FL3X by STAR®

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FL3X System-XS/-XS²
Instructions for Use

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Any semiconductor devices have an inherent chance of failure. You have to protect against injury, damage or loss

from such failures by incorporating safety design measures into your facility and equipment such as redundancy, fire protection, and prevention of over-current levels and other abnormal operating conditions.
The safety and handling instructions in this document have to be followed strictly.

EC Conformity

The FL3X System-XS/-XS² complies with the essential requirements of the following applicable European Community Directive(s) including current amendments, and carries the CE marking accordingly:

- 2014/53/EU Radio Equipment Directive

The following standard(s) have been used to assess the product:

- EN 61000-4-2 2009-12
- EN 61000-4-3 2021-11
- EN 61000-4-4 2013-04
- EN 61000-4-5 2019-03
- EN 61000-4-6 2014-08
- EN 61000-6-2 2019-11
- EN 61000-6-3 2022-06
- EN 61326-1 2013-07
- EN 55011 2022-05
- ETSI EN 300 328 V2.2.2(2019-07)

The FL3X System-XS/-XS² is designed, intended and authorized for industrial use only. Using the product in domestic environment may lead to electromagnetic disturbances.

This product is compliant with the European Community Directive 2011/65/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS).

Revision History

Document number: 3-0104-0A01-D11

Version	Date	Description
D1V0-4	19-Oct-2021	Preliminary version
D1V0-13	14-Jun-2023	Updated Preliminary version
D1V0a-F	08-Oct-2024	Release
D1V1-1	09-Oct-2024	Fixed description of pin 14 (Sub-D 25)
D1V1-F	25-Oct-2024	Release
D1V2-F	25-Feb-2025	Updated chapter 4.2.1.1: Prepare the OS Image Update (added step 6) Updated chapter 4.2.1.2: Embedded Website renamed to FL3X Diagnostics Website
D1V3-F	12-Mar-2025	Moved chapter 4.2 to chapter 5.2. Updated description of the interfaces.
D1V4-F	24-Apr-2025	Updated chapter 1.4: Added new entries in notice Updated chapter 3.5.9: Changed ADIO into High-Side-Switch and changed values of input ranges Updated chapter “Troubleshooting”: Added new entries

Related Hardware / Software Versions

Product	Reference No.	Version	Remarks
FL3X System-XS	3-01040A01	60	
FL3X System-XS²	3-01040C01	60	FL3X System-XS_squared

Contents

1 General 6

1.1 Intended User Group 6
1.2 Intended Use 6
1.3 Used Pictograms 7
1.4 Safety and Handling Instructions 8
1.5 Meaning of Text Styles 9

2 Product Description 10

2.1 FL3X System-XS/-XS² at a glance 10
2.2 Accessory Parts 10

3 Technical Data 11

3.1 Electrical Characteristics 11
3.2 Physical Characteristics 11
3.3 Environmental Conditions 11
3.4 Block Diagram 11
3.5 Interfaces 12
3.5.1 Sub-D 25 (Power, Interfaces and IOs), DIPs and LEDs 12
3.5.2 Power supply 13
3.5.3 Power and Status LEDs 14
3.5.4 Power Modes 14
3.5.5 RTC 14
3.5.6 CAN-FD 14
3.5.7 LIN 15
3.5.8 SENT 16
3.5.9 ADIO 16
3.5.10 DO 17
3.5.11 Sleep/Wake DIP-Switches 17
3.5.12 Ethernet 18
3.5.13 USB 18
3.5.14 WiFi 19
3.5.15 Reset Button (Factory and Reset Software) 19
3.5.16 User LED 19

4 Getting Started 20

4.1 Assembly and Line-up 20
4.2 Licensing 20
4.3 Configuration and Operation 20

5 Maintenance 21

5.1 Open the Housing to change the battery or insert the SIM card 21
5.2 Software Installation and Update 22
5.2.1 Updating the OS Image of the System 22
5.2.2 Firmware Update 25

6 Shipping, Maintenance and Disposal 26

7 Troubleshooting 27

8 Ordering Information 28

8.1 FL3X System-XS/-XS² 28
8.2 Accessory Parts 28
8.3 Related Documents 28

9 Appendix 29

9.1 Appendix A: Guideline for handling ESD sensitive Products 29
9.2 Appendix B: 29
9.2.1 Acronyms and Abbreviations 29
9.2.2 List of Tables 30
9.2.3 List of Figures 30

1 General

1.1 Intended User Group

This document is written for expert technicians and/or engineers who are familiar with electronic components and systems.

Each person involved with setup or operation of the product must

1. be a qualified technician or engineer
2. strictly adhere to this manual
3. receive a briefing by an authorized person

	NOTICE
	If you are unsure of how to use the product as intended or have any questions about the use of the product, please discontinue use of the product immediately and contact the STAR ELECTRONICS GmbH & Co. KG Support.

	⚠ WARNING
	The product may only be used by expert technicians and/or engineers who are qualified and familiar with electronic components and systems! The use of the product by non-professionals is not permitted and strictly forbidden!

1.2 Intended Use

The FL3X System-XS/-XS² is a testing equipment. It was developed to test the communication behavior of automotive bus systems together with Electronics Control Units and sensors in a fully controlled testing and/or laboratory environment.
For this intended use, the FL3X System-XS/-XS² offers the following options:

- Transmit and receive data (e.g. Use Case “Remaining Bus Simulation”).
- Exchange of data traffic between two or more bus systems (e.g. Use Case “Gateway”)
- Manipulation of data traffic (e.g. Use Case “Manipulation of signal values based on user configuration”)
- Recording of data traffic (e.g. Use Case “Logging”)

Any deviation from the intended use and/or installation in a testing vehicle is only permitted with specific **prior written approval** of STAR ELECTRONICS GmbH & Co. KG.

	⚠ WARNING
	The FL3X System-XS/-XS² may be used to communicate with networked electronic systems. E.g. CAN or LIN. Any use of the product outside a fully controlled testing and/or laboratory environment may result in death or serious injury due to unpredictable behavior of a vehicle and/or potentially missing, deactivated, or malfunctioning safety devices on a vehicle! The user is responsible to ensure the safety of the entire system. This includes amongst other things a safety shutdown.

	NOTICE The device is not a calibrated measurement device. STAR ELECTRONICS GmbH & Co. KG accepts no liability whatsoever for the correctness of any measurement results.

	⚠ WARNING The FL3X System-XS/-XS² is **NOT** designed, intended, or authorized and may **NOT** be used for or in connection with the following purposes and/or devices: - use as part of medical systems - life support applications - aviation, space, nuclear, or military applications - use in areas where combustible or explosive gas mixtures are likely to occur - any other purposes / devices deviating from the intended use of the product specified by STAR ELECTRONICS GmbH & Co. KG.

	⚠ WARNING The product may only be used by expert technicians and/or engineers who are qualified and familiar with electronic components and systems! The use of the product by non-professionals is not permitted and strictly forbidden!

1.3 Used Pictograms

The meaning of used pictograms is shortly described below.

Follow the specific instructions in the document where these pictograms are placed.

	⚠ WARNING Used to indicate a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	⚠ CAUTION Used to indicate a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.
	NOTICE Used to indicate a situation which may result in an operating failure. Damage of the product may occur, but there is no hazard of injury if not avoided.
	NOTICE Used to indicate an electrostatic discharge sensitive product. The product is subject to damage by ESD, if no precautions are taken.
	Information Used to indicate information provided only for purposes of clarification, illustration, and general information.
	Reference References to other documents.
	Product marking which shows the compliance of the product with the European Waste Electrical and Electronic Equipment Directive 2012/19/EU.

1.4 Safety and Handling Instructions

Please read the instructions for use carefully. To protect the device or the application against damage, or to avoid personal injury the FL3X System-XS/-XS² has to be handled as described herein.

Changes or modifications of the FL3X System-XS/-XS² are not allowed for safety and warranty reasons!

*STAR ELECTRONICS GmbH & Co. KG i*s not liable for any damages arising from non-observance of the product information.

