS485 interface of Port 2
16	Line B of the RS-485 interface of Port 2

Fig. 3. Electrical connections of the SMC controller.

The controller has two serial ports, Port 1 and Port 2.

The port 1 is destined for communication with devices of Slave type. Two RS-485 interface systems are added to the Port 1. The operation of both systems is identical. Interface systems are electrically connected and galvanically isolated from the remainder of the system. Interface lines are connected to terminals 1, 2, 3, 4 for the first port, and 5, 6 , 7 , 8 for the second port. The RS-485 bus enables the direct connection to 32 devices with RS-485 interface. The maximal bus length depends on the baud rate and is included in limits from several dozens of meters for high speeds, up to ca 1.2 km for low speeds.

The port 2 is destined for the controller configuration with the PC computer.

The Port 2 includes RS-485, RS-232 and USB interfaces. The RS-485 interface enables the connection of the controller to the RS-485 serial bus, its lines has been led out to terminals 14, 15 and 16. RS-232 and USB interfaces are destined to connect with the Master system.

The RS-232 interface signals are led out to terminals 12, 13 and 14. The USB interface is available on the controller frontal plate. RS-485, RS-232 and USB interfaces are connected to the Port 2 and cannot be used simultaneously.
The current program on a CD is included in the controller set.
The current programming package for SMC is included on the www.lumel.com.pl/download page.
All updatings can be carried out by means of the programming package runs on this page.

The tool package CPDev (*Control Program Developer*) serves to program the SMC controller. It is composed of:

- compiler CPDev,
- program simulator CPSim
- communication configurer CPCon.

Three libraries complete the package - IEC_61131, Basic_blocks and Complex_blocks.

4.3. Installing COM Port for Windows

The controller USB Port takes advantage of the program which is created in the system by the new USB Serial Converter device and the Port (Com) assigned to him – USB Serial Port. The installation of the controller in the Windows system causes the addition of a successive serial COM Port to the list of ports serviced by the operating system.

4.4. Installing COM Port Controllers in the Computer.

On the CD added to the product, there are catalogues with controllers for following operating systems:

- WIN_XP: Windows 2000, Windows XP, Windows Vista, Windows Server 2003.
- WIN_XP_64: Windows Vista x64, Windows XP x64, Windows Server 2003 x64.

NOTE: Controllers do not co-operate with Windows 98 and ME systems.

Installation in Windows 2000, Windows XP, Windows Vista and Windows Server 2003 systems.
In order to install controllers for these systems, one must start the program realizable from the catalogue with the controller for the given system:

- WIN_XP\CDM_Setup.exe (for Windows 2000, Windows XP, Windows Vista and Windows Server 2003)
- WIN_XP_64\ CDM_x64_Setup.exe (for Windows XP x64, Windows Vista x64 and Windows Server 2003 x64).

This program will install controllers for new devices and ports in the system.
Next, one must connect the controller, which will be found and identified by the system, as USB serial converter, and the Port (Com) will be assigned to it – USB Serial Port.

5. CONTROLLER CONFIGURATION

NOTE : The language description and examples of controller programming are included in the programming manual.

Before proceeding to the controller configuration, one must prepare the controlling program taking advantage of tools included in the controller set.

5.1. PC ⇔ SMC Connection

5.1.1 Installation of the USB Controller

If the PC computer has not an installed USB port controller for the SMC, one must install it through the *CDM_Setup.exe* program from the CD acc. to the section 4.4. It generates, that the USB port will be serviced as a serial port.

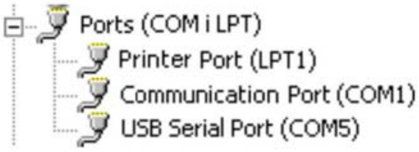
PC↔SMC Cable

Connect the USB port of the computer to the USB port of the SMC controller (on the frontal plate).

5.1.2 Number of the USB Port

Read out in the *Device Manager* of the Windows system, which COM port is the USB port connected to the SMC controller.

- Menu Start > *Settings* > *Control panel* > *System* > *Hardware* > *Device Manager*
  In the appearing window, develop Ports:



Ports (COM i LPT)
Printer Port (LPT1)
Communication Port (COM1)
USB Serial Port (COM5)

In the case like above, USB is the COM5 port.

5.1.3 Starting the CPCon configurer

One can start the configurer in three ways:

a) Menu CPDev: *Project* > *Run the configurer*

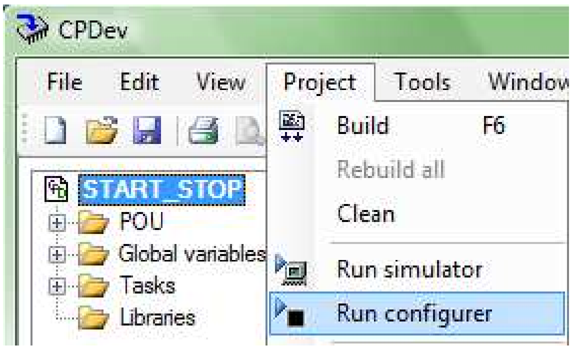


Fig.4. Starting the configurer from the Project Menu.

