

Ethernet card Ether 4.1

Instruction manual

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ISO 9001:2008 a OHSAS 18001:2007 TAYLLOR & COX s.r.o.



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1. Basic information

1.1 Description

Ethernet card Ether4 allows you to monitor status of the four potential free inputs, measure the temperature and supply voltage and control two relay outputs. Measured values and input status are transmitted in digital form to master system via ethernet interface.

1.2 Properties

- Four potential free inputs for alarm transmission
- Possibility connection of measuring device with SO output (max 2)
- One input for digital temp. sensors (max. 16 sensors)
- Measurement of supply voltage
- Wide supply voltage range (9-60 V DC)
- Communication via Ethernet
- Communication protocols TCP(client, server), UDP, SNMP, HTTP, XML, SMTP, Modbus TCP, SNTP
- Updating the firmware via ethernet
- Internal website to view current status and settings
- Possibility of entering custom alarms

1.3 Expandability

According to user requirements Ether4 card can be complemented with other hardware. The only limitation is the number of terminals (24).

- 8 inputs for alarm transmission
- Measurement of 8 analog values using AD converters
- Calculating of consumption DC (max. two consumptions)
- Measurement of the temperature up to 16 sensors (16 number of AD)
- Output options (operated manually or exceeding the limits)
 - 2 relays (relay Fujitsu FTR-B3, max.60V DC,AC)
 - 1 relay + 3 transistor outputs (transistor max. 60V DC, 50mA)
 - 6 transistor outputs



2. WEB interface - internal WEB site

Using internal WEB site you can track inputs and measured values. It also allows you to view and configure. To save the settings, you need to log username and password.

Default settings: Name: cantech Password: cantech IP address : 192.168.1.103 Mask : 255.255.255.0 Gateway : 192.168.1.1

How to set dafault : pressing button Reset permanently lights green LED, to go out (about 7 seconds) will be reset to factory settings.

Note: the name is not change, only the password and Ethernet settings.

5	Stat	us: Ok			Šump
ork	0				
surement	9	AL1 =	= 0		
ms		AL2 =	= 0		
		AL4 =	= 0		
er	#	St.	Description	Value	Unit
puts	1	\checkmark	Voltage	15,4	v
mload	2	1	Temperature1	24,8	°C
moau	3	×	Temperature2	0,0	°C
	4	\checkmark	Energy	0,0	kWh

2.1 Status display

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The status is periodically updated. The period is set on page "Other".

Status ... period is 0 and site updates are done manually <F5> Status: OK ... periodic data reading is fine Status: Connection lost ... Ethernet card is unavailable



... custom alarm conditions. After you place your cursor on icon displays the name of alarm

... status of the digital inputs with description



Table of values:

 \checkmark

×



- ... measurement is fine and the value is out of limits
 - ... measurement error

Note: User alarms can not be set using the HTML. It is only possible using program Eth4_nastavení.exe

As the temperature is measured with a longer period (800ms by default), the current measured temperature is displayed in a lighter color.

2.2 Network settings

CanTech Ether4		
Status	Network configuration	on
Network	NOTICE: Wrong set	tings can cause malfunction of communication. Use
Measurement	the Reset button or	n the device to set default values
Alarms	IP address:	192.168.1.103
Mail	Gateway:	192.168.1.1
Other	Mask:	255.255.255.0
Outputs	Primary DNS:	192.168.1.1
	Secondary DNS:	0.0.0.0
Download	SNMP trap1:	192.168.1.125
	SNMP trap2:	0.0.0.0
	UDP port:	30305
	User:	cantech
	Password:	****
		Save & Reboot

After changing values and storing the card decides, if it is necessary to perform a reboot. If the card does it, the following screen appears.

