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WESTERSTRAND LUMEX5 NTP Digital Clock Time System User Manual

WESTERSTRAND LUMEX5 NTP Digital Clock

Time System User Manual

User Manual

Digital Clock

LUMEX5 NTP, LUMEX7 NTP, LUMEX12 NTP

LUMEX5S NTP, LUMEX7S NTP, LUMEX12S NTP

Contents

General

LUMEX5,LUMEX7 and LUMEX12 are Digital Clocks for indoor use, displaying time in hours and minutes. The time can be displayed in either 12- or 24-hour format. The clock can also be configured to show the time, date and temperature alternately. Light intensity of the digits is adjustable by an automatic dimmer control. The clock is prepared for time synchronization by Network Time Protocol (NTP) from an NTP server. If the connection to the NTP server is lost the clock will continue to run on the built-in time base. Configuration of network settings, light intensity and other parameters is done via a WEB-browser.
The factory default setting for the IP address assignment is DHCP with foldback IP address 192.168.3.10. Please

note, if default settings are used no configuration is needed.
The clock is powered by 230 V mains. In case of power failure, the display is turned off, but the builtin real-time clock will continue to run for 48 hours. When the power is restored it will resynchronize automatically.

Functional description

Start up
When the power cable is connected to the electronics, the clock will display the time from the internal timekeeper. If no correct time, the display will show lines. After some seconds, the clock tries to receive a correct time message from an NTP server and then display correct time. In case the NTP would disappear, the clock will run on built-in quartz crystal.

Synchronisation

NTP
The clock is prepared for time synchronization by Network Time Protocol (NTP) from an NTP server. When a correct time message is received the clock will display correct time automatically. The colon between hours and minutes will flash when the clock is in sync and the time message is accepted.
Standalone
If the clock does not have an external synchronisation, it operates standalone.
Safety
Installation and maintenance of this device must be performed by accredited personnel. This product must not be installed by unauthorized users/operators. Electrical installation of the equipment must comply with applicable electrical standards.

Installation

Wall installation of single-sided clocks

- Unscrew 4 screws, 2 above and 2 below. Remove the back plate from the casing and mount it on the wall. We recommend Ø4mm and 30mm long screws adapted to the material of the wall.
- Disconnect the power before permanent installation. The cable must be double insulated and stripped to a maximum of 3 cm. It must also be secured with the cable relief.
- Connect the LAN cable to RJ45.
- Connect the power 230VAC, 50Hz. When the clock is permanently installed a readily accessible disconnect device shall be incorporated in the fixed wires.
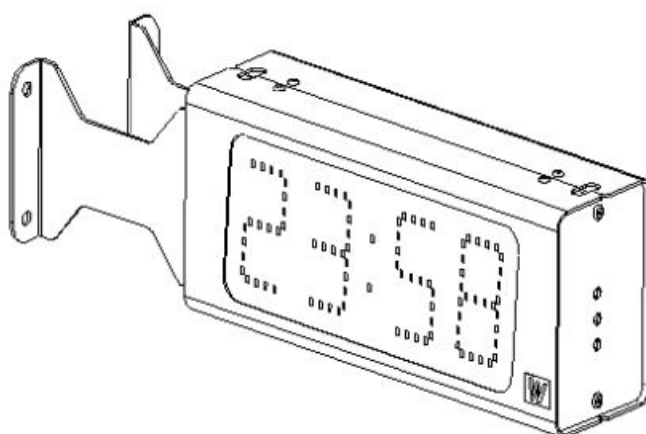- Mount the front on the back plate and fasten the 4 screws.
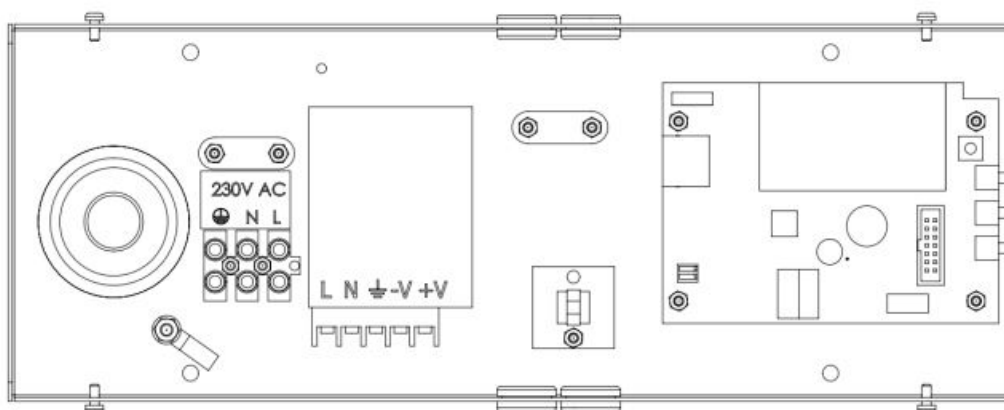
Ceiling mounted installation
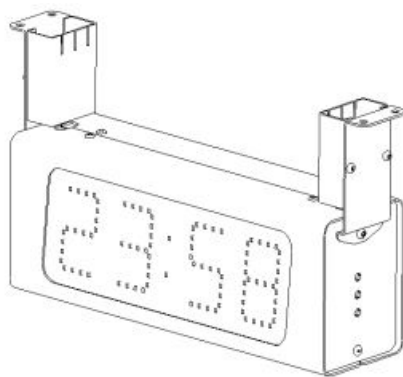
- Unscrew 2 screws under the service front (the front when you have R,F,P buttons to the right). Remove the front.
- Mount the 2 holders at the digital clock and mount it on the wall.
- Connect the LAN cable to RJ45.
- Connect the power 230VAC, 50Hz. When the clock is permanently installed a readily accessible disconnect device shall be incorporated in the fixed wires.
- Assemble the front and the cover for the holder.

