How to Upgrade to AES-256 Firmware

for

P4dragon DR-7X00 HF Modems

(Valid for Firmware versions 2.42.00 or 2.41.00_ALE and higher)

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1. Introduction

The Advanced Encryption Standard (AES) allows state-of-the-art data encryption, now also directly on the SCS HF modems - i.e. "on the fly" of an on-going PACTOR connection. The application software thus no longer has to provide encryption in the case of secure/classified data that must be passed to the other side of an HF link.

The AES-256 option allows all information transmitted via PACTOR to be encrypted, independently of the PACTOR level (PACTOR-1/2/3/4).

The AES-256 option is available since ALE firmware version 2.40.00_ALE and standard firmware version 2.42.00.

To use the AES-256 option **you need a license key available from SCS or authorized resellers**. This license code, the so-called **feature license**, needs to be stored in the non-volatile memory of the modem to activate the AES-256 option!

See <u>https://www.p4dragon.com/download/SCS_Feature_Licenses_How_To_1.0.pdf</u> for more details.

2. How to Upgrade the Modem Firmware

If you want to use AES-256, you need to upgrade your modem to a modem firmware that also supports AES. We recommend to upgrade to standard firmware 2.42.00 (or higher) for adding AES capability to your **SCS** modem. Special ALE firmware 2.41.00_ALE (or higher) does also contain AES capability.

For finally using AES you need to obtain a so-called features license from SCS.

Two tools are available for the actual firmware upgrade, the well-known **SCSupdate**.exe and the **P4config**.exe especially for DR-7X00 modems. It is up to you which tool you prefer.

Please make sure that you use the most recent version of your preferred tool!

P4config:

https://www.p4dragon.com/download/SCS_P4config%20V1.1.zip

SCSupdate:

https://www.p4dragon.com/download/SCSupdate.exe

Connect your modem to a PC either via USB, Bluetooth or Ethernet. How this works in detail is described in the installation manual.

For an USB connection you need the SCS USB driver! For a Bluetooth connection you need the optional Bluetooth module installed in the modem. Ethernet works only on a P4dragon DR-7800 with the optional network module installed.

https://www.p4dragon.com/download/InstallationGuide_DR-7X00.pdf

 The Windows USB drivers can be obtained from:

 https://www.p4dragon.com/download/SCS_USB_Driver_2_08_24_setup.exe

Make sure that you can access (talk to) the modem!

2.1 Using P4config.exe

P4confg.exe is available from the **SCS** website as a ZIP compressed archive and should be downloaded to your standard download folder and then decompressed into a separate (new) folder, e.g. "\P4config\". Extracting P4config.exe can simply be done by means of the MS Windows file Explorer, which allows to extract files from ZIP archives.

After the download and decompression are completed, double-click the P4config.exe executable.

The welcome dialog appears asking you for the (virtual) COM port the modem is connected to. Select the modem (or COM port respectively) and click "**con modem**".

TERMINAL PARAMETERS FIRMWARE LOG Info	
USB/BT PORT COM14 / SCS DRAGON 7800 COM5 / PCle to High Speed Serial Port	
COM6 / USB> Serielles USB-Gerät COM9 / com0com - serial port emulator COM10 / com0com - serial port emulator COM11 / BT> Standardmäßgige Seriell-über COM13 / BT> SCS DRAGON 7800 COM14 / SCS DRAGON 7800	^
COM15 / SCS DRAGON 7800	\sim
	_
Please select communication and press > con modern< ! TX:0 F	IX:0

P4config immediately connects to the modem and the **con modem** button gets green. Then click **FIRMWARE**.

The following dialog appears:

C P4conf	ig SCS - 2016 -2	021 (1.1.0.0)				_ ×
TERMINAL	PARAMETERS	FIRMWARE	LOG	Info		
USB/BT 🚽	PORT COM1	4 / SCS DRAGON	7800 💌	con modem	modem tools	
get firmware	list from web server		load local firmware file			
Please click 'get	firmware list' button to	load firmware list fro	m web server!	T		
	downloa	ad selected firmware	•			
	ut	odate firmware				
Modem communic	ation at COM port CO	M14.			TX	:65 RX:414

First press get firmware list from web server.

C P4confi	g SCS - 2016 -20	021 (1.1.0.0)			_ 🗙
TERMINAL	PARAMETERS	FIRMWARE	LOG	Info	
USB/BT 👻	PORT COM1	4 / SCS DRAGON (7800 💌	con modem	modem tools
get firmware I	ist from web server		load local firmware fil	9	
dragon_fw_2_42_	_00_dr7			•	
		100%			
Please select firmw	vare file and press DO	WNLOAD.			
	downloa	ad selected firmware	•		
	up	odate firmware			
M					TW CE DV 000
Modem communic	ation at CUM port CUI	M14.			TX:65_RX:396

Please choose the appropriate firmware "dragon_fw_2_42_00.dr7" (or 2_41_00_ALE.dr7). The firmware version number must be equal or higher than **2.42** (or 2.41.00_ALE for special ALE firmware, respectively) for HF networks using "**dynamic key AES**"

Click **download selected firmware**. The firmware then will be downloaded from the **SCS** update server to your local drive on your computer.