Follow the
a) specific safety and handling instructions placed at dedicated document positions
b) general safety and handling instructions below:

	NOTICE
	To prevent damage to the FL3X System-XS/-XS², or consequential damages: The voltage at the ADI must not exceed the supply voltage of the FL3X System-XS/-XS². Exceeding the supply voltage can lead to malfunctions or damage to the FL3X System-XS/-XS² and the connected device. The voltage at the ADI must always be disconnected before the supply voltage of the FL3X System-XS/-XS². If the supply voltage is disconnected first, this can lead to malfunctions or damage to the FL3X System-XS/-XS² and the connected device. Reverse polarity on the ADI connections can lead to the destruction of the FL3X System-XS/-XS². Ensure that the connections are connected correctly to avoid damage. Only for inserting a nano SIM card it's allowed to open the FL3X System-XS/-XS². Do not connect any other signals to the interfaces as described in the chapter "Interfaces". Ensure that all signals are within the specified range. High temperatures can damage the FL3X System-XS/-XS². Keep the FL3X System-XS/-XS² away from heaters, stoves, fireplaces, and other sources of heat. Do not expose the FL3X System-XS/-XS² to rain or use it near water. Do not use the FL3X System-XS/-XS² in areas of explosion hazard.

1.5 Meaning of Text Styles

In this document *filenames*, `source code`, **functions** and **structs** are marked with a different text format.

2 Product Description

2.1 FL3X System-XS/-XS² at a glance

The FL3X System-XS/-XS² is a small and powerful device for be a universal gateway for the automotive interfaces CAN-HS, CAN-FD, LIN and SENT. It has a wide power supply range and less power consumption. It supports sleep functionality with local-, bus- and RTC-wake up possibilities.

The FL3X System-XS/-XS² has following features:

- ARM Cortex-A72 64 bit Quad Core CPU with 1GHz, 1GByte RAM and 8GByte eMMC
- 1x 1000BASE-T RJ45 connector for configuration and measuring
- 1x USB 2.0 interface type A (Only STAR certified Accessory)
- 1x CAN-FD/2x CAN-FD
- 1x LIN/2x LIN
- 1x SENT/ 2x SENT
- CR1632 battery buffered Real Time Clock
- 2x ADIO
- 4x DO with separate power supply
- Sub-D 25 connector for automotive bus systems
- Integrated WiFi module and optional LTE module
- Fully supported by FL3X Config
    - remaining bus simulation
    - gateway
    - analyzing / measurement
    - logging

2.2 Accessory Parts

For further information about accessories for the FL3X System-XS/-XS² (see chapter 8.2).

	NOTICE
	Use only accessory parts from *STAR ELECTRONICS GmbH & Co. KG* listed in chapter 8.2 to ensure proper function and for warranty reasons! Other accessories without prior written consent of *STAR ELECTRONICS GmbH & Co. KG* must not be used.

3 Technical Data

3.1 Electrical Characteristics

Supply voltage			
	min	typical	max
Vin	8 V DC	12 V DC	36 V DC
Vin_DO (Digital Out)	6 V DC	-	33 V DC
RTC battery	CR1632		
Supply current – quiescent	Typ.: 3 mA		
Supply current – operating	Typ.: 350 mA (max 1500 mA)		
Additional supply current for LTE	Typ.: 60 mA (max 250 mA)		

Table 1: FL3X System-XS/-XS² electrical characteristics

3.2 Physical Characteristics

Connectors	
FL3X System-XS/-XS²	1 x Sub-D 25 pole 1 x RJ45 1 x USB-A
Internal connectors/slots	m.2 with key B nano SIM card holder
Weight approx.	160 g
Dimensions approx. L x W x H	110 x 105 x 35 mm³

Table 2: FL3X System-XS/-XS² physical characteristics

3.3 Environmental Conditions

Temperature	Operating: -20°C to +60°C Non-operating: -40°C to +70°C Storage: -40°C to +70°C
Relative Humidity	0 % to 90 % R.H., non-condensing

Table 3: FL3X System-XS/-XS² environment conditions

3.4 Block Diagram

The FL3X System-XS/-XS² uses has a BCM2711 Quad Core Cortex-A72 processor. Attached is an USB-Hub which is connected to the internal m.2-connector and to the USB-A connector. The processor is connected to the m.2 socket via one PCIe lane.

CAN-FD is supported via external CAN-FD controller which are connected via an SPI interface to the processor.

For LIN/SENT, Analog-In and Digital-In-Out functionality is a dsPIC33 used which communicates via SPI interface with the processor.

	Information
	The FL3X System-XS has one CAN-FD, one LIN and one SENT interfaces. The FL3X System-XS² has two CAN-FD, two LIN and two SENT interfaces.