Wall installation double-sided clock

- 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 holders at the digital clock and mount it on the wall.
- Connect the LAN cable to RJ45.
- Connect the power 230VAC, 50Hz. When the clock is permanently installed a readily accessible disconnect device shall be incorporated in the fixed wires.
- Assemble the front.

Temperature sensor, temperature/humidity sensor or external dimmer (Option)
If a temperature sensor is used, connect it to the CPU board according to the pictures below.
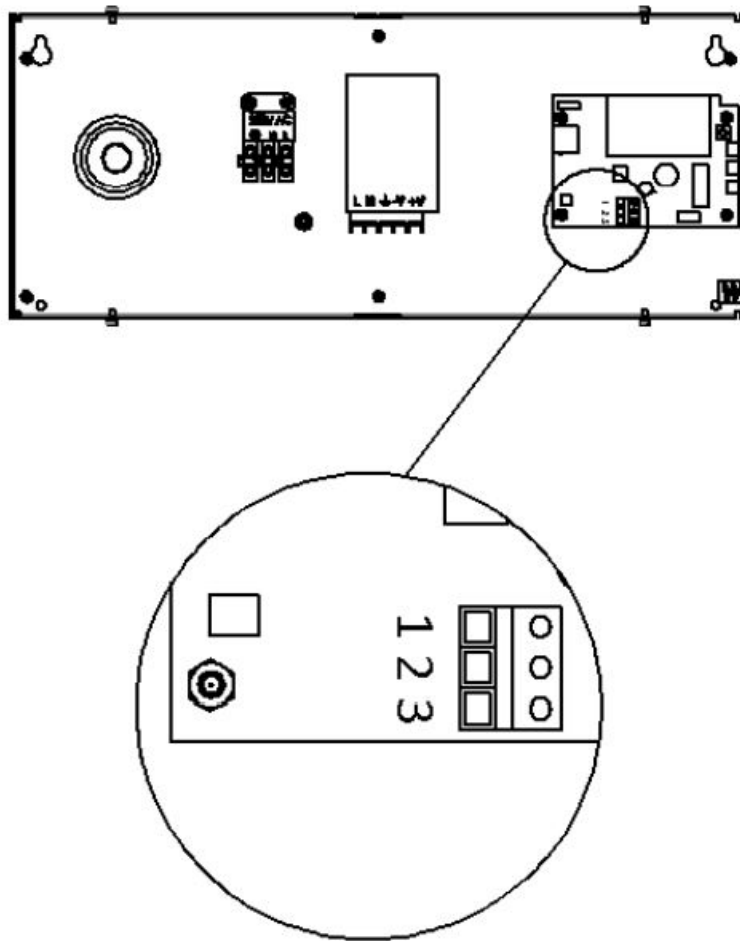
1. Red

