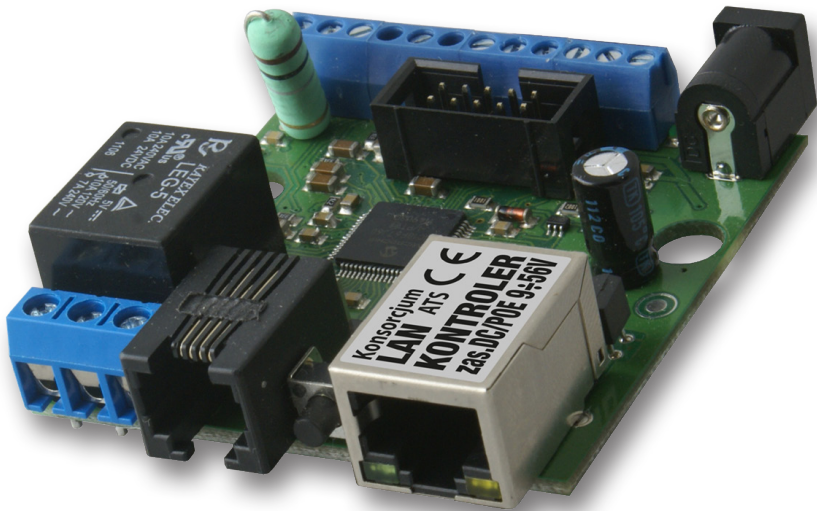# LAN Controller
manual

Firmware version 2.58 – „ISP"

LAN Controller

LAN controller is a simple, but innovative device which has long been lacking in the market network solutions. A small board serves as a web server which presents the various sensor readings and allows you to remotely control up to 5 outputs. Additionally Events Config feature allow you to program the appropriate action when sensor readings met certain conditions. ISP can use watchdog function, it check the ping up to 5 network devices, and if no response runs the relays. Useful for many applications can be a Scheduler, that allows the on / off the device at a specified time or for a specified period of time. There is also PWM output to control brightness of light or an electric motor speed. For far rom socket installation board could be powered by passive PoE. Few versions of firmware is available today, each is developed and after publication customer could upgrade it by preapred software. In Accessory are presented all sensors and upgrade kits compatible with Lan Controller.

Examples of applications

ISP
• watchdog function to checking TCP/IP connection and launch outputs if hanging happen
• temperature, supply voltage and person occupancy control in server rooms
• weather condition report on the occasion of IP cameras views

Home control
• home electric stove control (automatically or remote)
• turning on/off home lightening remote, by scheduler or by event, controlling intensity
• turning off TV box if remote is other person hands ;-)
• irrigation control - you don't need visit your garage to modify irrigation time or you can turn sprayer precisely in the moment when your favorite neighbor passes near ;-)

Home installations
• temperature controlling and simple automation in your heating system
• temperature and pressure controlling in solar thermal installations
• measurements of heat pump operation
• monitoring of grid voltage and automatic switching to backup with mail notification
• remote control (by LAN or wirelesslan) understands as forwarding command to one of output of Lan controller from input of other Lan controller

Renewable energy
• measurements of solar cells work
• measurements of wind turbines
• measurements of charging battery
• measurements of power consuming

RESTARTER, MONITOR, WATCHDOG, CONTROLLER
FEATURES:

• WWW or SNMP v2 management

• firmware upgrade via TFTP

• read data in real time without refreshing page

• possibility switch on/off to 5 relay direct from page WWW

• events panel to self-programming by user

• Scheduler (switch on/off output for definite time in week days)

• IP watchdog to five IP device

• monitoring additional devices eg. PIR sensors

• environmental temperature and supply voltage on board measurement

• temperature and current measurement from connected sensors

• power measurement for DC voltage

• possibility to connecting of the additional boards: with 4 switched PoE ports or 4 relays

• set time manualy or by server NTP

• posisibility sensors calibration

• frequency and duty modified PWM output

• remote control: each output of Lan controller setup as server can be controlled remotelly by LAN network from inputs of others Lan controllers