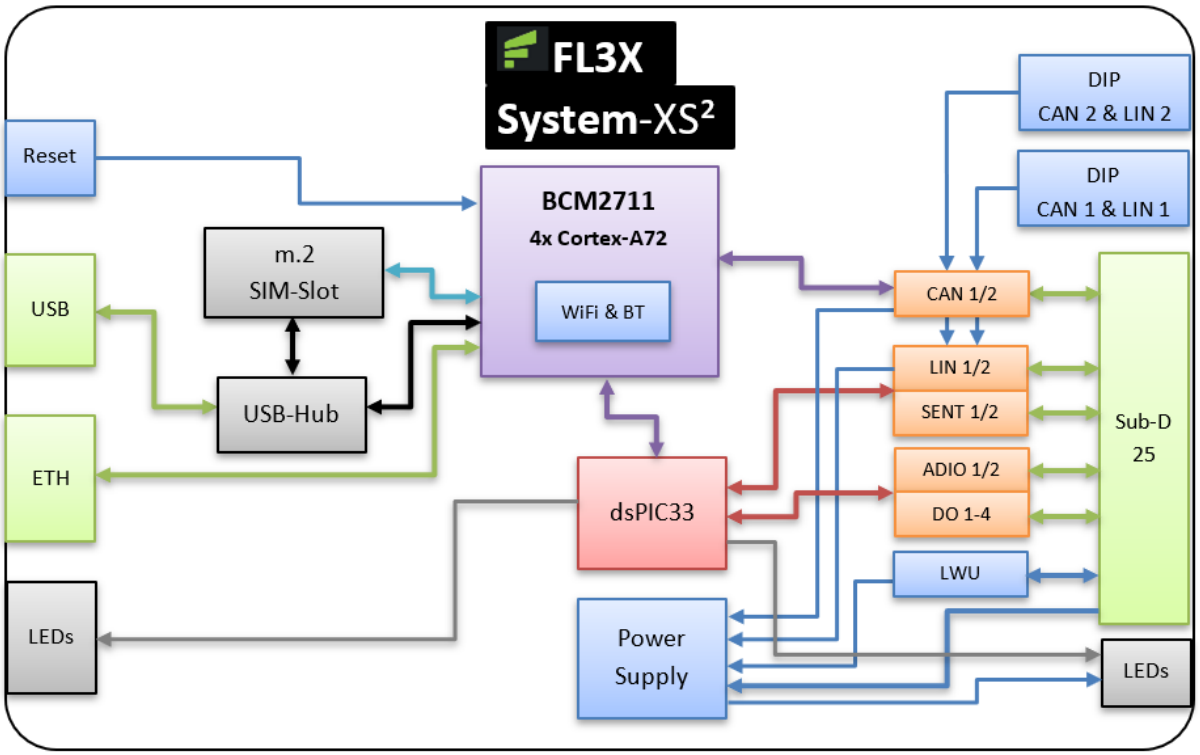


Figure 1: Block diagram FL3X System-XS²

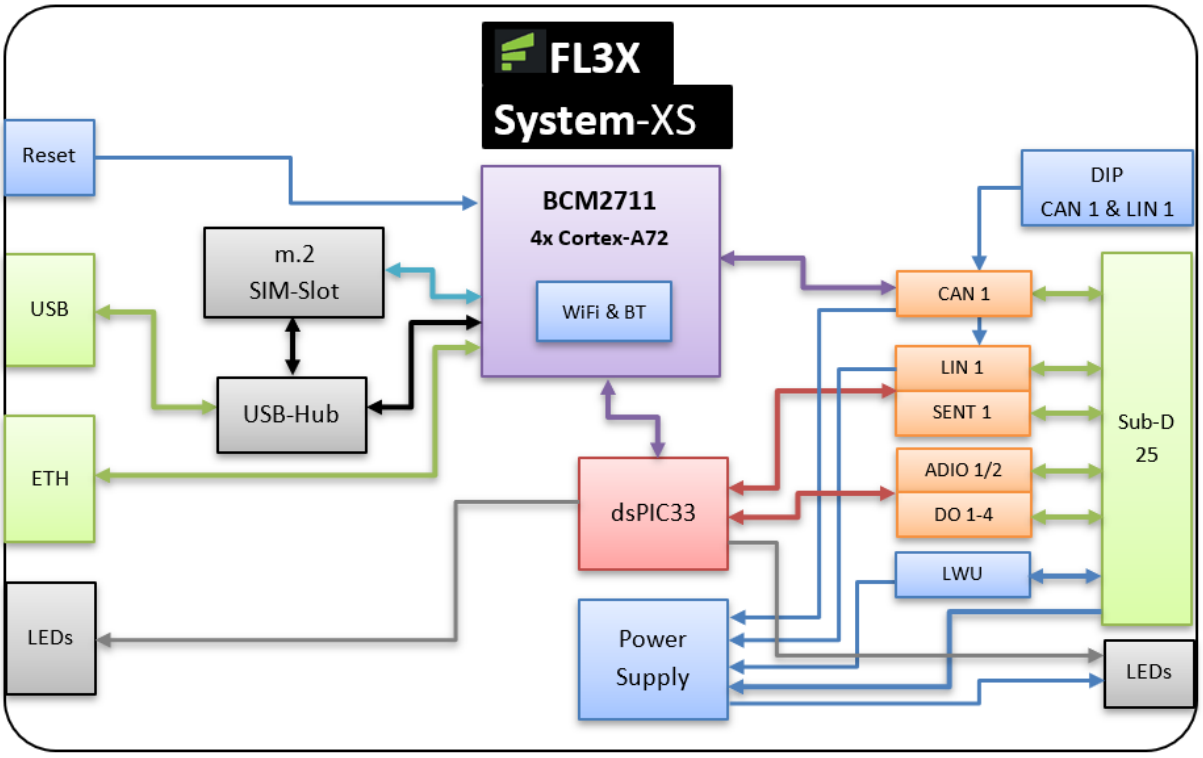


Figure 2: Block diagram FL3X System-XS

3.5 Interfaces

3.5.1 Sub-D 25 (Power, Interfaces and IOs), DIPs and LEDs

The Sub-D 25 connector from the FL3X System-XS/-XS² is used to power the device, for automotive bus interfaces CAN, LIN and SENT as well as for the digital and analog input and output signals.

The FL3X System-XS/-XS² has two LEDs to indicate the power mode “Normal” or “Sleep”. The green LED on the left indicates normal power mode (see chapter 3.5.3), the middle yellow LED indicates sleep mode (see chapter 3.5.3). The blue LED on the right indicates the state of the software (see chapter 3.5.3).

Figure 3: FlexSystem-XS Sub-D 25 side view

Pin overview for the Sub-D 25 connector.

Connector Sub-D 25		
Pin	Signal Name	Description
1	-Uin	Ground input signal
2	+Uin	Power input signal
3	DO1	Digital Out Signal 1
4	DO2	Digital Out Signal 2
5	DO3	Digital Out Signal 3
6	DO4	Digital Out Signal 4
7	CAN1-low	CAN 1 bus low signal
8	CAN1-high	CAN 1 bus high signal
9	+Uin DO	Power input digital out (DO1-4)
10	LIN1	LIN 1 bus signal
11	SENT1	SENT 1 bus signal
12	DNU	Do not use! (processor RS232-TTL)
13	DNU	Do not use! (processor RS232-TTL)
14	-Uin DO	Isolated Digital-Output Ground input signal
15	+5 V Out	+5V output for powering a SENT device/sensor
16	ADIO1	Analog In, Digital In/Out Signal 1
17	ADIO2	Analog In, Digital In/Out Signal 2
18	LWU	Local wake up for CAN & LIN
19	CAN2-low	CAN 2 bus low signal (XS² only)
20	CAN2-high	CAN 2 bus high signal (XS² only)
21	-Uin DO	Power-GND input digital out (DO1-4)
22	LIN2	LIN 2 bus signal (XS² only)
23	SENT2	SENT 2 bus signal (XS² only)
24	NC	No connect
25	NC	No connect

Table 4: Pinout Sub-D 25

3.5.2 Power supply

The FL3X System-XS/-XS² is powering between 8 V DC and 36 V DC. The power pins are located at the Sub-D 25 pins 1 and 2. The power input is overvoltage and reverse protected.

The Digital Output is supplied between 6 V DC and 33 V DC. The power pins are located at the Sub-D 25 pins 9 and 21. The power input is reverse protected.

3.5.3 Power and Status LEDs

The FL3X System-XS/-XS² has two LEDs for indicate the power modes:

- Green (left) ON: system is in normal power mode.
- Yellow (middle) ON: system is in sleep mode.

Only one LED is ON at a time, either green or yellow.

The blue LED indicates different FL3X Config project states off the FL3X System-XS/-XS²:

- OFF: No FL3X Config project is loaded, or system is booting.
- ON: A FL3X Config project is loaded.
- Blinking: The Factory-Image is active.

3.5.4 Power Modes

The FL3X System-XS/-XS² has two power modes, normal and sleep. Normal mode means the power supply is on and all parts are running. In sleep mode the power supply is shut down and only the RTC is active, additional the CAN and LIN Transceiver are supplied for listen the bus for awake the device.

The sleep mode can be reached when:

- Corresponding CAN/LIN 1 or 2 DIP-Switch for Sleep/Wake is active and the software has activated the sleep state of the transceiver, and NO bus activity is on the network.
- Low signal at LWU (Local wake up) at Sub-D 25 pin 18.

The sleep mode will be leaved after:

- When corresponding CAN/LIN 1 or 2 DIP-Switch for Sleep/Wake is active, and Bus activity is on the network.
- Positive edge at LWU (Local wake up) at Sub-D 25 pin 18.
- RTC time event
- Repowering the FL3X System-XS/-XS².

3.5.5 RTC

The FL3X System-XS/-XS² has a battery buffered RTC RX8035 from Epson. This RTC can be configured to generate a pulse to wake the device from sleep mode.

3.5.6 CAN-FD

The FL3X System-XS/-XS² has one or two CAN-FD interfaces. They are located at the Sub-D 25 pins 7/8 and 19/20 (XS² only).

The CAN-FD bus is implemented with a TCAN4550 controller and transceiver.

With the DIP-Switch it is possible to activate the Sleep/Wake function from the TCAN4550.

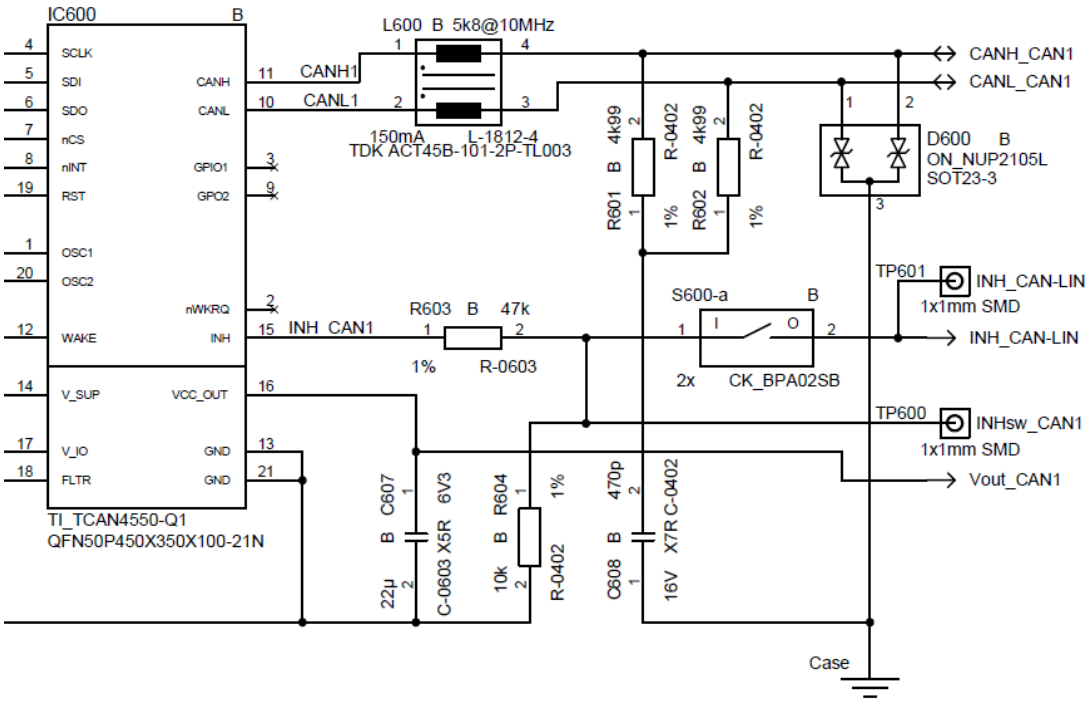


Figure 4: CAN-FD interface

3.5.7 LIN

The FL3X System-XS/-XS² has one or two LIN interfaces. They are located at the Sub-D 25 pins 10 and 22 (XS² only).

