



NTP slave clocks with NCI

## Network Clock Interface NCI

The Network Clock Interface (NCI) provides NTP synchronization to most types of **MOBA**Time slave clocks and master clocks. The easy way of commissioning, its high performance at low costs and its small dimensions make it suitable for most new or existing LAN/WAN Ethernet installations.

The interface is synchronized by the Network Time Protocol (NTP) from a multicast capable time server within the network. The NCI generates the common time codes *MOBA*Line and DCF in local time format for synchronization of various types of analog and digital slave clocks or submaster clocks.

# NTP Clocks synchronized from a Time Server

## 1 Time server

- Provides Network Time Protocol (NTP) multicast messages (coordinated universal time, UTC)
- Provides Season table for local time calculation, multicast messages

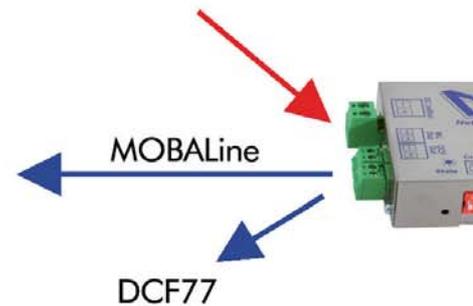
## 2 NTP analog clocks with external power supply

- Power supply for NCI: External DC power supply 24..56 V
- Clock movement synchronized and powered by MOBALine time code from NCI
- DCF time code for corresponding movements available (current loop passive)
- Automatic local time calculation

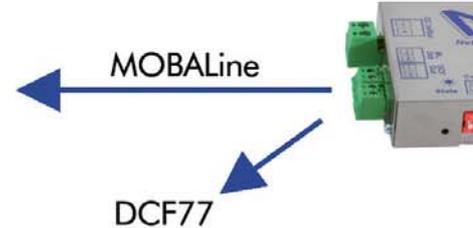
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external power supply  
24..56 VDC



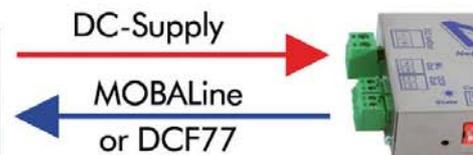
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## 3 NTP analog clocks with PoE

- Power supply for NCI: Power over Ethernet (PoE)
- Clock movement synchronized and powered by MOBALine time code from NCI
- DCF time code for corresponding movements available (current loop passive)
- Automatic local time calculation

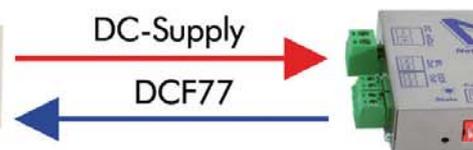
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## 4 NTP digital clocks

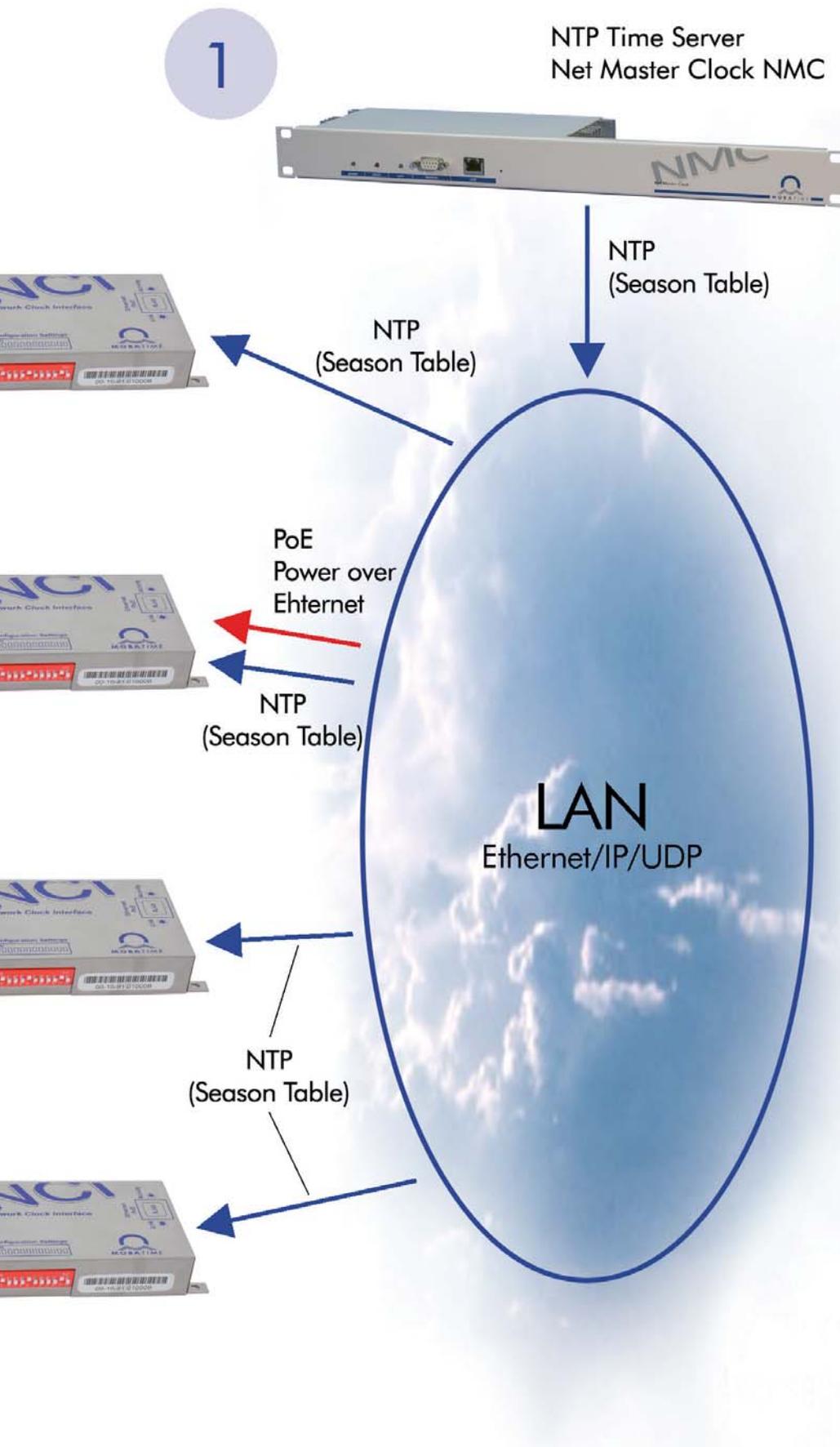
- Power supply for NCI: DC supply from digital clock
- Power supply for digital clock: Mains
- Digital clock synchronized by MOBALine or DCF time code from NCI
- Automatic local time calculation

