

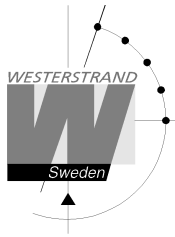
# Instructions

## Digital clock

LUMEX 5, LUMEX 7 and LUMEX 12

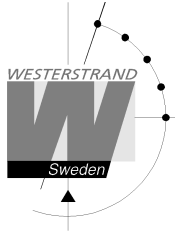
With NTP and Power-Over-Ethernet connection





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## General

Digital clock for indoor application has 4 digits and colon displaying time.  
The digits consist of 7 segments.

Example: 23:59

Digital clock for indoor application with second has 6 digits and colon displaying time.  
The digits for the second consist of 7 segments.

Example: 23:59:48

The configuration of the clock is made via a WEB-browser . The digital clock is synchronised by a NTP server. The colon will flash when time from the NTP server is accepted.

The clock has adjustable light intensity. The intensity of display has 8 levels.

If power failure occurs the display is turned off. After power failure the display is turned on and it will show bars until it is synchronised by a NTP server.

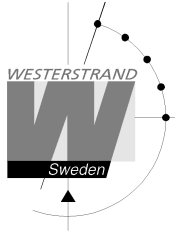
## LAN connection

The digital clocks are equipped with a RJ45 (10BASE-T) connector for direct connection to the LAN via a Power-Over-Ethernet switch. Each clock has a unique IP address. The IP address, gateway, subnet mask and server IP address is set up via a WEB-browser. If DHCP is used the clock will receive its IP address automatically from the DHCP server.

*The clock has standard IP fall back address 192.168.3.10.*

## NTP

To distribute correct time to different users in a Local Area Network (LAN) the Network Time Protocol (NTP) is used. NTP is a part of the protocol family TCP/IP. Westerstrand digital clocks type Ethernet LAN are operated and controlled by Time distributed in the Network



## Power-Over-Ethernet

Power-over-Ethernet (PoE) is a network standard based on IEEE 802.3af that provides a means of delivering power to devices connected to the LAN. This technology eliminates AC electrical wiring, wall transformers, allows centralised UPS backup, and is fully compatible with both powered and non-powered Ethernet devices. In addition to providing time synchronisation and control over Ethernet, PoE enabled Ethernet cable provides power to the clock. System installers need run only a single Ethernet cable that carries both power and data to each clock. This allows greater flexibility placing clocks and, in most cases, significantly decreases installation costs. Westerstrand clocks are fully compliant with the IEEE 802.3af standard for providing power over Ethernet.

## Functional description

### Start up

When the power cable is connected to the electronics the digital clock will show bars in the display. As soon as the clock has received and accepted the NTP signal, the display will show correct time.

### Automatic “take over function”

In case the NTP would disappear, the built-in quartz crystal will take over control of correct time.

## Installation

- Unscrew 4 screws, 2 above and 2 under, remove the back plate from the casing and mount it on the wall.
- Connect the LAN cable to RJ45 (10BASE-T) to the Power over Ethernet (POE) splitter, DATA IN.
- Mount the casing.
- Configure the digital clock.