2. Black

3. Shield

Configuration using R F P buttons

General
Configuration of network settings, light intensity and other parameters is done via a WEB-browser. Some of the parameters can also be set using three buttons located at one side of the clock. Please note, if default settings are used no configuration is needed. The programming is made with push buttons placed on the side of the clock (see below).
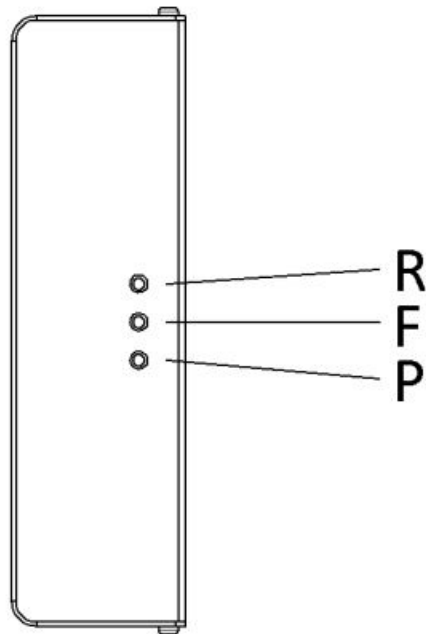
Button
[R] Return Enter base mode (display time)
[F] Function Next function / Accept displayed value
[P] Program Enter the displayed function / Increase displayed value. Hold button for rapid count.

Programming time

1. Push [F] until display shows

   > ti nE

2. Push [P] and display shows

   > yy 13   (year)

3. Push [P] until desired year (00-99) and accept with [F]

4. Display shows

   > nn 1   (month)

5. Push [P] until desired month (1-12) and accept with [F]

6. Display shows

   > dd 1   (day)

7. Push [P] until desired date (1-31) and accept with [F]

8. Display shows

   > hh 12   (hour)

9. Push [P] until desired hour (0-23) and accept with [F]

10. Display shows

    > nn 07   (minutes)

11. Push [P] until desired minute (00-59), accept with [F] and clock starts

    > ti nE

12. Display shows

13. Push [R]. Program finished

14. Display shows the set time

Setting light intensity
The light intensity for the digits can be adjusted in 8 levels. An automatic dimmer function regulates the light

intensity within each level.

1. Push [F] until display shows

| di SP |
(display)

2. Push [P] to select

3. Display shows

| di 1 |
(display intensity)

4. Push [P] until desired intensity (1 – low, 8 - high) and accept with [F]
5. Push [R]. Program finished

View / configure IP address
The Clocks IP address can be either static or dynamic (DHCP). Configuration of IP addressing work mode is done using a web-browser. The default setting is DHCP. Using the R F & P buttons it is possible to view or change the current IP-address. It is also possible to see if the Clock is using static or dynamic IP address. If the work mode is DHCP it is not possible to change the IP address manually.
To view the current IP address: In this example we demonstrate IP address 192.168.2.51

1. Push [F] until display shows

| IP d |
(IP mode)

   IP mode d = dynamic (DHCP), s = static IP
2. Push [P] to select

3. Display shows

| A1 92 |
(first part)

4. Push [P] to select

5. Display shows

| b1 68 |
(second part)

6. Push [P] to select

7. Display shows

| C 2 |
(third part)

8. Push [P] to select

9. Display shows

| d 51 |
(fourth part)

10. Push [R]. Return to base mode

Configuration using a WEB browser

Login
It is possible to login as administrator or guest. The administrator has the rights to read and to write/change configuration. A guest can read only.

Username
admin or guest.

Password
Enter a password. Default password is password. After the login a function menu will be shown.

Status

Westerstrand Urfabrik AB

Refresh

Name	Clock_Name
UTC	2020-01-24 09:43:54, week 4 Fri
LT	2020-01-24 10:43:54, week 4 Fri
Timezone	UTC+01:00, winter (CET)
IP	192.168.2.23 (DHCP)
Netmask	255.255.240.0
Gateway	192.168.1.1
DNS	192.168.1.13
MAC	00-07-09-10-1E-D1
Alarms	No alarms
NTP	Synchronized: (172.16.0.70), s=2, n=132, TO=59 m
Sensor	Dimmer=4/5, Sensor=10905, Temp=22 °C
Uptime	0 day, 21 h, 51 min, 22 sec // Total: 78682 sec
Firmware	LISA-Q162 (Jan 20 2020). BOOTK64-X150

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Name	Symbolic name. The name is set in function *General*
UTC/LT	Current time
Timezone	Offset to UTC during normal time (=winter time).
IP	The Clocks IP address
Netmask	Shows the netmask setting
Gateway	Shows the IP address of the gateway
DNS	Shows the IP address of the DNS server
MAC	A MAC address has format 00-07-09-xx-xx-xx