b) *Tools > Configurer*

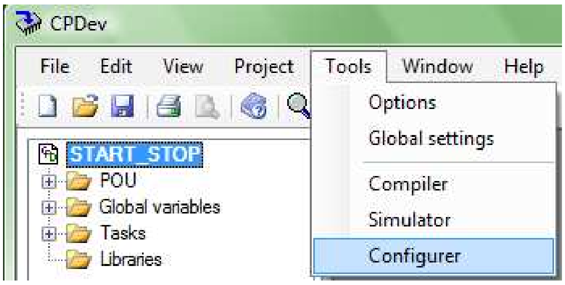


Fig. 5. Starting the configurer as tools

c) Menu start: CPDeV > CPCon

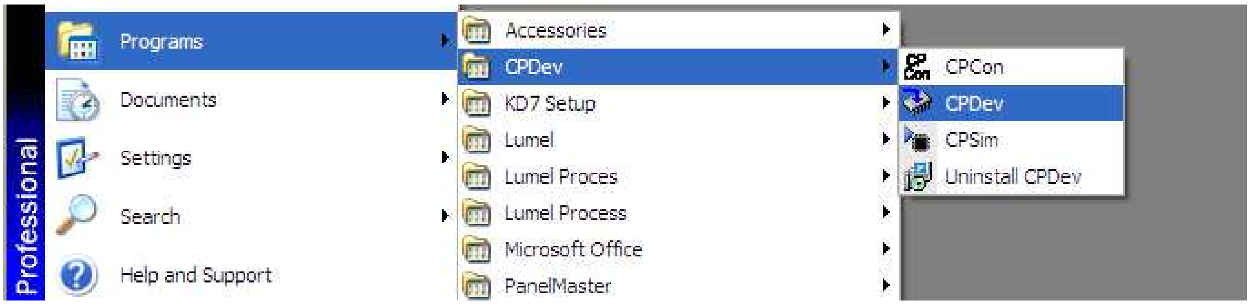
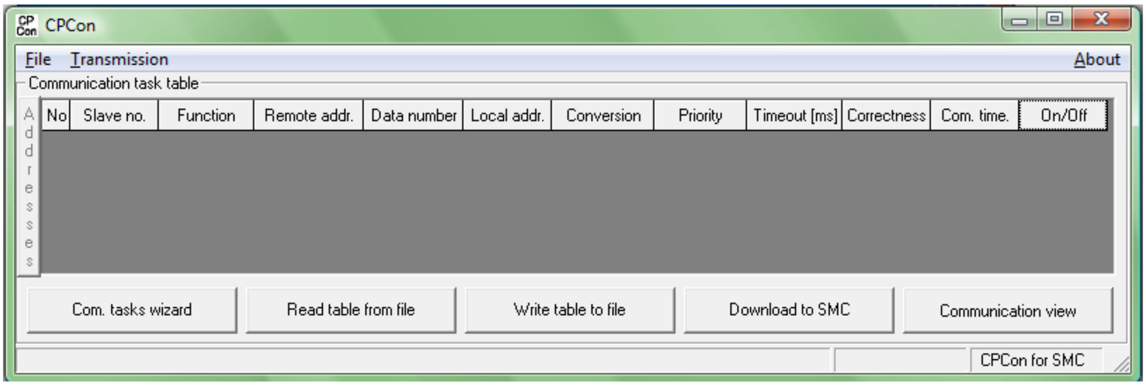


Fig. 6 Starting the configurer from the system menu

The first way is applied directly after the Project compilation. The two next require the file import from the compiled project. After starting, the configuration window of the CPCon communication appears

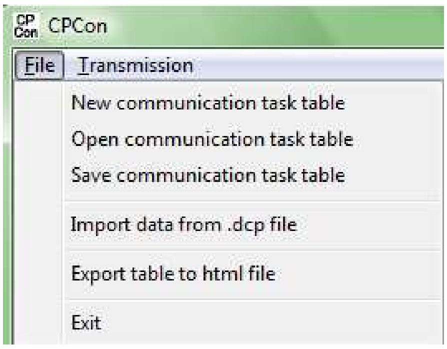


No	Slave no.	Function	Remote addr.	Data number	Local addr.	Conversion	Priority	Timeout [ms]	Correctness	Com. time.	On/Off

Fig. 7. Table of communication tasks

The *communication* task table has a basic meaning. It defines which transactions of the MODBUS protocol, i.e. exchange of messages *queries – responses* (readout) or *commands – confirmation* (write) will take place. Transactions are named here *communication tasks*.

5.1.4 Menu CPCon


CPCon
File
Transmission
New communication task table
Open communication task table
Save communication task table
Import data from .dcp file
Export table to html file
Exit

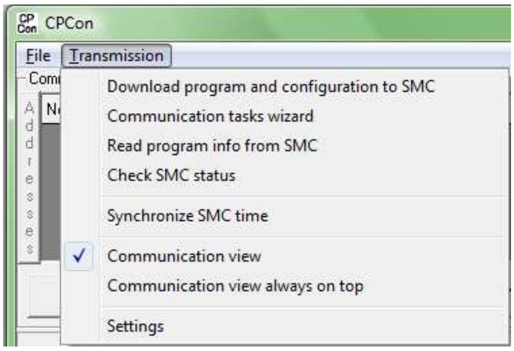

CPCon
File
Transmission
Download program and configuration to SMC
Communication tasks wizard
Read program info from SMC
Check SMC status
Synchronize SMC time
✓ Communication view
Communication view always on top
Settings

