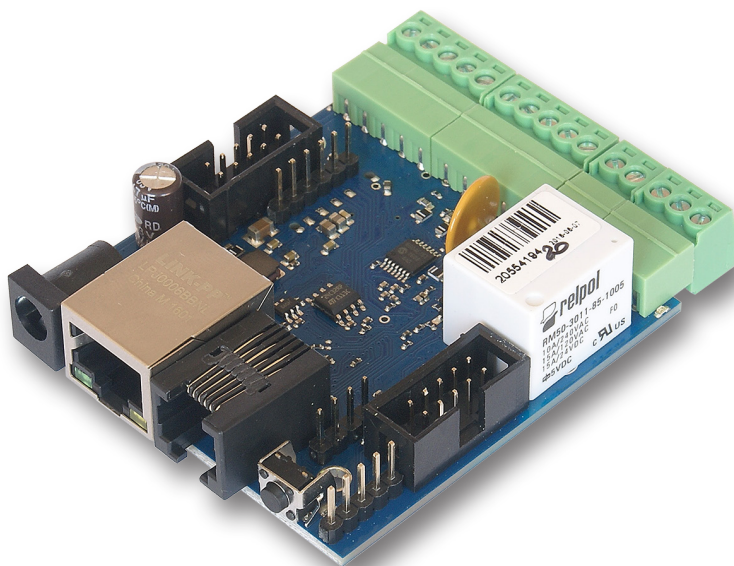


LEDATS.PL

LAN Controller V3.0



Manual

LAN Kontroler

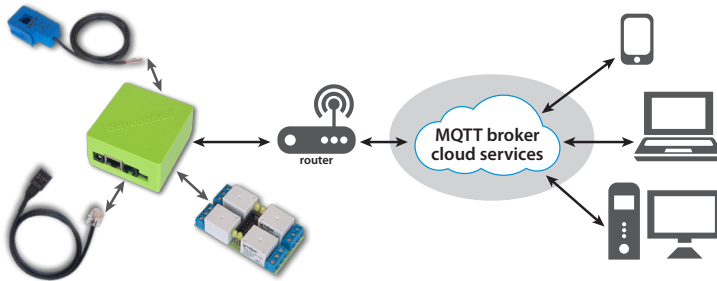
Lan Controller v3 is a completely new version of device produced from 2011y.

A small board works as a web server which presents the various sensor readings: temperature, humidity, voltage, current, events and allows you to remotely control up to 10 outputs.

Modern 32bit processor, additional flash chip, regulated amplifier for measurements allow not only for more features but innovative web interface. Thanks communication between hardware and web browser by XML files it is possible to design own web interface, which fit much better to end customer demands as our universal and should be easiest to use for specific functionality. We hope to acquire new applications thanks it.

Lan Controller talks with computers and Internet network using universal protocols like *HTTP* and *SNMP*. In new version we add support for *MQTT* now and we launched free (up to 5 devices) cloud *mqtt.ats.pl*. It allow to collect, processing and present as a graph all data sent by Lan Controller.

Specific functionality of *MQTT protocol* allow control outputs from Internet even if device is located in local network behind router.



Example of applications

- **in industry:** machines, technological lines, working environment monitoring;
- **in markets:** refrigerators remote monitoring;
- **in offices and workplaces:** cooperation with access systems, observation of environmental conditions;
- **at home:** for heaters automation, lighting according dust sensor or scheduler, garden watering systems;
- **at home:** for controlling temperature in heating installations, heat pumps, solar installations;
- **renewable energy:** measurements of productivity of PV installations, battery charging, AC power consumption and production measurements;
- **in farms and garden:** monitoring and controlling greenhouses, watering, food dispensing machines for animals.

We invite you to visit our website

www.tinycontrol.eu

There you will find the firmware updates and information about the new possibilities.

Monitoring, Controlling, Restarting

FEATURES:

- 4 analog inputs
 - 2 analog inputs up to 3,3V - for DC voltage, DC current or other physical quantities by voltage output sensors,
 - digital buses: 1wire - up to 6 DS18B20 temperature sensors, I2C - up to 2 sensors, for example AM2320 humidity sensor,
 - 4 logical inputs, as state (high, low) sensors (open, close, PIR) and for pulse counters from energy meters,
 - 1 relay on board, (NZ,C,NO),
 - 1 transistor output, same voltage as supply, for loads up to 1A,
 - 4 outputs OC standard, for switching relays or small power loads
 - 4 PWM outputs, works as PWM, on/off and servos control*
 - UART port for communication with PV DC/AC Inverters like Duraluxe, SDS011 AIR quality sensor or other devices
 - communication option for LoRa and GSM modules*
 - temperature and supply monitor on board
 - modern and convenient web interface with pulse down menu
 - possibility of modification web interface or build new from scratch by www generator
 - possibility of configuration Status panel, upload own background (with drawing of installation) and setting of sensor and outputs windows visibility
 - logging as administrator for configuration and user for status preview
 - advanced Even Config with checking if 2 conditions are fulfilled
 - support for: SNMP, HTTP GET/POST request or all MQTT protocols
 - free access (up to 5 devices) to mqtt.ats.pl cloud for collecting, computing and visualization of data.
 - remote controlling of outputs from Internet and mobile device even if LAN Controller is behind router*,
- * option possible in future.

Lan Controller is innovative device for remote controlling and measuring by LAN network and internet. Because of many measurement features, many configuration possibilities and embedded automatization are of application is only limited by user imagination. But it cause that our company as a producer is not able to test all possible configurations and it could happen that ones of setting will not work according to your expectations. In all such cases please mail to info@tinycontrol.pl

But in first place we ask to read this manual carefully. As a rich source of information also serves user forum <http://tinycontrol.pl/forum/>

You are invited to use and share you experience!

FACTORY SETTINGS

- IP address of the module: **192.168.1.100**
- **administrator: admin** password: **admin**
- **user: user** password: **user**

TECHNICAL SPECIFICATIONS

- supply voltage: 8 ÷ 55 V DC
- power consumption: 0,5W - without an attached relays
- PoE supply: YES, passive (PoE max. <55 V)
- Protection from wrong supply polarization: YES
- interface: Ethernet 100 Mbit/s
- relay: 255 V AC 10 A
- operating temperature: -20 to +85 °C
- weight: 50 g
- dimensions: 67 x 68 x 39 mm + DIN socket (can be mounted on DIN rail)

INPUT / OUTPUT:

• 4 ANALOG INPUTS INPA1 ÷ INPA4 WITH AMPLIFIER - 2 input voltage ranges:

The scope of of measured voltage for a range of 3.3 V

gain=1 from 0 to 3300 mV

gain=10 from 0 to 330 mV

gain=50 from 0 to 60 mV

The scope of of measured voltage for a range of 33 V

gain=1 from 0 to 33000 mV

gain=10 from 0 to 3300 mV

gain=50 from 0 to 600 mV

for voltages between 0 ÷ 5 mV, the measurement is not sure.

• 2 ANALOG INPUT WITHOUT GAIN INPA5 ÷ INPA6:

range of measured voltage of 0.1 ÷ 3.3 V

• 1 DIGITAL INPUT in standard 1-WIRE and I2C (connector 6P6C RJ12):

measurement 6 temperature probes DS18B20 and the temperature and humidity sensor AM2320

• 4 LOGIC INPUT:

V_{Low} - max 1,1 V

V_{High} - min 1,5 V, max 12 V

• 1 RELAY:

10 A / 240 V AC, 15 A / 24 V DC

3 styki: NZ, NO, C

• 1 TRANSISTOR OUTPUT:

giving adequate voltage to control receivers with current consumption up to 1A

• 4 OUTPUT OUT1 ÷ OUT4 (connector IDC10-2):

OC output of 100 mA, controlled downside to switching relays, transistors, etc.

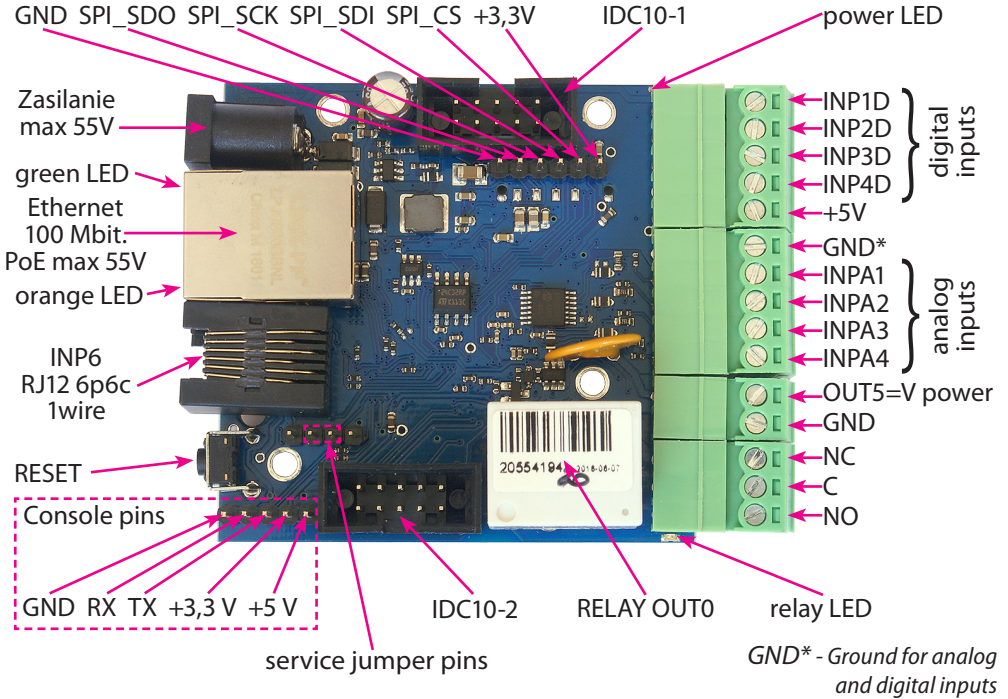
• 4 PWM OUTPUT:

the output frequency range of 50 Hz to 100 kHz

• UART - serial - console preview functioning of the Lan Controller system:

Transmission parameters: 115200 bitrate, 8 N 1

PINS and COMPONENTS DESCRIPTION



PIN/Component	Description
Power	Power supply 8V ÷ 55V DC
power LED	LED indicator on – power on board
relay LED	LED indicator on – relay active
green LED	LED indicator on – eth link active
orange LED	LED indicator on – data transmitted
IDC10-1	Additional Inputs / Outputs PWM1÷3
IDC10-2	Additional outputs transistor OC standard, for example, relays
INP1D÷INP4D	Logical inputs Low=0~0,8V, High=0,8V~20V Also supports a pulse counter
+5V	For sensors supply
GND*	Ground for analog and digital inputs
INPA1÷A4	Analog inputs
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

