



SUN-2242

User manual



Benefits and Technical Information.

SUN-2242 is an Ethernet I/O controller with build-in web server. It has **2** digital inputs, **2** analog inputs, **2** relay outputs and 1-Wire input for up to **5** temperature & humidity sensors.

SUN-2242 can be controlled and monitored over any TCP/IP network and Internet by web browser or any specialized monitoring software by SNMP v1 and v2 protocol.

Benefits

Easy and fast configuration – full configuration can be performed through the Web using a web browser

- Control and configuration over SNMP

IP security – access is protected by name and password

Removable terminal connectors

2 dry contact inputs for monitor discrete detectors - door sensor, motion sensor, smoke detector and etc. (voltage free)

2 analog inputs

2 relays with NO contacts; ON/OFF or Pulse modes

1-Wire input for up to 5 Temperature & humidity sensors

- HTTP API commands
- XML (over HTTP)
- SNTP synchronization protocol
- Firmware update over IP
- Alarm alert – SNMP trap and E-mail
- **SMTP with TLS Encryption**
- **TLS 1.0, TLS 1.1 and TLS 1.2 support**
- **E-mails to up to 2 recipients like alarm alert**
- **Dynamic DNS with support of DynDNS and No-IP services**

Power requirements

Input Voltage: 12VDC / 0.5 A (adapter)

Power Connector: Jack Ø5.5 x 2.0 / 10mm

Ethernet Interface

Connector: 8-pin RJ45

Magnetic Isolation Protection: 1.5 kV (built-in)

Number of ports: 1

Speed: 10/100 Mbps, Auto MDIX

Protocols

HTTP, DHCP, SNMP v1 and v2, SNTP, SMTP, SMTP TLS, XML

Operating conditions

Operating temperature: -20 to +70 °C

Operating Relative Humidity: 5 to 85% (non-condensing)

Digital inputs

Number: 2

Type: Dry contact

Isolation: Non isolated

Dry Contact Level: Logic "0": Short to GND

Logic "1": Open

Analog inputs

Number: 2

Type: Single ended

Input range: 0 to 60 VDC

Isolation: Non isolated

Resolution: 10-bit

Relay outputs

Number: 2

Contact type: Form A (N.O. contact)

Max. switched current: 3A

Max. switched voltage: 30VDC

Insulation Resistance: 1000 mega-ohms 500 VDC at 20°C, 50% RH

Mechanical Life Expectancy: 5 000 000 operations

Electrical Life Expectancy: 120 000 operations

1-Wire interface

RJ11 for connecting 5x temperature & humidity sensors

Physical Characteristics

Housing: Aluminum enclosure / wall mount

Weight: 170 g

Dimensions: 112 x 82 x 40 [mm]

Warranty – 2 years

Device Connection

Connect the SUN-2242 to 10/100 Mb/s network. Use a classic TP patch cable for connection to switch, router or to PC.

If the Ethernet connection is OK, the ACT and LINK indicator should light up and then ACT indicator blink according to network data transfer.

Restoring defaults factory configuration

Press and hold the Reset button located on the back of the box, connect power, and hold the button pressed for 10 seconds or more.

Default network parameters configuration:

IP address: 192.168.2.2

Network mask: 255.255.255.0

Default gateway: 192.168.2.1

IP configuration via DHCP: Disabled

User name: admin

Password: admin

Installation Guidelines

SUN-2242 controller must be installed by qualified personnel.

Controller must not be installed directly outdoors.

