



# Procedure for update of SW in DK-STM VE6

		Verified	Address Banedanmark Carsten Niebuhrs Gade 43 DK-1577 Copenhagen V DENMARK	Planning Siemens A/S Borupvang 9 DK-2750 Ballerup	
		Replaces			
		Approved by Banedanmark 			
	1. issue Date and initials	Latest Issue Date and initials	Scale -	Drawing name <b>Procedure for update of SW in DK-STM VE6</b>	
Prepared	31-01-2022 FAL		Unit -		
Checked	31-01-2022 BBE				
Approved	31-01-2022 PBO				
© Copyright Banedanmark	Language EN	Version <b>01.00 31.01.2022</b>	Drawing Number <b>IN 655.00 Q5019</b>		Page/ of page 1 (18)

# List of contents

<b>1</b>	<b>DOCUMENT INTRODUCTION .....</b>	<b>4</b>
1.1	INTRODUCTION.....	4
1.2	CHANGE LOG .....	4
1.3	REFERENCES.....	4
1.4	ABBREVIATIONS.....	4
<b>2</b>	<b>PROCESS FOR SOFTWARE UPDATE .....</b>	<b>5</b>
<b>3</b>	<b>SOFTWARE UPDATE SETUP .....</b>	<b>6</b>
3.1	PREREQUISITES.....	6
3.2	CONNECT DK-STM SUBRACK TO LAPTOP VIA PATCH CABLE .....	7
3.3	CONFIGURE IPV4 SETTINGS FOR NETWORK ADAPTOR.....	7
3.4	START DHCP SERVER AND VERIFY CONNECTION .....	8
3.4.1	<i>Firewall deactivation</i> .....	9
<b>4</b>	<b>SOFTWARE UPDATE PROCEDURE.....</b>	<b>10</b>
4.1	VERIFY BOOTLOAD SW (FIRMWARE) ON VE6.....	10
4.2	BREAK SOFTWARE SEAL .....	11
4.3	UPLOAD SOFTWARE TO THE DK-STM SUBRACK .....	12
4.4	SEAL SOFTWARE.....	14
4.5	UPDATE LABEL(S).....	16
4.6	DOCUMENTATION FOR SOFTWARE UPDATE AND SEALING .....	16
4.7	DOKUMENTERET SLUTAFPRØVNING ACCORDING TO AN 656.00 Q4446.....	16
<b>5</b>	<b>MD4 CHECKSUM.....</b>	<b>17</b>
<b>6</b>	<b>VE6 BOOTLOAD SW (FIRMWARE).....</b>	<b>17</b>
<b>7</b>	<b>TOOLS AND SOFTWARE .....</b>	<b>18</b>
7.1	HARDWARE .....	18
<b>8</b>	<b>SIEMENS NOTES .....</b>	<b>18</b>

# List of figures

Figure 1	- SW update process diagram.....	5
Figure 2	- SW directory example.....	6
Figure 3	IPv4 settings example.....	7
Figure 4	DHCP icon in task manager.....	8
Figure 5	DHCP server program .....	8
Figure 6	05_CheckVE6BootBlock started .....	10
Figure 7	05_CheckVE6BootBlock press any key .....	10
Figure 8	05_CheckVE6BootBlock BAB signature .....	11
Figure 9	01_unseal_VE6 startup.....	11
Figure 10	02_load_VE6_SW_lad startup .....	12
Figure 11	02_load_VE6_SW_lad SW upload and MD4 checksum .....	13
Figure 12	MD4-file and checksealstate files.....	13
Figure 13	03_seal_VE6 startup.....	14
Figure 14	03_seal_VE6 sealed and protocol file .....	15

# List of tables

Table 1 IPv4 settings .....	7
Table 2 - MD4 checksum .....	17
Table 3 BAB signature for VE6 .....	17

# 1 Document introduction

## 1.1 Introduction

This technical note describes the tools and process for updating the software of the DK-STM when installed in a vehicle and with VE6 in the subrack.

The person performing the update must be instructed in the use of tools, software and the process used for updating the software of the DK-STM.

## 1.2 Change Log

Version	Date	Author	Changed sections	Reason for change
01.00	2022-01-31	FAL		New document

## 1.3 References

Document incl. Titel, Unique Id and Version	Ref.	Reference ID
DK-STM Dokumenteret Slutaafprøvning	/1/	AN656.00 Q4446 01.14
Programmeringsvejledning, STM-DK Subrack (Siemens Document)	/2/	G81002-E3135-F850-A

## 1.4 Abbreviations

Term	Explanation
DK-STM	STM dedicated for Danish Infrastructure
DA	Data Available (STM is in monitoring mode)
Service laptop	Laptop with DK-STM software package.

