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SVSKA2001 Data logger reprogramming kit User manual

LSI LASTEM SRL



Revisions list

Issue	Date	Description of changes
Origin	04/09/2020	
1	17/09/2020	Change "Skip Flash Erase" option on pages 13 and 14
2	11/10/2021	Replaced pen drive and related references
3	20/07/2022	Replaced ST-Link utility with STM32 Cube Programmer; added unlock commands; made minor changes

About this manual

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1 Introduction

This manual explains how to install and use the SVSKA2001 kit for reprogramming the Alpha-Log and Pluvi-One data loggers. Before proceeding with the use of this kit, try the LSI.UpdateDeployer software (see IST_05055 manual).

The kit can also be used to unlock the data loggers in case of lock.



The USB pen drive contains:

- ST-LINK/V2 software and drivers
- STM32 Cube Programmer software
- firmware of LSI LASTEM data loggers
- this manual (IST_03929 Data logger reprogramming kit User manual)

The procedure consists of:

- > installing the programming software and the ST-LINK/V2 programmer drivers on the PC
- connecting the ST-LINK/V2 programmer to the PC and to the data logger
- > sending the firmware to the data logger or sending it the unlock commands in case of lock.



2 Preparing the data logger for the connection

The reprogramming or unlocking of the data logger takes place by means of the ST-LINK programmer. To connect the programmer, it is necessary to remove the electronic boards of the data logger as described below.

CAUTION! Before proceeding use an antistatic device (e.g. an antistatic wrist strap) to reduce, dampens, inhibits electrostatic discharge; the buildup or discharge of static electricity, can damage electrical components.

1. Remove the two caps and then unscrew the two fixing screws.



 Remove terminal 1÷13 and 30÷32 from the terminal board. Then on the right side of the terminal board, apply light pressure downwards and at the same time push towards the inside of the data logger until the electronic boards and the display come out completely.





3 Installing the programmer software and drivers on PC

The STM32 Cube Programmer software facilitates fast in-system programming of the STM32 microcontrollers during development via the ST-LINK, ST-LINK/V2 and ST-LINK-V3 tools.

Note: The part number of the STM32 Cube Programmer software is "SetupSTM32CubeProgrammer_win64.exe".

3.1 Getting started

This section describes the requirements and the procedures to install the STM32 Cube Programmer (STM32CubeProg).

3.1.1 System requirements

The STM32CubeProg PC configuration requires as a minimum:

- PC with USB port and Intel[®] Pentium[®] processor running a 32-bit version of one of the following Microsoft[®] operating systems:
 - Windows® XP
 - Windows[®] 7
 - Windows® 10
- 256 Mbytes of RAM
- 30 Mbytes of hard disk space available

3.1.2 Installing the STM32 Cube Programmer

Follow these steps and the on-screen instructions to install the STM32 Cube Programmer (Stm32CubeProg):

- 1. Insert the *LSI LASTEM* pen drive on the PC.
- 2. Open the folder "STLINK-V2\en.stm32cubeprg-win64_v2-11-0".
- 3. Double-click the executable *SetupSTM32CubeProgrammer_win64.exe*, to initiate the installation, and follow the on-screen prompts (from fig. **1** to fig. 13) to install the software in the development environment.

Prg 35	5% STM32CubeProgrammer Extracting	\times
		_
	Cancel	
		_



fig. 2 - Click Next to continue





Next



fig. 5 - Click Next for the default directory

Pre STM32CubeProgram	nmer Installation Wizard	– 🗆 🗙	STM32CubeProgrammer Installation Wizard	– 🗆 🗙
STM32CubeProgramm Step 5 of 8	ner Components selection	STM32 CubeProgrammer	STM32CubeProgrammer Package installation Step 6 of 8	STM32 CubeProgrammer
Ub.agranted	Select the packs you want to install: Note: Conved packs are required. Select the packs are required. Select the packs are represented by the pack of the pack	67,22 MB 338,15 MB 53,04 MB 76,04 MB	Pack installation progress: CL:Program Fiels/SHKrodectronic/SHK32Cube/Spragamer/Bit/External.coder/M2964_ 25H22Cube/Stragamer/Bit/Stranal.coder/M2964_ 27J3 2/3	STH1210E EVAL Vources Library
STMicroelectronics	Total space required: Available space:	400,84 MB 45,55 GB @ Drevious @ Dext	STManalestonia	i 🏟 Bext 🔘 Quit