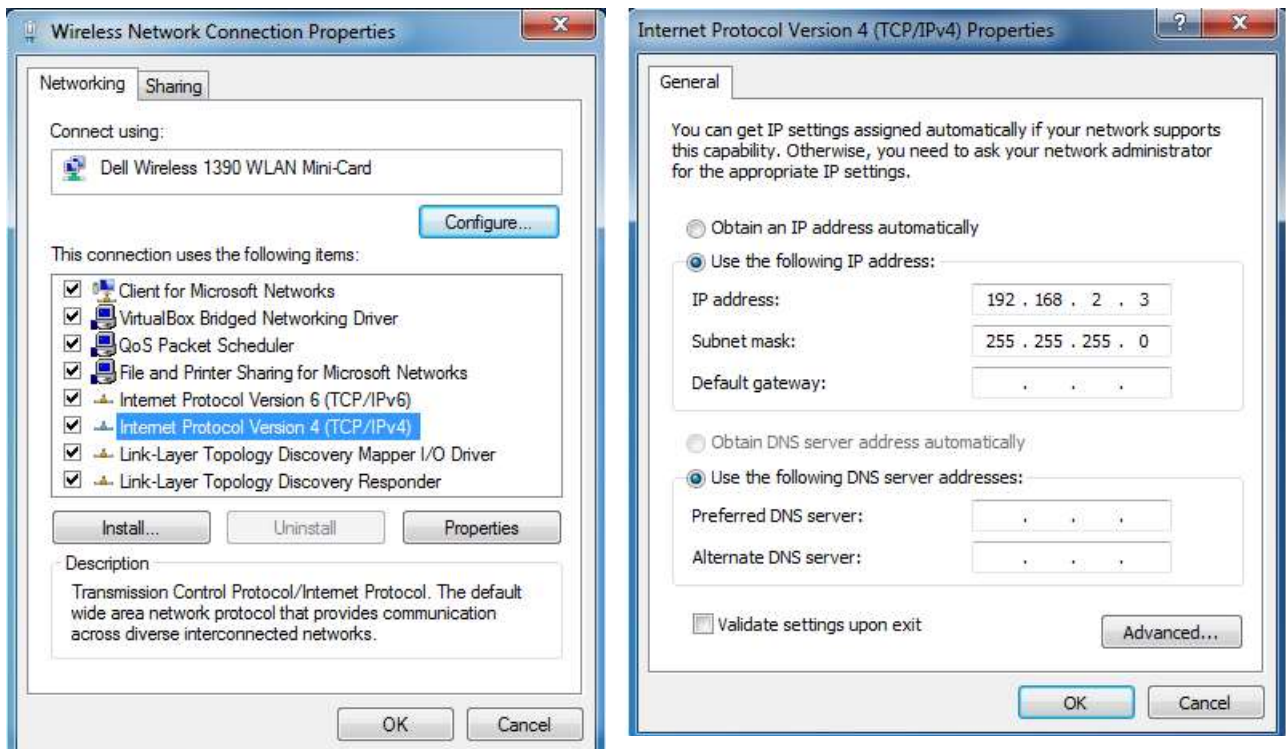
SUN-2242 must not be used for medical, life saving purposes, or for any purpose where its failure could cause serious injury or the loss of life.

This unit must not be used in any way where it's function or failure could cause significant loss or property damage.

The first step is to establish communication between computer and SUN-2242 controller.

This can be done by assigning a temporary IP address to the computer.

For computers with Windows OS assigning of IP address is made in “Local area connection properties” or “Wireless Network Connection Properties”.



IP Address of the computer should be at the same network.

Into the web browser you should type <http://192.168.2.2>. If network settings are correct the login page will appear.

Web Pages

❖ Login Page - access to the SUN-2242 is protected by name and password



❖ Status Page - Monitoring parameters

STATUS NETWORK SYSTEM ACCOUNT SNMP EMAIL SENSORS INPUT/OUTPUT DDNS UPDATE

Digital Inputs

Name	Value	Alarm State	Alarm Alert
Digital Input 1	OPEN	CLOSED	Disabled
Digital Input 2	OPEN	CLOSED	Disabled

Analog Inputs

Name	Value	Lower Range	Upper Range	Hysteresis	Alarm Alert
Analog Input 1	0.000	0.000	60.000	1.000	Disabled
Analog Input 2	0.000	0.000	60.000	1.000	Disabled

Outputs

Name	Value	Pulse Control	On/Off Control	Mode
Relay 1	OFF	<input type="button" value="Pulse"/>	<input type="button" value="ON/OFF"/>	Manual
Relay 2	OFF	<input type="button" value="Pulse"/>	<input type="button" value="ON/OFF"/>	Manual

Sensors

Status	Name	ID	Value	Lower Range	Upper Range	Hysteresis	Alarm alert	Lock
✓	Sensor 1	0000095F0A09	31.5°C	-40.0	85.0	1.0	Email	<input checked="" type="checkbox"/>
			-----	---	---	---	Disabled	
✓	Sensor 2	F815D53735F3	31.9°C	-40.0	85.0	1.0	Email	<input checked="" type="checkbox"/>
			52.8%RH	0.0	100.0	1.0	Email	
✗	Sensor 3	FFFFFFFFFFFF	-----	---	---	---	Disabled	<input type="checkbox"/>
			-----	---	---	---	Disabled	
✗	Sensor 4	FFFFFFFFFFFF	-----	---	---	---	Disabled	<input type="checkbox"/>
			-----	---	---	---	Disabled	
✗	Sensor 5	FFFFFFFFFFFF	-----	---	---	---	Disabled	<input type="checkbox"/>
			-----	---	---	---	Disabled	

Status page has 4 sections – “Digital inputs”, “Analog inputs”, “Outputs” and “Sensors”.