Alarms	Shows if the Clocks has any alarms. The following alarm texts can be displayed.
	No Alarms = Clock OK.
	Not synchronised = The Clock is not synchronised.
	5-minute limit = The received time message is more than 5 minutes wrong compared to internal time. The message is not accepted.
	Authentication = The MD5 authentication has failed.
	Temp is out of bounds = Temperature reading is currently out of bounds.
NTP	Synchronised = The clock has been synchronised from an NTP server with name/IP ntp.se
	s = Stratum, time quality. A low value is better.
	n = Number of time settings from this NTP server.
	TO = Timeout in minutes before NTP alarm.
Sensor	Dimmer=4/5: Current dimmer value / Set dimmer level. Maximum value 8.
	Sensor=8784: Current light sensor data. Possible values 0-65535.
	Temp=21° C: Current temperature reading.
Uptime	Time in operation since last power failure.
Firmware	Present firmware version.

Network
Enter general network parameters.

DHCP
Off Static IP address according to static IP below. On DHCP IP address with fallback according to IP fallback below. Fallback: If DHCP is activated this will be the DHCP fallback address.

Static IP To be checked if static IP address is used.
Address: Enter the static IP-address.
Subnetmask: Enter the subnetmask.
Gateway: Gateway IP address.
DNS: IP address of DNS server. Two different addresses can be entered, DNS1 and DNS 2.

Utilities Syslog: Syslog server IP address. Send syslog messages if checked.
Identity access: Identify access is used in combination with application software Wunser. Wunser is a PC program that is used for finding and doing light configuration on Westerstrand Ethernet products. Firmware updates are

also handled by Wunser. Wunser uses UDP port 9999 when communicating with other Westerstrand products and UDP port 69 when downloading new firmware. These ports can be open, closed or prepared for encrypted communication. Identify access = Normal ; port 9999 and port 69 is open. Identify access = Password ; port 9999 and port 69 are using AES encryption. The password used is
the same as the administrator login password. Identify access = Disabled ; port 9999 and port 69 is closed.
Telnet: Use of Telnet protocol allowed if checked. Web server: Use of HTTP protocol (web-browser) allowed if checked. HTTPS: Use of secure communication protocol HTTPS (web-browser) if checked.

SNMP This function is used to activate the SNMP, enter the address of one or more SNMP servers and to define the SNMP community. The IP address can be specified as an IP address or as a full domain name. Up to three SNMP server addresses can be entered.

Trap type: This function is used to choose SNMP trap version. Trap type v1 = Trap according to SNMPv1 Trap type v2 = Trap according to SNMPv2

NTP
NTP settings

General Description
Westerstrand NTP Clients has several features to achieve a reliable and accurate time. The configuration of the different facilities is flexible, and the features can be selected or deselected depending on each customer's individual needs. As an NTP Client the unit has three different ways to determine the most accurate and reliable candidates to synchronize the system clock. Which model that is used depends on the specific installation and the customer requirements. The NTP client has also a server list where up to 5 different time servers can be entered. The three different ways are:

1. FIRST Always use the first server in the list if available. If not available, take the next one. This suits

   installations where it is more important to know exactly from where the clients get time than to have the most

   accurate time. The other NTP servers in the list will then be more of backup servers.

2. STRATUM Use the NTP server with best stratum. The software sends a request to all servers in the list and

   uses the time from the one with best stratum. If same stratum it will use the one that is first in the server list.

   This suits installations where it is important that the time is coming from a time server high up in the pyramid.

3. MEDIAN Send a request to all servers in the list and use the median value (the NTP server that is in the

   middle). This will filter out all misleading time messages.

   In addition to these rules there are some more features such as synchronization limits and a clock discipline

   algorithm is also included. This algorithm measures the oscillators drift over a longer period and makes

   compensations for the drift.

DHCP option 042
Ask for time using the server IP addresses received from the DHCP server (DHCP option 0042). Maximum 2 NTP servers are set automatically by option 0042.

Broadcast
Accept broadcast/multicast time messages. Broadcast address: 255.255.255.255

Multicast
Accept multicast time messages. Multicast address: 224.0.1.1

NTP server Select NTP servers, e.g. 192.168.1.237 or as an URL ntp.se. Also see NTP mode=DHCP 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.

Set local Time Used for manual time setting.

Interval Interval in seconds between NTP requests.

Remove time at alarm This function is used to define how the clock should behave during a NTP synchronization alarm. See Alarm timeout below. If the checkbox is checked the clock will show –:– in case of synchronization alarm. If the box is not checked, the clock continues to show time and uses its own built-in quartz oscillator as time reference.

