

Bosch Video Management System

Bosch VMS OPC Server



BOSCH

en Technical Service Note

Table of contents

1	Introduction	4
2	Bosch VMS OPC Server	6
2.1	OPC Server events	7
2.2	OPC Server commands	9
3	Installation	11
3.1	Bosch VMS Server	11
3.2	Bosch VMS Operator Client and 3rd party client	11
4	Bosch VMS Proxy	13
4.1	Bosch VMS Proxy commands	13
5	Configuration files	15
6	Example for 3rd party client (HTML file)	18

1 Introduction

**Notice!**

Please note, that OPC is not the preferred solution for connecting Bosch VMS to 3rd party components. BU-ESS/MKP rather recommends using our existing .NET SDKs.

This document describes the different components that Bosch Video Management System offers to establish a connection between Bosch Video Management System and a 3rd party management system. This description helps you in writing your own commands for controlling Bosch VMS from inside your management system.

List of used abbreviations:

- AE: Alarms and Events
- Bosch VMS: Bosch Video Management System
- DA: Data Access
- HTML: Hypertext Markup Language
- I/O: Input/Output
- OPC: OLE for Process Control (OLE: Object Linking and Embedding)
- XML: Extensible Markup Language

For details regarding Bosch VMS OPC Server, see *Bosch VMS OPC Server*, page 6.

For details regarding Bosch VMS Proxy, see *Bosch VMS Proxy*, page 13.

Installation, page 11 describes how to install a connection between Bosch VMS and a 3rd party management system.

The files needed by OPC Server and Bosch VMS Proxy, are described in *Configuration files*, page 15.

Example for 3rd party client (HTML file), page 18 gives an example for a 3rd party application in form of an HTML file.

Components

The following software components are used to realize a connection:

- Bosch VMS OPC Server
Forwards events from Bosch VMS to the 3rd party software and forwards commands from 3rd party software to Bosch VMS.
It is installed but not automatically registered in Windows where Bosch VMS Management Server software is installed.
- Bosch VMS Proxy
Forwards events from Bosch VMS to the 3rd party software and forwards commands from 3rd party software to Bosch VMS.
It is installed on each computer where Bosch VMS Operator Client and/or Bosch VMS Management Server software is installed.
- 3rd party application
As an example we provide an HTML page with code (JScript) to send commands like Show Live or Show Playback to Bosch VMS Proxy. This HTML page can be integrated in a 3rd party management system.
It is installed on a computer where Bosch VMS Operator Client software is installed.
You can use Softing OPC Toolbox as a 3rd party application on a Bosch VMS Operator Client computer or on a standalone computer to send commands like open/close a relais to the Bosch VMS OPC Server.

The following image shows the connection between a 3rd party application and Bosch VMS Server via OPC Server and Bosch VMS Proxy.

