Damocles 2404i – Manual

Inputs 1 – 8
Each blue COM terminal is shared by two inputs.

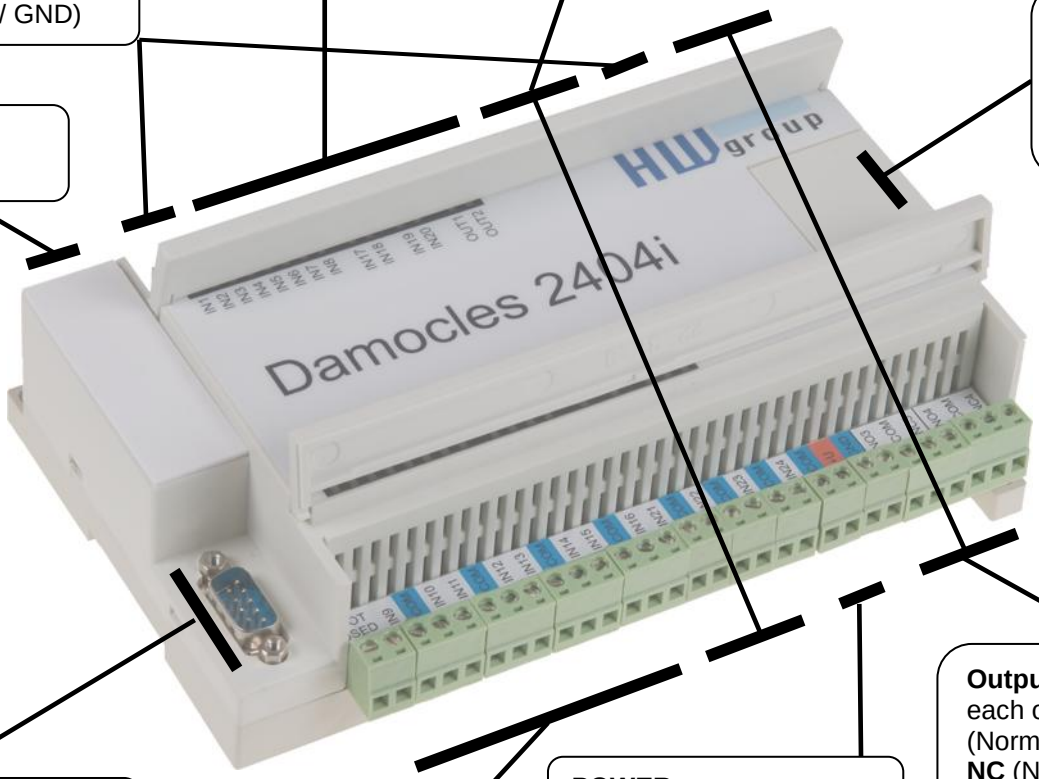
Inputs 17 – 24
Each blue COM terminal is shared by two inputs.

POWER
12V supply (+U / GND)

Configuration

Default:
DIP1= Off
DIP2= Off

ETHERNET
Link & Activity

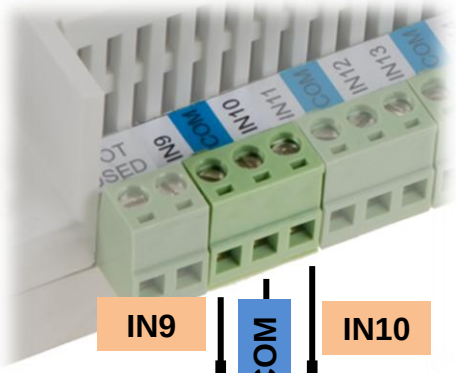


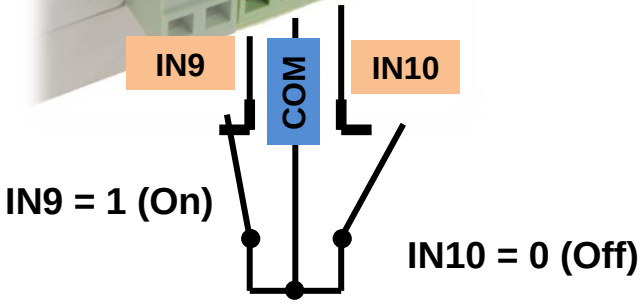
Outputs: relays 1–4, each output has a **NO** (Normally Open) and a **NC** (Normally Closed) relay contact.

RS-232 – Serial port configuration, temperature

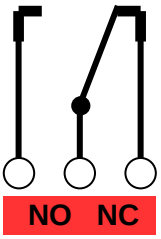
POWER
12V supply (+U / GND)

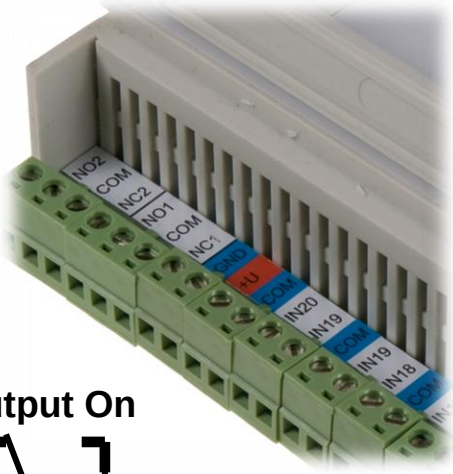
Inputs 9 – 16
Each blue COM terminal is shared by two inputs.



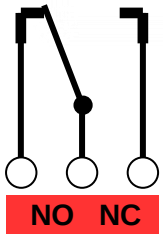


Output Off





Output On

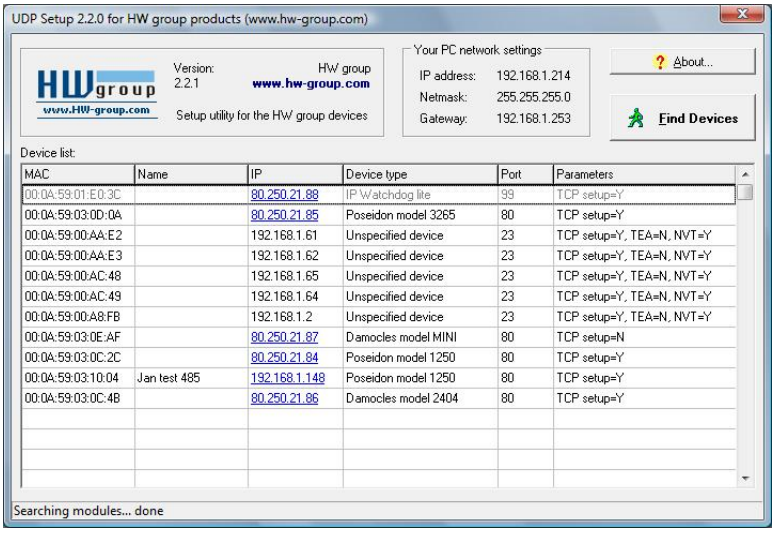


1) Connecting the cables

- Turn the unit upside down and write down its MAC address that is printed on the label.
- Set the switches: **DIP1=Off**, **DIP2=Off**, remaining DIP switches do not matter.
- Connect the unit to the Ethernet (with a patch cable to a switch, cross-over cable to a PC), RJ-45 port.
- Plug the power adapter into a mains outlet and connect it to the Damocles power connector.
- The green **POWER** LED lights up.
- If the Ethernet connection works properly, the **LINK** LED lights up after a short while, and then flashes whenever data are transferred (activity indication).