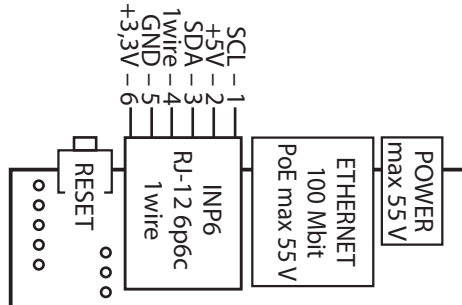
RESET BUTTON

Pressing for about 0.5 seconds to change state relays, and hold for longer - up to around five seconds will change all settings (both network and configuration) on the factory reset. Confirmation of the settings is fast switching on and off the relay (click-click), not to be confused with the change of status and exclusion of the relay after a reboot.

login as an administrator: user: admin password: admin
IP: 192.168.1.100

DESCRIPTION OF CONNECTORS:

RJ12 6P6C (1-wire bus, I2C), IDC10-1, IDC10-2:



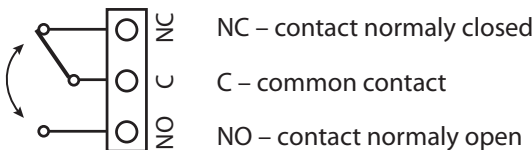
IDC10-2

OUT1 – 10		9 – POWER
OUT2 – 8		7 – PWM0
OUT3 – 6		5 – GND
OUT4 – 4		3 – +5V
INPA6 – 2		1 – INPA5

IDC10-1

GPIO1 – 10		9 – +5V
GPIO2 – 8		7 – UART_RX
PWM3 – 6		5 – GND
PWM2 – 4		3 – +3,3 V
PWM1 – 2		1 – UART_TX

Outputs connection - relay OUT0:



CAUTION: Although the relays are able to switch alternating voltage 255VAC 10A, the same Lan Controller does not meet the safety requirements for connection to dangerous voltages for unauthorized persons (unsecured plugs, no ground). Such a system can make a person authorized and properly secure the device in a closed box, eg. Electricity. It is safer to also use external relays eg. DIN rail switching high voltage and only the controlled from Lan Controller.

IDC10-2 socket: Connection OUT1÷OUT4

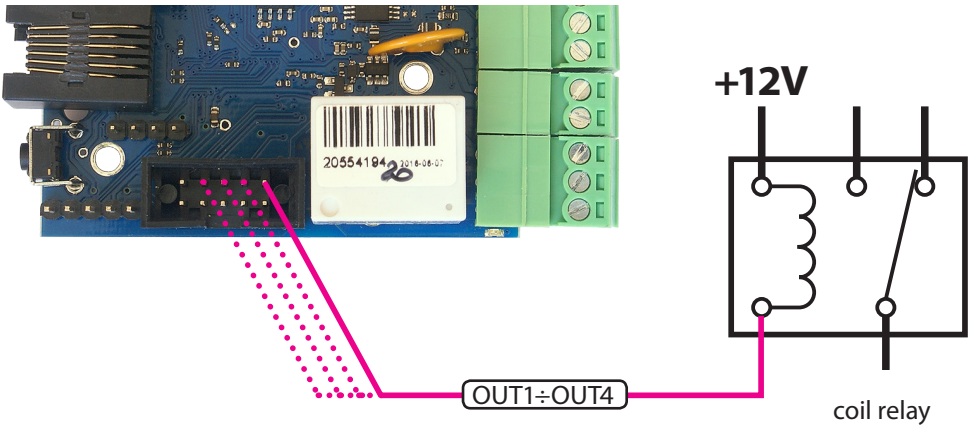
OUT1÷OUT4 are open collector, it means that the switching means connecting mass of the system.

So, it can be actuated, for example relays, motors of low power (fans), connecting on the one hand to the output OUT "-" (mass), and on the other hand, "+" supply.

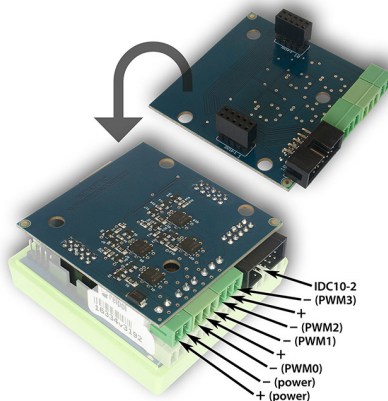
For relays with 12V coils or fans use an external 12V power supply.

In the case of the finished plate 4-ch relay can plug them supplied with them tape outlet IDC10-2. The relays are then fed from the internal 5V.

CAUTION: For relays with more power switched due to the higher power consumption, it is recommended to use an external power supply, for example, 12V or 24V. + 5V voltage from the Lan Controller board is also used to power sensors and should not be charged more strongly than 300mA.



Connecting the PWM outputs on transistor circuit extension (optional)

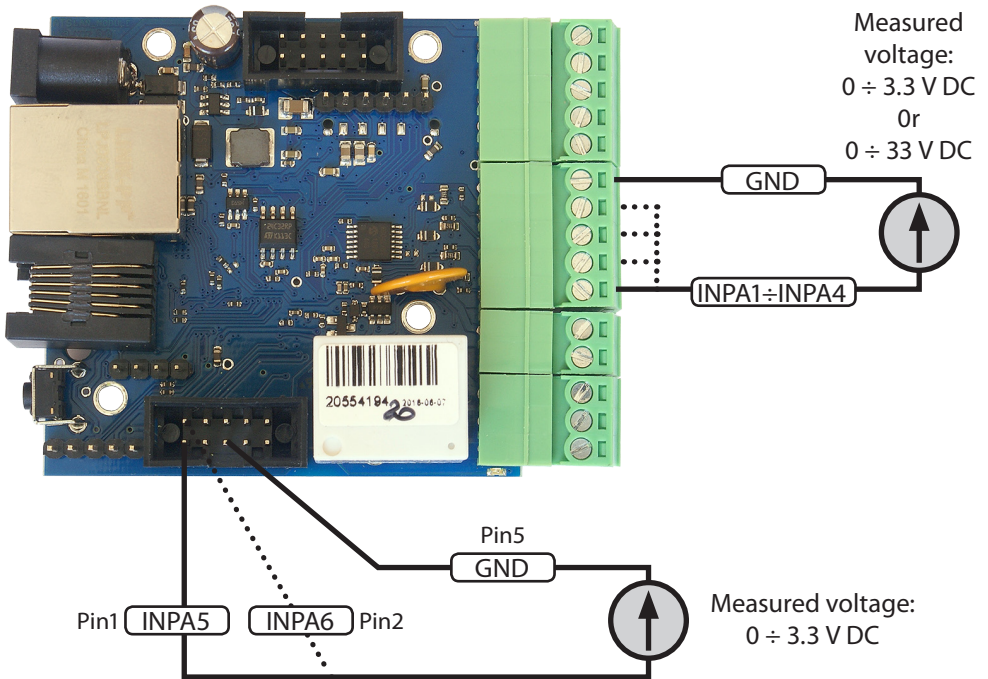


SENSORS CONNECT

1. Measurement of DC voltage at the inputs INPA1÷INPA4 (3÷33V)

To enable the measurement to be in the "Input" to choose for INPA1÷INPA4 range $V_{in} = 3.3V$ or $33V$, and possibly small signal strengthening GAIN.

For INPA5 and INPA6 can turn on only $3.3V$ range.



2. Measurement of the DC voltage through resistive divider

If you need to measure the voltage higher than 33V to INPA1÷INPA4 or 3.3V on INPA5, INPA6 use a resistive divider. U voltage dividers connected to the terminals should be safe, or properly protected against accidental shock hazard.

WARNING: The supply voltage of long cables exposed to lightning, for example, the photovoltaic system can result in the transfer of electrical charge on the sensitive input Lan Controller and can cause damage.

EXAMPLE

U – Input voltage for the measurement

U_2 – the voltage at the input INPA1÷INPA4 or INPA5, INPA6

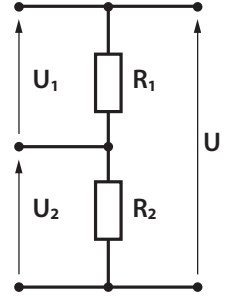
for the measurement of up to 33 V at the input INPA5 or INPA6 (max. 3.3 V) should be used divider:

$R_1 = 9 \text{ k}\Omega$, $R_2 = 1 \text{ k}\Omega$,

for the measurement of up to 360 V at the input INPA1÷INPA4 (max. 33 V) should be used divider:

$R_1 = 99 \text{ k}\Omega$, $R_2 = 10 \text{ k}\Omega$,

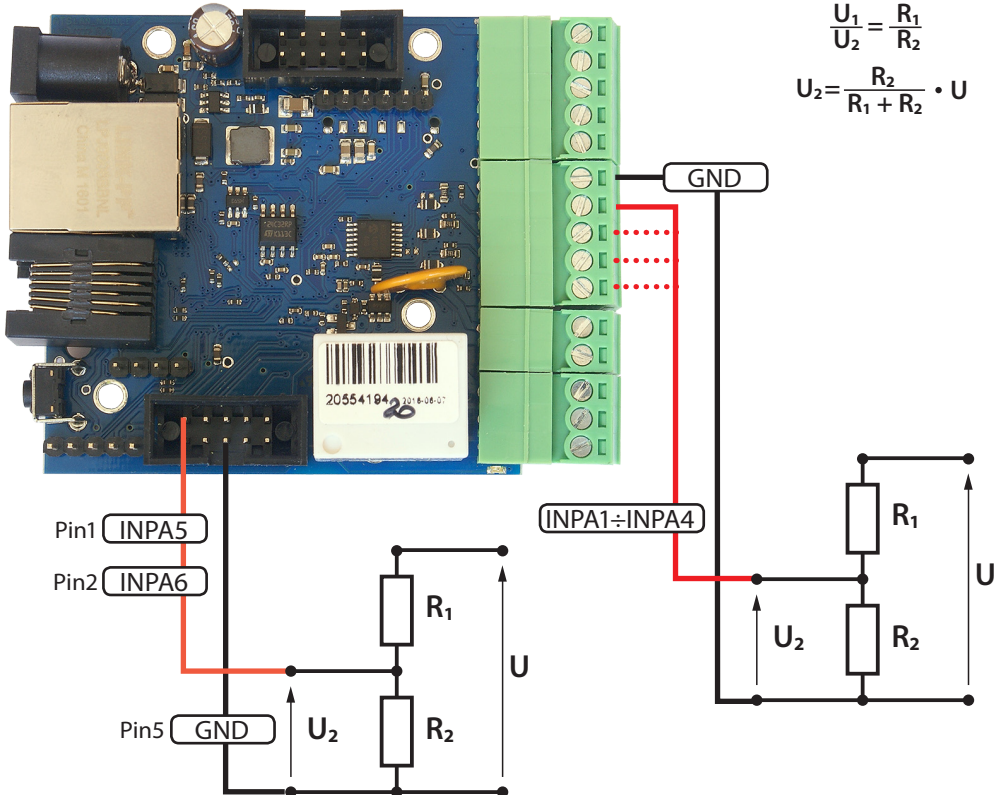
As a result of the multiplier enter of sharing: U / U_2



