LAN Controller V2.0

Firmware version 3.00

Manual

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 6 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 outputs 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

Agriculture

- Irigation systems
- Animal food processing automatization

RESTARTER, MONITOR, CONTROLLER

FEATURES: *(may vary depending on the firmware version):*

- 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 and 1 transistor output up to 1A 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
- temperature and humidity measurement by DTH22 sensor
- power measurement for DC voltage
- power measurement from grid by elecricity meterer impulse
- 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
- automaticaly send state or value inputs to SNMP server
- implemented protocols: HTTP, SNMP, SMTP, SNTP, ICMP, DNS, DHCP.
- supported temperature sensors: PT1000, DS18B20
- support 1wire protocol

We hope that the LAN controller will have new applications not only in the ISP networks, but most of all as a simple home automation, control the status of any type of installation, the measurement of renewable energy sources or as a simple measure of the energy consumption of the various receivers. Therefore, the range of sensors will be expanded to implement such measurements.

TECHNICAL SPECIFICATIONS

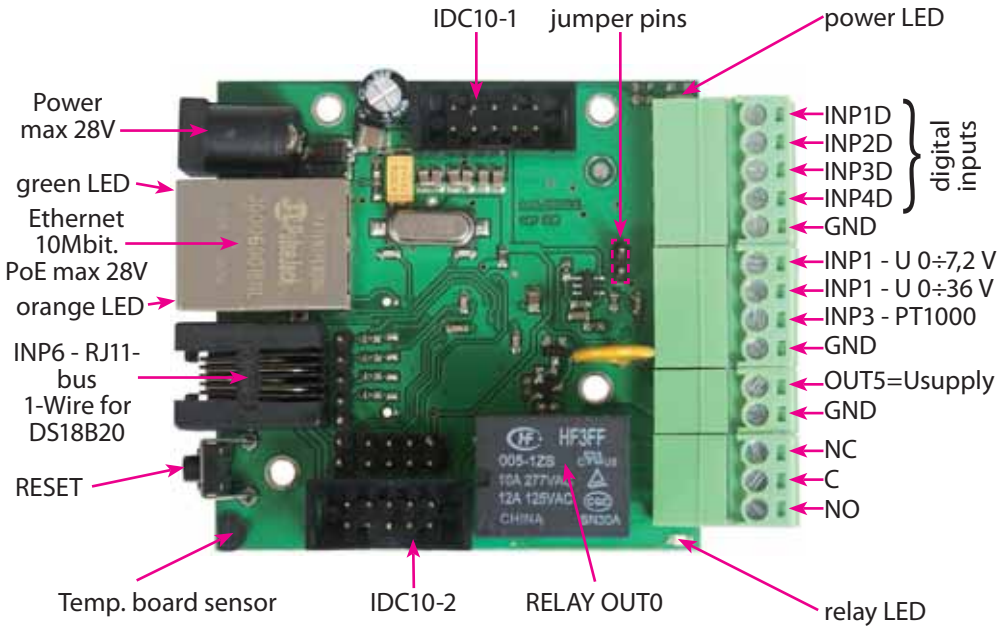
- supply voltage: 8÷28 V DC
- power consumption : about 1W
- PoE supply: YES, passive
- Protection from wrong supply polarization: YES
- interface: ethernet 10Mbit/s
- relay: 255VAC 10A
- operating temperature: –20 do +85 °C
- weight: 50g
- dimensions: 60 x 68 mm (without plugs)

INPUT/OUTPUT:

- **5 ANALOG INPUTS:**
  temperature, voltage, current (by additional boards) and another physics measurements
- **DIGITAL INPUT for 1WIRE bus (connector RJ11):**
  support for 4 or 6 temperature sensors DS18B20
- **DIGITAL INPUT:**
  support temperature and humidity sensor DHT22
- **4 LOGICAL INPUTS:**
  for monitoring, as a pulse counter from energy meter
- **1 RELAY OUTPUT:**
  (NO, NC, C)
- **1 TRANSISTOR OUTPUT:**
  up to 1A
- **4 OUTPUTS:**
  to switch relays or transistors
- **1 PWM OUTPUT:**
  2,6 KHz do 4 MHz
- **supply voltage and temperature monitoring on board**
- **reverse polarization protection**