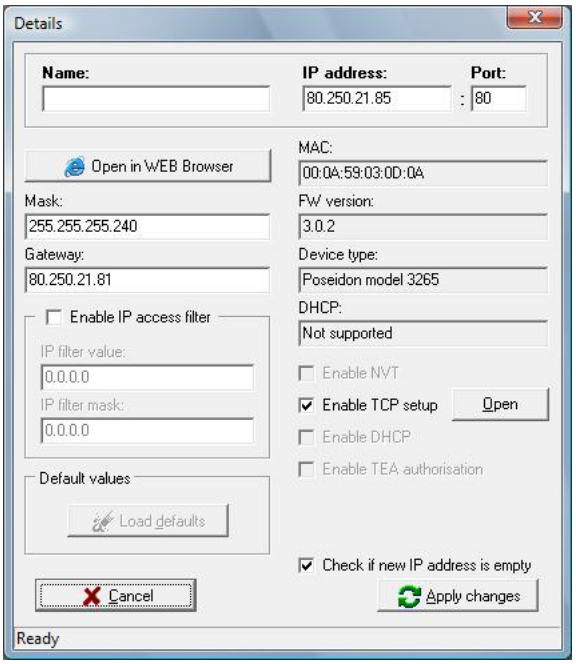
2) Configuring the IP address – UDP Config

UDP Config utility – root directory of the supplied CD (Windows and Linux versions). Available for download at www.HW-group.com
Software > UDP Config.



- Click the icon to launch **UDP Config**. The program automatically looks for connected devices.
- To search for devices, click the **Find Devices** icon.

The program searches for devices in your local network. Individual Poseidon units are identified by their MAC addresses (printed on the label at the bottom side of the unit). Double-click a MAC address to open a basic configuration dialog.



Configure network parameters

- IP address / HTTP port (80 by default)
- Network mask
- Gateway IP address for your network
- Device name (optional)

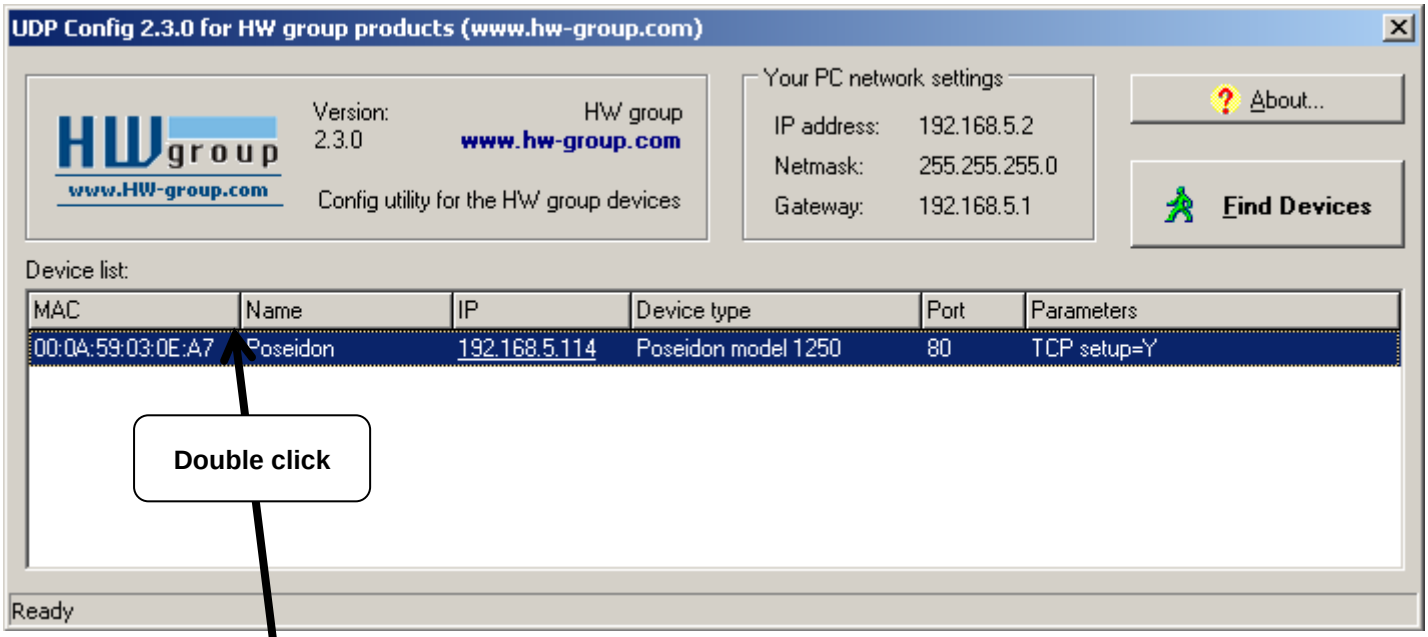
Click the **Apply Changes** button to save the settings.

Notes:

- *To reset the device to factory defaults, toggle DIP1 several times within 5 seconds after power-up.*
- *No configuration changes can be stored while DIP2=On. To change the IP address, set DIP2=Off.*

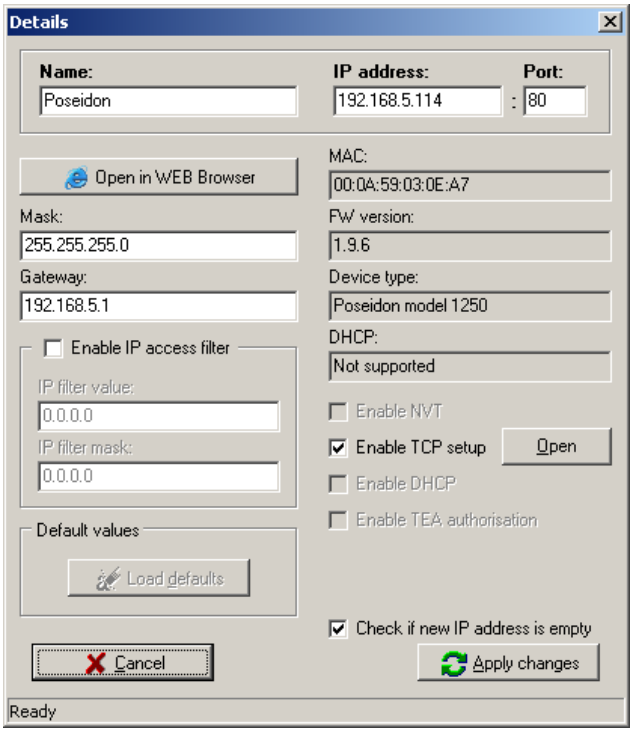
3) Configuring the IP address – UDP Config

The **UDP Config** utility is located in the root folder of the CD, or it is available for download at www.HW-group.com. Run **UDP Config**. The program automatically searches for connected devices.



