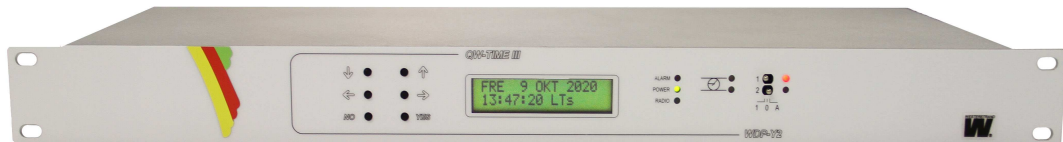


QWTIME III MASTER CLOCK
User Manual

Document: DOK11069en03
Author: PM
Date: 2021-11-09
Page: 1 of 75

User Manual

Master Clock WDP-Y2 19" 1HE

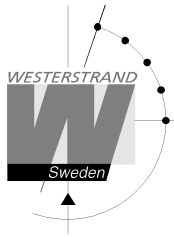


WESTERSTRAND URFABRIK AB

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



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User Manual

Document: DOK11069en03
Author: PM
Date: 2021-11-09
Page: 2 of 75

List of contents

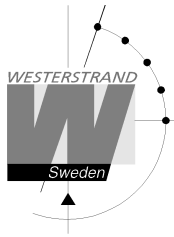
TECHNICAL SPECIFICATIONS	4
LAN CONNECTION.....	4
GENERAL DESCRIPTION	5
INSTALLATION	6
CALCULATION OF CABLE AREA IN TIME SYSTEMS.....	7
SYNCHRONISATION INPUT.....	8
<i>General</i>	8
<i>Synchronisation from another Master Clock</i>	8
SERIAL PORT RS232/RS485.....	9
<i>General</i>	9
<i>Connection via RS232</i>	9
<i>Connection via RS485</i>	9
PROGRAMMING	10
GENERAL.....	10
RUNNING MODE.....	10
START UP.....	11
SET TIME WHEN IN OPERATION.....	12
<i>Summer to winter (Day light saving)</i>	12
SLAVE CLOCK.....	13
ALARMS.....	14
<i>Example 1, display alarms</i>	15
<i>Example 2, erase (clear) alarms</i>	16
WEEK PROGRAM & DATE PROGRAM.....	17
<i>Concept description</i>	17
<i>Week Program, example 1 (New program)</i>	19
<i>Week Program, example 2 (Change program)</i>	20
<i>Week Program, example 3 (Erase program)</i>	21
<i>Week Program, example 4 (Astronomical function)</i>	22
<i>Week Program, example 5 (Block program)</i>	23
<i>Week Program, example 6 (Mask program)</i>	24
<i>Date Program, example (New program)</i>	25
DISPLAY PROGRAM.....	26
TEMPORARY PROGRAM, EXAMPLE.....	27
GROUP => PERIOD.....	28
DISPLAY HOLIDAYS.....	29
SPEC.-FUNCTIONS.....	30
<i>Status</i>	31
Status sync. source.....	32
Status impulse output.....	32
Status RS232/RS485-port.....	32
Status Alarm relay.....	33
Status IP.....	33
<i>Keylock</i>	34
<i>Language</i>	36
<i>Country</i>	37
<i>Position</i>	39
<i>Setup</i>	40
Setup sync. source.....	41

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P.O. Box 133
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Tel. +46 506 48000
Fax. +46 506 48051

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E-mail: info@westerstrand.se



QWTIME III MASTER CLOCK

User Manual

Document: DOK11069en03
Author: PM
Date: 2021-11-09
Page: 3 of 75

Setup impulse output	42
Setup RS232/485 port.....	44
Setup Alarm Relay	48
NO.....	48
YES.....	48
Setup IP	49
<i>Software version</i>	50
<i>Holidays</i>	51
Fixed holidays.....	51
Variable holidays.....	52
Enable/disable	52
Holidays, example 1, insert a new fixed holiday	53
Holidays, example 2, erase fixed holiday	54
Holidays, example 3, disable a variable holiday.....	55
GOOD FR ON?	55
GOOD FR OFF?	55
Display format.....	56
CONFIGURATION USING A WEB BROWSER	57
<i>Login</i>	57
<i>User name</i>	57
<i>Password</i>	57
<i>Status</i>	58
<i>Network</i>	60
DHCP	61
Use DHCP	61
Static IP	61
VLAN.....	61
Utilities	61
SNMP	62
<i>NTP</i>	63
NTP mode.....	64
DHCP option 042	64
Broadcast	64
Multicast.....	64
NTP server.....	64
Interval	64
<i>NTP Advanced</i>	65
Server	65
Client.....	66
<i>Remote</i>	67
Remote control.....	67
<i>General</i>	68
<i>Name</i>	68
<i>Password</i>	68
Lost password	69
<i>Firmware Download</i>	69
<i>Restart</i>	69
<i>Backup/Restore</i>	69
FIRMWARE DOWNLOAD / WUNSER	70
General	70
PROGRAMMING FORM	71
MAP	72
FAULT TRACING.....	73

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P.O. Box 133
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Tel. +46 506 48000
Fax. +46 506 48051

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



Technical specifications

Crystal Frequency:	4,915200 MHz.
Accuracy:	0,1 sec./24 hours (at +20°C).
Microprocessor:	HD6412394.
Max. load impulse output:	Minute 1A, second 0,5A. (The output is equipped with short circuit protection which resets automatically.)
Impulse duration:	Minute 2 sec. selectable 0.1-9.9 sec. Seconds 0.5 sec. selectable 0.1-1 sec.
Impulse memory:	72 hours (impulse memory with rapid impulsing after power failure).
Program memory:	>100 years (EE-memory).
Number of control functions:	800.
Relay outputs:	2 changeover potential-free contacts.
Max. load/relay output:	240 V 6A.
Total load relay outputs:	Number of relay outputs x 6A
Connection voltage:	100-240 V 50/60 Hz
Power consumption:	30 W.
Ambient temperature:	Between 0°C and +40°C.
Relative humidity:	Max. 85% non-condensing.
Case:	19".
Dimensions:	Height =44.5 mm (1U) Width =446 (484) mm Depth =210 mm (exclusive connectors)
Weight:	1.6 kg
Colour:	RAL 7030 and RAL 7035
CE-Approval, EMC	Emission acc. to EN61000-6-3, Immunity acc. to EN61000-6-2.

LAN connection

Supports application protocols:	
(For time distribution)	NTP version 1, 2, 3 and 4, RFC5905, SNTPv4, RFC 4330
Daytime Protocol (RFC867), Time Protocol (RFC 868)	
Other supported protocols:	SNMP v2c, MIB II (RFC1155, RFC1157, RFC1213), HTTP, HTTPS.
Transport protocol:	
Internet protocol:	TCP, UDP/IP, ICMP
IPv4, (IPv6 ready)	
IP-address assignment	Dynamic, using DHCP, or fixed IP-address
VLAN support:	IEEE standard 802.1Q. The Ethernet port and can be configured to use one VLAN ID.
Compatibility:	Ethernet version 2/IEEE 802.3
Ethernet:	Supports 10/100BASE-T (RJ45) connections
Art. number:	123339-00

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Fax. +46 506 48051

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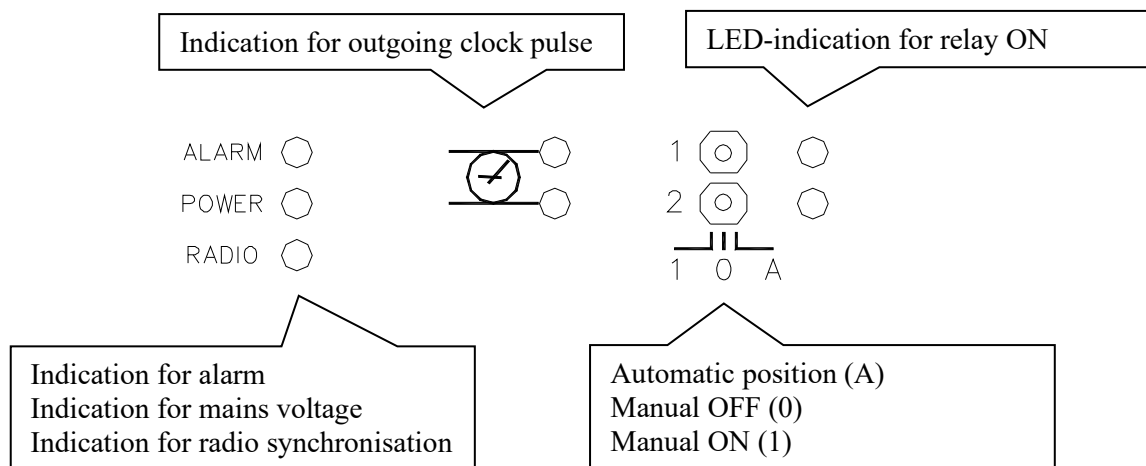
General description

The Master Clock Programmer is a combination of yearly programmer with 2 outputs for control and regulation of various energy consumers such as electrical striking plates, buzzers for pause signalling etc, and a quartz Master Clock for operating Slave Clocks.

In case of power failure the built in Real Time Clock keeps the internal time updated. (the outputs are set to position OFF). Connected Slave Clocks are automatically corrected by rapid impulsing when power returns and the outputs resume their positions (ON/OFF) which were previously programmed (with a 10 second switching delay between the different outputs. Entered data's are stored for at least 100 years.

The Master Clock Programmer have pre-programmed fixed public holidays and summer/winter time correction (daylight saving). The clock offers full flexibility with regard to programming working days between holidays, public holidays to weekdays, holiday periods etc.

A total of 800 control functions can be programmed over the two outputs. Repeating daily functions on a certain output only requires 1 control function.





Installation

The Master Clock Programmer is 19" mounting.

1. Mount the Master Clock in a 19" stand or cabinet. Screws are not included.
2. Connect the slave clock lines.
3. Connect the signal line/lines (to relay contacts).
 NOTE! For connection of signals etc., mixed voltages must not be used. Therefore, choose either 230VAC or, for example 24VAC for connection to the relays.
4. Connect, other accessories/options such as radio synchronisation, Ethernet, RS232 etc.
5. Connect the supply voltage. Note that the supplied power cord is equipped with a lock to prevent it from being accidentally pulled out. To be able to disconnect the cord, the red lock button must be pushed to the side.



The wall socket must be close to the Master Clock and be easily accessible.

1	2	3	4	5	6	7	8	9	10	11	12
		DCF/GPS/RDS/FM GND + DCF				EXT. BATT. 2 3 1			RS232/485 GND TD RD		

1	2	3	4	5	6	7	8	9	10	11	12

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 SE-545 23 TÖREBODA

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Calculation of cable area in time systems

General

To make a time system with impulse operated analogue and digital slave clocks perform satisfactory, the cable from the Master Clock to the Slave Clocks need to be dimensioned correctly.

A 10% voltage drop is allowed in the cable.

The length and area of the cable and the current (load) on the cable affect the voltage drop.