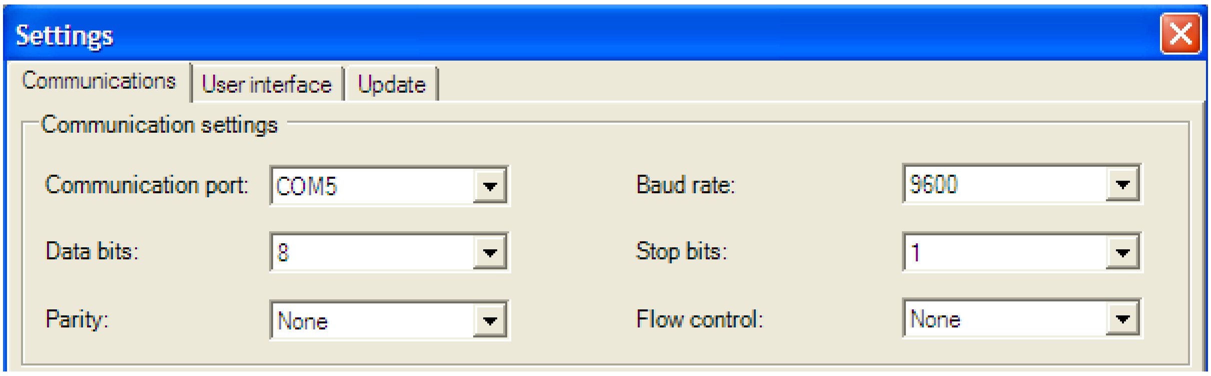
Fig. 8. File menu of the CPCon program ***Fig. 9. Transmission menu of the CPCon program***

Buttons under the table (Fig. 7) realizes a part of functions given in options. The project file *import* is necessary, when CPCon was started in the second or third way. The read out metric contains documentation data of the carried out program by the controller.

The *synchronization* sets the controller clock acc. to the computer.

5.1.5 Transmission Settings

- *Transmission > Settings*
  The *Settings* window with *Communication* tags, *Program Settings and Update*, appear in the window.
- *Vertical communication*
  The Tag serves to set PC ↔ SMC communication parameters. The port number issues from the Device Manager of the PC computer.

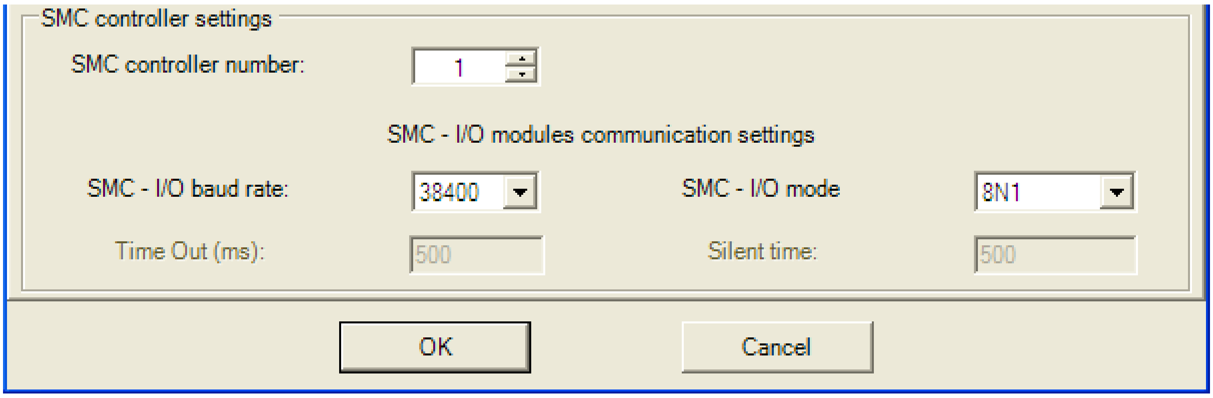


Communication settings

Communication port: COM5
Baud rate: 9600
Data bits: 8
Stop bits: 1
Parity: None
Flow control: None

Fig. 10. Setting of the PC ↔ SMC communication

- *Horizontal communication*
  Communication parameters SMC ↔ in/out modules can be selected from the tag (or other devices). Parameters must be the same as they set in modules.
  The 8N1 mode selected below means 8-bit data, odd parity (N) and 1 stop bit.


SMC controller settings

SMC controller number: 1

SMC - I/O modules communication settings

SMC - I/O baud rate: 38400

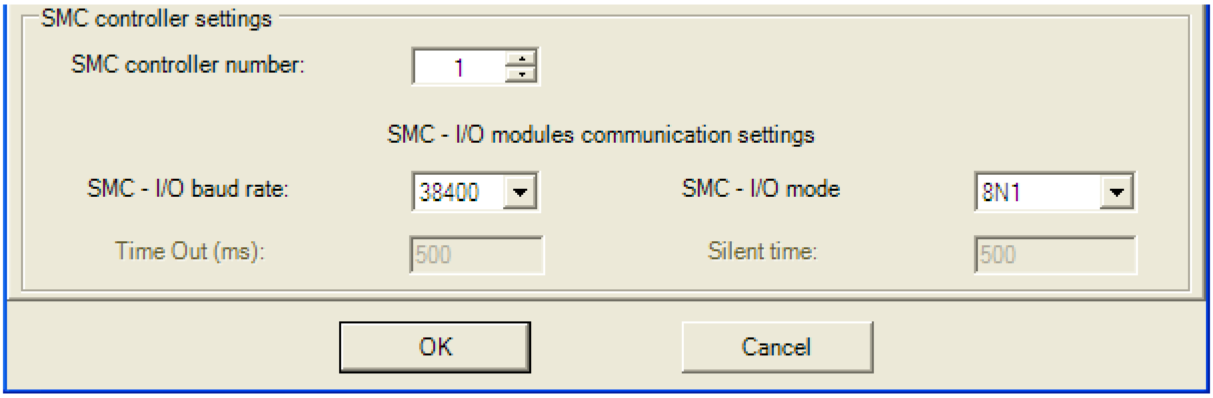
SMC - I/O mode 8N1

Time Out (ms): 500

Silent time: 500

Fig. 11. Setting of the PC SMC ⇔ in/out module communication

- *Program Setting*
  Language selection.


