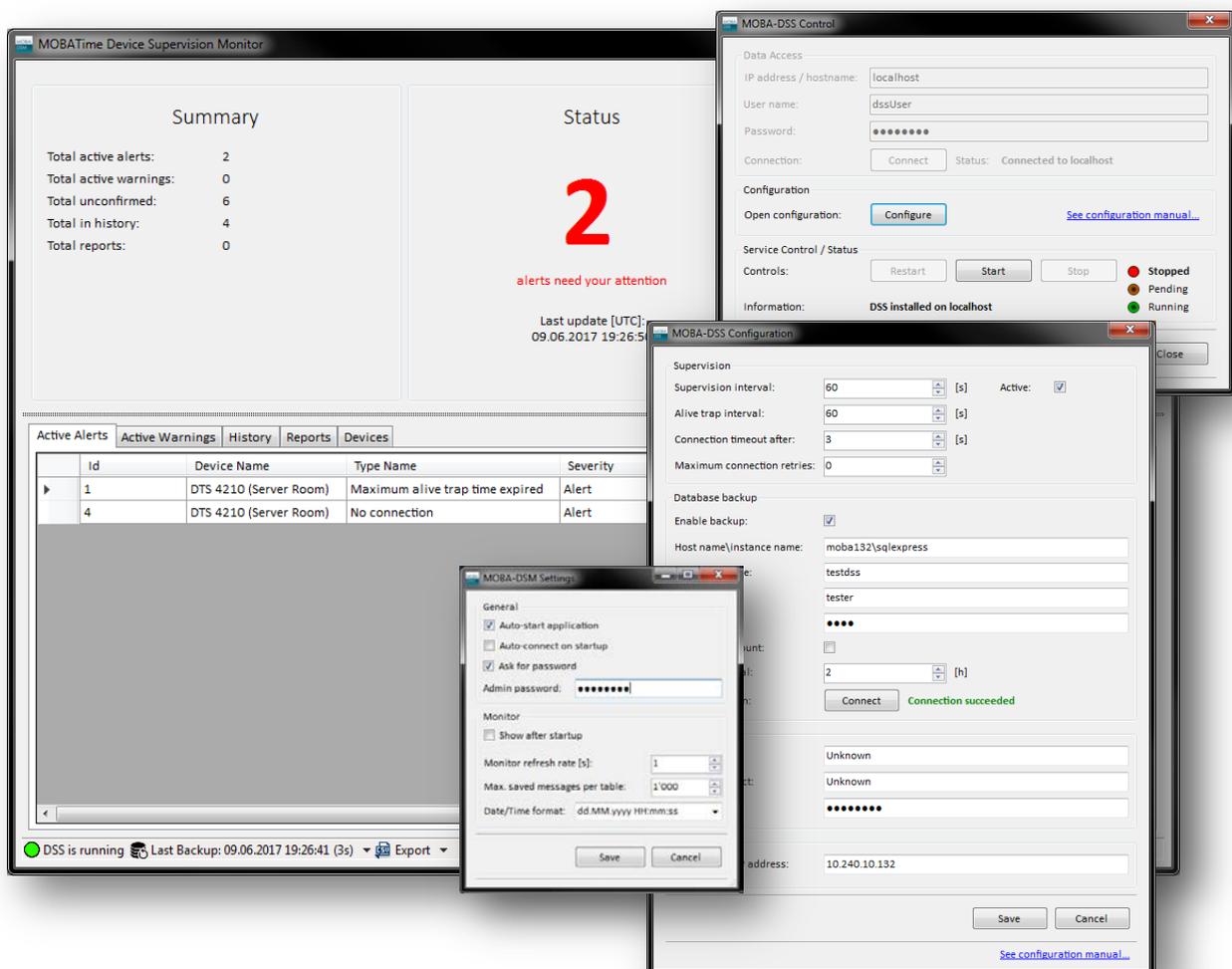


# INSTALLATION & USER GUIDE

## MOBA-DSS/DSM

MOBA Device Supervision Service / Device Supervision Monitor



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# 1. System requirements

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<b>Operating system:</b>	Windows 7 / 10, Windows Server 8, 12
<b>Hardware (minimal):</b>	x86 CPU (1.4GHz), 512MB Ram, 1GB+ free on HDD, Network interface
<b>Network:</b>	Ports required: 80, 161, 162, 443 and 65530
<b>Backup DB:</b>	MS SQL Server 2008/2012 with enough storage capacity <sup>1</sup>
<b>Dependencies:</b>	.NET 4.5 Full MSSQL Server Compact 4.0 MOBA-NMS Expert <sup>2</sup>

MOBA-DSS requires MOBA-NMS Expert for configuration; NMS is also able to read the logged data within its internal database. The .NET as well as MSSQL Server Compact prerequisites are contained in the DSS installer.

MOBA-DSM is a standalone Device Supervision Monitor that can display the same data as NMS. It is also able to configure the DSS although NMS is mandatory to put devices under supervision.

Both features, the MOBA-DSS and MOBA-DSM, are contained in the installer. One is free to install only one of the two features.

MOBA-DSS support SNMP version 2 and 3, version 1 is not supported.

**NOTE:** On the workstation where MOBA-DSS is running, MOBA-DSM is required in order to make initial network configurations and to start/stop the service.

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<sup>1</sup> One message (e.g. alarm) requires approx. 1kB uncompressed and 350Bytes compressed space.

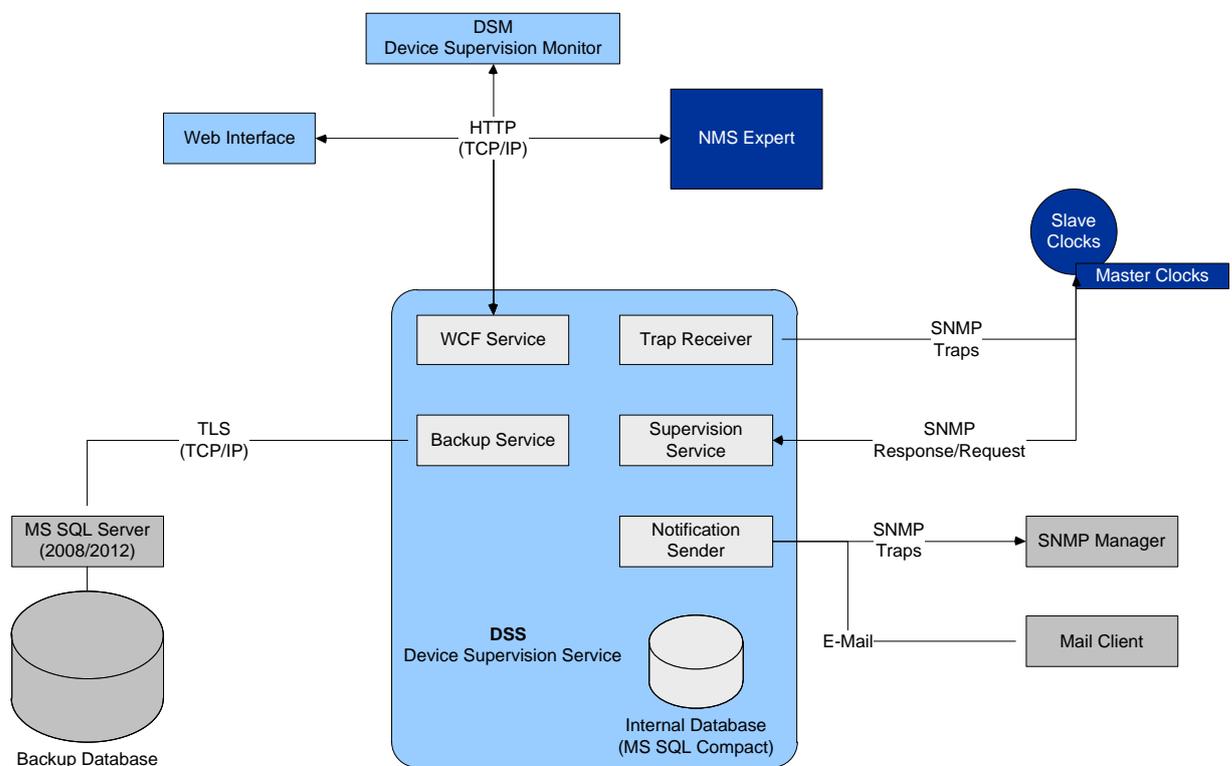
<sup>2</sup> NMS can run on another workstation, but under the same domain.

## 2. Integration, Purpose and Working Principle

Our network management system MOBA-NMS is the main tool to configure and control MOBATIME network products. However, NMS was not designed and built to run 24/7, which means it is not capable of constant supervision.

Therefore, the purpose of the Device Supervision Service (DSS) is to have a standalone, long-running system that permanently monitors the state of MOBATIME devices. DSS is implemented as a native Windows service, which is a background service without a user interface. Once started, DSS will run as long as the workstation it is installed on is up and running. DSS is able to supervise any network clock by MOBATIME, such as master clocks (e.g. DTS) and slave clocks (e.g. NCC, SEN40). Supervised by default are traps and the state of a device, such as alarms. For every device one can specify additional custom parameters to supervise (e.g. supply voltage).

The following diagram shows the structure and technical integration of DSS:



DSS ships together with the new Expert version of NMS and can only be accessed over this version of NMS. Hence, NMS Pro and Basic do not support DSS. Windows' Communication Framework (WCF) is used to access DSS. Adding devices for supervision can only be made via NMS Expert, but it is possible to access data via the Device Supervision Monitor (DSM). DSM basically is the user interface to DSS and ships together with DSS (included in the same installer). DSS data could also be accessed over a web interface (browser) or another standalone application. Communication with MOBA devices happens over SNMP.