The LIN bus is implemented with a TJA1021 transceiver.

With the DIP-Switches it is possible to activate the Sleep/Wake function.

The Master/Slave termination is made with an optical relay and can activated per software.

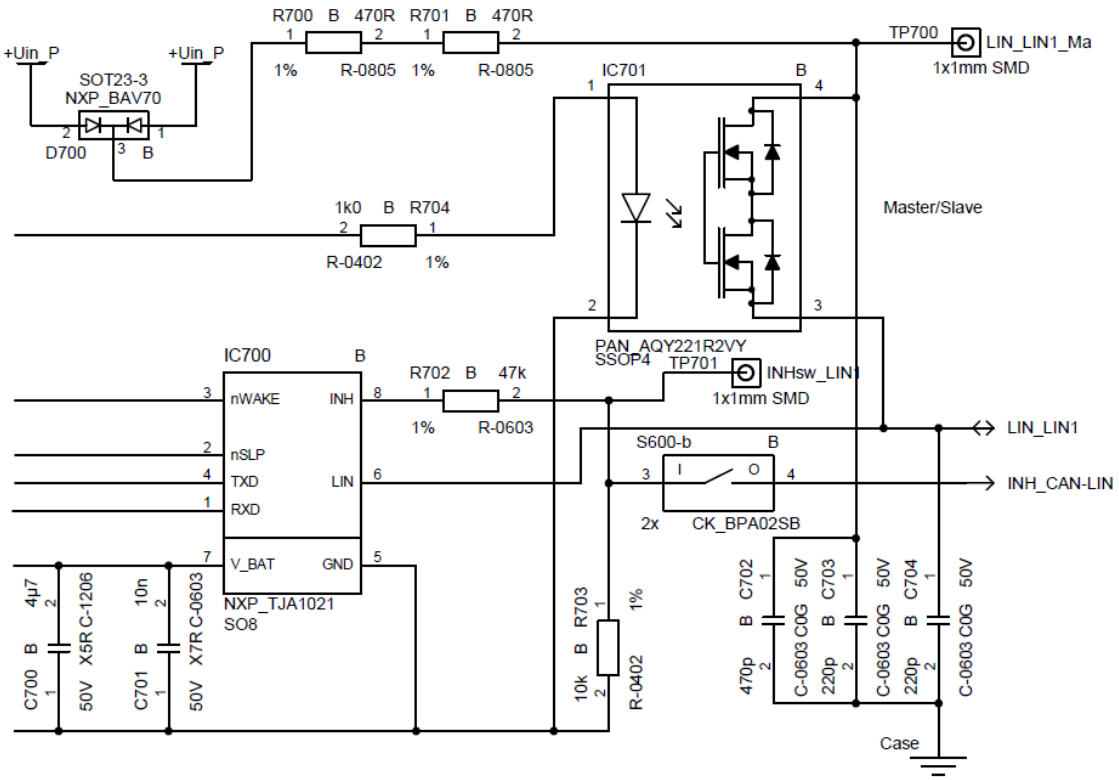


Figure 5: LIN interface

3.5.8 SENT

The FL3X System-XS/-XS² has one or two SENT interfaces. They are located at the Sub-D 25 pins 11 and 23 (XS² only).

The SENT bus is implemented with a logic gate.

3.5.9 ADIO

The FL3X System-XS/-XS² has two ADIO (Analog or Digital In/Output) interfaces. They are located at the Sub-D 25 pins 16 and 17.

The ADIO is an “analog input” or “digital input” or “digital output”.

The digital output is implemented with two “high-side-switch” (HSS) BSP752 from Infineon. HSS means the ADIOx pin is either driven to “Vin” or is “high impedance”. To use the HSS, the load must connect with the input (one pin of the load) to the ground and the other pin (output from the load) must connect to the ADIOx pin.

The nominal load current of one digital output of the ADIOx is 1.3 A, the output is over current and over temperature protected.

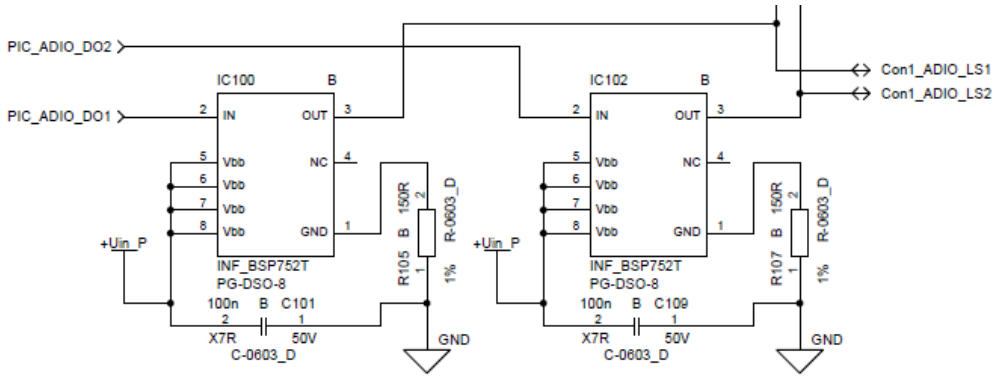


Figure 6: Low-side-switch digital output

To use the input as analog or digital input the BSP752 output must be disabled. The analog and digital input can be switched between two input ranges (by software). One input range is 0 to 35 V, the second is 0 to 9.0 V. The input impedance is round about 10 kOhm (see R109 and R111).

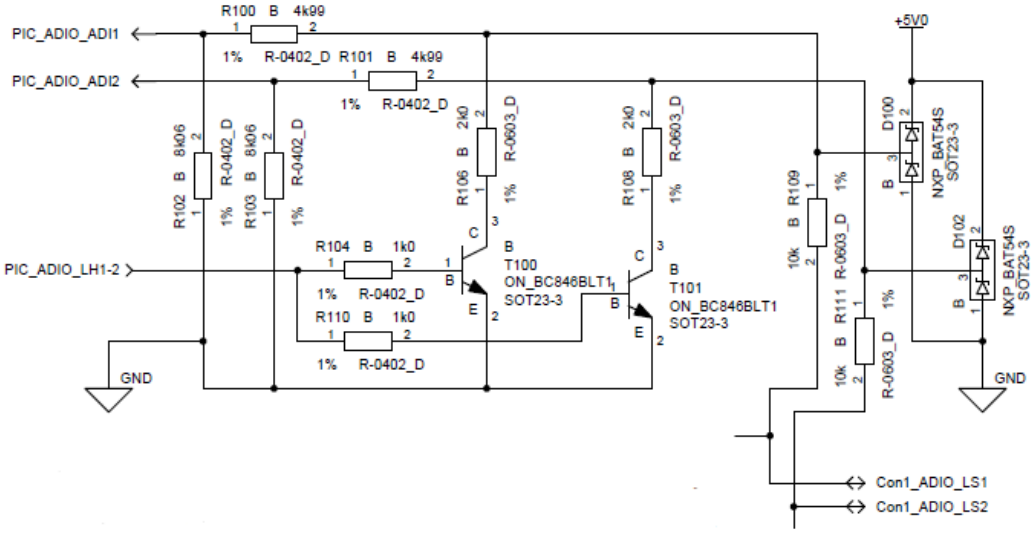


Figure 7: Analog or digital input

3.5.10 DO

The FL3X System-XS/-XS² has four DO (Digital Output) interfaces. They are located at the Sub-D 25 pins 3 – 6. The “digital” output pins DO[1..4] are powered via Sub-D 25 pin 9 (+Uin_DO) and 21 (-Uin_DO).

	Information
	The input voltage range of the +Uin_DO is between 6 and 33 V. The input +Uin_DO is reverse protected.

The output pins are driven via the power switch IC TSP2H000 from TI.

The maximum current load of one DOx is 200 mA. The output is over current and over temperature protected.

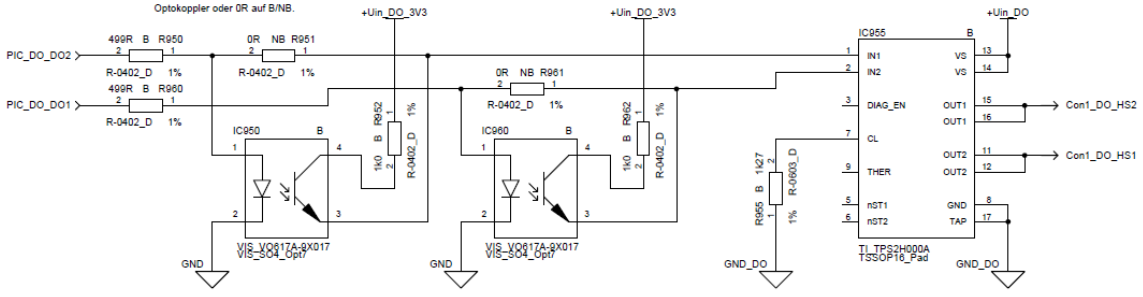


Figure 8: Isolated digital output

3.5.11 Sleep/Wake DIP-Switches

On the FL3X System-XS/-XS² are 1 or 2 DIP-Switches with two ports (see Figure 3).