## 2 Process for software update

The diagram shows the software update process to follow when updating the software of the DK-STM when installed in a vehicle.

Chapter 3 and describes the process in detail.

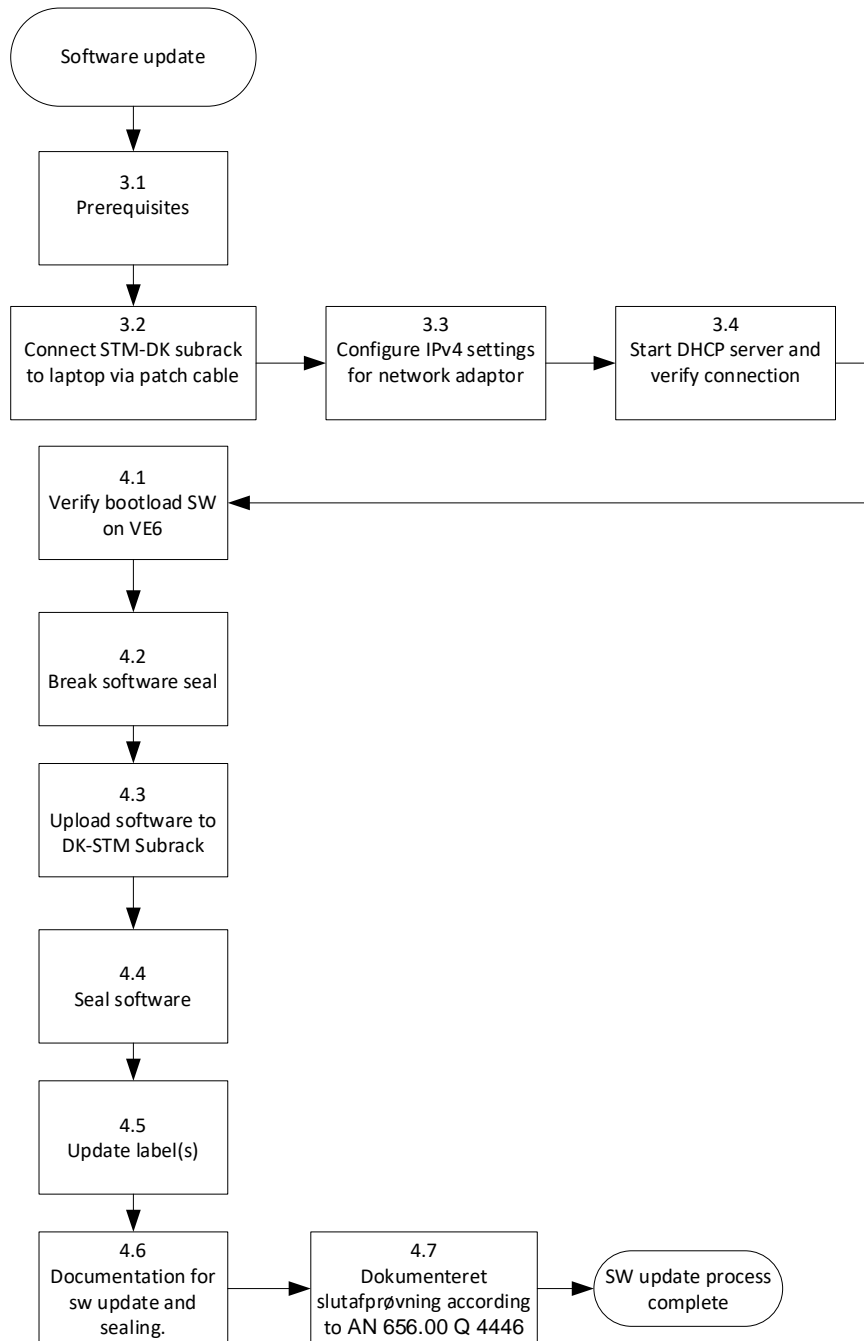


Figure 1 - SW update process diagram

## 3 Software update setup

In this chapter each process will be explained in detail in order to describe and clarify what to do for each step in the SW update process as defined in chapter 4.

The tools and software are described in chapter 7.

### 3.1 Prerequisites

- The service laptop holds the SW-release package for SW already installed on the DK-STM and the new SW to be installed. The library with the software package could be named DK-STM\_SW\_xx.xx.xx or something similar.
  - xx.xx.xx corresponds to a SW release which could be 03.01.00.
  - The library contains several folders and files which are used for the update process
  - The directory path for the SW-library shall not contain space or special letters in the directory path.
  - VE6\_SW contains the SW file (.lad) and the file for sealing (.sig)
  - See Figure 2 for SW directory example.