$$U = U_1 + U_2$$

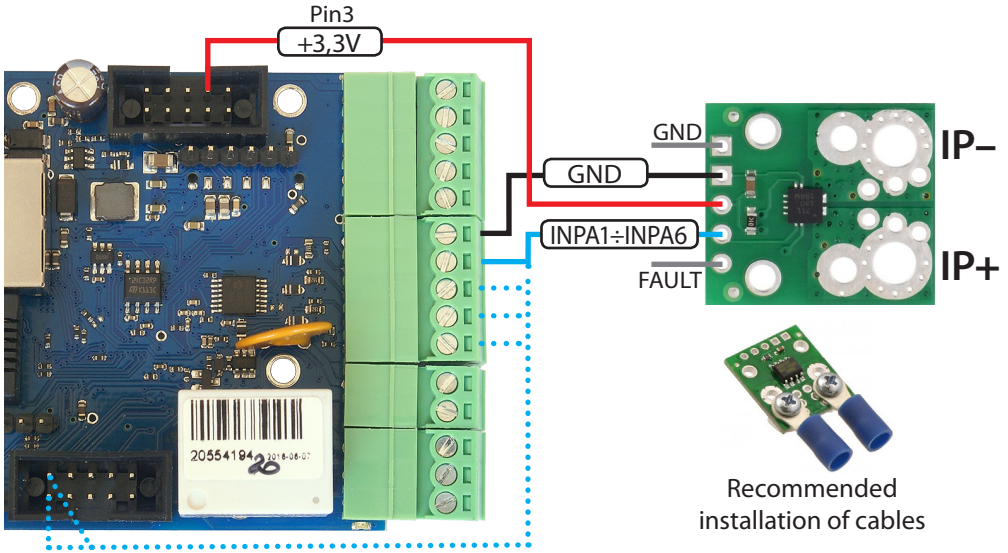
$$\frac{U_1}{U_2} = \frac{R_1}{R_2}$$

$$U_2 = \frac{R_2}{R_1 + R_2} \cdot U$$



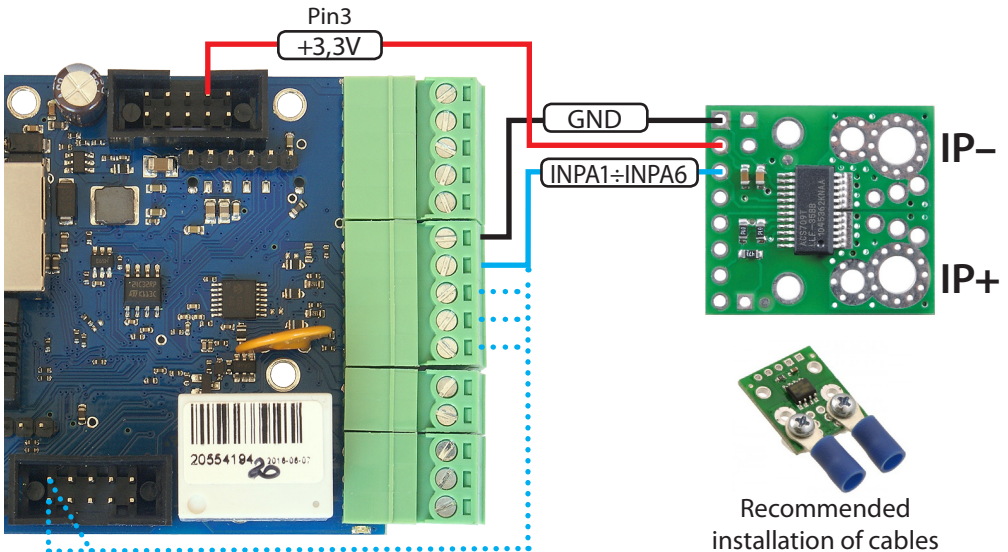
3. Connection the current sensor ACS711ex

The sensor can measure DC currents to 15A or 30A (depending on the version of the sensor). It can be connected to all analog inputs: INPA1÷INPA6. Power supply: + 3.3V (pin 3 of the output IDC10-1).

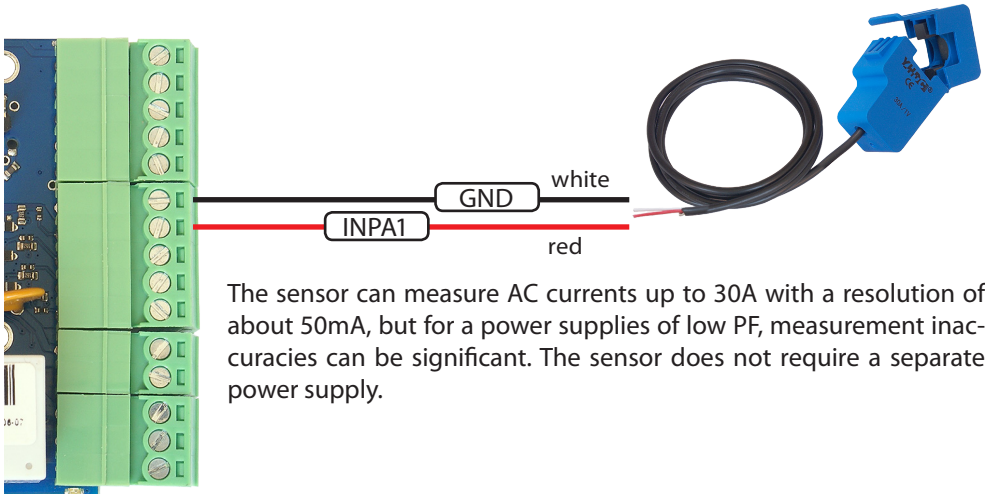


4. Connection the current sensor ACS709

The sensor can measure DC currents to 75A. It can be connected to all analog inputs: INPA1÷INPA6. Power supply: + 3.3V (pin 3 of the output IDC10-1).

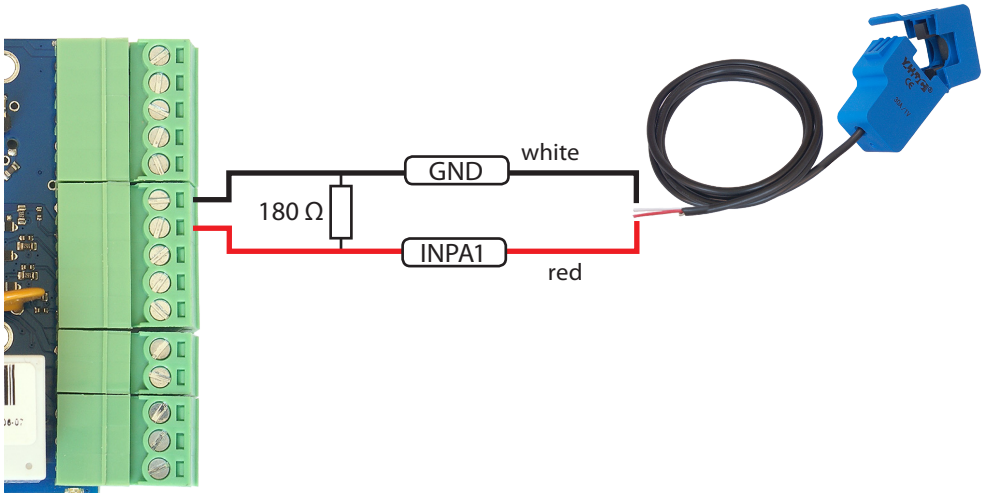


5. Connection of the AC sensor SCT 013 030



The sensor can measure AC currents up to 30A with a resolution of about 50mA, but for a power supplies of low PF, measurement inaccuracies can be significant. The sensor does not require a separate power supply.

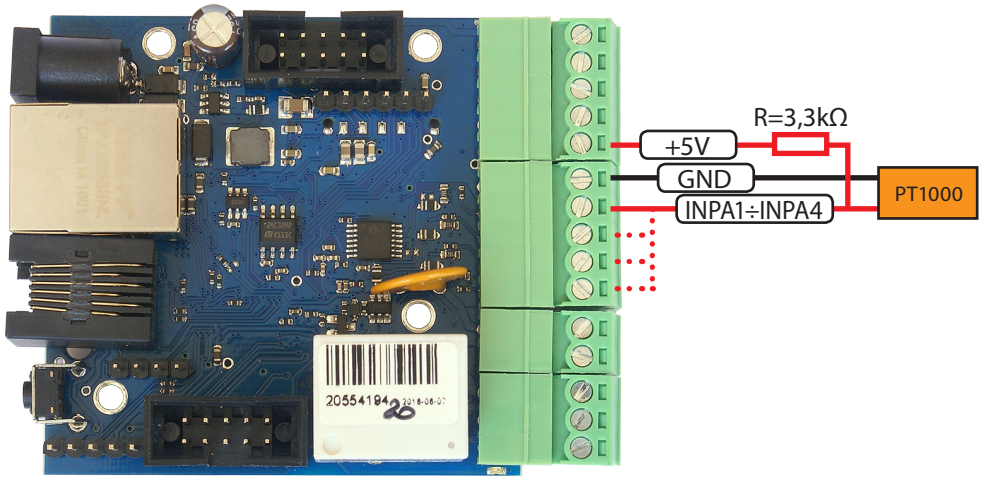
6. Connection of the AC sensor SCT 013 000



The sensor can measure the AC current. This model does not have an internal resistor which is conducted to measure, and therefore for a measurements to about 26A, connect the 180 Ω resistor in parallel to the terminals (INP and GND). The displayed value will be real. For measurements higher currents should give smaller resistor and proportionally multiply displayed current.