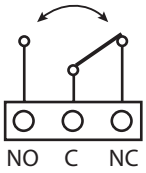
Default user and password is „admin”, IP adress is 192.168.1.100

PINS and COMPONENTS DESCRIPTION



Złącze / Element	Opis
Power	Power supply 8V ÷ 28V DC
power LED	Shine LED means power on board
relay LED	Shine means relay active
green LED	Shine LED means eth link active
orange LED	Shine means data transmitted
IDC10-1	To connect additional relay board
IDC10-2	To connect upper board (future extension)
INP1D	Logical input, pulse counter
INP2÷4D	Logical inputs
INP1	Input for voltage measure 0 ÷ 7.2V (3.6V if jumper on)
INP2	Input for voltage meas. 0 ÷ 36V
INP3	Input for PT1000 sensor for high temp. measure
GND	General ground
OUT5	Transistor output (+), voltage = power supply, max 1A
GND	Ground for transistor output (–)
NC	Relay OUT0, normally closed contact
C	Relay OUT0, common contact
NO	Relay OUT0, normally open contact

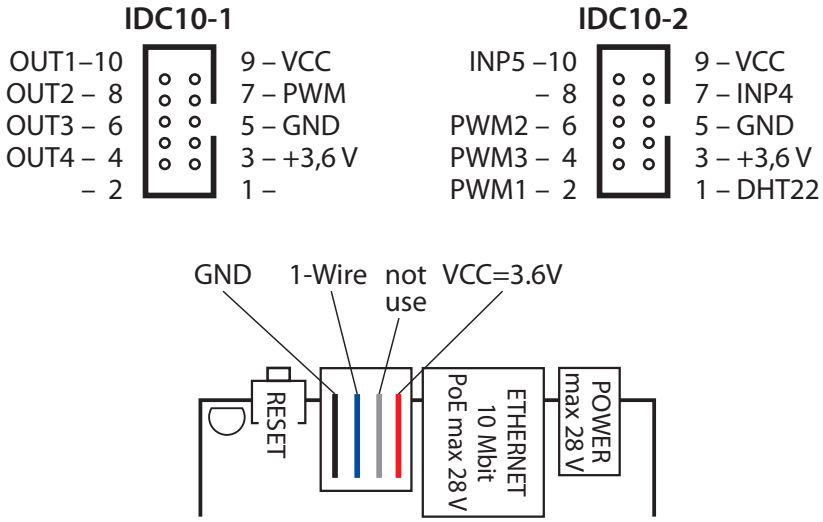
RELAY BOND:



NO – contact normaly open
C – common contact
NC – 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.

IDC10-1, IDC10-2 and RJ11 (bus 1-WIRE):



