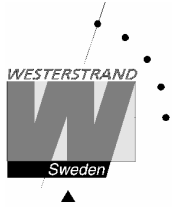


Option Ethernet QWTIME III



List of contents

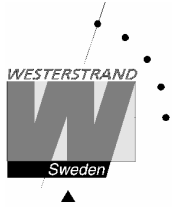
List of contents	2
General	3
Technical data.....	3
Configuration.....	4
Work mode (NTP Server or Client)	5
WEB browser	6
Login window.....	6
Status >>.....	7
General >>.....	8
General >>.....	8
Network >>.....	9
NTP >>.....	10
Help>>.....	11
Program TELNET	12
Alarm.....	19

WESTERSTRAND URFABRIK AB

P.O. Box 133
SE-545 23 TÖREBODA

Tel. +46 506 48000
Fax. +46 506 48051

Internet:: <http://www.westerstrand.se>
E-mail: info@westerstrand.se



General

The Ethernet module makes it possible to connect a Master Clock to a LAN (Ethernet Local Area Network). The module can be built into any QWTIME III Master Clock.

The module can be used for Master Clock remote control, programming of relay outputs, alarm distribution, supervision and for distribution of correct time. The module can be configured to work as a NTP server or NTP client.

For transmission of correct and accurate time the NTP (Network Time Protocol) is used. NTP is a part of the protocol family UDP/IP.

When using the Ethernet module for time distribution the Master Clock can act as a NTP primary server or as a NTP client.

Units connected to the LAN, supporting NTP, can receive correct time from the Master Clock via the network module.

Included with the Ethernet module is NyToP, Westerstrand NTP-client for Windows 98/NT/2000/XP.

For remote control and relay programming the windows based application software QW3Control can be used. The QW3Control is an option.

To configure the different parameters such as IP-address, work mode etc. the program TELNET is used.

Technical data

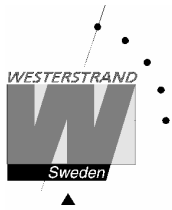
Art. no.:	123383-00
Supports protocols: (For time distribution)	NTP version 1, 2 and 3, RFC1305 SNTP, RFC 1769
Other supported protocols:	SNMP v1 Enterprise MIB (RFC 1155 - 1157) HTTP, Telnet
Transport protocol:	TCP/IP
IP-address assignment	Dynamic, using DHCP, or fixed IP-address
Compatibility:	Ethernet version 2/IEEE 802.3
Ethernet:	Supports 100BASE-T (RJ45) connections
Ambient temperature:	-20°C up to +55°C
Device Management:	Web-Based (requires web browser) or Telnet
NTP client software:	NyToP , freeware, manual 1672
Application software:	QW3Control art. no. 123396-00, manual 1739

WESTERSTRAND URFABRIK AB

P.O. Box 133
SE-545 23 TÖREBODA

Tel. +46 506 48000
Fax. +46 506 48051

Internet: <http://www.westerstrand.se>
E-mail: info@westerstrand.se



Configuration

Most of the configuration parameters are set via an external PC by using a *Web-browser* or *Telnet*, but some of the settings can also be done from the Master Clock.

The following parameters can be set from the Master Clock by using the special function *setup*.

- IP address

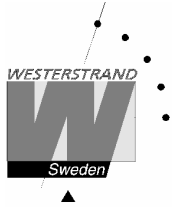
The following parameters can be viewed from the Master Clock by using the special function *status*.

- IP address

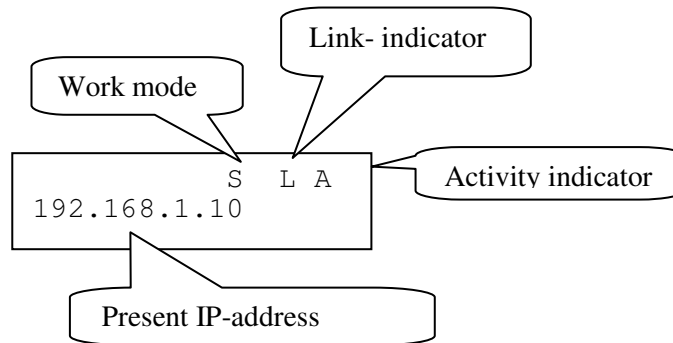
Example:

Give the module IP-address 192.168.1.66

MON 14 OCT 2007 09:07:00 LTW	Select function by using ↓ .
SPEC.-FUNCTIONS	Accept using YES. Press NO until wished function is displayed.
SPEC.-FUNCTIONS SETUP	Accept using YES.
SETUP IP	Press NO until the text IP is displayed. Accept using YES.
IP 192.168.001.066?	Set, by using the arrows, the IP-address 192.168.001.066. Accept using YES.
SETUP IP	Return to running mode by using ←.
SPEC.-FUNCTIONS SETUP	←
SPEC.-FUNCTIONS	←
MON 14 OCT 2007 09:07:00 LTW	



Status IP



Work mode S = Server. The Master Clock works as a NTP time server.
C = Client. The Master Clock works as a NTP time client.

Link indicator L = Link activated. The Master Clocks is connected to a network.
= No link activated. The Master Clock is not connected to a network.

Activity indicator A = Showing the network traffic from / to the Master Clock.

Work mode (NTP Server or Client)

The network module can work in two different modes

Server:

The Master Clock works as a NTP time server answering to NTP requests from NTP clients.

Client/Server:

The Master Clock is both NTP client and NTP server.

The work mode is set from the Master Clock, SPEC.-FUNKTIONS / SETUP / SYNC.SOURCE.

SYNC.SOURCE = NTP CLIENT

The Master Clock acts as a NTP-client receiving its time from an external NTP server.

SYNC.SOURCE = GPS, RDS, DCF etc.;

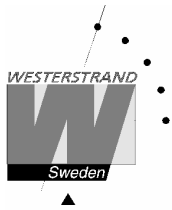
The Master Clock acts as a NTP server providing connected external clients with correct time.

WESTERSTRAND URFABRIK AB

P.O. Box 133
SE-545 23 TÖREBODA

Tel. +46 506 48000
Fax. +46 506 48051

Internet:: <http://www.westerstrand.se>
E-mail: info@westerstrand.se



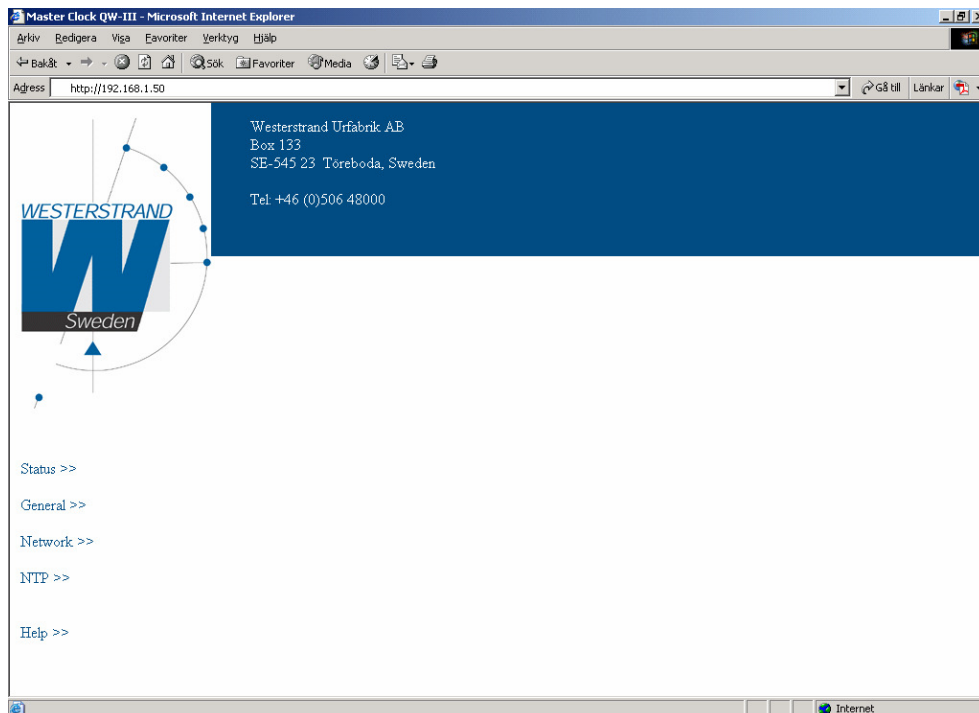
WEB browser

Login window

The Web interface requires a password. Always use user name *admin* and a valid password. Default password is *password*.