CanTech Ether4		
Status	Reboot	Šumperk
Network	Your settings have been saved.	
Measurement	Performing reset	
Alarms	The device will be on address: <u>http://192.168.1.103/</u>	<u>/</u>

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After completing the reset, change text "Performing Reset" to "Reset done"

2.3 Measurement settings

CanTech Ether4		
Status	Setting values	
Network	Calibration Load nu	mber
Measurement	Select value:	1 -
Alarms	Sciect vulde.	
Mail	Text:	Voltage
Other	Serial number:	
Outputs	Measure:	
Download	Mail error:	
	Dec. places:	1 •
	unit:	V
	Watch limits:	
	Trap:	
	Mail. Output:	N/A
	Min:	0,0
	Max:	0,0
	Hysteresis:	0,0
		Save

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Select value : select the value with which to work

<u>Text</u>: description of value – maximum 24 symbols

<u>Serial number</u> : number of the thermometer

- if it is used only one thermometer, a value is empty
- when using multiple thermometers, each must have its own address. The number can be entered manually or provided that, they are connected gradually (only one), number can be loaded using the button "Load number"

Measure : determines if a value is in a given position measure

Trap error : fail measurement trap is sent

Mail error : fail measurements are sending mail

Dec.places : how many decimal places the value is displayed

<u>Unit</u> : unit of display values

Watch limits : it determines whether to watch, if the value in the specified limits

<u>Trap</u> : sends the trap when limits are exceeded

Mail: mail will be sent when limits are exceeded

<u>Output</u> : determines the output, that is activated when limits are exceeded, INV behind the name indicates that the output will be negated

Min, Max, Hysteresis : settings of watched limits



2.4 Calibration

CanTech Ether4			
Status	Calibration		
Network	Voltage : 15,4 V		
Measurement	Meter	AD	
Alarms	0,0	0	MIN Single point
Mail	0,0		Single point
Other			
Outputs			
Download			

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Calibration can be performed either single-point or two-point:

- <u>Single-point calibration</u> value at MIN remains 0,0 and at button single-point to enter the current value and presses the button Single-point.
- <u>Two-point calibration</u> sets the minimum value and this is entered at MIN and presses MIN. Then set the maximum value and this is entered at Two-point and presses Two-point. At the top left you can see the measured value

Note: The calibration constants are not stored after calibration to EEPROM memory – when you turn off or change value on the card Measurement are read original. For save the constants is necessary to return on card Measurement and press Save.

2.5 Alarm settings

CanTech Ether4		
Status	Alarm settings	
Network	Select alarm:	1 -
Measurement		
Alarms	Use:	
Mail	Trap:	
	Mail:	V
other	Text ON:	AL1 = 1
Outputs	Text OFF:	AL1 = 0
Download		Save

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<u>Select alarm</u> : select the alarm, with which to work <u>Use</u> : if the alarm is to be used <u>Negation</u> : checked – alarm is, when the contact is closed unchecked – alarm is, when the contact is open <u>Trap</u> : sends the trap <u>Mail</u> : sends the mail <u>Text ON</u> : text of presence of alarm <u>Text OFF</u> : text of cancel the alarm

2.6 Email settings

CanTech Ether4		
Status	Mail settings	
Network	Use mail: 📃	
Measurement	Server:	
Alarms	User:	
Mail	Password:	
Other	To: From:	
Outputs	Subject:	
Download		Save

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<u>Use mail</u> : if they are to be sent emails - global ON or OFF

Server : SMTP server (max. 29 characters)

<u>User</u> : login for secure servers (max. 29 characters)

Password : login for secure servers (max. 14 characters)

To : to whom should be sent email, multiple recipients are separated by "," (max. 59 characters)

From : from whom (max. 19 characters)

Subject : subject of the report (max. 29 characters)



2.7 Other settings

CanTech Ether4			≥ ₩
Status	Other settings		
Network	Title:	Šumperk	
Measurement	Signature:	<pre> <</pre>	
Alarms	Dec. Separator:		
Mail	Period[ms]:	1000	
Other	Switching off Ethernet:		
Outputs	Luiemet.	Save	
Download			

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<u>Title</u> : text displayed in the page header