For example: to increase the range x3 (78A) must be used resistor 60,4 Ω
to increase the range x4 (104A), use a resistor of 45,3 Ω

7. Connection the PT1000 temperature sensor

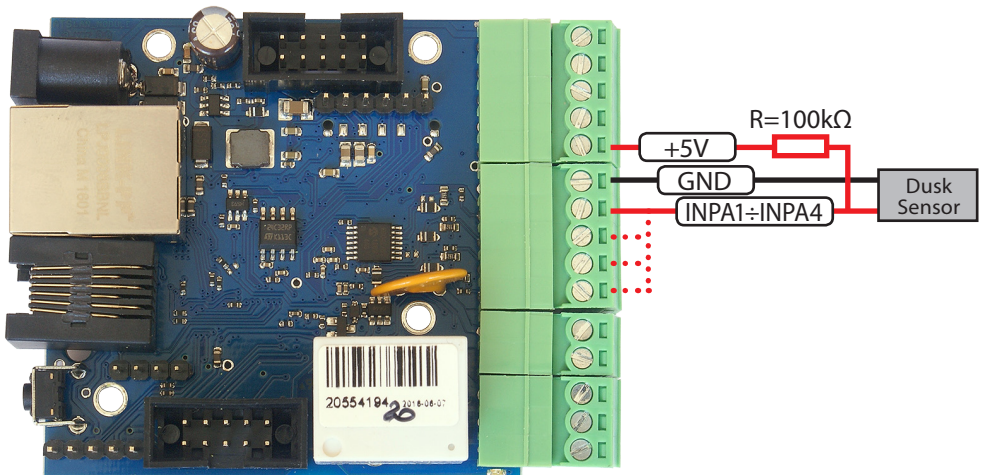


To enable the measurement to be in the "Input" to choose for INPA1 ÷ INPA4 measurement PT1000.

Attention:

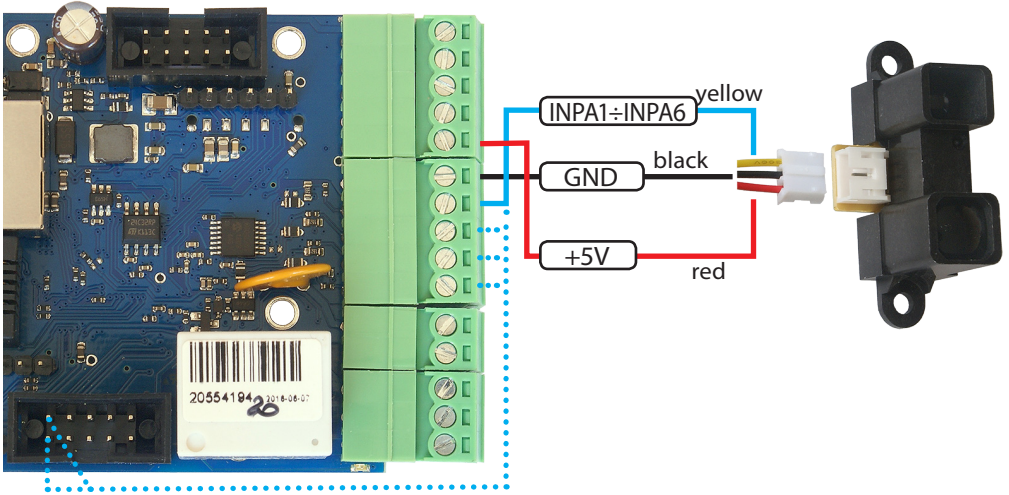
PT1000 analog sensor require calibration due to cable resistance.

8. Connection of the dusk sensor



To enable the measurement to be in the "Input" choose for INPA1 ÷ INPA4 range of 3.3V. The day indicated voltage is close to 0, but with nightfall will grow significantly, up to about 2,9V in total darkness. This allows enough freely determine the point of switching night lighting.

9. Connection distance sensor

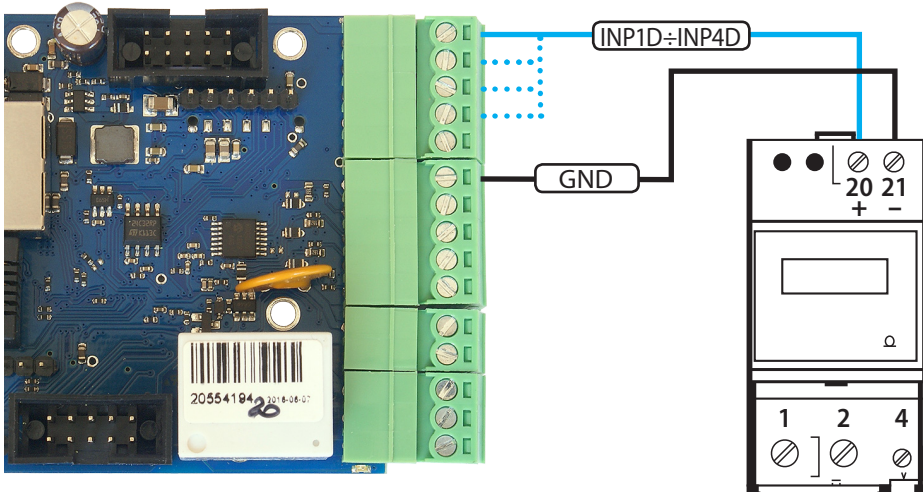


Sharp GP2Y0A02YK0F sensor allows measurements of distances in the range of 20 to 150 cm by using infrared reflection.

It can be connected to the inputs INPA1÷INPA6, set to 3.3V.

For a + 5V power supply output voltage will be highest for 20 cm (about 2,9V) and will decrease as the distance.

10. Energy measurement by means counter with pulse output

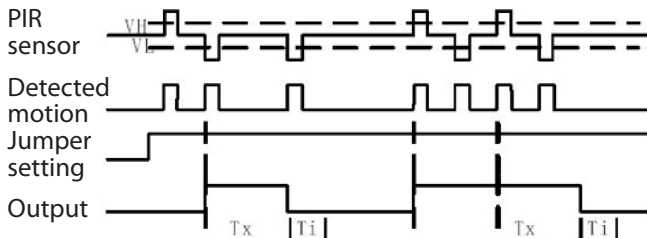
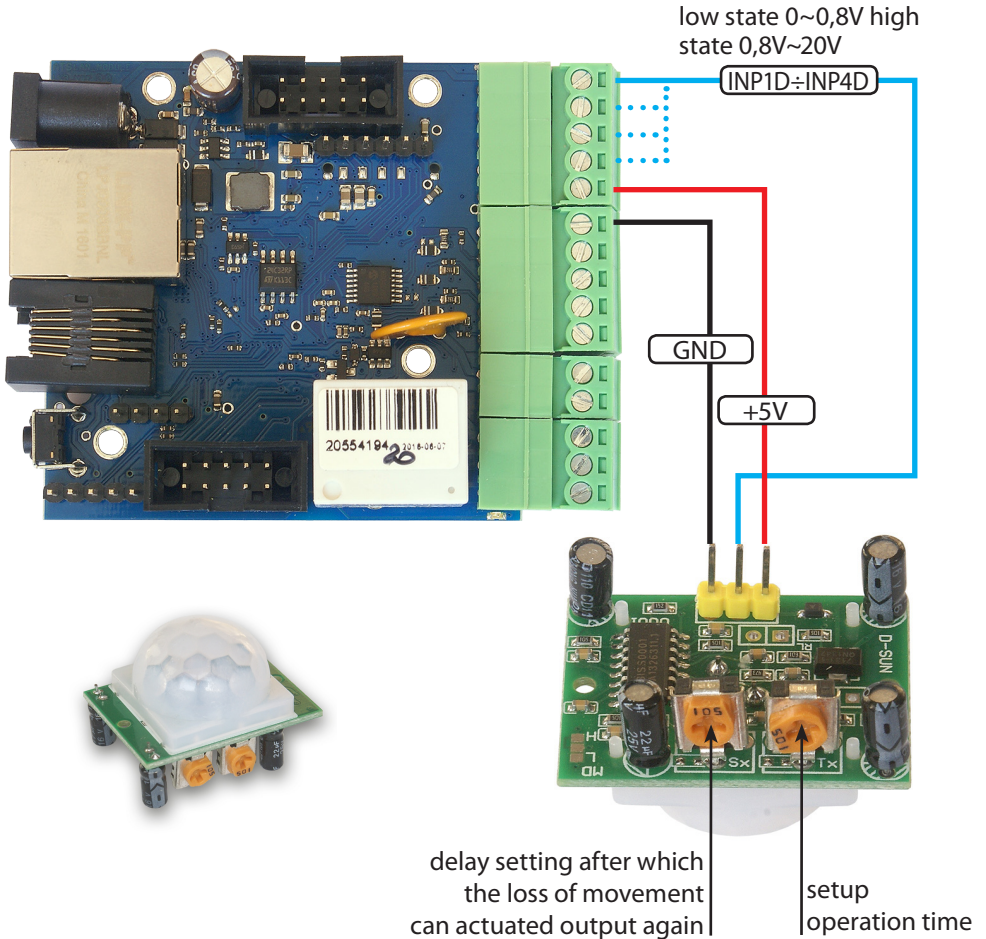


The outputs of the counter: "S-" is connected to GND, and the "S+" to logic inputs INP1D÷INP4D. In the "Power / Energy" choose the correct input on the menu, and then in the window below, enter conversion imp / kWh, which is characterized by a connected counter.

11. Connection of PIR motion/presence sensor

The sensor uses a analysis of the infrared radiation. Low state logic output is a state of rest, a state indicating the activity is high.

The detector can be adequately linked to + 5V, GND, and one of the digital inputs INP1D÷ INP4D, and then set its negation.



NOTES

Management by WWW.

All functions Lan Controller v3 are available for configuration and viewing via the website.

There are two types logon: as an **administrator** and **user**.

The **administrator** has access to all settings, the **user** only to the panel status, which sees only what will make an administrator. In the following pages shows the settings and configurations available after logging in as an administrator.