After login a function list is displayed.:

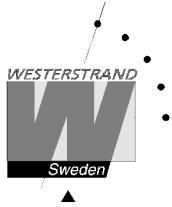


WESTERSTRAND URFABRIK AB

P.O. Box 133
SE-545 23 TÖREBODA

Tel. +46 506 48000
Fax. +46 506 48051

Internet:: <http://www.westerstrand.se>
E-mail: info@westerstrand.se



Status >>

Displays the Master Clock status. The status is automatically updated every 10th second.

The screenshot shows a web interface for the Master Clock status. On the left is a navigation menu with links: Status >>, General >>, Network >>, NTP >>, and Help >>. The main content area has a blue header with contact information for Westerstrand Urfabrik AB. Below the header, the title 'Station Master Clock' is displayed. The status information includes IP, MAC, NTP mode, country, DST, current time (LT), UTC, sync status, timeout, NTP server, and number of time settings. A green 'No errors' message is shown, followed by uptime and firmware version details.

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

Station Master Clock

IP=192.168.14.236
MAC=00-90-C2-C7-44-8B

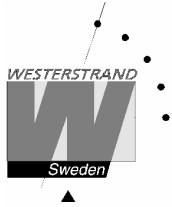
NTP mode=Server
Country=EET , UTC 120 minutes
DST= Sun in intervals Mar 25-31 03:00 (W>S) and Oct 25-31 03:00 (S>W)

LT=2013-04-25 12:30:06.620 Thu (summer)
UTC=2013-04-25 09:30:06.620
Sync=1 (<=4 Not synched., >=5 Synched.)
Timeout=63 seconds
NTP server[2]=192.168.1.237, stratum=15
Number of timesettings=246

No errors

Uptime=3700 seconds
Firmware=HUR-A154 (Apr 10 2013 10:58:28)

The last line shows current firmware version, here HUR-A154.

**General >>**

Set general parameters.

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

General

Name

Password repeat

Firmware Download Off On

Status >>
General >>
Network >>
NTP >>
Help >>

Name Symbolic name, maximum 48 characters
Example: Station Master Clock.

Password Enter a new password. The password has to be repeated.

Firmware Function to enable firmware download.

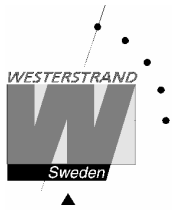
Save Save parameters.

WESTERSTRAND URFABRIK AB

P.O. Box 133
SE-545 23 TÖREBODA

Tel. +46 506 48000
Fax. +46 506 48051

Internet:: <http://www.westerstrand.se>
E-mail: info@westerstrand.se

**Network >>**

Used to set the network parameters.

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

>

Network

DHCP Off On

IP

Gateway Subnetmask

DNS

SNMP Setting

SNMP Off On

SNMP server

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

Status >>
General >>
Network >>
NTP >>
Help >>

DHCP

With this function it is defined if the Ethernet modules should receive its IP-address automatically from a DHCP server or use the static IP-address.

IP

This function is used to give the Ethernet module a static IP-address.

Gateway

This function is used to enter a gateway IP-address.

Subnetmask

This function is used to enter a subnetmask.

DNS

This function is used to enter a name server IP-address.

SNMP

With this code the SNMP functionality can be disabled/enabled.

SNMP server

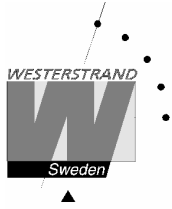
This function is used to enter the IP-address of the SNMP server.

WESTERSTRAND URFABRIK AB

P.O. Box 133
SE-545 23 TÖREBODA

Tel. +46 506 48000
Fax. +46 506 48051

Internet:: <http://www.westerstrand.se>
E-mail: info@westerstrand.se

**NTP >>**

Used to set the NTP parameters.

NTP mode

Select work mode of the network module:

Server	The Ethernet module answers time request from clients.
Client/Server	The Ethernet module acts as both a NTP client and a NTP server. In the master clock sync. source NTP CLIENT was chosen.

Broadcast/Multicast Server

---	No broadcast/Multicast
Broadcast	Broadcast to IP=255.255.255.255 with selected interval is enabled.
Multicast	Multicast to IP=224.0.1.1 with selected interval is enabled.