Alarm timeout Time in minutes before the NTP synchronization alarm is activated.

Timezone Select country/time zone. A NTP server sends UTC time. The clock will correct this to local time. If Daylight Saving Time (see below) is checked it will also and adjust for DST (Daylight Saving Time) automatically.

Daylight Saving Time If checked then this timezone uses DST (Daylight Saving Time).

NTP advanced
Advanced NTP settings

Client mode FIRST. Always use the first server in the list if available. If not available take next one.
This suits installations where it is more important to know exactly from where the clients get time than to have the most accurate time. The other NTP servers in the list will then be more of backup servers. STRATUM. Use the NTP server with best stratum. The software sends a request to all servers in the list and uses the time from the one with best stratum. If same stratum it will use the one that is first in the server list.
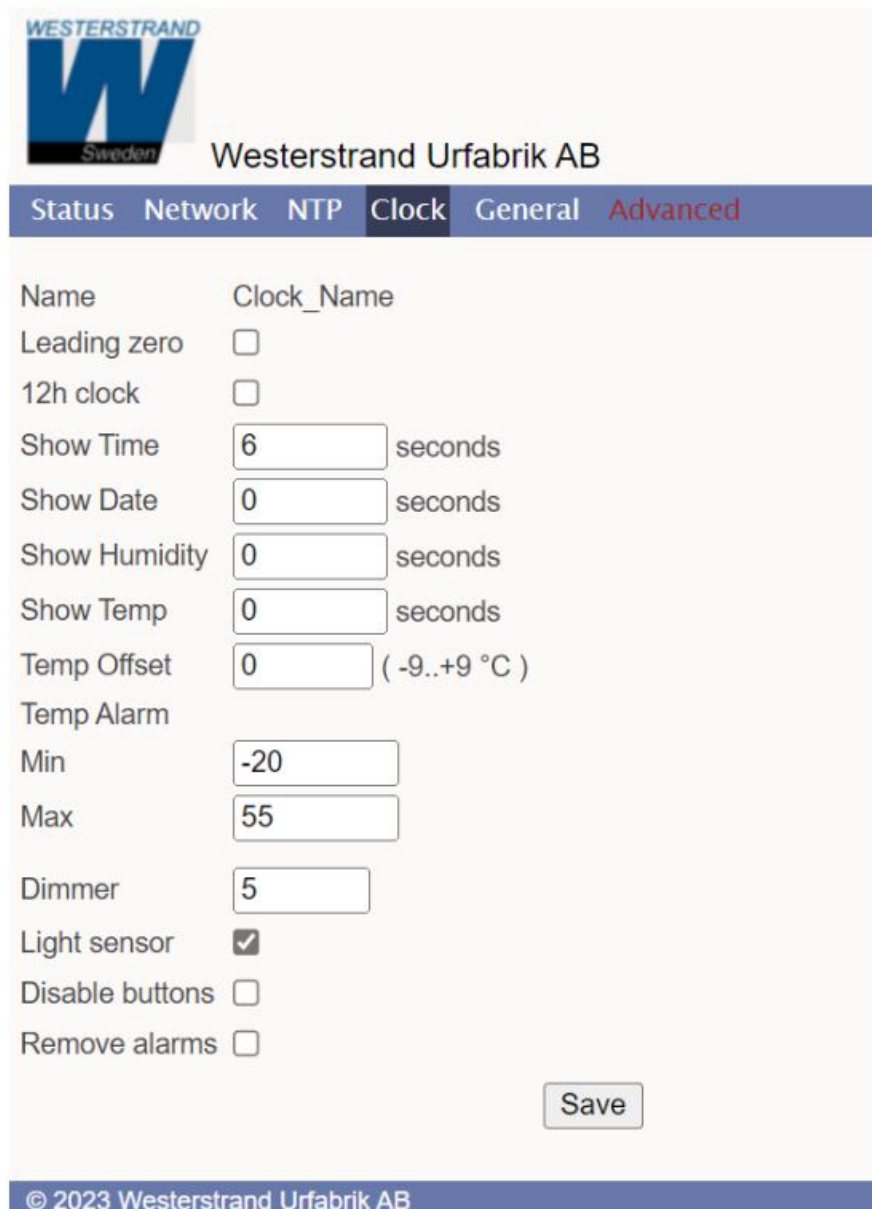This suits installations where it is important that the time is coming from a time server high up in the pyramid. MEDIAN. Send a request to all servers in the list and use the median value (the NTP server that is in the middle). This will filter out all misleading time messages.