SMC controller settings

SMC controller number: 1

SMC - I/O modules communication settings

SMC - I/O baud rate: 38400

SMC - I/O mode 8N1

Time Out (ms): 500

Silent time: 500

Fig. 12. Language setting

5.2 SMC Communication ⇔ Devices (SM Modules)

For the SMC controller communication with object devices can serve :

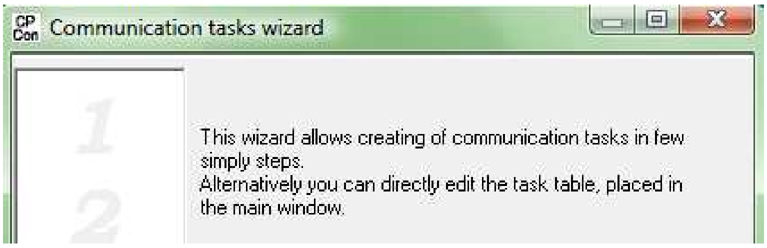
a) global variables, which addresses, e.g. START, STOP, ALARM, have been assigned to,

b) COM_SM1, COM_SM2, etc, communication blocks, dedicated for SM module.

The communication is configured by fulfilling a suitable number of rows of the task table.
Each line represents one *communication task* of the SMC controller.
The filling can me made directly from the table (the right mouse key adds or erases the row, or by means of the *task creator* (button) composed of several windows:

- Press the button Com. tasks wizard in the program window.

  The creator information window appears



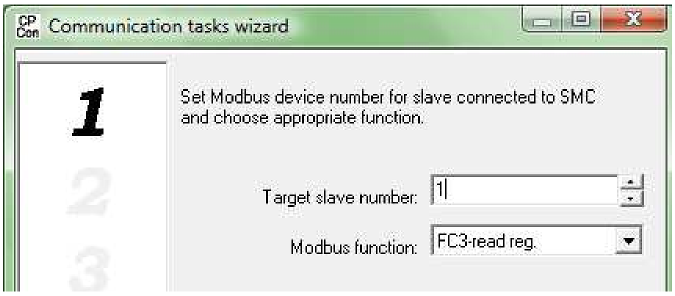
Communication tasks wizard

This wizard allows creating of communication tasks in few simply steps.
Alternatively you can directly edit the task table, placed in the main window.

Fig. 13. Creator of communication tasks

5.2.1 Device Number. MODBUS Function

- Input devices (e.g. SM5) can be read out by groups by means of the function with Code 3 (readout of registers , named FC3 here (*Function Code 3*). The first window can have the shape like below.



Communication tasks wizard

Set Modbus device number for slave connected to SMC and choose appropriate function.

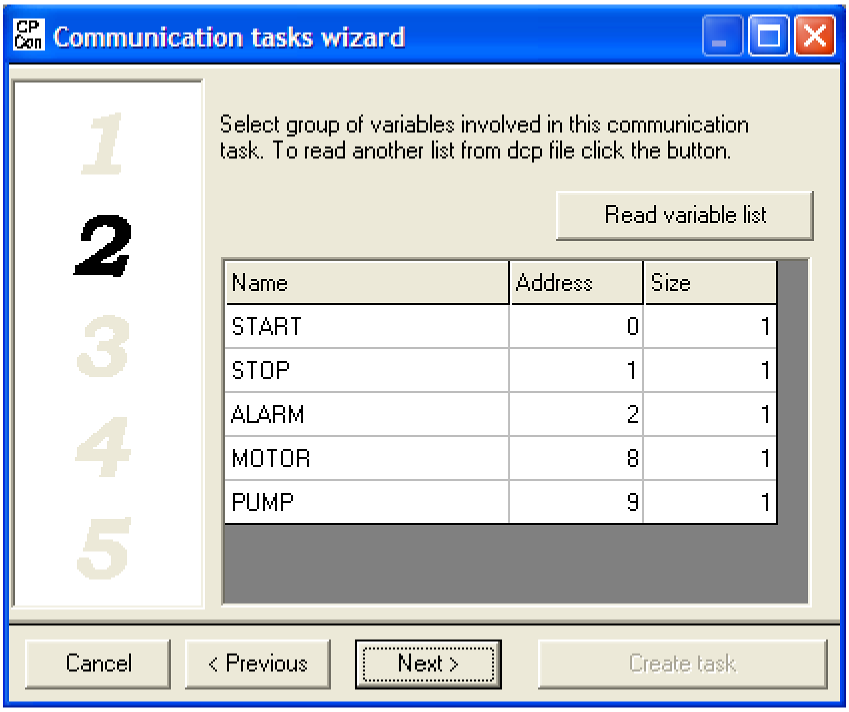
Target slave number: 1

Modbus function: FC3-read reg.

Fig. 14. Definition of the target slave number and the readout function

5.2.2 Variables. Addresses

- The list of global variables with addresses appears in the creator window.



Communication tasks wizard

Select group of variables involved in this communication task. To read another list from dcp file click the button.

Name	Address	Size
START	0	1
STOP	1	1
ALARM	2	1
MOTOR	8	1
PUMP	9	1

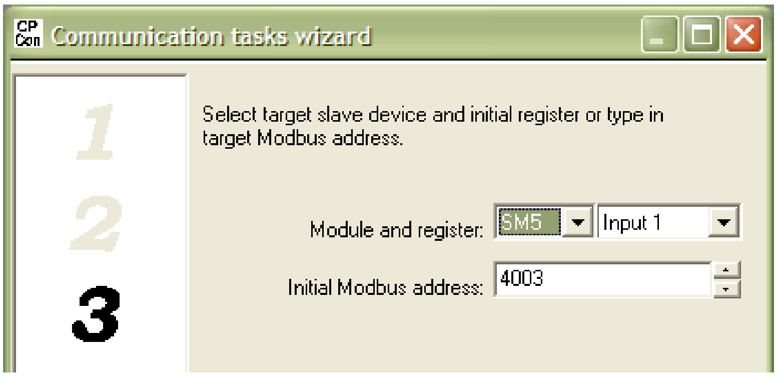
Fig. 15. Assignment of global variables to the device.