---

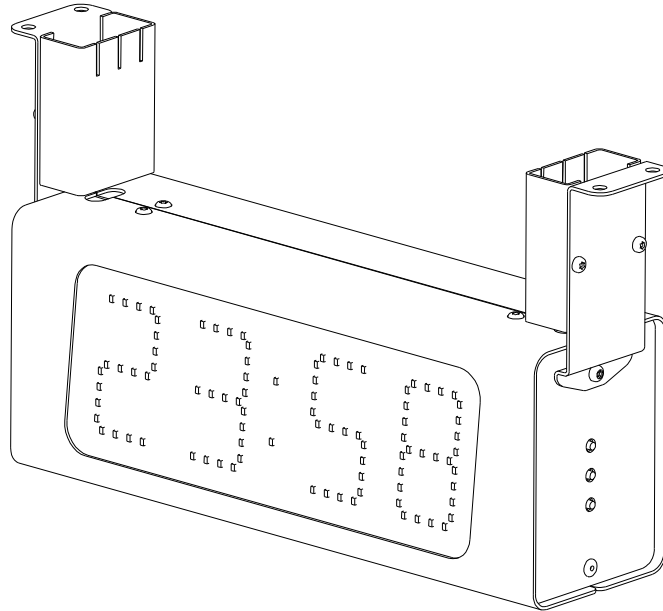
### WESTERSTRAND URFABRIK AB

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545 23 TÖREBODA

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Internet:: [www.westerstrand.se](http://www.westerstrand.se)  
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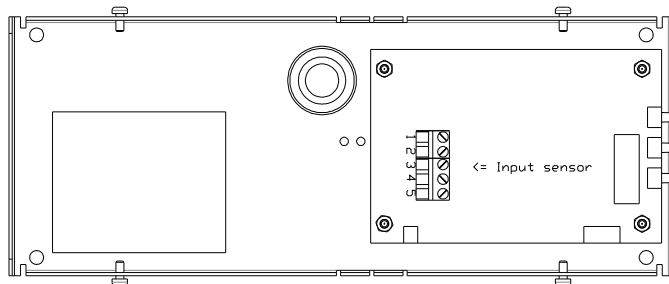
## Installation ceiling mounted



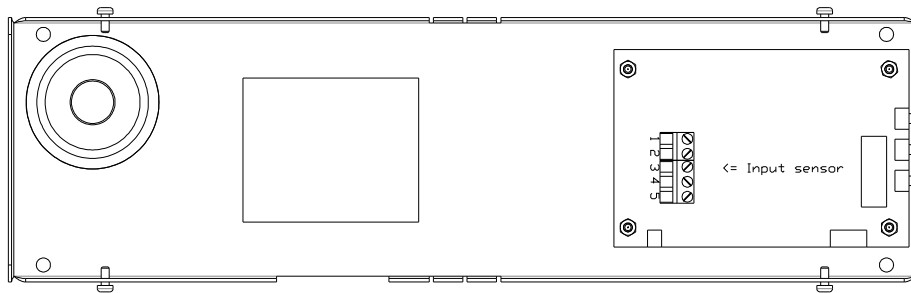
- Unscrew 2 screws under the service front.(The front when you have R,F,P buttons to the right.) Remove the front.
- Mount the 2 holder at the digital clock and mount it.
- Connect the LAN cable to RJ45 (10BASE-T) to the Power over Ethernet (POE) splitter, DATA IN.
- Assemble the front and the cover for the holder.
- Configure the digital clock

## Connection temperature sensor (this is an option).

### LUMEX 5

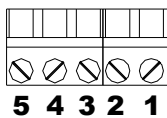


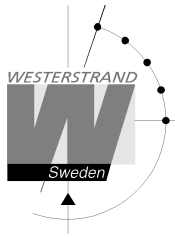
### LUMEX 5/S, LUMEX 7, LUMEX 7/S



## Input temperature sensor P.C.B (Electronics).

- 1 Brown
- 2 Black
- 5 Screen





## Configuration using a WEB-browser

### Password

A password is required. Always enter user *admin*. Default password is *password*. If the first letter of the password is blank no question about user and password will appear.

If you forget the password, then a TELNET session must be started. The last line shows a number of characters within square brackets []. Contact Westerstrand and enter this value.

Anslut till 192.168.14.201 ? X

Användarnamn och lösenord krävs för servern 192.168.14.201 på Klockan höger om kartan..

Varning: Den här servern begär att du ska skicka ditt användarnamn och lösenord på ett sätt som inte är säkert (grundläggande autentisering utan säker anslutning).

Användarnamn:

Lösenord:

Kom ihåg lösenordet

OK Avbryt

After login a function menu is displayed:



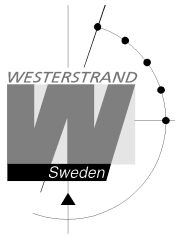
Status >>

General >>

Network >>

NTP >>

Help >>



**Status >>**

Show status of the clock. The information is refreshed every 10<sup>th</sup> second or by a click on button *Refresh*.