1. Status

The screenshot shows the 'Status' page of the LAN Controller. The interface includes a sidebar menu on the left with categories like Panel, Control/Out, Config/Network, and Firmware Upgrade. The main content area displays various status metrics and controls, with seven numbered callouts (1-7) highlighting specific elements:

- 1:** System status bar showing Uptime (10 sec, 3 min, 0 hour, 0 day), Version (1.27b), VCC SUPPLY (19.4 V), and Temperature (33 C).
- 2:** Window control buttons (Window, EN).
- 3:** Test buttons (test0 to test5) with ON/OFF indicators.
- 4:** PWM Out's section with pwm0 to pwm3 controls.
- 5:** Inputs section, including Analog sensor (inpa1 to inpa6) and Temperature sensor (T1 to T6).
- 6:** Digital input state section (INPD1 to INPD4).
- 7:** Power/Energy section showing power and price metrics.

Page that displays all the data collected from the Lan Controller indicating the name and sensor readings, analog inputs and outputs, and logic.

From the position of administrator can in any way to remove these items, move, and add scripts changing the displayed value (*)

Status page items

1. Information panel - displays:

- Time since last reboot: Uptime
- Date and time
- VCC supply voltage
- CPU temperature

2. Language and positions menu:

- ON/OFF - enable / disable moving items
- SAVE - save the positions of elements

- RESET - reset the position of elements

- EN - site language

3. ON/OFF Output panel: out0 ÷ out5 - displays the names of outputs and the switching which is also an indicator of the output - ON / OFF

4. PWM Output panel: pwm0 ÷ pwm3 - displays the names of exits, and a button switch which is also an indicator of the output - ON / OFF. Below is a slider to change the fill factor.

5. Analog inputs panel: inpa1 ÷ inpa6 - displays the names and values of readings analog inputs.

The readings are shown as the value directly from the transducer mV and measured as the value calculated from the sensor (e.g., the current value A)

6. Temperature and humidity measurements panel: field contains the name of the sensor and the value field.

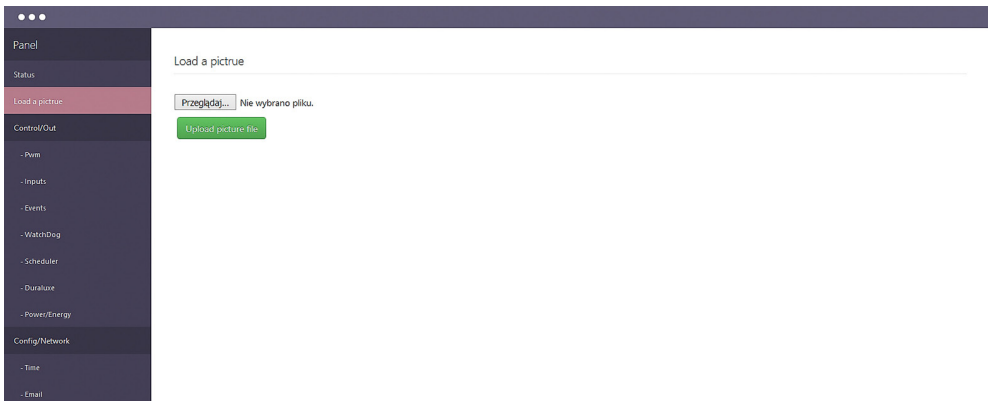
DS1 ÷ DS6 field display DS18B20 temperature sensors, and the fields T1 and H respectively the temperature and relative humidity measured by the humidity sensor.

7. Logic inputs panel: INP1D÷INP4D - displays the names of zones, and below is shown their logic state.

8. Additional menu is composed of three buttons:

- The button with a brush is responsible for changing the background color / inputs
- The folder button is responsible for the storage of items in a folder
- The clasps button enables / disables fields stretching

2. Load a picture - page visible only to the administrator

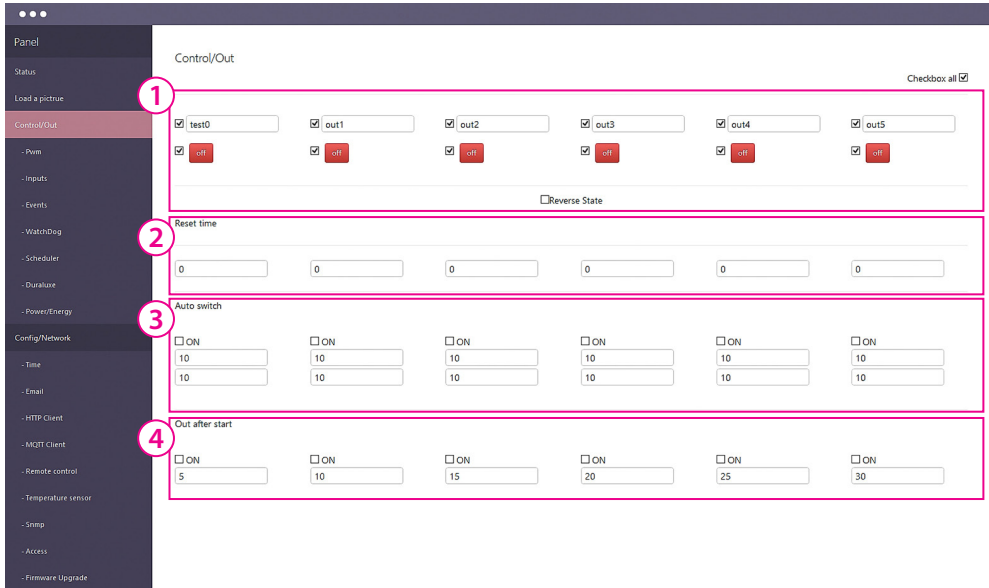


Przełóżaj - button to open the window to choose the image file from the local computer. *Uploaded photo must be in the size 1024x768 otherwise not be displayed correctly.*

Remove image - remove the image file

Uploaded an image file is to improve the presentation of the data, it may be for example a system diagram or drawing the operator panel. Ideally suited when Lan Controller is an element of control of the machine or installation.

3. Control - page is only visible to the administrator. It contains a set of pages to configure the inputs and outputs visible in **Status**.



Control / Out

- 1. ON/OFF output panel** - allows you to select which outputs out0÷out6 may be visible. Separately, you can select the description field and the change of state. In the latter case it makes it possible to change the state of the user. Checkbox "Reverse State" reverses only logical state of the outputs (relay does not change). Lan Controller remembers the state of the outputs when power is restored.
- 2. Reset time** - automatically changes the output state to opposite entered the time in seconds from the first change (caused by the user or by the function of events).
- 3. Auto switch** - the output changes automatically switched on times on / off certain fields.
- 4. Out after start** - sets the delay in switching outputs after power (if it was turned on before turning off). The very useful in controlling high power loads.

Control / PWM

1. Switching Frequency for the outputs pwm0 and pwm1 ÷ pwm3 - here the frequency is the same for these outputs.

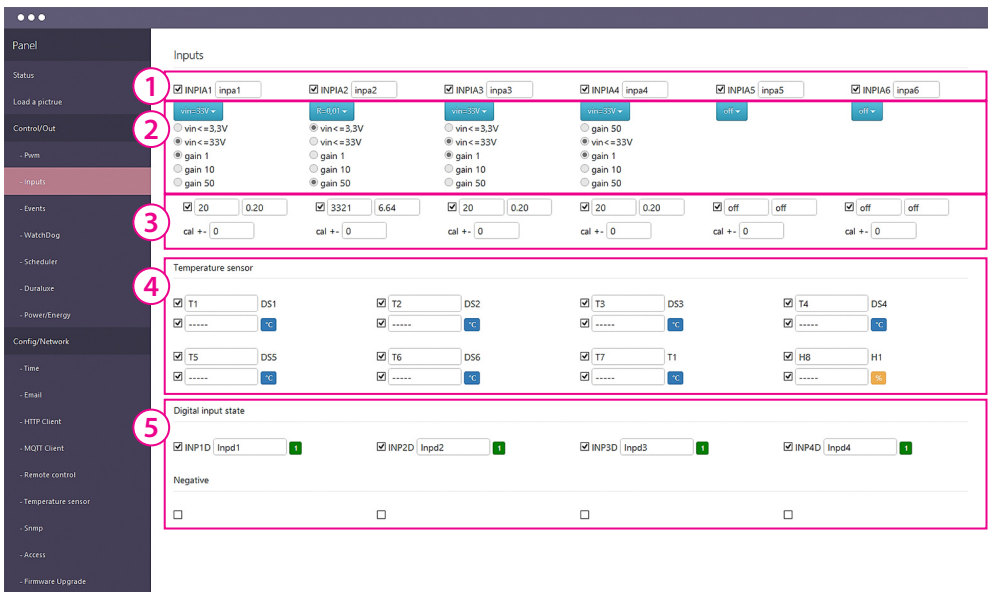
2. PWM Output panel - it allows you to select which pwm0 ÷ pwm3 output to be seen. Separately, you can select the visibility of the description fields, slider changes the duty ratio and the on / off PWM output.

Additional field:

"active low" - is used to reverse the action of the switch and fill factor,

"mode on/off" - check this box causes the PWM output changes in the output of the two state: on / off.

NOTE: for the Lan Controller v3 is available a separate system - board - the overlay transistor, which allows you to use PWM outputs to control the load of up to 2÷4A (depending on the amount used of outputs) and a voltage input connected to the cap (maximum 28V). In the on / off switch allows us to enable / disable connected consumers, such as LED lighting, sprinkler valves or fans, while the PWM duty cycle change slide smoothly regulate the output voltage. The ideal application is for example the brightness control of LED strips. The transistor outputs of the system are connected in a common "+" (such as LED strip RGB).



Control / Inputs

1. Input analog measurement inclusion panel and input name field.

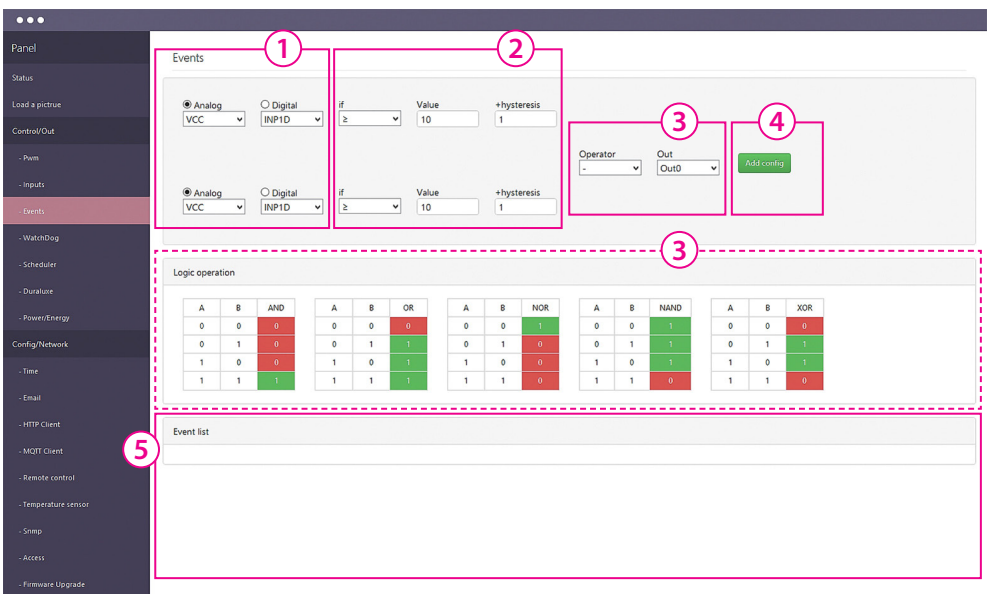
ATTENTION: when you save names are allowed ONLY characters: a ÷ z, A ÷ Z, 0 to 9, and " _ " (underscore) without nationality characters.