Among global variables of our project, we highlight input variables.
The logic addresses of variables are e.g. 0,1, 2, and the dimension of each is a byte. Addresses of input variables are successive numbers, then the readout by groups (by blocks) is suitable.

Note. If the list is empty, then the click of the (*write the variables list in*) allows to import variables from the chosen file in the being opened window.

5.2.3 Device. Beginning Address.

- Example of the SM5 module device association for communication tasks. For example, the START variable register has the address 4003.



Select target slave device and initial register or type in target Modbus address.

Module and register: SM5 Input 1

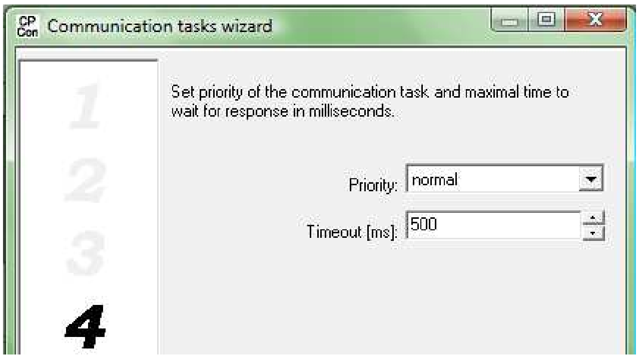
Initial Modbus address: 4003

Fig. 16. Assignment to the device and definition of the beginning address.

5.2.4 Priority. Timeout

Communication tasks defined by type lines of the main table are made in breaks, which after performing the program time remains to the end of each cycle. If the break is important, the task can be carried out several times. The task with a *normal* priority is carried out twice rarely than the task with a *high* priority, and the task with a *low* priority, three times rarely. *Timeout* means the maximal period of time during which the exchange of messages with the device has to be finished.

- It is assumed that the communication task from SM5 will have a *normal* priority and the exchange of messages has to be finished during 500 ms (*timeout*).



Set priority of the communication task and maximal time to wait for response in milliseconds.

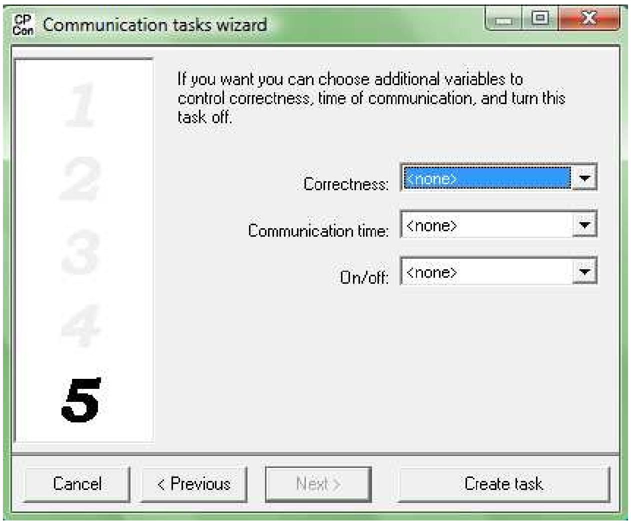
Priority: normal

Timeout [ms]: 500

Fig. 17. Assignment of the priority and waiting time.

5.2.5. *Control Variables*

The last creator window serves for the configuration of transmission control, if the appropriate fragment of the program forecasts it. It is indicated in the window, to which of variables has to be write the information about the correctness or incorrectness of the communication, which of the variable is destined to write the communication time in, and by means of which, one can enable or disable communication tasks.
Control variables are used in advanced projects.



If you want you can choose additional variables to control correctness, time of communication, and turn this task off.

Correctness: <none>

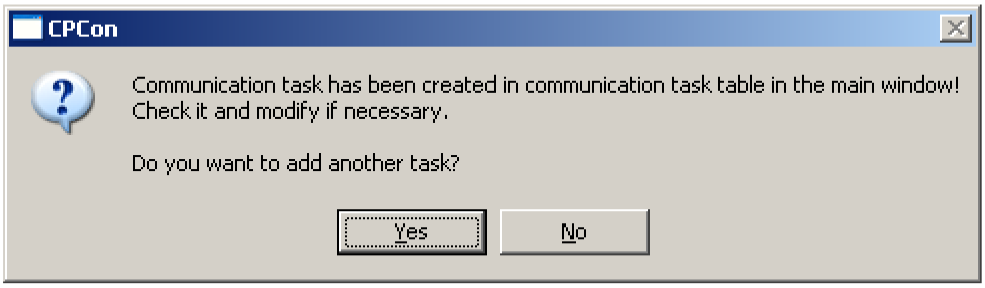
Communication time: <none>

On/off: <none>

Fig. 18. Control variables

5.2.6 *Creation of the Communication Task*

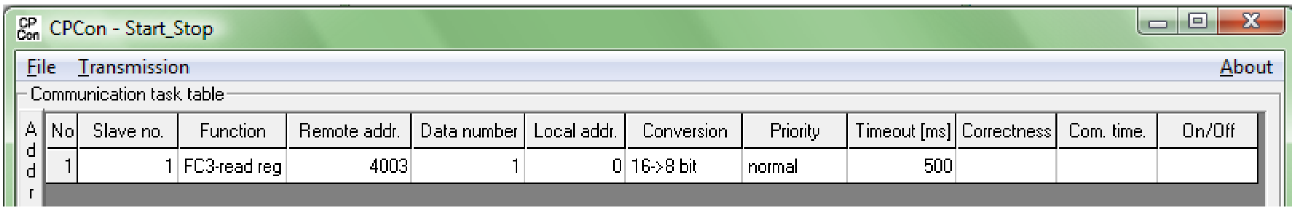
- Press the button Create task .