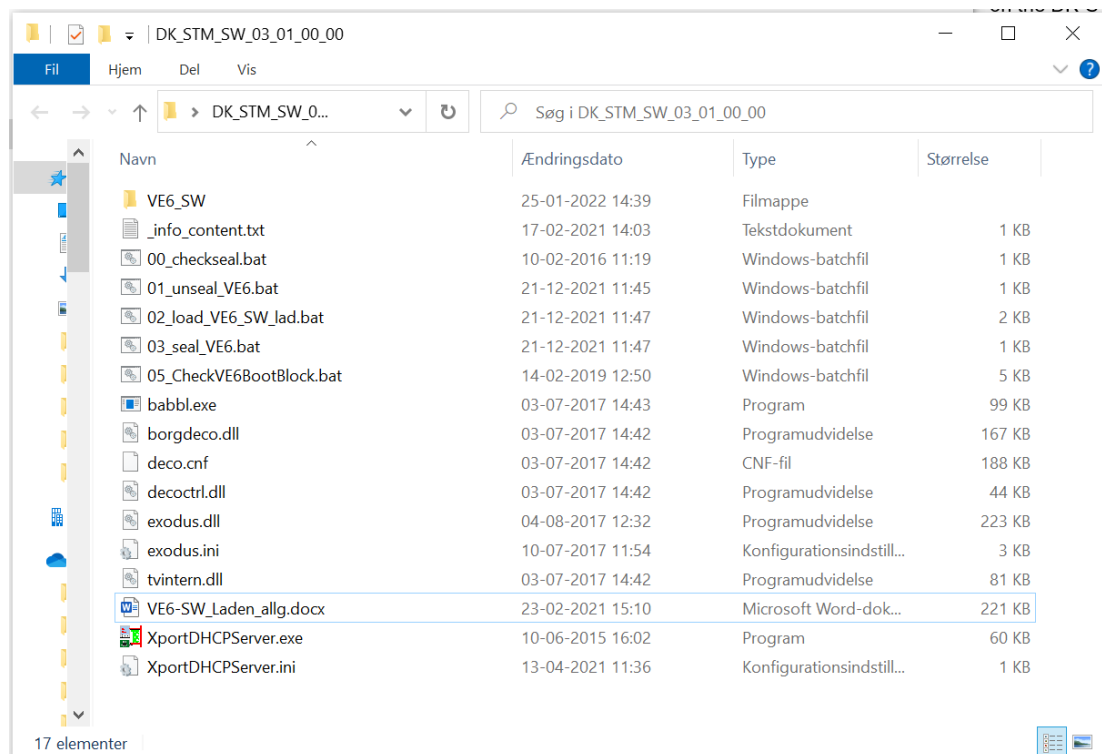


Figure 2 - SW directory example

### 3.2 Connect DK-STM subrack to laptop via patch cable

The DK-STM Subrack VE6 board is connected to service laptop, with DK-STM software, using a standard patch cable.

**NB:** The laptop shall be CE-marked and the laptop and connection to DK-STM subrack shall be protected against unauthorized access.

### 3.3 Configure IPv4 settings for network adaptor

The IPv4 settings on the network adaptor on the service laptop shall be configured to use a specific IP address. See Table 1 for settings and Figure 3 for example.

If the setting is incorrect it is not possible to connect to the VE6 board in the DK-STM subrack.