DIP-Switches 1[1-2] are for de- or activating the Sleep/Wakeup the device from CAN1 and/or LIN1.

DIP-Switches 2[1-2] are for de- or activating the Sleep/Wakeup the device from CAN2 and/or LIN2.

The DIP-Switches are located right from the Sub-D 25 connector. A Local Wake Up (LWU) signal on the Sub-D 25 (pin 18) gives the possibility to wakes the CAN/LIN transceivers with a positive edge signal.

CAN1 and LIN1 Sleep/Wake DIP-Switch 1 and 2		
Sw	Function	Description
1	CAN 1 wake-up	If ON, allows the CAN 1 to manage the power supply (INH)
2	LIN 1 wake-up	If ON, allows the LIN 1 to manage the power supply (INH)

Table 5: CAN1 LIN1 DIP-Switch

The second DIP-Switch (FL3X System-XS² only) is located right from the first one.

CAN2 and LIN2 Sleep/Wake DIP-Switch 3 and 4		
Sw	Function	Description
3	CAN 2 wake-up	If ON, allows the CAN 2 to manage the power supply (INH)
4	LIN 2 wake-up	If ON, allows the LIN 2 to manage the power supply (INH)

Table 6: CAN2 LIN2 DIP-Switch

3.5.12 Ethernet

The FL3X System-XS/-XS² has an 1000BASE-T ethernet interface with two status LEDs.

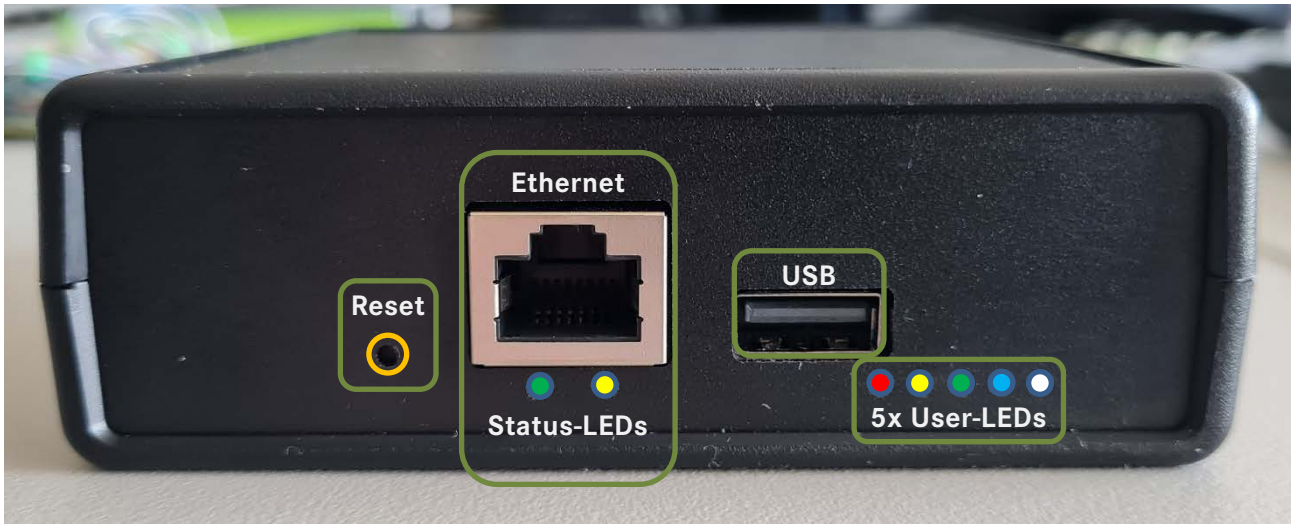


Figure 9: FL3X System-XS/-XS² Ethernet and USB side view

The ethernet connector is a RJ45 connector with 8 pins. The two LEDs below the connector indicates the status “Link = green” and “Activity = yellow” of the ethernet interface.

Connector Ethernet RJ45		
Pin	Signal Name	Description
1	TRD0p	Ethernet TX D0 plus
2	TRD0n	Ethernet TX D0 minus
3	TRD1p	Ethernet RX D1 plus
4	TRD2p	Ethernet TRX D2 plus (1Gbit)
5	TRD2n	Ethernet TRX D2 minus (1Gbit)
6	TRD1n	Ethernet RX D1 minus
7	TRD3p	Ethernet TRX D3 plus (1Gbit)
8	TRD3n	Ethernet TRX D3 minus (1Gbit)

Table 7: Pinout Ethernet RJ45

3.5.13 USB

The USB connector is a standard USB-A connector. For example, USB flash drives can be used.

Connector USB-A		
Pin	Signal Name	Description
1	VBUS	5 V output 500 mA
2	Dm	USB bus low
3	Dp	USB bus high

Connector USB-A		
Pin	Signal Name	Description
4	GND	Ground

Table 8: Pinout USB-A

NOTICE
It depends on the FL3X Config project if a USB device can be used. Please contact the STAR ELECTRONICS support team for more information.

3.5.14 WiFi

The FL3X System-XS/-XS² can communicate via WiFi. The WiFi must be activated by software. The default WiFi IP address is 198.51.100.50. The default WiFi password is the serial number of the device.

There is no separate LED for the WiFi status, the status is displayed with the green user LED (see Figure 9):

- LED ON => WiFi active
- LED OFF => WiFi disabled

3.5.15 Reset Button (Factory and Reset Software)

The FL3X System-XS/-XS² has a small push reset button behind the cover (see Figure 9). If the device is in an error state and can no longer be reached via LAN and/or WiFi, it is possible by carefully pressing the “Reset Button” with a thin object to load the factory software as a first solution. If the first solution does not help, then another software can be installed as a second solution.

By pressing the button:

- at **runtime** for more than 3 seconds and after release the button, the processor loads the factory software.
- during **power up** for more than 3 seconds, the processor loads a software from an USB stick, if a compatible software is found on the stick (see chapter 5.2.1.2).

3.5.16 User LED

The FL3X System-XS/-XS² has five user LEDs (white, blue, green, yellow and red, see Figure 9).

Some of these LEDs have a special function in some states.

The green LED indicates WiFi is ON or OFF (see chapter 3.5.14).

The red LED indicates runtime errors for FL3X Config projects.

4 Getting Started

4.1 Assembly and Line-up

Read and follow these instructions when connecting and using the FL3X System-XS/-XS²:

	NOTICE
	Ensure that all signal lines connected to the FL3X System-XS/-XS² are in the allowed range. Be sure to connect all cables as described in this manual. Never insert anything metallic into the openings of the FL3X System-XS/-XS². Ensure to grasp the plug and not the cable when disconnecting the FL3X System-XS/-XS².

4.2 Licensing

The FL3X System-XS/-XS² itself doesn't need any license. But to run a FL3X Config project, runtime licenses are maybe required. Please see the FL3X Config user manual for more details.

4.3 Configuration and Operation

1. Connect all used interfaces as described in chapter interfaces (see chapter 3.5).
2. Connect the ethernet interface to the PC where FL3X Config is running
3. Use FL3X Config to create, build and flash a project your device. Details can be found in [1] the FL3X Config user manual.

5 Maintenance

5.1 Open the Housing to change the battery or insert the SIM card

Open the housing of the FL3X System-XS/-XS² is only allowed to insert an Nano SIM card or change the RTC battery.

Follow the steps to open the housing:

1) The 4 screws on the underside of the housing have to be loosened.
2) Remove the top of the housing.

For changing the CR1632 battery are steps 3 to 5 not necessary!

3) Unscrew the 4 screws that hold the circuit board in place.
4) The M.2 module and the Nano SIM card can be inserted on the bottom side, (see Figure 11)
5) Fix the M.2 module with a M3x5 screw.

To close the FL3X System-XS/-XS² follow the steps from point 2 or 3 backwards.