Signature : text at the end of the window Status

Dec. Separator. : decimal separator

<u>Period</u> : period for refresh site Status in milliseconds. If 0, then the refresh does not <u>Switching off Ethernet</u> : if checked and fulfilled condition, that the first output is controlled by exceeding the limits, then, when it exceeds the minimum and the output switch, disconnect the Ethernet, thereby substantially reduced consumption of device. It has using in applications backed from batteries

2.8 Output

CanTech Ether4			
Status	Output		
Network	NOTE: Time of S	Status - If	0 relay switches, when is 1-255 relay switches
Measurement	and after set tin	ne switche	s back.
Alarms	Outputs	Status	Time of Status[s]
Mail	Relay		0 Switch
Other	Output1	0D 8	0 Switch
Outputs		GNDL	0 Switch
Download	Output2		Switch
	Output3		Switch

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<u>Time of status</u> : determines the lenght of the switching relay (if I need to restart the switch, on which hangs Ether4). If 0, the relay switches permanently.

- mark for the internal relay – displays the status of auxiliary relay contacts - mark for the transistor output– displays the status of signal to the transistor base

2.9 XML

Analog values and alarm states are provided through status.xml

Value < 0 - 15 > - analog values

alarm – status of the inputs

salarm – which alarms are used

error – measurement fault

valarm - alarm of limits exceeding

measure - which values are measured

calarm - status of the user alarms

cmeze - limits of user alarms

cmod - mode for user alarms

tidx – index of the measured thermometer

Output states are in rele.xml

period<0 - 1> - if the relay was switched with set time of switching, this value determines the time to switch back

status<0 - 5> - output status

type<0 - 5> - determines the type of output

- 0 ... output is not connected
- 1,2 ... relay is on output
- 3-8 ... transistor is on output

Status of the inputs in the form of text are in texta.xml

talr<0 - 7> - input status

2.10 Reset the device

Using the site /config/tinit.htm can reset the device or putting in default settings



3. SNMP protocol

iReasoning MIB Browser						
			-			
Address: 192.168.1.103:161	Advanced OID:	.1.3.6.1.4.1.42401.1.4.1.3	r GO			
SNMP MIBs	Name/OID	Value	80			
	alarm1.0	off				
BEC1213-MIB iso ora dod interpet mamt mit	alarm2.0	off	P			
Ethera ico ora dod internet private enterpri-	alarm3.0	off				
Energission global internet. private lenter pris	alarm4.0	on	500			
	alarm5.0	off				
	alarm6.0	off				
alarms	alarm7.0	off				
	alarm8.0	off				
	alarmx.0	8				
	alarmv.0	2				
	error.0	256				
	value1.0	120				
	value2.0	310				
	value3.0	310				
	value4.0	310				
	value5.0	310				
	value6.0	0				
	value7.0	310				
	value8.0	310				
	value9.0	0				
	value10.0	310				
Node Name alarms	value11.0	310				
OID 136141424011413	value12.0	310				
Suptav	value13.0	310				
Decess	value14.0	0				
Statue 28	value15.0	0				
DefVal	value16.0	310				
.iso.org.dod.internet.private.enterprises.cantech.group.ether.version.alarms 7:54:19 dop. 2M of 4M 🔒						

MIB file (Ether4.mib) is stored in the Ethernet card and is available in Download section.

Note: The analog values are converted to an integer value, by multiple according to number of decimal places.

4. Modbus TCP

Card communicates with Modbus protocol on port 502. The measured values are converted to an integer value according to the number of decimal places and stored in registers starting at address 30001 in 32bit form.