For performance reason the internal database can only hold a limited amount of data (currently < 10'000 messages). In order to back-up the data for as long as needed, a Microsoft SQL Server can provide access to a database where all the queried data will be stored. All communications are encrypted and access to DSS is protected with username and password.

## 2.1. Time Handling

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All the time handling across MOBATIME network products is ensured to be in UTC time. Hence, DSS also uses UTC time for all its operations. It follows an incomplete list of actions and DSS related parties where UTC time is ensured:

- DSS Internal database;
- Backup database (MS SQL Server);
- WCF service (HTTP communication);
- Trap receiver (SNMP alive-traps and alarm traps);
- Supervision service (time stamping of requested data);
- DSM (all time and date displays).

**NOTE:** DSS and DSM operate on time and date from their host system (Windows). Hence, make sure the following:

- Time should be as precise as possible (computers tend to drift, set highest time update rate of the host time);
- Time jumps shall never occur, especially not into the past (this would cause undefined behavior of DSS and DSM);

Best practice is to synchronize the host computer to the most precise NTP server in the network (MOBATIME DTS).

**NOTE:** Times and dates that are displayed in the following parties can be affected by time zone settings of their host:

- NMS Expert (overview and tables in device supervision monitor);
- Web interface.

Database viewers such as MS SQL Management Studio always display dates and times as they are stored in the database.

## 2.2. Working Principle

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Generally, DSS supervises the configured devices (user defined) in a user defined interval. Every alarm or warning that any device produces will be registered in DSS' internal database. This database can hold up to 10'000 active and 10'000 inactive alerts as well as 10'000 custom reports. If required, a backup service can be configured which copies all the internal data to a remote database. To access the internal database one can use the device supervision monitor built into NMS Expert or DSM (as mentioned above). Communication between DSS and the monitors is solved via web-protocols (HTTP). This ensures a reasonable transfer rate and flexibility.

In specific, DSS offers two basic supervision modes, a passive and an active mode:

- **Passive supervision (trap receiver)**

In the graph above this mode is the trap receiver. In a user defined interval (in seconds) it expects an alive-trap from every device under supervision. Communication only happens unidirectional; hence DSS does not ask for any data, the devices send those traps independently (if so configured). If a device under supervision produces an alarm (e.g. "Time not OK") it will instantly send an alarm trap to the trap receiver. The receiver then registers the received alarm with time of occurrence delivered in the alarm trap. Once the problem could be resolved, the device will send again an alarm trap, but with order to clear it. So, DSS will move the alarm from active to inactive (history). Passive supervision can be switched off.

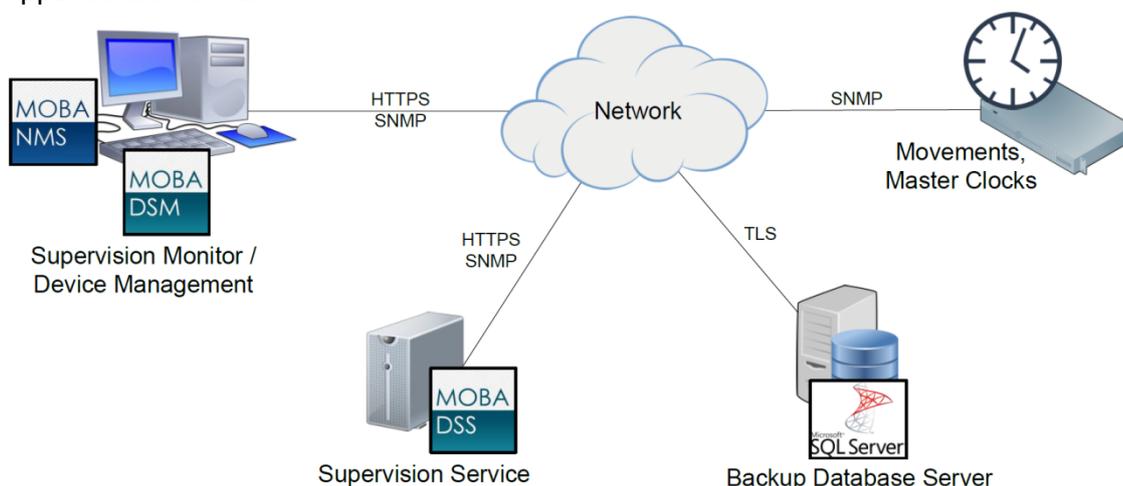
- **Active supervision**  
 Contrary to passive, the active supervision directly requests status information from every supervised device. This service operates also in a user defined interval and it can also be switched off. If there is a device that owns a response but does not answer, the request will be sent again (for a user defined amount of times). If such device still not answers, a “No connection” alert will be registered. Active supervision also offers to register custom parameters for supervision. For example, one could register the power supply voltage level to supervise.
- **Notification sender**  
 DSS offers a notification sender that can be configured to send SNMP-traps to a superordinate SNMP manager. Those traps are simple notifications containing basic information about the supervised device (supervised by DSS) and alarm information. However, only the occurring of an alarm is notified and not it’s clearing.

### 2.3. Workflow Example

It follows a likely workflow example of how to use NMS, DSS, DSM and MS SQL Server in combination. How to configure such a setup is explained later in this manual.

#### Setup

This illustration shows how all the different devices are connected and where each application is used.



If DSS was installed on the same machine as NMS and DSM, workflow as well as communication and setup would barely change. NMS, DSS and DSM could even be installed together on a MS SQL server, but this is not recommended. Even though it is possible we recommend backups to be located on a remote/separate system in order to decrease data loss from a system failure.

#### Situation

Currently, no device shows any alarm. Therefore, the supervision monitors do not show any alert or warning. One device called “CLOCK” will eventually loose GPS reception, due to a worker on the roof who uses the GPS antenna as clothes rack. An operator called “USER” with access to DSM and NMS will work of this event, further called “ALERT”.

### Working off an event

1. CLOCK loses GPS reception.
  - 1.1. CLOCK sends a "Time source failed timeout" alarm trap to the SNMP manager address which points to DSS.
  - 1.2. The trap receiver within DSS registers this received alarm (ALERT) in its internal database. As alarm time, DSS uses the UTC formatted timestamp delivered with the alarm trap.
  - 1.3. DSM polls, in a user defined interval, ALERT from DSS' database. This interval is by default 1 second (fastest possible).
  - 1.4. The supervision monitor displays the received ALERT instantly under the tab "Active Alerts" or accordingly under "Active Warnings" if specified so by the user.
2. USER will immediately see the big number incrementing from 0 to 1 active alert which needs his attention.
  - 2.1. USER clicks on ALERT, which causes DSM to displays details about this selected alert.
  - 2.2. USER reads ALERT's details but wants to have more information about CLOCK. Hence, he right-clicks on ALERT in the table.
  - 2.3. DSM displays a pop-up window with details about CLOCK (such as device type, name, IP address, MAC, etc.).
3. Knowing the details of ALERT and CLOCK, USER can find the origin.
  - 3.1. To find the origin, USER opens NMS and selects CLOCK in the "Device View".
  - 3.2. He opens the device configuration and finds details about the time source. It shows very bad reception, but the antenna seems to be present and otherwise working normal.
  - 3.3. With all these information, within minutes USER finds the GPS antenna covered and is able to regain GPS reception quickly.
4. Some final steps for USER and he has successfully and quickly resolved ALERT.
  - 4.1. CLOCK regains sufficient GPS reception and sends a clear alarm trap to DSS.
  - 4.2. DSS clears ALERT, moves it from active to history.
  - 4.3. DSM updates its views and hence moves ALERT to history as well.
  - 4.4. USER opens the "History" tab, selects ALERT and confirms it alternatively with his name and/or some notes on ALERT's origin.

**NOTE:** This section describes one way of setting up DSS with its relatives and using our tools. Certainly, the above setup and workflow is by design what we recommend.

### 3. Installation

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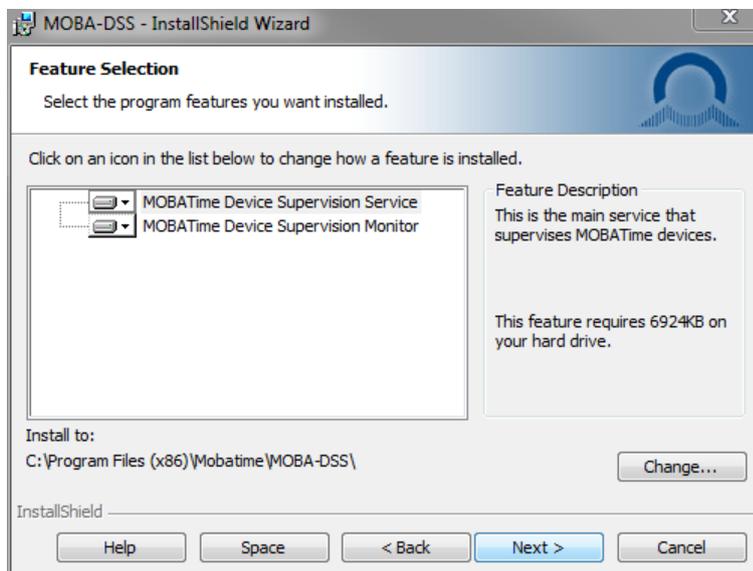
MOBA-DSS/DSM ships with the following files:

- **moba-dss-setup.exe** (installer file incl. references to prerequisites)
- ISSetupPrerequisites (folder with pre-downloaded installers of prerequisites)
- DSS\_Default\_Tables\_and\_Views.sql (query file to initialize the remote DB tables and views)
- BE-801202.xy-MOBA DSS-DSM Installation and User Guide.pdf (this guide)

#### 3.1. Installation Steps for MOBA-DSS/DSM

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1. Start installation by **double-clicking the installer file**.
2. **Follow the step-by-step instructions** of the setup wizard (InstallShield).
3. Under **feature selection** you can choose, whether to install all the features or just DSS or DSM.