Formula

$$A = l \times I \times k$$

A = Area [mm²]

l = cable length [m]

I = current [A]

k = 0,015 [constant]

Power consumption

Impulse Slave Clocks

Analogue clocks minute \leq 400 mm: 7,5 mA

Analogue clocks minute \leq 900 mm: 15 mA

Analogue clocks minute + sweep seconds hand \leq 400 mm: 25 mA

Digital Clocks: 4 mA

Time-Code (TC) Slave Clocks

Analogue clocks minute \leq 400 mm: 14 mA

Analogue clocks minute \leq 900 mm: 20 mA

Analogue clocks minute + sweep seconds hand \leq 400 mm, indoor: 12 mA

Analogue clocks minute + sweep seconds hand \leq 400 mm, outdoor: 20 mA

Analogue clocks minute + sweep seconds hand \leq 900 mm: 27 mA

Example

A time system consists of 40 pcs. analogue clocks with diameter 300 mm.

The power consumption will then be $40 \times 7,5 = 300 \text{ mA} = 0,3\text{A}$.

Cable length is 100 metres.

$$A = 100 \times 0,3 \times 0,015 = 0,45 \text{ mm}^2$$

Choose a cable with an area of at least $0,45 \text{ mm}^2$.

WESTERSTRAND URFABRIK AB

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SE-545 23 TÖREBODA

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

Internet: <http://www.westerstrand.se>
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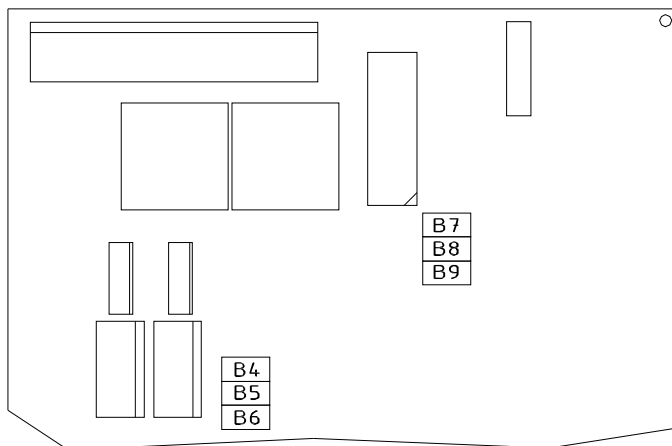
Synchronisation input

General

The Master Clock is equipped with a synchronisation input intended for connection to an external synchronisation source. The sync. source can be either a radio receiver type GPS, RDS, MSF, DCF77 or another Master Clock that transmits synchronisation pulses. The Master Clock is factory prepared for connection to a radio receiver. Detailed connection diagram for different radio receivers can be found in the separate manual delivered together with respectively receiver. If the Master Clock is going to be synchronised from another Master Clock it must be reconfigured. See below.

Synchronisation from another Master Clock

1. Turn off power.
2. Open the Master Clock by loosening the four screws holding the front panel. Lift the panel and set the jumpers B4-B6 according to the instruction below.
3. Remount the front panel and turn on the power again.
4. Set the sync. source parameter by using the special function *SETUP/SYNC.SOURCE* .
5. Connect the sync. pulses to screw terminal 8 and 9.
6. Set the master clock to correct time +/- 30 sec.
7. When the synchronisation pulses have been accepted by the master clock the colon (:) between hours and minutes in the display starts to flash.



	B4	B5	B6	
PREP. FOR RADIO RECEIVER	X		X	FACTORY DEFAULT
PREP. FOR SYNC. PULSE FROM ANOTHER MASTER CLOCK		X		

X = Closed

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P.O. Box 133
 SE-545 23 TÖREBODA

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

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 E-mail: info@westerstrand.se



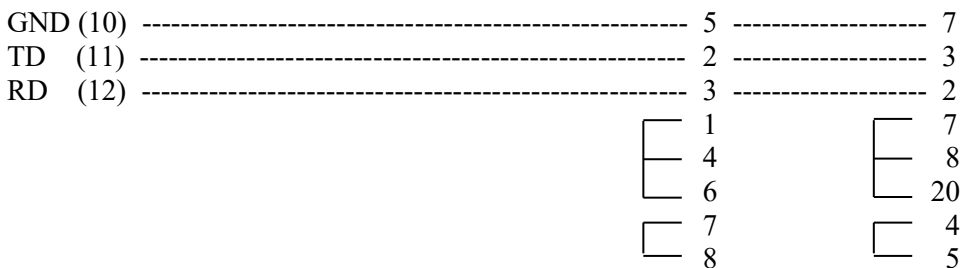
Serial port RS232/RS485

General

The Master Clock has a serial port for connection to a PC or other similar equipment. The serial port is factory set to RS232. If RS485 connection is used the Master Clock has to be reconfigured according to the jumper instruction below. Please see section *SPECIALFUNKTION/SETUP/SERIAL PORT* for details about type of interface, protocol, baudrate etc.

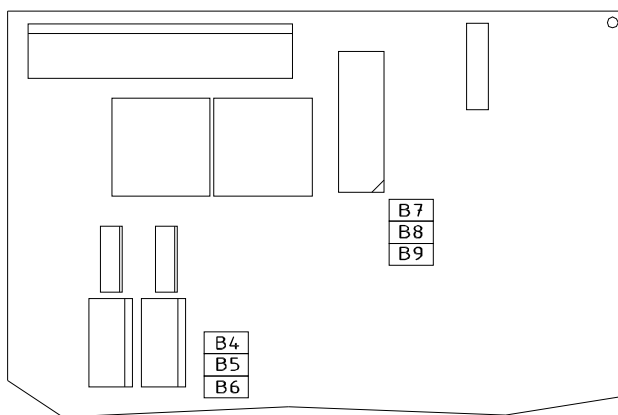
Connection via RS232

Master Clock External equipment DTE (9-polig D-sub) (25-polig D-sub)



Connection via RS485

1. Turn off power.
2. Open the Master Clock by loosening the four screws holding the front panel. Lift the panel and set the jumpers B7-B9 according to the instruction below.
3. Remount the front panel and turn on the power again.
4. Enter the special function setup/serial port and change the setting to RS485.
5. Connect the RS485 signal to screw terminal 10, 11 and 12.



	B7	B8	B9	
PREP. FOR RS232	X		X	FACTORY DEFAULT
PREP. FOR RS485		X		

X= Closed



Programming

General

Using 6 buttons and a 2-row 16-character display carries out all programming. Programming is self-instructive and to simplify the dialogue Yes/No questions are used.

Running mode

When the Master Clock is in operation it shows date and time in the display.

This is called *running mode* in this documentation.

LTs = Local Time summer.

LTw = Local Time winter.

MON 16 MAR 2020
 10:11:00 LT_w

MON 16 MAR 2020
 10:11:00 LT_w

SET TIME

SLAVE CLOCK

ALARMS

WEEK PROGRAM

DATE PROGRAM

DISPLAY PROGRAM

TEMPORARY PROGR.

GROUP → PERIOD

DISPLAY HOLIDAYS

SPEC.-FUNCTIONS

- | | |
|------------------------------|------------|
| 1- Select function | ↑↓ |
| 2- Enter programming mode | YES |
| 3- Move sideways | ← → |
| 4- Change/scroll | ↑↓ |
| 5- Accept | YES |
| 6- Cancel / Leave prog. mode | ← |



QWTIME III MASTER CLOCK

User Manual

Document: DOK11069en03
Author: PM
Date: 2021-11-09
Page: 11 of 75

Start up

STARTING

LANGUAGE
ENGLISH?

When the Master Clock is connected for the first time correct/requested language has to be entered. Press **NO** until requested language occurs in the display e.g. English. Accept with YES.

COUNTRY
DEU?

Press **NO** until correct country code occurs.
For Germany, select DEU. Accept with YES.

SET TIME
200316 09:07:00

Set, by using the arrows, the right time format i.e. year, month, day and hour but a few minutes in advance.
Wait for the right time and synchronise using YES.

SLAVE CLOCK
= 12:00?

Now the question: SLAVE CLOCK 12.00?
If the Slave Clocks show 12.00, answer **YES**,
if not set the time shown by the slave clocks. Accept using **YES**.

MON 16 MAR 20
09:07:00 LT

The Master Clock is now in running mode.

NOTE! If a slave clock runs out by a minute, its cabling must be pole changed and the slave clock to be corrected manually.

NOTE! If the time of the slave clocks is ahead of correct/present time the Master Clock Programmer will wait until correct time corresponds with the slave clocks.

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



Set time when in operation

MON 16 MAR 2020
09:07:00 LT_w

Select function using ↓.

SET TIME

Enter the programming mode with YES.

SET TIME
200316 09:07:00

Set, by using the arrows, the right time.
Format; year, month, day and hour but a few minutes in advance.
Wait for the right time and synchronise using YES.

SET TIME

Leave programming mode by pressing ← several times.

MON 16 MAR 2020
09:07:00 LT

The master clock is now back in running mode.

Summer to winter (Day light saving)

Resetting between summer and wintertime is fully automatic and does not need programming.



Slave Clock

This function is used to enter the time that the slave clocks are showing.

This is useful if, by some reason, the master clock and the slave clocks should show different times.

When the slave clock time has been entered, the master clock will automatically adjust the slave clocks to correct time.

Please note that before using this function make sure that all connected slave clocks are showing the same time. If any of the slave clocks are showing a divergent time this clock must be manually adjusted to the same time as the other clocks.

The impulses to the slave clocks are temporarily stopped when entering this function.

MON 16 MAR 2020 09:07:00 LT	Select function using ↓.
SLAVE CLOCK	Enter the programming mode with YES.
SLAVE CLOCK = 09:07 OFF	SLAVE CLOCK = 09.07? (Example) If the slave clocks show 09.07 answer YES, if not, set the time shown by the slave clocks.
SLAVE CLOCK = 09:07 OFF	YES.
SLAVE CLOCK = 09:07 ON	YES.
SLAVE CLOCK	Leave programming mode by pressing ← several times.
MON 16 MAR 2020 09:07:00 LT	The master clock is now back in running mode.



Alarms

The master clock is equipped with several supervision facilities to detect functional disturbances. When a functional disturbance is detected the following will happen:

- Red alarm LED is lit.
- Alarm relay* is activated.
- An alarm message is displayed in function ALARM.

The function ALARM is used to display and erase (clear) alarm messages.

Type of alarm	Indication	Reason for alarm	Action
NO RADIO	Red alarm LED lit. Alarm relay activated.	The radio receiver is not working.	Check the radio receiver. If OK, clear the alarm.
UF LOW	Red alarm LED lit. Alarm relay activated	Impulse voltage below alarm limit.	Check the load on the impulse output. If OK, clear the alarm.
SHORT CIRCUIT	Red alarm LED lit. Alarm relay activated	Short circuit on impulse output	Remove the short circuit. If OK, clear the alarm.
CURRENT LOW	Red alarm LED lit. Alarm relay activated	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	Red alarm LED lit. Alarm relay activated	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	Red alarm LED lit. Alarm relay activated Works only if the master clock is equipped with batteries for running reserve.	By some reason the power to the master clock has been switched off.	Check the mains. If OK, clear the alarm.

* One of the relay outputs can be used as an alarm relay. This function is as default disabled but can be enabled via SPECIAL FUNCTION/ SETUP/ ALARM RELAY/YES.