Register	Byte3	Byte2	Byte1	Byte0			
(1)	Value0	Value0					
(2)	Value1						
(16)	Value15						
(17)	Alarms of values Used alarms Alarms						
(18)	Failures of measure	ment	Measured values				
(19)	Period1	Period0	Used outputs	Output states			
(20)	State of user alarms		Used user alarms				



5. Program for setting – Eth4_setting.exe

5.1 Introduction window and description of menu

Ether4.0 - Ether4_1.eth						
File Settings D	File Settings Display Login 192.168.1.103 💌 9760 🛬					
IP address	192.168.1.103	Load				
Mask	255.255.255.0	Save				
Primary DNS	192.168.1.1	Reboot				
Secondary DNS	0.0.0.0	Password				
Gateway	192.168.1.1					
SNMP trap IP1	0.0.0.0	public				
SNMP trap IP2	0.0.0.0	public				
TCP server IP	0.0.0.0					
TCP server port	9770					
NB name	ETHER4	O None				
UDP port	30305	Czech				
User	cantech					
Read community	public read					
Write community	private write	public				
NTP server pool.ntp.org						
🔽 Send mail	🔽 Modbus rev	rerse				
Enable shutdown ETH. Control output without password						

Menu:

File

Open – load the settings file Save – saves the settings to a file

Save as – saves the settings to a new file

Setting

Load – loads the entire setting of Ethernet card

Save - saves entire setting to the Ethernet card

Note: <Load> <Save> in individual windows works only with partial settings **Display** – opens the windows for setting



Login(**Logout**) – used to log on to enable the save settings **IP address** – IP address of card you want to set

In this window you can set the parameters of network. In addition you can enter: **SNMP trap IP(1,2)** – target server for a trap and community **NB name** – name card **UDP port** – port for communication over UDP **User** – username for administrator access (**Read, Write) community** – community of SNMP protocol **NTP server** - time server **Send mail** – globally enable of sending mails **Enable shutdown ETH.** – see. network settings using the HTTP **Modbus reverse** – values are stored in registers in the reverse order of bytes

Reboot – resets the card to update the network parameters **Pasword** - save the new password

5.2 HTML – setting texts

E Setting HTML	-192.168.1.103			
Title	Sumperk			
Signature	Ca	nTech	Load	Save
Alarm 1 0	AL1 = 0		Format	Unit
Alarm 2 0	AL2 = 0	1	Voltage	V
Alarm 3 0	AL3 = 0	2	Current	A
Alarm 4 0	AL4 = 0	3	Energy	kWh
Alarm 4 0	AL5 = 0	4	Temperature1	°C
Alarm 5 0	AL6 = 0	5	Temperature2	°C
Alarm 6 0	AL7 = 0	6	Temperature3	°C
Alarm 7 0	AL8 = 0	7	Т6	°C
Alarm 1 1	AL1 = 1	8	T7	°C
Alarm 2 1	AL2 = 1	9	Т8	°C
Alarm 3 1	AL3 = 1	10	Т9	°C
Alarm 4 1	AL4 = 1	11	T10	°C
Alarm 5 1	AL5 = 1	12	T11	°C
Alarm 6 1	AL6 = 1	13	T12	°C
Alarm 7 1	AL7 = 1	14	T13	°C
Alarm 8 1	AL8 = 1	15	T14	°C
		16	T15	°C

Using this window you can set texts of headers, alarms and values as through HTML.



5.3 Config. – measurement setup

Sets the AD converters and their calibration, setings thermometers, power consumption and alarm inputs. AD converters can be used only for the first eight values (default is fitted only measuring voltage converter).

Configuration -192.	168.1.103											
Load Save	Measure	Calibratio	on									
Values Limits Other	1											
				<u>Thermometer</u>		Converter		<u>Calibra</u>	tion	Ene	rgy / P	ulse
	TYPE	Measu	re Value	Serial number	Address	MUX Config	Number	Direction Offset	Constant	ldx	1.hrs	2.hrs
Voltage	1x AD	• 🗸	0,00		208 🛃	152 🛃	1 🔀	7 21 🔀	0,00209527			
Current	1x AD	• 🗸	0,00		210 🔀	152 🛃	1 🛛	26 🔀	0,00211459			
Energy	Energy	• 🗸	0,00						1,00000000	0 🔀	1 🔀	0 🔀
Temperature1	nx T · RE3	• 🗸	0,00	3B4702020000FC								
Temperature2	nx T - RE3	• •	0,00	3B4702020000FB								
Temperature3	nx T · RE3	• 🗸	0,00	3B4702020000F1								
Energy AC	Energy	• •	0,00						1,00000000	1 🔀	8 🏹	0 🔀
Pulse	Pulse	• 🔽	0,00						3600,0000000	0 🏹	0 🏹	1 🔀
Т8	nothing											
Т9	nothing	•										
T10	nothing											
T11	nothing											
T12	nothing											
T13	nothing											
T14	nothing											
T15	nothing											