Only accept Stratum 1 This function makes it possible to synchronise to Stratum 1 time servers only. Check box = Off ; synchronise to time server independent of stratum level. Check box = On ; synchronise only if time server is operating on Stratum 1 level.

Authentication If authentication is activated: Use MD5 authentication. Server ID/Key: Authentication data for the external NTP servers configured in the NTP server list.

Clock
Used to configure general clock parameters.

Leading zero Time: not checked; " 8:29″,checked; "08:29″. Date: not checked; " 7.9 ", checked "07.9 " (Sep 7).

12h clock Show e.g. " 2:49″ (12h clock) instead of "14.29" (24h clock).

Show Time Loop-time in seconds for time.

Show Date Loop-time in seconds for date.

Show Humidity Loop-time in seconds for relative humidity.
Show Temp Loop-time in seconds for temperature.
Temp Offset Adjust the temperature reading (-9 to +9 °C).
Alarm Set temperature bounds. The temperature alarm "Temp is out of bounds" will be active when the temperature reading is below the min value, or above the max value.
Dimmer Enter the dimmer value (1-8).
Light sensor Allow for input from light sensor.
Disable buttons Disable buttons on the clock. When the buttons are locked the only thing that can be done using the buttons is to read the IP-address.

General
Used to configure general parameters.

Name Symbolic name, maximum 64 characters. This name is shown in the status menu and is also included in SNMP and Syslog messages. Example: Digital Clock, reception.
Contact Contact person. This information is included in SNMP messages.

Location The place where the clocks is located. Example: "Building 3 Room 214". This information is included in SNMP messages.

Password Login password. Admin = Adminstrator password. The administrator has the rights to read and to write/change configuration. Default password = password. To switch off the password functionality enter password = nopassword Guest = Guest password. A guest can read only. The button [Save] is deactivated for guest users. Default password = password.

Firmware Download Function to enable firmware download. See also section Firmware Download.
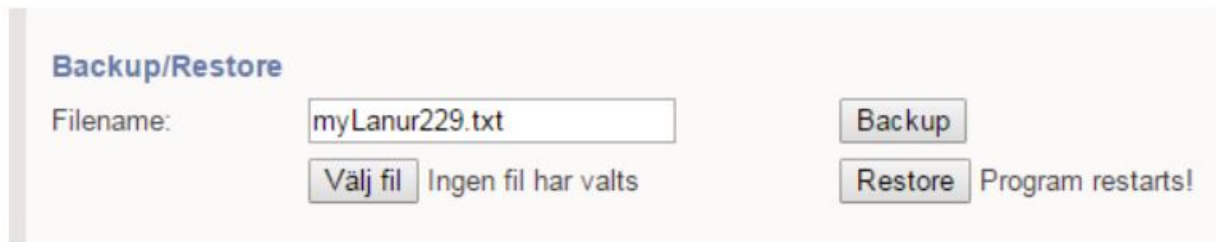
Restart
Restart the Clock.