QWTIME III MASTER CLOCK

User Manual

Document: DOK11069en03
Author: PM
Date: 2021-11-09
Page: 15 of 75

ALARMS- DISPLAY

To show the alarms

ALARMS- ERASE

To erase the alarms

Example 1, display alarms

MON 16 MAR 2020
09:07:00 LT

Select function using $\uparrow\downarrow$.

ALARMS

Accept with YES.

ALARMS- DISPLAY

Press NO until the wished function is shown.
Accept with YES.

14AUG 15:52
NO RADIO

The alarm is displayed.
Press $\uparrow\downarrow$ to see next alarm.
Return to running mode press \leftarrow .

ALARMS- DISPLAY

\leftarrow .

ALARMS

\leftarrow .

MON 162 MAR 2020
09:07:00 LT

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



Example 2, erase (clear) alarms

MON 16 MAR 2020 09:07:00 LT	Select function using ↑↓ .
ALARMS	Accept with YES.
ALARMS- ERASE	Press NO until the wished function is shown. Accept with YES.
17MAR 15:52 NO RADIO	The alarm is displayed. Press YES to erase the alarm.
ERASE?	Accept with YES.
ALARMS- ERASE	Return to running mode press ←.
ALARMS	←.
MON 16 MAR 2020 09:07:00 LT	



Week Program & Date Program

Using these two functions, programming of the outputs is made.

Concept description

Program	A "program" refers to programming an output to a certain time. The word program represents a single time event and several programs are defined as a <i>group</i> of programs. For example: output 2 switches on every working day (Monday-Friday) at 8.00.
Week program	A week program is a program, which is repeated every week. You can for each program choose for which days of the week it shall be valid: Individual or block programming. M = Monday T = Tuesday W = Wednesday T = Thursday F = Friday S = Saturday S = Sunday
Date program	A date program is a program, which is valid for a specific date.
Group	A group of programs, signal events.
Type of signals	There are some different kinds of signals, depending on how the relay output is to be used.
ON/OFF	Is used when a longer lasting switching ON is required, e.g. for controlling fans, door locks, lighting etc.
01s	Is used when a short pulse is required, e.g. for bells/buzzers. Pulse duration selectable from 1-99 seconds.
Astr.	Astr. (Twilight) is a function which closes/opens a predestined relay at sunrise resp. sunset. Which day and month of the year it is, and where the Master Clock is located geographically, define the time of the sunrise resp. sunset. The sunrise resp. sunset are calculated in the software of the Y8 module. The geographic position of the Master Clock is entered at starting up. A map indicating latitude (Enorth) and longitude (Eeast) is enclosed.
Mask	A program that is repeated f. ex every hour is easily entered by the use of mask program. XX.15.00 ; the program is repeated every hour att minute 15. 08.XX.00 ; the program is repeated every minute between 08.00 and 09.00. XX.XX.00 ; The program is repeated every minute.

WESTERSTRAND URFABRIK AB

P.O. Box 133
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Tel. +46 506 48000
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QWTIME III MASTER CLOCK User Manual

Document: DOK11069en03
Author: PM
Date: 2021-11-09
Page: 18 of 75

To simplify programming 3 sub menus are used:

WEEK PROGRAM
NEW GROUP A

To enter new programs.

WEEK PROGRAM
ERASE GROUP A

To erase a separate existing program.

WEEK PROGRAM
CHANGE GROUP A

To change existing programs.

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QWTIME III MASTER CLOCK User Manual

Document: DOK11069en03
Author: PM
Date: 2021-11-09
Page: 19 of 75

Week Program, example 1 (New program)

Example: Outputs No. 2 shall switch on Monday – Friday at 09.00 and off at 17.00.

```
MON 16 MAR 2020
09:07:00 LT
```

Select function using $\uparrow\downarrow$.

```
WEEK PROGRAM
```

Enter programming mode using YES.

```
WEEK PROGRAM
NEW GROUP A
```

Select new program using YES.

```
WEEK PROGRAM
NEW GROUP A
```

Select group of programs using $\uparrow\downarrow$, accept using YES.

```
OUTPUT 2 ON
----- 08:00:00
```

Select output using $\uparrow\downarrow$. Move to the right using \rightarrow .

```
OUTPUT 2 ON
----- 08:00:00
```

State type of signal using $\uparrow\downarrow$.

```
OUTPUT 2 ON
MTWTF-- 08:00:00
```

State the days the program shall function using $\uparrow\downarrow$.
Move to the right using \rightarrow .

```
OUTPUT 2 ON
MTWTF-- 09:00:00
```

State the time of the program using $\uparrow\downarrow$.

Move to the right using \rightarrow .

Accept using YES.

If the program is approved the text “Program saved” is displayed quickly.

```
OUTPUT 2 OFF
MTWTF-- 17:00:00
```

Continue with programming OFF for the same output or leave programming by pressing \leftarrow several times.

```
WEEK PROGRAM
```

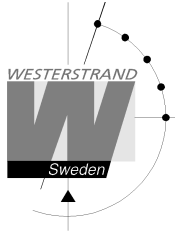
```
MON 16 MAR 2020
09:07:00 LT
```

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Week Program, example 2 (Change program)

Example: A signal on output 1, Monday – Friday at 08.00, shall be changed to 08.15. Signal length is 5 seconds.

MON 16 MAR 2020
09:07:00 LT

Select function using $\uparrow\downarrow$.

WEEK PROGRAM

Enter programming mode using YES.

WEEK PROGRAM
CHANGE GROUP A

Select change program using YES.

WEEK PROGRAM
CHANGE **GROUP A**

Select group of programs using $\uparrow\downarrow$, accept using YES.

OUTPUT 2 05S
MTWTF-- 08:00:00

Select output using $\uparrow\downarrow$. Move to the right using \rightarrow .

OUTPUT 2 05S
MTWTF-- 08:00:00

Step forward to the program, which is to be changed using NO and YES.

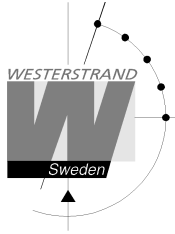
OUTPUT 2 05S
MTWTF-- 08:**15**:00

Change the time to 09.15 using the arrows.
Accept using YES.

WEEK PROGRAM

Leave the programming by pressing \leftarrow several times.

MON 16 MAR 2020
09:07:00 LT



Week Program, example 3 (Erase program)

Example: A signal on output 1, Fridays at 16.30 shall be deleted. Signal length is 5 seconds.

```
MON 16 MAR 2020  
09:07:00 LT
```

Select function using $\uparrow\downarrow$.

```
WEEK PROGRAM
```

Enter programming mode using YES.

```
WEEK PROGRAM  
ERASE GROUP A
```

Select erase program using YES.

```
WEEK PROGRAM  
ERASE GROUP A
```

Select group of programs using $\uparrow\downarrow$, accept using YES.

```
OUTPUT 1 ON  
MTWTF-- 09:00:00
```

Select output using $\uparrow\downarrow$. Move to the right using \rightarrow .

```
OUTPUT 1 05S  
----F-- 16:30:00
```

Step forward to the program that is to be erased using NO and YES.
Accept using YES.

```
WEEK PROGRAM
```

Leave the programming by pressing " several times.

```
MON 16 MAR 2020  
09:07:00 LT
```



Week Program, example 4 (Astronomical function)

Example: Output No. 1 shall switch ON all sunset All days and switch OFF at sunrise.

MON 16 MAR 2020
09:07:00 LT

Select function using $\uparrow\downarrow$.

WEEK PROGRAM

Enter programming mode using YES.

WEEK PROGRAM
NEW GROUP A

Select new program using YES.

WEEK PROGRAM
NEW **GROUP A**

Select group of programs using $\uparrow\downarrow$, accept using YES.

OUTPUT 2 ON
MTWTF-- 08:00:00

Select output using $\uparrow\downarrow$. Move to the right using \rightarrow .

OUTPUT 2 **ASTR**
MTWTF--

State type of signal using $\uparrow\downarrow$.

OUTPUT 2 ASTR
MTWTF--

State the days the program shall function using $\uparrow\downarrow$.
Accept using YES.

If the program is approved the text "Program saved" is displayed quickly.

WEEK PROGRAM

Leave the programming by pressing \leftarrow several times.

MON 16 MAR 2020
09:07:00 LT



Week Program, example 5 (Block program)

Example: Outputs No. 2 shall switch on Monday, Wednesday and Friday at 09.00.

MON 16 MAR 2020 09:07:00 LT	Select function using $\uparrow\downarrow$.
WEEK PROGRAM	Enter programming mode using YES.
WEEK PROGRAM NEW GROUP A	Select new program using YES.
WEEK PROGRAM NEW GROUP A	Select group of programs using $\uparrow\downarrow$, accept using YES.
OUTPUT 2 ON ----- 08:00:00	Select output using $\uparrow\downarrow$. Move to the right using \rightarrow .
OUTPUT 2 ON ----- 08:00:00	State type of signal using $\uparrow\downarrow$.
OUTPUT 2 ON M-W-F-- 08:00:00	State the days the program shall function using $\uparrow\downarrow$. Move to the right using \rightarrow .
OUTPUT 2 ON M-W-F-- 09:00:00	State the time of the program using $\uparrow\downarrow$. Move to the right using \rightarrow . Accept using YES. If the program is approved the text "Program saved" is displayed quickly.
OUTPUT 2 OFF M-W-F-- 09:00:00	Continue with programming OFF for the same output or leave programming by pressing \leftarrow several times
WEEK PROGRAM	
MON 16 MAR 2020 09:07:00 LT	

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P.O. Box 133
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Tel. +46 506 48000
Fax. +46 506 48051

Internet: <http://www.westerstrand.se>
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Week Program, example 6 (Mask program)

Example: Outputs No. 2 shall switch on for 5 seconds every hour at minute 15, all days in the week.

```
MON 16 MAR 2020
09:07:00 LT
```

Select function using $\uparrow\downarrow$.

```
WEEK PROGRAM
```

Enter programming mode using YES.

```
WEEK PROGRAM
NEW GROUP A
```

Select new program using YES.

```
WEEK PROGRAM
NEW GROUP A
```

Select group of programs using $\uparrow\downarrow$, accept using YES.

```
OUTPUT 2 ON
----- 08:00:00
```

Select output using $\uparrow\downarrow$. Move to the right using \rightarrow .

```
OUTPUT 2 05S
----- 08:00:00
```

State type of signal using $\uparrow\downarrow$.
05S = Pulse with 5 seconds length.

```
OUTPUT 2 05S
MTWTFSS 08:00:00
```

State the days the program shall function using $\uparrow\downarrow$.
Move to the right using \rightarrow .

```
OUTPUT 2 05S
MTWTFSS ** :15:00
```

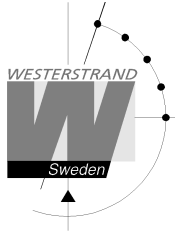
State the time of the program using $\uparrow\downarrow$. ** = every hour.
Move to the right using \rightarrow .
Accept using YES.

If the program is approved the text "Program saved" is displayed quickly.

```
WEEK PROGRAM
```

Leave programming by pressing \leftarrow several times.

```
MON 16 MAR 2020
09:07:00 LT
```

Date Program, example (New program)

Example: Outputs No. 1 shall switch on the 1st of August at 12.00.