Type - 1xAD - simple AD converter

- 2xAD 1. double converter 1. input
- 2xAD 2. double converter 2. input
- 1xT RE3 one thermometer on port RE3 (no need to enter the seriál number)
- 1xT RC2 one thermometer on port RC2 (at this version is not used)
- nxT RE3 multiple thermometers on port RE3 (must enter the seriál number) Energy – calculates the energy
- Pulse work with a delay between pulses on the inputs 1,2
- Nothing value is not used

Measure – if the value should be measured

Value – display of the measurement result after the tap of a button Measure

Serial number – number of thermometer – right mouse button to load number (at this point must be connected just one thermometer)

Address – I2C converter address

MUX – port of I2C multiplexer

Config – configuration constant of AD converter

Number - number of measurements for averaging values

Direction – indicates, that the measured variable takes only positive values – to the measurement around zero does not appear -0,0

Offset – displacement of converter in zero (in LSB)

Constant - conversion constant of value

 \mathbf{Idx} – index of energy or pulse (0,1)

1.hrs – if the type Energy

0..7 - 1. value of multiple

8 - energy is calculated based on arrival pulse on input

- if the type Pulse



0..1 – number of binary input which generates a pulse

2.hrs – if the type Energy

0..7 - 2.value of multiple

if the type Pulse

0 – measure time between pulses

 $1-measure \ performance$

Description of the calculation of energy:

DC energy(consumption)

Assigned Type=Energy, 1.hr=(0..7), 2.hrs=(0..7)

Because Ether4 has no clock circuit, it is based on crystal frequency of processor (its accuracy indicates the accuracy of the calculation of energy). About every 1,6s (exactly $3*2^2(125*10^6)$) timer overflow occurs and at this time is calculated energy.

< Energy > = < Energy> + <1.hr> * <2.hr> / 2235.174

This value is roughly every minute saved in EEPROM (set minute, because memory has a limited number of entries).

To view the energy is used calculation

<Value> = <Energy> * <Constant>

This allows display energy in Wh (Constant = 1.0), or in kWh (Constant = 0.001)

Consumption of connected meter with SO output

Assigned: Type=Energy, 1.hr=8, 2.hr=(0..1) Note: because the binary inputs are connected as follows



Connected meter must "master" level voltage 3,3V. We tested measurement the consumption with electricity meter Maneler 9901.

Consumption is calculated every 1,6s as follows

< Consumption> = < Consumption > + <Number of pulses>

and the displayed value is

< Consumption > = < Consumption > * <Constant>

where the constant is determined by the type of meter.



Work with pulses:

The time between pulses

Assigned Type=Pulse, 1.hr=(0..1), 2.hrs=0 Pulse lenght is calculated as follows

<Value> = <n> / <Constant>

where $\langle n \rangle$ is the number of CPU ticks ($1s = 125*10^{6}/(3*2^{8})$ ticks) Constant = 40690,104 specifies delay in seconds

Measurement of immediate consumption

Assigned Type=Pulse, 1.hr=(0..1), 2.hrs=1 Immediate consumption is calculated as follows