DST info

Default is Off. DST info ON means that Day-Light-Savings information is included in the NTP message.

MD5

MD5 is a security algorithm. Default is unchecked. When checked (=enabled), then also the NTP client/server must use MD5, else a NTP message is ignored.

NTP server 1..5

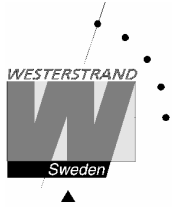
This function is used if the Master Clock is receiving time from an external NTP Server and NTP mode Client/Server. The value entered can be either an IP-address or a name if the DNS server (name server) functionality is used. Server ip address is then the address of the external NTP Server. Up to five different NTP servers can be entered. If the first one fails it will automatically go to the next one and so on.

WESTERSTRAND URFABRIK AB

P.O. Box 133
SE-545 23 TÖREBODA

Tel. +46 506 48000
Fax. +46 506 48051

Internet:: <http://www.westerstrand.se>
E-mail: info@westerstrand.se

**Interval(s)**

NTP client poll interval in seconds

This function is used if work NTP Client/Server is selected.

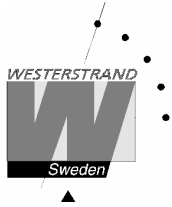
Max. correction (s)

This function is used if the Ethernet module is configured as an NTP client

Enter max. correction in seconds. The time is compared with current time in the Master Clock. If 0 is chosen, then no check of the time is done.

Help>>

Used to view a pdf help file.



Program TELNET

This program is used for setting of parameters after the network controller has an IP address. Start a telnet session. Enter the IP address of the network controller. If the IP address is unknown it can be displayed by using the special function *status*.

Please note that if password is used the Telnet session will start with the question *Password:*

Please enter a valid password.

Telnet in Windows 2000

```
Microsoft (R) Windows 2000 (TM) version
5.00 (Build 2195)
Welcome to Microsoft Telnet-client
Telnet-client build 5.00.99203.1

Escape-sign is CTRL+~

Microsoft Telnet> open 192.168.1.240
```

Press [?] + [Enter]. A help menu is shown:

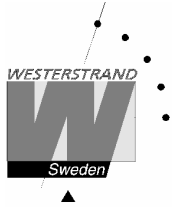
```
D          Display data
G i*      Gateway,          N i*      Subnetmask
E d       Max correction in seconds, 0 no check
I d       NTP Client poll interval in seconds
S c       NTP server
X 35/36*  SNMP    OFF/ON
X 37/38*  HTTP   OFF/ON
X 41/42   NTP timebase UTC/LT, X 43/44   MD5   OFF/ON
X 45/46   DLS info OFF/ON,      X 47/48   Firmware Download OFF/ON
X 51/52   Echo  OFF/ON
X 54 i*   IP address: Static or DHCP fallback
X 55 i*   Nameserver
X 56 i*   SNMP server
X 71/72*  Type of IP address: Static/DHCP
X 93      Quit
X 98      Save,          X 99      Save and restart
d digit, c character, i IP address in dotted format, * restart required
```

WESTERSTRAND URFABRIK AB

P.O. Box 133
SE-545 23 TÖREBODA

Tel. +46 506 48000
Fax. +46 506 48051

Internet:: <http://www.westerstrand.se>
E-mail: info@westerstrand.se



D Display data

Display data about the network controller:

```
HUR-A159
Westerstrand Urfabrik AB
http://www.westerstrand.se

UTC=2014-06-02 07:10:54.633
LT =2014-06-02 09:10:54.633 Mon
Sync=6 (Server+Client)
NTP Server=192.168.1.237
Mode: ECHO UTC.

MAC=00-90-C2-EB-8F-A2
IP=192.168.14.134 (Static)
Gateway =192.168.1.1
Subnetmask =255.255.240.0
DNS server=192.168.1.12
Interval=50 s
Max. correction=0 s
[48551522D19693519]
```

The first line shows current program version in the network controller.

G Gateway IP address

Example: Assume that the gateway IP address has the address 192.168.1.1:

```
(? help) >G 192.168.1.1 [Enter]
(? help) >X 99 [Enter]
```

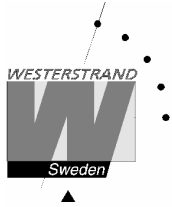
Remark: If not used the gateway IP address must be set to 255.255.255.255.