Status >>

General >>

Network >>

NTP >>

Help >>

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Box 133  
SE-545 23 Töreboda, Sweden  
Tel: +46 (0)506 48000

**DUX-B**

IP=192.168.3.37  
MAC=00-C0-33-0A-C8-AE

UTC=2018-10-11 11:15:36.021 Thu  
LT=2018-10-11 13:15:36.021 Thu (Summer)  
Country/Timezone=+1d (Berlin,Brussels,Paris) ,UTC=60 min.  
Summertime from 25 Mar 01:00, Wintertime from 25 Oct 01:00 (UTC)  
NTP server=192.168.3.254  
Number of time settings=1657

Dimmer[7,972] = 16

No Alarms

Uptime=100271 seconds  
Firmware=DUX-B175 (Oct 03 2018 09:20:57)

MAC	Unique address. Always 00-C0-33-aa-bb-cc. The last 3 numbers (aa-bb-cc) are found on the network card, e.g. 0AC8AE
UTC=	Current UTC time
LT=	Current Local time
Country/Timezone=	Country code (Berlin, Brussels, Paris)
NTP server=	Address of NTP server
Number of time settings=	1657 (The clock has been synchronised 1657 times)
Uptime=	100271 (The clock has been running 100271 seconds since the last power failure or reset).
Firmware=	Firmware version
Dimmer[7,972]=16	972 - Input value from sensor: Low..High means Light..Dark. 7 – Display intensity: 1..8 means low..high intensity.
No Alarms	Alarm information, e.g. NTP_timeout No answer from NTP server NTP_fail Can't open NTP port DNS_resolve Can't resolve URL

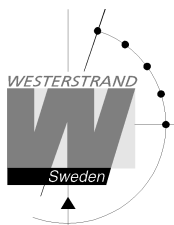
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**General >>**

Program general parameters



Westerstrand Urfabrik AB  
 Box 133  
 SE-545 23 Töreboda, Sweden  
 Tel: +46 (0)506 48000

**General**

Name	DUX-B	
Contact	Contact	
Location	Location	
Time (format <i>YYMMDD HHMM</i> )	181010 0924	
Format	time=7:59, date=28.9	12/24 hour format <input type="radio"/> 12h <input checked="" type="radio"/> 24h
Show time (s)	25	Show date (s) <input type="text" value="0"/>
Show temperature (s)	0	
Temp. offset (-9..9 °C)	0	
Temp. alarm low (°C)	-990	Temp. alarm high (°C) <input type="text" value="990"/>
Dimmer (1..8)	7	
Password	****	repeat <input type="text" value="****"/>
Firmware Download	<input type="checkbox"/>	

Save

Status >>

General >>

Network >>

NTP >>

Help >>

**Name** Symbolic name, max. 48 signs. This name is shown in the status menu.

**Time** Set time manually. The colon will stop flashing. If NTP time is read the colon will start flashing again

**Format** Select time and date format

- time=7:59, date=28.9
- time=7:59, date=28.09
- time=7:59, date=9.28
- time=7:59, date=09.28
- time=07:59, date=28.9
- time=07:59, date=28.09
- time=07:59, date=9.28
- time=07:59, date=09.28

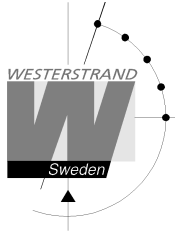
12/24 hour format Select 12h or 24 h clock.

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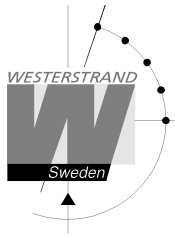
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- Show time(s)/  
date(s)/  
temperature(s)      Select display interval in seconds for time, date and temperature.  
Interval 0..25 seconds.
- Temp offset      Correction of sensor value, max. 9°C.
- Temp. alarm      An alarm is generated if the temperature is outside the limits.  
Low/high      Avoid alarms by setting impossible values, e.g. -990 and 990.
- Dimmer low/high (1..8)  
Dimmer interval.
- Password      Enter a new password. The password must be repeated. Ignore password by choosing a password with a blank as 1<sup>st</sup> character.
- Firmware Download      On: Open the clock for firmware download. The clock display becomes black. After restart this value always is *Off*. Also see section Firmware below.
- Save      Save parameters. If new password was entered then the clock will restart. Then the web reader (e.g. Internet Explorer) also must be restarted.



### Network >>

Enter general network parameters.