IP-adresse	192.168.1.14
Subnetmask	255.255.255.0
Gateway	192.168.1.1

Table 1 IPv4 settings

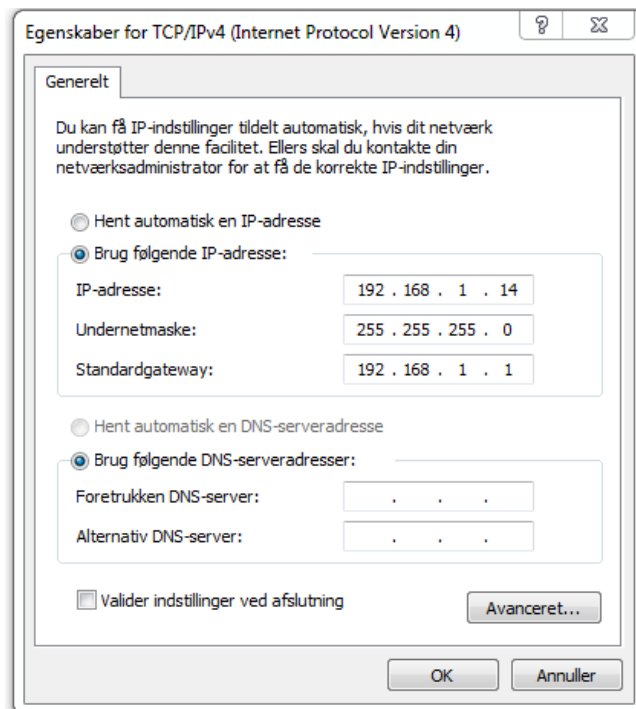


Figure 3 IPv4 settings example

### 3.4 Start DHCP server and verify connection

- In the directory with software start **ExportDHCPServer**.
  - See Figure 2 for SW directory example.
- When the DHCP server is started it can be found in the task manager
  - See Figure 4.
- Click on the DHCP server icon. Afterwards the DHCP server program will open.
  - See Figure 5.
- When the connection for the VE6 is established the following shall be shown in the DHCP server program:
  - Server offers IP address: 192.168.1.150-200. (See Figure 4 for example)
  - If the connection was unsuccessful it shall be checked if the firewall blocks the connection.
  - If the firewall is not the problem, then try to restart the DK-STM Subrack via the ON/OFF switch on the SV5.
  - If the connection problem persists, it shall be verified that the IPv4 settings are correct.
- The DHCP-connection shall be active at any time when performing the software update process or else it is not possible to finish the software update.
  - The DHCP server can be stopped from the task manager.

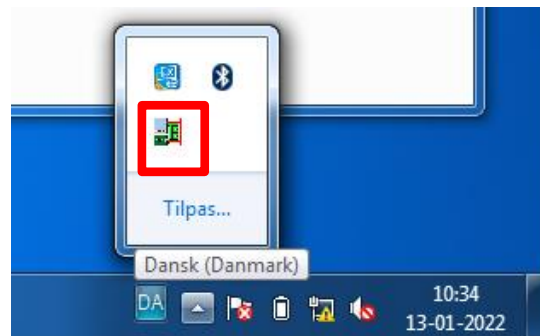


Figure 4 DHCP icon in task manager

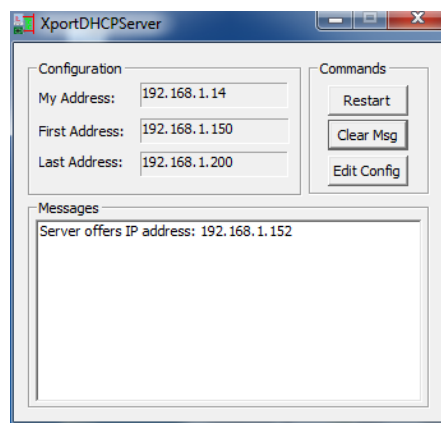


Figure 5 DHCP server program



### 3.4.1 Firewall deactivation

It is possible that the Windows firewall will open a pop-up window with a warning when blocking the DHCP server. Firewall access can be granted for the program in this pop-up. The access shall be allowed for private and public and networks.

It can be beneficial to setup the firewall settings prior to the use of DHCP server program.

# 4 Software update procedure

This section describes the software update procedure for VE6

## 4.1 Verify bootload SW (Firmware) on VE6

- In the SW directory **05\_CheckVE6BootBlock** shall be started
  - See Figure 2 for SW directory example.
- After startup a command prompt window will open and the instructions shall be followed.
  - Press a key when (tryk på en vilkårlig tast) whenever prompted for it.
  - Verify that no errors happened during the procedure.
  - See Figure 6 and Figure 7 for examples.
- Verify that the BAB signature for channel 11 and 12 is correct according to Table 3.
  - See Figure 8 for example.
  - If the BAB signature is not correct according to Table 3 then the SW update process shall be aborted.
  - If something when wrong ty again and check the settings.