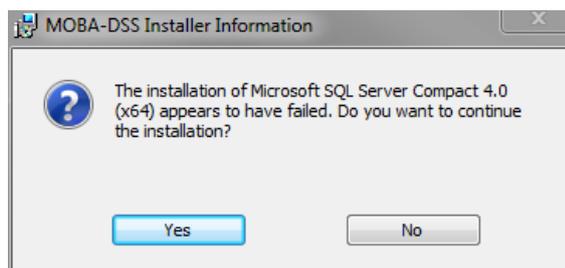


4. InstallShield will probably request permissions to install:
  - a. .NET framework
  - b. SQL Server Compact

**Grant permissions** to install both dependencies.

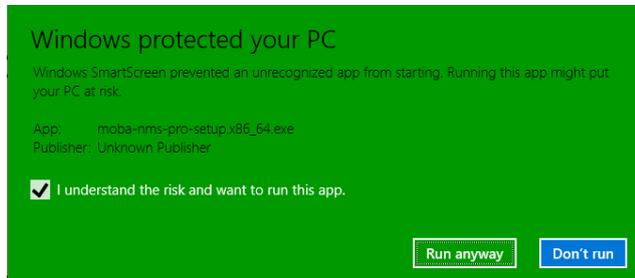
**Note:** DSS can only run, if all dependencies are installed correctly.

**Failure:** If for example Microsoft SQL Server Compact appears to have failed (see picture below), click “Yes” to continue installation. If DSS does not run correctly, try to uninstall MS SQL Server Compact and DSS, and try installation of DSS again.



## Windows SmartScreen on Win10

If you have enabled Windows SmartScreen on your Workstation you will probably get a message similar to below. Please ignore this message and continue with „Run anyway“.



### 3.2. MS SQL Server and Database Installation

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MOBA-DSS ships with an included compact database (DB) to log alerts and reports. But this DB only stores up to 10'000 messages. In order to store the whole history (or e.g. to have an automatic backup), an optional DB-server with appropriate credentials is required.

MOBA-DSS supports MS SQL Server 2008/2012. To install MS SQL Server you have to complete these steps sequentially:

1. Install SQL Server 2012:  
[https://msdn.microsoft.com/en-us/library/ms143219\(v=sql.110\).aspx](https://msdn.microsoft.com/en-us/library/ms143219(v=sql.110).aspx)
2. Install MS SQL Server Management Studio:  
<https://msdn.microsoft.com/en-gb/library/mt238290.aspx>  
This software provides easy access to the DB server and allows creating databases, logins and tables.
3. Create a Database (DB):  
[https://msdn.microsoft.com/en-us/library/ms186312\(v=sql.110\).aspx](https://msdn.microsoft.com/en-us/library/ms186312(v=sql.110).aspx)
4. Create a Login:  
[https://msdn.microsoft.com/en-us/library/aa337562\(v=sql.110\).aspx](https://msdn.microsoft.com/en-us/library/aa337562(v=sql.110).aspx)

#### Recommendations:

- a. General: We recommend you use “SQL Server authentication” over “Windows authentication”.
  - b. Server Roles: “public” only.
  - c. User Mapping: Select only the DSS DB you created in the previous step. Also select the role memberships “db\_datareader”, ”db\_datawriter” and “public”.
  - d. Status: Grant connection to DB.
5. Initialize the DB with tables:
    - a. Select the DB you created in step 3 and click “New Query”.
    - b. Open the **DSS\_Default\_Tables\_and\_Views.sql** file which ships with MOBA-DSS.
    - c. If the remote DB name is e.g. “DssDb”, you have to replace the question marks in brackets on top of the query with this name:

```
USE [DssDb]
GO
```

- d. Execute the query and refresh the DB.

**NOTE:** This query might show an ignorable error message if you include the first three statement blocks (ALTER and DROP). This is because there are initially no tables/views to alter and drop (this statement blocks are used to clean the DB). However, this is not a problem, since the query will have executed successfully anyways.

Simply refresh the DB and you will see the successful creation of all tables and views.

**NOTE:** It is very important to follow the above steps sequentially in order to have MS SQL Server and MOBA-DSS work properly. The links provide important information and step-by-step instructions for installation and setup.

**NOTE:** The **views** combine the data from multiple tables and allow viewing and exporting data in a readable fashion.

If you have any questions relating DB setup, SQL or other third party products, please contact your database administrator, use Microsoft support or visit the links provided in this guide. Additional information and help can be found here:

[https://msdn.microsoft.com/en-us/library/mt590198\(v=sql.1\).aspx](https://msdn.microsoft.com/en-us/library/mt590198(v=sql.1).aspx)

<https://mva.microsoft.com/>

## 4. Initial Configuration and Startup

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### 4.1. Initial configuration

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In order to make the DSS bind to the correct network interface and to use the correct IP address for later access, you need to complete the following steps:

1. Start MOBA-DSM as administrator.
2. In the *MOBA-DSS Control* panel click **Configure** and in the field *Hostname/IP* type in a valid IP address of the network interface you would like DSS to use.
3. Make other configurations acc. to section 7. MOBA-DSS Configuration.
4. Click Save.

#### NOTE:

- If DSS is started without manual IP configuration, it will bind on any interface available.
- The specified IP address has to be valid and configured on the network interface.
- The specified IP cannot change (static) at any time, or the DSS will not work properly (communication would fail).
- Network configuration changes can only apply, when you restart the DSS or if it is not running.
- If Service Control panel is disabled (grayed out), DSS is not installed on the workstation, where DSM is and network configurations cannot be changed.
- Configuration can also be changed via MOBA-NMS Expert.

### 4.2. Start-up MOBA-DSS

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**NOTE:** MOBA-DSS is a background service and offers no user interface. The following steps require the initial configuration to be done already.

In Order to start the service, complete the following steps:

1. Start MOBA-DSM as administrator (if not started already).
2. In the *MOBA-DSS Control* panel under *Service Control*, **start** the service.

Status indication of the service:

- Status indicator: **green** (Running), DSS has successfully started.
- Status indicator: **orange** (Pending), DSS is currently starting up or stopping.
- Status indicator: **red** (Stopped), DSS has stopped (not running)

**NOTE:** Service Control panel disabled (grayed out): DSS is not installed on the workstation, where DSM is. Hence, controlling the service status is not possible.

The monitor becomes visible by clicking on **Open Monitor**.

### 4.3. Notes on MOBA-DSM

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#### Program behavior

MOBA-DSM is running in the background of Windows but offers some user interfaces.

Once DSM is started, Windows will show this icon  in the task bar. To see options, right-click on this icon. The following options will be presented:

- Supervision Monitor: opens a monitor receiving live data from the DSS.
- Control Panel: opens a window with the possibility to stop DSS or make configuration changes.
- Settings: here you can make DSM to auto-start and other settings related to DSM.
- Exit: shuts the DSM down but not the DSS.

#### Administrator privileges

If MOBA-DSM was started without administrator privileges some actions will not be possible to execute. The following actions require administrator privileges:

- Configuration of MOBA-DSS
- Start, restart and stop MOBA-DSS
- Clean and reset MOBA-DSS (database)

Those actions are indicated by a shield icon  when administrator privileges are missing. MOBA-DSM will ask permission to elevate if such an action needs to be performed. Permission grant will cause DSM to restart on administrator execution level.

## 5. Software Purpose and Structure

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Generally, MOBA-NMS can be used for the same things as DSM. But NMS is not capable of running 24/7 and it cannot take over the process of initialization of DSS, whereas DSM can.

DSM is a native Windows application based on .NET 4.5 and it can run 24/7 (depends on its host). DSM offers the following user interfaces to interact with DSS:

- Tray icon with menu: DSM runs in the background and offers access via an icon and a menu in the Windows task bar;
- Control panel: used to start/stop and configure DSS (incl. initial IP configuration);
- Configuration panel: offers access to DSS configurations;
- Supervision monitor: shows all the data (alerts, devices etc.) captured by DSS;
- Settings panel: offers some settings related to DSM itself.

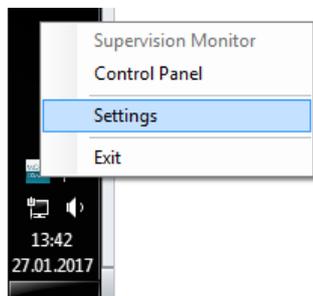
### 5.1. Tray Icon and Menu

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After a successful installation and startup of DSM, you can find this icon in the Windows task bar:



A right-click on this icon shows you the following menu:



If the connected DSS is running, the Supervision Monitor is not grayed out and can be clicked (opened), otherwise it cannot be opened.

Exit will close DSM without prompt. Be aware that this does not stop or affect DSS in any ways.