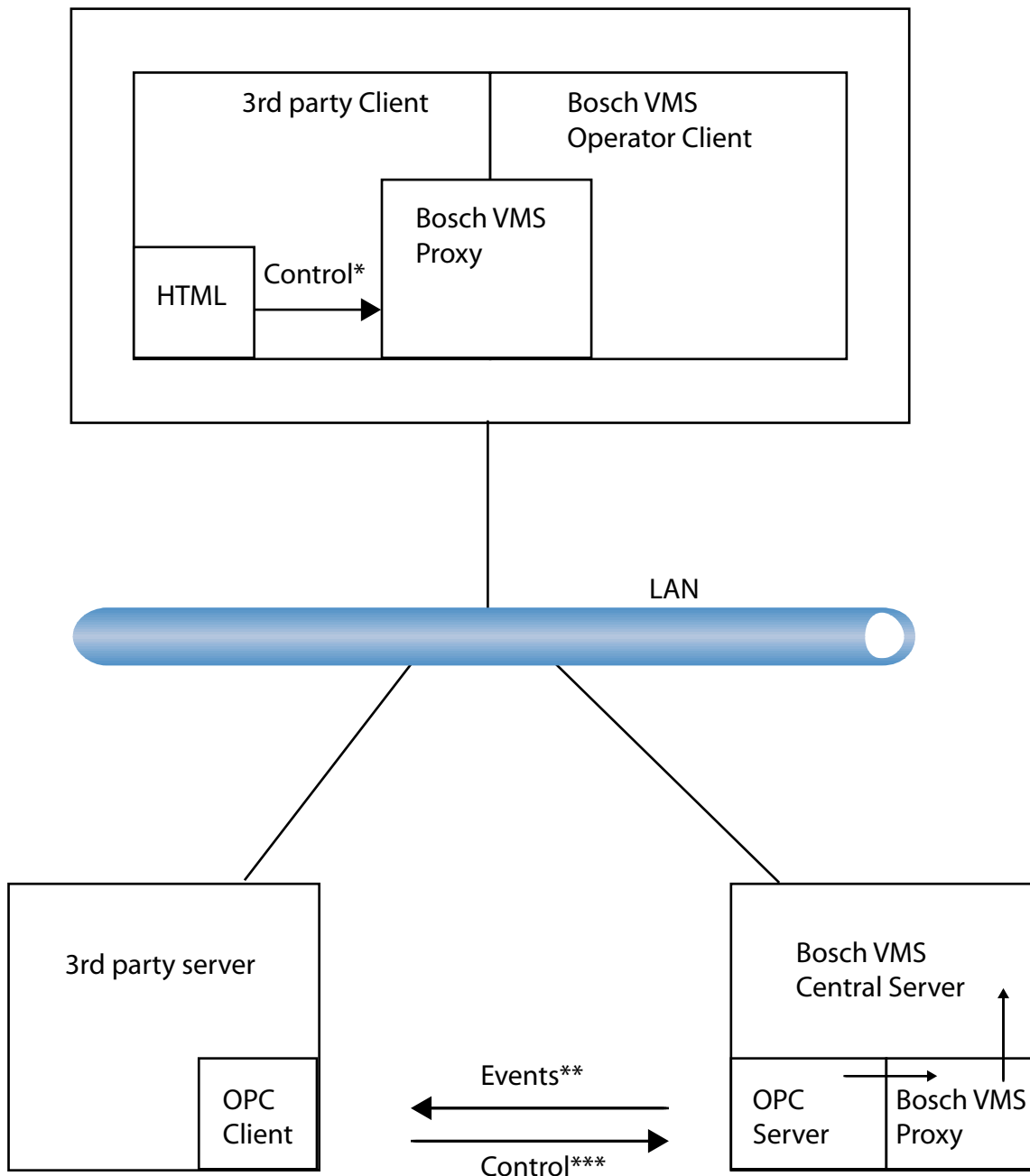


Figure 1.1: Connection 3rd party application – Bosch VMS Management Server

See *Bosch VMS Proxy commands*, page 13 for commands (*) that you can send from an application on 3rd party side to Bosch VMS Operator Client.

The connection between a 3rd party application and Bosch VMS Operator Client does not need OPC Server. The commands being sent by the 3rd party application can be processed by an HTML file with code. For an example for such an HTML file, see *Example for 3rd party client (HTML file)*, page 18.

See *OPC Server events*, page 7 for events (**) that are sent from 3rd party server to Bosch VMS OPC Server.

See *OPC Server commands*, page 9 for commands (***) that you can send from 3rd party server to Bosch VMS OPC Server.

2 Bosch VMS OPC Server

The Bosch VMS OPC Server software is used for sending state changes of the following items from Bosch VMS to a 3rd party management system like Softing OPC Toolbox.

The following items are available:

- Input
- Relay
- Encoder
- Decoder
- Virtual Input
- Camera

Bosch VMS OPC Server has the following features:

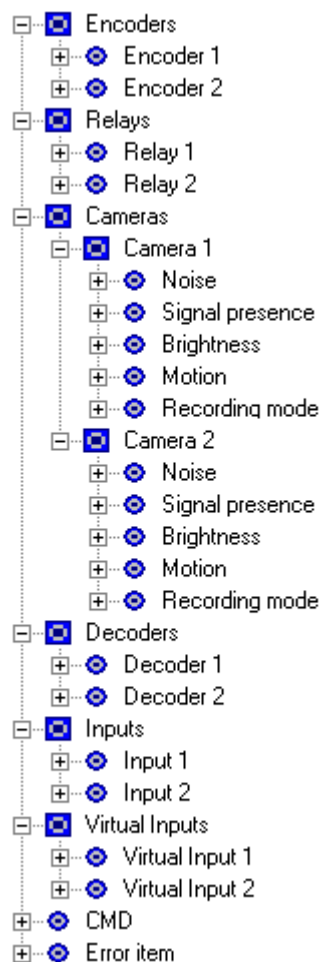
- Notification of state changes in cameras, decoders, encoders
- Start and stop recording
- Control of relays and virtual inputs, status notification of I/O objects in Bosch VMS

On startup, OPC Server reads a Bosch VMS configuration file where all items like cameras, relays, inputs, decoders, encoders, virtual inputs are listed.