Communication task has been created in communication task table in the main window! Check it and modify if necessary.

Do you want to add another task?

The first line with data set in the creator appears in the table of communication tasks and with it, the conversion of registers into bytes, 16 → 8 bit.

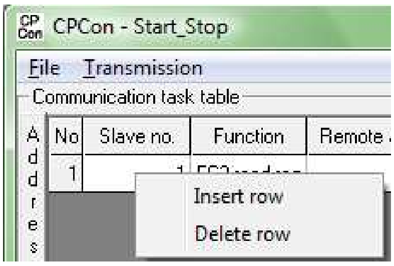


Addr	No	Slave no.	Function	Remote addr.	Data number	Local addr.	Conversion	Priority	Timeout [ms]	Correctness	Com. time	On/Off
	1	1	FC3-read reg	4003	1	0	16->8 bit	normal	500			

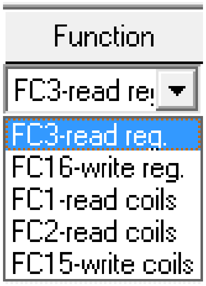
Fig. 19. View of the table after the task configuration.

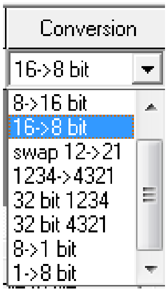
5.2.7. Direct Filling of the Table (alternative for the Creator).

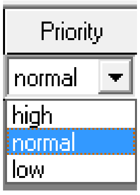
Addition and elimination of the row – right Mouse key



Function code, kind of conversion, priority – selection from the menu.







Other cells – written in the ordinary way.

5.2.8. Writing the Configuration into the File.

The table of communication tasks can be utilized in later modifications or in other Projects. The file with the table is also indispensable when the CPSim Simulator has to stimulate the operation of devices added to the controller. The CPCon configurer write files with the XMC extension.

- Press the button

The window *Write file with the configuration of the communication subsystem* appears, in which one must write the file name, e.g. *Start_Stop.xmc* (XMC extension added automatically).

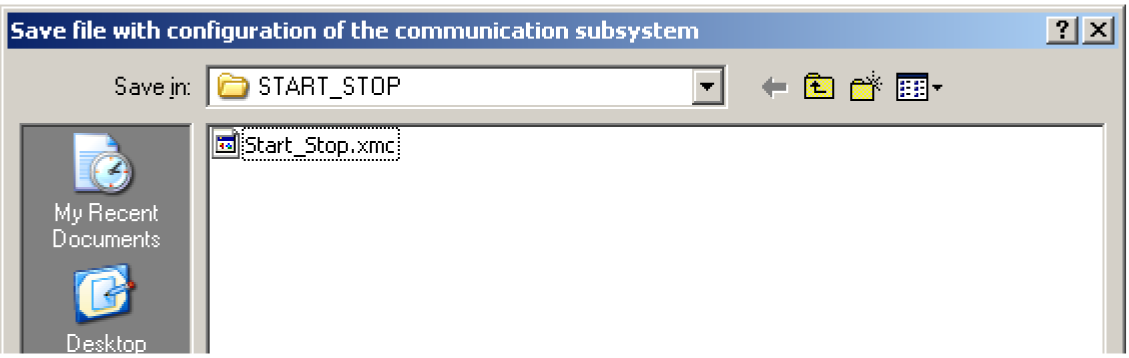


Fig. 20 Writing the project to the file

5.2.9. *Configuration Readout (for Check, Modification, ETC.)*

- Press the button

  Select the file in the appearing window *Open file* with the confirmation of the communication subsystem and click *Open*.