• e-mail notification about programmed events

• SNMP TRAP notification about programmed events

• HTTP client: GET, POST notification

• automaticaly send state or value inputs to SNMP server

• implemented protocols: HTTP, SNMP, SMTP, SNTP, ICMP, DNS, DHCP

• supported temperature sensors: NTC10K B=3950, KTY-84, PT1000

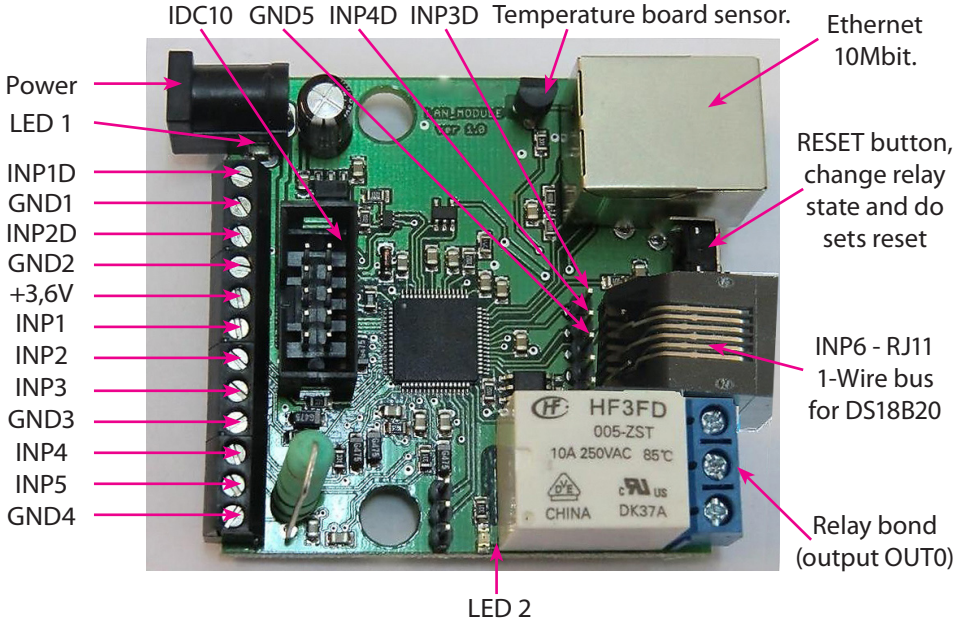**Default user and password is „admin", IP adress is 192.168.1.100**

TECHNICAL SPECIFICATIONS

- supply voltage: 8÷56V
- power consumption : about 1W
- PoE supply: YES, passive
- Protection from wrong supply polarization: YES
- interface: ethernet 10Mbit/s
- relay: 255VAC 10A
- operating temperature: −20 do +85 °C
- weight 45g (without casing)
- casing type Z-67 (not included)
- dimensions 57x67mm

INPUT/OUTPUT:

- **1 RELAY** to switch on/off another devices, available contact: NC and NO

- **4 OUTPUT** to switch relays, ports PoE or another devices;

- **1 CONFIGURABLE PWM OUTPUT** from 2,6 KHz to 4Mhz;

- **4 LOGICAL INPUT** (max 12V): to monitoring another devices, eg. bufor supply. collaboration with outputs: OC,NO, NC

- **5 ANALOG INPUT:**

  INP1: temperature measurement witch thermistor NTC 10K B=3950 (from −40 to +120 °C) or thermistor KTY-84-130 (from −40 to +300℃), accuracy 1℃ (dependent on NTC)

  INP2: thermistor NTC 10K or voltage mesurement to 3,6V, with use additional divider increase range.

  INP3: voltage measurement to 35V, accuracy ± 0,1V;

  INP4: temperature measurement by PT1000 (from −20 to +350 °C) accuracy ± 2℃;

  INP5: measurment DC current to 3A, accuracy ± 10mA;

- **1-WIRE BUS (RJ11 connector)** to input sensor DS18B20 - max 4 sensors

PINS and COMPONENTS DESCRIPTION

IDC10 GND5 INP4D INP3D Temperature board sensor.

Ethernet 10Mbit.