Backup/Restore
Backup
Save the clock configuration to a file. The clock suggests the Name field as filename (here MyLanur229.txt). Click [Backup]. Passwords are not saved.
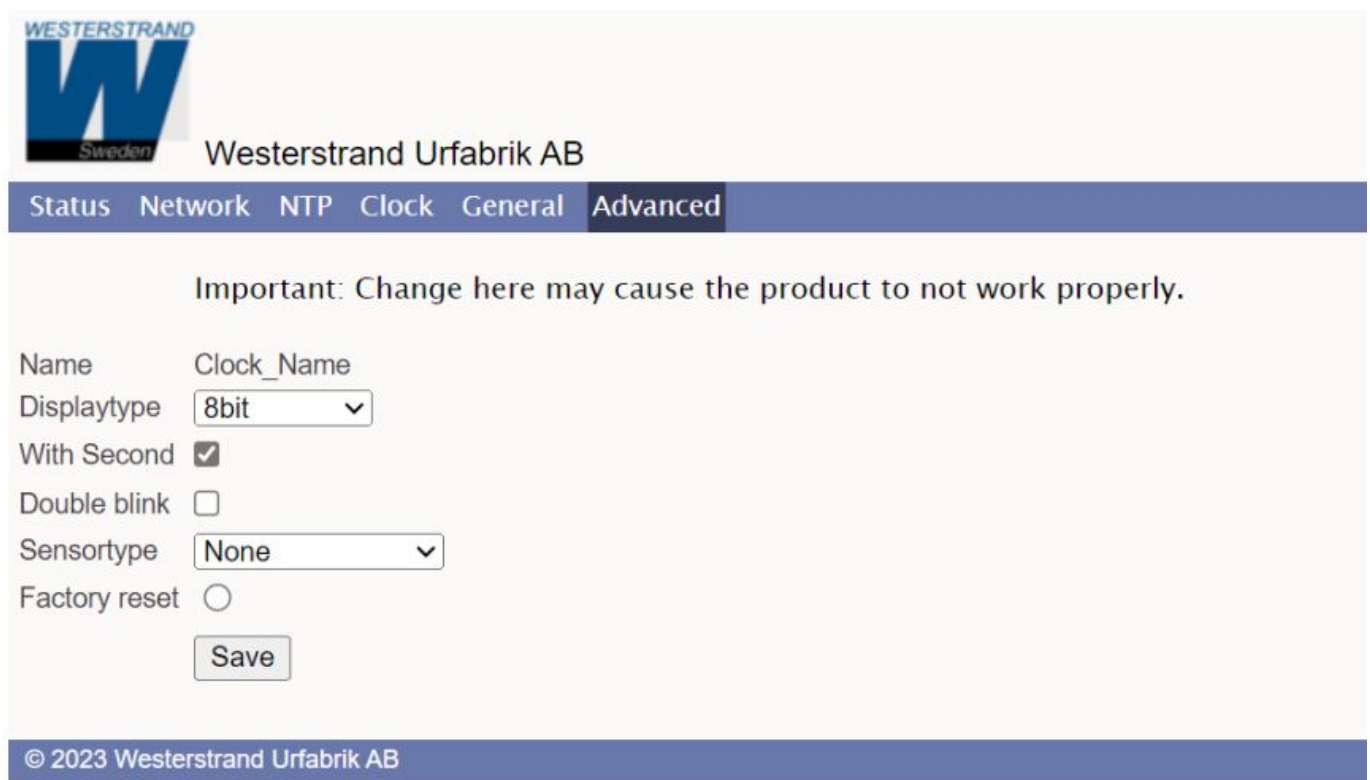

Restore
Select file ([Välj fil]). Here file myLanur229.txt was selected. Click [Restore]. The clock restarts. Refresh the page. The MAC- and IP-address never are restored. .

Advanced
Functionality to configure hardware settings for the clock, and to do a factory reset of the clock. Changing the hardware settings may cause the clock to function improperly.

Display type Set type of display.
With Second Set whether the clock has second digits.
Double blink When checked, and the clock is synchronised, the colon between minutes and seconds is flashing,

otherwise it is steady. The first colon (between hours and minutes) is always flashing.

Firmware Download / Wunser

General
The Clock has support for firmware upgrade via the network. The utility program Wunser is used for firmware upgrade. Wunser can be downloaded using the following link:
http://www.westerstrand.com/archives/download.htm
If checkbox Firmware Download is clicked, then the application jumps to a boot-loader. If no firmware upgrade take place within 60 seconds, then the old application is restarted again with the current firmware. When the clock is in boot-loader mode, then the green LED on the RJ45-connector is flashing. When the program is in boot-loader mode, then the clock will answer on PING only.
For details of the download procedure, see Wunser manual, 4296.
Also other programs, e.g. windows built in client tftp, can be used: c:ARMLisa>tftp 192.168.2.61 put LISA-Q132.MOT Successful transfer: 1234092 byte 15 sec., 82272 byte/s

Find IP-address
At delivery, the clock is set to DHCP, with fallback address 192.168.3.10. If this has been changed and is unknown, the clock can be found using Wunser, see manual 4296. The clock is identified in the product list by its MAC-address. Each product is labelled with the individual MAC-address.

Reset Button

At a normal start (Reset Button is not pressed) then the green LED is flashing about 2 seconds. Then the green LED is turned off. When the clock is synchronized the green LED is turned on.