C P4confi	g SCS - 2016 -2	021 (1.1.0.0)					_ ×
TERMINAL	PARAMETERS	FIRMWARE	LOG	Info			
USB/BT 🖵	PORT COM1	4 / SCS DRAGON	7800 💌	con modem	modem tools		
get firmware l	ist from web server		load local firmware fil	•			
dragon_fw_2_42	_00_dr7			•			
		100%					
Done			KB	/s 2184,53			
	downloa	ad selected firmware					
C:\P4Config\webupdate\dragon_fw_2_42_00_dr7\dragon_fw_2_42_00.dr7							
update firmware							
Modem communic	ation at COM port COI	M14.				TX:65	RX:396

Click **update firmware** to start the actual firmware updating process...

C P4confi	ig SCS - 2016 -2	021 (1.1.0.0)			_ 🗙
TERMINAL	PARAMETERS	FIRMWARE	LOG	Info	
USB/BT 💌	PORT COM1	4 / SCS DRAGON 1	7800 💌	con modem	modem tools
get firmware	list from web server		load local firmware file	8	
dragon_fw_2_42	_00_dr7			•	
	63%				
UPDATE: ACK file	transfer	Byte 439552 c	of 699812 / Sector 17	'17 of 2734	
	downloa	ad selected firmware	•		
C:\P4Config\web	update\dragon_fw_2_	_42_00_dr7\dragon	_fw_2_42_00.dr7		
	ut	odate firmware			
Modem communic	ation at COM port COI	M14.			TX:141 RX:2591

Now the new firmware will be loaded into your modem:

As soon as the progress bar reaches 100 %, the update is completed.

The modem now re-boots, which takes about 20-30 seconds, and then is available using the new firmware. **Congrats!**

You now may close P4config.exe again if no other operation is required.

2.2 Using SCSupdate.exe

SCSupdate.exe is available from the **SCS** website and should be downloaded into a separate (new) folder, e.g. "\SCSupdate\".

After the download has finished, double-click the SCSUpdate.exe executable.

The welcome dialog appears asking you for the (virtual) COM port the modem is connected to. Select the modem (or COM port respectively) and click Next >>.

udrate	Select a Modem/ ComPort from the list	~
dulate	audrate	
auto detect	auto detect cet manual	

🤓 SCSupdate 2.0.0.11 - Select modem and baudrate	Х
Modem / ComPort	
COM1 Kommunikationsanschluss COM2 PCIe to High Speed Serial Port COM3 Silicon Labs CP210x USB to UART Bridge COM4 BT Serial Port COM5 PCIe to High Speed Serial Port COM9 com0com - serial port emulator COM10 com0com - serial port emulator COM10 com0com - serial port emulator COM11 BT Serial Port COM13 BT Serial Port COM13 BT Serial Port COM14 SCS DRAGON 7800 (via USB)	
	Next >>

SCSupdate then connects to the modem and retrieves the version of the current firmware as well as other modem features.

🤓 SCSupdate 2.0	0.0.11 - modem info	×
Gathering	information	o auto detect
Modem info		
Model	: Dragon DR-7800 Connection: USB	
FW:	2.41.00_ALE_beta P3: license installed	
BIOS	: 1.20	
PR modems	SCS-DSP-modem (standard modem)	
	-/-	
	<< Previ	ous Next >>

Click Next >> and then choose "download from **SCS** (recommended)", then again click Next >>.

🥸 SCSupdate 2.0.0.11 -	Specify update file source	Х
2	SCSupdate can now check if there is an update available. Therefore the internet will be accessed. If You allow access to the internet choose 'download' as update file source. Otherwise choose a locally stored update file source. Update File Source	
Don't ask me again	<< Previous Next >	>>

Please then choose the appropriate firmware "dragon_fw_2_42_00.dr7.zip. The firmware version number must be equal or higher than **2.42** (or 2.41.00_ALE for the special ALE firmware, respectively) for HF networks using "**dynamic key AES**".

🥸 SCSupdate 2.0.0.11 - select download file	\times
Select download	
dragon_fw_2_42_00_dr7.zip(Release V. 2.40)	
show Beta-Versio	n
File Info	
P4dragon Firmware History:	<u> </u>
Version 2.42.00: - PACTOR AES-256 encryption added	
Version 2.40.00: - FSAmpl and PSKAmpl range extended to 109000 mV (DR-7800) / 104500 m'	
Version 2.30.97:	-
Change Update Source Nex	t >>

Then again click Next >>.

The firmware then will be downloaded from the SCS update server to your local disc on your computer:



Then again click Next >>

🤓 SCSupdate 2.0.0.11 - Updating modem	×
Send Update	
Update Progress	
	Close

Click Send Update to start the actual firmware updating process...

🤓 SCSupdate 2.0.0.11 - Update 43 % transferred	Х
Send Update	
Please wait while update file transfer has completed!	
Under Deserver	
Update Progress	
43 %	
Writing 798156 byte in 3134 sectors	
	_
Close	

As soon as the firmware upload is completed, the following message appears:



The modem now re-boots, which takes about 20-30 seconds, and then is available using the new firmware. **Congrats!**

3. Ordering a License Key, Storing it to the Modem

How to obtain and store a license key for special modem features is described in the following document:

https://www.p4dragon.com/download/SCS_Feature_Licenses_How_To_1.0.pdf

Also see general information on AES and other special features in the "P4dragon ALE firm-ware" on the **SCS** download page:

https://www.scs-ptc.com/downloads.html



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