Power

LED 1

INP1D
GND1
INP2D
GND2
+3,6V
INP1
INP2
INP3
GND3
INP4
INP5
GND4

RESET button, change relay state and do sets reset

INP6 - RJ11 1-Wire bus for DS18B20

Relay bond (output OUT0)

LED 2

| PIN/Component	Description
Power	Power suplly 8V÷56VDC or via PoE
RELAY bond	To connect external device, *detail description below*
LED1	Shine LED means Power on board
LED2	Shine LED means relay active
IDC10	To connect additional board, *detail description below*
INP1D	Logical input 1
GND1	gnd for INP1D and INP2D or general gnd
INP2D	Logical input 2
GND2	general gnd
+3,6V	Supply for sensors NTC-10K and KTY-84 connected to INP1 or INP2
INP1	input for sensor NTC-10K or voltage measurement max (without divider) 3,6V
INP2	input for sensor NTC-10K or KTY-84-130
INP3	input for voltgae measuerment max 35V
GND3	general gnd
INP4	input for sensor PT1000 or connected the same sensor in solar controller
INP5	Input for current measurement
GND4	Gnd for current measurement Or general if don't measurement current
INP6	input for sensor DS18B20 (1-Wire bus on the connector RJ11)
INP3D	Logical input 3
INP4D	Logical input 4
GND5	gnd for INP3D and INP4D or general gnd

Relay Bond:
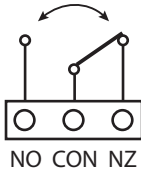
NO – contact normaly open

CON – common contact

NZ – contact normaly closed

ATTENTION: In spite of that relay can switch AC voltage 255 VAC 10A, board fail to comply with safety requirements (lack housing, earthing). Therefore that receiver connect with the assistance safety external relays eg. on DIN bus, controlled by relay on board.

IDC10 and 1-Wire:

1 – analog input not use	2 – analog input not use
3 – +3,6V	4 – OUT4
5 – GND	6 – OUT3
7 – PWM output	8 – OUT2
9 – VIN, vcc suplly	10 – OUT1
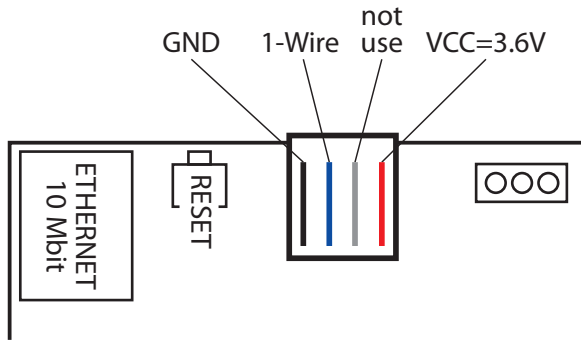
Reset button

Push about 0,5 second cause change relay state on opposite, push and keep longer about 5 second (if we not logged by WWW on modul) cause modul reset, next if you still keep button about 10 second cause set all settings to default. Set all settings to default confirmation is fast switch relay on/off (klik-klik), don't wrong this with change relay state about 0,5s and switch relay off after restart.
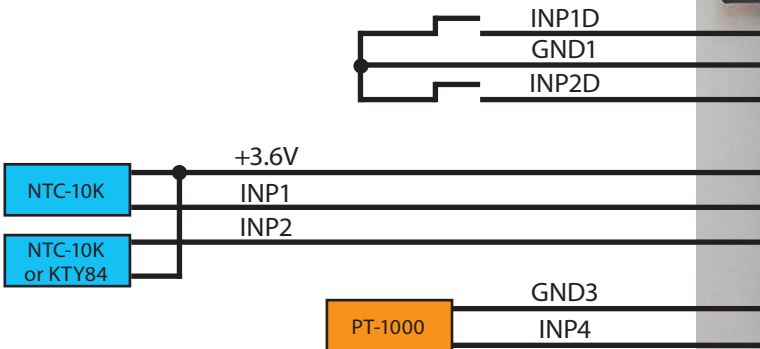
User and password: admin
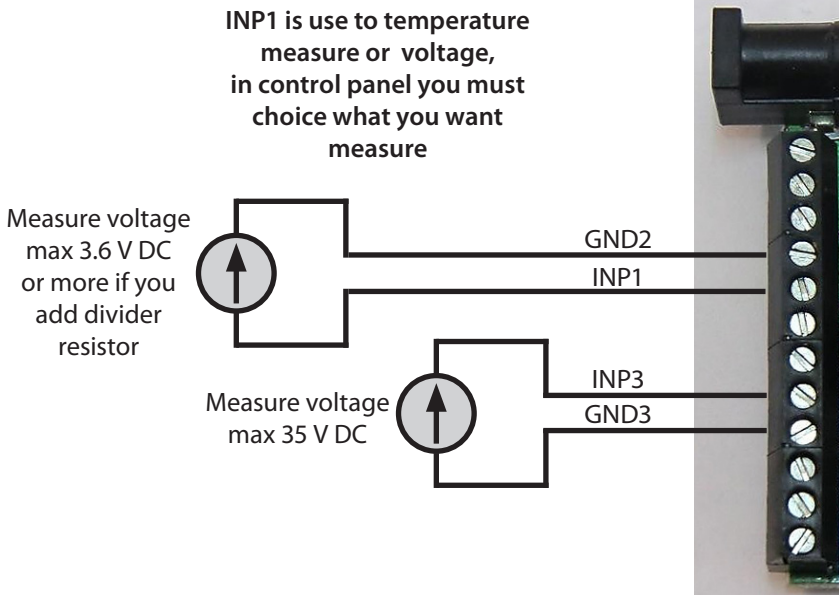**IP: 192.168.1.100**