2. Selection functions menu for analog input or voltage range. After selecting the voltage range can select a checkbox to strengthen the input. The range of useful measurements for these reinforcements was given at the point of INPUT / OUTPUT instructions. If you select a specific sensor for the analog input range and strengthening will set themselves.

3. Reading measurement inclusion panel - for display on the Status page. The field can not be displayed even when it is turned on, for example, to send readings to a remote server. The panel also contains a field calibration - a value that is added to or subtracted directly to the measuring transducer and no conversion for the selected function. This makes it exactly offset the impact, for example. Long cables on the measured value.

4. Temperature and humidity measurements panel - allows you to select the name field and the field of temperature and humidity sensors for display on the Status page.

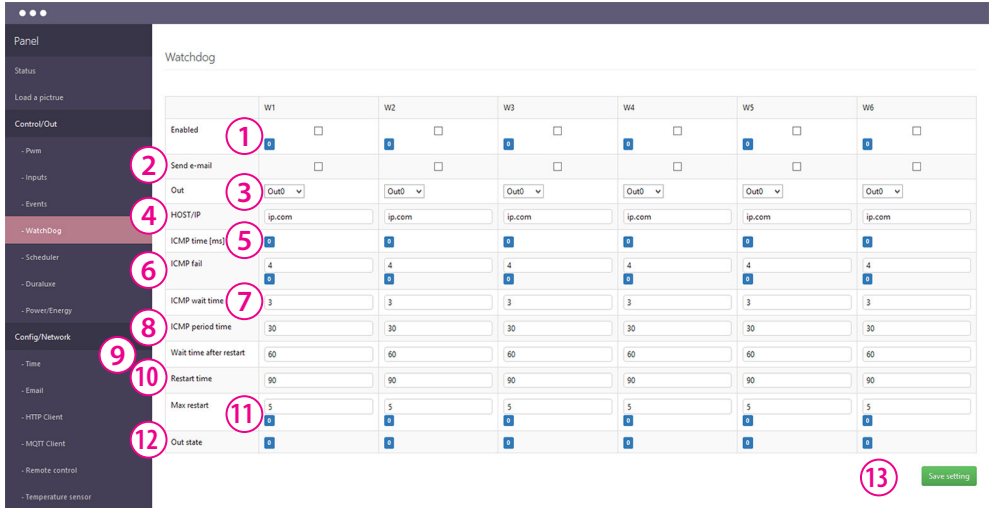
5. Visibility and the names logic inputs status panel. Below are checkboxes "Negative" - if you want to change the logic of the logic input.



Control / Events

Events is a simple mechanism for the creation of Lan Controller machine performing programmed actions in the event of certain conditions, such as switching out1 when the temperature exceeds the specified value, sending an e-mail when you change the logic state etc. Innovation is the mechanism to connect using the logical operator of two conditions the fulfillment of which gives a predetermined reaction.

1. **Setting condition:** we can select the analog or digital. In the digital menu uses additional virtual state EVNT types described in the Scheduler configuration.
2. **In this field we choose operator:** \geq or $<$, and enter the value and hysteresis.
3. **Operator** is used for the realization of two inputs depending on if you use only one left to sign -. Below is an auxiliary operators action table.
4. **Set made** incident to the conditions and press the button "Add config".
5. **In Event list** field it is shown input selection, the conditions and the fact that at the moment they are met (at NO / YES). To activate events mark the checkbox On if you want the event to be permanent (ie. Always performed after the occurrence of a condition, not just once) - select the Per. Then please remember that we lose control, eg. On the dial - manual shut-down if the condition does not occur. Removal of condition after pressing trash symbol.

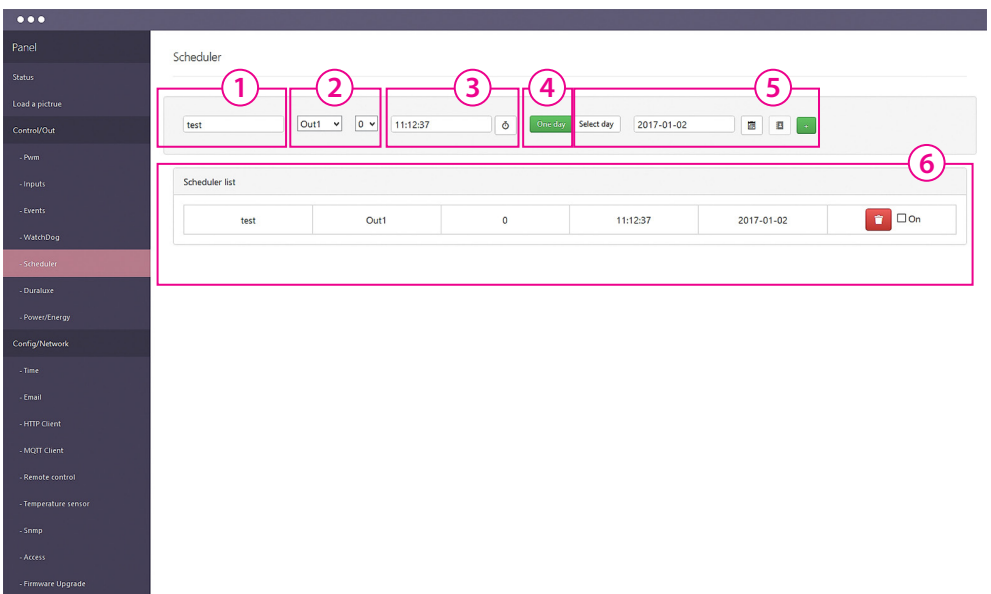


Control / Watchdog

Watchdog is basic tool for local/internet network administrators. By sending an ICMP packet (ping) to configured address it guards if remote machine answers and if necessary, can reset power such as client device. It maybe used in homes, especially to reset the radio equipment or modems operating on long cables, more susceptible for interferences. Up to 6 devices (W1 ÷ W6) can be setup to be supervised.

1. **Enabled** - mark checkbox for enable service.
2. **Send e-mail** - mark checkbox for sending email if watchdog restart, email service should be configured prior.
3. **Out** - choose output powering device (for reset).
4. **HOST/IP** - address which is checked if connection fail, for home customers best check first address in service provider infrastructure or their DNS server.
5. **ICMP time** - it show i ms response time or timeout if address accessible (*in the local network with a low time shows 0*).
6. **ICMP fail** - enter how many gaps response to a request ICMP will reset output. The following figure showing how many times the server did not respond to ping.
7. **ICMP wait time** - maximal waiting time for ping response in seconds.
8. **ICMP period time** - the period of time in seconds between successive ICMP queries.
9. **Wait time after restart** - he period of time in seconds before start sending queries after reset, it is demand for waiting for full device reset.
10. **Restart time** - the period of time in seconds of switching off power (reset).
11. **Max restart** - maximal number of restart, after this number watchdog is off because reset not repair connection.
12. **Out state** - show "0" for normal state, "1" for resetting period.

WARNING! AFTER EACH SETUP PRESS THE BUTTON "SAVE SETTING" [13]



Control / Scheduler

Scheduler is a list of tasks to be performed within a specified time, or periodically at certain days and times.

1. In this field, enter the name of the event.
2. From the selection menu, select the output which is to be action and select the desired logical value "0" or "1".
3. In this field you specify the exact time of the event.
4. Select "One day" for a single event - then we can select a date from the calendar,
5. Or choose "Select day" and then select from the menu the last days of the week when they have followed cyclical event. At the end of the + key add the selected event to the list.
6. In the panel "Scheduler list" we have a set of events that can be removed, for example, in the case of error, or add a checkbox to perform "On".

Panel

Status

Load a picture

Control/Out

- Pwm
- Inputs
- Events
- WatchDog
- Scheduler
- Duraluxe
- Power/Energy

Config/Network

- Time
- Email
- HTTP Client
- MQTT Client
- Remote control
- Temperature sensor
- Smp
- Access
- Firmware Upgrade

Duraluxe

Enabled

Input	Value	Unit
Temperature	0.0	°C
PvVolt	0.0	V
GridCurrent	0.0	A
GridVolt	0.0	V
GridFreq	0.00	Hz
Watt	0	V
GridZero	0	V
Energy	0.0	V
Total Work Hour	0	V
Current State	undefined	V

DISCONNECTED

Connected

Control / Duraluxe

The option of reading the value of electricity production and power network of the inverters of Duraluxe. Communication with the inverters takes place via the RS232 interface. Description supplied to these devices.

Control / Power/Energy

Power/Energy tab is used to set power settings and energy monitored by the energy meter with pulse output or measuring current and voltage sensors connected to the analog inputs INPA1 ÷ INPA6.

The measurement meter with pulse output:

For logic input INP1D ÷ INP4D connect the "+" (plus) output pulse counter, to GND "-" (minus) from the counter.

Then, in the drop-down menu, select the input INP1D÷INP4D which is hooked counter [1] and in the field below enter the number of pulses is attributable to 1 kWh. [2]

Measurement of analogue current and voltage sensors:

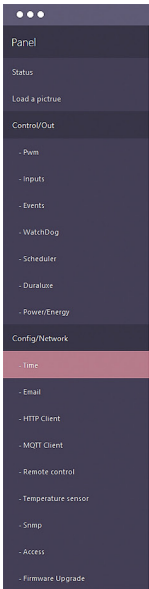
[1] Panel name visible measurement. From the left, select the input INP is connected to the current sensor, and in the right menu, select the input (sensor) voltage. When measuring AC transconductors SCT can select the approximate value of the tension we have in the electricity grid.

