



## The Master Clock for Networks

# Net Master Clock NMC

The Net Master Clock NMC is a master clock, developed especially for network environment.

It is able to control self-setting *MOBALine* or IRIG-B / AFNOR slave clocks and is used as an accurate NTP time reference (Time Server) for computer systems.

The NMC can be synchronized by a time signal receiver (DCF 450 or GPS 4500) and/or by NTP time servers (LAN /

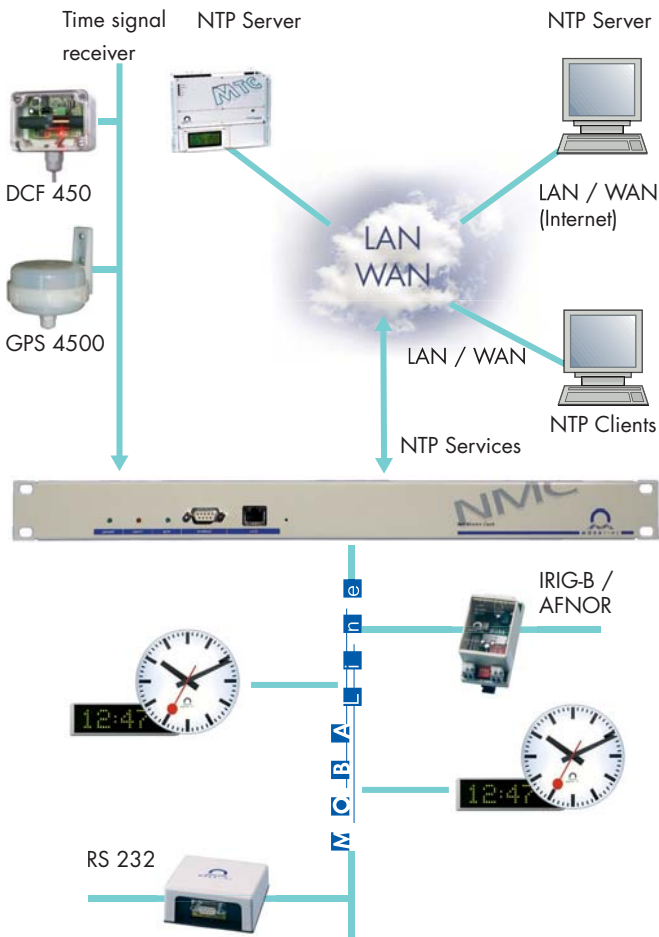
Internet). On the RS 485 line self-setting slave clocks can be operated and monitored.

By the DCF current loop output other devices (e.g. master clocks) can be synchronized.

The Net Master Clock is equipped with 4 alarm inputs to monitor other connected devices. Alarms are signaled by a relay, with SNMP traps or by e-mail.

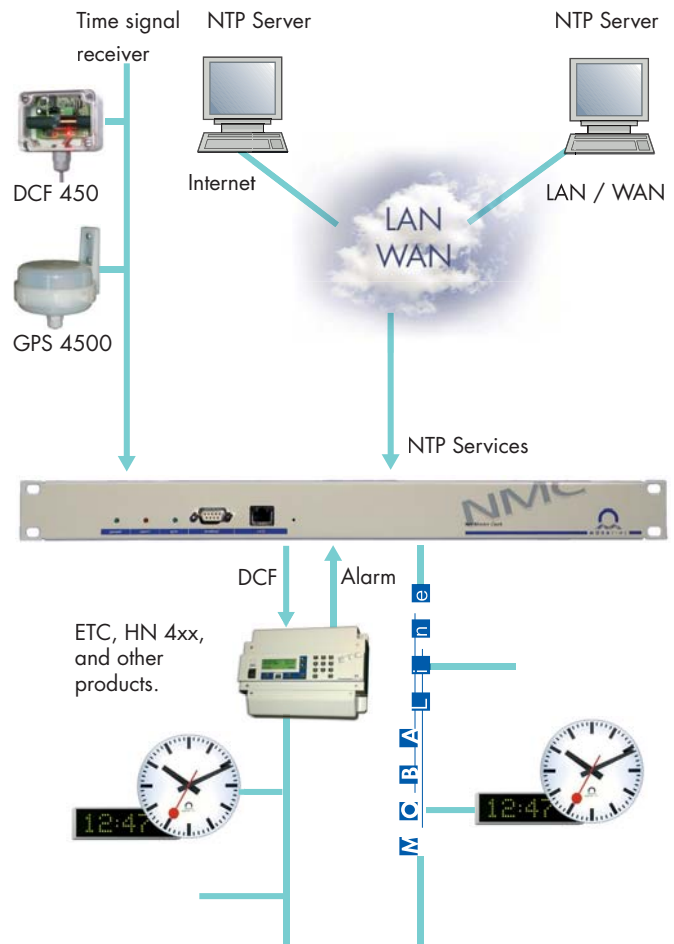
## Net Master Clock NMC Master Clock and NTP Time Server

NMC e.g. as NTP server and MOBALine master clock.