The program looks for devices on your local network. To identify a particular Damocles unit, look at the MAC address on the label at the bottom of the unit.

Double-click a MAC address to open a basic configuration dialog.



- Set the IP address
- HTTP Port
- Network mask
- Gateway IP address
- Device name (optional)

Caution: *If you don't know these details or are not sure, please contact your network administrator.*

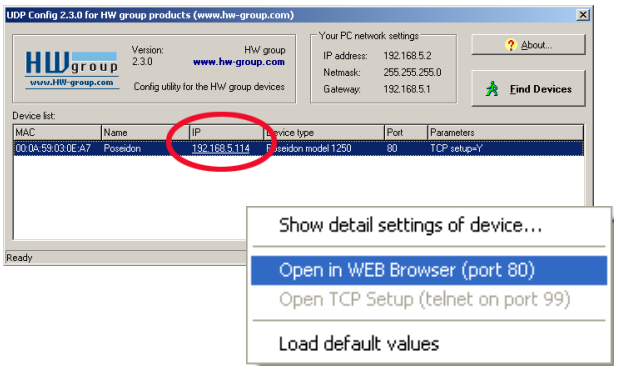
Click the **Apply Changes** button to save your changes.

Note: *Alternatively, you may use the following utilities to configure the IP address:*

- **UDP Config for Linux**
- **Hercules** utility (`/Hercules.exe`) (UDP Setup or serial port terminal)

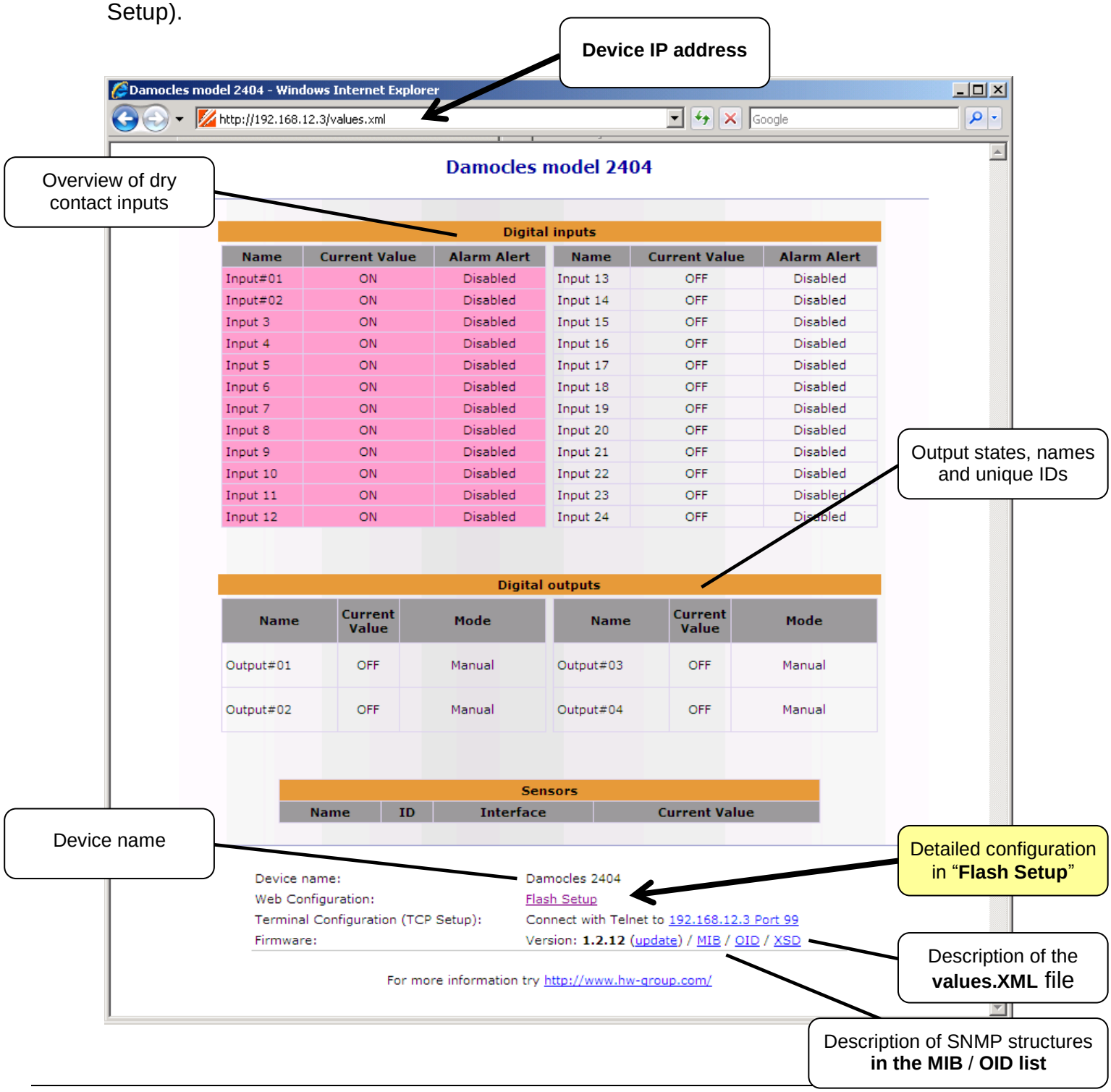
- **RS-232 serial port** (any terminal program, 9600 8N1, DIP1=ON, restart)