[3] Visibility panel measurement values: P1-P4 show the temporary values of powers in kW, and E1-E4 the counted energy in kWh.

4. Config / Network

Config / Network

1. **MAC Address** - field display its value (*Each Lan Controller has a unique address, it can be identified in case of connection of several devices*).
2. **Host Name** - a place to put a personalized Lan Controller name.
3. **Enable DHCP** - to activate select the checkbox, displays the status (OFF / ON).
4. **Panel network settings** - if DHCP [3] is not activated (OFF), allows you to enter the network settings in which it is to operate Lan Controller. With the DHCP displays the downloaded configuration settings.



Time

NTP

Set manual 1970-01-01:01:06:06

NTP Servers pool.ntp.org

Port 123

Time interval 600

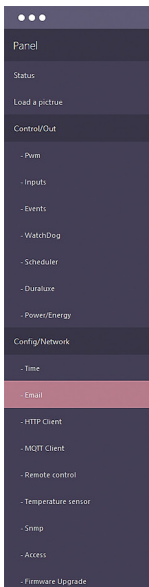
Time zone 1

Save

Config / Time

1. NTP / Set manual - selecting the desired option to "manual" input the date and time (*Set manual*) or a choice of designated NTP server.

2. NTP Servers - field to enter the name of an NTP server, communication port, Interval time (*period in minutes at which time will be synchronized with the server*) and select the time zone (*according to the table GMT - Zone [0] is the zone of the meridian of Greenwich*).



Email

SMTP Server smtp.com

Port 587

User user

Password ****

To reciver@com

From sender@com

Subject subject

Text text

Save Test email send

Config / Email

1. Setting the parameters of the Email client.

2. field to enter a subject and content of sent messages.

3. buttons" to save your settings (*Save*), and test the settings and send a test message (*Test email send*).

ATTENTION:

Some servers (eg. Google) require authentication outgoing mail. Unfortunately, our device does not provide such functionality.

To send e-mail messages, select the servers that do not require it.

Config / HTTP Client:
 the client sends HTTP requests using the GET to the specified server and port at a specified time.
 The way the "paste" the sensor looks like this:

%*xy* - where:

- %** – In this place will be inserted into the value of the selected sensor;
- xx** – the number of sensor, be a two-digit value (eg. 01, 05, 12);
- y** – determines the divider value of the sensor and has a value from 0 to 3;
- 0** – do not divide values
- 1** – divide by 10
- 2** – divide by 100
- 3** – divide by 1000

The divider can better match the decimal place for a specific sensor, because the sensor values are returned in whole numbers, eg. Temperature 245, is 24.5, and thus for temperature sensors DS, if we want to get ready for the result we need to set a divider by 10, that is, enter a value of 1. eg. %161- returns sensor value DS1 divided by 10.

Examples http GET request to the server thingspeak, recording the value of the sensor T1 to the server every 30 seconds:

update?api_key=H2PN0035KRVRG6Q0&field1=%141 – just type in the box "Remote url" while the server is sent the following syntax:

update?api_key=H2PN0035KRVRG6Q0&field1=26.3 – here you can notice the substitution of the sensor to the indicated place.

Manually question from a Web browser without LK3 send as:

http://api.thingspeak.com/update?api_key=H2PN0035KRVRG6Q0&field1=26.3

query:

GET /update?api_key=H2PN0035KRVRG6Q0&field1=26.3 HTTP/1.0

Host: api.thingspeak.com

Connection: close

Sensors numbers:

INPA1	0	INPA1_RAW	7	T1	14	DS6	21	energy1	39	out3	46	inpd1	53
INPA2	1	INPA2_RAW	8	H1	15	DIFF1	22	energy2	40	out4	47	inpd2	54
INPA3	2	INPA3_RAW	9	DS1	16	DIFF2	23	energy3	41	out5/wy_tranz	48	inpd3	55
INPA4	3	INPA4_RAW	10	DS2	17	power1	35	energy4	42	pwm0	49	inpd4	56
INPA5	4	INPA5_RAW	11	DS3	18	power2	36	out0	43	pwm1	50		
INPA6	5	INPA6_RAW	12	DS4	19	power3	37	out1	44	pwm2	51		
VIN	6	TEMP	13	DS5	20	power4	38	out2	45	pwm3	52		

The numbers of sensors only for inverters / inverters ongrid Duralux (eg. DS 1500-TL) plugged into LK3.

DUX0	24	DUX2	26	DUX4	28	DUX6	30	DUX8	32	DUX10	34
DUX1	25	DUX3	27	DUX5	29	DUX7	31	DUX9	33		

MQTT Client

MQTT protocol is designed primarily to exchange data between devices on the Internet of Things and servers and client devices such as smartphones.

The main advantage is to keep the connection in both directions, making it possible to control a simple Lan Controller located on the local network with the phone being in the local network operator.

1. In this field, we give the parameters used to connect to our server and authentication. Mqtt services can take place without authentication, for example, a local area network.

The Your device number is a unique number that is part of the MAC-address. We serve it with the recording equipment in the service mqtt.ats.pl. In response, we charge a unique prefix associated with the device and our account.

Prefix is a unique feature for a class of devices, the devices themselves or the same sensors.

Time is a parameter in seconds, at which time the data are to be sent and stored in the database. We recommend setting 300 seconds or more..

Parameter - **Ping Time** - determines the refresh rate of the connection broker mqtt. The default value is 60 seconds.

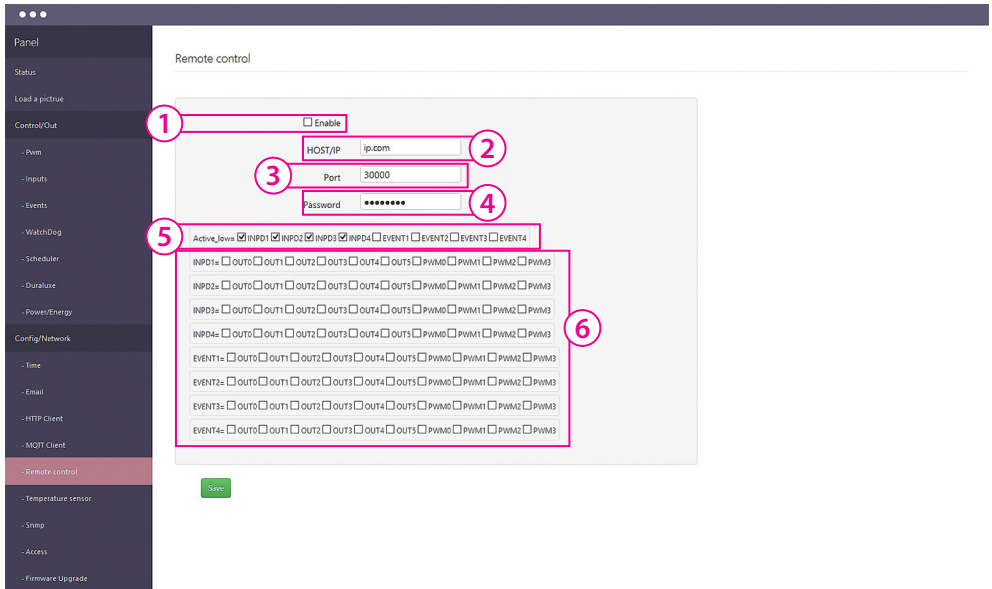
2. In this field you select, the readings are input / output to be sent to the server. Then confirm the selection by pressing the "Save".

The service mqtt.ats.pl is based on open source broker Mosquito.

To use the service mqtt.ats.pl, you must first register on the website:

mqtt.ats.pl/register/

Once activated by the administrator and received an email confirmation, you can use service. The service is free for up to 5 registered devices.



Config / Remote control

Lan Controller has a functionality to send controlling packets from one to other (by UDP protocol). This way we can switch on/off OUTx outputs of Lan Controller (**Server**) by the pushing INPDx to GND on other device (**Client**). Controllers should be connected, but can be away from each other. Most frequently this feature could be used in a local network of one building for receiving logical signals of sensors of one device on others.

Example:

A dusk sensor is connected to **Lan Controller no 1** and "**Even config**" turn relay. Same function we control the relay, which short connects INP1D to GND, giving a signal by remote control to switch the relay on **Lan Controller no2**. This way we can switch on night lights only from one sensor.

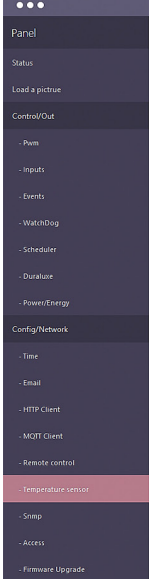
Server - device which receives signals, their OUTx, PWM, outputs are controlled by **Client**.

Client - device which puts signals, their logical INPDx inputs or virtual events EVNTx control **Server**.

One device works as a **Server** and **Client** at the same time.

Settings:

1. Checkbox for enabling function
2. **HOST/IP** - put **Server** address if device works as **Client**
- put any address (obligatory) if works as **Server**
3. **Port** - default 3000, same on both devices
4. **Haslo** - same on both devices
5. **Active_low checkbox** - for reversing output state (*check on Client*)
6. **INPD, EVENT/OUT, PWM matrix check** (*only on Client*) for input we control output we like to switch on **Server**.



Temperature sensor

Read ID DS18 ID = xxxxxx

Save to Position



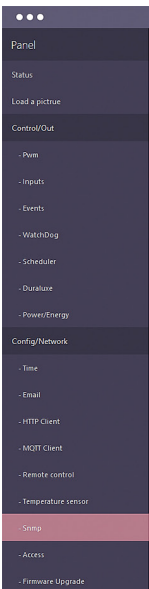
Assigning an item number for the currently connected sensor DS18B20.

Config / Temperature sensor

1. Correct chosen sensor (*others should be removed*),
2. Refresh the button "Read id", (*if it does not appear ID, reset Lan Controller*),
3. Enter the position number and press "Save to" button.

The read ID number will be assigned to the desired position, where „1“ corresponds to INP6, „2“ is INP7 ... and „6“ is INP11. To add additional sensors, proceed as described above **CONNECTED WITH ONLY ONE, CURRENTLY added SENSOR.**

If you want to remove the assignment, refresh the "Read id" without sensor (*so that the field was empty*) and memorize the redundant item number ("Save to").