The screenshot shows the Westerstrand web interface. On the left is a navigation menu with links: Status >>, General >>, Network >> (highlighted), NTP >>, and Help >>. The main content area has a dark blue header with the company name and address: Westerstrand Urfabrik AB, Box 133, SE-545 23 Töreboda, Sweden, Tel: +46 (0)506 48000. Below the header are three sections: Network, SNMP Setting, and Mail setting. The Network section has a DHCP checkbox checked, with fields for IP (192.168.3.37), Gateway (192.168.0.1), and DNS (192.168.0.1). It also has IP fallback (192.168.3.10) and Subnetmask (255.255.240.0) fields. The SNMP Setting section has an SNMP checkbox unchecked and an SNMP server field (192.168.14.1). The Mail setting section has a Mail checkbox unchecked, a Mail server field (192.168.1.10), a From field (info@westerstrand.se), and a To field (16213@home.se). At the bottom of the settings is a 'Save and restart' button and a note: 'Wait 15 seconds after [Save and restart], then press Refresh'.

DHCP      Off – Static IP address according to IP below.  
            On – DHCP IP address with fallback according to IP fallback below.

IP/IP fallback IP address

Gateway      Network gateway

Subnetmask    Network subnet mask

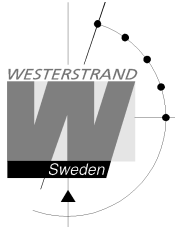
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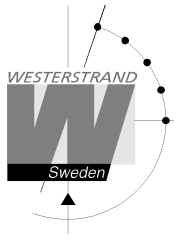
**SNMP** If SNMP is ON the clock will send SNMP traps to the selected SNMP server. The clock also will answer SNMP poll requests. Please contact Westerstrand for more information about SNMP and MIB-files.

**Mail** If Mail is ON the clock will send a message when an error is generated. The subject contains the symbolic name. A mail also is sent at midnight about temperature information.

**Mail server** SMTP mail server address

**From** Source e-mail address. Some mail servers require a valid e-mail address.

**To** Destination e-mail address. Only one recipient is supported.



**NTP >>**

Enter NTP parameters.



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Tel: +46 (0)506 48000

**NTP**

DHCP server	<input checked="" type="checkbox"/>
NTP server 1	<input type="text"/>
NTP server 2	<input type="text"/>
NTP server 3	<input type="text"/>
NTP server 4	<input type="text"/>
NTP server 5	<input type="text"/>
Broadcast/Multicast Client	<input type="checkbox"/>
Country/Timezone	+1d (Berlin,Brussels,Paris) ▼
Interval(s)	60

Wait 15 seconds after [Save and restart], then press Refresh

Status >>

General >>

Network >>

NTP >>

Help >>

DHCP server

Not checked: Select NTP server according to NTP Server below  
Checked: The DHCP server will allot a NTP sever according to option 42 in the DHCP protocol (see RFC 2132 for more information). Then the NTP Server below will be obsolete. The time offset information to UTC (DHCP option 42) is ignored, so the country information below always must be set.

NTP Server

Select NTP server, e.g. 192.168.1.237 or as an URL ntp1.sp.se. Also see DHCP server above. Up to five different NTP servers can be entered. If the first one fails it will automatically go to the next one and so on.

Broadcast/Multicast Client

Accept NTP broadcast messages. If Broadcast Client is checked and no broadcast NTP messages are received, then NTP request to 'NTP server' will start automatically according to 'Interval(s)'.

Country/Timezone

Select country/timezone. A NTP server sends UTC time. Rule for DST (daylight saving time) for each country is hard coded in the firmware. Also see DHCP server above and Day Light Savings below. See the program help file for information about available countries/timezones.

Interval(s)

Interval in seconds between NTP requests.

**Help>>**

A short help file in PDF format is displayed.

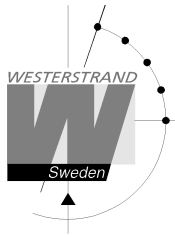
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## SNMP

### General

SNMP is enabled in function Network. The clock will send traps to the management server and answer on polls. The SNMP functions have been tested with a freeware program from IReasoning ([www.ireasoning.com](http://www.ireasoning.com)) and with Castle Rocks Management Console SNMPc. MIB files: WESTERSTRAND.MIB and WESTUR.MIB. Contact Westerstrand for further information.