OPC Server supports DA V.2. DA helps creating the namespace and sending commands to devices like open or close a relay.

Note: It is not supported to directly send commands to devices via DA by changing the item's value. To send commands use the DA item CMD. Also it is not supported to query the current state of a device using DA. Use AE instead when you want to be notified about a state change of a device.

The 3rd party system DA namespace looks like this:



This picture was made with Softing OPC Toolbox.

2.1 OPC Server events

OPC server notifies state changes on the Bosch VMS side with an AE event to the 3rd party Server. *OPC Server events, page 7* describes the notified values.

The following table lists all error events which Bosch OPC Server can generate.

Interface Type	Event Name	State Value	State Id
Camera / Signal Presence			
Bosch.Vms.Server.VideoDevice	SignalPresence	Unknown	0
Bosch.Vms.Server.VideoDevice	SignalPresence	Present	5
Bosch.Vms.Server.VideoDevice	SignalPresence	NotPresent	353
Camera / Brightness			
Bosch.Vms.Server.VideoDevice	SignalTooBright	SignalOK	5
Bosch.Vms.Server.VideoDevice	SignalTooBright	Signal-NotOk	360

Interface Type	Event Name	State Value	State Id
Bosch.Vms.Server.VideoDevice	SignalTooDark	SignalOK	5
Bosch.Vms.Server.VideoDevice	SignalTooDark	Signal-NotOk	361
Camera / Noise			
Bosch.Vms.Server.VideoDevice	SignalTooNoisy	SignalOK	5
Bosch.Vms.Server.VideoDevice	SignalTooNoisy	Signal-NotOk	362
Camera / Motion			
Bosch.Vms.Server.VideoDevice	MotionDetect	Motion Detected	367
Bosch.Vms.Server.VideoDevice	MotionDetect	Motion Stopped	363
Camera / Recording Mode			
Bosch.Vms.Server.VideoDevice	RecordingMode	Alarm	365
Bosch.Vms.Server.VideoDevice	RecordingMode	None	364
Bosch.Vms.Server.VideoDevice	RecordingMode	Manual	365
Bosch.Vms.Server.VideoDevice	RecordingMode	Continuous	368
Bosch.Vms.Server.VideoDevice	RecordingMode	Motion	367
Relay			
Bosch.Vms.Server.RelayDevice	RelayState	Relay Error	27
Bosch.Vms.Server.RelayDevice	RelayState	Relay Closed	301
Bosch.Vms.Server.RelayDevice	RelayState	Relay Opened	300
Input			
Bosch.Vms.Server.InputDevice	InputState	Input Error	27
Bosch.Vms.Server.InputDevice	InputState	Input Closed	24
Bosch.Vms.Server.InputDevice	InputState	Input Opened	25
Virtual Input			
Bosch.Vms.Server.VirtualInput	InputState	Input Closed	24
Bosch.Vms.Server.VirtualInput	InputState	Input Opened	25
Encoder			
Bosch.Vms.Server.EncoderDevice	EncoderState	On	25

Interface Type	Event Name	State Value	State Id
Bosch.Vms.Server.EncoderDevice	EncoderState	Off	24
Bosch.Vms.Server.EncoderDevice	ConnectionState	NotAuthorized	0
Bosch.Vms.Server.EncoderDevice	ConnectionState	Connected	25
Bosch.Vms.Server.EncoderDevice	ConnectionState	Disconnected	24
Decoder			
Bosch.Vms.Server.Decoder	DecoderState	On	25
Bosch.Vms.Server.Decoder	DecoderState	Off	24
Bosch.Vms.Server.Decoder	ConnectionState	NotAuthorized	0
Bosch.Vms.Server.Decoder	ConnectionState	Connected	25
Bosch.Vms.Server.Decoder	ConnectionState	Disconnected	24

Table 2.1: Bosch VMS OPC Server Event Details

Bosch VMS Proxy Error	GUID	State Identifier
Command forwarding failures		
Command forwarding failed	Target device GUID	27
Bosch VMS connection failures		
Connection to BVMS server down	Empty GUID	-1
Connection to BVMS reestablished	Empty GUID	-1

Table 2.2: Bosch VMS OPC Server / Bosch VMS Proxy Error Events

2.2 OPC Server commands

The following table lists the commands that you can send with OPC Server:

Target	Command	GUID	Description
Camera	StartRecording	Camera as GUID	Triggers manual recording start for a specific camera
StopRecording	Camera as GUID	Triggers manual recording end for a specific camera	
Relay	Open	Relay as GUID	Opens the relay
Close	Relay as GUID	Closes the relay	
Virtual Input	Open	Virtual Input as GUID	Opens the virtual input
Close	Virtual Input as GUID	Closes the virtual input	

Target	Command	GUID	Description
--------	---------	------	-------------

Table 2.3: List of commands (OPC Server)

3 Installation

This chapter describes the steps required to install the connection between a 3rd party system and Bosch VMS.