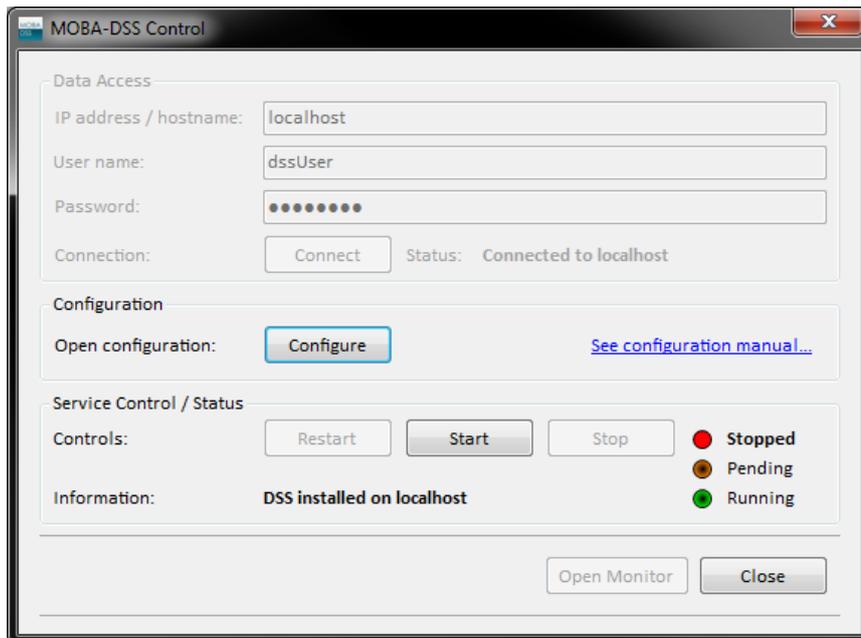
A double-click on this DSM icon will directly open the control panel.

**NOTE:** Closing all DSM related windows does not exit the application. It resides running in the background and can be accessed via tray icon.

### 5.2. Control panel

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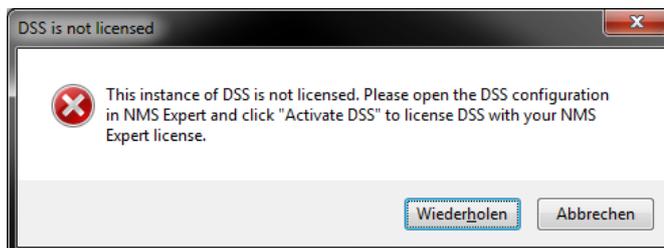
With the control panel you can connect to either a DSS instance running on the same computer/workstation DSM was installed on or to a remotely running DSS. If a DSS instance is installed locally, you see the following panel:



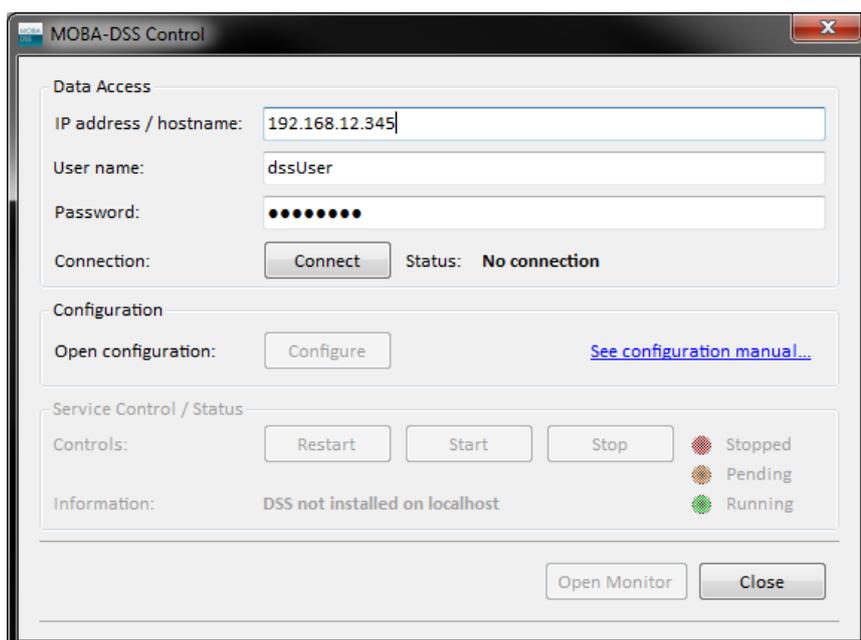
The configure button allows you to make changes to the DSS incl. IP configuration.

In “Service Control / Status”, you can see the status of the locally installed DSS. It also offers Start/Stop and Restart functions.

DSS requires a valid license from NMS in order to run. Hence, at first start of DSS, DSM will display a warning with the demand for activation over NMS Expert. See section “6.2 Activation of DSS” for more information.



If no DSS is installed where DSM is, you see the following panel:



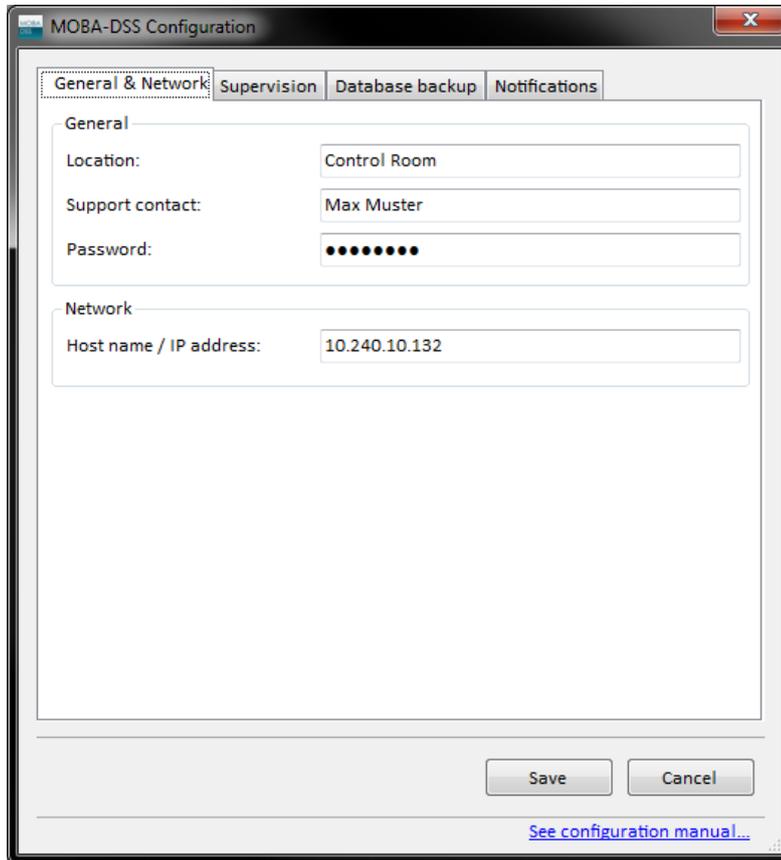
In the Data Access area you can connect to a **running** DSS on another host. Having successfully connected to a DSS, the configure button will be activated.

**NOTE:** It is not possible to configure the IP address of a remote DSS nor to start or stop it.

### 5.3. Configuration panel

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DSM also allows you to make initial configurations (if DSS is installed locally) while DSS is not running.



The screenshot shows a window titled "MOBA-DSS Configuration" with four tabs: "General & Network", "Supervision", "Database backup", and "Notifications". The "General & Network" tab is active. Under the "General" section, there are three input fields: "Location" with the value "Control Room", "Support contact" with the value "Max Muster", and "Password" which is masked with seven black dots. Under the "Network" section, there is one input field: "Host name / IP address" with the value "10.240.10.132". At the bottom of the window, there are two buttons: "Save" and "Cancel". Below the buttons is a blue hyperlink that says "See configuration manual...".

As mentioned already, network configuration (IP address/hostname) can only be made if DSS is installed on localhost (same host as DSM). If that is the case, DSS does not need to run in order to alter any configuration. But to test database connection, DSS has to run.

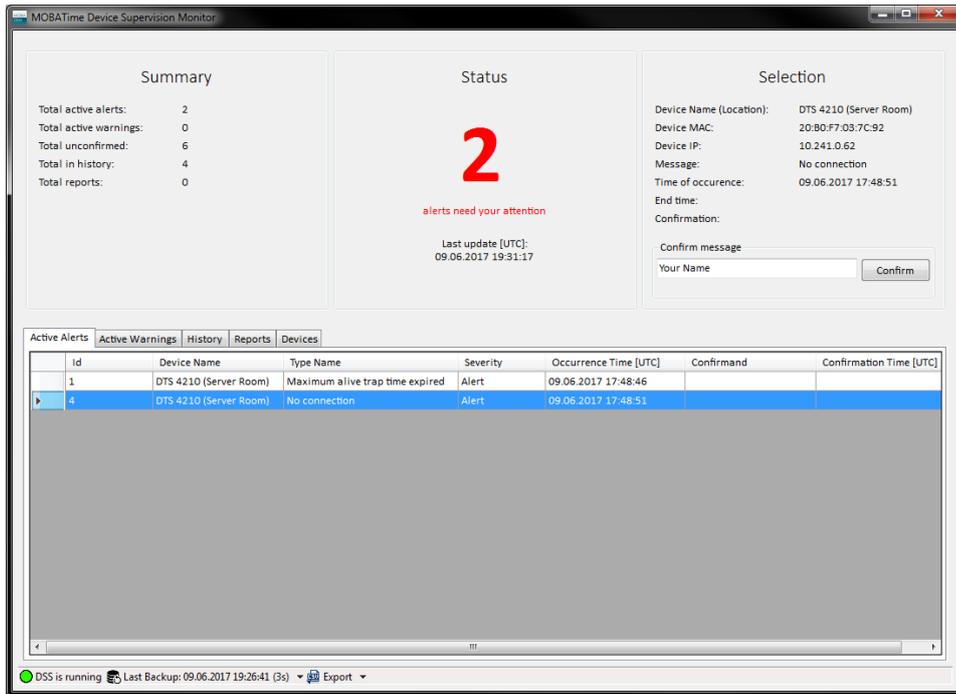
**NOTE:** If Network changes are made, DSS requires a restart.