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## 5 NTP synchronized submaster clock

- Power supply for NCI: DC supply from master clock
- Master clock synchronized by DCF time code from NCI
- Automatic local time calculation



## Features of the NCI

NTP servers such as the Net Master Clock (NMC) are able to provide a season table for local time calculation to the NCI. The season table can easily be customised by Telnet at the server for all listening devices. When using a standard multicast NTP server without season server functionality it is possible to select 1 out of 52 entries from a predefined season table at each NCI.

Due to multicast messaging (Ethernet, IP, UDP) there is no need to set any IP or gateway address nor any subnet mask. Since most routers can forward multicast messages the installation can consist of several networks.

All needed configuration settings such as choosing the multicast address or the season entry can be done once at installation time by means of DIP switches.

When feeding the NCI via Power over Ethernet (PoE), a single connection to a PoE capable LAN switch/router is needed. An extra DC input allows to feed the interface by an external DC power supply, when no PoE is available.

In case of slave clock synchronization the NCI is delivered ex factory fully integrated in the desired analog or digital clock. Depending on the clock type and the kind of installation different ways of powering the NCI are possible. The drawing on the left side gives an overview.



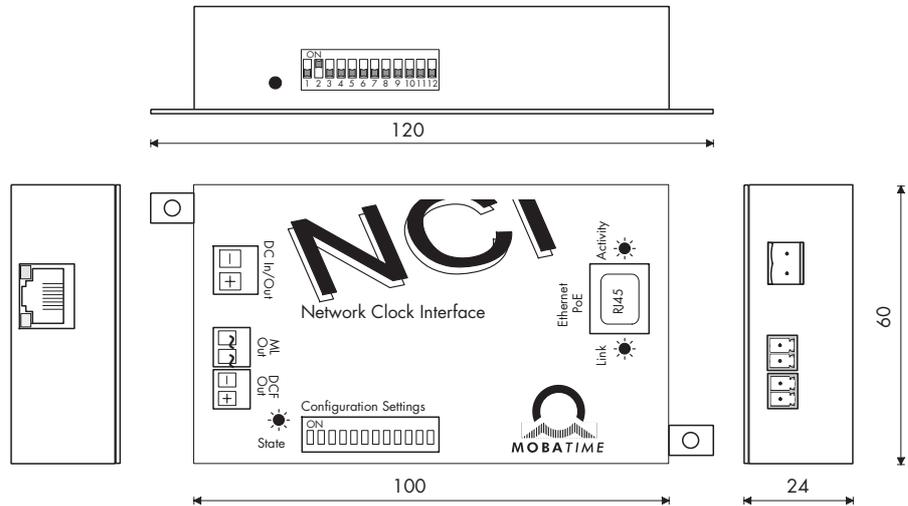
Owing to the small dimensions the NCI can be built into slave clocks or in cable ducts.

# Network Clock Interface NCI

## NCI connections and dimensions

### Connectors:

- Alternative DC power input (24..56 V)
- Time code output *MOBALine*
- Time code output DCF 77



## Technical Data

Ethernet connectivity	Ethernet controller 10Mbit/s RJ45 connector with integrated LED (activity, link)
Processor	Single chip FLASH processor 1 kB RAM, 24 kB FLASH, external serial EEPROM 1 kb
Synchronization	Network Time Protocol (NTP), UTC
Time code outputs	<i>MOBALine</i> : local time 15 V / 50 Hz / 20 mA max. DCF: passive current loop, optocoupler: $U_{max}=30\text{ V}$ , $I_{on}=10..15\text{ mA}$ , $I_{off}=2\text{ mA}$ @ 20 V.
Output accuracy	+/-20 ms (synchronized)
Time keeping	Autonomous operation on quartz basis during 24 h
Power supply	DC input: 24..56 V or PoE: 48 V (phantom / pins 4,5 and 7,8)
Current consumption	<100 mA @24 V / <50 mA @48 V
Configuration	12 x DIP switches
Display	1 x state LED
Temperature range	-30...+70°C, 10-90 % relative humidity, without condensation
Housing	Stainless steel, bottom 1 mm, top 0.5 mm, printed. Ears for wall mounting
Dimensions	120 x 60 x 24 mm (l x w x h), weight: approx. 200 g
Order number	202 376
Documentation	Instruction manual BE-800445