Net Master Clock as MOBALine master clock and NTP time server, synchronized by a time signal receiver (DCF 77 or GPS) or NTP servers (LAN / Internet). NTP services Server and Client are possible simultaneously.

NMC e.g. as main master clock, synchronized from GPS and / or NTP.



Net Master Clock for synchronization and monitoring of a conventional slave master clock.

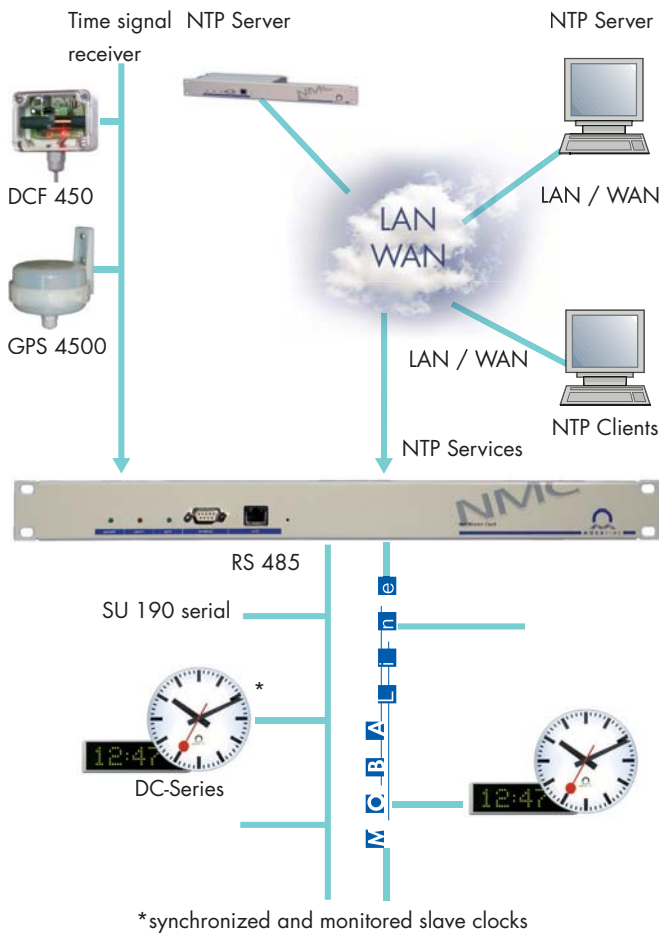
### NMC front view with LEDs and connectors



LEDs: Mains power, alarm, synchronization and network transmission control.

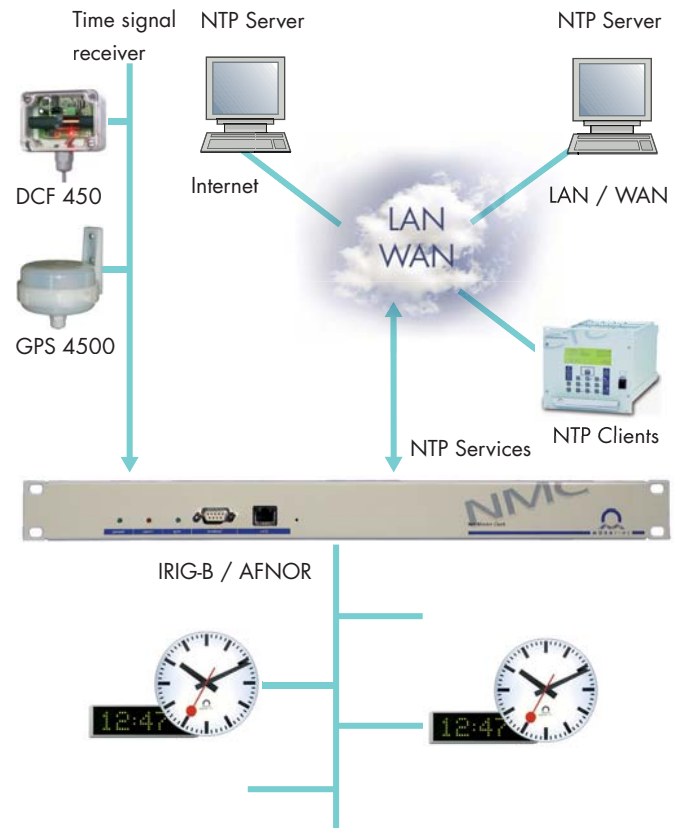
- Connectors:
- LAN connector RJ45, 10 / 100 Mbit
  - PC terminal connector, RS 232 Sub-D 9p