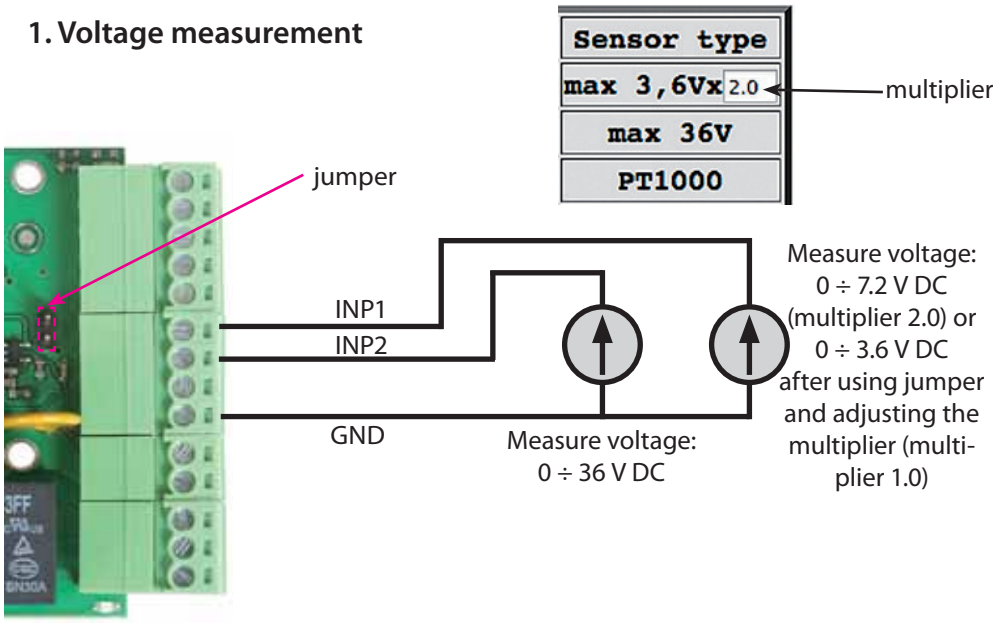
RESET BUTTON

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.

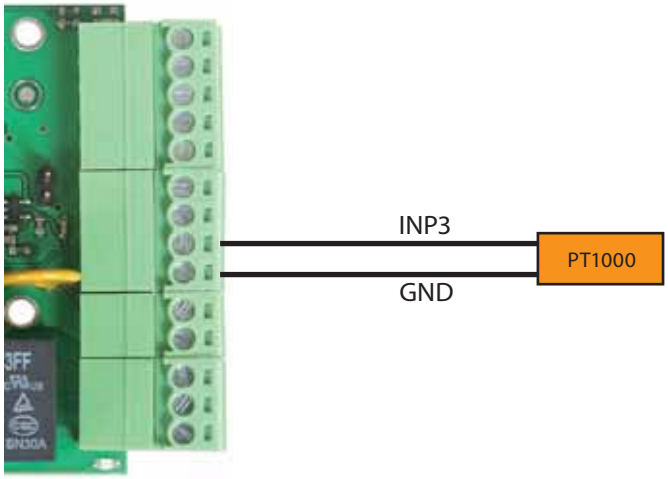
User and password: admin
IP: 192.168.1.100