- **Digital Inputs section** can be used for monitoring sensors in “dry contact”(volt free) mode - motion PIR sensors, Water Leak sensors, Water level sensors, Door/window sensors, Smoke detectors.

One side of the sensor is connected to IN1 or IN2 terminal and the other is connected to GND terminal.

Please note that Digital inputs are not galvanic isolated!

- **Analog Inputs section** can be used for monitoring directly batteries, power supplies, solar panels and any analog sensor with voltage up to 60V DC.

Please note that Analog inputs are not galvanic isolated!

- **Outputs section** can be used to open/close garage door and control motors, pumps, valves, lights ...

For loads greater than 3A/30V DC an external relay should be used.

- **Sensors section** can be used for control 5x1-Wire sensors for temperature and humidity.

Maximum cable length when is used UTP cable is 50m.

❖ Network Settings page – configuration of network parameters

Field	Value
Device Name	
Enable DHCP	Static
MAC Address	54:10:EC:D3:08:55
IP Address	192.168.2.2
Gateway	192.168.2.1
Subnet Mask	255.255.255.0
Primary DNS	192.168.2.1
HTTP Port	80

Device name – up to 15 characters.

MAC address – hardware address of the device. It is unique and cannot be changed.

IP address – The SUN-2242 IP address configuration can be either static or set through DHCP.

Enable DHCP - allows device automatically obtain a valid IP address from Gateway

Gateway – default gateway IP address

Subnet mask – local network mask

Primary DNS – needs to be set properly for correct operation. Domain Name Service associates host names with IP addresses. Without a correctly configured DNS server, the following functions will not work:

- Time synchronization (SNTP), used in e-mails and SNMP traps
- E- mailing (SMTP)

HTTP Port – The TCP port used for HTTP communications with SUN-2242. A default setting for this port is 80. Value of HTTP port can be changed from 80 to 65500. It is recommended that the port be left unchanged unless the user has an understanding of TCP/IP and ports

❖ System Settings

Setting	Value	Constraint/Format
System name	IPS	max 31 symbols
System location	IPS location	max 31 symbols
Hardware version	V1	
Firmware version	V1.00	
NTP Server	time.google.com	max 36 symbols
Time zone	+03:00 hh:mm	[hh:-12 ... +12], [mm:00 ... 59]
Interval	12 h	Automatic synchronization interval
NTP status	OK	
Current time	21.06.2018,12:30:48	[dd.mm.yyyy],[hh:mm:ss]
Uptime	25days,13:40:23	
Temperature Units	°C	[Celsius/Fahrenheit]

System name – used in the XML to easy identify of the device

System location – used in the XML to easy identify of the device

NTP server – host name of the NTP server used to synchronize time of the controller

Time zone – offset of time zone with respect to that of the NTP Server.

Interval – Automatic synchronization interval. This option allows the user to specify how often the time on the SUN-2242 will be synchronized with the NTP server

Uptime - time since SUN-2242 was last powered.

Temperature Units - Specifies the unit of temperature (C – Celsius / centigrade, F – Fahrenheit)

Account Settings - One user account with username and password can be configured for HTTP access.

Sensor Settings

This page is used to configure temperature and humidity sensors.

Up to 5 x 1-Wire sensors can be connected to the SUN-2242.

Every 1-Wire sensor comes with a unique ID. After a sensor is connected must to find it by click on the button "Find sensors".of Status web page.

Name	ID	Type	Measured Value	Lower Range	Upper Range	Hysteresis	Email	Trap
Sensor 1	0000095F0A09	Temperature	31.9°C	-40.0	85.0	1.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Humidity	-----	---	---	---	<input type="checkbox"/>	<input type="checkbox"/>
Sensor 2	F815D53735F3	Temperature	32.3°C	-40.0	85.0	1.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Humidity	51.9%RH	0.0	100.0	1.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sensor 3	FFFFFFFFFFFF	Temperature	-----	---	---	---	<input type="checkbox"/>	<input type="checkbox"/>
		Humidity	-----	---	---	---	<input type="checkbox"/>	<input type="checkbox"/>
Sensor 4	FFFFFFFFFFFF	Temperature	-----	---	---	---	<input type="checkbox"/>	<input type="checkbox"/>
		Humidity	-----	---	---	---	<input type="checkbox"/>	<input type="checkbox"/>
Sensor 5	FFFFFFFFFFFF	Temperature	-----	---	---	---	<input type="checkbox"/>	<input type="checkbox"/>
		Humidity	-----	---	---	---	<input type="checkbox"/>	<input type="checkbox"/>