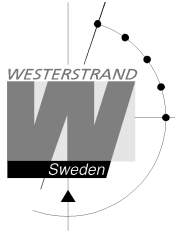
MON 16 MAR 2020 09:07:00 LT	Select function using $\uparrow\downarrow$.
DATE PROGRAM	Enter programming mode using YES.
DATE PROGRAM NEW	Select new program using YES.
OUTPUT 1 ON AUG 01 08:00:00	Select output using $\uparrow\downarrow$. Move to the right using \rightarrow .
OUTPUT 1 ON AUG 01 08:00:00	State type of signal using $\uparrow\downarrow$.
OUTPUT 1 ON AUG 01 08:00:00	State the date the program shall function using $\uparrow\downarrow$. Move to the right using \rightarrow .
OUTPUT 1 ON AUG 01 12:00:00	State the time of the program using $\uparrow\downarrow$. Move to the right using \rightarrow . Accept using YES. If the program is approved the text "Program saved" is displayed quickly.
OUTPUT 1 OFF AUG 01 12:00:00	Continue with programming OFF for the same output or leave programming by pressing \leftarrow several times.
DATE PROGRAM	
MON 16 MAR 2020 09:07:00 LT	

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P.O. Box 133
SE-545 23 TÖREBODA

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

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Display Program

MON 16 MAR 2020
09:07:00 LT

Select function using $\uparrow\downarrow$.

DISPLAY PROGRAM

Enter display program using YES.

DISPLAY PROGRAM
GROUP **A**

Select program group using $\uparrow\downarrow$, accept with YES.

GROUP A
OUTPUT **ALL**

Select output to be displayed using $\uparrow\downarrow$, accept with YES.

OUTPUT 2 ON
MTWTF-- 08:00:00

Step forwards alt. Backwards using $\uparrow\downarrow$.

DISPLAY PROGRAM

Leave the function display program by pressing \leftarrow several times.

MON 16 MAR 2020
09:07:00 LT

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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



Temporary Program, example

Example: Outputs No. 2 shall switch on immediately 15.35.00 and turn off according to normal week program. The temporary program will automatically be erased when the event has been effected.

MON 16 MAR 2020
09:07:00 LT

Select function using $\uparrow\downarrow$.

TEMPORARY PROGR.

Enter programming mode using YES.

OUTPUT 2 ON
15:35:00

Select output using $\uparrow\downarrow$. Move to the right using \rightarrow .

OUTPUT 2 **ON**
15:35:00

State type of signal using $\uparrow\downarrow$.
Accept using YES

OUTPUT 2 ON
15:35:00

Accept using YES or change the time of the program using $\uparrow\downarrow$.

TEMPORARY PROGR.

Leave the programming by pressing " several times.

MON 16 MAR 2020
09:07:00 LT



Group => Period

Each program group can be associated to one or several *time periods*. A time period can consist of one or several dates. Maximum 99 time periods can be used. Program group **A** is as default associated to a time period covering the complete year, 1/1-31/12.

Example:

A school has one group of programs that are used during the school season and another used during school holidays. School season = Group **A**, School holidays = Group **B**.

The school holidays are at the following dates: 1/5, 10/6-15/8, 23/9 and so on...

MON 16 MAR 2020
09:07:00 LT

Select function using $\uparrow\downarrow$.

GROUP => PERIOD

Enter programming mode using YES.

GROUP **B**
1: _____ - _____

Select group of programs using $\uparrow\downarrow$, accept using YES.

GROUP B
1: **MAY01** - _____

State the date when the period shall begin.
Move to the right using \rightarrow .

GROUP B
1: MAY01 - **MAY01**

State the date when the period shall end.
Accept with Yes.

GROUP B
2: _____ - _____

Continue with next time period.

GROUP B
2: **JUN07** - _____

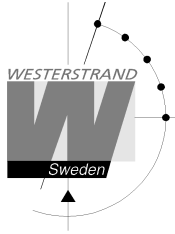
GROUP B
2: JUN07 - **AUG15**

Accept with YES.

GROUP => PERIOD

Continue with next time period or leave
programming by pressing \leftarrow several times.

MON 16 MAR 2020
09:07:00 LT



Display Holidays

This function is used to display the public holidays that are stored.

Example:

MON 16 MAR 2020
09:07:00 LT

Select function using $\uparrow\downarrow$.

DISPLAY HOLIDAYS

Enter display program using YES.

DISPLAY HOLIDAYS
01: 01Jan

Scroll using $\uparrow\downarrow$.

DISPLAY HOLIDAYS

Leave the programming by pressing \leftarrow several times.

MON 16 MAR 2020
09:07:00 LT



Spec.-Functions

The special functions contain functions used during setup and configuration of the Master Clock. If the default settings are used no configuration is needed.

MON 16 MAR 2020 09:07:00 LT	Select function using ↓ .
SPEC.-FUNCTIONS	Accept with YES.
SPEC.-FUNCTIONS STATUS	Press NO until wished function is shown. Accept with YES.
STATUS	Show status information of the different output/ input in the Master Clock.
KEYLOCK	Keylock and password function.
LANGUAGE	Language selection.
COUNTRY	Country selection.
POSITION	Selection of position for astronomical function.
SETUP	Setup / configuration of the different impulse system, type of synchronisation etc.
HOLIDAYS	Change holidays
DISPLAY FORMAT	Display format in running mode.
SOFTWARE VERSION	Present software version.
SPEC.-FUNCTIONS STATUS	Return to running mode press ←.
MON 16 MAR 2020 09:07:00 LT	

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P.O. Box 133
SE-545 23 TÖREBODA

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

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Status

With this function each input/output status can be checked.

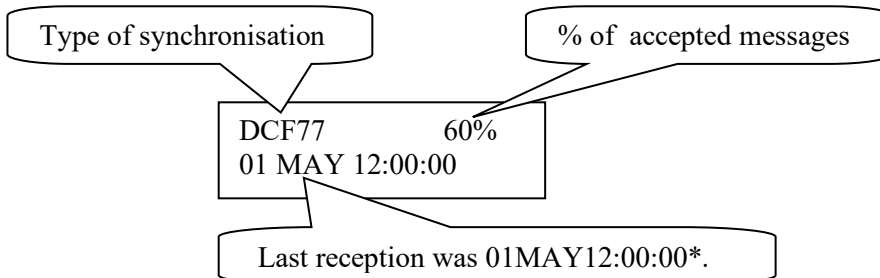
Example:

Check the status of the radio receiver.

MON 16 MAR 2020 09:07:00 LT _w	Select function using ↓.
SPEC.-FUNCTIONS	Accept with YES. Press NO until wished function is shown.
SPEC.-FUNCTIONS STATUS	Accept with YES.
STATUS SYNC.SOURCE	Press NO until wished input/output is shown. Accept with YES.
DCF77 60% 16MAR 19:59:00	The radio receiver has accepted 60% of the radio messages. Last reception was 16/3 19:59:00.
STATUS SYNC.SOURCE	Return to running mode press ←.
SPEC.-FUNCTIONS STATUS	←
SPEC.-FUNCTIONS	←
MON 16 MAR 2020 09:07:00 LT _w	

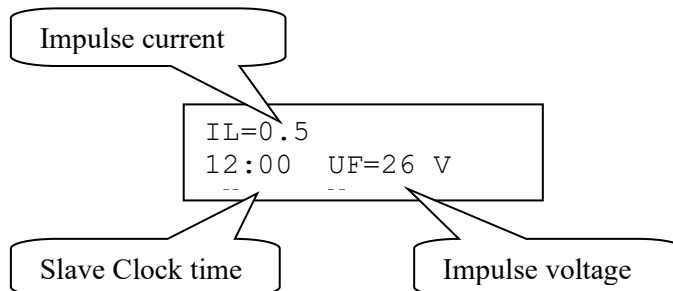


Status sync. source

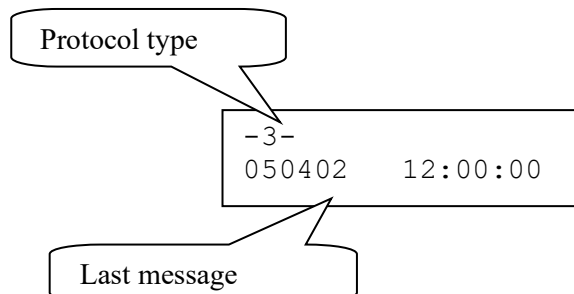


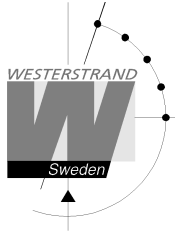
*Remark: The marked position always shows the actual second. This information is updated every other second.

Status impulse output

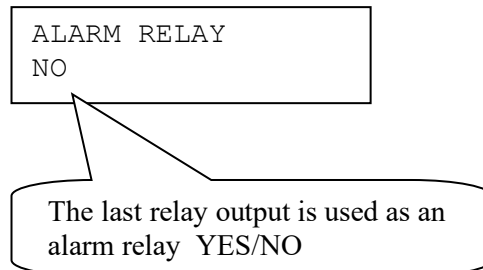


Status RS232/RS485-port

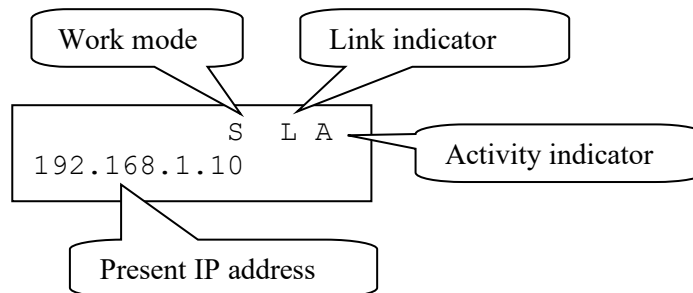




Status Alarm relay



Status IP



Work mode S = Server. The Master Clock is configured to work as an NTP Time Server.
C = Client. The Master Clock is configured to work as an NTP Time Client.

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

Activity indicator A = The Master Clock is accessed via the network.

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



Keylock

With this function it is possible to lock the keyboard. When activated the keylock will lock all buttons in the Master Clock.

There are two levels of keyboard protection.

1. Low level protection
Keylock **ON** : Keyboard locked, press ← YES to open.
2. High level protection
Keylock with **Password** : Keyboard locked, enter password to open.