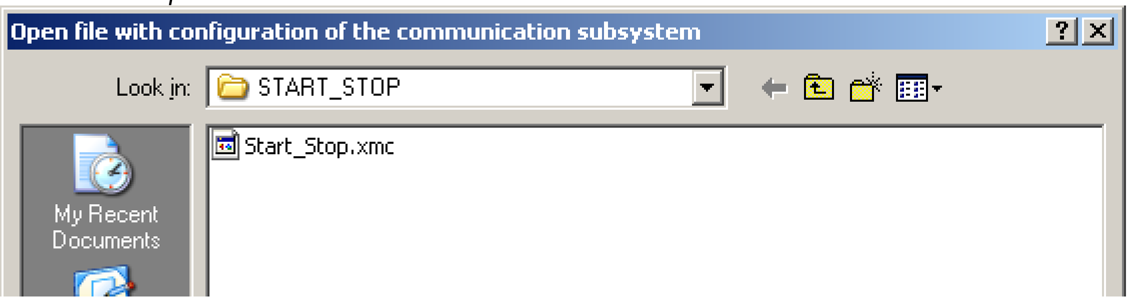


Fig. 21 Reading in the project to the file

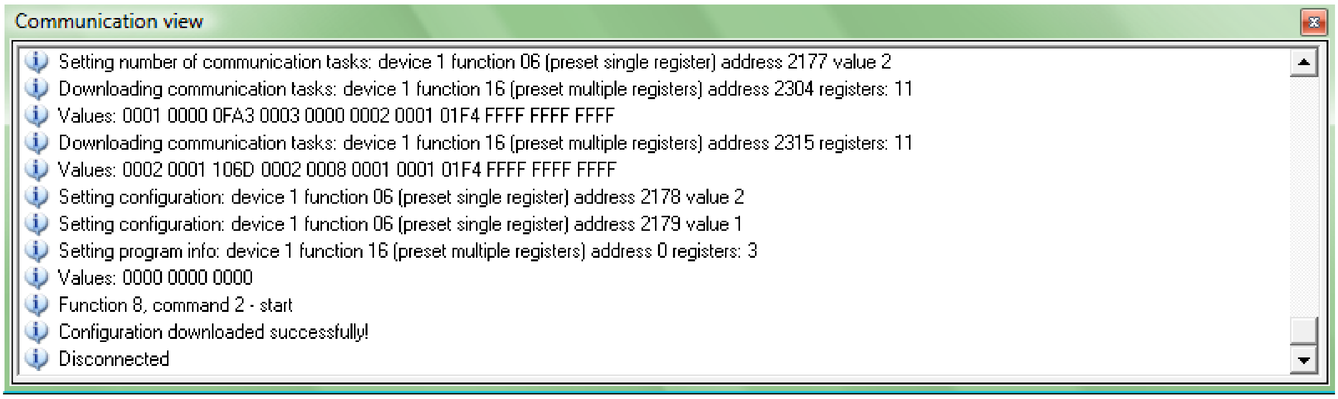
In case of the file Start_Stop.xmc, the table of communication tasks will be looked like previously.

5.3 Writing the Program in SMC

- Before writing, it is worth to open the lower part of the window by clicking *Communication monitoring*. It allows to check if the write has proceeded correctly.

- Press the button

- The window of the project specification (metric) appears, which with the program will be written in the SMC controller.
  During the write, check information is displayed in the *Communication monitoring* window.



```
Setting number of communication tasks: device 1 function 06 (preset single register) address 2177 value 2
Downloading communication tasks: device 1 function 16 (preset multiple registers) address 2304 registers: 11
Values: 0001 0000 0FA3 0003 0000 0002 0001 01F4 FFFF FFFF FFFF
Downloading communication tasks: device 1 function 16 (preset multiple registers) address 2315 registers: 11
Values: 0002 0001 106D 0002 0008 0001 0001 01F4 FFFF FFFF FFFF
Setting configuration: device 1 function 06 (preset single register) address 2178 value 2
Setting configuration: device 1 function 06 (preset single register) address 2179 value 1
Setting program info: device 1 function 16 (preset multiple registers) address 0 registers: 3
Values: 0000 0000 0000
Function 8, command 2 - start
Configuration downloaded successfully!
Disconnected
```

Fig. 22. Exemplary communication window PC⇔SMC

After writing the program, the SMC controller begins instantly its execution, communicating with object devices.

6. DESCRIPTION OF THE TRANSMISSION PROTOCOL FUNCTIONS

Following functions of the MODBUS protocol were implemented in the controller.

code	Meaning
03	Readout of n-registers
06	Write of a single register
16	Write of n-registers
17	Identification of the slave device

6.1. Readout of n-registers (code 03)

Request:

The function enables the readout of values included in register, in the addressed slave device. **Registers are 16 or 32-bit units, which can include numerical values related to process variables a.s.l.**

The request frame is defined by the first 16-bit address of the register and the number of registers to readout. The meaning of the register contents about given addresses can be different for different device types. The function is not available in the broadcast mode.

Example: Readout of 3 registers beginning from the register with 6B h address.

address	function	register address Hi	register address Lo	number of registers Hi	number of registers Lo	checksum
11	03	00	6B	00	03	7E

LRC

Response:

Register data are packed beginning from the lowest address: first the older byte, next the younger register byte.

Example: Response frame.

address	function	numb. of bytes	value of reg.107 Hi	value of reg.107 Lo	value in reg.108 Hi	value in reg.108 Lo	value in reg.109 Hi	value in reg.109 Lo	checksuma
11	03	06	02	2B	00	00	00	64	55

LRC

6.2. Writing the Value in the Register (Code 06)

Request:

The function enables the modification of the register contents. It is available in the broadcast mode.

Example:

address	function	register address Hi	register address Lo	value Hi	value Lo	checksum
11	06	00	87	03	9E	C1

LRC

Response:

The correct response for the request of the value write in the register is the message retransmission after performing the operation.

Example:

address	function	register address Hi	register address Lo	value Hi	value Lo	checksum
11	06	00	87	03	9E	C1

LRC

6.3. Writing in n-registers (Code 16)

Request:

The function is available In the broadcast mode. It enables the modification of the register contents.
Example: Write of two registers beginning from the register with the address 136.

address	funct.	regist. address Hi	regist. address Lo	numb. of reg. Hi	numb. of reg. Lo	numb. of bytes	data Hi	data Lo	data Hi	data Lo	check-sum
11	10	00	87	00	02	04	00	0A	01	02	45

LRC

Response:

The correct response includes the slave unit address, initial address and the number of written addresses.
Example:

address	function	register address Hi	register address Lo	number of registers Hi	number of registers Lo	checksum
11	10	00	87	00	02	56

LRC

6.4. Report Identifying the Device (Code 17)

Request:

The function allows the user to obtain information about the device type, status and configuration depending on it.
Example:

address	function	checksum
11	11	DE

LRC

Response:

The field „Device identifier" in the response frame means the unique identifier of the given device class, however remaining fields include parameters dependent on the device type.

7. ERROR CODES

When the master device transmits the request to the slave device then, with the exception of messages in the broadcast mode, it waits for a correct response. After transmitting the request of the master unit, one of the four possible events can appear:

❒ If the slave unit receives the request without a transmission error and can perform it correctly, then returns the correct response.

❒ If the slave unit does not receive the request, not any response is returned. In the program of the master device, timeout conditions will be fulfilled for the request.