SNMP

Community read 1

Community write

Trap Enabled 2

Trap receiver IP

Community trap

Save

Config / SNMP

1. Fields community (password) for SNMP, must be the same in your queries in order to LK replied
2. TRAP Enabled – enabled send TRAP by SNMP

Config / Access

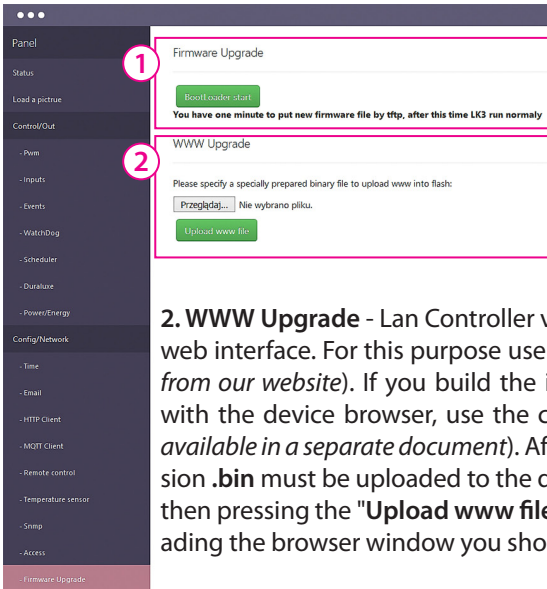
1. ZChecking the "Auth Enabled" will make the administration of the device address in the browser login window will appear, to prevent access to the XML data without authorization. While the second login window is set to distinguish the type of access: the **administrator** or the **user** (*admin/admin* lub *user/user*).

In the first case, we have full access to the configuration, in the second only to the panel "Status", on which the **user** has access after logging (visible) only the data which display defined (marked) **administrator**.

The login and password for the administrator are the same for the first and second login window.

2. Selecting the "Upgrade Enabled" is necessary to download the new version of firmware to the device via tftp.

Normally, especially in networks where access management controller to an unauthorized person, the field **should be disabled**.



Config / Firmware Upgrade

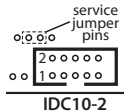
1. The "Bootloader start" is used to switch the mode Lan Controller in **bootloader** mode. In this mode, the device is the TFTP server and waits for a file sent to the TFTP client (eg. TFTP32 program). When you press the button, we have 1 min. to upload firmware.

2. **WWW Upgrade** - Lan Controller v3 is able to modify or even create a new web interface. For this purpose use a **www generator**. (You can download it from our website). If you build the interface from scratch, to communicate with the device browser, use the command XML. (The full command set is available in a separate document). After generating such a file with the extension **.bin** must be uploaded to the device. First, select the file to upload, and then pressing the "Upload www file" followed by loading the file. After reloading the browser window you should see the modified interface.

Lan Controller V3 software update

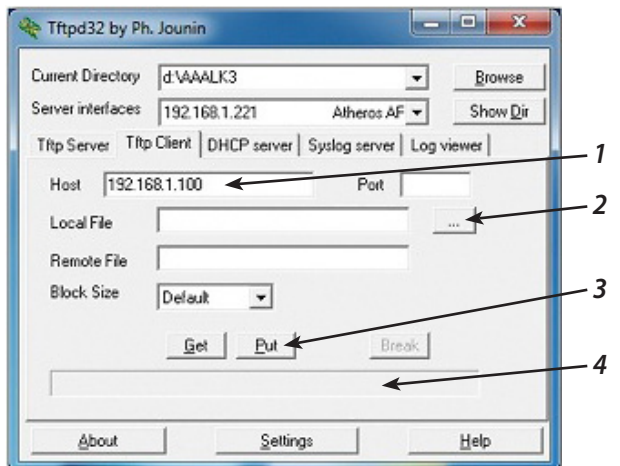
1. Download the new version of the firmware from the: <http://tinycontrol.pl/tinycontrol/lan3/instrukcja.php>
2. Prepare any tftp client software (eg. tftp32) to send the downloaded file to Lan Controller being in „bootloader” mode. For this purpose, in the Lan Controller menu „Firmware upgrade” select **Bootloader Start** and run the tftp client.
3. Watch progress of file loading and whether has successfully been updated. After restarting Lan Controller is ready for operation.

An alternative way of switching Lan Controller into „bootloader” mode (if we can not log in to the Lan Controller):
 1. disconnect the power supply, 2. short pins „service jumper pins”, 3. connect the power supply - Lan Controller starts in bootloader mode and will wait for the file.



Upgrade using the tftp32 or tftp64 programs (WINDOWS)
http://tftp32.jounin.net/tftp32_download.html

When the program starts, select computer interface (**Server interfaces**) is connected to Lan Controller and select service **Tftp Client**. In the **Host** (1) enter the address of our Lan Controller. Then, when Lan Controller is in bootolader mode, by pressing button (2) next to **Local File**, select the file to upgrade the firmware (the **.bin** extension). Press button **Put** (3) - after a moment should appear below the progress bar of the file upload (**box 4**). After the message about successfully uploaded files can be reset Lan Controller.



Reading XML data

Reading is possible or if the authorization is disabled and we are already logged in. If not, you should specify before your username and password, for example:

admin:admin@192.168.1.100/xml/(...)

The basic list of positions XML files to read data from:

basic sensors: 192.168.1.100/xml/ix.xml

an array of events: 192.168.1.100/xml/eve , 192.168.1.100/xml/eve2.xml

mqtt settings: 192.168.1.100/xml/mqtt.xml

Scheduler: 192.168.1.100/xml/sched.xml

configuration settings: 192.168.1.100/xml/st.xml

setting names: 192.168.1.100/xml/stat.xml

Watchdoga setting: 192.168.1.100/xml/wdog.xml

More XML files will be published in a special document describing how to create your own website using the generator Web and XML files.

Switching sockets http request

The current version allows you to control via http commands with browser bar or other device used for the following commands:

IP/outs.cgi?out=xxxxx – switches specific output to the opposite of the present

IP/outs.cgi?outx=x – enable or disable the specific output

When password authentication is enabled, the commands have the following form:

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

user:password@IP/outs.cgi?outx=x

Examples:

http://192.168.1.100/outs.cgi?out=0 – changes the state out0 to the opposite (ON/OFF)

http://192.168.1.100/outs.cgi?out0=0 – turn off out0

http://192.168.1.100/outs.cgi?out0=1 – turn on out0

dla PWM

http://192.168.1.100/outs.cgi?pwm=0 – changes the state pwm0 to the opposite (ON/OFF)

http://192.168.1.100/outs.cgi?pwm0=0 – turn off pwm0

http://192.168.1.100/outs.cgi?pwm0=1 – turn on pwm0

NUMBERS OID for SNMP

OUT0÷OUT5 and PWM0÷PWM3 can read and write, the rest is read only.

iso.3.6.1.4.1.7616.3.1.0.0 = INTEGER: 0	OUT0
iso.3.6.1.4.1.7616.3.1.1.0 = INTEGER: 0	OUT1
iso.3.6.1.4.1.7616.3.1.2.0 = INTEGER: 0	OUT2
iso.3.6.1.4.1.7616.3.1.3.0 = INTEGER: 0	OUT3
iso.3.6.1.4.1.7616.3.1.4.0 = INTEGER: 0	OUT4
iso.3.6.1.4.1.7616.3.1.5.0 = INTEGER: 0	OUT5
iso.3.6.1.4.1.7616.3.1.6.0 = INTEGER: 1	PWM0
iso.3.6.1.4.1.7616.3.1.7.0 = INTEGER: 1	PWM1
iso.3.6.1.4.1.7616.3.1.8.0 = INTEGER: 1	PWM2
iso.3.6.1.4.1.7616.3.1.9.0 = INTEGER: 1	PWM3
iso.3.6.1.4.1.7616.3.2.1.0 = INTEGER: 1	INPD1
iso.3.6.1.4.1.7616.3.2.2.0 = INTEGER: 1	INPD2
iso.3.6.1.4.1.7616.3.2.3.0 = INTEGER: 1	INPD3
iso.3.6.1.4.1.7616.3.2.4.0 = INTEGER: 1	INPD4
iso.3.6.1.4.1.7616.3.3.1.0 = INTEGER: 0	INPA1
iso.3.6.1.4.1.7616.3.3.2.0 = INTEGER: 2	INPA2
iso.3.6.1.4.1.7616.3.3.3.0 = INTEGER: 2	INPA3
iso.3.6.1.4.1.7616.3.3.4.0 = INTEGER: 2	INPA3
iso.3.6.1.4.1.7616.3.3.5.0 = INTEGER: 0	INPA4
iso.3.6.1.4.1.7616.3.3.6.0 = INTEGER: 0	INPA5
iso.3.6.1.4.1.7616.3.3.7.0 = INTEGER: 871	VIN
iso.3.6.1.4.1.7616.3.3.8.0 = INTEGER: 3700	TEMP
iso.3.6.1.4.1.7616.3.4.1.0 = INTEGER: -600	DS1
iso.3.6.1.4.1.7616.3.4.2.0 = INTEGER: -600	DS2
iso.3.6.1.4.1.7616.3.4.3.0 = INTEGER: -600	DS3
iso.3.6.1.4.1.7616.3.4.4.0 = INTEGER: -600	DS4
iso.3.6.1.4.1.7616.3.4.5.0 = INTEGER: -600	DS5
iso.3.6.1.4.1.7616.3.4.6.0 = INTEGER: -600	DS6
iso.3.6.1.4.1.7616.3.4.7.0 = INTEGER: 276	AM2320 (temperature)
iso.3.6.1.4.1.7616.3.4.8.0 = INTEGER: 123	AM2320 (humidity)
iso.3.6.1.4.1.7616.3.4.9.0 = INTEGER: 0	DIFF1
iso.3.6.1.4.1.7616.3.4.10.0 = INTEGER: 0	DIFF2
iso.3.6.1.4.1.7616.3.5.1.0 = INTEGER: 60	Power1
iso.3.6.1.4.1.7616.3.5.2.0 = INTEGER: 60	Power2
iso.3.6.1.4.1.7616.3.5.3.0 = INTEGER: 0	Power3
iso.3.6.1.4.1.7616.3.5.4.0 = INTEGER: 0	Power4
iso.3.6.1.4.1.7616.3.5.5.0 = INTEGER: 2	Energy1
iso.3.6.1.4.1.7616.3.5.6.0 = INTEGER: 2	Energy2
iso.3.6.1.4.1.7616.3.5.7.0 = INTEGER: 0	Energy3
iso.3.6.1.4.1.7616.3.5.8.0 = INTEGER: 0	Energy4

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.

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