Remark: "PASSWORD --" means that no password is used

Example 1:

Activate keylock without password

MON 16 MAR 2020 09:07:00 LT	Select function using ↓ .
SPEC.-FUNCTIONS	Accept with YES. Press NO until wished function is shown.
SPEC.-FUNCTIONS KEYLOCK	Accept with YES.
KEYLOCK OFF PASSWORD --	Change to keylock ON.
KEYLOCK ON PASSWORD --	Accept with YES.
KEYLOCK ON PASSWORD --	Accept with YES.
SPEC.-FUNCTIONS KEYLOCK	Return to running mode press ←.
MON 16 MAR 2020 09:07:00 LT	

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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



QWTIME III MASTER CLOCK User Manual

Document: DOK11069en03
Author: PM
Date: 2021-11-09
Page: 35 of 75

Example 2:
Activate keylock with password

MON 16 MAR 2020 09:07:00 LT	Select function using ↓.
SPEC.-FUNCTIONS	Accept with YES. Press NO until wished function is shown.
SPEC.-FUNCTIONS KEYLOCK	Accept with YES.
KEYLOCK OFF PASSWORD --	Change to keylock ON.
KEYLOCK ON PASSWORD --	Accept with YES.
KEYLOCK ON PASSWORD 99	Enter, by using the arrows, a 2-digit password. Accept with YES.
SPEC.-FUNCTIONS KEYLOCK	Return to running mode press ←.
MON 16 MAR 2020 09:07:00 LT	

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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



Language

With this function the language be selected.

Example:

MON 16 MAR 2020 09:07:00 LT	Select function using ↓ .
SPEC.-FUNCTIONS	Accept with YES. Press NO until wished function is shown.
SPEC.-FUNCTIONS LANGUAGE	Accept with YES.
LANGUAGE ENGLISH?	Select, by using the arrows, the wished language. Accept with YES.
SPEC.-FUNCTIONS LANGUAGE	Return to running mode press ←.
MON 16 MAR 2020 09:07:00 LT	



QWTIME III MASTER CLOCK

User Manual

Document: DOK11069en03
 Author: PM
 Date: 2021-11-09
 Page: 37 of 75

Country

With this function the Country can be selected.
 The following country codes are available:

ALG = Algeria	ESP-W	NLD = Netherlands
Au-EST	EST = Estonia	NOR = Norway
AuCSTN	FIN = Finland	NZL = New Zealand
AuCSTS	FRA = France	PHL = Philippines
Au-WST	FRO = Faroe Islands	POL = Poland
Au-TAS	GBR = Great Britain	PRT = Portugal
AUT = Austria	GRC = Greece	QAT = Qatar
BEL-1	GRL = Greenland	OMN = Oman
BEL-2	HKG = Hongkong	ROU = Romania
BEL-3	HRV = Croatia	RUS-M
BEL-4	HUN = Hungary	SAU = Saudi Arabia
BGR = Bulgaria	IND = India	SGP = Singapore
BRA = Brazil	IRL = Ireland	SWE = Sweden
CAN-P	ISL = Iceland	SYR = Syria
CAN-M	ISR = Israel	TUR = Turkey
CAN-C	ITA = Italy	UAE = United Arab Emirates
CAN-E	JOR = Jordan	US-HAW
CHE = Schweiz	KWT = Kuwait	US-ALA
CYP = Cyprus	LTU = Lithuania	US-P
DEN = Denmark	LUX = Luxembourg	USA-M
DEU = Germany	LVA = Latvia	USA-C
EGY = Egypt	MEX = Mexico	USA-E
ESP = Spain	MLT = Malta	US-ATL
	MUS = Mauritius	VEN = Venezuela
	MYS = Malaysia	ZAF = South Africa
		EUROPÉ = CET, without holidays
		GLOBAL = UTC, without holidays

Example:

MON 16 MAR 2020
 09:07:00 LT_w

Select function using ↓.

SPEC.-FUNCTIONS

Accept with YES.
 Press NO until wished function is shown.

SPEC.-FUNCTIONS
 COUNTRY

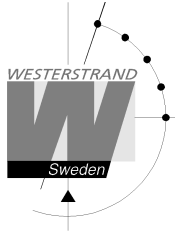
Accept with YES.

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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



QWTIME III MASTER CLOCK

User Manual

Document: DOK11069en03
Author: PM
Date: 2021-11-09
Page: 38 of 75

COUNTRY
D49 ?

Select, by using the arrows, the wished country.
Accept with YES.

SPEC.-FUNCTIONS
COUNTRY

Return to running mode press ←.

MON 16 MAR 2020
09:07:00 LTW

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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



Position

Enter the geographic position of the Master Clock.

This information is needed for the signal type "Astr." (Twilight), in order to make it possible for the software to calculate the time of sunset and sunrise.

Example:

MON 16 MAR 2020
09:07:00 LT

Select function using ↓.

SPEC.-FUNCTIONS

Accept with YES.
Press NO until wished function is shown.

SPEC.-FUNCTIONS
POSITION

Accept with YES.

POSITION
07E 052N

Press buttons ↓ and ↑ until requested longitude occurs.
Press →. State latitude. Accept with YES.

SPEC.-FUNCTIONS
POSITION

Return to running mode press ←.

MON 16 MAR 2020
09:07:00 LT



Setup

With this function the different output and input can be configured. If the default setup is used no configuration is needed.

Example:

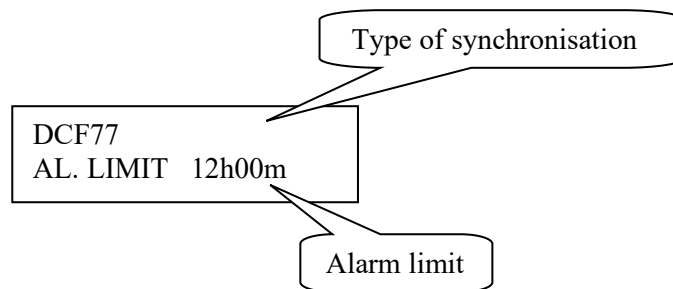
Set the alarm limit for *radio alarm* to 1 hour. (Default setting is 12 hours.)

MON 16 MAR 2020 09:07:00 LT	Select function using ↓ .
SPEC.-FUNCTIONS	Accept with YES. Press NO until wished function is shown.
SPEC.-FUNCTIONS SETUP	Accept with YES.
SETUP SYNC SOURCE	Press NO until wished input/output is shown. Accept with YES.
DCF77 AL.LIMIT --h -- m	Set, by using the arrows, the alarm limit to 1 hour (01h).
DCF77 AL.LIMIT 01h 00 m	Accept with YES
SETUP SYNC SOURCE	Return to running mode press ←.
SPEC.-FUNCTIONS SETUP	←
SPEC.-FUNCTIONS	←
MON 16 MAR 2020 09:07:00 LT	



Setup sync. source

Below is a description of the different configuration parameters available in the setup menu for *sync. source*. Please remark that if default settings are used no configuration is needed.



Type of synchronisation

State type of external synchronisation. The following time sources can be selected:

-----	No external synchronisation.
DCF77	Radio synchronisation DCF77.
GPS	Radio synchronisation GPS.
RDS	Radio synchronisation RDS.
MSF	Radio synchronisation MSF/RUGBY.
1/1M SYNC	Polarised 1/1-minute impulse, sync.
1/1M SLAVE	Polarised 1/1-minute impulse, slave.
1/2M SYNC	Polarised 1/2-minute impulse, sync.
1/2M SLAVE	Polarised 1/2-minute impulse, slave.
TC	Time code type hard wired DCF.
FMSF	Finnish FM time signal.
NTP CLIENT	The Master Clock is NTP client*
RS232	Synchronisation via RS232
AFNOR	Time code according to AFNOR NFS-87500 (IRIG-B with date)**
1/1 SEC SYNC	Polarised 1/1-sec impulse, sync.
1/1 SEC SLAVE	Polarised 1/1-sec impulse, slave.

*Only applicable if the Master Clock is equipped with option Ethernet.

**Only applicable if the Master Clock is equipped with option IRIG-B.

Alarm limit

The configuration parameter *Alarm limit* specifies the time delay before the radio alarm is activated. Default setting is that the radio alarm is inactivated, AL.LIMIT --h--m.

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P.O. Box 133
SE-545 23 TÖREBODA

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

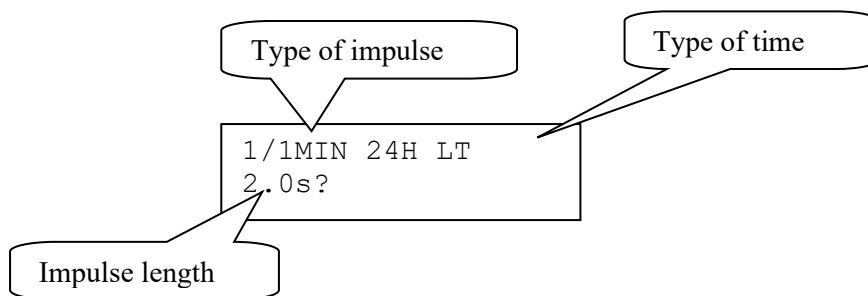
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Setup impulse output

Below is a description of the different configuration parameters available in the setup menu for *impulse output*. Please remark that if default settings are used no configuration is needed.

Impulse type



Type of impulse

Selection of impulse type. The following types are available.

1/1M-24H	: Polarised 1/1-minute impulse with 24 hours resetting (default).
1/1M-12H	: Polarised 1/1-minute impulse with 12 hours resetting.
1/2M-24H	: Polarised 1/2-minute impulse with 24 hours resetting
1/2M-12H	: Polarised 1/2-minute impulse with 12 hours resetting.
SEC-12H	: Polarised Second impulses with 12 hours resetting.
SEC-60S	: Polarised Second impulses with 60 seconds resetting.
TC	: Hard wired DCF Time Code.
TC-POL	: Polarised hard wired DCF Time Code.
1/1M-UP	: Non polarised (Uni-Polar) PPM synchronisation pulse. Pulse length 1 second.
SR2-58	: (SR2, hourly correction 2-wired, with imp. correction on the 58th minute).
SR2-59	: (SR2, hourly correction 2-wired, with imp. correction on the 59th minute).
SR3-58	: (SR3, hourly correction 3-wired, with imp. correction on the 58th minute).
SR3-59	: (SR3, hourly correction 3-wired, with imp. correction on the 59th minute).
IRIGB123	: Time code according to IRIG Document 200-98, Format B123.*
AFNOR	: Time code according to AFNOR NFS-87500.*
-----	: No impulse system.

*Only applicable if the Master Clock is equipped with option IRIG-B.

Type of time

LT = Local Time.

NT = Normal Time (winter time).

UTC = Universal Time Coordinated.

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P.O. Box 133
SE-545 23 TÖREBODA

Tel. +46 506 48000
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Impulse length

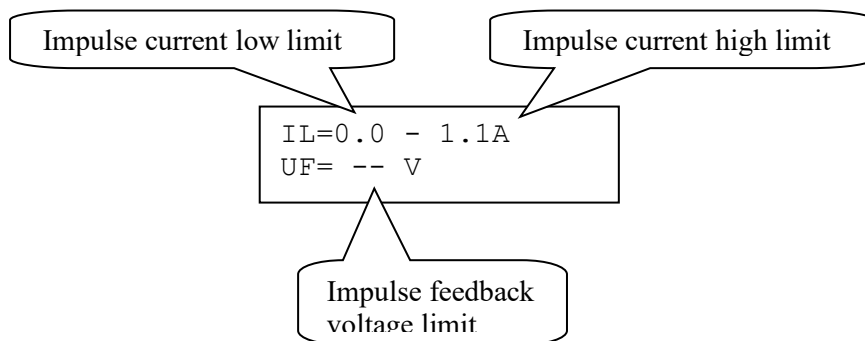
Configuration of impulse length.