SENSORS CONNECT

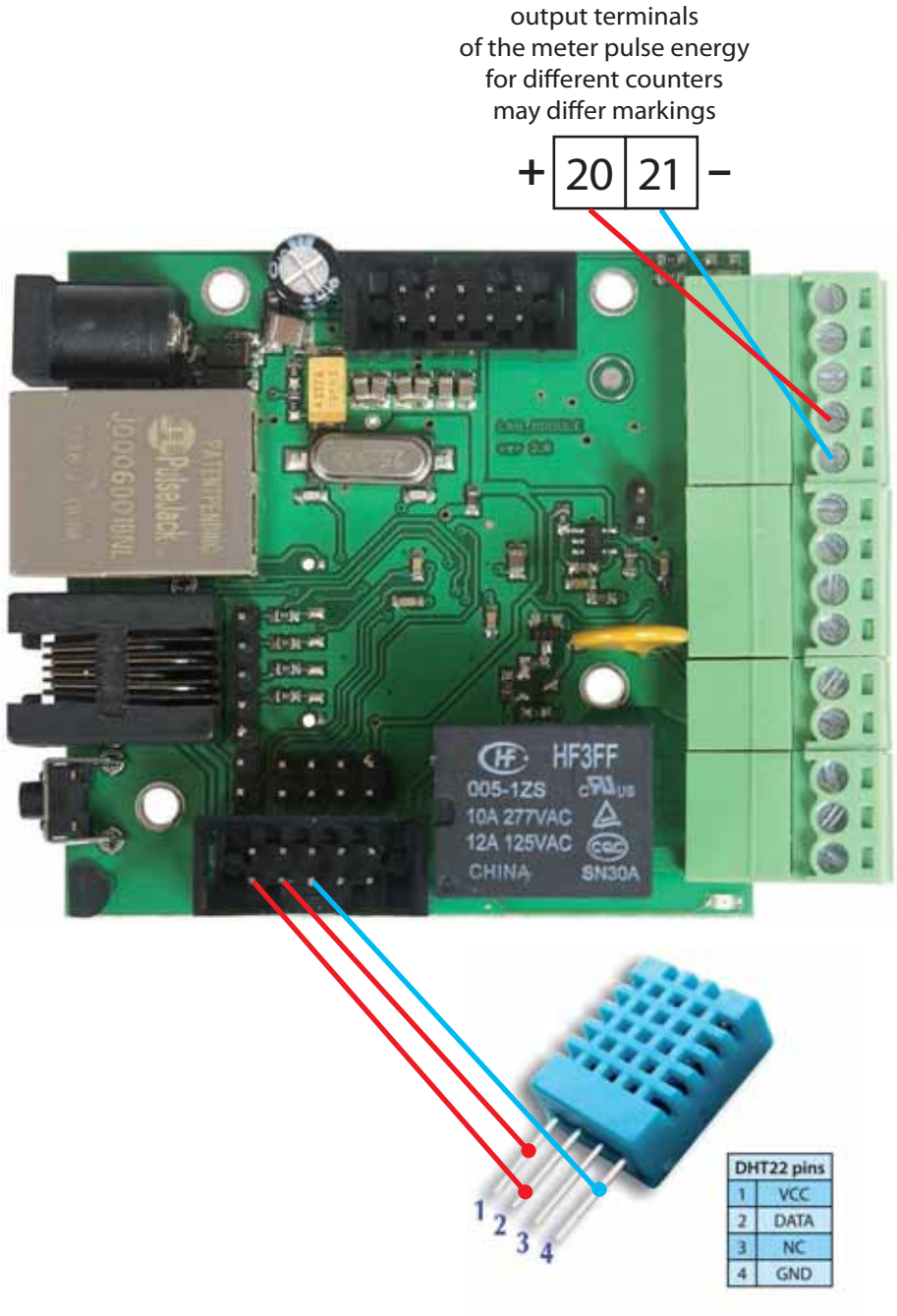
1. Voltage measurement



2. Temperature measurement



3. DHT22 sensor and pulse output from the counter



Management by WWW.

1. Control Panel

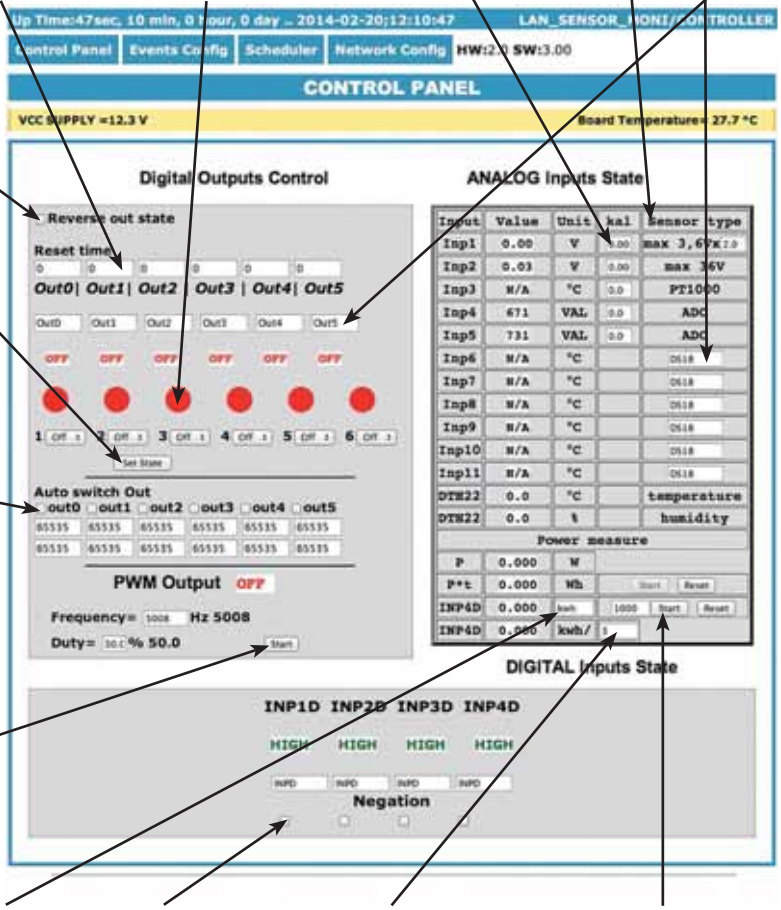
Reset time – „0" for normal outputs work (ON/OFF) , for time > 0 output change state and return to state before after the specified time in seconds (max 65534).