E Max. correction in seconds, 0 no check

This function is used if the Ethernet module is configured as an NTP client (work mode 1). Enter max. correction in seconds. The time is compared with current time in the Master Clock. If 0 is chosen, then no check of the time is done.

I NTP client poll interval in seconds

This function is used if work mode 1 (NTP Client) is selected.



N Subnet mask

Example: Assume that the subnet mask is 255.255.240.0:

```
(? help) >N 255.255.240.0 [Enter]
(? help) >X 99 [Enter]
```

Remark: If not used the subnet mask must be set to 255.255.255.255

P Password

With this function it is possible to lock the network controller with a password. This is used to avoid unauthorised programming. The password can be up to 9 characters and the following characters can be used:

0 – 9, A – Z, a – z . Please note that the password is case sensitive.

Password examples:

```
Admin
123456789
B9x35r
```

The password code is set according to: >P [code], e.g.

```
(? help) >P Admin [Enter]
(? help) >X 98 [Enter]
```

To disable the password function:

```
(? help) >P [Enter]
(? help) >X 98 [Enter]
```

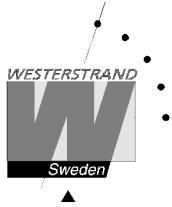
S NTP server

This function is only used if the Master Clock is receiving time from an external NTP Server and Work mode W1 is selected. The value entered can be either an IP-address or a name if the DNS server (name server) functionality is used. Server ip address is then the address of the external NTP Server.

Example:

The Swedish National Testing and Research Institute, SP has two NTP time servers.
The Internet address for one of them is *ntp1.sp.se*.

```
(? help) >S ntp1.sp.se [Enter]
(? help) >X 98 [Enter]
```

**X41/42 NTP time base UTC/LT**

With this function the *type of time* transmitted in the NTP message is chosen.

Example: Send UTC

```
(? help) >X41 [Enter]  
(? help) >X 98 [Enter].
```

X43/44 MD5 OFF/ON

If the NTP client software NyToP is used the security of the transmission can be increased by the use of MD5 together with a private (secret) key.

MD5 (Message-Digest algorithm 5) is a widely used cryptographic hash function with a 128-bit hash value. MD5 must be enabled in both the Ethernet module and the NyToP software.

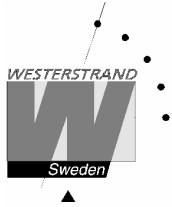
With this code the MD5 functionality can be disabled/enabled.

Example: Turn OFF MD5

```
(? help) >X43 [Enter]  
(? help) >X 98 [Enter]
```

Example: Turn ON MD5

```
(? help) >X44 [Enter]  
(? help) >X 98 [Enter]
```



X45/46 DLS info OFF/ON

With this function it can be decided to send summer/winter time information within the NTP message.

Example: Turn off S/W information

```
(? help) >X45 [Enter]  
(? help) >X 99 [Enter]
```

Example: Aktivate S/W information

```
(? help) >X46 [Enter]  
(? help) >X 99 [Enter]
```

Remark: This function is only used in countries where the rules for daylight saving (DLS) is not defined in advance. It will also only work with NTP client software NyToP.
According to the NTP-standard it should not be any information about DLS included in the message. The time zone is decided locally in the NTP client.

X47/48 Firmware Download OFF/ON

X51/52 Local Echo OFF/ON

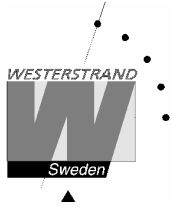
With this code the Telnets echo function can be turned off.

Example: Turn off Telnet echo for entered characters.

```
(? help) >X51 [Enter]  
(? help) >X 99 [Enter]
```

Example: Turn on Telnet echo

```
(? help) >X52 [Enter]  
(? help) >X 99 [Enter]
```

X 54 Static IP address

This function is used to enter the module static IP-address.
When entering a new IP address, make sure to remember the new IP address!

Example: Assume a change from address 192.168.1.102 to address 192.168.1.134:

```
(? help) >X 54 192.168.1.134 [Enter]
(? help) >X 99 [Enter]
```

To remove the connection for the old IP address in your PC:
>ARP -D 192.168.1.101
Start a new telnet session with IP address 192.168.1.134

X55 DNS Name server

This function is used to enter the IP-address of a DNS name server.