For explanations to each parameter please see chapter DSS Configuration later in this document.

### 5.4. Supervision Monitor

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This monitor displays all the data the connected DSS has collected. With default settings you will have a live feed of the data, but its refresh-rate can be changed in the settings panel.

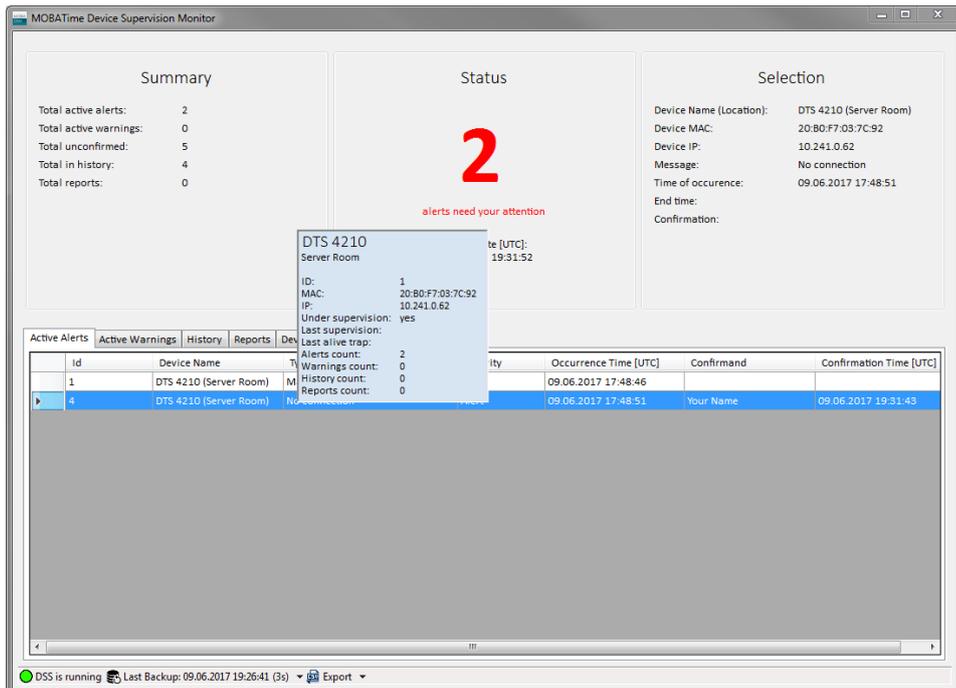


Prominent in the middle you see the total of active alerts and the time of last update. To the left is a summary of all collected messages. To the right is displayed the details of a selected message. The lower half of the monitor has multiple tabs each with a table containing all the messages collected. DSM will collect every message incl. the past within the database of DSS.

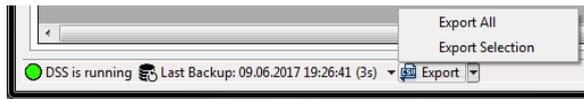
Alerts and warnings can be confirmed, active ones and those in history. To do so, select an unconfirmed message, type in a name and/or message in the field under "Selection" and click on confirm.

Confirmation information will be displayed immediately in the table. Multiple selections are also possible.

If you right-click a message in any table, details about the device of origin will be displayed.



DSM offers a function for data export (lower left, indicated by a CSV icon).



You can export either all the data or simply the selected rows. By just clicking on the icon itself, all rows in the current tab will be exported. A path chooser dialog (explorer) allows you to name and place the file. Multiple rows can be selected either with control (“Ctrl”) or shift.

The monitor also shows the current backup status and the possibility to trigger a backup manually. This tool strip also offers a clean method that clears all the data DSM has loaded so far. However, it does not delete any data from DSS.

DSS also offers to supervise other parameters than alarms, called “Custom parameter”. The active supervision will create a report for each requested parameter. Those are collected in “Reports” tab. In the following picture, column “Value” would be the “supply voltage 1” reported in millivolts.

The screenshot shows the MOSA Time Device Supervision Monitor interface. It features a summary section on the left, a status section in the center, and a selection section on the right. Below these is a table of active alerts.

id	Device Name	Name	OID	Query Time	Value
11	D75 4210 (Server Room)	dts4210SupplyVoltage1	1.3.6.1.4.1.13842.4.4210.1.40.1.0	21.03.2017 13:39	29186
10	D75 4210 (Server Room)	dts4210SupplyVoltage1	1.3.6.1.4.1.13842.4.4210.1.40.1.0	21.03.2017 13:38	29188
9	D75 4210 (Server Room)	dts4210SupplyVoltage1	1.3.6.1.4.1.13842.4.4210.1.40.1.0	21.03.2017 13:37	29190
8	D75 4210 (Server Room)	dts4210SupplyVoltage1	1.3.6.1.4.1.13842.4.4210.1.40.1.0	21.03.2017 13:36	29185
7	D75 4210 (Server Room)	dts4210SupplyVoltage1	1.3.6.1.4.1.13842.4.4210.1.40.1.0	21.03.2017 13:35	29188
6	D75 4210 (Server Room)	dts4210SupplyVoltage1	1.3.6.1.4.1.13842.4.4210.1.40.1.0	21.03.2017 13:34	29183
5	D75 4210 (Server Room)	dts4210SupplyVoltage1	1.3.6.1.4.1.13842.4.4210.1.40.1.0	21.03.2017 13:33	29201
4	D75 4210 (Server Room)	dts4210SupplyVoltage1	1.3.6.1.4.1.13842.4.4210.1.40.1.0	21.03.2017 13:32	29197
2	D75 4210 (Server Room)	dts4210SupplyVoltage1	1.3.6.1.4.1.13842.4.4210.1.40.1.0	21.03.2017 13:31	29177
1	D75 4210 (Server Room)	dts4210SupplyVoltage1	1.3.6.1.4.1.13842.4.4210.1.40.1.0	21.03.2017 13:30	29177
12	D75 4210 (Server Room)	dts4210SupplyVoltage1	1.3.6.1.4.1.13842.4.4210.1.40.1.0	21.03.2017 13:40	29184
13	D75 4210 (Server Room)	dts4210SupplyVoltage1	1.3.6.1.4.1.13842.4.4210.1.40.1.0	21.03.2017 13:41	29190
14	D75 4210 (Server Room)	dts4210SupplyVoltage1	1.3.6.1.4.1.13842.4.4210.1.40.1.0	21.03.2017 13:42	29187
15	D75 4210 (Server Room)	dts4210SupplyVoltage1	1.3.6.1.4.1.13842.4.4210.1.40.1.0	21.03.2017 13:43	29180
16	D75 4210 (Server Room)	dts4210SupplyVoltage1	1.3.6.1.4.1.13842.4.4210.1.40.1.0	21.03.2017 13:44	29178

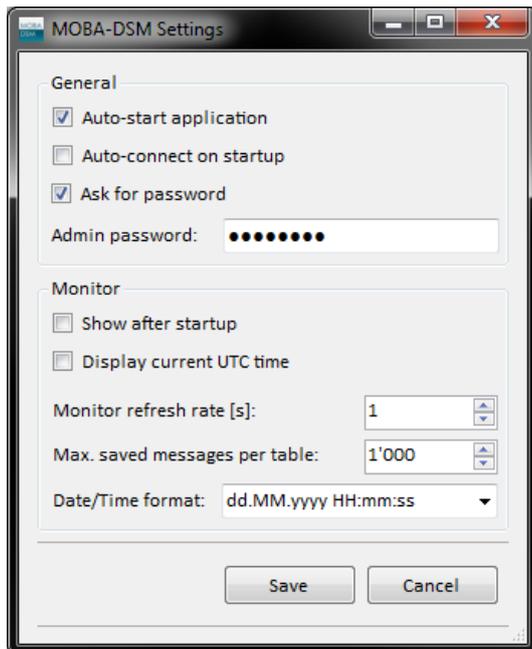
## 5.5. Settings panel

The settings panel is only about DSM. Here you can choose to let the system auto-start DSM after launch. Also the monitor can be displayed automatically.

It is also possible to let DSM auto-connect to a remote DSS.

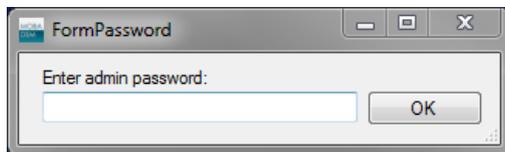
**NOTE:** This auto-connect feature is critical in terms of timing with respect to Windows start-up. So, if Windows has not fully started up when DSM tries to connect, the connection attempt might fail and you would have to try connecting manually.

DSM also offers the display of a UTC clock on the monitor window.



The password features protects every “write” access. By default, no password is specified. This means that a user has to enter a valid administrator password for all of these actions:

- Modify any configuration related to DSS;
- Restart/start/stop DSS;
- Change DSM settings;
- Confirm alerts.