Power up	The application stays in boot-loader mode for ever and waits for firmware upgrade.
Application 3-9 seconds	Soft reset. The application restarts immediately.
Application >=10 seconds	Cold reset. The application restarts immediately in DHCP mode. If no DHCP server exist, the clock will take default address 192.168.3.10 after 60 seconds. All parameters except the MAC address will take default values.
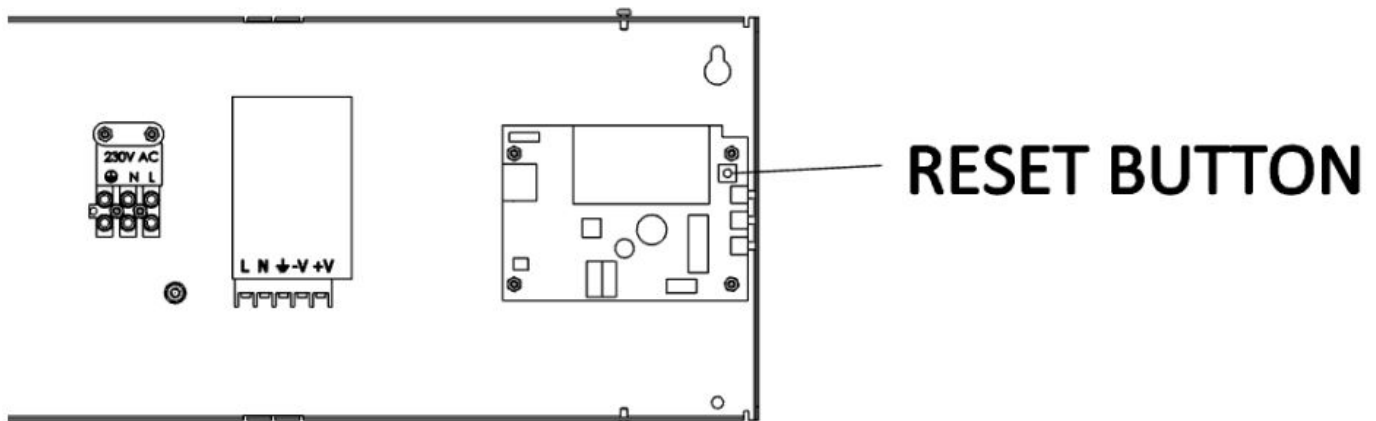
Technical specification

General

Art. no.:	LUMEX 5 NTP, LUMEX 7 NTP, LUMEX 12 NTP LUMEX 5S NTP, LUMEX 7S NTP, LUMEX 12S NTP
Mounting/Installation:	Single-, double sided. Wall or ceiling mounted.
Digits:	Single line red LED. Indicating time in HH:MM or HH:MM:SS
Digit height:	50 mm, 70 mm or 120 mm
Synchronisation:	NTP
Accuracy	0,1 sec/24 h at 22° C (free-running mode)
Internal time keeping during power failure:	48 hours (display is turned off)
Time format:	12- or 24-hour format selectable. Alternatively showing date: day and month.

Network

Protocols supported:	SNTPv4, RFC 4330, SNMP v2c, MIB II (RFC 1213), RFC2863, HTTP, HTTPS, Telnet, FTP
NTP protocol modes:	Unicast client mode (point to point), support for DHCP option 042, Broadcast/Multicast mode (point to multipoint). Multicast group address 224.0.1.1
Transport protocol:	TCP/IP
IP address assignment:	Static IP address or Dynamic (DHCP)
Compatibility:	Ethernet version 2/IEEE 802.3
Ethernet:	Supports 10/100BASE-T (RJ45) connections
Ethernet cable type:	Shielded
Device Management:	Web-Based (requires web browser) or via Telnet
Additional info.:	Support for DNS

Power supply

Supply voltage:	100-240VAC 50/60Hz
Power consumption:	0,35A (LUMEX 5 NTP, LUMEX 5S NTP, single- and double sided). 0,35A (LUMEX 7 NTP, single- and double sided). 0,35A (LUMEX 7S NTP, single sided). 0,7A (LUMEX 7S NTP, double sided). 0,7A (LUMEX 12 NTP, LUMEX 12S NTP, single- and double sided).

Environmental

Temperature range:	0°C to +40°C.
IP class:	IP 30

Housing

Housing:	Aluminium

Abbreviations

DST Daylight Saving Time
DHCP Dynamic Host Configuration Protocol
DNS Domain Name System. The Internet's system for converting alphabetic names into numeric IP addresses.
LED Light Emitting Diode
LT Local time
MAC Physical address (Media Access Control)
NTP Network Time Protocol
PING Packet Internet Grouper
SNMP Simple Network Management Protocol
UTC Coordinated Universal Time

Documents / Resources

[**WESTERSTRAND LUMEX5 NTP Digital Clock Time System**](#) [pdf] User Manual
LUMEX5 NTP Digital Clock Time System, LUMEX5 NTP, Digital Clock Time System, Clock Time System, Time System, System

References

- [**User Manual**](#)