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

Value of calibration - adds to or subtracts the desired value

Select the type of sensor connected to the corresponding input

Any text description, max 8 chars



Change outputs state display

Set State
All output simultaneously according to combo box

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

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

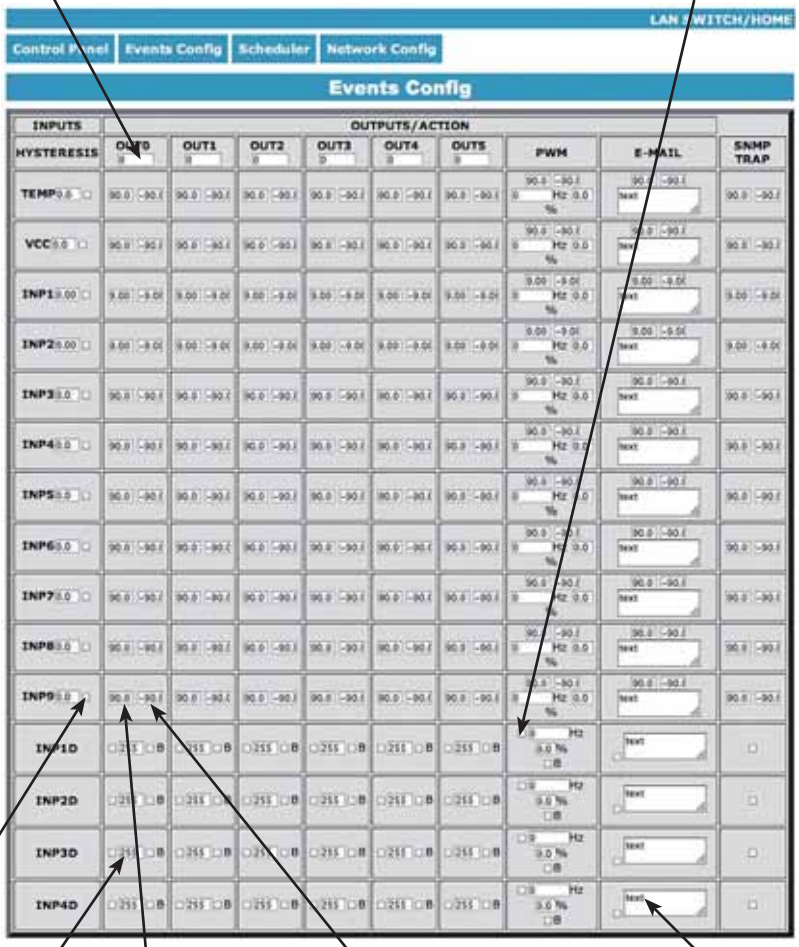
Any description of the measured physical quantity, such as kWh, L/min, etc.