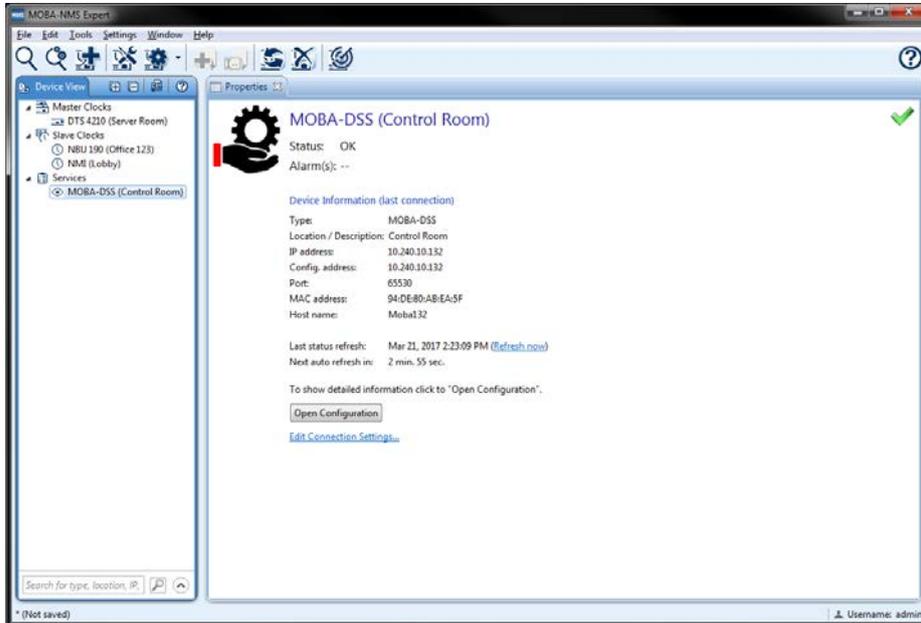
The maximum saved messages limitation ensures the 24/7 ability. The more messages are saved in the tables, the more memory in CPU power is required.

A user has also the possibility to change how dates and times are displayed by selecting one of a selection of common date/time formats.

## 6. Integration in NMS Expert

With NMS Expert one can find any DSS running in any connected network. Since this is just as searching any other MOBATIME device, please consult NMS help [?](#) for instructions.

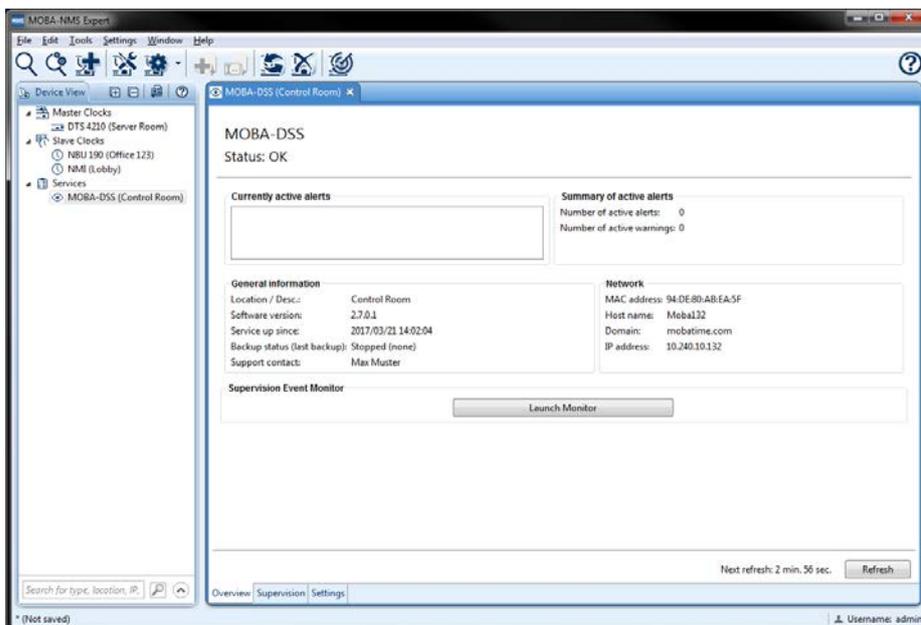
In the “Device View” one can find a category called “Services”. This is where DSS is placed after adding it to NMS.



It follows an explanation of the different screens related to DSS.

### 6.1. Overview

The DSS configuration view has 3 tabs, where the first is an overview of the status of DSS and its supervised devices.

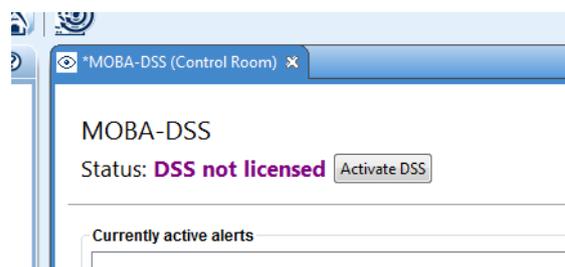


“Status”, “Currently active alerts” and “Summary of active alerts” indicate alarm status of DSS and all of the supervised devices.

NMS Expert offers a “Supervision Event Monitor” with which one can display all alerts and reports DSS has collected.

## 6.2. Activation of DSS

NMS only runs with a valid license, so does DSS. When DSS is opened the first time, NMS (and DSM) will display a warning, that DSS is not activated.

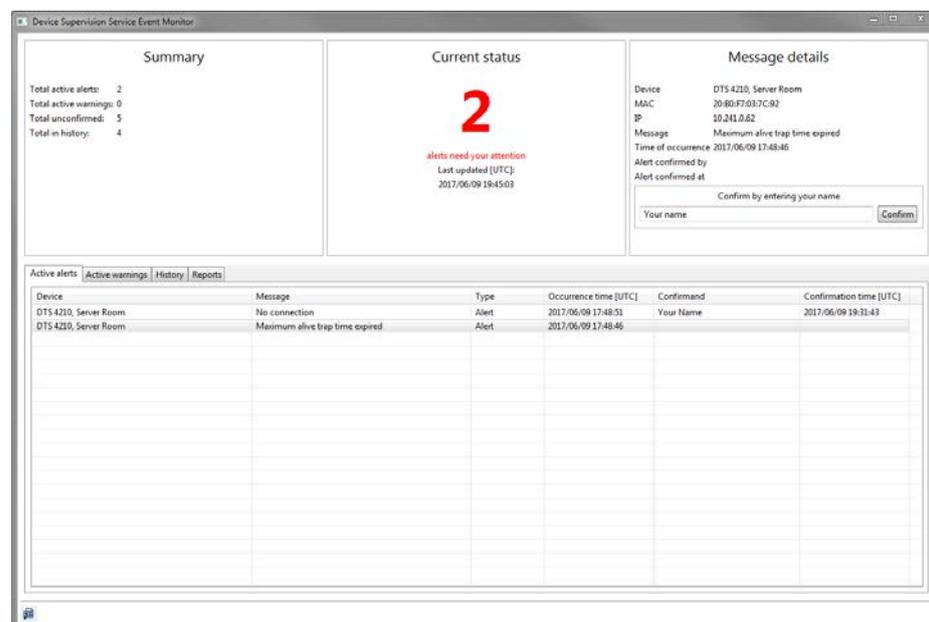


By pressing the “Activate DSS” button on top of the overview page, DSS will be activated using the NMS license. Therefore, as long as NMS is licensed, DSS is as well.

After successful activation the button will disappear and the status will be OK.

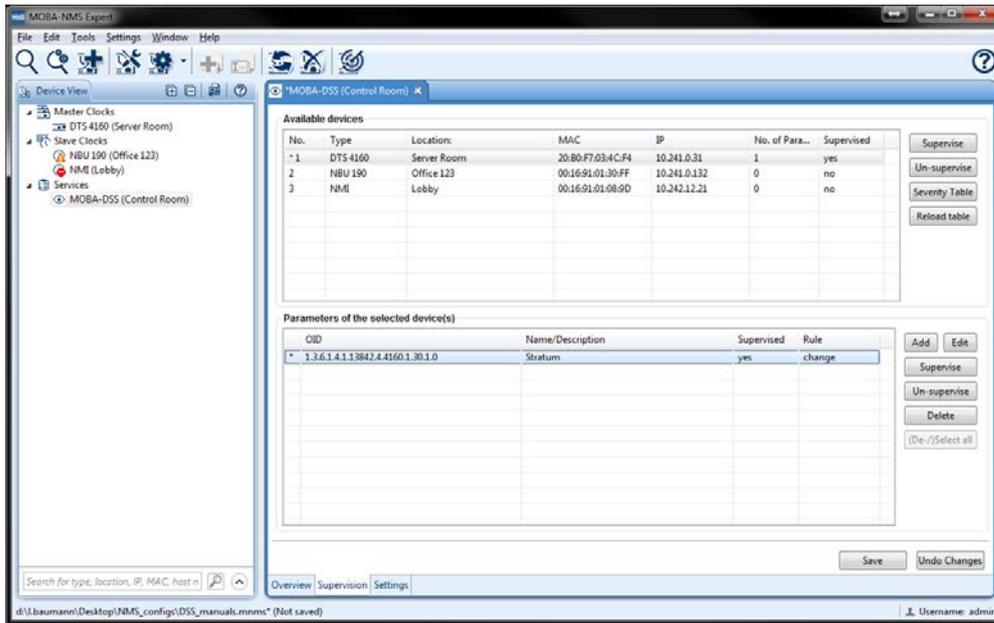
## 6.3. Supervision Event Monitor

The supervision event monitor pretty much shows the same data as DSM. But it is not capable of running 24/7 and it closes as soon as another device in NMS device view is selected.