Name – can be entered a description up to 15 characters

ID – unique number for each sensor

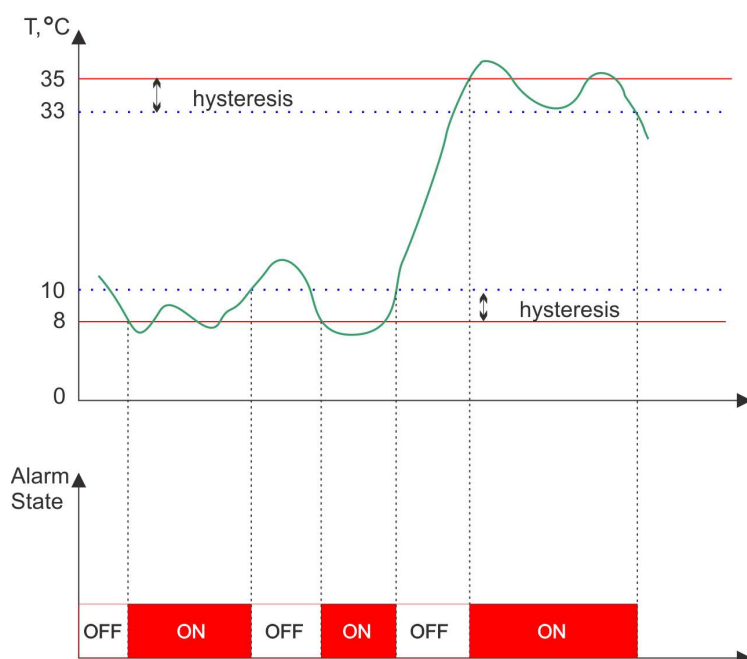
Type – Temperature or Humidity

Measured value – the value that sensor is reading.

Lower range - value below this range are considered to be “incorrect” and alarm event occurs

Upper range - value above this range are considered to be “incorrect” and alarm event occurs

Hysteresis – hysteresis is used to avoid multiple alarms when the measured value fluctuate.



Trap – device send a **SNMP Trap** when alarm event occurs and this option is checked

E-mail - device send an **E-mail** when alarm event occurs and this option is checked

After connecting new sensors or changing RJ11 connections, click again on the button of the Status web page “Find sensors”.

SNMP Settings

STATUS NETWORK SYSTEM ACCOUNT **SNMP** EMAIL SENSORS INPUT/OUTPUT DDNS CLOUD UPDATE

SNMP Settings

SNMP	Enable ▾
SNMP Port	161
Write Community	private
Read Community	public

Traps	Disable ▾
IP Address	0.0.0.0
Port	162
Community	public

[Download MIB File](#)

Save

The Simple Network Management Protocol - SNMP, is a commonly used service that provides network management and monitoring capabilities. SNMP offers the capability to poll network device and monitor data. SNMP is also capable changing the configurations on the host, allowing the remote management of the network device. The protocol uses a community string for authentication from the SNMP client to the SNMP agent on the managed device.

The **SNMP Settings** page allows you to configure the settings for communication with the device using the SNMP protocol v2.0.

SNMP settings

SNMP - Enable / Disable communication by SNMP

SNMP Port – communication port for SNMP protocol. Default port is 161.

Write Community - The community is authorized to write values to variables over SNMP. The default write community string is “private”.

Read Community - The community is authorized to read values to variables over SNMP . The default read community string is “public”.

Trap settings

Trap - Enable / Disable sending trap messages

Trap IP address — IP address of the trap destination

Trap community – default trap community is “public”

Traps are sent in following conditions:

dry contact inputs change their status

measured value on analog inputs goes outside the range

measured temperature or humidity goes outside the range

Email Settings

Mail server address can be set by hostname or IP address.

SUN-2242 supports TLS 1.0, TLS 1.1 and TLS 1.2 encryption. This ensures successful send emails with most of the public email servers .

When TLS encrypted connection is selected, the connection to the email server will be securely. TLS generally requires the use of port 465.

By default SMTP port is 25, without encrypted connection,. Sender e-mail, username, and password are standard authentication details.

There is a button for test email settings with a feedback.

The screenshot shows a web interface with a dark blue navigation bar at the top containing the following menu items: STATUS, NETWORK, SYSTEM, ACCOUNT, SNMP, EMAIL (highlighted in red), SENSORS, INPUT/OUTPUT, DDNS, and UPDATE. Below the navigation bar is a light gray panel titled "Email Settings". On the left side of this panel is a dark blue sidebar with the following labels: SMTP Server, SMTP port, Encrypted connection, User Name, Password, From, Subject, E-mail recipient 1, E-mail recipient 2, Send test email, and Test email result. The main content area of the "Email Settings" panel contains the following fields and controls: an empty text input field for the SMTP Server; a text input field for the SMTP port containing the value "465"; a dropdown menu for the Encrypted connection set to "TLS"; three empty text input fields for User Name, Password, and From; two empty text input fields for E-mail recipient 1 and E-mail recipient 2, each followed by a small square checkbox; a "Send Test Email" button; and the text "OK" below the test button. At the bottom center of the "Email Settings" panel is a "Save" button.