fig. 7 - Click Next to continue

fig. 8 – Wait the installation progress





fig. 9 - Click Next to continue



Pre STM32CubeProgrammer Installation Wizard	– 🗆 🗙	m STM32CubeProgrammer Installation Wizard	×
STM32CubeProgrammer Package installation Step 6 of 8	STM32 CubeProgrammer	STM32CubeProgrammer Shortcuts setup Step 7 of 8	STM32 CubeProgrammer
Pack installation progress: Incomposition progress: Presidential installation progress: 27.3 27.3		Create dorbuds in the Start Veru Create address dorbuds in the Start Veru Create address dorbuds on the Start Veru Create address dorbuds o	create shortbut for: Gummit user e al users v Epfeult
STMicroelectronica		STMicroelectronics	terios
	Previous Pext Quit	fig. 12 - Click Nex	kt to continue

fig. 11 - Click Next to continue



fig. 13 - Click Done



3.1.3 Installing ST-LINK, ST-LINK/V2, ST-LINK/V2-1 USB driver signed for Windows7, Windows8, Windows10

This USB driver (STSW-LINK009) is for ST-LINK/V2, ST-LINK/V2-1 and ST-LINK/V3 boards and derivatives (STM8/STM32 discovery boards, STM8/STM32 evaluation boards and STM32 Nucleo boards). It declares to the system the USB interfaces possibly provided by the ST-LINK: ST Debug, Virtual COM port and ST Bridge interfaces.

Attention! The driver must be installed prior to connecting the device, to have a successful enumeration.

Open the folder "STLINK-V2\Driver" of the *LSI LASTEM* pen drive and double-click the executable:

- dpinst_x86.exe (for 32-bit operating system)
- dpinst_amd64.exe (for 64-bit operating system)

To initiate the installation, follow the on-screen prompts (from fig. 14 to fig. 16) to install the drivers.

Device Driver Installation Wizard Welcome to the Device Driver	Design Charac Analisian Winne The shippers, and your best Aling
Installation Wizard! This wizard helps you install the software drivers that some computers devices need in order to work.	Picase net whether the down brief. The two later same care to complete.
	Include Sector Streets Sector 2000
To continue, click Next.	Consider anyon the data is not one provide data and any one of the constant and any one of the constant and any one of the provider data any one of the provider

fig. 14 - Click Next

fig. 15 - Click Install



fig. 16 – Click Finish



3.2 Connection ST-LINK, ST-LINK/V2, ST-LINK/V2-1, ST-LINK/V3 to USB port Connect the USB cable:

• Micro-USB to ST-LINK/V2



• USB type-A to USB port PC

It will turn on red LED on the programmer:



STM3

3.3 Upgrade the firmware



1. Open rogrammer and after few seconds



A77

2. Proceed to upgrade the firmware as described from fig. 17 to fig. 20. The PC must be connected on internet.



Port

eb.

voltage



fig. 17 – Click Firmware Upgrade

be unsuchen	
pi-Linkyv2	5T-LINK/V2 V Refresh device
Open in update mode ST-Link ID: 34FF74065250343836240943	Copen in update mode
Current Firmware: Type: STM8/STM32 Debugger Version: V2J3957 Update to Firmware: V2J3957 STM8/STM32 Debugger Upgrade	Current Firmware: Type: STM8/STM32 Debugger Version: V23987 Update to Firmware: V23967 STM8/STM32 Debugger Upgrade Upgrade Upgrade successful.

fig. 19 – Click Upgrade



Continue with connecting the data logger to the programmer (§4).



4 Connection to the data logger

For connecting the data logger to the programmer, proceed as follows:

1. Connect the 8 pin Female/Female cable to the J13 black connector of the card connector (if there is a cable connected, disconnect it) and to the connector JTAG/SWD of the probes. Then connect the power cable (terminal block 13+ and 15-) and switch on the data logger.



2. Set ST-LINK configuration parameters and do the connection as described from fig. 21 to fig. 22.

ST-LINK	 Connect 						
ST-LINK configuration							
Serial number 34FF74 🔻 💋							
Port	SWD 👻	·					
Frequency (kHz)	4000 👻	•					
Mode	Normal 🔹	•					
Access port	0 🗸						
Reset mode	Hardware reset 🔹	•					
Speed	Reliable 🔹						
Shared	Disabled 🔹 🔻	1					
Debug in Low Power mode External loader Target voltage 0.03 V Firmware version V2J39S7							