SENSORS CONNECT

1. Current measurement
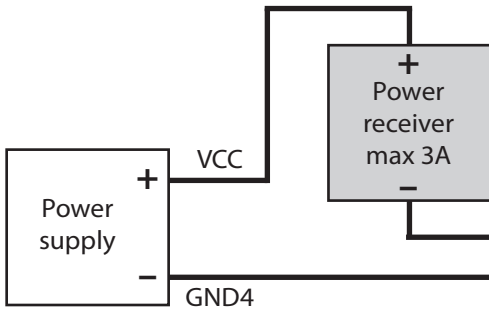
2. Temperature measurement and logical input

3. Voltage measurement

INP1 is use to temperature measure or voltage, in control panel you must choice what you want measure

Measure voltage max 3.6 V DC or more if you add divider resistor

GND2

INP1

INP3

GND3

Measure voltage max 35 V DC

Additional resistor to increase measure range INP1

Measure voltage

R

INP1

R = 10K   increase range 2 (multiplier 2) that is 3.6V x 2 = 7.2V

R= 20 K increase range 3 (multiplier 3)

R= 30 K increase range 4 (multiplier 4) etc.

Add resistor must be connected with set proper multiplier in field VCC on control panel page.

multiplier

Sensor type

○ TEMP ◉ VCC |1

○ NTC10 ◉ KTY84
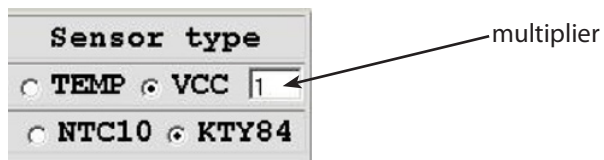
Management by WWW.

1. Control Panel

Change outputs state display

Reset time – „0" for normal outputs work (ON/OFF) , for time > 0 output change state and return to state before after the specified time in seconds (max 65534).

Any text description, max 8 chars

Value of calibration - adds to or subtracts the desired value

Choice type connected sensor

automatic socket arming at fixed time (two panes: one - time arming, second - break time)

click cause change relay state on opposite (OUT0 relay on board)

Run PWM generator (when changing frequency or fill does not need to turn off the generator)

Set State All output simultaneously according to combo box

Run Power measure from INP3 (voltage) and INP5 (current)

2. Events Config

Delay of set outputs after occur events, in seconds max 65535

If checked it responds to a change of state, otherwise no reaction (off)