### Example

Temperature low limit was set to 18 (°C). When the temperature sensor is read (once per minute) a trap is generated

The web browser will show:

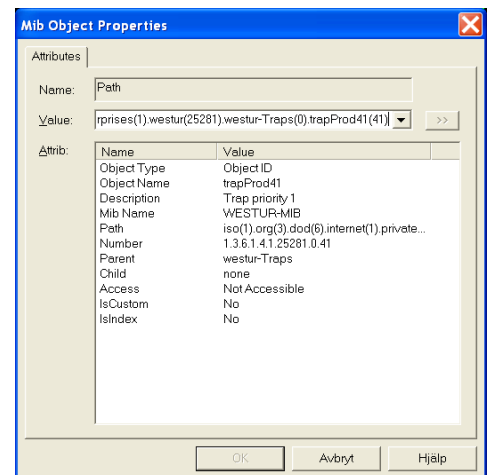
Two days ago= min. 15 °C, max. 22 °C, average. 19 °C

Yesterday = min. 17 °C, max. 20 °C, average. 17 °C

Today = 15 °C (min. 15 °C, max. 15 °C, average. 15 °C )

Alarm=Temp. low

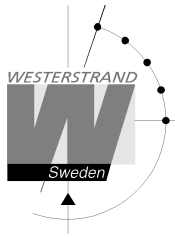
A trap 41 with data 6 is transmitted. The pictures are from program SNMPc.



Event History - 201.Lumex_5 - Any-Priority					
Normal	2008/08/26	08:51:49	201.Lumex_5	08:51:49*	[192.168.14.81]: Device Up
Info	2008/08/26	08:54:06	201.Lumex_5	08:54:06*	[192.168.14.81]: Status OK
Normal	2008/08/26	09:30:14	201.Lumex_5	09:30:14	[192.168.14.81]: Reset (29) **OK**
Info	2008/08/26	10:50:35	201.Lumex_5	10:50:35	[192.168.14.81]: No_alarms (0)
Severe	2008/08/26	10:54:13	201.Lumex_5	10:54:12	[192.168.14.81]: Temperature_low (6)
Warning	2008/08/26	10:54:34	201.Lumex_5	10:54:34*	[192.168.14.81]: Status fail, 1 error(s)
Normal	2008/08/26	11:10:44	201.Lumex_5	11:10:44*	[192.168.14.81]: Device Up

Event Properties...	
Full Message Text	10:54:12 [192.168.14.81]: Temperature_low (6)



## Traps

Traps are cleared automatically.

Trap	Explanation
41	Sever error
42	Major error
43	Minor error
44	Automatic removal of a unique trap 41-43 or information.
45	No error. Will clear trap 41-44.

Trap	Data	MIB text	Explanation
45	0	No_alarms	The clock has no errors
41	1	NTP_timeout	NTP timeout
41	2	NTP_fail	A NTP request failed
42	3	Resolve	DNS resolve failed
41	6	Temperature_low	The temperature is below lower limit
41	7	Temperature_high	The temperature is above higher limit
44	29	Reset	Power up

## Poll

The picture on the next page shows all OIDs. Use OID 'NumberOfAlarms' (1.3.6.1.4.1.25281.1001) for check number of alarms.



Picture from SNMPc:

The screenshot shows the SNMPc interface with a tree view on the left and a list of MIB values on the right. The tree view is expanded to show the 'dux' folder under 'westur'. The list of MIB values includes:

- WESTERSTRAND-MIB|dux.1=59
- WESTERSTRAND-MIB|dux.2=86357
- WESTUR-MIB|duxError=No\_alarms(0)
- WESTERSTRAND-MIB|dux.6=0
- WESTERSTRAND-MIB|dux.7=166
- WESTERSTRAND-MIB|dux.8=168
- WESTERSTRAND-MIB|dux.9=536870977
- WESTUR-MIB|duxTempNow=15
- WESTUR-MIB|duxTempMin=14
- WESTUR-MIB|duxTempMax=15
- WESTUR-MIB|duxTempAve=14
- WESTUR-MIB|ErrorTime=11:44:06
- WESTERSTRAND-MIB|westur.100.0=36 20
- WESTUR-MIB|alarm1.0=Temp. low
- WESTUR-MIB|alarm2.0=Temp. low
- WESTUR-MIB|alarm3.0=Temp. low
- WESTUR-MIB|alarm4.0=Temp. low
- WESTUR-MIB|alarm5.0=Temp. low
- WESTUR-MIB|alarm6.0=Temp. low
- WESTUR-MIB|firmware.0=DUX-A120 (Aug 26 2008 10:49:30)
- WESTUR-MIB|numberOfAlarms=1**
- WESTUR-MIB|ipDefault=192.168.14.81
- WESTUR-MIB|ipFallback=192.168.14.81
- WESTUR-MIB|ipGateway=192.168.1.1
- WESTUR-MIB|ipSubnetmask=255.255.240.0
- WESTUR-MIB|ipSNMPserver=192.168.14.1
- WESTUR-MIB|ntpServer=192.168.14.104
- WESTUR-MIB|upTime=3415
- WESTUR-MIB|nationCode=sweden(46)
- WESTUR-MIB|clockType=web\_model
- WESTUR-MIB|manual=1787LLVV.pdf, LL=language, VV=version
- WESTUR-MIB|clockIdent=Digital Clock Lumex 5 with DS18S20 sensor