fig. 21 – Click Connect

100 500	620.0ehopunne								- 0 X
STM C	Concerner -						8	1 💶 🛛	• 🛪 🖅
≡	Memory & F	le editing							Connected
	Device memory	Open fil	÷ •					97-(NK	• Disconard
١	Add_ 0x0800	- • 00	81408	Dea - 3-	+ Fad	- 9	· •	<u>if-1</u> Serai number	Serriguntion
	Address		4		C	ASO		Post	
08	0x35000000 0x35000000	20018008 08004091	06804641 06804691	83064091 85064091	08004391			Presency kits	4000 *
CPU	0v08000020	00000000	00000000	00000000	08004093			Wate	Annual A
	0x050000000 0x05000040	08004091	00800800	05004051 05004051	08003338	.8		Access part	0 *
	0v0800050	08004010	00004091	08004091	00004093			Read-mode	and the second second second
۲	0v95090060	08004091	06804691	05004051	08004093			Speed	Idalia -
	Owstabilition of	08004099	08204291	0.500.0091	08308393			Shand	
100	0430000000	08004093	06804691	00004051	08304391	.000			
	0v95090090	06004091	06804691	85064051	08004093	.8888		Debug in Low Pr Edeniar Deder	
	0x38000040	08004095	08004091	0800-9091	08004093	.0000		Terget voltage	641V
	0v35000000	08004093	06804891	85054051	08004093	.8899		FREMARE VESSO	V81997
_	Log			ive!	Update Vet	oskylevel 🛞 1 💿	2 (0.1)		
۲	161950 - See	:18 Bytes					14		
0	141950: Set 141950: Addw	1304 Byte					B	Tar	
\odot	14/19/50 : Read p 14/19/50 : Data re 14/19/50 : Time at	rogense ad ausoestudy lepsed during 10	erned operatio				0	Service III Device III Revision III	MCU Gr415 Rev4
?							100% ①	Plack size CPI Bootloader Versi	Still Contex+MM

fig. 22 – Wait the connection

Now, you are able to reprogram the data logger (§5).



5 Reprogramming data loggers

The firmware of the data logger is stored in the microprocessor memory at the address 0x08008000 while at the address 0x08000000 there is the boot program (bootloader).

To upload the firmware, follow the instructions of chapter §5.1.

For an update of the bootloader, follow the instructions of the chapter §0.

5.1 Firmware upload

1. Click on

where a style of the STM32 Cube Programmer. It will appear the Erasing & Programming option.



Click on "Browse" and choose the <data logger-x.yy.zz>.bin file to upgrade the product (the first version of bin file is stored in FW\<data logger code> path of the LSI LASTEM pen drive; before proceeding contact LSI LASTEM for the latest version).

ATTENTION! It is important to set these parameters:

- Start address: 0x08008000
- Skip Flash Erase before programming: unselected
- Verify programming: selected





3. Click Start programming and wait for the programming operation end.

	Prg Messaggio		×	
	File download	d complete		
Log	Prg	Messaggio		×
10:22:06 : Address : 0x0 10:22:06 : Erasing memory of 10:22:06 : Erasing internal m 10:22:09 : Download in Prog	08008000 orresponding to seg emory sectors [16 17 iress:	Download ve	arified successfully	ОК
10:22:16 : File download cor 10:22:16 : Time elapsed duri 10:22:16 : Verifying 10:22:16 : Read progress: 10:22:18 : Download verified	nplete ng download operation: I successfully	00:00:10.265		

4. Click Disconnect.

	Connected							
	ST-LINK	•	Disconnect					
ST-LINK configuration								

- 5. Disconnect the power and the cable from board.
- 6. Reassemble the product in every it parts (§0, proceeding backwards).

ATTENTION! Firmware must be loaded at 0x08008000 (Start Address). If the address is wrong, it is necessary to load the *bootloader* (as described in chapter §0), before repeating the firmware upload.

ATTENTION! After loading the new firmware the data logger continue to show the previous firmware version.



5.2 Programming bootloader

The procedure is the same as for the firmware upload. *Start address, File path* (the name of the firmware) and other parameters must be changed.