Events Config

INPUTS	OUTPUTS/ACTION							
HYSTERESIS	OUT0 0	OUT1 0	OUT2 0	OUT3 0	OUT4 0	PWM	E-MAIL	SNMP TRAP
TEMP 0.0 ☐	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0 / 0 Hz / 0.0 %	100.0 0.0 / text0	100.0 0.0
VCC SUPPLY 0.0 ☑	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0 / 0 Hz / 0.0 %	100.0 0.0 / text1	100.0 0.0
INP1 °CV 0.0 ☑	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0 / 0 Hz / 0.0 %	100.0 0.0 / text2	100.0 0.0
INP2 °C 0.0 ☑	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0 / 0 Hz / 0.0 %	100.0 0.0 / text3	100.0 0.0
INP3 V 0.0 ☑	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0 / 0 Hz / 0.0 %	100.0 0.0 / text4	100.0 0.0
INP4 °C 0.0 ☑	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0 / 0 Hz / 0.0 %	100.0 0.0 / text5	100.0 0.0
INP5 A 0.00 ☐	10.00 0.00	10.00 0.00	10.00 0.00	10.00 0.00	10.00 0.00	10.00 0.00 / 0 Hz / 0.0 %	10.00 0.00 / text6	10.00 0.00
INP6 °C 0.0 ☑	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0 / 0 Hz / 0.0 %	100.0 0.0 / text7	100.0 0.0
INP1 DIG	☐	☐	☐	☐	☐	☐ 0 Hz / 0.0 %	☐ text8	☐
INP2 DIG	☐	☐	☐	☐	☐	☐ 0 Hz / 0.0 %	☐ text9	☐

Save Config

inclusion of an input

The hysteresis value for a given input.

The value of the input beyond the upwards the the socket will be activated, send an e-mail or SNMP Trap

The value of the input, after crossing down that slot will be activated, send an e-mail or SNMP Trap

Save setings (ON/OFF input you don't must save)

Email text taht will be send if events occurance, max amount char is 79. **Chars „=" and „&" are not allowed**

For logical input INP1D and INP2D, e-mail and SNMP Trap notification are send when input level change from 1 to 0 or 0 to 1, additional to email text (at end) will be add value 1 or 0 mark actual input state.

Functional Description Event Table
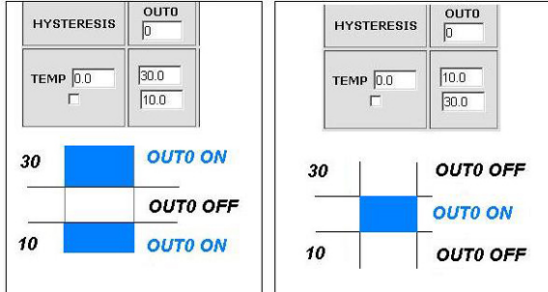
With this change, you can flexibly define thresholds and intervals in which such slot is to be enabled / disabled.

If you have the proper checks the condition of a number of sensors is to force the state OUTX outputs and setting the PWM generator to be that was last registered event.

3. Watchdog

Amount PING failures, after this one of three events will be happen: set (ON) output, set (OFF) output reset (ON/OFF) output on definite time (max 65535s).

(max 65535s).

Time to respond is 4 seconds, after this time if no response one PING failure is counting. Then if it happen, during waiting for next respond PINGs to other IP addresses are not realised. It can stretch watchdog time to other IP addresses.

Selecting this option forces the watchdog off when in the Event Table occur off / on the socket.

Upon his return to the previous state output watchdog is started automatically.

4. Scheduler

Format: number output (from 0 to 4),day1,day2,day3,day4,day5,day6, xx:xx:xx(time)
Week Day: Mo - Monday, Tu- Tuesday, We - Wednesday, Th - Thursday, Fi - Friday, Sa - Sa-turday, Su - Sunday, ## - all week day. Letter size is important.

Example:
0,Mo,12:23:00 - sets out0 every Monday at 12:23:00
1,Sa;Fi,Mo,23:22:03 - sets out1 every Saturday, Friday and Monday at 23:22:03
1,Sa;Fi,Mo,Tu,Su,Th,23:22:03 - sets out1 every Saturday, Friday, Monday, Tuesday, Sunday and Thursday at 23:22:03
0,##,12:01:30 - sets out0 every week day at 12:01:30
The effect of this may be the inclusion of a relay, switched off or reset (turn on and off) for a limited period in seconds. (max 65535).