1/1 and 1/2 -minute impulse: 0.1 s – 9.9 s.
Second impulses: 0.1 – 1.0 s.

Remark:

When selecting second impulses with pulse length > 0.5 seconds, the pulse length for rapid impulses is automatically adjusted to 0.5 seconds.

Alarm limits



Impulse current low limit

Alarm limit for low current (minimum load). The minimum load can be set from 0A up to 1.1A.

Impulse current high limit

Alarm limit for high current (maximum load). The maximum load can be set from 0A up to 1.1A.

Impulse feedback voltage limit

Alarm limit for feedback impulse voltage.

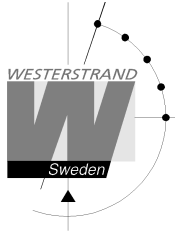
-- : No limit (default).
01 - 99 : Limit in volts, V.

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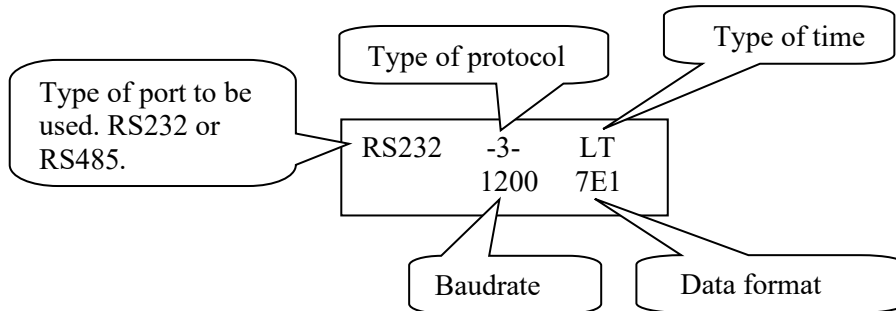
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SE-545 23 TÖREBODA

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

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Setup RS232/485 port



Type of port

Choose serial port to used. RS232 or RS485.

Type of protocol

Name of the transmission / reception protocol used in the module. The following protocols are available.

- 1 : General 2-way-communication protocol.
- 2, 3, 5 and 7 : Automatic time message protocols.
- NMMI :NMEA 0183, ZDA Time string, transmitted every minute.
- NMSE :NMEA 0183, ZDA Time string, transmitted every second.

Type of time

Type of time received or transmitted.

LT = Local Time.

NT = Normal Time (winter time).

UTC = Universal Time Coordinated.

Baudrate

Available speeds:

300, 600, 1200, 2400, 4800, 9600, 19200, 38400 baud.

Data format

Data format of message received or transmitted.

No. of data bits, 7 or 8.

Type of parity, non, odd or even.

No. of stop bits, 1 or 2.

Available formats:

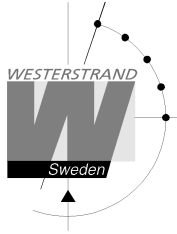
7N1, 7N2, 7O1, 7O2, 7E1, 7E2, 8N1, 8N2, 8O1, 8O2, 8E1, 8E2.

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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



QWTIME III MASTER CLOCK User Manual

Document: DOK11069en03
Author: PM
Date: 2021-11-09
Page: 45 of 75

Protocol description

Protocol 2

The message has length 20 bytes according to:

STX F G W 20 YY MM DD HH MM SS ETX BCC

F - Flag bits

7 =0
6 =1
5 =0
4 =0 Winter time, =1 summer time
3 =1 Synched from Radio source, e.g. DCF77
2 =1 Synched from timeserver

1 0 Type of time
OFF OFF UTC
OFF ON LOC
ON OFF NOR

Example:

Assume wintertime time, synched from radio source, synchronized from timeserver, local time:
Bits 6, 3, 2 and 0 are set: 0100 1101 = 4Dh = 'M'

G - UTC offset during wintertime from letter 'P' in 1/2 hour steps.

Example:

Germany 2 x 1/2 = 1 hour, so 'P'+2 = 'R'

W Weekday '1' Monday .. '7' Sunday
YY Year '00'..'99'
MM Month '01'..'12'
DD Day of month '01'..'31'
HH Hour '00'..'23'
MM Minute '00'..'59'
SS Second '00'..'59'
ETX 03h
BCC Exclusive or of bytes F..ETX

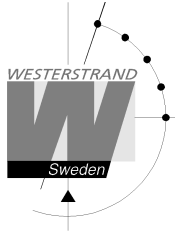
The message is transmitted each second

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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



Protocol 3

At second 56 this message will be transmitted:

HH:MM:00 SP DD/MN/YY SP NNN SP W CR LF (25 bytes)

HH = Hour '00' - '23'.
: = 3AH
MM = Minute '00' - '59'.
SP = Blank 20H.
DD = Date '01' - '31'.
/ = 2FH
MN = Month '01' - '12'.
YY = Year '00' - '99'.
NNN = Daynumber '001' - '365' (3 bytes).
W = Weekday '1' - '7'.
CR = 0DH.
LF = 0AH.

At second 60 (0) a synchronisation sign SUB (1AH) is transmitted.

Remark: The message transmitted at second 56 is *next* minute.

Example:

At 09:07:56 is a message transmitted. The time included in this message will be 09:08:00.

Protocol 5

T:YY:MN:DD:WW:HH:MM:SS CR LF (24 bytes)

T = T
: = 3AH
YY = Year 00....99
MN = Month 01....12
DD = Day 01....31
WW = Day of week 01....07
HH = Hour 00....23
mm = Minutes 00....59
ss = Seconds 00....59
CR = Carriage return 0Dh.
LF = Line feed 0Ah.

The time message is sent out each minute or each second.

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SE-545 23 TÖREBODA

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

Internet: <http://www.westerstrand.se>
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QWTIME III MASTER CLOCK User Manual

Document: DOK11069en03
Author: PM
Date: 2021-11-09
Page: 47 of 75

Protocol 7

STX WW VV YYYY MN DD HH MM SS F G BCC ETX (24 bytes)

STX = 02h (1 byte).

WW = Week number '01'-'53'
VV = Weekday '01'-'07'
YYYY = Year '2003-2099'
MN = Month '01'-'12'
DD = Day '01'-'31'
HH = Hour '00'-'23'
MM = Minute '00'-'59'
SS = Second '00'-'59'

F = '0' Winter-time.
= '1' Summer-time.

G = Offset to UTC for winter-time according to (1 byte):
' ,' (2Ch) -2 hours, '.' (2Eh) -1 hour, '0' (30h) 0 hour.

BCC = Checksum; Exclusive OR of bytes WW..F G in hexadecimal ascii format (2 bytes). Byte STX is NOT included!.

ETX = 03h (1 byte).

This message is sent out each second.

NMEA

ZDA - Time & Date - UTC, Day, Month, Year and Local Time Zone

```
      1      2 3 4      5 6 7  
      |      | | |      | | |  
$--ZDA, hhmmss, xx, xx, xxxx, xx, xx*hh<CR><LF>
```

Field Number:

- 1) Universal Time Coordinated (UTC)
- 2) Day, 01 to 31
- 3) Month, 01 to 12
- 4) Year
- 5) Local zone description, 00 to +- 13 hours
- 6) Local zone minutes description, same sign as local hours
- 7) Checksum

NMMI :NMEA 0183, ZDA Time string, transmitted each minute.

NMSE :NMEA 0183, ZDA Time string, transmitted each second.

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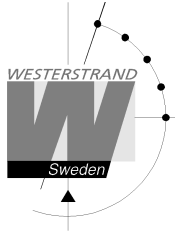


Setup Alarm Relay

One of the relay outputs can be used as an alarm relay. This function is as default disabled but can be enabled via this special function.

Enable alarm relay:

MON 16 MAR 2020 09:07:00 LTW	Select function using ↓.
SPEC.-FUNCTIONS	Accept with YES. Press NO until wished function is shown.
SPEC.-FUNCTIONS SETUP	Accept with YES.
SETUP ALARM RELAY	Press NO until the text ALARM RELAY is shown. Accept with YES.
ALARM RELAY NO	Change to YES by pressing ↓.
ALARM RELAY YES	Accept with YES.
SETUP ALARM RELAY	Return to running mode press ←.
SPEC.-FUNCTIONS SETUP	←.
SPEC.-FUNCTIONS	←.
MON 16 MAR 2020 09:07:00 LTW	



Setup IP

This function can be used to give the Master Clock an IP address if it is equipped with option Ethernet. Please note that IP address as well as all other network parameters can be configured via an external PC using Telnet. See separate manual for this.

Example:

Give the Master Clock IP address 192.168.1.100.

MON 16 MAR 2020 09:07:00 LT _w	Select function using ↓.
SPEC.-FUNCTIONS	Accept with YES. Press NO until wished function is shown.
SPEC.-FUNCTIONS SETUP	Accept with YES.
SETUP IP	Press NO until the text IP is shown. Accept with YES.
IP 192.168.013.199	Set the first digit group of the IP address using ↑↓. Move to the right using →.
IP 192.168.013.199	Continue with the second digit group. Change digits using ↑↓. Move to the right using →.
IP 192.168.001.199	Continue with the third digit group. Change digits using ↑↓. Move to the right using →.
IP 192.168.13.100	Continue with the fourth digit group. Change digits using ↑↓. Accept with YES.
SETUP IP	Return to running mode press ←.
SPEC.-FUNCTIONS SETUP	←.
SPEC.-FUNCTIONS	←.
MON 16 MAR 2020 09:07:00 LT _w	



QWTIME III MASTER CLOCK User Manual

Document: DOK11069en03
Author: PM
Date: 2021-11-09
Page: 50 of 75

Software version

This function shows the software version for the Master Clock.

MON 16 MAR 2020 09:07:00 LT	Select function using ↓ .
SPEC.-FUNCTIONS	Accept with YES. Press NO until wished function is shown.
SPEC.-FUNCTIONS SOFTWARE VERSION	Accept with YES.
QW3-A1301 123342-00 11m	The software version is QW3-A130. 11m = Uptime for this Master Clock.
SPEC.-FUNCTIONS SOFTWARE VERSION	Return to running mode press ←.
SPEC.-FUNCTIONS	←
MON 16 MAR 2020 09:07:00 LT	

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Holidays

Normal public holidays are pre-programmed, and the following year's public holidays are calculated automatically at the turn of the year.

There are two different types of holidays:

- Holidays with *fixed date*; holidays that is appearing at the same date year after year.
- Holidays with *variable date*; holidays that is changing date from year to year.

It is possible to change the existing, pre-programmed holidays.

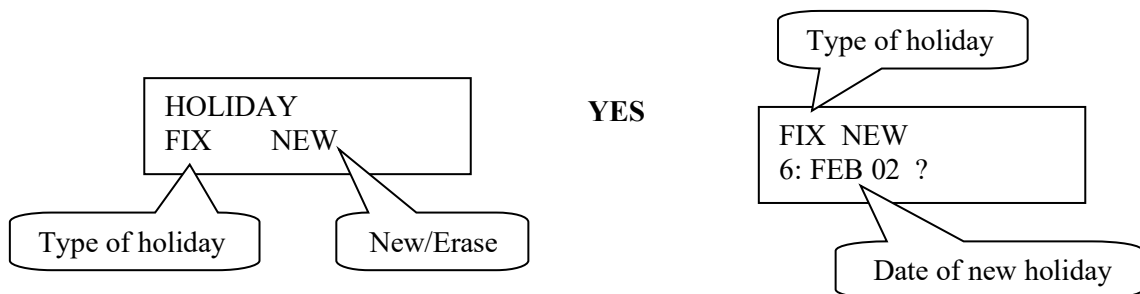
- *Fixed date holiday* can be inserted (NEW) or deleted (ERASE).
- *Variable date holidays* can be *enabled* or *disabled*. Disabled means that the holiday is deactivated until it is manually enabled again.