Caution!

Install 3rd party server and Bosch VMS Management Server on separate computers.

Install Management Server and Operator Client on separate computers. If not, the connection does not work.

Do not use No Touch Deployment for installing a new version of Bosch VMS Operator Client.

Install a new version manually.

3.1 Bosch VMS Server

- ▶ Ensure that Bosch VMS Version 1.1.3 or higher is installed and that the Management Server is started on the Bosch VMS server computer.

To install:

1. Start Bosch VMS Configuration Client on the Management Server.
2. Create a user group with one or more users and no password (see Bosch VMS online help for details).
3. Export the configuration of Bosch VMS to BVMSConfig.xml via the menu **System->Export Device Information for OPC**. The export destination folder must be
<Installation directory>\Bosch\VMS\bin\
Each time the Bosch VMS configuration is changed, repeat this step and restart BVMSOpcServer.exe. You perform this restart with restarting Softing OPC Toolbox.

BVMSOpcServer.exe is automatically installed with Bosch VMS Server installation. The Server installation also automatically installs OPC Core Components 2.00 Redistributable 2.20.msi which is required for running the Bosch VMS OPC Server.

1. Create a Windows user with the name `mgts-service` with a password complying the password policy of the affected server.
Note: Ensure that this password is also configured on the BIS Server.
2. For registering the OPC Server and setting appropriate DCOM settings, run:
<Installation directory>\Bosch\VMS\bin\RegisterBvmsOpcServer.exe
3. Confirm the password for the `mgts-service` user configured earlier.
4. Edit Bosch.Vms.BISProxy.dll.config for the user credentials of the administrator user (see *Bosch VMS Proxy Configuration File*, page 17 for details).

3.2 Bosch VMS Operator Client and 3rd party client

- ▶ We recommend using a dual monitor system.

Configure the IE security settings:

1. On the **Tools** menu, click Internet **Options**.
2. Select the **Security** tab.
3. Select **Trusted Sites**.
4. Click **Custom Level**.
5. Enable the options **Download unsigned ActiveX controls** and **Initialize and script ActiveX controls not marked as safe** and click **OK**.
6. Click **Sites**:
7. Deactivate the option **Require server verification (https:) for all sites in this zone** and add the name of the 3rd party server computer.
8. Add your custom web page to the trusted sites.

In one particular case editing the configuration file Bosch.VMS.BISProxy.dll.config is recommended: if the client computer has multiple network adapters installed, enter the IP address of the LAN network adapter manually in the configuration file.

- ▶ Enter the IP address of the client computer.

Example:

```
<?xml version="1.0" encoding="utf-8" ?>
<configuration>
<appSettings>
<add IsServerMode="0">
<!-- <add Host="127.0.0.1" /> -->
<add Login="Admin" />
<add Password="" />
</appSettings>
</configuration>
```

- ▶ Start the Operator Client of Bosch VMS, select the Bosch VMS server and log on using the same account as configured with Configuration Client.

4 Bosch VMS Proxy

Bosch VMS VMS Proxy has the following features:

- Displaying a selected camera on a Bosch VMS monitor (Bosch VMS supports maximum 4 digital monitors)
- Starting instant playback for a pre-configured time period
- Starting and stopping Bosch VMS Operator Client from the 3rd party side

The Bosch VMS Proxy is implemented as a COM server, i.e. the delivery is a DLL which is installed and registered as part of the Bosch VMS server and client installation. The COM server implementation allows for accessing the Bosch VMS Proxy functionality from either C++/C# code but also from scripting code like JScript.

Currently both ways to access the Bosch VMS Proxy functionality are used for the 3rd party system/Bosch VMS connection: access via JScript from within the 3rd party system client (browser based client using HTML with embedded JScript code) and access via C++ code from within OPC Server.

Bosch VMS Proxy forwards 3rd party system-triggered commands to Bosch VMS, see *Bosch VMS Proxy commands*, page 13.

4.1 Bosch VMS Proxy commands

Some commands like Show Live Image or Playback are forwarded directly to the Bosch VMS Client via Bosch VMS Proxy without OPC Server due to performance reasons.