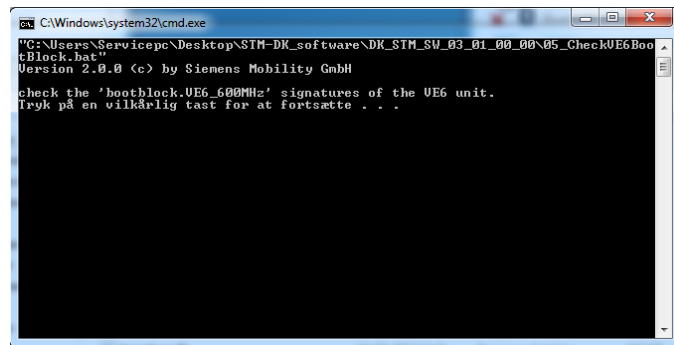


Figure 6 05\_CheckVE6BootBlock started

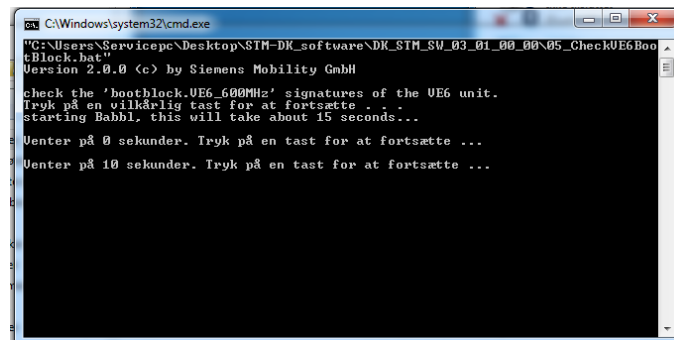


Figure 7 05\_CheckVE6BootBlock press any key

```

C:\Windows\system32\cmd.exe
"C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00_05_CheckUE6BootBlock.bat"
Version 2.0.0 (c) by Siemens Mobility GmbH

check the 'hoothlock.UE6_600MHz' signatures of the UE6 unit.
Tryk på en vilkårlig tast for at fortsætte . . .
starting Babbl, this will take about 15 seconds...
Venter på 0 sekunder. Tryk på en tast for at fortsætte ...
Venter på 0 sekunder. Tryk på en tast for at fortsætte ...

expect 'hoothlock.UE6_600MHz' U: #4.17.2.0 sig: 889ba0953140250e3d3f439086d42d50
ch 11 'hoothlock.UE6_600MHz' U: #4.17.2.0 sig: 889ba0953140250e3d3f439086d42d50
ch 12 'hoothlock.UE6_600MHz' U: #4.17.2.0 sig: 889ba0953140250e3d3f439086d42d50

** OK **

Tryk på en vilkårlig tast for at fortsætte . . .

```

Figure 8 05\_CheckVE6BootBlock BAB signature

## 4.2 Break software seal

- Determine the installed SW version on VE6
  - Can be determined in DMI.
  - Can be found on label on front of VE6.
- Localize the SW directory for existing SW installed on STM-DK Subrack i.e C:/.../DK\_STM\_SW\_03.01.00
  - See Figure 2 for SW directory.
  - The seal can only be broken with same SW package as installed on the VE6.
- I SW directory (see Figure 2) start **01\_unseal\_VE6**
  - When any key is pressed the seal will be broken.
  - Se Figure 9 for example.

```

C:\Windows\system32\cmd.exe
Removing seal
Tryk på en vilkårlig tast for at fortsætte . . .

```

Figure 9 01\_unseal\_VE6 startup

### 4.3 Upload software to the DK-STM Subrack

- For the SW release to be installed (e.g. 03.01.00) localize the directory containing the software package
  - See Figure 2 for SW directory
- In the SW directory (see Figure 2) start **02\_load\_VE6\_SW\_lad**
  - When any key is pressed the upload will start
  - See Figure 10 for example.
- After SW upload is shall be verified that the SW is uploaded to both channel 11 and 12 and that the MD4-Checksum is correct.
  - See Figure 11 for example
  - See section 5 and Table 2 for SW and MD4-checksum
- It shall be verified that the MD4-checksum I protocol file is the same as in Table 2.
  - The MD4-file is automatically saved in C:/...../DK\_STM\_SW\_R03.00.XX/VE6\_SW. The file can be opened with notepad. The file is saved with date and time stamp and is named with following syntax **Signatur\_DD-MM-YYYY--\_TT-MM.**
  - Se Figure 12 for file examples.