<Value> = <Constant> * 40690,104 / <n>

Note: <n> may take up maximum 2^32, which corresponding about 29 hours

Configuration -192.1	68.1.103												
Load Save	Measure	Calibra	ation										
Values Limits Other													
				<u>Limi</u>	<u>its</u>			Em	Dr		<u>Output</u>		
	Des.m.	Use	MIN	MAX	Hyst.	Trap	Mail	Trap	Mail	Use	Negation	Number v.	
Voltage	1 🔀											0 🔀	
Current	1 🔀		10	28	1	V							
Energy	1 🔀											0 🔀	
Temperature1	1 📿											0 🔀	
Temperature2	1 🔀											0 🔀	
Temperature3	1 🔀											0 🔀	
Energy AC	1 🔀											0 🔀	
Pulse	1 🔀												
Т8	1 🔀											0 🔀	
Т9	1 🔀												
T10	1												
T11	12											0 🔀	
T12	1 🔀											0 🔀	
T13	1 🔀											0 🔀	
T14	12											0 🔀	
T15	1 🔀											0 🔀	
								1					

Des.m. – number of decimal places

Use – use the control limits

MIN, MAX, Hyst – parameters of limits

Trap, Mail – when exceeding the limits is sent trap, mail

Error – Trap, Mail - when fail is sent trap, mail

Output – Use – when exceeding the limits the output is activated

Negation – output operates in reverse

Number v. – which output is activated



E Configuration -192.168.1.103		• 🗙
Load Save Measure	Calibration	
Values Limits Other		
Version 0 2 Period. Type 0 2 Period Status 0 2 Addres Separa Period Input p	dAD: 25 d DS: 80 80 2 9 9	

Version, Type, Status – not used yet

Period AD – time in 10ms between reading AD converters
Period DS – time in 10ms between reading thermometers
Address MUX – address I2C multiplexer
Separator – character of separator of decimal places
Period HTML – period of update HTML page Status
Input pulse 1(2) delay – minimum length SO pulse at 10ms

Calibration -19	2.168.1.103				
		MIN	MAX	Calculation	Сору
Meter :		10	25	Offset	Const
Voltage		0	0	0	0
Current		0	0	0	0
Energy		0	0	0	0
Temperature1		0	0	0	0
Temperature2		0	0	0	0
Temperature3		0	0	0	0
Energy AC		0	0	0	0
Pulse		0	0	0	0

Calibration procedure:

- selection of value, with which I want to work
- set the minimum value
- enter it on line Meter
- tap on MIN



- perform the same with the maximum value
- Calculation calculate the value of offset and constant
- Copy calculated values are copied into the corresponding fields on the card Values

5.4 Mail – mail settings



Same as in HTML.

Format HTML : in the mail are used HTML Tags

5.5 Output – output settings

目 Output	📕 Output -192.168.1.103						
Output1 :	1 - relay1 💌	Relay 1	Load				
Output2 :	2 - relay2 💌	Relay 2	Save				
Output3 :	0 - nothing 💌						
Output4 :	0 - nothing 💌						
Output5 :	0 - nothing 💌						
Output6 :	0 - nothing 💌						

Used to assign physical outputs to logic. It is factory set and user should only change the description of the output.



5.6 Custom alarms – set custom alarms

E Custom	Alarms -192.168.1.1	03									
Limits C	ustom alarms								Load	Save	`
	Туре	Value1	Value2		Low1	High1	Low2	High2	Description		
Limits1	ть тн 🔻	Temperature1 💌	Nothing	•	22,0 🜩	23,0 🜩	0,0 韋	0,0 🚖			
Limits2	ТL ТН -	Temperature2 💌	Nothing	-	33,0 🚖	34,0 🗢	0,0 🗢	0,0 🚖			
Limits3	ТЬ ТН 🔻	Temperature3 💌	Temperature	1 💌	1,0 韋	3,0 🜩	0,0 韋	0,0 🗢			
Limits4	-	Voltage 💌	Nothing	•	0,0 🗢	0,0	0,0 🚖	0,0 🚖			
Limits5	•	Voltage 💌	Nothing	•	0,0 🗢	0,0	0,0 🚖	0,0 🜩			
Limits6	-	Voltage 💌	Nothing	_	0,0 🗢	0,0	0,0 🗢	0,0 🗢			
Limits7	-	Voltage 💌	Nothing	_	0,0 🗢	0,0	0,0 🗢	0,0 🗢			
Limits8		Voltage 💌	Nothing	-	0,0 韋	0,0	0,0 🚖	0,0 🗢			

Limits are used to monitor values like limits on measurement. Use for setting thermostat, that enter into user alarms.