NMC e.g. as a master clock for monitored slave clocks.



Net Master Clock to control and monitor up to 31 self-setting slave clocks and to synchronize self-setting MOBALine slave clocks.

NMC e.g. as NTP server and IRIG-B / AFNOR master clock.

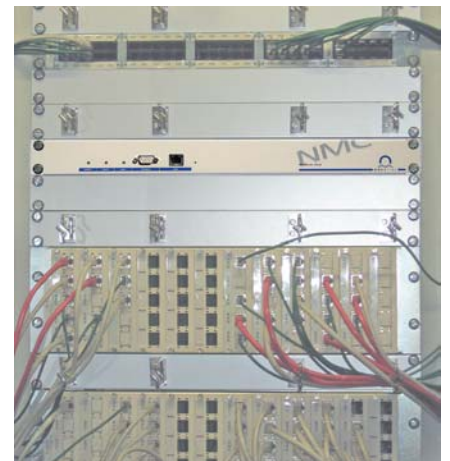


Net Master Clock as IRIG-B / AFNOR master clock and NTP time server.

NMC rear view with connectors



Connectors: Mains power connector, DC power supply input, 4 alarm inputs, DCF input, DCF or pulse output, MOBALine or IRIG-B / AFNOR time code output, RS 485 clock line, DC power supply output, alarm relay contact.



NMC mounted in a 19" IT-Rack.

# Specifications Net Master Clock NMC

Technical Data		
Time signal outputs	MOBALine: output current (current limit adjustable), for up to 100 slave clocks NTP / SNTP (server) RS 485 clock line to connect up to 31 SU 190 movements DCF time code output (current loop passive) IRIG, AFNOR, DCF-FSK: Ri < 600 ohm (IRIG instead of MOBALine)	700 mA    option
Network services	NTP client NTP server, max. number NTP and SNTP client requests: 100 requests / sec. SNMP traps E-mail for alarm messages (2 addresses possible) Time, Date, FTP (for update) Time synchronization and monitoring from MTC (Master Time Center)	
Network interface	10BaseT / 100BaseTX (IEEE 802.3) Auto-negotiation / manual Connection: RJ45	
IP configuration	DHCP, static IP	
Serial interface	D-Sub 9 (38400, 8, no parity, 1, no handshake)	
Operating control	Software terminal at RS 232 Telnet	
LED indication	Power supply, synchronization status, LAN monitoring, alarm	
Local time calculation	Automatically, preprogrammed season time change over Up to 80 predefined time zone entries 20 entries programmable on PC for download All outputs can be individually allocated to a time zone (UTC or local time)	
Accuracy	GPS (DCF input) to NTP server: NTP client to NTP server: GPS (DCF input) or NTP client to clock lines: Time deviation without external time source (at 20..25°C): (After 24 hours synchronization from time source) Remark: With NTP synchronization the accuracy may be lower, depending e.g. network - topology, traffic ...	typical +/- 3ms typical +/- 3ms typical +/- 5ms 0.1 second / day
External time source	External NTP / SNTP servers (4 NTP sources programmable) and / or DCF 77 time signal receiver (current loop, e.g. DCF 450) or GPS time signal receiver (current loop, e.g. GPS 4500)	
4 inputs for alarm contact	To connect external devices	
Alarm relay	Potential free close contact for the signalization of alarms	open -> alarm
Power supply	AC input: 85 .. 250 VAC, 50 - 60 Hz DC input: 22 .. 30 VDC / 1.5 A (> 28 V required for MOBALine) DC output: nominal 28 VDC, max. 400 mA, to supply SU 190 movements and / or GPS 4500	
Dimensions	19" rack mounting, 1 height units, w x h x d mm	483 x 44 x 125
Running reserve		none
Ambient temperature	0 to 50°C, 10 - 90 % relative humidity, without condensation	