4) WWW interface of the device



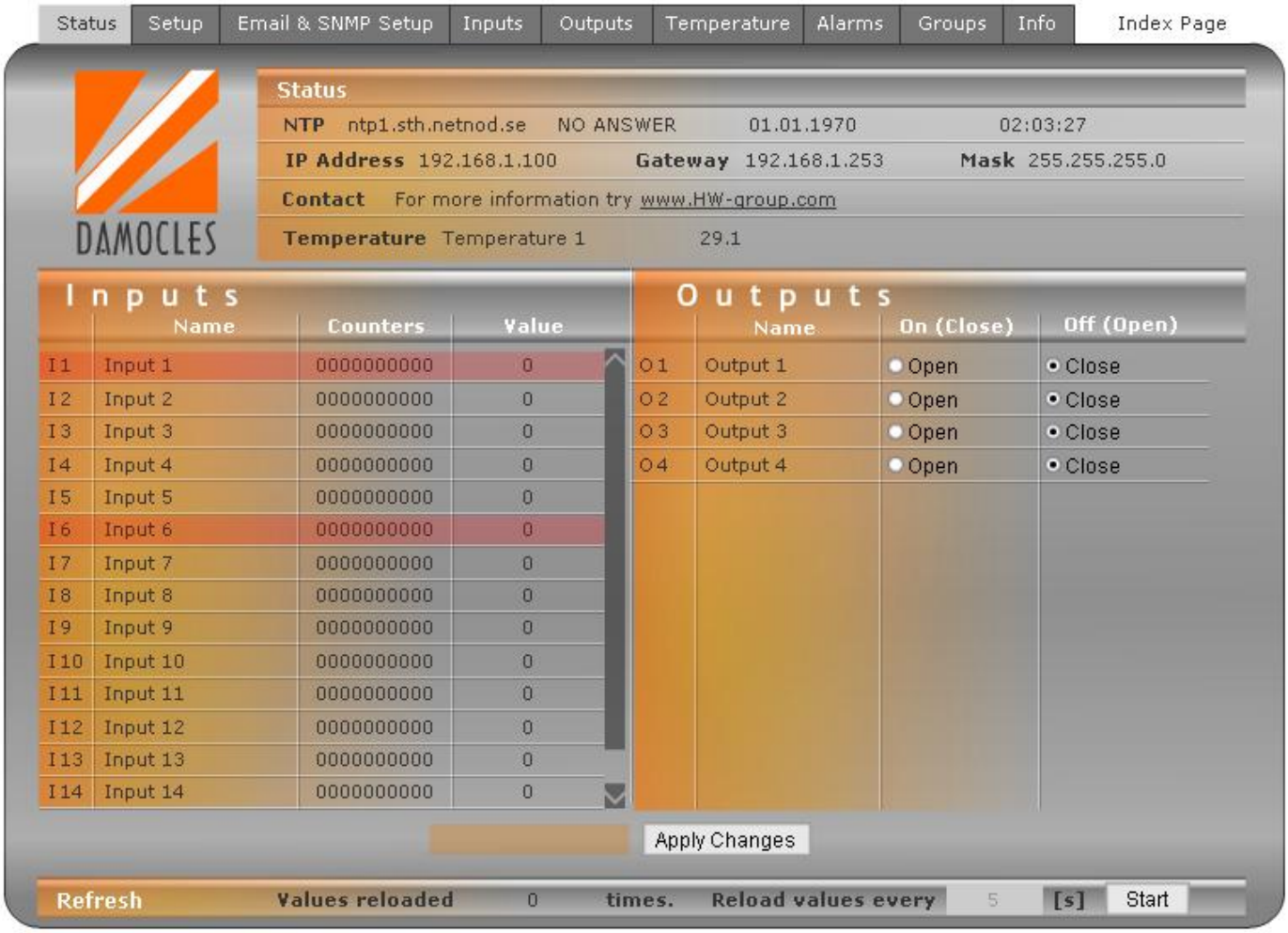
- **To open the WWW interface of the device**:
  - Enter the IP address into a web browser
  - Click the IP address in UDP Config
  - Click the underlined IP address in UDP SETUP

- The WWW page displays current status of inputs and outputs.
- Click the "**Graphic Flash SETUP**" link to open the graphical configuration interface (Flash Setup).



5) Flash SETUP

To open the FLASH interface, FLASH support needs to be installed on your PC. If the computer is connected to the Internet, the needed plug-in is downloaded automatically.



Flash Setup allows you to:

- Control outputs
- Assign names to inputs and outputs and their states
- Watch current sensor readings (refreshed automatically at predefined intervals)
- Set SNMP parameters (Community names & rights), define target IPs for SNMP traps that are sent upon alarm
- Set device name, password, and secure IP address range
- and more...

6) Sending e-mail

Alarms and e-mail alerting

Damocles supports alerts to changes on one particular input – "**Single Alarm**", as well as alerts to a certain input combination – "**Group Alarm**".

	Name	Current Value	ON (Close)	OFF (Open)	Single Alarm	Alarm Group 1	Alarm Group 2
I1	Input#01	1	ON	OFF	None	None	None
I2	Input#02	1	ON	OFF	OFF	None	None
I3	Input 3	1	ON	OFF	ON	None	None
I4	Input 4	1	ON	OFF	None	None	None
I5	Input 5	1	ON	OFF	ON	None	None
I6	Input 6	1	ON	OFF	ON	None	None
I7	Input 7	1	ON	OFF	ON	None	None
I8	Input 8	1	ON	OFF	ON	None	None
I9	Input 9	1	ON	OFF	ON	None	None
I10	Input 10	1	ON	OFF	ON	None	None
I11	Input 11	1	ON	OFF	ON	None	None
I12	Input 12	1	ON	OFF	ON	None	None
I13	Input 13	0	ON	OFF	ON	None	None
I14	Input 14	0	ON	OFF	ON	None	None
I15	Input 15	0	ON	OFF	ON	None	None
I16	Input 16	0	ON	OFF	ON	None	None
I17	Input 17	0	ON	OFF	ON	None	None
I18	Input 18	0	ON	OFF	ON	None	None
I19	Input 19	0	ON	OFF	ON	None	None

- Alarm state (On or Off) to be notified by sending an e-mail or SNMP Trap can be configured for each individual input. >> **Inputs** tab, green **Single Alarm** column.
- Each individual Alarm needs to be activated >> **Inputs** tab, **Enable** column.
- For each Alarm, a target destination needs to be set. Four SNMP Trap targets (named A, B, C, D) and two e-mail targets (named E, F) are available >> **Alarms** tab, **SNMP** or **E-mail** column.
- Destinations A through D (for SNMP) and E, F for e-mail need to be configured and enabled.

Testing e-mail

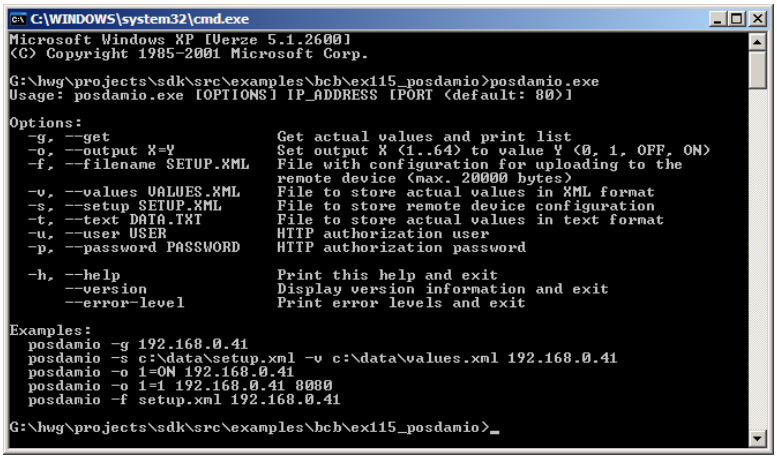
To send an e-mail directly from the device, check the following settings.

- Gateway IP address >> **Setup** tab, **Network Settings** pane, **Gateway** field.
- DNS server settings >> **Setup** tab, **Network Settings** pane, **DNS** fields.
- SMTP server settings >> **Email & SNMP** tab, **Email Settings** pane.
- Send a test e-mail to verify correct operation
  >> **Email & SNMP** tab, **Email Settings** pane.