Fixed holidays

Example of fixed holidays:

JAN01 New Year's Day

DEC25 Christmas day

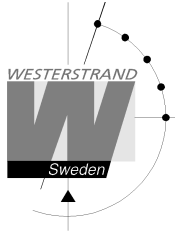


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P.O. Box 133
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Tel. +46 506 48000
Fax. +46 506 48051

Internet: <http://www.westerstrand.se>
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QWTIME III MASTER CLOCK User Manual

Document: DOK11069en03
 Author: PM
 Date: 2021-11-09
 Page: 52 of 75

Variable holidays

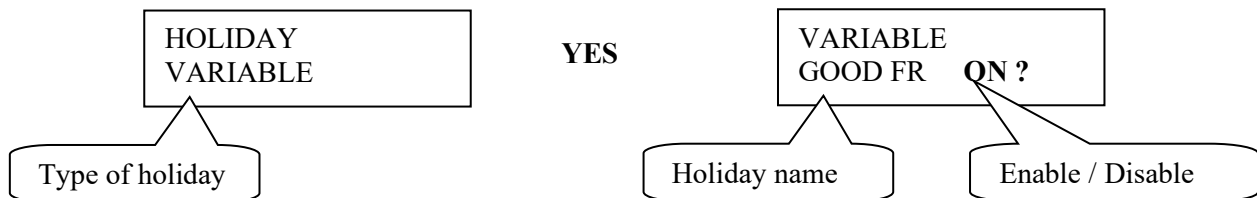
Example of variable holidays:

Good Friday

Easter Monday

Holiday abbreviations used

Language English		Language French		Language German	
EAST. TH	Easter Thursday				
GOOD FR	Good Friday				
EAST. MO	Easter Monday				
ASCENS.	Ascension				
COR CH	Corpus Christi				
PENT. MO	Pentecost Monday				
PRAY DAY	Pray Day				
JOH. EVE					
JOH. DAY					
ALL ST.	All Saints Day				
WED NOV	Bank holiday				
MO MAY	Bank holiday				
MO JUN	Bank holiday				
MO AUG	Bank holiday				
MO OCT	Bank holiday				



Enable/disable

OFF = This holiday is disabled (not used)

ON = This holiday is enabled (used)

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Holidays, example 1, insert a new fixed holiday

Insert January 25 as a new fixed holiday.

MON 16 MAR 2020 09:07:00 LT _w	Select function using ↓.
SPEC.-FUNCTIONS	Accept with YES . Press NO until wished function is shown.
SPEC.-FUNCTIONS HOLIDAY	Accept with YES .
HOLIDAY FIX	Press NO until the text HOLIDAY FIX is shown. Accept with YES .
HOLIDAY FIX NEW	Press YES
FIX NEW 6 : JAN --	Press buttons ↓ and ↑ until requested month occurs. Move to the right using →.
FIX NEW 6 : JAN 25	Press buttons ↓ and ↑ until requested day occurs. Accept with YES .
FIX NEW 7 : -----	Leave this function by pressing ←.
HOLIDAY FIX	←
SPEC.-FUNCTIONS HOLIDAYS	←
MON 16 MAR 2020 09:07:00 LT _w	



Holidays, example 2, erase fixed holiday

Erase the fixed holiday January 01.

MON 16 MAR 2020 09:07:00 LT _w	Select function using ↓ .
SPEC.-FUNCTIONS	Accept with YES . Press NO until wished function is shown.
SPEC.-FUNCTIONS HOLIDAY	Accept with YES .
HOLIDAY FIX	Press NO until the text HOLIDAY FIX is shown. Accept with YES .
HOLIDAY FIX ERASE	Press NO until the text FIX ERASE is shown. Press YES .
FIX ERASE 1 : JAN01 ?	Press button ↑ until requested holiday occurs. Accept with YES .
FIX ERASE 1 : JAN01 ERASE?	Accept with YES .
FIX ERASE 1 : JAN01 OK	The holiday Jan 01 is erased.
FIX ERASE 2 : MAY01	Leave this function by pressing ←.
HOLIDAY FIX	←
SPEC.-FUNCTIONS HOLIDAYS	←
MON 16 MAR 2020 09:07:00 LT _w	



Holidays, example 3, disable a variable holiday

Disable holiday Good Friday.

MON 16 MAR 2020 09:07:00 LTW	Select function using ↓ .
SPEC.-FUNCTIONS	Accept with YES . Press NO until wished function is shown.
SPEC.-FUNCTIONS HOLIDAY	Accept with YES .
HOLIDAY VARIABLE	Press NO until the text HOLIDAY VARIABLE is shown. Accept with YES .
VARIABLE EAST . TH OFF?	Press → until the text GOOD FR is shown.
VARIABLE GOOD FR ON ?	Change ON to OFF by pressing button ↑.
VARIABLE GOOD FR OFF ?	Accept with YES .
VARIABLE EAST MO ON?	Press ←.
VARIABLE SAVE ?	Accept with YES .
HOLIDAY VARIABLE	←
SPEC.-FUNCTIONS HOLIDAYS	←
HOLIDAYS	←
MON 16 MAR 2020 09:07:00 LTW	



Display format

With this function the display format in running mode can be selected.

The following two formats can be selected:

MON 16 MAR 2020
10:11:00 LTw

Standard format, default format.
LT = Local Time. (LTs when summer time)
NT = Normal Time (Winter time).
UTC = Universal Time Coordinated.

MON 16 MAR 2020
LTw

Format 2, used for test / fault finding.

Example:

MON 16 MAR 2020
09:07:00 LT

Select function using ↓ .

SPEC.-FUNCTIONS

Accept with YES.
Press NO until wished function is shown.

SPEC.-FUNCTIONS
DISPLAY FORMAT

Accept with YES.

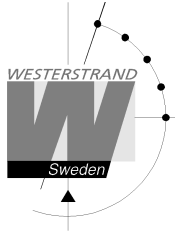
DISPLAY FORMAT
STANDARD

Select, by using the arrows, the wished display format.
Accept with YES.

SPEC.-FUNCTIONS
DISPLAY FORMAT

Return to running mode press ←.

MON 16 MAR 2020
09:07:00 LT



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.

User name:

Password:

Remember my password

OK Cancel

User name

admin or guest.

Password

Enter a password. Default password is *password*.
After login a menu is displayed:



QWTIME III MASTER CLOCK

User Manual

Document: DOK11069en03
 Author: PM
 Date: 2021-11-09
 Page: 58 of 75

Status

Status	Network	NTP	Remote	General	
Name	Master Clock				Refresh
UTC	2021-01-22 12:10:37, week 3 Fri				
LT	2021-01-22 13:10:37, week 3 Fri				
Timezone	UTC+01:00, winter				
IP	192.168.3.12 (Static)				
Netmask	255.255.240.0				
Gateway	192.168.1.1				
DNS	192.168.1.13				
MAC	00-07-09-10-23-AA				
NTP	NTP Client + Server				
Status	Synchronized: (192.168.3.7), Stratum=1, Answers=181				
Alarms	No alarms				
Uptime	0 day, 2 h, 57 min, 19 sec				
Firmware	MEC-A111 (Jan 20 2021). BOOTK64-X151				
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Name	Symbolic name of the Master Clock. This is set in function <i>General</i> .
UTC/LT	Current time, UTC and Local Time
Timezone	Time zone offset to UTC
IP	Shows the IP address of unit
Netmask	Shows the netmask setting
Gateway	Shows the IP address of the gateway
DNS	Shows the IP address of the DNS server
MAC	Shows the MAC address of the unit in format 00-07-09-xx-xx-xx
NTP	Work mode NTP Server = The Master Clock is working as NTP Server only. NTP Client + Server = The Master Clock is working as both Server and Client.
Status	<i>Not Synchronised</i> The Master Clock has never been synchronised. <i>Synchronised</i> The Master Clock has been synchronized at some point, either through manual timing or via an external time source. <i>Synchronised in holdover</i> The main clock works as an NTP client and has received time from an external time server but has lost contact with the server and has therefore switched to using its built-

WESTERSTRAND URFABRIK AB

P.O. Box 133
 SE-545 23 TÖREBODA

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

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QWTIME III MASTER CLOCK

User Manual

Document: DOK11069en03
Author: PM
Date: 2021-11-09
Page: 59 of 75

	<p>in oscillator as a reference. <i>Synchronized: (192.168.3.7), Stratum=1, Answers=16</i> The Master Clock is synchronized and gets its time from an NTP server with IP address 192.168.3.7. This NTP server has stratum level 1 and the main clock has received responses to 16 NTP requests.</p>
Alarms	<p>Shows if the Master Clock has any alarms. Example: <i>No Alarms</i> = The Master Clock is OK. <i>No Radio</i> = The watch has lost synchronization for a long time. <i>5-minute limit</i> = Received time message is more than 5 minutes incorrect in relation to the clock's internal time. The message is not accepted. <i>Authentication</i> = MD5 authentication failed. See also section Alarm in this document</p>
Uptime	Uptime for the Master Clock since last power failure
Firmware	Program version

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SE-545 23 TÖREBODA

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

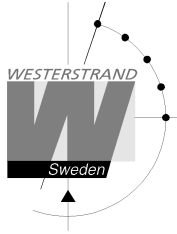
Internet: <http://www.westerstrand.se>
E-mail: info@westerstrand.se



Network

Enter general network parameters

Status	Network	NTP	Remote	General
DHCP				
Use DHCP	<input type="radio"/>			
Fallback	<input type="text" value="192.168.3.10"/>			
Static IP				
Use static IP	<input checked="" type="radio"/>			
Address	<input type="text" value="192.168.13.101"/>			
Subnetmask	<input type="text" value="255.255.240.0"/>			
Gateway	<input type="text" value="192.168.1.1"/>			
DNS 1	<input type="text" value="192.168.1.13"/>			
DNS 2	<input type="text"/>			
VLAN				
Enable VLAN	<input type="checkbox"/>			
VLAN tag (0-4094)	<input type="text" value="0"/>			
VLAN prio (0-7)	<input type="text" value="0"/>			
Utilities				
Syslog	<input type="text"/>	<input type="checkbox"/>		
Identity access	<input type="text" value="Normal"/>			
Telnet	<input type="checkbox"/>			
HTTP	<input checked="" type="radio"/>			
HTTPS	<input type="radio"/>			
SNMP				
Enable SNMP	<input checked="" type="checkbox"/>			
Read community	<input type="text" value="public"/>			
Read/write community	<input type="text" value="private"/>			
Trap address 1	<input type="text"/>			
Trap address 2	<input type="text"/>			
Trap address 3	<input type="text"/>			
Trap type	v1 <input type="radio"/> v2 <input checked="" type="radio"/>			
<input type="button" value="Save"/>				



DHCP

Use DHCP

Unchecked – Static IP address according to static IP below.