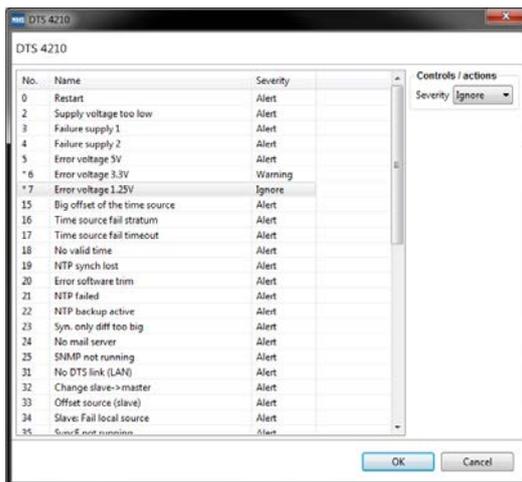


## 6.4. Supervision – Put devices under supervision

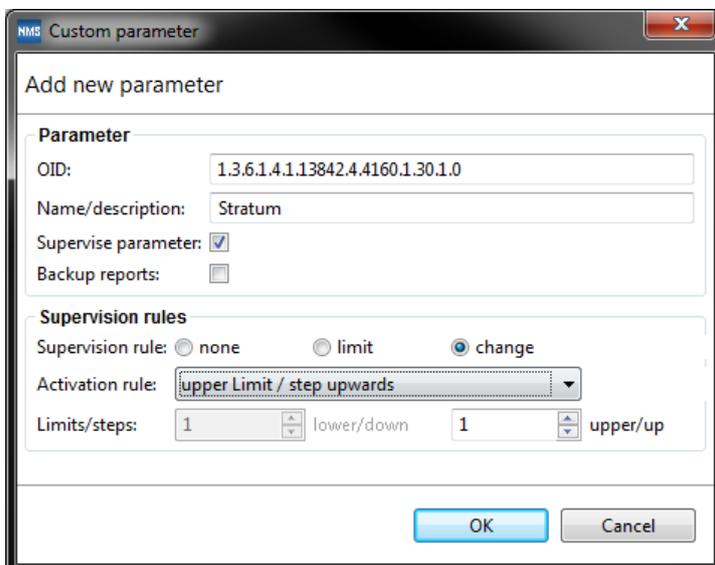
In the second tab all the devices (except for DSS itself) from “Device View” are listed and can be put under supervision. One device at the time can be selected, supervised, alert severity changed or custom parameters for supervision added.



Every device type may throw different types of alarms. Some of those alarms might even be uninteresting to some users. Therefore, one can change each alarm's severity by selecting a device and "Severity Table". By default, every alarm is treated as such, but the user can override severity with "Warning" or "Ignore".



For any device one can register additional "Custom Parameters" to supervise. Select one device and click the "Add" button.



The above window will pop up where the following can be set/edited:

- **OID:** exact definition of the parameter to supervise;
- **Name/description:** free text with e.g. Stratum for the example parameter;
- **Supervise parameter:** check box has to be ticked in order to activate supervision;
- **Backup reports:** Whether or not the queried reports shall be copied to the backup database.

DSS offers to apply none or two rules to a supervised parameter. If a rule was overstepped, DSS will activate a warning.

- Supervision rule **limit:** an upper and/or lower limit (boundary) can be specified. Crossing the limit activates a warning.
- Supervision rule **change:** every time the value changes by a user defined step size with respect to the previous value, a warning is activated.

**NOTE:** Warnings activated due to a limit role will disappear automatically, as soon as the value is within limits again. The warnings activated by value change can be cleared by confirmation.

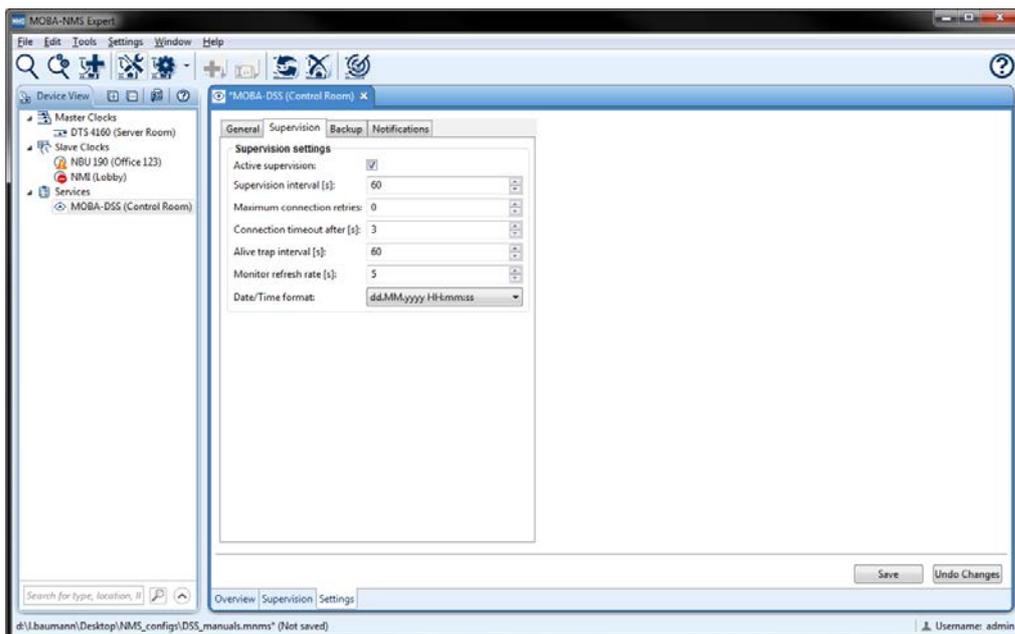
If “Supervised” is un-ticked, the parameter will be registered but not supervised. Once OK was clicked, the selected device(s) will indicate that some changes were made (\*) as well as the parameter number. Save changes in order to update DSS.

Parameters and its affiliated reports can be deleted by selecting one or more parameters in the lower of the two tables and clicking on “Delete”. Deletion will be executed after save was clicked. Parameters that are about to be deleted appear italic and with an “x” in the first column.

**NOTE:** Deleting a custom parameter will also delete all its affiliated reports! This does not apply to the backup/remote DB. This data will not be deleted.

## 6.5. Settings

Configuration changes that affect DSS and how it operates can be made in the settings tab.



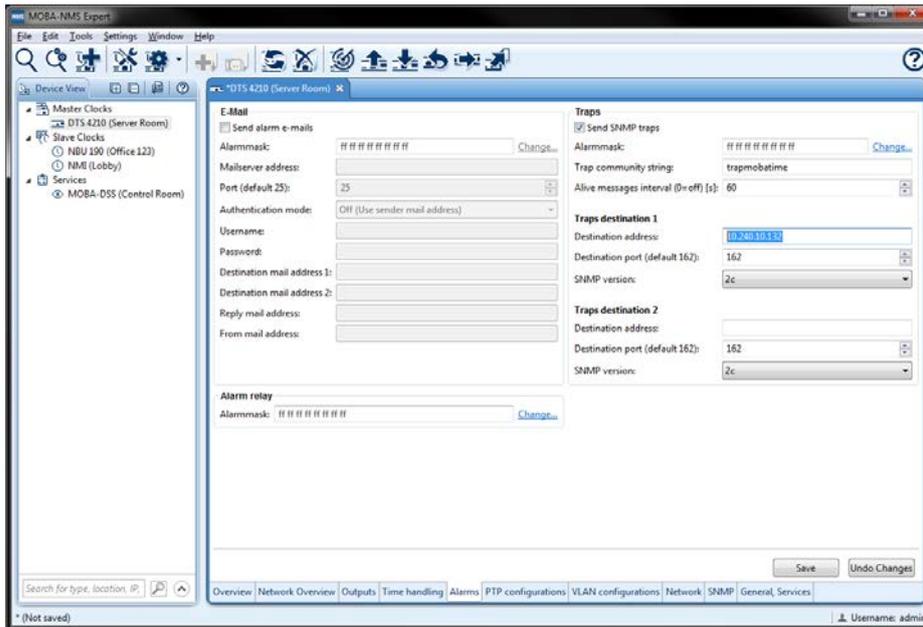
“Remote database settings” can be made if a backup service should backup the internal database of DSS to a database server (e.g. MS SQL Server).

Under “Supervision settings” one can specify supervision intervals and so on. For more information on configurations see chapter DSS Configuration.

One can also change the password to access DSS. Please note that this is the same password DSM uses to load data. Hence, it needs to be changed there as well.

## 7. Configure Devices for Supervision

Every device that should be supervised by DSS needs to be configured accordingly. Every MOBATIME network device offers the feature to send SNMP alarm and alive-traps to a certain SNMP manager.



For example the DTS master clock configuration has a tab “Alarms” with some traps settings to the right of the window. In order for DSS to supervise properly, the checkbox “Send SNMP traps” has to be ticked. The alive-trap interval needs to be equal or shorter (recommended) than the alive-trap interval specified for DSS. Also one of the Traps destination addresses need to be the DSS’s IP address.

## 8. Licensing & Activation

MOBA-DSS requires a valid NMS-Expert license and can run only once per Windows distribution. MOBA-DSM only ships together with MOBA-DSS.