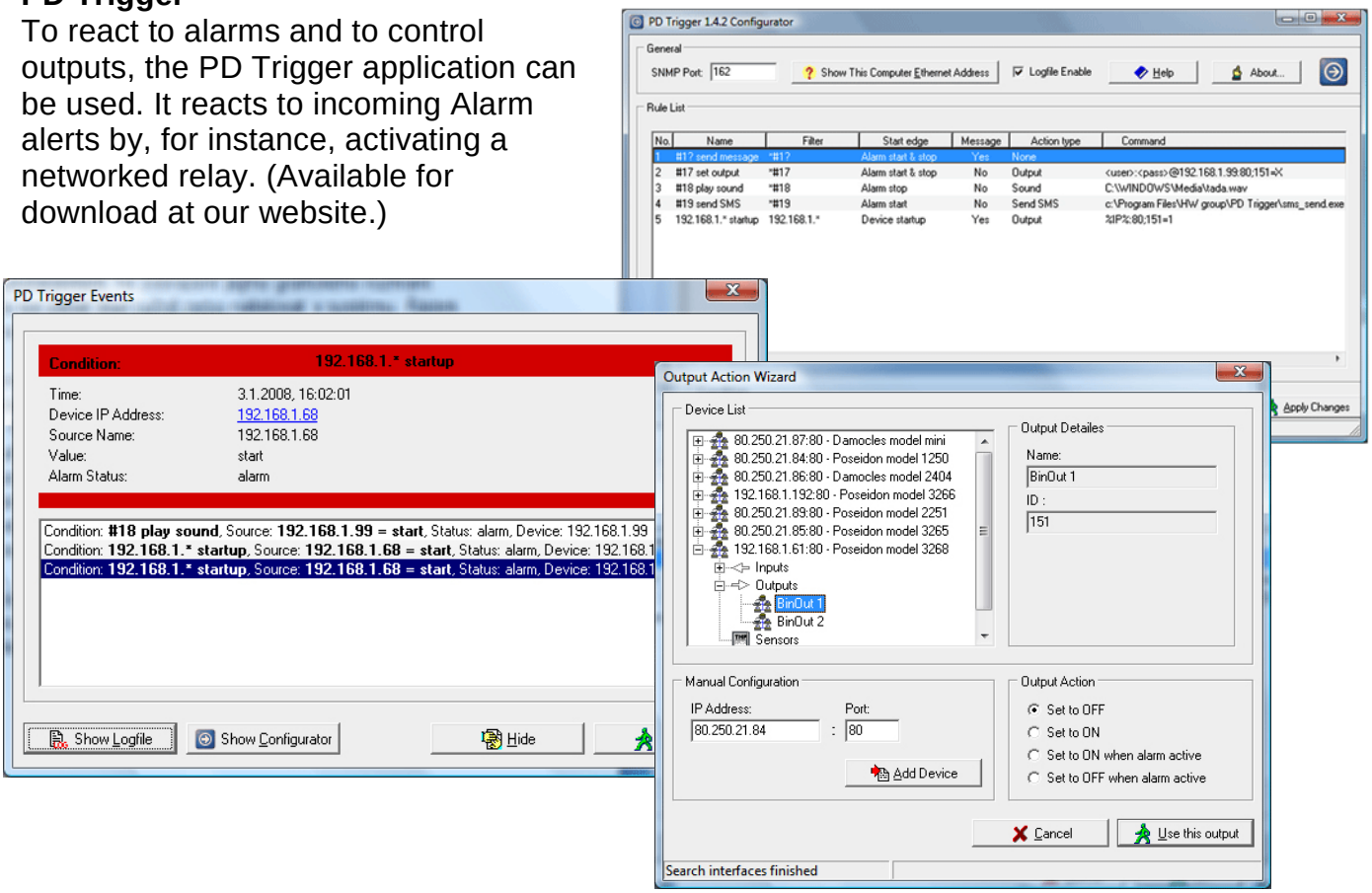
7) Controlling inputs / outputs with custom SW

- **M2M protocols**
  Your custom software can use SNMP, XML or Modbus/TCP protocols to control outputs.

- **PosDamIO**
  For simple output control using the command line, the HWg PosDamIO utility can be used**.**
  PosDamIO uploads a XML file with the requested output states to a specified IP address.
  The utility is available for Windows and Linux, including source code, as a part of our **HWg-SDK** (available for download at our website).



- **PD Trigger**
  To react to alarms and to control outputs, the PD Trigger application can be used. It reacts to incoming Alarm alerts by, for instance, activating a networked relay. (Available for download at our website.)



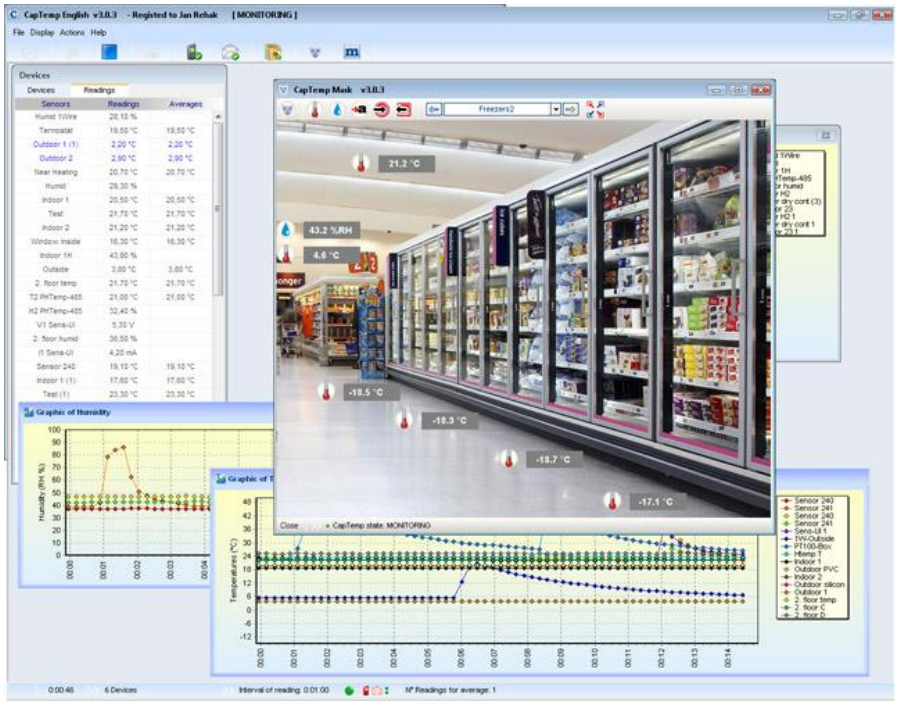
Note: *Unauthorized changes of output states can be prevented by requiring a password or configuring a range of allowed IP addresses, or completely denied by switching DIP 2 to ON. When DIP 2 is ON, output states cannot be changed.*

- **CapTemp**
  Software for collecting and analyzing sensors readings in food processing and other industries.