Negation for digital input for Even Config tripping

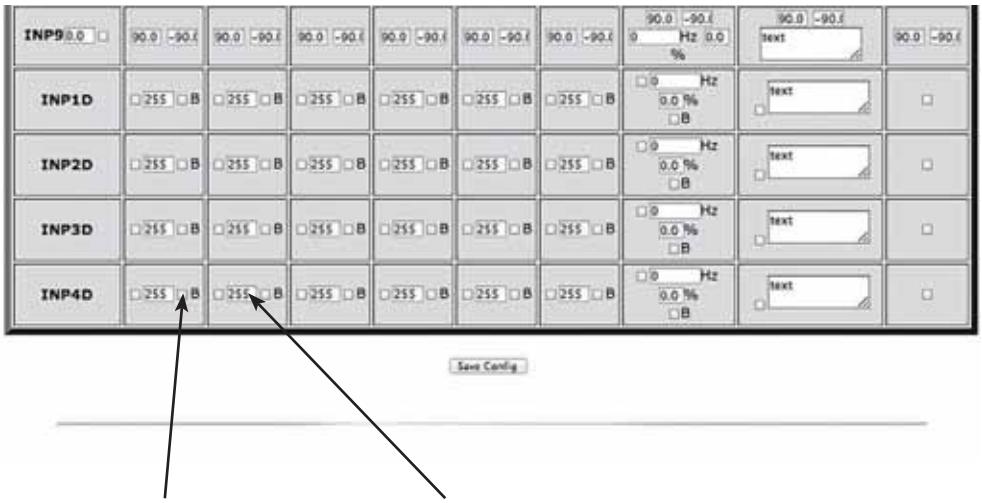
Divider pulse counter - for example as ours energy meter sends 1000 pulses per 1 kWh is enter 1000, as it sends 1600 pulses enter 1600, etc.

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

2. Events Config



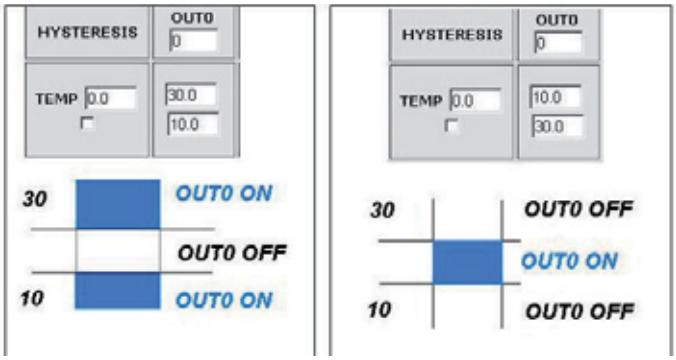
For logical input INP1D ÷ INP4D, e-mail and SNMP Trap notification are send when input level change from 1 to 0 or 0 to 1, additional to email text (at end) will be add value 1 or 0 mark actual input state.



Bistable operation input - the first change at INPD to turn on output, the second amendment to disable output

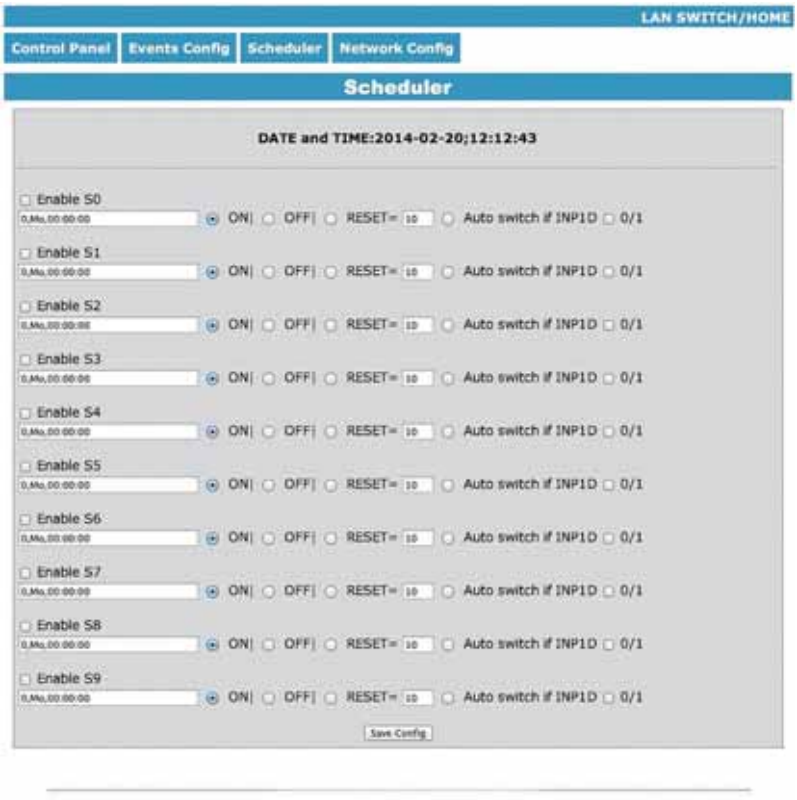
If a value greater than 0, is at work bistable output is automatically switched off after this time, max 255 seconds