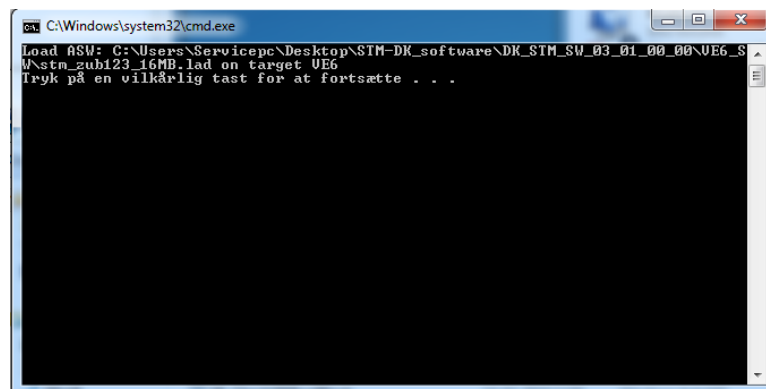


Figure 10 02\_load\_VE6\_SW\_lad startup

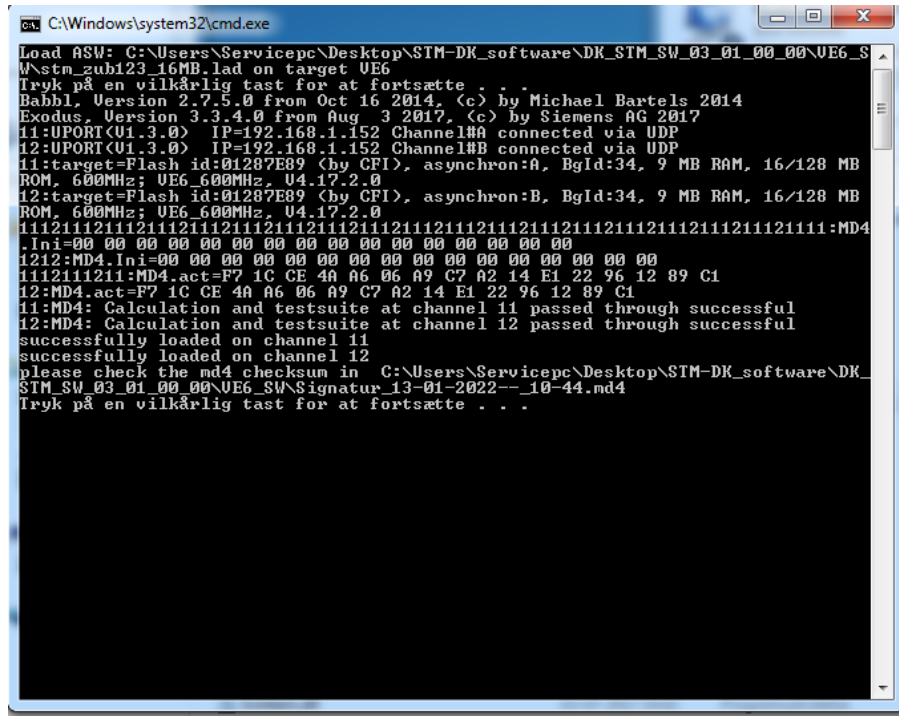


Figure 11 02\_load\_VE6\_SW\_lad SW upload and MD4 checksum

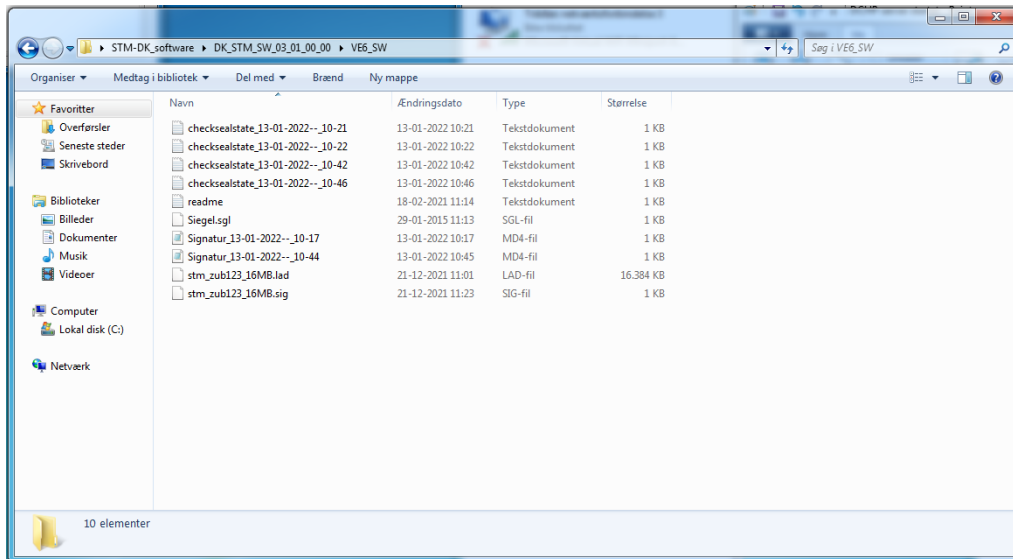
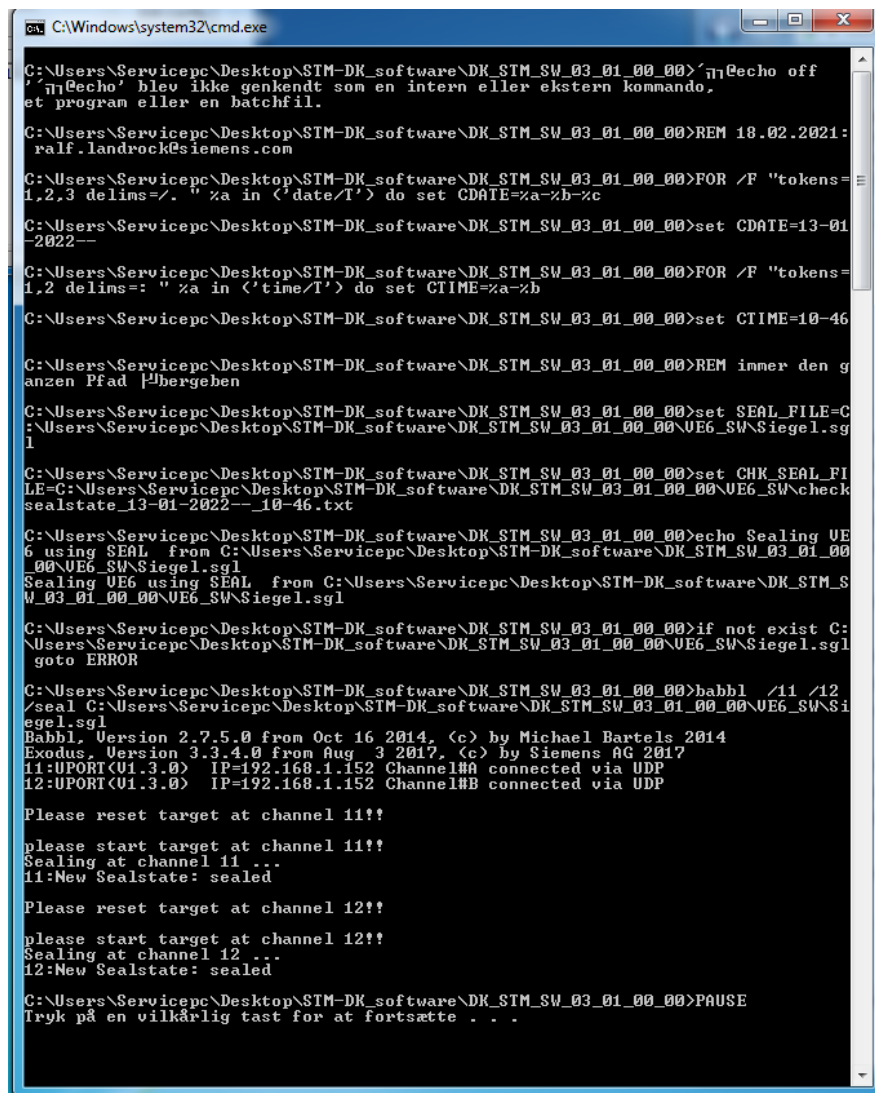