  CapTemp and MonTemp is a pair of utilities to monitor production processes. The programs can supervise all sensors by HW group (temperature and humidity sensors, contacts, etc) as well as sensors by other manufacturers.

  CapTemp logs the readings into an internal database, displays several most recent ones, and processes conditions and alarms. Alerts to readings within an alarm range are sent by e-mail, or by SMS via a GSM modem connected to the PC.

  MonTemp subsequently processes data stored in the database, generates graphic reports, histograms, and ISO or HACCP quality assurance protocols.

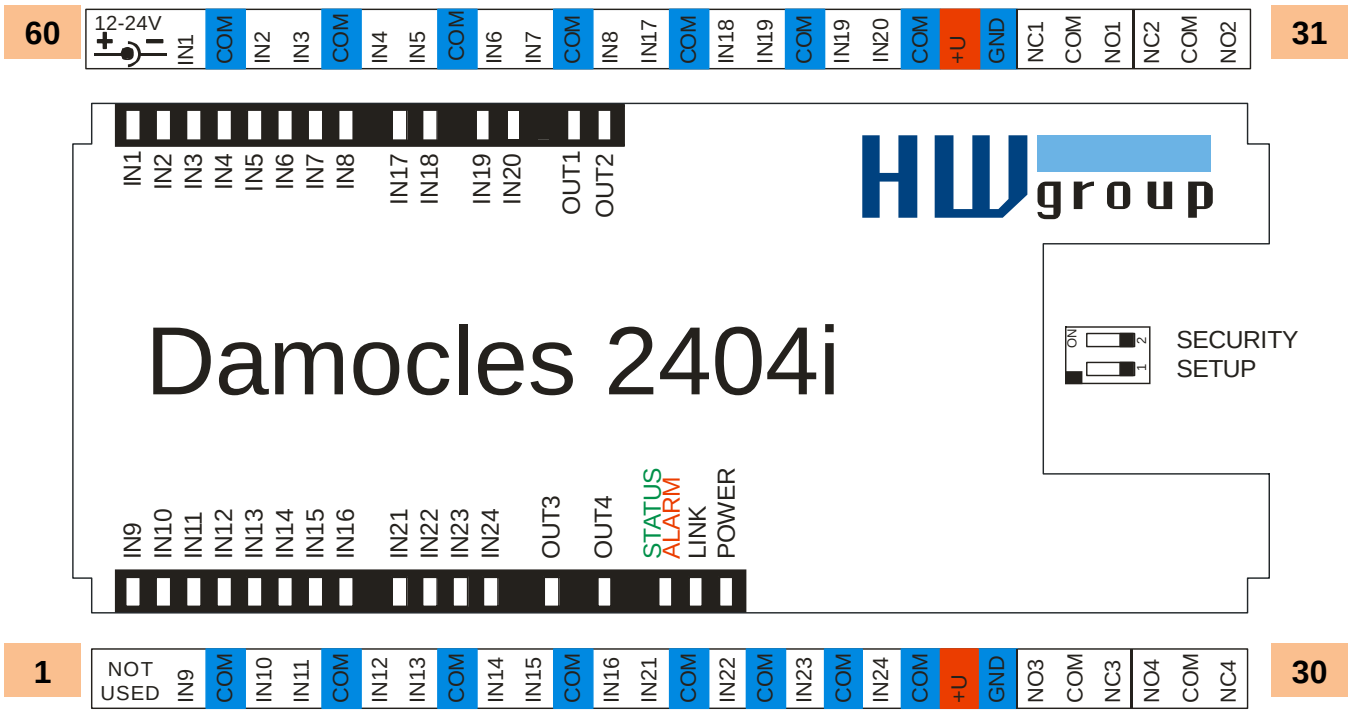


  - CapTemp supports Poseidon, Damocles and I/O Controller products
  - Alarm alerts are sent by e-mail or SMS (GSM modem)
  - Well-designed graphical environment
  - Supports conditions and rules for simple control tasks
  - Evaluation version functions for 21 days without restrictions

Technical specifications

- **Ethernet**: RJ45 – 10BASE-T/10 Mbit/s
- **24 digital inputs:** Shared “COM” terminal for every two inputs
- **4 digital outputs:** Relay contact outputs, each output controls a NO and a NC contact
- **Port 1:** RS-232 (DB9M connector), device configuration, temperature sensor connection
- **Configuration DIP switches**
  - DIP1 = On activates Serial SETUP mode (9600 8N1)
    Restores factory defaults when 5x toggled within 5 seconds after power up
  - DIP2 = On prevents changes in the configuration
- **Device features**
  - **Alarming** when a reading threshold is exceeded
  - **Remote monitoring** of input states and temperature sensor
  - **Pulse counter** for every input
  - Remote **output control**
  - **Local output control** with Alarm conditions (Group 1 and Group 2)

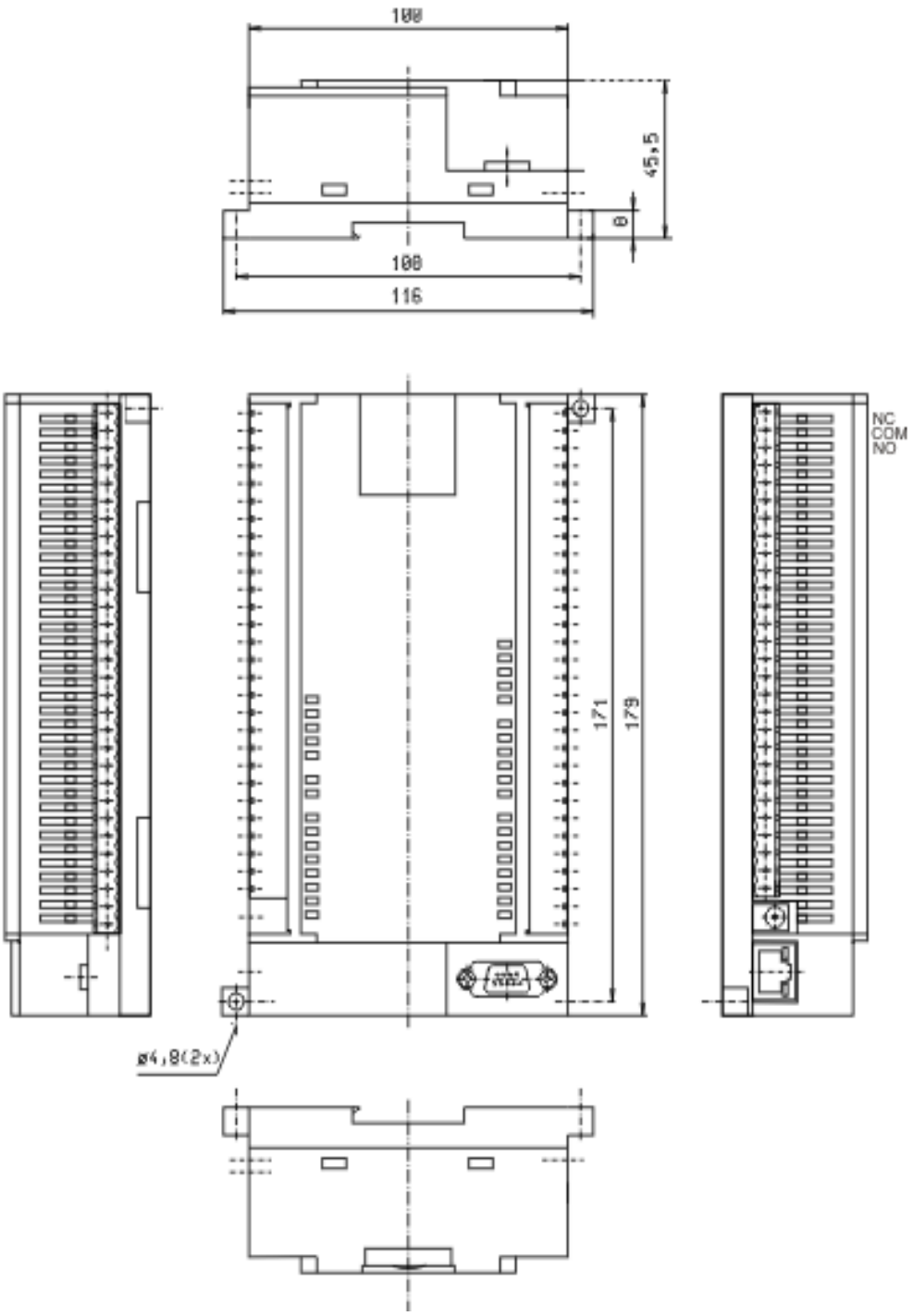
- **Power supply:** +12V / 250 mA
- **Dimensions:** 116 x 179 x 46 [mm]
- **LED indicators:** Power, LINK, STATUS, ALARM