- 1. Click on of STM32 Cube Programmer. It will appear the Erasing & Programming option. 🧐 🖪 🕒 🎐 🔆 🖅 Erasing & Programming Connected Erase external me File path Start address Size Select Index Start Address Skip flash erase before programming 0x08000000 0 2K Verify programming 1 0x08000800 2K Run after programming 0x08001000 2K 2 0x08001800 2K 0x08002000 2K atic Mode 0x08002800 2K Full chip erase f 0x08003000 2K V Download file 0x08003800 2K Option b... 0x08004000 2К 0200004000 Live Update Verbosity level 1 2 3 Log 15:21:09 : Size : 16 Bytes 15:21:09 : UPLOADING ... 15:21:09 : Size : 1024 Bytes 15:21:09 : Address : 0x8000000 \$ STM32L4x1/STM32L475x 15:21:09 : Read progress: 15:21:09 : Time elapsed during the read operation is: 00:00:00.007 ? 100%
- 2. Click on "Browse" and choose the **Bootloader.bin** stored in the *LSI LASTEM* pen drive (path FW\<data logger code>).

ATTENTION! It is important to set these parameters:

- *Start address*: 0x0800**0000**
- Skip Flash Erase before programming: selected
- Verify programming: selected



Prg STI	M32CubeProgrammer									– 🗆 X
STM32 Cube	2 Programmer						(19)	f		* * 57
≡	Erasing & Programming									Connected
	Download	Era	ase flash r	nemory	Erase ext	ternal i	memory		ST-LINK	 Disconnect
.	File path SSB\Bootloader.bin 💌 Browse		Eras	e selecte	ed sectors	Full o	hip erase:	s	ST-LIN erial number	K configuration 34FF74 🔻 💋
OB	Start address 0x08000000		Select	Index	Start Ad	dress	Size	P		SWD 👻
	Skip flash erase before programming			0	0x08000	0000	2K	F		4000 🔻
CPU	Verify programming			1	0x08000	800	2K	- N		Normal 🔫
CHUN	Run after programming			2	0x08001	000	2K	A		0 🗸
SWV	Start Programming			3	0x08001	800	2K	R		Hardware reset 🔻
				4	0x08002	000	2K	s		Raliable
	Automatic Mode			5	0x08002	800	2К	s		INCHADIC .
REG	Full chip erase			6	0x08003	000	2К			Disabled C
	V Download file			7	0x08003	800	2К	E	xternal loader	
	Option b			8	0x08004	000	2К	Ē	irmware version	V2J39S7 Firmware upgrade
(ALL)	Log Live U 0938:14: Size :16 Bytes	pdate	Verbos	ity level	• 1	2	3			
()) () ()	0938:14 : UPCADING 0938:14 : State : 1024 Bytes 0938:14 : Address : 0x800000 0938:14 : Read progress: 0938:14 : Data read successfully 0938:14 : Time elapsed during the read operation is: 00:00:00.014					10	0% 🗵	B D T D R FI C B	Targe oard levice STM ype levice ID evision ID lash size PU ootloader Versic	et information 432L4x1/STM32L475xx/S MCU 0x415 Rev 4 512 KB Cortex-M4 in

3. Click Start programming and wait for the programming operation end.

Pro Mo	essaggio X	
()	File download complete	
Log	Pro Messaggio	X
10:16:32 : File : Bootloader.bi 10:16:32 : Size : 19.73 KB 10:16:32 : Address : 0x0800000 10:16:32 : Download in Progress:	Download verified successfu	lly ОК
10:16:32 : File download complete 10:16:32 : Time elapsed during dow 10:16:32 : Verifying 10:16:32 : Read progress: 10:16:33 : Download verified success	nload operation: 00:00:00.221	

Now, continue with the firmware upload (see §5.1).



6 How to unlock LSI LASTEM data loggers in case of locking

The SVSKA2001 programming kit can be used to unlock Pluvi-One or Alpha-Log data logger. It could happen, during its operation, that the data logger locks. In this situation the display is off and the Tx/Rx green LED is on. Turning the instrument off and on does not solve the problem.



To unlock the data logger, proceed as follows:

- 1. Connect the data logger to the programmer (§0, §4).
- 2. Run STM32 Cube Programmer and click Connect. An error message appears:



3. Click OK and then 2, expand RDP Out Protection, set the RDP parameter to AA

Read Out Protection			
Name	Value	Value Description	
RDP	AA 🔻	Read protection option byte The read protection is used to protect the software code stored in Flash AA : Level 0, no protection BB : or any value other than 0xAA and 0xCC: Level 1, read protection	
BOR Level			

4. Click Apply and wait the end of the operation.





Then, proceed with the programming of the bootloader (§5.2) and the firmware (§5.1).

7 SVSKA2001 programming kit disconnection

Once the reprogramming procedures have been completed, disconnect the SVSKA2001 programming kit and close the data logger as described in chapter \$0, proceeding backwards.