Example: Assume that the DNS name server has the address 192.168.1.6:

```
(? help) >X 55 192.168.1.6 [Enter]
(? help) >X 99 [Enter]
```

X71/72 Static IP-address/DHCP

With this function it is defined if the Ethernet modules should receive its IP-address automatically from a DHCP server or use the static IP-address defined with function X54.

Example: Use static IP address:

```
(? help) >X 71 [Enter]
(? help) >X 99 [Enter]
```

Example: Receive IP address automatic from DHCP server:

```
(? help) >X 72 [Enter]
(? help) >X 99 [Enter]
```

Remark: If the module is set to receive IP address automatically and it doesn't receive an address it will automatically use the static IP-address (fallback).

X 93 Quit and restart without save

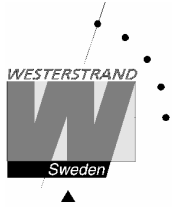
Restart the network controller without saving new data.

WESTERSTRAND URFABRIK AB

P.O. Box 133
SE-545 23 TÖREBODA

Tel. +46 506 48000
Fax. +46 506 48051

Internet:: <http://www.westerstrand.se>
E-mail: info@westerstrand.se



(? help) >X 93 [Enter]

X 98 Save

Save data to memory.

(? help) >X 98 [Enter]

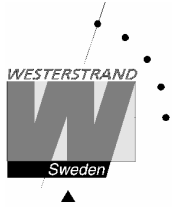
X 99 Save and restart

Save data to memory. The network controller is restarted.

(? help) >X 99 [Enter]

backspace Cancel input

Cancel the input of data. The data is displayed.



Alarm

The master clock is equipped with several supervision facilities to detect functional disturbances. Via the web browser status tab it is possible to see the Master Clock status including alarm (error) messages. The following alarm messages are available:

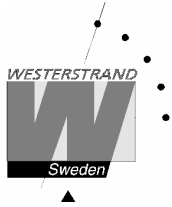
Type of alarm	Alarm code	Priority level	Indication	Reason for alarm	Action
RESET	12	-	SNMP trap sent	See action	The firmware in the network controller was restarted
WATCHDOG	16	-	SNMP trap sent	See action	This is not an alarm. It is a alive signal transmitted each 24 hour to tell connected SNMP management systems that the Sub Master Clock is alive.
NO RADIO	30	2	Red alarm LED lit. Alarm relay activated. SNMP trap sent.	The Sub Master Clock has not been synchronised for a longer period.	Check the network settings and connection to the NTP server (Central Master Clock). If OK, clear the alarm.
COMM	41	3	SNMP trap sent.	This is a general alarm for different types of network related errors such as: - NTP server address is incorrect or can not be found. - No response to NTP request. - Internal Communications errors on the network module.	-Verify the network connections. -Check network settings. -Check the NTP server
STRATUM	44	3	SNMP trap sent	Present NTP server has wrong stratum level.	Check the NTP server.
RESOLVE	46	3	SNMP trap sent	Fail to resolve an URL name	-Verify the network connections. -Check network settings. -Check the NTP server
UF LOW	52	1	Red alarm LED lit. Alarm relay activated SNMP trap sent	Impulse voltage below alarm limit.	Check the load on the impulse output. If OK, clear the alarm.
SHORT CIRCUIT	53	1	Red alarm LED lit. Alarm relay activated. SNMP trap sent	Short circuit on impulse output	Remove the short circuit. If OK, clear the alarm.

WESTERSTRAND URFABRIK AB

P.O. Box 133
 SE-545 23 TÖREBODA

Tel. +46 506 48000
 Fax. +46 506 48051

Internet:: <http://www.westerstrand.se>
 E-mail: info@westerstrand.se



CURRENT LOW	61	1	Red alarm LED lit. Alarm relay activated SNMP trap sent	Impulse current below alarm limit.	Check the load on the impulse output. If OK, check that the alarm limit is correctly configured. If OK, clear the alarm.
CURRENT HIGH	71	1	Red alarm LED lit. Alarm relay activated SNMP trap sent	Impulse current above alarm limit.	Check the load on the impulse output. If OK, check that the alarm limit is correctly configured. If OK, clear the alarm.
POWER DOWN	77	1	Alarm relay activated	By some reason the power to the master clock has been switched off.	Check the mains.