- **COM** – Common ground for a pair of inputs
- **IN1 .. IN24** – Inputs I1 through I24, connected against a common ground (COM)
- **+U** – +12 to 24 VDC supply
- **GND** – Power supply ground, connected to the COM common grounds
- **NO, NC, COM** – Electrically isolated relay outputs

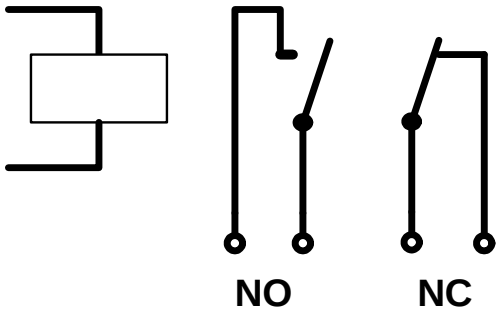
Ethernet port	
+ Interface	RJ45 (10BASE-T) – 10 Mbps or 10/100 Mbps network compatible
+ Supported protocols	IP: ARP, TCP/IP (HTTP, Modbus over TCP), UDP/IP (SNMP)
+ SNMP compatibility	Ver:1.00 compatible, some parts of the ver 2.0 implemented
Serial port 1 DB9M - RS-232	
+ Connector	Cannon 9 male (DB9M)
+ Pinout	Standard IBM PC - DB9M (RxD,TxD,RTS,CTS, GND)
+ Usage	Serial setup, 9600 8N1 Temperature sensor (max 1 sensor)
+ Max. distance	Up to 2m
Digital Inputs	
+ Input type	24 Contact Input (Ready to Dry contact or Wet contact)
+ Isolation	Optoisolated (1kV)
+ Wet contact	Logic 0: 0-3V / Logic 1: 5-30V
+ Input current	Min current 4mA, max current 50 mA
+ Pulse counter	Each Digital input , min pulse width 100 ms Power violation memory for all input counters
+ Max. distance	Up to 30m
Digital Outputs	
+ Output type	4 Relay contacts (NC, NO every output)
+ Max. load	up to 4A/24V
+ State	Power up state (NO state memory)
LED Status indicators	
+ POWER	Green - power OK
+ LINK & Activity	Green - Ethernet connectivity
+ Alarm & RS-232 Setup	Red - blinking - Device is in the RS-232 Setup mode
DIP SWITCH configuration	
+ DIP1 - RS--232 Setup mode	ON = RS-232 Setup mode over Port 1 (RS-232 mode only) OFF = Run mode **Load defaults:** Toggle 3 times during first 5 seconds after device power-up to load default settings.
+ DIP2 - Security	ON = Security mode - remote configuration disabled OFF = Non-Security mode - remote configuration enabled
+ DIP3-8	Not used
Physical parameters	
+ Voltage requirements	12-24 V/ 600 mA DC
+ Power connection	- coaxial power connector (barrel, inner 2.5 mm outer 16.3 mm) - connect power directly to the terminal board (pin 15,16 and 65, 66)
+ Dimensions / Weight	116 x 179 x 46 [mm] / 500 g
+ Temperature	-10°C to 60°C

Mechanical dimensions



DO – Outputs

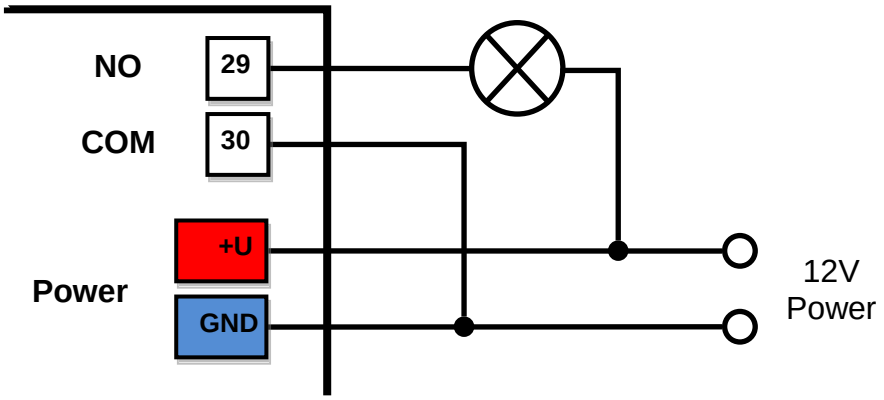
Each output controls two independent relay contacts: one “**Normally Open**” contact (**NO**, open when the power is off and after startup), and one “**Normally Closed**” contact (**NC**, closed when the power is off and after startup).



Both contacts ale electrically isolated; hence, two separate devices (one connected to the NO terminals, the other to the NC terminals) can be connected to a single output.

Contact state (closed / open) is indicated by the corresponding LED.

The picture shows an example of connecting a 12V light bulb, powered from the same source as the unit and controlled by the Normally Open contact of output No. 4.