Inputs / Outputs Settings

STATUS
NETWORK
SYSTEM
ACCOUNT
SNMP
EMAIL
INPUT/OUTPUT
DDNS
UPDATE

Inputs/Outputs Settings

Digital Inputs

Name	Value	Low Level	High Level	Alarm State	Email	Trap
<input type="text" value="Digital Input 1"/>	OPEN	<input type="text" value="CLOSED"/>	<input type="text" value="OPEN"/>	CLOSED ▾	<input type="checkbox"/>	<input type="checkbox"/>
<input type="text" value="Digital Input 2"/>	OPEN	<input type="text" value="CLOSED"/>	<input type="text" value="OPEN"/>	CLOSED ▾	<input type="checkbox"/>	<input type="checkbox"/>

Analog Inputs

Name	Value	Units	Lower Range	Upper Range	Hysteresis	Multiplier	Offset	Email	Trap
<input type="text" value="Analog Input 1"/>	0.000	V	<input type="text" value="0.000"/>	<input type="text" value="60.000"/>	<input type="text" value="1.000"/>	<input type="text" value="1.000"/>	<input type="text" value="0.0000"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="text" value="Analog Input 2"/>	0.000	V	<input type="text" value="0.000"/>	<input type="text" value="60.000"/>	<input type="text" value="1.000"/>	<input type="text" value="1.000"/>	<input type="text" value="0.0000"/>	<input type="checkbox"/>	<input type="checkbox"/>

Local Relay Outputs

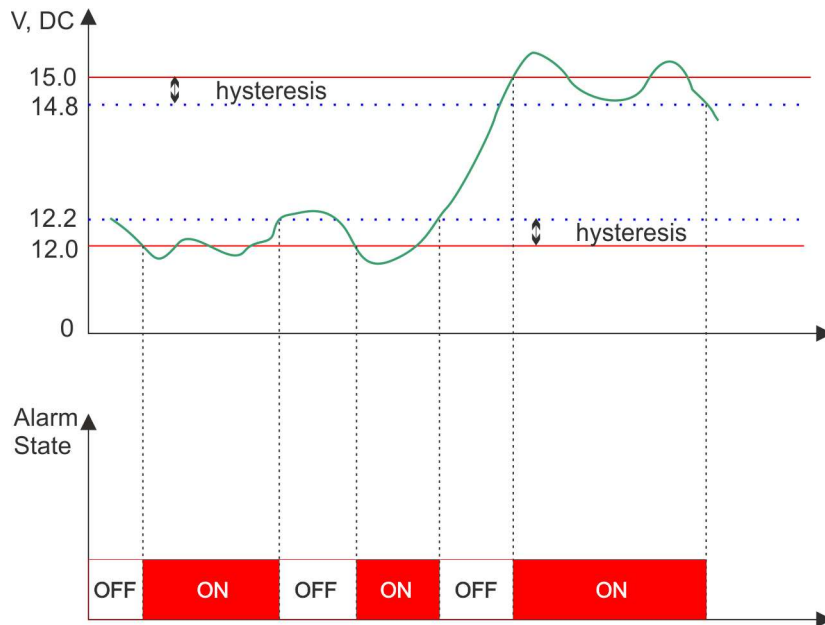
Name	Current value	Relay Control	Pulse duration, sec.
<input type="text" value="Relay 1"/>	OFF	Manual ▾	<input type="text" value="3.0"/>
<input type="text" value="Relay 2"/>	OFF	Manual ▾	<input type="text" value="3.0"/>

Name - this text field describes the function of the selected input or output. Up to 15 characters may be entered.

Digital inputs – used for direct connection of volt-free contacts. One side of the contact is connected to Input1 or Input2 and the other side is connected to terminal in the middle – GND. User can choose and type own name on the Low and High levels. Also user can choose which type of alarm to be activated – Trap or Email or both alarms. **Digital inputs are not galvanic isolated!**

Analog inputs - used for measuring DC voltages. Before using alarm alerts need to set values in the fields Lower Range and Upper Range. Parameters “Units”, “Multiplier” and “Offset” can be used to convert measured voltage from any sensor to meaningful engineering values. **Analog inputs are not galvanic isolated!**

Use hysteresis value to avoid numerous false alerts (by e-mail or SNMP Trap) whenever the reading value fluctuates around the threshold !