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. Scheduler

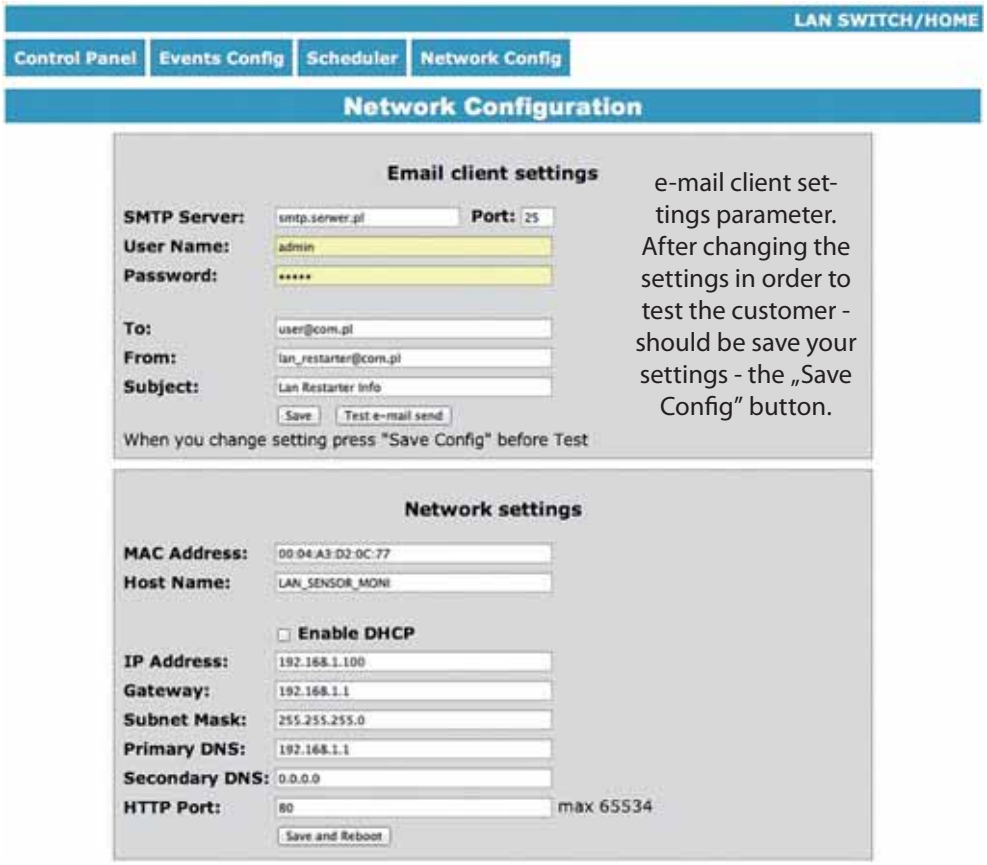


Format: number output (from 0 to 4),day1,day2,day3,day4,day5,day6, xx:xx:xx(time)
Week Day: Mo - Monday, Tu- Tuesday, We - Wednesday, Th - Thursday, Fi - Friday, Sa - Saturday, Su - Sunday, ## - all week day. Letter size is important.

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).

