FL3X
Interface-PCIe & -PXIe

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BENEFITS

- 5x pluggable transceiver modules (2-6 channels per module depending on the bus system)
- Pluggable transceiver modules available for CAN-HS, CAN-FD, CAN-FD SIC, FlexRay, 100BASE-TX, 10BASE-T1S, 100BASE-T1, 1000BASE-T1, LIN*, SENT*, K-Line*, RS232*, SPI*
- Available in PCIe and PXIe form factor
- Synchronous timestamp generation for most of the bus interfaces (resolution up to 1 µs)
- Trigger 2x in/out configurable
- Configurable bus termination
- Bosch E-Ray IP core FlexRay controller
- Bosch D_CAN IP core CAN controller
- Bosch M_CAN IP core CAN-FD Controller
- Intel Triple-Speed-Ethernet Ethernet controller
- V2.1 A FlexRay protocol specification
- V2.0 A/B CAN protocol specification
- ISO 11898-1:2015 CAN protocol specification
- Bosch CAN-FD specification 1.0

*driver possible but not available at the moment

DRIVER

- Uniform FL3X Interface API (same API for all FL3X Interfaces)
- CPU load reduction through DMA
- Driver Windows 64-bit (Windows 10)
- Driver Linux (Kernel 5.4)
- Linux Preempt-RT support

SOFTWARE SUPPORT

- The device is supported by FL3X Config starting with version 1.1 and the FL3X Interface API starting with S6V7-F

FL3X INTERFACE-PXIE & -PCIE - OVERVIEW

With the FL3X Interface family a highly variable automotive bus interface solution for Dataloggers and PCs, which supports the current and upcoming bus and network systems via pluggable physical layer modules and the usage of a FPGA.

The FL3X Interface-PCIe/PXIe is the middle class solution of the FL3X Interface Family in the PCIe form factor for usage in a Logger or Measurement PC. It can be used as a full functional Interface with writing and reading ability with our Driver for Linux, Windows or Xenomai.

The FL3X interface-PCIe/PXIe has one FPGA for the hosting of bussystems and five FL3X Tiny3 slots for pluggable transceivers which can provide FlexRay, CAN-HS/FD/SIC, LIN/SENT, 10 BASE-T1S, 100BASE-TX and 100/1000BASE-T1 channels. Because of its free mountable slots and the FPGA, it can be extended with any available or upcoming FL3X Tiny 3 and communication channel.

- PCIe/PXIe interface
- FL3X Tiny3 exchangeable Physical Layer slots
- 5x M9 connector
- 3,3 V DC, 5 V DC and 12 V DC compatible PXI power supply
- 3,3 V and 12 V DC compatible PCI power supply
- LEDs signal the state of the network

FL3X Interface-PXIe & –PCIe

PHYSICAL LAYER FL3X TINY3

You can use the following FL3X Tiny3 combinations out of the box. For other combinations feel free to contact us.

Slot 1	Slot 2	Slot 3	Slot 4	Slot 5
–	–	1x FlexRay	2x Ethernet* 100Mbit/s	2x CAN-HS/FD
–	–	2x CAN-HS/FD	2x CAN-HS/FD	2x CAN-HS/FD

*BASE-T1, BASE-TX and BASE-T

CAN-HS / CAN-FD

- Silent mode useable for listening without bus interference
- Transmit FIFO up to 512 messages
- Configurable TX-acknowledges
- Significant bus error messages

FLEXRAY

- Asynchronous monitoring mode allows listening without FlexRay synchronicity
- Combined asynchronous and synchronous monitoring mode (the procedure of a bus startup can be monitored and registered exactly)
- Configurable TX-acknowledges
- Network synchronicity will be reported immediately (with timestamp)
- Chronological correlation of bus messages with one timestamp base
- Extensive filter configuration available
- Significant bus error messages
- Triggering on the precise slot and cycle

ETHERNET

- FL3X Interface-PXIe/-PCIe with Ethernet will be detected as standard Ethernet interface
- Resolution of timestamp 1μs and 1ns possible (32/64bit)
- Access to the Ethernet packets by NDIS driver (raw sockets possible)
- Access to the data packets by FL3X Interface API
- Special WinPcap version allows access to the timestamps
- of the Ethernet packets
- External synchronization by trigger input possible

SCOPE OF DELIVERY

- FL3X Interface-PCIe or FL3X Interface-PXIe
- Documentation
- FL3X Interface API driver

ORDER INFORMATION FL3X INTERFACE-PXIE /-PCIE

Product	Description	Order number
FL3X Interface-PXIe	The FL3X Interface-PXIe is a PXIe bus interface card.	3-V0942A01
FL3X Interface-PCIe	The FL3X Interface-PCIe is a PCIe bus interface card.	3-V0952A01

ORDER INFORMATION ACCESSORY PARTS

Product	Description	Order number
FL3X Tiny3 2*10BASE-T1S	Pluggable transceiver module with two 10BASE-T1S transceivers	3-00882K01
FL3X Tiny3 2*1000BASE-T1	Pluggable transceiver module with two 1000BASE-T1 transceivers (88Q2112-A2-NYD2A000, Marvell)	3-00882H02
FL3X Tiny3 3*1000BASE-T1 switch MACsec	Pluggable transceiver module with three 1000BASE-T1 switch and MACsec support (88Q5152, Marvell)	3-00882J02
FL3X Tiny3 2*100BASE-T1	Pluggable transceiver module with two 100BASE-T1 transceivers (BCM89810A2AMLG, Broadcom)	3-00882C02
FL3X Tiny3 3*100BASE-T1 switch	Pluggable transceiver module with three 100BASE-T1 switch (BCM89500BQLEG, Broadcom)	3-00882D01
FL3X Tiny3 2*100BASE-TX switch	Pluggable transceiver module with two 100BASE-TX switch (88E6350RA1-TFJ2I000, Marvell)	3-00882B01
FL3X Tiny3 2*FlexRay	Pluggable transceiver module with two FlexRay transceivers (TJA1081BTS, NXP)	3-00880A01
FL3X Tiny3 4*CAN-FD/HS	Pluggable transceiver module with four CAN-FD/HS transceivers (MCP2562FD, Micrel)	3-00881G02
FL3X Tiny3 2*CAN-FD/HS	Pluggable transceiver module with two CAN-FD/HS transceivers (TJA1145T/FD, NXP)	3-00881E01
FL3X Tiny3 4*LIN/2*SENT	Pluggable transceiver module with four LIN (TJA1021T, NXP) and two SENT transceivers	3-00884A02
FL3X Tiny3 1*K-Line/1*UART/1*SPI	Pluggable transceiver module with one K-Line (TJA1021T, NXP), one UART and one SPI transceivers	3-00884B01
BusCable 200 8M9m 9SUBDf CAN&FR	1. End: 8-pole M9 male connector, type 712 2. End: 9-pole SubD female connector Length: approx. 2 m	3-00341J02
BusCable 2Way 200 8M9m 9SUBDf CAN&FR	1. End: 8-pole M9 male connector, type 712 2. End: 2 x 9-pole SubD female connector Length: approx. 2 m	3-00341L02
BusCable 200 8M9m 9SUBDf OABR	1. End: 8-pole M9 male connector, type 712 2. End: 9-pole SubD female connector (Pin 1,2/4,5) Length: approx. 2 m	3-00342P01
BusCable 2Way 200 8M9m 9SUBDf OABR	1. End: 8-pole M9 male connector, type 712 2. End: 2 x 9-pole SubD female connector (Pin 4,5) Length: approx. 2 m	3-00342Q01