Local Relay Output settings can select whether the local relay to be activated manually by click button “ON/OFF” or automatic by any of the following parameters:

- Digital Input 1
- Digital Input 2
- Analog input 1
- Analog input 2
- Sensor 1 Temperature
- Sensor 1 Humidity
- Sensor 2 Temperature
- Sensor 2 Humidity
- Sensor 3 Temperature
- Sensor 3 Humidity
- Sensor 4 Temperature
- Sensor 4 Humidity
- Sensor 5 Temperature
- Sensor 5 Humidity
- Any alarm

For every Relay control can be set different time for Pulse duration. The resolution is 0.1 second. By default both relays are activated manually by web interface of the Status web page.

Only one parameter can be assigned for relay activation, at the same time.

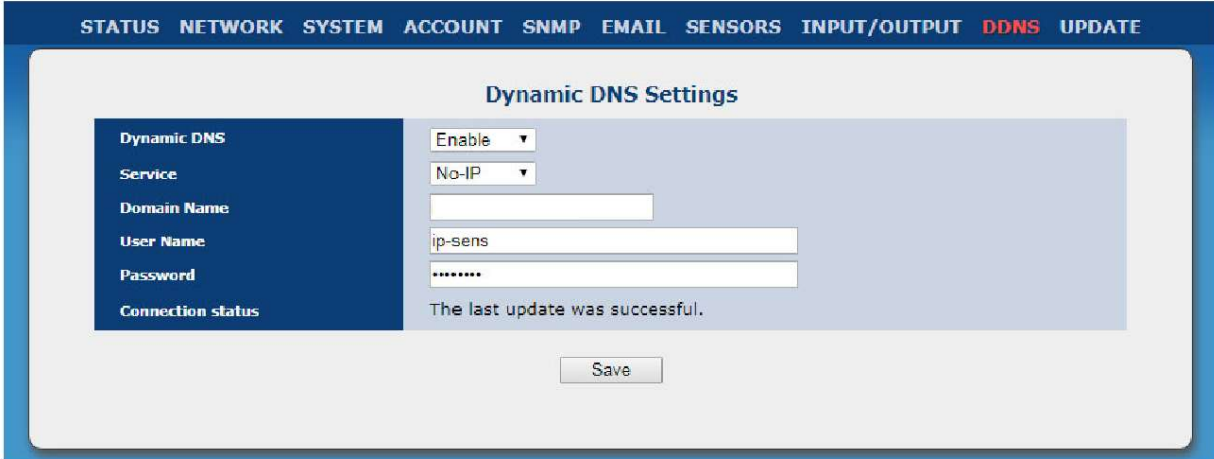
When the relay is triggered automatically by a parameter then button for manual operation on the Status page hides.

For loads greater than 3A/30V DC an external relay should be used !

Dynamic DNS

Dynamic DNS service lets you assign a fixed host and domain name to a dynamic Internet IP address .

SUN-2242 supports Dynamic DNS services from DynDNS and No-IP.