## 9. Important notes for DSS to run

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- Network Ports: The following **ports** have to be open and free of any other use:  
Port: 80, 161, 162, 443, 65530
- SNMP: For all master clocks (DTS) DSS uses SNMPv3 to communicate and for all slave clocks it uses SNMPv2.  
DSS supports only SNMPv2 traps, which can be sent by every MOBATime network device.
- Firewall: The **firewall** has to allow the above ports and be configured to allow DSS to communicate on them.
- IP address: MOBA-DSM allows you to assign DSS a specific network interface via an existing IP address or host name.  
If an IP address was specified, it has to be valid and configured on the network interface. This specified **IP address cannot change** at any time (static), or DSS will not work properly.  
If **no IP** address is specified, DSS will bind on any interface available.  
DSS requires a restart in order to bind on another network interface.  
**NOTE:** If a host name was specified and an underlying IP address changes, DSS should be able to realize this change. But we recommend restarting DSS after such a change.
- Local Database: In the root directory of the DSS is located the local database (LocalDatabase.sdf) used to store approx. 10'000 alerts. Depending on the supervision settings made (see chapter 9 MOBA-DSS Configuration) and the amount of devices under supervision, this file has variable size (some megabytes).
- Backup Database: The backup or remote database can be hosted in a Microsoft SQL Server 2008 or 2012 (older/newer distributions might work, but have not been tested).  
This DB can grow greater than 12GB per year (very much depends on supervision configuration). In order to ensure DSS to run over years, this DB has to be dumped (TRUNCATE) from time to time. If the table size grows over approx. 100'000 entries, DSS could run out of memory and hence quit service.  
One entry (message of type alert or report) has an average size of 125 bytes. Therefore, 100'000 messages have a size of approx. 12MB.

## 10. DSS Configuration

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The following configurations can be made using MOBA-NMS Expert or MOBA-DSM:

### Network (DSM only)

Host name / IP address: DSM allows users to change the network interface DSS has to use. One can use a valid host name or IP address (v4 or v6) to specify an interface (e.g. 192.168.1.2).

### General/Access

Location: Location or description of DSS (e.g. "Control room, Supervision Service 1").

Support contact: Specify the support contact (e.g. if the user differs from the one how configured the service).

Password: The password to access DSS (default: mobatime).

### Supervision

Active: If selected, DSS actively supervises devices (described below). Otherwise, DSS only uses passive supervision (described in chapter 2).

Supervision interval: The amount of seconds between active supervision (e.g. 60s => every 60s the devices under supervision will be asked to return any alert and custom parameter specified). We recommend an interval of 60 seconds or greater.

Alive-trap interval: Maximum time between two alive-traps every supervised device has to maintain (e.g. 60 seconds means, that an alert will be generated, if a device has not sent an alive-trap in the last 60 seconds).

**Important note:** Intervals below 10 seconds are futile. Also make sure, that every device under supervision sends at least as often alive-traps to the DSS, otherwise lots of misleading alerts could be generated.

We recommend sending an alive-trap every 30 second from the devices under supervision to the DSS, whereas the DSS specifies only an interval of 60 seconds. This way DSS will not produce futile alerts.

Connection timeout after: After how many seconds a connection attempt shall be aborted.

Max. connection retries: How many times a connection shall be tried to establish, before a no-connection alert will be generated.

Monitor refresh interval: How often the event monitor should refresh its data. In NMS this feature can be found on the settings tab. In DSM it can be found on the settings window.

### Remote/Backup Database

Enable backup: Whether or not backups shall be made automatically in the specified interval.

Host/instance name: The address of the database plus the instance name of the DB (e.g. "sqlserv\DSSDB").

Database name:	The name of the database (e.g. "MOBA-DSS")
User name:	User name to access the DB. Also Windows user names can be used.
Password:	Password to access the DB with the above user name.
Windows account:	Tick this checkbox, if the credentials (user) specified is a Windows account, un-tick otherwise (SQL authentication).
Backup interval:	Interval at which the local DB is synchronized with the remote/backup DB.
Test connection:	NMS and DSM offer to test the remote DB settings. This test only reveals, if the credentials and access are valid, but does not test user rights (read/write rights on the DB).
Backup now:	This function enables a user to manually trigger a backup (backup is only executed when currently the auto-backup process is not running).

### Mail Notifications

Send mail notifications:	DSS can be enabled to forward alarms and warnings to two mail recipients.
Mail server address:	Address of the mail server used to send mails (IPv4, IPv6 or hostname possible).
Mail server port:	Port for outgoing mails of the used mail server.
Mail server user name:	User name of login to use.
Mail server password:	Password to login with the above user name.
From address:	Sender mail address the recipients will see in the mail header.
Reply to address:	Mail address in the mail header to which can be replied. Note that DSS may not receive e-mails, therefore may "from" and "reply to" addresses differ.
Destination 1/2 address:	DSS may send notification mails to two different recipients.
Send alarms/warnings:	One can choose, whether DSS shall send both alarms and warnings per mail.

### SNMP trap Notifications

Send SNMP traps:	It is possible to supervise/manage DSS with an external SNMP manager tool. By enabling this option, DSS will send SNMP alive as well as alarm traps to two possible manager addresses.
Alive trap interval:	Alive trap interval in seconds at which DSS sends out alive traps to the configured targets (manager addresses).
Target 1/2 IP:	Manager address 1 to which alive and alarm traps will be sent.
Target 1/2 port:	Default port for SNMP traps is 161, but this can be changed freely.
Trap community:	The community string identifies a group of SNMP devices. Default is "trapmobatime", but this can be changed freely.

**NOTE:** The more devices and parameters under supervision, the longer backups will take and also one active supervision cycle takes longer (the set interval may not be followed).

## 11. Reset, Update or Uninstall DSS/DSM

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### Reset

Settings and configurations as well as captured data can be brought back to a factory state. Reset can be the following:

- Clean all or partial data of the local or backup database of DSS;
- Reset settings and configurations of DSS and DSM (incl. passwords)

The reset form can be accessed by pressing the key CTRL+SHIFT+M while the window focus is on the DSM Control.

**NOTE:** Reset and clean operations cannot be undone and wrong handling can lead to unwanted data loss!

### Update

MOBA-DSS/DSM can be updated by executing a supposedly new installer execution file (normally called: moba-dss-setup.exe). If any version of MOBA-DSS/DSM is already installed, the installer will ask to choose an action, either "Update", "Repair" or "Uninstall". Choose "Update" in order to perform an update.

### Uninstall

MOBA-DSS/DSM offers multiple **uninstallation** possibilities. The following uninstall procedures are equivalent:

- Go to "Start" > Type "programs and features" > open "Programs and Features" > right-click on "MOBA-DSS" > select "uninstall" > follow the uninstall wizard.
- Execute the MOBA-DSS/DSM installer again (moba-dss-setup.exe) > select "Uninstall" > follow the uninstall wizard.
- Type "Win + R" > type "appwiz.cpl" > right-click on "MOBA-DSS" > select "uninstall" > follow the uninstall wizard.

**NOTE:** After any of those uninstall procedures make sure the install directory has been deleted successfully (default directory: C:\Program Files (x86)\MOBATime\MOBA-DSS\).

## 12. Troubleshooting

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If you have trouble to install or start the application for the first time, find some common error descriptions with solutions below:

### **SNMP Traps are not handled or not received**

**Error:** DSS shows alarm(s) about “maximum alive trap interval expired” even though alive-traps are sent by supervised device(s).

If alive-traps are received by the host over its network access, but DSS does not clear correspondent alarm(s), then there are two obvious reasons.

**Solution 1:** Another tool/service consumes these trap packets (such as another SNMP trap receiver).

⇒ Stop all other tools/services that consume SNMP traps.

**Solution 2:** Windows Firewall might block DSS trap receiver or dumps SNMP traps.

⇒ Add an inbound firewall rule that allows MOBA-DSS to receive packets on port 162.

### **Service does not start (STATE: 1 STOPPED)**

**Error:** The service is registered in the Windows services but cannot be started.

**Solution 1:** Restart your workstation and try again.

**Solution 2:** Re-install the service and make sure, that SQL Server Compact as well as the .NET frameworks were installed correctly.

**Solution 3:** Install and test the service on another computer.

**Solution 4:** Port 162 (SNMP) might be used by some other software. Find out which software and free port 162. This port is mandatory for DSS to run.

**Solution 5:** If no IP was specified, DSS might bind on any network adapter and IP it can find. Specify a valid IP of the network adapter you want DSS to bind with.

### **Start or uninstall icons (shortcuts) cannot be found**

**Error:** The service was installed but no icons or shortcuts are to be found.

**Solution:** MOBA-DSS is installed in C:\Program Files\MOBATime\MOBA-DSS. But it does not generate any shortcuts or icons. The service can be uninstalled by executing InstallShield again and choosing the option to uninstall.

To start the service, see chapter 3.

## 13. Frequently asked questions FAQ

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Here you find answers to commonly asked questions about MOBA-DSS.

**Q: How can I access and configure MOBA-DSS?**

A: The service is currently only accessible and configurable via MOBA-NMS Expert and the corresponding MOBA-DSS plugin as well as MOBA-DSM.

**Q: Can I have multiple instances of MOBA-DSS run on the same workstation?**

A: No, but a virtual machine can run a separate instance.

**Q: How long are log files (alert list) kept locally on my machine?**

A: For as long as the DB does not contain more than 10'000 alerts.

**Q: Why does DSS produce so many “Maximum alive-trap time expired” alerts?**

A: DSS expects every supervised device to send alive-traps in a certain interval. If a device does not have the DSS IP address configured as SNMP manager, DSS produces one alert per device. If a device specifies an alive-trap interval greater than the one of DSS, many alerts will be generated. If the intervals align, network delays could produce some alerts. Therefore, we recommend for every supervised device an alive-trap interval shorter than DSS (e.g. half).

## 14. Contacting Support

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In case you have to contact support, please include following information in your initial message:

- Type of operating system (i.e. Windows 7, 64-bit, ...);
- Your MOBA-NMS edition (i.e. Basic 64-bit, Pro Limited 32-bit, ...);
- Your MOBA-DSS and DSM version;
- Your license identification number (MOBA-NMS > Settings > License Manager > License ID);
- A screenshot of the problem.



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