General

Time is an important aspect everywhere. Apart from needing an accurate appreciation of time in our daily activities, it is important that things around us occur when they should. A time system is the most reliable and cheapest way to correctly set the time for all functions.

Westerstrand TIME SYSTEM is divided into the following groups:

♦ Impulse systems
  - Minute impulses
  - Second impulses

♦ Intelligent systems
  - 1-way TC
  - 2-way NTP

♦ Wireless time systems

♦ Stand alone clocks
  - Synchronized clocks
  - Battery clocks
  - GPS clocks
  - Time and temperature LED displays

See below for a description of these systems.

• Impulse systems (minute and second impulses)
  This type of system is marked by the slave clocks (analogue or digital) being controlled and run by 24VDC alternating impulses that are transmitted from a Westerstrand quartz master clock/master clock programmer or time central. The impulses are either 1/1-minute, ½-minute or 1/1-second, depending on whether the clock has a second hand or not.
  E.g. 1/1 minute impulses means that the master clock or time central synchronizes the connected slave clock once per minute.
  The clocks are connected in parallel to the master clock or time central with 2-wire cable. On installation, the programming informs the master clock or time central of the times currently displayed on the newly installed clocks, and the master clock then automatically sets them at the correct time by sending rapid impulses.
  In the case of a power failure, connected clocks stop, but when the power returns they restart and rapid impulses automatically reset them.
Diagram of a time system with minute impulses/time code.

Receiver antennas for GPS, DCF, RDS time signals etc.

WDP-Y2 from the QW-TIME III product group is a master clock programmer that controls and regulates TIME.

Slave clocks, digital clocks, attendance clocks, computers etc. always have the exact TIME when they are connected to a product from the QW-TIME III range.
Intelligent systems (1-way)

- **TC (Time code)**

  This type of system is marked by the fact that the display clocks (analogue or digital) are controlled and run with a **serial time code** containing comprehensive information on year, month, day, hour and minute, which is transmitted from the Westerstrand **TIME CODE master clock**.

  Each clock has a microprocessor that receives time codes, senses the positions of the clock's hands using magnets and hall sensors and then **automatically sets the hands correctly**.

  All the clocks in a time code system are connected to a 2-wire bus that combines a 24VDC power supply to the serial time code. This combination of **power supply and time code on the same cable pair** simplifies both cable routing and installation.

  On installation, the hour and minute hands on an analogue clock are automatically set to 12.00 until the correct time information via the time code is transmitted from the master clock. When the newly installed clock receives the approved time code, the hands are automatically set to the correct time. In the case of a digital clock system, the correct time is set automatically within two minutes of the clock being connected.

  In the event of a power failure, clocks stop temporarily. When the power returns, the hands (analogue clock) are initially automatically set to 12.00 and then to the correct time. Digital clocks are automatically set to the correct time within two minutes of the power returning.

  The diagram on the previous page shows the make-up of a system.
Intelligent systems (2-way) network connected time system NTP

Analogue NTP clocks for Ethernet – Indoors/outdoors
Westerstrand analogue NTP clocks receive the time from the local network time server.
Automatic time setting every minute (adjustable) during normal operation.
Option for monitoring and alarm management via a standard protocol.
In the event of a power failure, the clock stops temporarily and automatically restarts and is reset when the power returns.
Two power supply alternatives:
- 230VAC.
- PoE, Power over Ethernet, RJ45 network contact in combination with power supply and data.
A special network switch with a PoE output is needed with the PoE version.

Technical information:
Configuration via a web browser or Telnet.
Support for DHCP option 42 for automatic installation of the NTP server address.
Time synchronization with alternatives Unicast, Multicast or Broadcast.
If a clock loses contact with the network time server, it continues to run on its inbuilt time base.
When contact with the time server is restored, the clock is synchronized against the network time server again.
The clock automatically senses the positions of the hands.

Analogue indoor clocks are always delivered with PoE connection.
Digital indoor clocks and analogue clocks for outdoor mounting are delivered with 230 V AC or PoE connection.
Digital outdoor clocks are delivered with 230 V AC.
- **Wireless time systems**

*Wireless time systems* for flexible installations. The master clock is connected to a transmitter that sends time information via radio (869 MHz). The slave clocks can be placed up to 200 meters from the transmitter, depending on material in walls and floors. The transmitter signal strength can be adapted to suit different installations. The installation can be complemented with slave transmitters to increase the range.

If a slave clock loses contact with the master clock, it continues to run on its inbuilt time base. When contact with the master clock is restored, the time is synchronized against the master clock again. Analogue slave clocks automatically sense the positions of the hands.

Most Westerstrand digital and analogue clocks can be provided with radio reception. Digital clocks run on 230VAC whereas analogue clocks run on batteries.
• **Stand alone clocks**

**Synchronized clocks**
Stand alone clocks run on 230V AC

**Battery clocks**
Stand alone clocks that run on batteries
Internal quartz crystal is used as the time base

**GPS clocks**
Stand alone clocks that run on 230V AC
The clocks have an inbuilt receiver and antenna for synchronizing time against a GPS satellite
An internal quartz crystal forms the time base when the GPS signal is not available

**Time and temperature LED displays**
Stand alone clocks that run on 230V AC
Internal quartz crystal is used as the time base
Internal 48 hour's reserve power
• Choice of clock size
in the first place depends on the reading distance. Below are guidelines for clocks with
conventional faces and clocks with digit displays (digital clocks).

Product information
For further information on the different products, see the separate brochures.