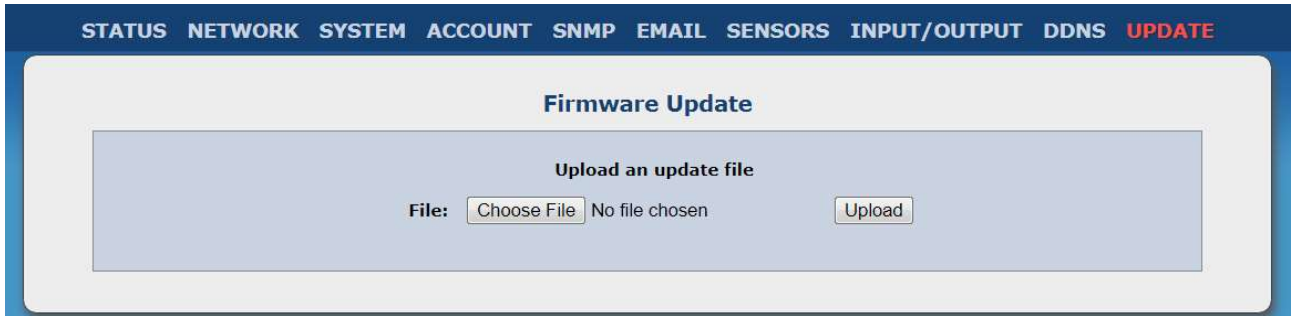


The screenshot shows the 'Dynamic DNS Settings' page. At the top, there is a navigation bar with tabs: STATUS, NETWORK, SYSTEM, ACCOUNT, SNMP, EMAIL, SENSORS, INPUT/OUTPUT, DDNS (highlighted in red), and UPDATE. The main content area has a title 'Dynamic DNS Settings' and a left sidebar with a dark blue background containing the following items: Dynamic DNS, Service, Domain Name, User Name, Password, and Connection status. The main form area contains: 'Enable' (dropdown menu), 'No-IP' (dropdown menu), an empty text field for 'Domain Name', a text field for 'User Name' containing 'ip-sens', a text field for 'Password' containing '*****', and a status message 'The last update was successful.'. A 'Save' button is located at the bottom center of the form area.

Firmware update

On this web page you can update SUN-2242 with the new firmware.

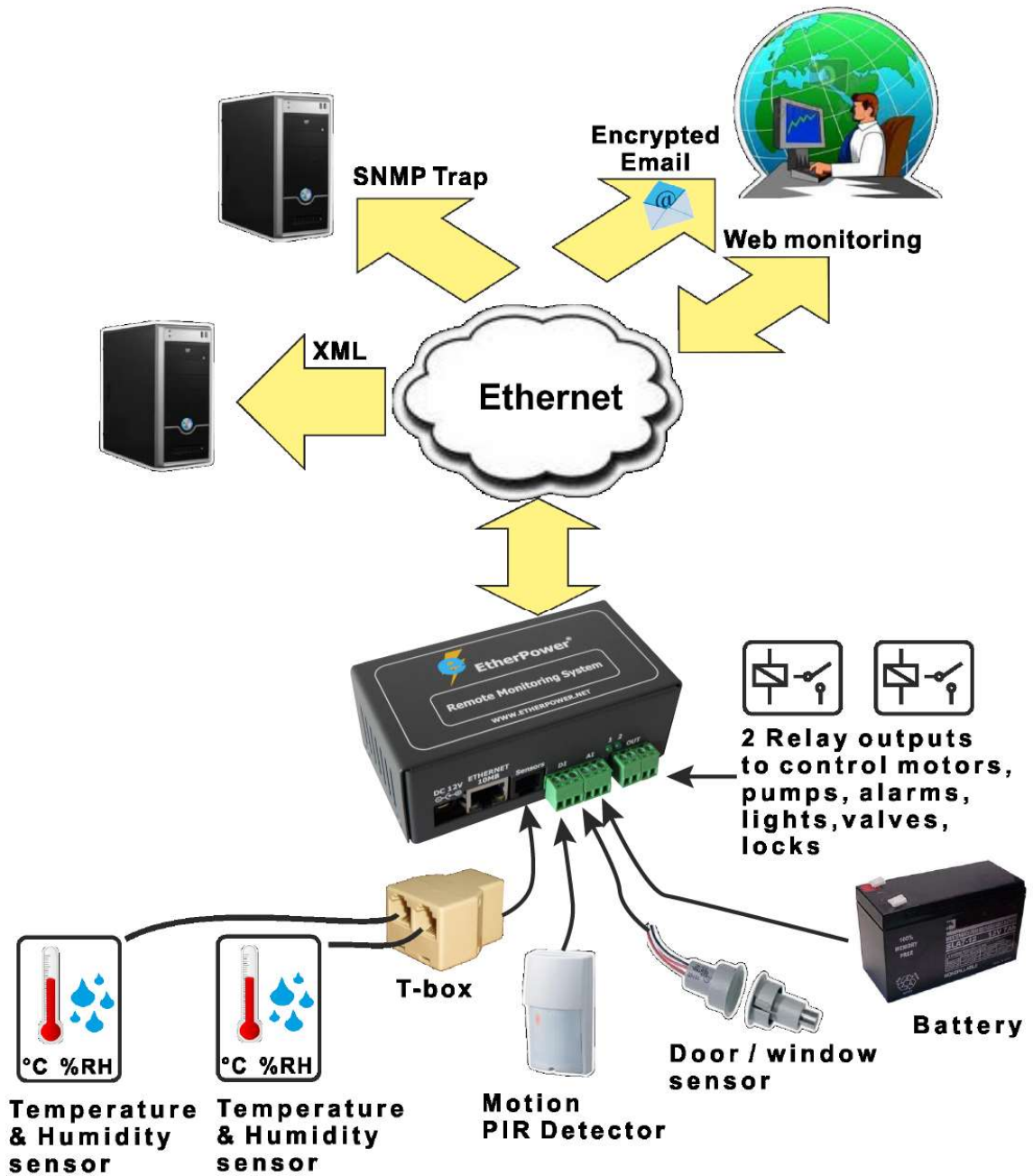
Please keep in mind not to power off the device during the update! It can damage the device!

