System requirements NMS Software (Network Management System)

These system requirements are necessary to flawlessly install and run the following products:
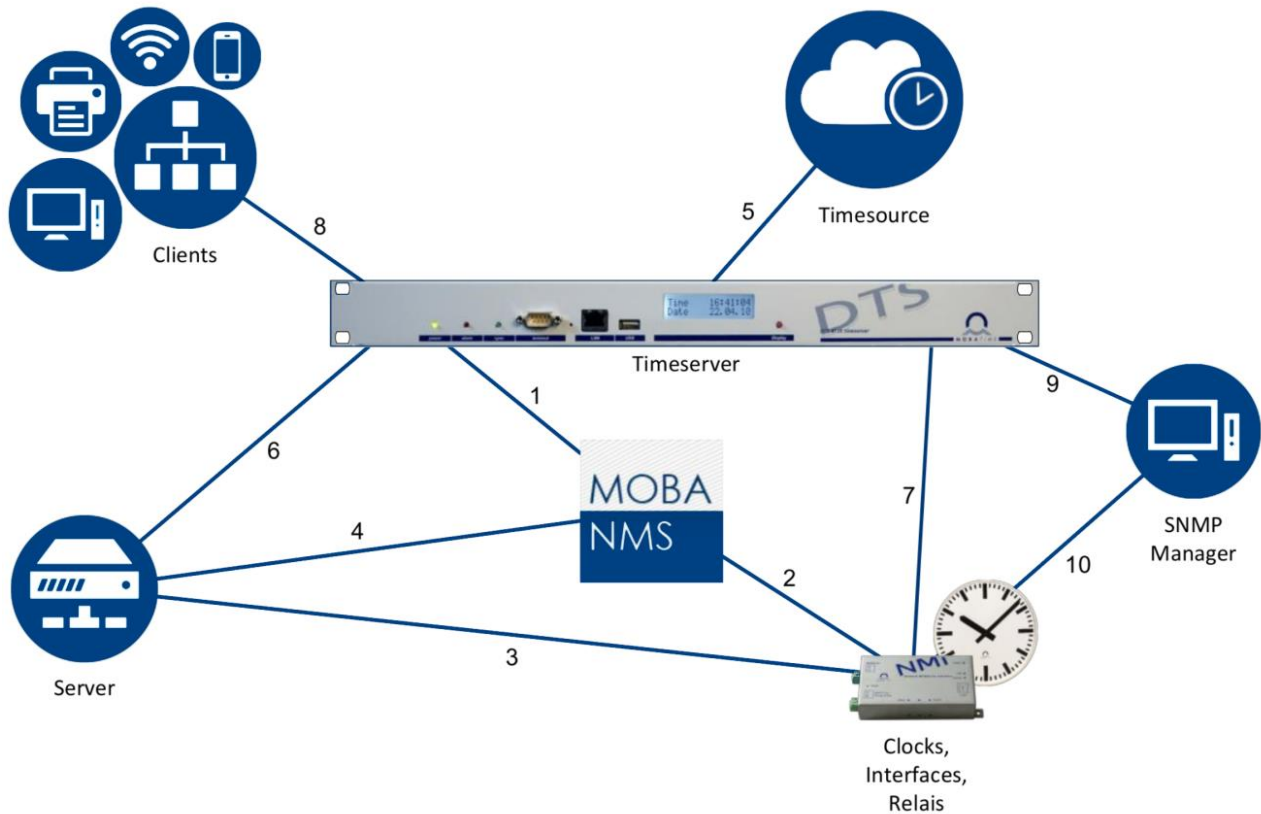- NMS Basic
- NMS Pro
- NMS Expert (incl. DSS)

Every single workstation (PC) requires a valid license to run any of these applications.

Workstation	Web-Interface	Server / Network
● Recommended operating systems: Windows 10 / 11 Windows Server 2016 / 2019 64 bit ● 1 GHz CPU with 512 MB RAM ● Minimal screen resolution of 1024 x 768 and 16 Bit Color depth	● Supported web browsers: Edge, Mozilla Firefox, Google Chrome ● Minimal screen resolution of 1024 x 768 and 16 Bit color depth	● We offer single-user licenses only. Therefore, you need a separate license for every workstation and user. We also do not provide server-licenses. ● In order to ensure flawless communication, several ports have to be opened depending on the used devices and system setup (see table on the following pages).

Server / Network system requirements (application related)

Required ports and protocols depend on the application and used products.
See table on the following pages.

You're required to select the highest level in column "use" if multiple device-types are required for a system (e.g. for NMS you read "mandatory" and for some end device "optional", relevant is "mandatory").