Name:	numberOfAlarms
OID:	1.3.6.1.4.1.25281.1001
Descr:	Number of alarms

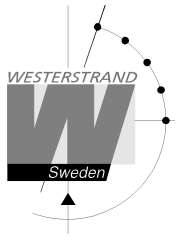
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## RASER

This program is used for finding network clocks and setting parameters. RASER sends broadcast messages on UDP port 9999. All Westerstrand Ethernet controllers will answer.

Install with setup file SETUP\_RASERxxx.EXE (xxx=version e.g. 105). Icon 'RaSer' is created on the desktop. Start the program. Click on button [Help]. Manual RASER.PDF is displayed. Check this manual for further information.

### Find a Westerstrand Ethernet module

1. Set firmware mask. Examples:

- \* Search all Westerstrand Ethernet modules (default)
- D* Search only modules with letter D in the firmware text, e.g. DUX-A122

2. Set IP mask. Examples:

- 255 Broadcast to all, i.e. 255.255.255.255 (default)
- 13* Only show answers from segment 255.255.13.255

3. Click on button [Search]. The box becomes green. Program RASER will timeout after 5 seconds. Break a search by a click on [Break].

Example: Here a search for all modules with firmware D.. was made. Total 16 module were found, but only 3 corresponds to mask D

```
RASER version 1.06 - Search Westerstrand ethernet modules

Firmware mask: DUX
IP mask: 255

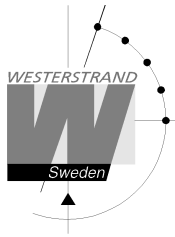
[Clear] [Break] [Search]

** Broadcast 2008-11-13 09:59:36. Mask=255.255.255.255

Unit 1: DUX-A120 (Sep 02 2008 11:21:38)
=====
Name      = Lumex 5 skrubben
Mac       = 00-90-C2-D3-C6-AC
IP        = 192.168.3.147
Subnetmask= 255.255.240.0
Gateway   = 192.168.1.1

Unit 2: DUX-A122 (Nov 13 2008 08:57:04)
=====
Name      = Digital Clock Lumex 5 with DS18S20 sensor
Mac       = 00-90-C2-CA-8E-83
IP        = 192.168.2.19
Subnetmask= 255.255.255.0
Gateway   = 192.168.1.99

Total number of answers: 12
```



## Parameters

Set parameters in selected clocks. Blank fields will be ignored by the controller.

### NTP server:

Select NTP server, e.g.

192.168.1.237

*ntp1.sp.se*

### Country:

Select country. This information is used by the controller to calculate the local time from the NTP server message.

### Interval:

Set interval in seconds between time requests.

The screenshot shows a software window titled "RASER version 1.05 - Search Westerstrand ethernet modules". Inside, there are two input fields: "Firmware mask" with the value "DUX-A104" and "IP mask" with the value "255". A "Parameters" dialog box is open in the foreground, containing the following fields and options:

- NTP server: 192.168.1.237
- Country: SWE (selected in a dropdown menu)
- Interval: 67
- Reply:
- Restart:
- Transmit button

### Reply:

Send an answer from modules affected by the parameters. This assumes that checkbox [Restart] is unmarked. See section *Find a Westerstrand Ethernet module* above for the reply format.

NOTE. Firmware DUX-A will automatically restart so replies never are displayed.

### Restart:

Force restart the controller.

### Transmit:

Send selected parameters. At least 4 letters in the beginning of the firmware mask must correspond to the real firmware name.

### More functions:

If the info window is right-clicked more functions are displayed.