5. Network Configuration

Network Configuration

Email client settings

SMTP Server:	smtp.serwer.pl	Port:	25
User Name:	user		
Password:	user		

To: user@com.pl

From: lan_restarter@com.pl

Subject: Lan Restarter Info

[Save Config]   [Test e-mail send]

When you change setting press "Save Config" before Test

e-mail client settings parameter. After changing the settings in order to test the customer - should be save your settings - the „Save Config" button.

Network settings

MAC Address: 00:04:A3:35:08:43

Host Name: LAN_SWITCH-SENS

☐ Enable DHCP

IP Address: 192.168.1.100

Gateway: 192.168.1.1

Subnet Mask: 255.255.255.0

Primary DNS: 192.168.1.2

Secondary DNS: 0.0.0.0

[Save Config and Reboot]

Remote Control

☑ Enable

Server ○ Port: 30000

Client ● IP - 192.168.1.10   Port: 30000

Password - 1234567

INP1D - ☑ OUT0 ☐ OUT1 ☐ OUT2 ☐ OUT3 ☐ OUT4

INP2D - ☐ OUT0 ☐ OUT1 ☐ OUT2 ☐ OUT3 ☑ OUT4

[Save Config]

Remote Control - working as a server (receiving packets and enables / disables the corresponding output) or client (send packets to the server status change to INP1D or INP2D). LK working as a server can be actuated from any number of clients, provided it is set to the same password. Change in INP1D or INP2D low can switch outputs selected in the state of „ON", return to enter the high state output switches to „OFF".

ACCESS settings

☐ Enable auth

User: admin

Password: ●●●●●

Max char 8

The user name and password to access the module.
You can disable authorization.

NTP settings

NTP Server: pl.pool.ntp.org **Port:** 123

Time Interval 10

Time Zone 2

NTP server settings.
Time Interval - the interval in minutes between synchronizations.

SNMP settings

Read Comm1 : public

Read Comm2 : read

Write Comm1: private

Write Comm2: write

☐ TRAP Enable

Trap Reciver IP 192.168.1.1

Trap Comm

Save Config

Fields community (password) for SNMP, must be the same in your queries in order to LK replied.

TRAP Enable – enabled send TRAP by SNMP.

HTTP Client Configuration - Below is a sample screenshot settings HTTP client to send data to the server **https://www.thingspeak.com**, (you can create an account and test) .
To add a content query the value of a specific sensor or I/O , use the „# „ and enter the number (below the list of numbers for I/O). Said sample server requires a field name = value, you can type on a matter such as field =12.4, then you will be sent a constant value 12.4 to the server. To send a specific value , enter the sensor field = # xx, where xx - a two-digit number of I/Os. (**NOTE! Record must be double digit**, as we enter „5" to write „05".
How do we want to send data from several sensors that use the #xx several times).
Maximum server name is 31 characters, the maximum string RemouteURL is 127 characters. The time window, type frequency in seconds with which data will be sent to the server. In the following example, and for normal queries between „GET" and „/" is a space.

HTTP client settings

Server address api.thingspeak.com **Port:** 80 **time:** 5

Remote URL GET /update?key=NG0UH6II1FDC47B&field1=#10&field2=#05

Auto send ☑

Save Config

I/O TABLE NUMBERS (soft 2.15)

#define OUT0 (5)

#define OUT1 (6)

#define OUT2 (7)

#define OUT3 (8)

#define OUT4 (9)

#define TEMP (10)

#define VCC (11)

#define INP1 (12)

#define INP2 (13)

#define INP3 (14)

#define INP4 (15)

#define INP5 (16)

#define INP6 (17)

#define INP7 (18)

#define INP8 (19)

#define INP9 (20)

#define I3XI5 (30)

#define PXT (31)

#define INP1D (41)

#define INP2D (42)

#define INP3D (43)

#define INP4D (44)

AUTO SEND TRAP settings

☐ **Enable Automatic Send TRAP**

☐ TEMP

☐ VCC

☐ INP1

☐ INP2

☐ INP3

☐ INP4

☐ INP5

☐ INP6

☐ INP7

☐ INP8

☐ INP9

☐ INP1D

☐ INP2D

☐ INP3D

☐ INP4D

Time Interval [6] * 10s = 1.00m

Enable Automatic Send TRAP – enable automatic send TRAP by SNMP (above TRAP Enable must be enable)

Time Interval (max value 10555) – period to send TRAP from given INPUT, accuracy 10 s

Date and Time

NTP ○

Set Manual ⦿ [1970-01-01;02:47:0]

Time is set individually or with an NTP server. When set manually each time you reboot the machine need to set the time.