Following figure shows the location of the CR1632 battery on the top side:

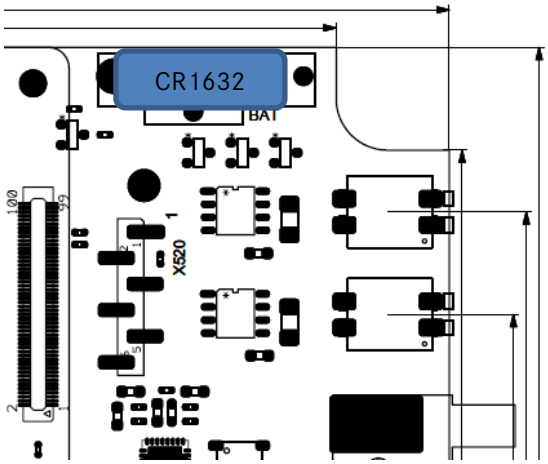


Figure 10: FL3X System-XS/-XS² location of CR1632 battery

Following figure shows the location of the M.2 module and Nano SIM card holder on the bottom side.

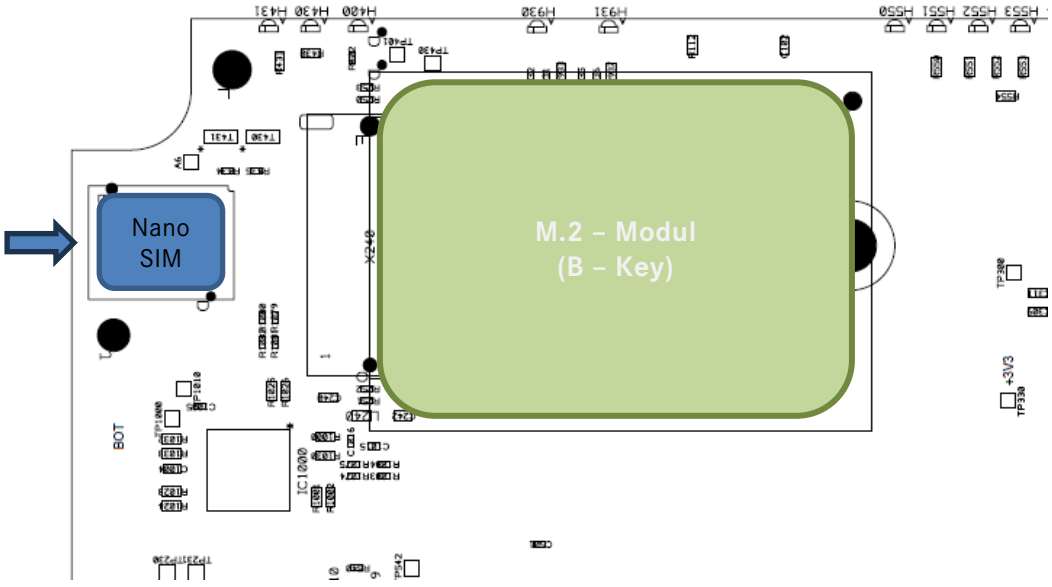


Figure 11: FL3X System-XS/-XS² location of M.2 module and Nano SIM card holder

5.2 Software Installation and Update

NOTICE
Third-party applications are used in the following. STAR ELECTRONICS GmbH & Co. KG denies liability for any third-party software.

5.2.1 Updating the OS Image of the System

5.2.1.1 Prepare the OS Image Update

For updating the FL3X System-XS/-XS² you need an USB stick with a minimum size of 16 GB.

Information
1) Download the image file via https://flex-product.com/download-center 2) Pick the latest version for FL3X System-XS (or a specific version if required). FL3X System-XS and FL3X System-XS² use the same image. 3) Extract the ZIP file to your local storage. 4) The relevant image file is named *FS-XS_latest.img*. 5) The version of the image file is also written in the file *FS-XS_latest.txt*.

The following steps 1 to 9 describe the OS Image update:

1. Copy the OS image file to the folder C:\temp (create the folder if necessary).
2. Get the Raspberry Pi imager via the following link: https://www.raspberrypi.com/software/
3. Connect the USB stick to the PC
   Attention: All data on this USB stick will be deleted.
4. Start the application Raspberry Pi imager.
5. Select the option “Choose OS”:

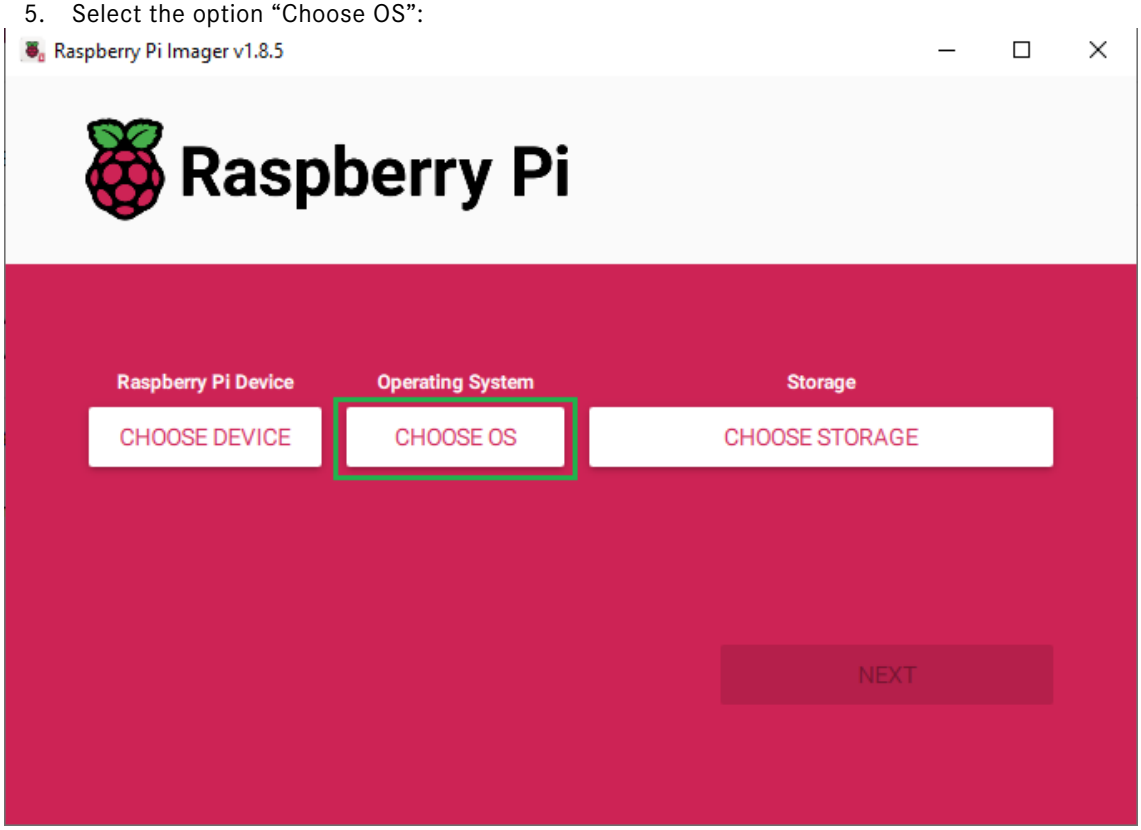


Figure 12: Step 1 Selection of the OS image, Raspberry Pi Imager version used: v1.8.5

