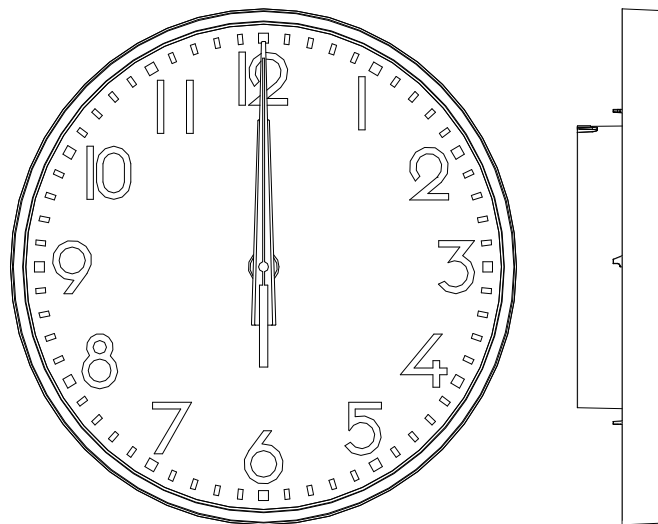


# Analogue TC Clock

## TECHNICAL MANUAL



## 1. General

Westerstrand analogue clock for wired DCF Time-Code (TC) from Master Clock provides the possibility to create a time distribution system with high accuracy and high reliability.

The clock is intended for connection to a 2-wire bus that combines power supply and serial Time-Code.

A built-in microprocessor receives the Time Code, reads the position of the hands, and sets the clock to correct time.

The Time-Code, built up according to the DCF-format, contains information about year, month, day hour and minute. At each minute shift seconds are synchronized as well. The transmission speed is 1 bit/second.

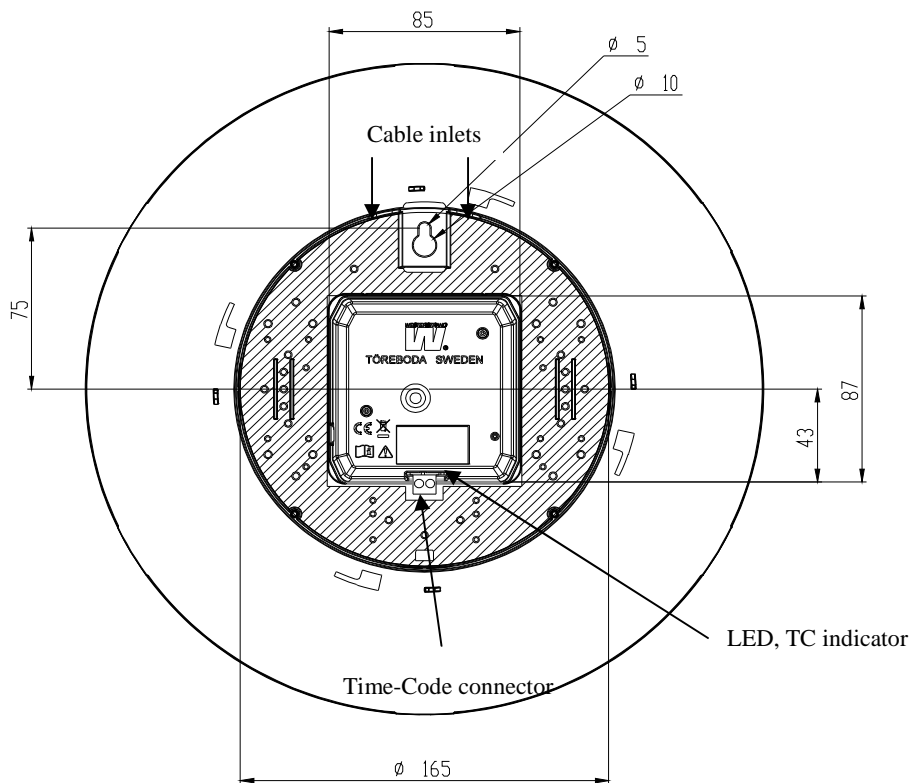
24V DC power supply for the built-in electronics is combined with the Time-Code.

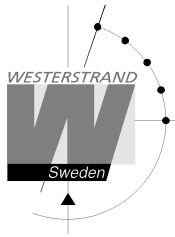
The TC clock is equipped with a two motor, 3 hands analogue movement. Initial setting function and error correction is automatic. The movement starts automatically after reception of the of the time code.

## 2. Installation

1. Ensure that the Time-Code cable is positioned in the shaded area, see fig. 1.
2. When the clock is wall mounted use the cable inlets, see fig. 1.
3. Measure and assemble an appropriate mounting screw (not included).
4. Connect the Time code cable into the plug-in socket and mount the clock on the wall.
5. After approximately 5 seconds the hands will run to 12.00 o'clock position and stop.
6. The movement tries to receive the time code. If the time code is accepted, the movement will go to correct time.

Fig. 1





### 3. Synchronisation

After connection of the time code, the hands are driven to 12:00.

When the hands have reached this position, the motors will be stopped and wait for a correct time code.

The hands will not move until the time code has been accepted. After the receiving process is finished, the hands are driven to show the correct time and the movement starts normal run.

During normal run the movement synchronises after 2 subsequent correct messages. A correction is done if necessary (when a difference between received time and displayed time occurs). The correct position of the hands is checked according to item 5. *Checking of hands position in normal run (automatically)*.

### 4. Restart of clock movement

The movement is running approx. 2 seconds after a power down due to a big capacitor in the electronics.

The capacitor is charged (stores energy) during normal operation and is discharged in case of power failure. If the movement by any reason has to be restarted follow the procedure below:

- Remove the Time Code Plug in socket.
- Wait for minimum 5 seconds.
- Plug in the Time Code socket again.

### 5. Checking of hands position in normal run (automatically)

The movement automatically checks its hand position. The second hand, every time the hand is in the 12 position.

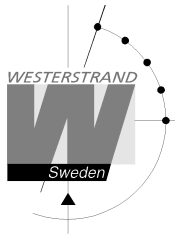
The minute and hour hand, every time the hands are in 12:00 position (2 times every day).

### 6 Summer-/ winter time change

This is done fully automatic, no assistance of the user necessary.

### 7 LED indicator TC code

An indicator, red LED, is mounted next to the TC input. It indicates the TC reception, See fig 1.



## 7 Working conditions

### 7.1 General

The clock is for indoor use only.

### 7.2 Technical Data

Connection:	2-wire
Connection voltage:	24VDC combined with serial Time-Code
Type of Time-Code:	DCF-format
Working temperature:	0 C to +40°C
<b>Current consumption</b>	
Max current continuous:	10 mA
Average continuous current:	1 mA
Total start-up time	Approx. 6 min.
Automatic time synchronisation:	Every minute

## 8 Cleaning the clock exterior

A clean clock is always a more representative product. The exterior should regular be cleaned to maintain the clock in good condition.

### *Cleaning solutions*

Never apply cleaning solutions directly to components. Solutions are always sprayed on the cloth, and then the cloth is used to wipe the component. Almost any type of household cleaner can be used to clean the outside of the clock case. The cleaner should not dissolve or scratch the finish. When rubbing alcohol is used with cotton swabs, the swabs should be moist, not dripping with solution. Avoid ammonia-based cleaners.