The following table lists the available commands that can be forwarded from the 3rd party client to Bosch VMS via Bosch VMS Proxy.

Target	Command	GUID	Parameter	Description
Camera	ShowLive	Camera as GUID		Triggers live display of a specific camera
Playback	Camera as GUID	Duration as unsigned Integer	Triggers playback of a specific camera, Duration: Playback rewind time in seconds	
Operator Client	LaunchOperatorClient			Starts the Bosch VMS Operator Client, Login: Bosch VMS user
TerminateOperatorClient			Exits the Bosch VMS Operator Client	
CloseCameo		Selected<monitorId> All	Closes one or all Image panes	
SetCameo-Space-Granularity		<monitorId> <granularity>	Sets the Image pane pattern	

Table 4.4: List of commands (Bosch VMS Proxy)

Use the GUIDs from BVMSConfig.xml.

Show Live / Show playback image

These commands display a camera image in the next free Image pane of Bosch VMS Operator Client or in the selected Image pane if all Image panes already display camera images.

Start/Stop Bosch VMS Operator Client

Bosch VMS Operator Client is started/stopped after 3rd party system logon, via JScript. To achieve this, a Proxy method is called which starts/stops the Bosch VMS Operator Client. The method gets an XML string as parameter which describes the command. Additionally the command has another parameter containing the user name of the Bosch VMS user.

Note: Do not configure a password for this user.

The command looks like this:

```
<nsPV:Command xmlns:nsPV=file:///S3K/Proxymanager Name="LaunchOperatorClient">
<nsPV:Parameters>
<nsPV:Parameter Name="Login" display name="Login" ... >[Bosch VMS user]</
nsPV:Parameter>
</nsPV:Parameters>
</nsPV:Command>
```

To stop the Bosch VMS Operator Client:

```
<nsPV:Command xmlns:nsPV=file:///S3K/Proxymanager Name="TerminateOperatorClient" />
```

The user is asked to confirm exiting the application.

5 Configuration files

This chapter describes all configuration files that are required for the connection of the 3rd party system and Bosch VMS.

To initialize the OPC Server correctly, its configuration is built during the startup of the server by reading BVMSConfig.xml. and BVMSCommand.xml.

To obtain BVMSConfig.xml, you export this file from within Bosch VMS Configuration Client after each configuration change.

Note: Bosch VMS OPC Server discards state changes from unknown addresses and ignores commands on unknown addresses (filtering via GUID).

BVMSConfig.xml

To create BVMSConfig.xml use Bosch VMS Configuration Client (see *Bosch VMS Server, page 11*). This file lists all Bosch VMS devices with their name and their unique identifier. This file is used as input for the OPC server.

Structure of a configuration file:

```
<BVMSServer xmlns:bvms="file:///S3K/BVMSOpcServer">
  <bvms:Input name="Input 1" id="ID as GUID"/>
  .....
  <bvms:Input name="Input N" id=" ID as GUID " />
  <bvms:VirtualInput name="Virtual Input 1" id=" ID as GUID " />
  .....
  <bvms:VirtualInput name="Virtual Input N" id=" ID as GUID " />
  <bvms:Camera name="Camera 1" id=" ID as GUID "/>
  .....
  <bvms:Camera name="Camera N" id=" ID as GUID "/>
  <bvms:Relay name="Relais 1" id=" ID as GUID "/>
  .....
  <bvms:Relay name="Relais N" id=" ID as GUID " />
  <bvms:Decoder name="Decoder 1" id=" ID as GUID "/>
  .....
  <bvms:Decoder name="Decoder N" id=" ID as GUID "/>
  <bvms:Encoder name="Encoder 1" id=" ID as GUID "/>
  .....
  <bvms:Encoder name="Encoder N" id=" ID as GUID "/>
</Bosch VMSServer>
```

Descriptions:

- Camera: Data of a Camera item (name and identifier of the component).
- Relay: Data of a Relay item (name and identifier of the component).
- Input: Data of a Detector item (name and identifier of the component).
- VirtualInput: Data of a Detector item (name and identifier of the component).
- Decoder: Data of a Decoder item (name and identifier of the component).
- Encoder: Data of an Encoder item (name and identifier of the component).

Description of the attributes:

- Name: name of the component
- id: unique 128 bit key of the component (identifier realized as GUID)

BVMSCommand.xml

The Bosch VMS Proxy command file is automatically installed on the Bosch VMS server machine (for example, in <Installation directory>\Bosch\VMS\AppData\BVMSCommand.xml).