- |                     |                          |
|---------------------|--------------------------|
| [Clear]             | Blank the info window    |
| [Log communication] | Log communication. Test. |
| [About]             | Show program information |

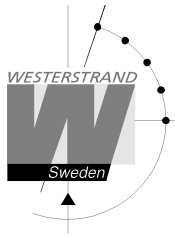
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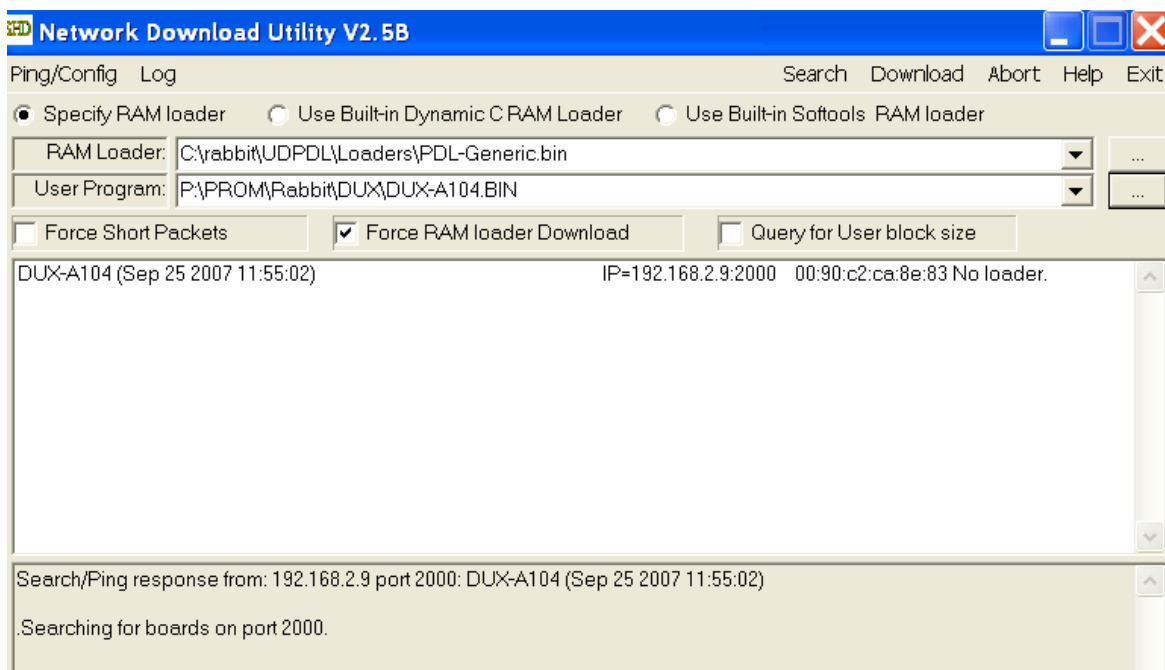


## Firmware

With program UDPDownload.exe new firmware could be download via Ethernet.  
Before download current clock firmware must be activated. This is done from the Web I function *Genera*>>. Select *Firmware Download/On* and *Save*. The clock display became black.

Start program UDPDownload.exe.  
Select RAM Loader *PDL\_Generic.bin*. This file is found on the same folder as UDPDownload.exe.  
Select new firmware file. Here *DUX-A104.BIN*.

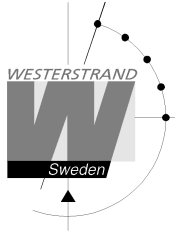
The program searches for activated download units.



Here only one unit with IP address 192.168.2.9 was found. A new search could be done by entering *Search*.

Select the clocks for downloading new firmware. No select is required if only one clock was found.  
Enter *Download*. The download starts automatically. After download the clocks restarts and the white screen will be blank.

Check the clocks on the network with program RASER.



## Technical data

### General:

LED viewing angle: 140 degrees  
Temp.sens.(factory opt.): Dallas DS18S20 with accuracy 0.5°C from -10°C to 85°C.  
Running reserve: 24 hours internal time keeping  
Power supply: IEEE 802.3af

### Network:

Protocols supported: SNTP, RFC1769, SNMP v1 Enterprise MIB (RFC 1155 - 1157), HTTP, Telnet  
Transport protocol: TCP/IP  
IP address assignment: Fix IP address or DHCP  
Compatibility: Ethernet version 2/IEEE 802.3  
Ethernet: Supports 10BASE-T (RJ45) connections  
Device Management: Web-Based  
Additional information: Support for DNS

### Environmental:

Temperature range: 0 °C till +40 °C.  
Relative humidity: < 80% Non condensing