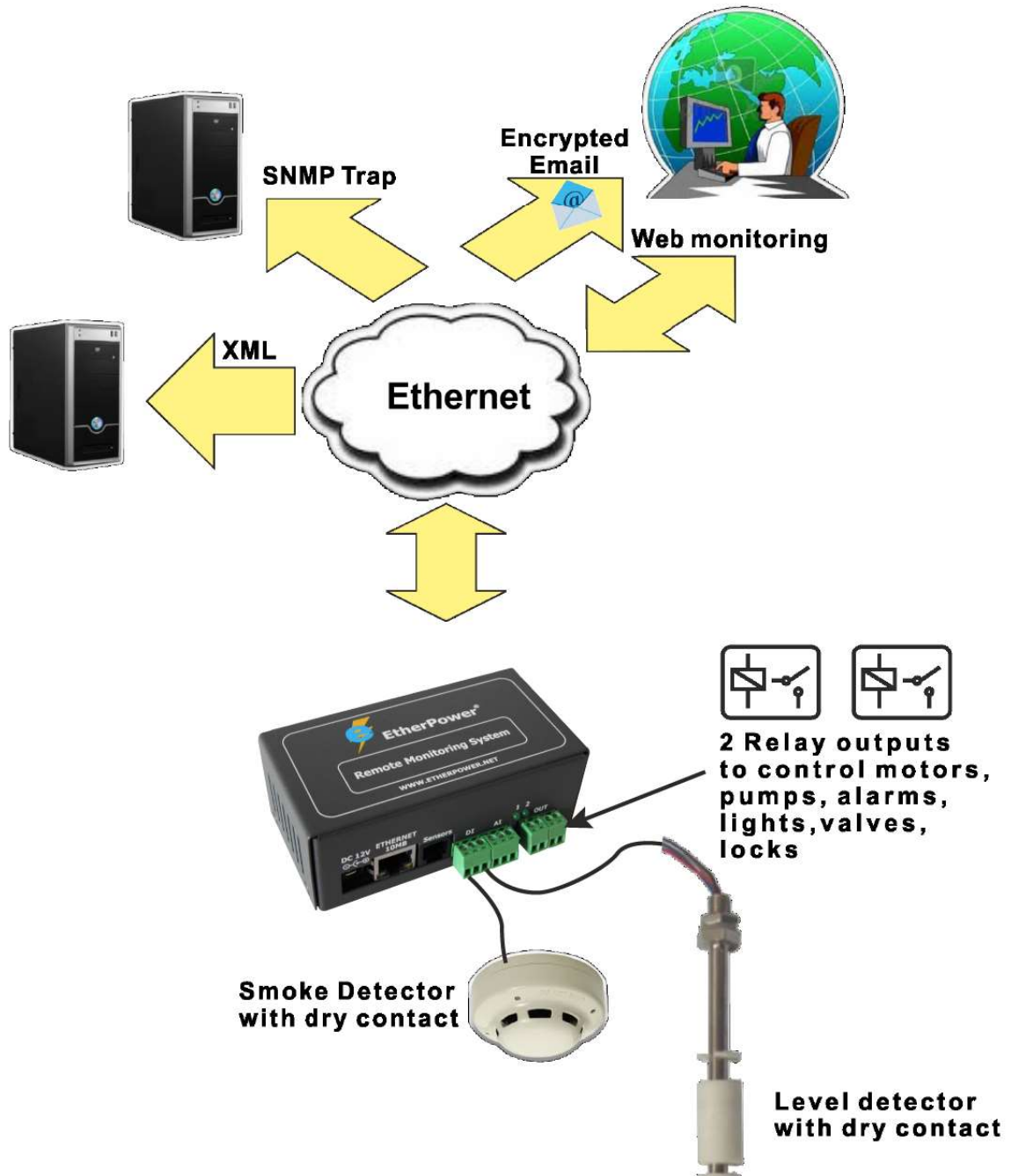


The screenshot shows the 'Firmware Update' page. At the top, there is a navigation bar with tabs: STATUS, NETWORK, SYSTEM, ACCOUNT, SNMP, EMAIL, SENSORS, INPUT/OUTPUT, DDNS, and UPDATE (highlighted in red). The main content area has a title 'Firmware Update' and a section titled 'Upload an update file'. Below this title, there is a 'File:' label, a 'Choose File' button, the text 'No file chosen', and an 'Upload' button.

Application Examples

Remote monitoring application





Control of 220V AC / 20 A motor using external relay