The definition of an item's command is stored in BVMSCommand.xml. The OPC server also reads these data on startup and depending on the item type (camera, relay, etc.) these data is stored in the properties of the CMD item. Additionally all command items have an attribute id as GUID, which identifies a relay, virtual input, or camera.

A possible structure of the file can look like this:

```
<BVMSCommands xmlns:nsPV="file:///S3K/Proxyverwalter">
<nsPV:Camera>
<nsPV:Commands>
<nsPV:Command ID="guid" .../>
</nsPV:Commands>
</nsPV:Camera>
<nsPV:VirtualInput>
<nsPV:Commands >
<nsPV:Command ID="guid" .../>
</nsPV:Commands>
</nsPV:VirtualInput>
<nsPV:Relay>
<nsPV:Commands >
<nsPV:Command ID="guid" .../>
</nsPV:Commands>
</nsPV:Output>
</Bosch VMSCommands>
```

Descriptions:

- Camera: definition of the commands for the item type Camera
- VirtualInput: definition of the commands for the item type Virtual Input
- Relay: definition of the commands for the item type Relay

An example for displaying a camera on a monitor can look like this:

```
<nsPV:Commands>
<nsPV:Command Name="ShowLive" OPCServerKlasse="OPCBVMSOpcServer"
Anzeigenname="Show Camera" Description="Display images on a monitor" ID="id as GUID">
</nsPV:Command>
</nsPV:Commands>
```

BVMSOpcServer.xml

The OPC Server reads this file during initialization. If the file is not present, the OPC Server uses default values which are displayed in the example below.

Example of a file:

```
<BVMSOpcServer debug="0" disconnectionTimeout="0"/>
```

The file evaluates two values: debug and disconnectionTimeout.

The following values are possible for debug: 1 or 0. If debug = 1, OPC Server logs all notifications coming from Bosch VMS in %CommonApplicationData%\Bosch\VMS\Log \BVMSOpcServer.xml

On an English Windows OS, %CommonApplicationData% usually is C:\Documents and Settings\All Users\Application Data

disconnectionTimeout specifies the number of seconds to wait for the next update of the Error item (Malfunction), when the connection to Bosch VMS gets lost. disconnectionTimeout is only required when the connection to Bosch VMS is lost very often for a short time (< 20 s). BVMSOpcServer_Commands.log contains commands received from BIS Server to send to the Bosch VMS Proxy.

BVMSOpcServer.log contains connect/disconnect messages and processed Bosch VMS events.

BVMSOpcServer_Events.log contains events received from Bosch VMS Proxy.

Bosch VMS Proxy Configuration File

The Bosch VMS Proxy configuration file is automatically installed when installing either a BVMS client or a BVMS server (for example, in <Installation directory>\Bosch\VMS\AppData\Bosch.Vms.BISProxy.dll.config).

This file contains information about the Bosch VMS Proxy execution mode, an optional client host IP and the credentials to be used for logging on to the Bosch VMS SDK.

For server installations, the configuration file defaults are:

```
<add IsServerMode="1" />
<add Login="Admin" />
<add Password=" " />
```

These settings cause that the Bosch VMS Proxy is started in server mode (which is a precondition for properly collaborating with OPC Server) and that SDK commands are executed using the given user credentials.

For client installations, the configuration file defaults are:

```
<add IsServerMode="0" />
<!-- <add Host="127.0.0.1" /> -->
<add Login="Admin" />
<add Password=" " />
```

These settings cause that the Bosch VMS Proxy is started in client mode (which is a precondition for triggering client commands like ShowLive) and that Bosch VMS SDK commands are executed using the given user credentials. The Host setting is optional and should only be set to the IP of the LAN network card in case of multiple network cards (e.g. a WLAN or a second LAN network card) being installed in the client system

Bosch VMS Proxy Logging Configuration File

The Bosch VMS Proxy logging configuration file is automatically installed on the Bosch VMS client machine (e.g. in <Installation directory>\Bosch\VMS\AppData\BISProxyLogCfg.xml for English Windows). This file configures the Bosch VMS Proxy Log4Net logging settings.

6 Example for 3rd party client (HTML file)

A sample HTML file with JScript code used for sending commands to Bosch VMS is available in <Program directory>\Bosch\VMS\Samples\BVMSProxySample.htm. For the list of commands used in this sample, see *Bosch VMS Proxy commands*, page 13. The GUIDs are taken from an example BVMSConfig.xml.

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