Relay after start

OUT0: ☐ ON

OUT1: ☐ ON

OUT2: ☐ ON

OUT3: ☐ ON

OUT4: ☐ ON

Output status when you turn on or reboot the LAN Controller

16

Reading XML data

Enter the IP address and the page name eg 192.168.1.100/st0.xml

The values of the sensors should be divided by 10

Control Panel:

- Dynamic data - st0.xml

- Static data - st2.xml

Events Config: s.xml

Watchdog: w.xml

Scheduler: sch.xml

Network Config: board.xml

Working time: s_time.xml using the Timezone

Switching sockets http request

You can arm / switch set out without clicking on the buttons in the control panel, making use of the following commands :

IP / outs.cgi ? Out = xxxxx - switches set the output to the opposite of the current
IP / outs.cgi ? OUTX = x - disable or enable a specific output

when password authentication is enabled , the command of the following form :

user : password @ IP / outs.cgi ? out = xxxxx
user : password @ IP / outs.cgi ? OUTX = x

Examples:

192.168.1.100/outs.cgi ? Out = 0 - changes the output state to the opposite out0

192.168.1.100/outs.cgi ? Out = 2 - out2 output changes state to the opposite

192.168.1.100/outs.cgi ? Out = 02 - changes the output state out0 and out2
to the opposite

192.168.1.100/outs.cgi ? Out = 01234 - changes the state of the outputs of out0 to out4
the opposite

192.168.1.100/outs.cgi ? Out0 = 0 - turns out out0 (ON state)

192.168.1.100/outs.cgi ? Out0 = 1 - turns out out0 (OFF)

192.168.1.100/outs.cgi ? Out1 = 0 - turns out out1 (ON state)

192.168.1.100/outs.cgi ? Out1 = 1 - turns out out1 (OFF)

192.168.1.100/outs.cgi ? Out4 = 0 - turns out out4 (ON state)

192.168.1.100/outs.cgi ? Out4 = 1 - turns out out4 (OFF)

Managing PWM by HTTP GET:

change frequency **http://192.168.1.100/ind.cgi?pwmf=9777** setup frequency to 9777

change duty **http://192.168.1.100/ind.cgi?pwmd=855** setup duty to 85,5%

turn off/on PWM **http://192.168.1.100/ind.cgi?pwm=0** or 1 on the end.