Figure 12 MD4-file and checksealstate files

## 4.4 Seal software

- In the SW directory (see Figure 2) start **03\_seal\_VE6**
  - When any key is pressed the sealing process will start
  - See Figure 13 for example.
- Verify that both channel 11 and 12 is sealed.
  - It can be verified in **New sealstate** command prompt. See Figure 13 for example
- Vi protocol file it shall be verified that the DK-STM software is sealed
  - A file is automatically saved in  
C:/...../DK\_STM\_SW\_R03.00.XX/VE6\_SW. The file can be opened with notepad. The file is saved with date and time stamp and is named with following syntax **Signatur\_DD-MM-YYYY--\_TT-MM**.
  - See Figure 12 for file examples.
  - Sealstate shall be verified for both channel 11 and 12 in the protocol file.
  - See Figure 14 for end of process and for creation of protocol file.



```
C:\Windows\system32\cmd.exe
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>echo off
'echo' blev ikke genkendt som en intern eller ekstern kommando,
et program eller en batchfil.
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>REM 18.02.2021:
ralf.landrock@siemens.com
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>FOR /F "tokens =
1,2,3 delims=/. " %a in ('date/T') do set CDATE=%a-%b-%c
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>set CDATE=13-01
-2022--
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>FOR /F "tokens =
1,2 delims=: " %a in ('time/T') do set CTIME=%a-%b
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>set CTIME=10-46
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>REM immer den g
anzen Pfad P%bergeben
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>set SEAL_FILE=C
:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00\VE6_SW\Siegel.sgl
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>set CHK_SEAL_FI
LE=C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00\VE6_SW\check
sealstate_13-01-2022--_10-46.txt
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>echo Sealing UE
6 using SEAL from C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00
_00\VE6_SW\Siegel.sgl
Sealing UE6 using SEAL from C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_S
W_03_01_00_00\VE6_SW\Siegel.sgl
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>if not exist C:
\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00\VE6_SW\Siegel.sgl
goto ERROR
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>babbl /11 /12
/seal C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00\VE6_SW\Si
egel.sgl
Babbl, Version 2.7.5.0 from Oct 16 2014, (c) by Michael Bartels 2014
Exodus, Version 3.3.4.0 from Aug 3 2017, (c) by Siemens AG 2017
11:U:PORT(01.3.0) IP=192.168.1.152 Channel#A connected via UDP
12:U:PORT(01.3.0) IP=192.168.1.152 Channel#B connected via UDP
Please reset target at channel 11!!
please start target at channel 11!!
Sealing at channel 11 ...
11:New Sealstate: sealed
Please reset target at channel 12!!
please start target at channel 12!!
Sealing at channel 12 ...
12:New Sealstate: sealed
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>PAUSE
Tryk på en vilkårlig tast for at fortsætte . . .
```

