



# FL3X Device-L²

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## BENEFITS

- 5 bus connectors that can be allocated flexibly via pluggable transceivers
  - 2-6 bus interfaces on each bus connector
- The following maximum interfaces\* can be reached:
  - 8 FlexRay controllers (8 Bosch E-Ray Cores)
  - 10 FlexRay channels
  - 20 CAN-FD / CAN-HS
  - 10 Standard Ethernet (100BASE-TX)
  - 7 Automotive Ethernet (1000BASE-T1, 100BASE-T1)
  - 30 SENT/ LIN
- 2 ARM Cortex A9 Dual Core (800 MHz) with 2 GByte DDR3 RAM
- Integrated WiFi and Bluetooth module
- Wake-up/sleep mode support
- Startup <200 ms
- Temperature range - 40°C to + 85°C

\*Depending on the combination of the pluggable transceiver and available FPGA-Images

## FL3X DEVICE-L² – THE MULTIFUNCTIONAL BUS CONTROL UNIT

FL3X Device-L² is the flagship of the FL3X Device product range, which is used and recognized by many car manufacturers and component suppliers in their automotive electronics development. The FL3X Device family provides manifold solutions for:

- gateways between different automotive bus systems
- bus interfaces
- remaining bus simulation
- signal manipulation
- data logging
- rapid prototyping

The multifunctional bus control unit FL3X Device-L² supports the current and upcoming bus systems and has numerous variable interfaces, thus covering most of the application fields where bus interfaces are required. This device is appreciated by embedded software developers since it facilitates the implementation and testing of even very tricky gateway applications and prototyping functionalities.

Together with the comprehensive FL3X Config software, the developers are enabled to set up and control their bus systems and ECU environment in a smart way.

## TECHNICAL FEATURES

- 2 Altera Cyclone V SOC (integrated ARM Cortex A9 Dual Core CPU)
- 2 GByte DDR3 RAM
- 5 bus connectors that can be allocated flexibly via pluggable transceivers
- 2-6 bus interfaces on each bus connector
- Up to 8 FlexRay controllers (8 Bosch E-Ray Cores)
- Up to 10 FlexRay channels (5 channel A and 5 channel B) available on the bus connectors
- In any case, 2 FlexRay cores can be connected internally (SelfSync)
- Up to 20 CAN-HS bus interfaces
- Up to 20 CAN-FD bus interfaces
- Wake-up/sleep support (wake-up possible via FlexRay or CAN)
- Up to 10 100 Mbit/s Ethernet bus interfaces
- Up to 10 100BASE-T1 bus interfaces
- 1 Gbit/s Ethernet configuration interface
- Integrated 1 Gbit/s Ethernet switch
- One internal and one external Micro SD card slot
- 4 digital inputs or outputs (DIO)
- 5 analog or digital inputs (ADI)
- Integrated WiFi module (b/n/g)
- Integrated Bluetooth module (4.2 BR/EDR BLE dual mode controller)

## SOFTWARE SUPPORT

- The device is supported by FL3X Config starting with version 5.0.

## HARDWARE

### Electrical characteristics

Supply voltage	8-42 VDC
Supply current (Sleep Mode)	<5 mA (@ 12 V)
Supply current (Operation Mode)	<600 mA (@ 12 V)

### Physical characteristics

Power	Binder series 702/712 - 2pol.
DIO, ADI	Binder series 702/712 - 7pol.
Ethernet, Con 1-5	Binder series 702/712 - 8pol.
Weight approx.	975 g
Dimensions L x W x H	241 x 124 x 36 mm

### Environmental conditions

Temperature	Operating/Storage: -40°C to +85°C
IP-Code	IP20*
Relative humidity	Operating/Storage: 0 % to 90 % RH, condensing

\*IP67 on request

## SCOPE OF DELIVERY

- FL3X Device-L²
- Documentation

## ORDER INFORMATION FL3X DEVICE-L²

Product	Description	Order number
FL3X Device-L²	The FL3X Device-L² is a multifunctional autonomous bus system platform.	3-V0870S03

## ORDER INFORMATION ACCESSORIES

Product	Description	Order number
FL3X Config Standard Runtime 1 year	Standard Runtime license for 1 year. Required once per device.	3-01142A01
FL3X Config Extended Runtime 1 year	Extended Runtime license for 1 year. Required once per device.	3-01142H01
FL3X Tiny3 2*100BASE-T1	Pluggable transceiver module with two 100BASE-T1 transceivers (88Q2112-A2-NYD2A000, Marvell)	3-00882H02
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
PowerCable 200 2M9m 1BANm2	1. End: 2-pole M9 male connector type 712 2. End: 2 x banana connectors (black/red) Length: approx. 2 m	3-00341D02
ConfigCable 200 8M9m 8RJ45m	1. End: 8-pole M9 male connector, type 712 2. End: 8-pole RJ45 connector Length: approx. 2 m	3-00342L01
BusCable 200 8M9m 9SUBDf UNIVERSAL	1. End: 8-pole M9 male connector, type 712 2. End: 9-pole SubD female connector Length: approx. 2 m	3-00342Z01
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 4Way 200 8M9m 9SUBDf CAN&FR	1. End: 8-pole M9 male connector, type 712 2. End: 4 x 9-pole SubD female connector (Pin2,7) Length: approx. 2 m	3-00342S01
BusCable 200 8M9m 9SUBDf OABR	1. End: 8-pole M9 male connector, type 712 2. End: 9-pole SubD female connector 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 Length: approx. 2 m	3-00342Q01
IOcable 200 7M9m 9SUBDf	1. End: 7-pole M9 male connector, type 712 2. End: 9-pole SubD female connector Length: approx. 2 m	3-00341F02
BusCable 3Way 200 8M9m 9SUBDf OABR	1. End: 8-pole M9 male connector, type 712 2. End: 3 x 9-pole SubD female connector Length: approx. 2 m	3-00342O01
BusCable 2Way 200 8M9m 8RJ45m ETH	1. End: 8-pole M9 male connector, type 712 2. End: 8-pole RJ45 connector Length: approx. 2 m	3-00342M01
BusCable 100 8M9m 9SUBDf CAN&FR	1. End: 8-pole M9 male connector, type 712 2. End: 9-pole SubD female connector Length: approx. 1 m	3-00342J01