6. Select the OS image from the folder C:\temp as shown in the following figure:

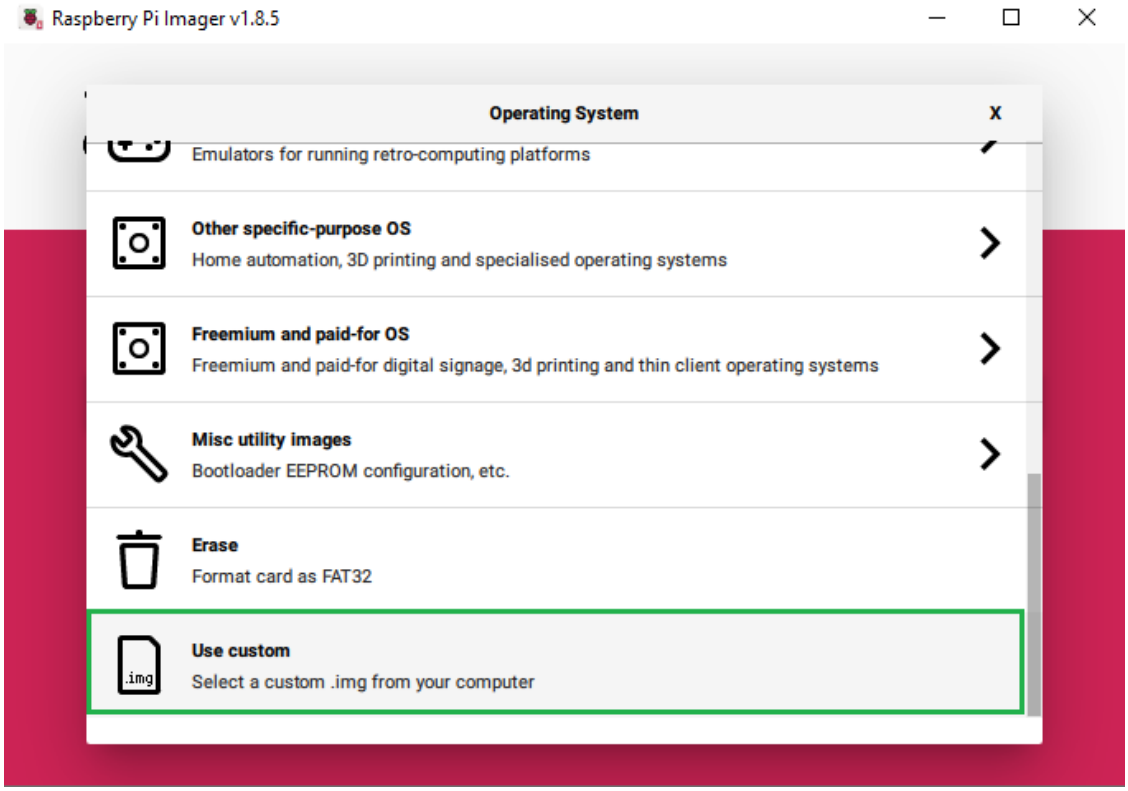


Figure 13: Step 2 Selection of the OS image, Raspberry Pi Imager version used: v1.8.5

7. Select the option “Choose SD card” and select your USB stick as shown in the following figure:

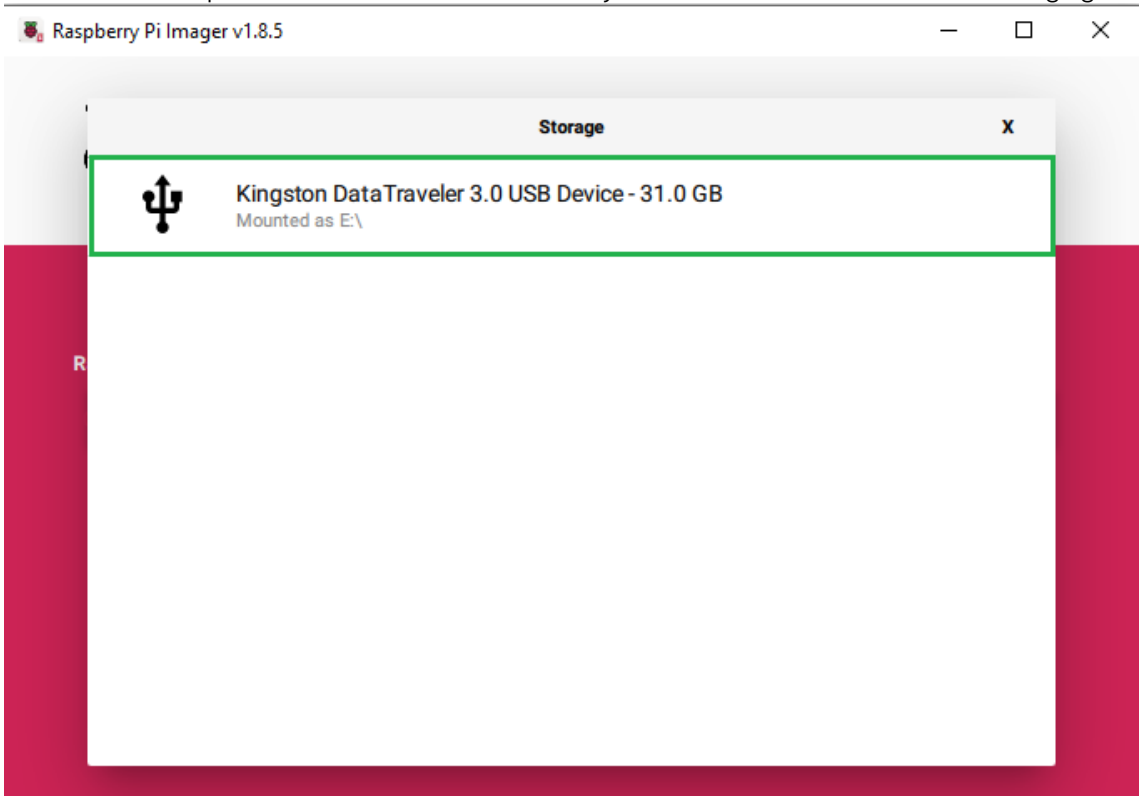


Figure 14: Step 3 Selection of the USB stick, used Raspberry Pi Imager Version: v1.8.5