Group	Application / Devices	Tasks	Service / Protocol	Port	Use	Connection
NMS	**LAN end devices (analog and digital clocks, NMI, NPR, …)**	Status query, configuration, supervision	multicast or unicast (with DHCP only)	UDP 65532	mandatory	**2**
		Configuration	DNS (domain name resolution)	TCP/UDP 53	optional	**4**
		Transfer of program files	TFTP	UDP 69	optional (mandatory for NPR and NCC)	**2**
		Firmware update	TFTP	UDP 69	optional	**2**
	Time server (DTS, NTS, …)	Status query, Configuration, supervision	UDP / SNMP (read/write, unicast)	UDP 161	mandatory	**1**
		Local time information (time-zone server function)	IGMP multicast/unicast	UDP 65534	optional	**1**
		NTP status, NTP monitor	NTPQ (unicast), NTP multicast	UDP 123	mandatory	**1**
		Firmware update	FTP / SFTP	TCP 21, 22	optional	**1**
		Backup, Restore, Export Support Information	SFTP	TCP 22	optional	**1**
	NTS	NTS search	Device search	UDP 65532	optional	**1**
	DSS	Supervision of MOBATime devices	SNMP, HTTP/HTTPS, SSH	80, 161, 162, 443, 65530	mandatory	**1, 2, 4**
Time server or **PC**	**DTS 4130 DTS 4132 DTS 4135 / 36 DTS 4138 / 39 DTS 4148 DTS 4160 DTS 4210 DTS 4801 / 02 NTS / NTS-IT**	Time synchronization of LAN devices	GPS, DCF, PTP, NTP, SNTP (unicast or multicast)	UDP 123	mandatory	**5, 7, 8**
			TIME, DAYTIME (unicast)	TCP/UDP 37, 13	optional	**7, 8**
		Configuration, supervision over LAN	Telnet	TCP 23	optional (alternatively serial[1])	**1**
			SSH	TCP 22	optional (alternatively serial[1])	**1**
		Firmware Update	FTP, SSH (SCP, SFTP)	TCP 21, 22	optional	**1**
		Network and NTP server configuration	DHCP (dynamic address distribution)	UDP 68	optional (helpful during installation)	**6**

…	…	NTP status, NTP monitor	NTPQ (unicast) NTP multicast	UDP 123	optional	1
		Status query, configuration	SNMP (get, set)	UDP 161	optional	1
		Configuration	DNS (domain name resolution)	TCP/UDP 53	optional	6
		Alarming	SNMP (notification)	UDP 162 (selectable)	optional	9
			SMTP (e-mail)	TCP 25 (selectable)	optional	6
LAN end devices or **PC**	**TREND (LAN) NBU 190 SAN / SEN 40 NCC NMI NPR Digital Clocks**	Time synchronization of LAN devices	NTP, SNTP (unicast or multicast)	UDP 123	mandatory	7
		Local time information (time-zone server function)	IGMP (multicast or unicast)	UDP 65534	optional (mandatory for time-zone server function)	7
		Status query, configuration, supervision	NMS (multicast/unicast, with DHCP only)	UDP 65532	mandatory	2
		Network and NTP server configuration	DHCP, (dynamic address distribution)	UDP 68	optional (helpful during installation)	3
		Status query, configuration	SNMP (read/write)	UDP 161	optional	2
		Configuration	DNS (domain name resolution)	TCP/ UDP 53	optional	3
		Alarming	SNMP (notification)	UDP 162 (selectable)	optional	10
		Temperature from sensor (digital clocks only)	TCP	TCP 10001	optional	2
		Configuration (digital clocks only)	Telnet	TCP 23	optional	2

[1] NTS, NTS-IT, DTS 4138 and 4148 are not equipped with a serial interface.

Checklist

To ensure a successful launch of MOBATime time-systems you should discuss the following points together with our sales:

o   Which devices do you use?

Time server, master clock, central:	_____	number:	_____
	_____	number:	_____
Slave clocks, interfaces, relays:	_____	number:	_____
	_____	number:	_____
	_____	number:	_____
Accessories:	_____	number:	_____
	_____	number:	_____

o   Which software do you need?

- Software:	NMS-Basic		number PCs:	_____
	NMS-Pro	☐ limited ☐ unlimited	number PCs:	_____
	NMS-Expert	☐ no DSS ☐ with DSS	number PCs:	_____
	_____		number PCs:	_____

o Shall the devices be supervised by a DSS?	☐ Yes	☐ No
o Do the NMS PCs have internet connectivity?	☐ Yes	☐ No
o Do the NMS PCs have an active firewall?	☐ Yes	☐ No
o How shall the time be distributed (NTP)?	☐ Unicast	☐ Multicast
o Is PTP required for synchronization?	☐ Yes	☐ No
o Does the network contain DNS/DHCP-servers?	☐ Yes	☐ No
o Is a firewall existing between MOBATime devices?	☐ Yes	☐ No
o Will the MOBATime devices be located in multiple subnets?	☐ Yes	☐ No
o Will devices (e.g. slave clocks) be powered over PoE?	☐ Yes	☐ No
o Is Internet connectivity required?	☐ Yes	☐ No
o Which version of IP is used for MOBATime devices?	☐ IPv4	☐ IPv6
o Have you checked the NMS system requirements?	☐ Yes	☐ Needless
o Have you checked the server / network requirements (protocols and ports according to the table) related to Router & Firewall?	☐ Yes	☐ No