4. Network Configuration



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

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

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

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

TRAP Enable – enabled send TRAP by SNMP.

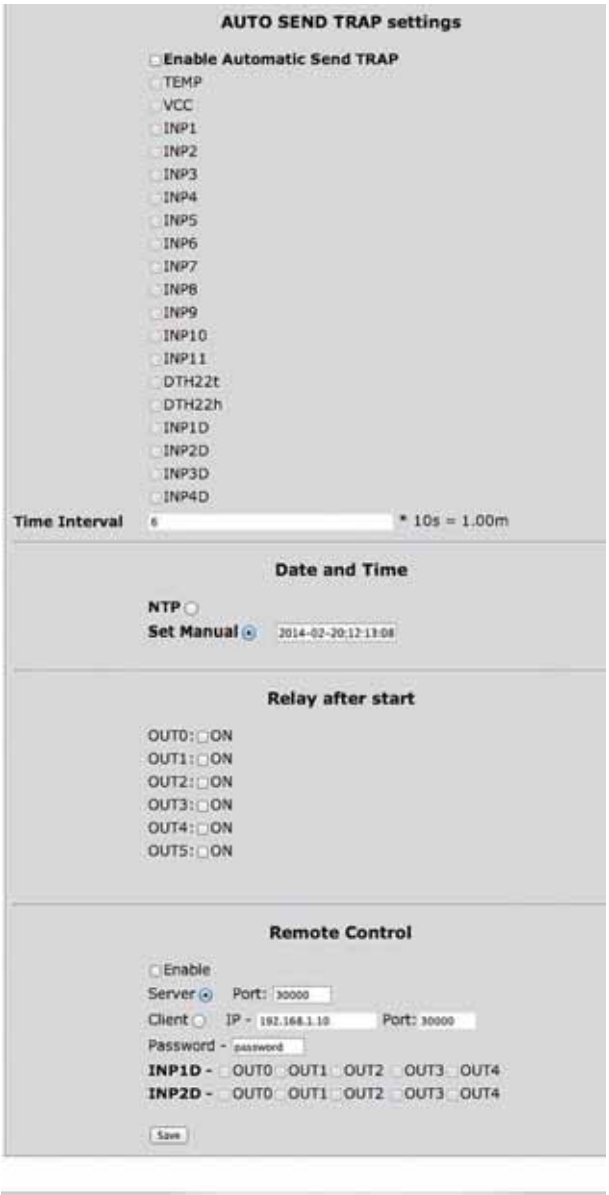
HTTP Client Configuration - Below is a sample screenshot settings HTTP client to send data to the server **https://www.thingspeak.com**, (you can create an account and test) . To add a content query the value of a specific sensor or I/O , use the „# „ and enter the number (below the list of numbers for 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.

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

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

Output status when you turn on or reboot the LAN Controller



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".

I/O TABLE NUMBERS (soft 3.00)

#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 INP10 (21)
#define INP11 (22)
#define DTH22_1 (23)
#define DTH22_2 (24)
#define I3XI5 (30)
#define PXT (31)
#define PINP3D (32)
#define PINP3D_24H (33)
#define INP1D (41)
#define INP2D (42)
#define INP3D (43)
#define INP4D (44)

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

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.3.6.1.2.1.1.4.0: 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 ALL (90) // iso.3.6.1.4.1.17095.3.100.0: READONLY OCTET_STRING.
#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 INP10 (21) // iso.3.6.1.4.1.17095.5.5.0: READONLY ASCII_STRING.
#define INP11 (22) // iso.3.6.1.4.1.17095.5.6.0: READONLY ASCII_STRING.
#define DTH22_1 (23) // iso.3.6.1.4.1.17095.6.1.0: READONLY ASCII_STRING.
#define DTH22_2 (24) // iso.3.6.1.4.1.17095.6.2.0: 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 PINP3D (32) // iso.3.6.1.4.1.17095.7.3.0: READONLY ASCII_STRING.
#define PINP3D_24H (33) // iso.3.6.1.4.1.17095.7.4.0: 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.