❒ If the slave unit receives the request, but with transmission errors (parity error, LRC or CRC checksum), not any response is returned. Timeout conditions for request will be fulfilled in the master device program.

❒ If the slave unit receives the request without transmission errors, but cannot perform it correctly (e.g.

If the request is a readout of a not existing bit output or register), then returns the response including the error code, informing the master device about the error cause.

The message with an erroneous response includes two fields differentiating it from the correct response.:

Function Code Field:

In the correct response, the slave unit retransmits the function code from the request message on the response code field.
All function codes have the most significant bit (MSB) equal 0 (code values are below 80h).
In the erroneous terror, the slave device set the MSB bit of the function code on 1. This occasions, that the function code value in the erroneous response is exactly higher of 80h than it had been in the correct response.
On the base of the function code with the set MSB bit, the master device program can begin the erroneous response and check the error code in the data field.

Data Field:
In the correct response, the slave device can return data on the data field (some information requested by the master unit).
In the erroneous response, the slave device returns the terror code on the data field. It defines the slave device conditions, which causes the error.

An example of master device request and erroneous slave device response is presented below. Data are in the hexadecimal shape.

Example: request

slave address	function	variable address Hi	variable address Lo	number of variables Hi	number of variables Lo	checksum	
0A	01	04	A1	00	01	4F	LRC

Example: erroneous error

slave address	function	error code	checksum	
0A	81	01	73	LRC

In this example, the master device addresses the request to the slave unit numbered 10 (oHa).
The function with the code (01) is not implemented in the concentrator, then the device returns the erroneous response with the error code nr 01. It indicates the forbidden function in the slave device. Possible error codes and their meanings are presented in the table below.

code	meaning
01	forbidden function
02	forbidden data address
03	forbidden data value
04	request being in realization
05	impossible request realization

8. TECHNICAL DATA

Serial port I:	
- baud rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bit/s
- mode	ASCII: 8N1, 7E1, 7O1,7N2 RTU: 8N2, 8 E1, 8O1, 8N1
- interface	2 x RS-485
Serial port II:	
- baud rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bit/s
- mode	ASCII: 8N1, 7E1, 7O1,7N2 RTU: 8N2, 8 E1, 8O1, 8N1
- interface	RS-485, RS-232 USB 1.1 – wire no longer than 3 m
Transmission protocol:	MODBUS – ASCII, RTU
Power consumption	≤ 4 VA

Rated operating conditions:	
- supply voltage	20…24…40 V a.c./d.c. or 85…230…253 V a.c./d.c.
- supply voltage frequency	40…50/60…440 Hz
- ambient temperature	0…23…55ºC
- relative air humidity	< 95% (inadmissible condensation of water vapor)
- external magnetic field	< 400 A/m
- working position	any
Storage and transport conditions:	
- ambient temperature	-20…70 ºC
- relative air humidity	< 95% (inadmissible condensation of water vapor)
Ensured protection levels:	
- from frontal housing side	IP 40
- from terminal side	IP 20
Overall dimensions:	45 x 120 x 100 mm
Weight :	0.25 kg
SMC casing:	for mounting on a 35 mm DIN rail
Electromagnetic compatibility:	
- noise immunity	acc. to EN 61000-6-2
- noise emissions	acc. to EN 61000-6-4
Safety requirements acc. to EN 61010-1:	
- installation category	III
- pollution level	2
Maximal phase-to-earth working voltage:	
- for supply circuits	300 V
- for other circuits	50 V

9. ORDERING CODES

PROGRAMMABLE CONTROLLER	***SMC-***	***X***	***XX***	***X***	***X***
Supply voltage:	*85…253 V a.c/d.c.*	***1***			
	20…40 V a.c/d.c.	***2***			
Version:	*standard*		***00***		
	non-standard settings		***NS***		
	custom-made*		***XX***		
Language:	*Polish*			***P***	
	English			***E***	
	other			***X***	
Acceptance tests:	without extra l requirements				***0***
	with an extra quality inspection certificate				***1***
	acc. to customer's request *				***X***

* After agreeing with the manufacturer

ORDERING EXAMPLE

The code: **SMC-1- 00- E-1** means:
SMC – programmable controller of SMC type
1 – supply voltage: 85…253 V a.c./d.c.
00 – standard version
E – English language
1 – delivered with an extra quality inspection certificate

10. MAINTENANCE AND GUARANTEE

The applied battery in the SMC controller requires replacement every 5 years. In order to replace the battery, one must send the controller to the Manufacturer’s Service Department.

In case of some incorrect operations:

1. In the period given in the annexed guarantee card

One should take the controller down from the installation and return it to the Manufacturer’s Quality Control Dept.
If the unit has been used in compliance with the instructions, the Manufacturer guarantees to repair it free of charge.

2. After the guarantee period:

One should turn over the controller to repair it in a certified service workshop.
The disassembling of the housing causes the cancellation of the granted guarantee.

Our policy is one of continuous improvement and we reserve the right to make changes in design and specifications of any products as engineering advances or necessity requires and revise the above specifications without notice.

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- INDUSTRIAL PROCESS CONTROLLERS
- CHART AND PAPERLESS RECORDERS
- POWER CONTROL UNITS AND SOLIDE-STATE RELAYS
- ELECTRONIC WATT-HOUR METERS
- INTEGRATION ELEMENTS OF MEASURING NETWORKS
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WE ALSO OFFER OUR SERVICES IN THE PRODUCTION OF:

- ALUMINIUM ALLOY PRESSURE CASTINGS
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QUALITY PROCEDURES:

According to ISO 9001 and ISO 14001 international requirements.

All our instruments have CE mark .
For more information, please write to or phone our Export Department **SMC-09/1 January 2010**

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