NUMBERS OID for SNMP

```
#define SYS_DESCR (99)          // iso.3.6.1.2.1.1.1.0: READONLY ASCII_STRING.
#define SYS_UP_TIME (97)         // iso.3.6.1.2.1.1.3.0: READONLY TIME_TICKS.
#define SYS_NAME (98)          // iso.3.6.1.2.1.1.5.0: READWRITE ASCII_STRING.
#define TRAP_RECEIVER_ID (1)        // iso.3.6.1.4.1.17095.2.1.1.1.0: READWRITE BYTE.
#define TRAP_RECEIVER_ENABLED (2)       // iso.3.6.1.4.1.17095.2.1.1.2.0: READWRITE BYTE.
#define TRAP_RECEIVER_IP (3)       // iso.3.6.1.4.1.17095.2.1.1.3.0: READWRITE IP_ADDRESS.
#define TRAP_COMMUNITY (4)      // iso.3.6.1.4.1.17095.2.1.1.4.0: READWRITE ASCII_STRING.
#define OUT0 (5)         // iso.3.6.1.4.1.17095.3.1.0: READWRITE BYTE.
#define OUT1 (6)         // iso.3.6.1.4.1.17095.3.2.0: READWRITE BYTE.
#define OUT2 (7)         // iso.3.6.1.4.1.17095.3.3.0: READWRITE BYTE.
#define OUT3 (8)         // iso.3.6.1.4.1.17095.3.4.0: READWRITE BYTE.
#define OUT4 (9)         // iso.3.6.1.4.1.17095.3.5.0: READWRITE BYTE.
#define TEMP (10)         // iso.3.6.1.4.1.17095.4.1.0: READONLY ASCII_STRING.
#define VCC (11)         // iso.3.6.1.4.1.17095.4.2.0: READONLY ASCII_STRING.
#define INP1 (12)         // iso.3.6.1.4.1.17095.4.3.0: READONLY ASCII_STRING.
#define INP2 (13)         // iso.3.6.1.4.1.17095.4.4.0: READONLY ASCII_STRING.
#define INP3 (14)         // iso.3.6.1.4.1.17095.4.5.0: READONLY ASCII_STRING.
#define INP4 (15)         // iso.3.6.1.4.1.17095.4.6.0: READONLY ASCII_STRING.
#define INP5 (16)         // iso.3.6.1.4.1.17095.4.7.0: READONLY ASCII_STRING.
#define INP6 (17)         // iso.3.6.1.4.1.17095.5.1.0: READONLY ASCII_STRING.
#define INP7 (18)         // iso.3.6.1.4.1.17095.5.2.0: READONLY ASCII_STRING.
#define INP8 (19)         // iso.3.6.1.4.1.17095.5.3.0: READONLY ASCII_STRING.
#define INP9 (20)         // iso.3.6.1.4.1.17095.5.4.0: READONLY ASCII_STRING.
#define I3XI5 (30)         // iso.3.6.1.4.1.17095.7.1.0: READONLY ASCII_STRING.
#define PXT (31)         // iso.3.6.1.4.1.17095.7.2.0: READONLY ASCII_STRING.
#define INP1D (41)         // iso.3.6.1.4.1.17095.10.1.0: READONLY BYTE.
#define INP2D (42)         // iso.3.6.1.4.1.17095.10.2.0: READONLY BYTE.
#define INP3D (43)         // iso.3.6.1.4.1.17095.10.3.0: READONLY BYTE.
#define INP4D (44)         // iso.3.6.1.4.1.17095.10.4.0: READONLY BYTE.
```
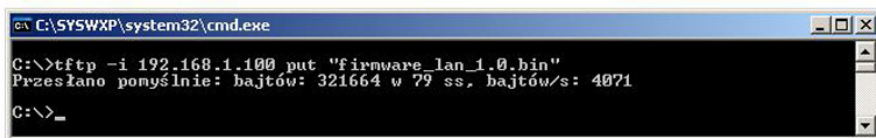
Firmware Upgrade

In the event that there is a new version of the software or special version for application, it is possible to load such software to the device. This can be done remotely over the network using TFTP.

You my upgrade firmware on two way:
1. By dedicate software „LAN Controler Tools" (find controler or put IP and click „Upgrade Firmware").
2. By any TFTP client, description below.

Send firmware file by TFTP, you have 5 second (Green LED on RJ45 socket blink) to start send firmware when modul run after reset (you my casus reset by click button „Save config and Reboot" in Network configuration or „Reset" button on board or dedicate software „LAN Controler Tools"). If start transmision not happen that device start work normal. If tftp transmision will start than wait about 90 second to finish upload firmware. After upload device will be reset and start normal. If you want to upload upgrade file chose „Save config and Reboot" in Network configuration or power OFF and power ON device .
The file must be send in binary mode eg. In Windows XP tftp client
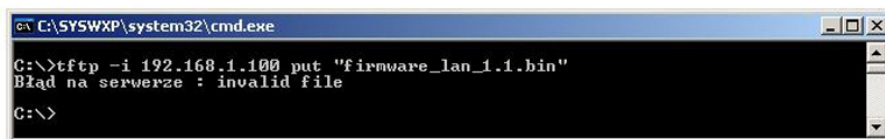tftp –i 192.168.1.100 put „file_upgrade.bin".

After successful loading, the device will reboot and will be ready to go.

If you try to send the wrong file get an error message „invalid file"

Contents of the instructions is regularly checked and if necessary corrected. If the observations errors or inaccuracies, please contact us. It can not be ruled out that, despite best efforts, however, some discrepancies arose. To get the latest version, please contact us or distributors.