Checked – DHCP IP address with fallback according to IP fallback below.

Fallback

If DHCP is activated this will be the DHCP fallback address.

Static IP

Use static IP

To be checked if static IP address is used.

Address

Enter the static IP-address.

Subnetmask

Enter the subnetmask. Default 255.255.255.0

Gateway

Gateway IP address.

DNS

IP address of DNS server. Two different addresses can be entered, DNS1 and DNS 2.

VLAN

Virtual Local Area Network.

The Ethernet port and can be configured to use one IEEE 802.1q VLAN ID

Enable VLAN

VLAN is enabled if checked

VLAN tag

A 12-bit value specifying a VLAN ID to which a port belongs. VLAN tags from 0-4094 can be entered here.

The selected tag is inserted into the data area of an Ethernet packet.

VLAN prio

Priority Values 0 (default, lowest priority) to 7 (highest priority) which can be used to prioritize network traffic for different types of data.

Utilities

Syslog

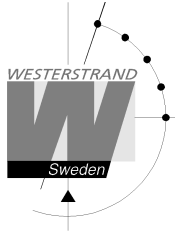
Syslog server IP address. Send syslog messages if checked.

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P.O. Box 133
SE-545 23 TÖREBODA

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

Internet: <http://www.westerstrand.se>
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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

Enable Telnet. Telnet enabled if checked.

Web server

Use of web-browser via HTTP or HTTPS allowed if checked.

HTTP

Use of HTTP (web-browser) if checked

HTTPS

Use of secure communication protocol HTTPS (web-browser) if checked.

SNMP

The Simple Network Management Protocol (SNMP) is used in network management systems to monitor status of devices. This function is used to activate the SNMP, enter the address of one or more SNMP servers and to define the SNMP community.

Trap address. 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.

Enable

SNMP is enabled if checked

Read community

Default public

Read/write Community

Default private

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

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SE-545 23 TÖREBODA

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Fax. +46 506 48051

Internet: <http://www.westerstrand.se>
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NTP

NTP settings

General description

Westerstrand NTP Servers has several features to achieve a reliable and accurate time service. The configuration of the different facilities is flexible, and the features can be selected or deselected depending on each customer's individual needs.

The Server can work as NTP Server only or as both NTP Server and NTP Client.

When working as 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 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 special clock adjusting algorithm where the speed of internal oscillator is increased or decreased depending on the difference between the internal clock and the NTP message. All of this to avoid false and inaccurate time and to give a, when needed, smooth time adjustment without time jumps.

A clock discipline algorithm is also included. This algorithm measures the oscillators drift over a longer period and makes compensations for the drift.

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Status	Network	NTP	Remote	General
DHCP option 42	<input type="checkbox"/>			
Broadcast	<input type="checkbox"/>			
Multicast	<input type="checkbox"/>			
NTP 1		<input type="text" value="ntp.se"/>		
NTP 2		<input type="text"/>		
NTP 3		<input type="text"/>		
NTP 4		<input type="text"/>		
NTP 5		<input type="text"/>		
Interval		<input type="text" value="1"/> minutes		
<input type="button" value="Save"/>				
NTP Advanced				

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NTP mode

This parameter defines if the unit shall work as an NTP Server only or both NTP Client and NTP Server.

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. Network DHCP must also be activated to enable this feature.

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 DHCP option 042 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.

Interval

Interval in seconds between NTP requests.

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P.O. Box 133
SE-545 23 TÖREBODA

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

Internet: <http://www.westerstrand.se>
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NTP Advanced

Advanced NTP settings

Status	Network	NTP	Remote	General
Server				
Server Mode	---	▼	Interval	1 minutes
Stratum when no external sync	1			
Clogging prevention	<input type="checkbox"/>			
My ID	0	Key		
Client				
Client Mode	First ▼			
5 minute limit	<input type="checkbox"/>			
Only accept Stratum 1	<input type="checkbox"/>			
Authentication	<input type="checkbox"/>			
Server 1 ID	0	Key		
Server 2 ID	0	Key		
Server 3 ID	0	Key		
Server 4 ID	0	Key		
Server 5 ID	0	Key		
<input type="button" value="Save"/>				
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Server

Server mode

With this function activated will the server broadcast/multicast NTP messages according to the chosen interval. The server will still answer NTP requests from NTP clients.

Broadcast address: 255.255.255.255

Multicast address: 224.0.1.1

Interval(s)

NTP broadcast interval in seconds. This function is used if broadcast/multicast server is activated. See above.

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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



Stratum when no external sync.

With this function it is defined which stratum level the NTP server shall adopt when it has been synchronized but now is working standalone. Synchronized means that the master clock / time central has received correct time, either from an external sync source, GPS or similar, or that the time is set manually.

If the NTP server has never been synchronized it will have stratum value 16 and LI-bits of the NTP message is set to 3 (clock unsynchronized).

Clogging prevention

The NTP server support access control with a call-gap function and can send kiss-o'-death packets if needed. If this function is activated clients asking for time too often, interval less than 1 second, will be denied and a kiss-o'-death packet will be sent.

My ID / Key

The NTP Server authentication data. Use for MD5 authentication.

Client

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.

5 minute limit *

With this feature, the acceptance of incorrect time messages can be limited. The reason for this limitation is to avoid "time jumps" in the event of functional disturbances. If the time message coming from the NTP server differs more than 5 minutes compared to the clocks internal time, this time message will be rejected.

The default setting is no limit.

Check box = Off; No restriction, accept all messages.

Check box = On; Only accept messages with a maximum time difference of 5 minutes.

* Please note that the Time Central has a general sync. limit feature that affects all modules. See Special functions, section Sync. Limits. If this feature is activated it overrides the 5 minute limit setting.

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.

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QWTIME III MASTER CLOCK

User Manual

Document: DOK11069en03
Author: PM
Date: 2021-11-09
Page: 67 of 75

Remote

Remote control

Remote control of the Master Clock



WESTERSTRAND URFABRIK AB

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SE-545 23 TÖREBODA

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General

Used to configure general parameters.

Status	Network	NTP	Remote	General
Name				
Name		<input type="text" value="WDP_Y2 19_ 1HE"/>		
Contact		<input type="text"/>		
Location		<input type="text"/>		
Password				
admin		<input type="password" value="••"/>	Repeat	<input type="password" value="••"/>
guest		<input type="password" value="••"/>	Repeat	<input type="password" value="••"/>
Miscellaneous				
Firmware		MEC-A109 (Sep 30 2020). BOOTK64-X151		
Firmware Download		<input type="checkbox"/>		
Restart Program		<input type="checkbox"/>		
<input type="button" value="Save"/>				
Backup/Restore				
Filename		<input type="text" value="WDP_Y2 19_ 1HE.txt"/>	<input type="button" value="Backup"/>	
		<input type="button" value="Bläddra..."/> Ingen fil är vald.	<input type="button" value="Restore"/>	Program restarts!
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Name

Symbolic name, maximum 64 characters. This name is shown in the status menu.

Example: Central Master Clock ICC

Password

Login password.

Admin = Administrator 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*.

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Lost password

If the password has been lost network card has to be cold started (FULL RESET). Contact Westerstrand for details.

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 WDP_Y2 19_1HE.txt)

Click [Backup].

Passwords are not saved.

Backup/Restore

Filename

Ingen fil är vald. Program restarts!

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Restore

Select file ([Välj fil]). Here file *WDP_Y2 19_1HE.txt* was selected.

Click [Restore].

The clock restarts. Refresh the page.

The MAC- and IP-address never are restored.

Backup/Restore

Filename

WDP_Y2 19_1HE.txt Program restarts!

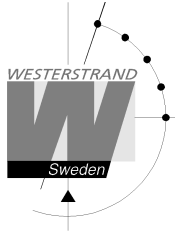
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QWTIME III MASTER CLOCK

User Manual

Document: DOK11069en03
Author: PM
Date: 2021-11-09
Page: 70 of 75

Firmware Download / Wunser

General

The Master Clock has support for firmware upgrade via the network. The utility program Wunser is used for firmware upgrade. Wunser can be downloaded from Westerstrand.se

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 program is in boot-loader mode, then the clock will answer on PING only.

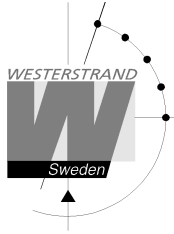
For details of the download procedure, see Wunser manual, 4296.

WESTERSTRAND URFABRIK AB

P.O. Box 133
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Fax. +46 506 48051

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**QWTIME III MASTER CLOCK
User Manual**

Document: DOK11069en03
 Author: PM
 Date: 2021-11-09
 Page: 71 of 75

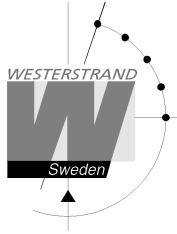
Programming form

Function	Group	Output no.	Type of signal	Day/Date	Time

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 SE-545 23 TÖREBODA Fax. +46 506 48051

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QWTIME III MASTER CLOCK User Manual

Document: DOK11069en03
Author: PM
Date: 2021-11-09
Page: 72 of 75

Map

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Fault tracing

The display is blank

- A. The green LED “POWER” is light?
 - A1. No.
 - A1A. Check the supply voltage.
 - A1B. Power supply wires connected correctly?
 - A2. Yes.
 - A2A. Restart the master clock by switching the supply voltage off and on.

After starting up the master clock, no impulses appear (to correct the slave clocks).

- B1. The master clock awaits the time shown by the slave clocks. Impulses will be distributed when correct time = the time shown by the slave clocks.

Relay outputs are programmed but nothing happens.

- C1. The switch on the front panel is in position **0**. Correct position is **A**.
- C2. Check that the output is working when the switch is in position **1**.
- C3. Different program types have different priority. E.g. a programmed holiday overrides a signal point in a week program.
Priority order (1=highest, 4=lowest):
1) Date program 2) Holiday 3) Group 4) Week program

Alarm messages

- D1. “Short circuit”

Excessive load on the impulse output. Check the slave clock wiring. Impulses are stored (memorised) during the alarm. When the fault is fixed, all the stored impulses are distributed by rapid impulsing.

- D2. “Memory full”

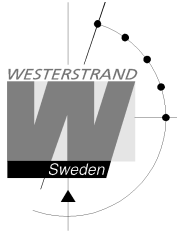
The master clock is out of memory, probably due to incorrect programming. Use week program for repetitive signals or group for a certain period. See the programming instructions in this manual.

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D3. “Exists”

The signal point is already programmed.

D4. “Not programmed”

When trying to change a non-existing signal point.

RADIO

Radio synchronisation is not working (DCF)

Check that the LED in the antenna is flashing in second's rhythm. The antenna should be mounted in the clear, with the arrow on the box aiming south. Check that the LED “Radio” on the master clock is flashing in second's rhythm.

Use special functions “Status/Sync. source” for information on the reception quality.

Accepted radio reception is shown by a flashing colon (:) between hours and minutes in the display.