8. In the next dialog select option “No” => the OS image will automatically be copied to the USB stick.

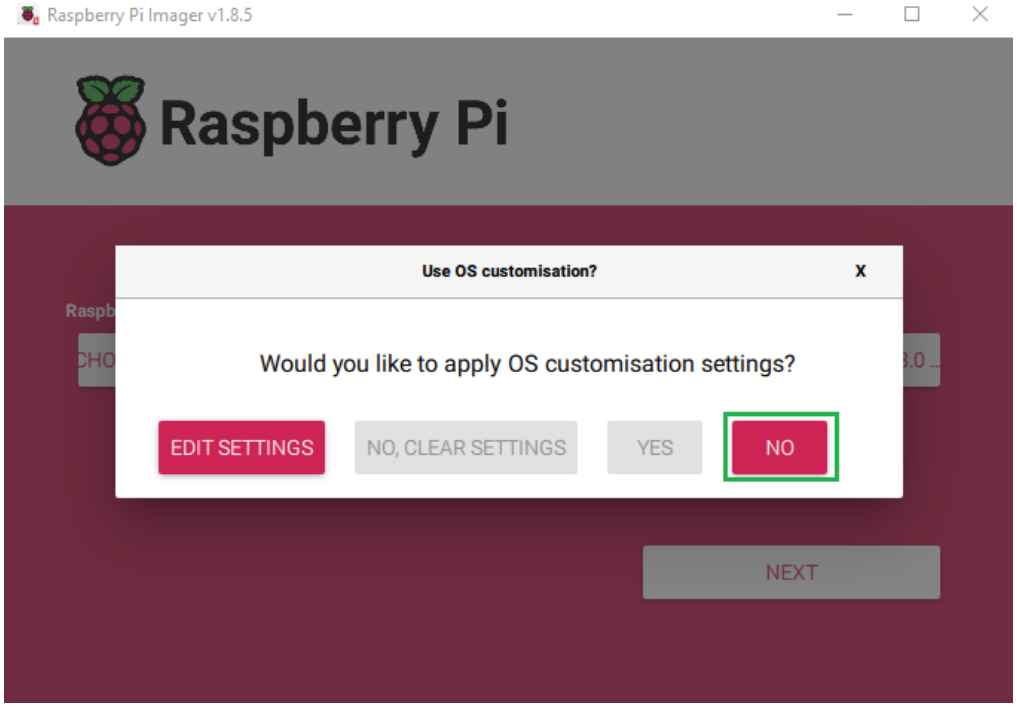


Figure 15: Step 4 OS customizations, used Raspberry Pi Imager version: v1.8.5

9. Wait until the upload is finished. Now the USB stick can be removed.

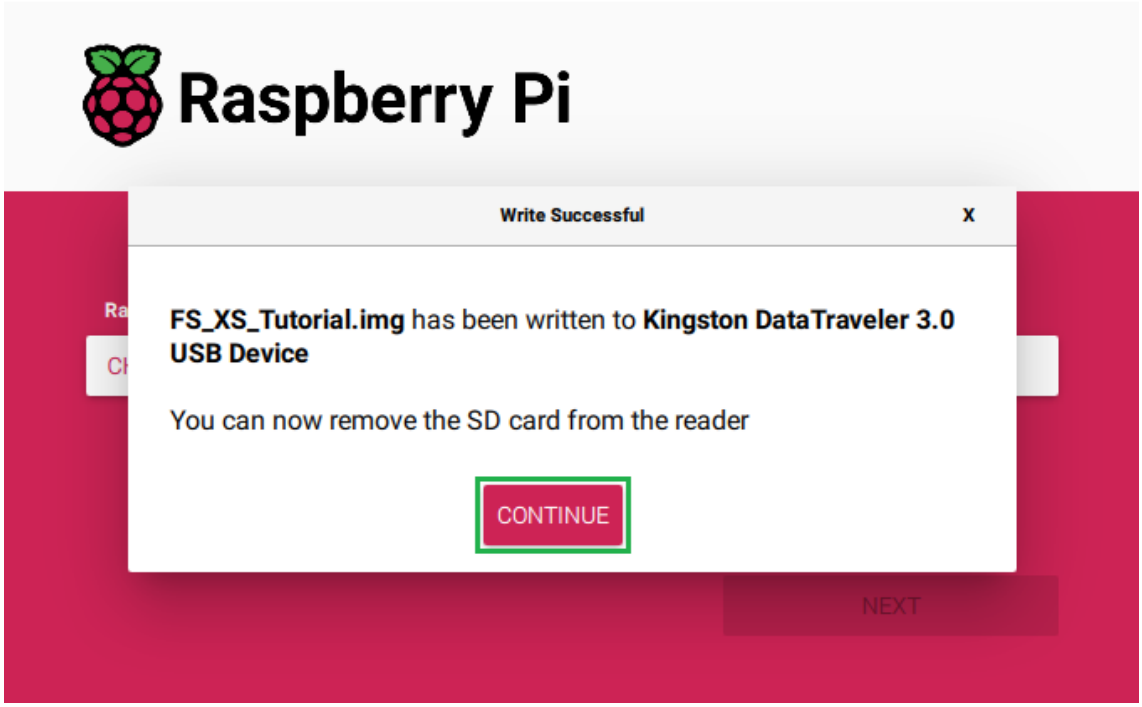


Figure 16: Step 5 Upload successful, used Raspberry Pi Imager version: v1.8.5

5.2.1.2 Execution of the OS Image Update

	NOTICE
	All files on the FL3X System-XS/XS² will be replaced! All projects saved on FL3X System-XS/XS² will be deleted!

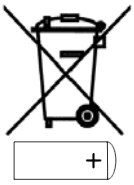
To bring the OS Image on to the FL3X System-XS/-XS², follow the next steps:

1. Disconnect the FL3X System-XS/-XS² from the power supply unit
2. Connect the USB stick to the FL3X System-XS/-XS².
3. Hold down the reset button (see chapter 3.5.15) on the FL3X System-XS/-XS² while powering on the device.
4. After 120 seconds, the device should be accessible again and the OS image should have been successfully updated.
5. Open the FL3X Diagnostics Website and check via System Info -> Firmware if the correct OS image version is shown.

5.2.2 Firmware Update

To update the firmware of a FL3X System-XS/-XS² use FL3X Config software.

6 Shipping, Maintenance and Disposal

 Lithium	The product contains a lithium battery. Dispose off properly per regulations of the country where end-of-life occurs.

7 Troubleshooting

This chapter contains some frequently asked questions about the FL3X System-XS/-XS².

1	Effect	The device is no longer accessible (via LAN and/or WiFi).
	Solution	Solution 1: Perform a Factory-Reset (see chapter 3.5.15) Solution 2: Perform a clean OS image installation (see chapter 5.2)
2	Effect	ADIO or device is not working properly after connecting ADIO
	Solution	Pay attention to the technical restrictions when using the ADIO connection (see chapter 1.4)

8 Ordering Information

8.1 FL3X System-XS/-XS²

Product	Description	Ordering number
FL3X System-XS	FL3X System-XS with 1x CAN, LIN, SENT	3-01040A01-01
FL3X System-XS²	FL3X System-XS with 2x CAN, LIN, SENT	3-01040C01-01
Option 'WideTemp'	Temperature range from -40 to +85°C	Please contact *STAR ELECTRONICS GmbH & Co. KG*

Table 9: FL3X System-XS/-XS² ordering information

8.2 Accessory Parts

Product	Description	Ordering number
LTE-Module m.2	LTE module (Europe) to communicate via cell connection in m.2 format	Please contact *STAR ELECTRONICS GmbH & Co. KG*
Sub-D 25 female connector	Connector for self-wiring the FL3X System-XS/-XS²	Please contact *STAR ELECTRONICS GmbH & Co. KG*
License	Different licenses are available	Please contact *STAR ELECTRONICS GmbH & Co. KG*
Customer specific parts		Please contact *STAR ELECTRONICS GmbH & Co. KG*

Table 10: FL3X System-XS/-XS² accessory parts

8.3 Related Documents

Document	Description	Ordering number
[1] 3-01140A01-D011 FL3X Config UserManual	FL3X Config User Manual	Please contact support-ee@star-cooperation.com

Table 11: Related documents

9 Appendix

9.1 Appendix A: Guideline for handling ESD sensitive Products

- Any tester, equipment, or tool used at any production step or for any manipulation of semi-conductor devices must have its shield connected to ground.
- The product itself and the carrier system of the product respectively must be placed on a conductive tabletop or covered by an antistatic surface (superficial resistivity equal to or higher than 0.5M /cm²), grounded through a ground cable (conductive cable from protected equipment to ground isolated through a 1M resistor placed in series).
- All manipulation of finished goods has to be made at such a grounded worktable.
- The worktable must be free of all non-antistatic objects.
- An antistatic floor covering grounded through a conductive ground cable (with serial resistor between 0.9M and 1.5M) should be used.
- It is recommended that you wear an antistatic wrist or ankle strap, connected to the antistatic floor covering or to the grounded equipment.
- If no antistatic wrist or ankle strap is worn, touch the surface of the grounded worktable before each manipulation of the ESD sensitive product.
- It is recommended that antistatic gloves or finger coats be worn.
- It is recommended that nylon clothing be avoided while performing any manipulation of parts.

9.2 Appendix B:

9.2.1 Acronyms and Abbreviations

Item	Definition
BD	Bus driver
BP	Bus plus
BM	Bus minus
CAN(-HS/FD)	Controller Area Network (high speed/flexible data rate)
DC	Direct Current
ECU	Electronic Control Unit
EN	European norm
EMC	Electromagnetic Compatibility
ESD	Electro-Static Discharge
FR	FlexRay
LED	Light Emitting Diode
LIN	Local Interconnect Network
LTE	Long Term Evolution
M.2	Minicard Gen2
NC	Not Connected
OS	Operating System
PCB	Printed Circuit Board
PIC	Programmable Interface Controller
PL	Physical Layer
RoHS	Restriction of Hazardous Substances
RTC	Real Time Clock
SENT	Single Edge Nibble Transmission
SIM	Subscriber Identity Module Card
SPI	Serial Peripheral Interface
USB	Universal Serial Bus
WiFi	Wireless Fidelity

9.2.2 List of Tables

Table 1: FL3X System-XS/-XS² electrical characteristics 11
Table 2: FL3X System-XS/-XS² physical characteristics 11
Table 3: FL3X System-XS/-XS² environment conditions 11
Table 4: Pinout Sub-D 25 13
Table 5: CAN1 LIN1 DIP-Switch 18
Table 6: CAN2 LIN2 DIP-Switch 18
Table 7: Pinout Ethernet RJ45 18
Table 8: Pinout USB-A 19
Table 9: FL3X System-XS/-XS² ordering information 28
Table 10: FL3X System-XS/-XS² accessory parts 28
Table 11: Related documents 28

9.2.3 List of Figures

Figure 1: Block diagram FL3X System-XS² 12
Figure 2: Block diagram FL3X System-XS 12
Figure 3: FlexSystem-XS Sub-D 25 side view 13
Figure 4: CAN-FD interface 15
Figure 5: LIN interface 16
Figure 6: Low-side-switch digital output 16
Figure 7: Analog or digital input 17
Figure 8: Isolated digital output 17
Figure 9: FL3X System-XS/-XS² Ethernet and USB side view 18
Figure 10: FL3X System-XS/-XS² location of CR1632 battery 21
Figure 11: FL3X System-XS/-XS² location of M.2 module and Nano SIM card holder 21
Figure 12: Step 1 Selection of the OS image, Raspberry Pi Imager version used: v1.8.5 22
Figure 13: Step 2 Selection of the OS image, Raspberry Pi Imager version used: v1.8.5 23
Figure 14: Step 3 Selection of the USB stick, used Raspberry Pi Imager Version: v1.8.5 23
Figure 15: Step 4 OS customizations, used Raspberry Pi Imager version: v1.8.5 24
Figure 16: Step 5 Upload successful, used Raspberry Pi Imager version: v1.8.5 24

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