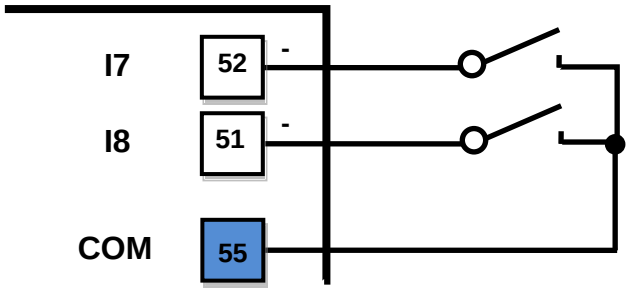


DI – Inputs

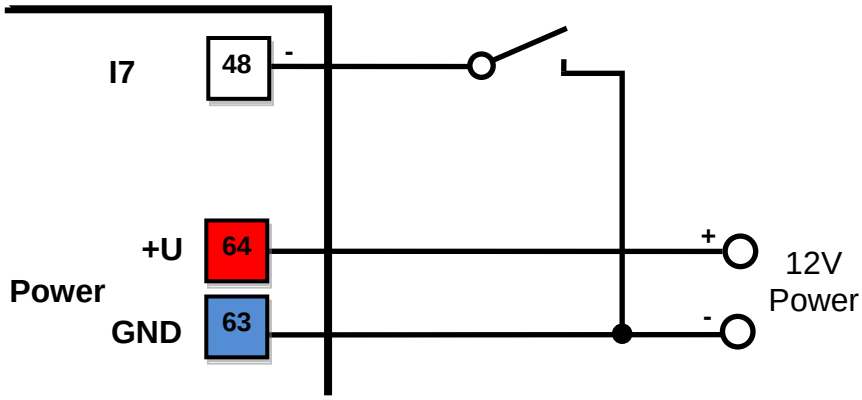
Digital inputs can be connected to external voltage, or to dry contacts (using the recommended wiring). The inputs are electrically isolated from the device supply voltage, unless the same supply is used to control them.

- Unconnected inputs read as “**0 (Off)**”.
  - **Disconnected sensor detection:** None, disconnected sensor reads as “**O (Off)**”.
- Activated inputs read as “**1 (On)**”, maximum resistance is given by the switching current and driving voltage.
  - For a 12V supply, the resistance must be less than 3kΩ.
  - For a 24V supply, the resistance must be less than 7kΩ.
- **Maximum wiring length:** 50 m
- **Supported sensors:** Any contact without external voltage (dry contact)
- **Polling period:** 800 ms
- **Range of sensor IDs:** Inputs use IDs from 1 to 24
- **Sensor names:** An input can be named using up to 12 characters
  - **State names:** Input state (On and Off) can be named with up to 6 characters (e.g. “Fuel Tank 14” “Full” / “Empty”)

Dry contact

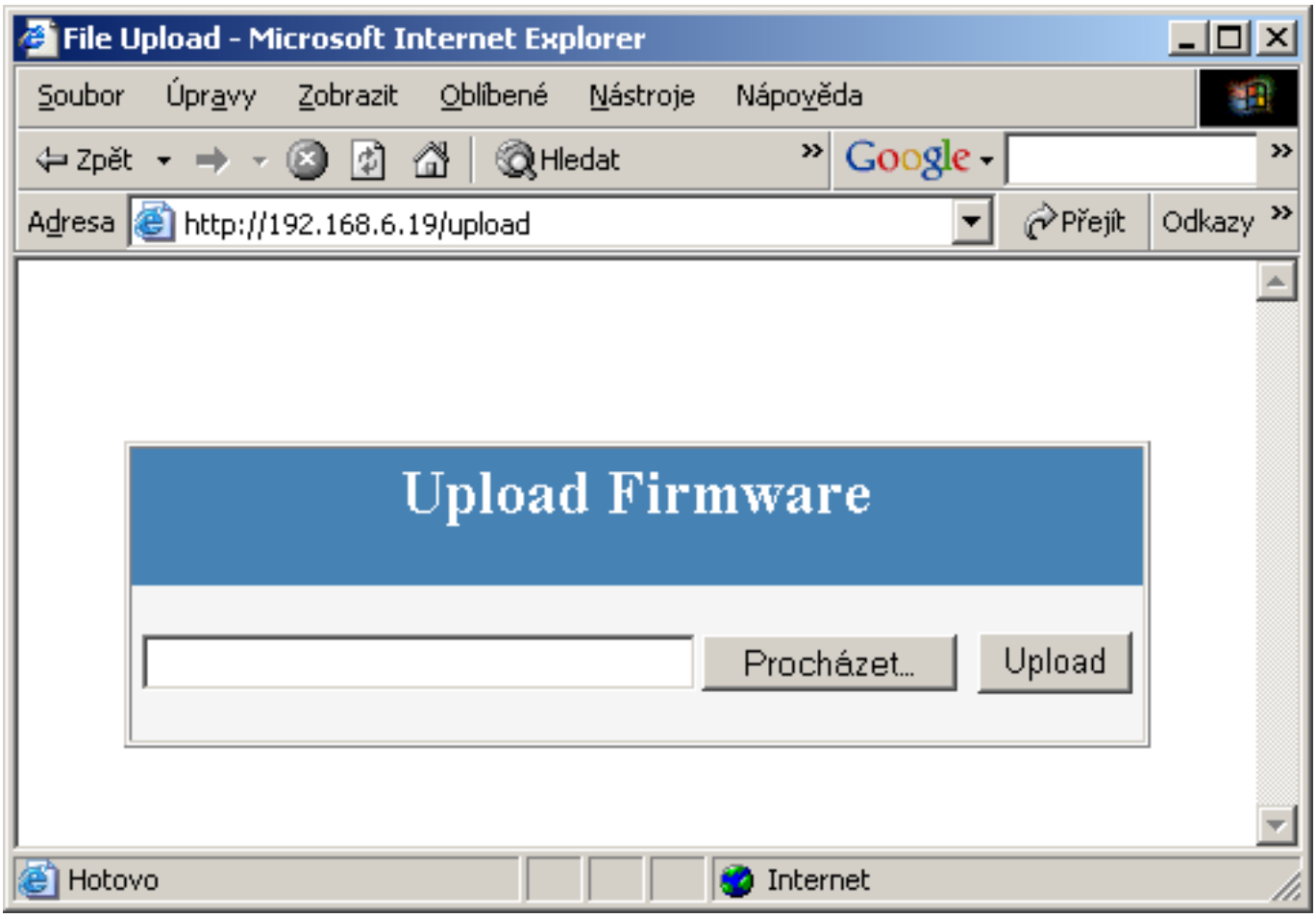


Driving an input against the supply voltage



Updating the firmware over the WEB

Upload the firmware in a **.hwg** file over http to **http://x.x.x.x/upload/**.
Connection problems etc. must be avoided during file transfer. If the update fails, upload the firmware over RS-232.



Firmware in the .HWg format is available at our website, or on the supplied CD.

TIP

- For a complete description of the **Flash Setup** user interface and for further details, see the **detailed manual for the Damocles line of products**.