Type : select the type of thermostat

Value1 : input value to the thermostat

Value2 : if selected, the difference of Value1-Value2 enters to the thermostat

Low1, High1 : limits of the thermostat for mod=0

Low2, High2 : limits of the thermostat for mod=1

Ether4 operates in mode 0. Over TCP can be changed mod to 1, so without having to reconfigure the limits of thermostats, You can change the level of monitoring limits only with single command.

AND (%) OR (I) NEG (*) Alam1 A1 FTON(10) FTOFF(5) Alam2 M4 Alam3 Alam4 Alam6 Alam6 Alam6 Alam7 Alam8 Alam8 Alam1 Alam1 Alam3 Alam6 Alam6 Alam6 Alam7 Alam8 Alam10 Alam11 Alam12 Alam13 Alam14 Alam14 Alam14 Alam14 Alam15 Alam14 Alam14 Alam14 Alam15 Alam14 Alam14 Alam15 Alam14 Alam14 Alam14 Alam15 Alam14 Alam14 Alam15 Alam14 Alam14 Alam15 Alam16	Custom /	Alarms -192.168.1.103				
AND (k) OR (I) NEG ('') I	Limits Cus	tom alarms	Load Save			
Alam1 A1 FTON(10) FTOFF(5) c. alam1 IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII		AND (&) OR ()) NEG (*) []	,,	Trap	Negation	Output
Alam2 M4 c. alam2 Nothing v Alam3 Nothing v Nothing v Alam4 Nothing v Nothing v Alam5 Nothing v Nothing v Alam6 Nothing v Nothing v Alam7 Nothing v Nothing v Alam8 Nothing v Nothing v Alam10 Nothing v Nothing v Alam12 Nothing v Nothing v Alam13 Nothing v Nothing v Alam16 Nothing v Nothing v Alam16 Nothing v Nothing v	Alarm1	A1 FTON(10) FTOFF(5)	c. alarm1			Out1 💌
Alam3 Image: matrix matr	Alarm2	M4	c. alarm2			Nothing 💌
Alam4 Image:	Alarm3					Nothing 💌
Alam5 Image:	Alarm4					Nothing 💌
Alam6 Image:	Alarm5					Nothing 💌
Alam7 Image: Constraint of the second of	Alarm6					Nothing 💌
Alam8 Image:	Alarm7					Nothing 💌
Alam9 Image: Constraint of the second of	Alarm8					Nothing 💌
Alam10 Image: Constraint of the second s	Alarm9					Nothing 💌
Alam11 Image: Constraint of the second s	Alarm10					Nothing 💌
Alarm12 Image: Constraint of the second	Alarm11					Nothing 💌
Alam13 Image: Constraint of the second sec	Alarm12					Nothing 💌
Alam14 Alam15 Alam16	Alarm13					Nothing 💌
Alam15 Nothing Alam16 Nothing	Alarm14					Nothing 💌
Alam16	Alarm15					Nothing 💌
i intering in the second secon	Alarm16					Nothing 💌



Each user alarm consists of logical operations between individual operands. Using the timer function, signals can be delayed (it used max. 8 timers). Based on the evaluation of the user alarm sends a trap, mail or switches associated output. Alarm is evaluated from left to right and parentheses indicate priority.

As an operand can be used:

- Alarm ... status of the binary input
- Value alarm ... limits of measured values
- Error ... measurement error
- Limits ... custom alarm limits
- Custom alarm ... another user alarm

Timer function are (dT – duration in seconds):

- FTON(dT) ... delay of rising edge



- FTOFF(dT) ... delay of falling edge



- FPULS(dT) ... pulse after rising edge





5.7 Discoverer – search device in network

Discoverer - 192.168.1.103			×
Search		Clear	
192.168.1.103 ETHER4	00-04-A3-AA-DF-1	0	^
			-

Finds all Ether4 in network and displays their IP address , NB name and MAC address.