Figure 13 03\_seal\_VE6 startup

```

C:\Windows\system32\cmd.exe
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>'
Echo' blev ikke genkendt som en intern eller ekstern kommando,
et program eller en batchfil.
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>REM 18.02.2021:
ralf.landrock@siemens.com
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>FOR /F "tokens=
1,2,3 delims=/." %a in ('date/T') do set CDATE=%a-%b-%c
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>set CDATE=13-01
-2022--
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>FOR /F "tokens=
1,2 delims=: " %a in ('time/T') do set CTIME=%a-%b
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>set CTIME=10-46
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>REM immer den g
anzen Pfad |>bergeben
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>set SEAL_FILE=C:
\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00\VE6_SW\Siegel.sg
l
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>set CHK_SEAL_FI
LE=C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00\VE6_SW\check
sealstate_13-01-2022--_10-46.txt
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>echo Sealing VE
6 using SEAL from C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00
_00\VE6_SW\Siegel.sgl
Sealing VE6 using SEAL from C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_S
W_03_01_00_00\VE6_SW\Siegel.sgl
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>if not exist C:
\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00\VE6_SW\Siegel.sgl
goto ERROR
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>babbl /11 /12
/seal C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00\VE6_SW\S
iegel.sgl
Babbl, Version 2.7.5.0 from Oct 16 2014, (c) by Michael Bartels 2014
Exodus, Version 3.3.4.0 from Aug 3 2017, (c) by Siemens AG 2017
11:U:PORT<01.3.0> IP=192.168.1.152 Channel#A connected via UDP
12:U:PORT<01.3.0> IP=192.168.1.152 Channel#B connected via UDP
Please reset target at channel 11!!
please start target at channel 11!!
Sealing at channel 11 ...
11:New Sealstate: sealed
Please reset target at channel 12!!
please start target at channel 12!!
Sealing at channel 12 ...
12:New Sealstate: sealed
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>PAUSE
Tryk på en vilkårlig tast for at fortsætte . . .
C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00>babbl /11 /12 /
checkseal 1>C:\Users\Servicepc\Desktop\STM-DK_software\DK_STM_SW_03_01_00_00\VE
6_SW\checksealstate_13-01-2022--_10-46.txt

```

Figure 14 03\_seal\_VE6 sealed and protocol file

#### **4.5 Update label(s)**

- Replace the SW-label, with installed SW-version on the VE6 in the DK-STM Subrack.

#### **4.6 Documentation for software update and sealing**

The protocol files can be saved for evidence of upload and sealing.

#### **4.7 Dokumenteret slutføringsprøvningsprocedure ifølge AN 656.00 Q4446**

- After completion of software update process test according AN656.00 Q4446 are to be performed for each cabin:
  - DK-STM is put in DA-mode
  - A brake test is performed using a brake test balise.
  - It is recommended to check the SW version and baseline in the DK-STM DMI in the maintenance menu when the DK-STM shall be put in DA-mode.

Se AN656.00 Q4446 ref. /1/ chapter 1.5, 4.1, 7.1.1, 7.1.2, 7.2.1 and 7.2.2 for further information.



## 5 MD4 checksum

SW-Release	Product MD4-Checksum
R03.01.00	F71C-CE4A-A606-A9C7-A214-E122-9612-89C1

Table 2 - MD4 checksum

The table shall be updated when a new SW is released.

## 6 VE6 BootLoad SW (Firmware)

SW-version	BAB signatur for VE6
R03.01.00	889ba0953140250e3d3f439086d42d50

Table 3 BAB signature for VE6

The table shall be updated when a new BootLoad is released.

# 7 Tools and software

## 7.1 Hardware

- **Service laptop**
  - Service laptop with latest SW-release packages.

# 8 Siemens notes

Siemens uses an internal document when updating and installing software on the DK-STM Subrack at Siemens or when installed in a vehicle.

This internal document, ref. /2/, holds a protocol to be filled when installing the software on a new DK-STM Subrack or updating the software.

This technical note is based on the internal Siemens programming instruction ref. /2/.