6. Program Ether4.exe

Program used to monitor one or more devices Ether4 in the network. Displays the status of inputs, outputs, user alarms and measured values. Status changes can be saved to a log file. Measured values can be saved to files and plot their graph.



Menu:

Find – find the device in the network and add it to the list States – reads the status of all devices from the list Settings:

> Delay of query – delay in seconds when repeated detecting state Capture traps – if they are to capture incoming traps Read status in trap – if the update status of the device when receiving a trap

Write Log – events stored in the file Ether4.log

Show window in trap – when receiving a trap window opens

View the message at a trap – if the program runs minimized, bubble appears at a icon of program Start normally – program starts as the normal application

Start normany – program starts as the norman application Start minimized – when you start the program adds an icon to SystemTray Display – here can show and hide individual toolbars and change their arrangement

Appearance of menu can be changed by clicking the right mouse button.



Device states are also displayed in the icon of the program:



All devices are within normal



Was captured the trap



Somewhere there is alarm



Appeared measurement fault or communication

6.1 Panel of Device list

List o	f devices				×
#	IP address	D	Description	ACVET	
1	192.168.10.103		Šumperk1		
2	192, 168, 1, 103		Šumperk2		

Column:

- serial number, color of field specifies the communication status







just communicate

- communication error
- IP address device address

 $D-\mathrm{if}$ is set the delay of query in menu, this field to select the devices, that we want to monitor

Description - description of the device

- A alarm
- C user alarm
- V exceeding the limits of the measured values
- E measurement fault
- T came trap after click on the line this indication will disappear

Right-clicking on a line of list appears menu:

Status - updates the status of the selected device

Texts - updating descriptions

Up – line moves up one position

Down - line moves down one position

- Insert inserts the line
- Delete deletes the line



6.2 Alarms panel

Alarms				
 AL1 = 0 AL2 = 0 AL3 = 1 AL4 = 0 	 c. alarm1 c. alarm2			

In left column are shown the status of digital inputs, the right displays the users alarm. If there is no defined user alarm, so does not appear

The green LED in left upper corner appears when List of devices is hidden and displays the communication status. Double click on it

to updates the status.

6.3 Values panel



- Measurement fault
 - right click menu appears -For working with data

Save data – at each reading of state the values are saved into file

Export data – data is exported to Excel

Chart <1-8> - values are displayed in the chart (only when saving to a file)

Note: File with data is in Application directory and its name consist of IP address and number of value (from zero). If you want to start a new measurement, this file must be deleted or renamed.

6.4 Outputs panel





Displays the status of the outputs. After clicking the left mouse button on the green LED can change this situation.



After clicking on the switch, the output switches. Before switching will ask for a name and password. Login data are stored and the second time to them without asking.

7. Upgrade firmware

Program Ether4_FW.exe used to store the new firmware to Ether4.

Ether4 FW: 1.0.02 (10.6.2014)					
Ether4 IP	address	192.168.1.103		F	'ut
File	D:\Data\	Ether4\Projekt\Et	her4.bin		2
Target :192.168.1.103 Sending a file :Ether4.bin Connect Write request Write request Write request Write request Sending data File successfully sent Connection canceled					

IP adresa Ether4 – IP address of card

File – to select the file with the new FW

Send – upgrades the new FW – communication status is printed in window

After the Send command performs the following:

- Card restarts
- Introduce a bootloader with the current IP address and MAC address
- Introduce the new FW
- The card will reboot and after about 4 seconds starts new program

In carrying out the upgrade should not be broken the connection or power card. If this happens, the card is broken – it only runs bootloader. When communication is interrupted, procedure may be performed again. If power is interrupted, bootloader does not use set IP address, but the deafult (192.168.1.103) and the upgrade must be performed with this IP address.



8. Connection

Example of connecting of external relay via OD output



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