

# neoVI FIRE 3 FlexRay

## The Most Advanced FlexRay Vehicle Interface, Gateway and Data Logger with CAN FD & LIN

### Vehicle Network Interface for FlexRay plus Data Logging System with CAN FD and LIN

2x FlexRay, 15x CAN FD, 4x LIN, 3x Ethernet Interfaces

The neoVI FIRE 3 FlexRay device is specially designed to add FlexRay, CAN FD, LIN and 100BASE-TX Ethernet to your application. The neoVI FIRE 3 FlexRay enables quick setup and monitoring of two FlexRay network pairs. In addition, it includes two complete FlexRay nodes, each with channel A and B physical layers, making neoVI the most advanced multi protocol vehicle network interface and data logger available.

The neoVI Fire 3 FlexRay includes 2x FlexRay, 15x CAN FD networks, up to 4x LIN networks, 2x 1Gb 10/100/1000BASE-T, 1x 10/100BASE-Tx. All networks run simultaneously and are hardware time-stamped. A fully-isolated high-speed ethernet interface allows messages to be sent and received without risk of damage to the networks or your computer.

### Features

- 2x FlexRay channels
  - Configurable for 1A± / 1B± (1 four wire) or 1A± / 2A± (2 two wire)
  - Selectable on-board termination between 100 ohms, 2.5 kohm, or no termination
  - Tx and Rx capable
- FlexRay Cold Start (Optional)
- 15x DW CAN / CAN FD channels (2x switchable\*)
- 15x Software enabled CAN termination
- 4x LIN channels
- 2x SW CAN\*
- 2x LSFT CAN\*
- 2x DoIP activation line
- 2x 1 Gb 10/100/1000BASE-T, 1x 10/100BASE-Tx for use with DoIP, XCPoE and more



- 2x Full-size SD card slots. SD 3.0 compatible and supporting up to 2 terabytes of total storage. Up to 800 Mbps logging performance. (1x 32 GB SD card included standard)
- 4x General Purpose MISC IO
- Real Time Clock for hardware timestamping of all messages and backup at 25ns
- Internal dual-band 802.11a/b/g/n Wifi with software selectable internal or external antenna
- 10x Programmable tri-color LEDs show link, error, and activity status
- Membrane buttons built into device case can be programmed to trigger data logs or other events
- 6 DOF IMU (accelerometer and gyroscope)
- Internal extended temperature battery for safe shutdown
- High precision GPS with external GPS antenna
- Device uses mTLS for secure communication with wireless neoVI cloud
- Buzzer

### Features Available in Future

- 1x USB Type-A connector for accessories such as RAD-IO2 or neoVI MIC2 manual trigger
- 4x General Purpose MISC IO



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- Instant wake on 2 CAN FD channels
- Intrepid Security Module provides hardware cybersecurity and embedded C Code capability
- Generalized Precision Timing Protocol (gPTP)
- HD video recording via IP Cameras
  - Supports AXIS P-Series and F-Series cameras
  - Supports HD cameras @ 720p and up to 30 FPS
- Up to 4 terabytes of storage with 2x 2 TB SD Cards
- External modem support (RAD-4G)

## Applications Fire 3 FlexRay - Connections

- Vehicle network tool
- Standalone data logger
- Wireless data logger with auto-download via WiFi or Ethernet
- Standalone ECU or vehicle simulator
- In-Vehicle data acquisition system
- Captive test fleet data collection
- Fleet management
- Vehicle pass-through interface support with J2534 and RP1210 (GM DPS, GM SPS, Ford DET, DiagRA, Chrysler CDA, etc.)

## Benefits

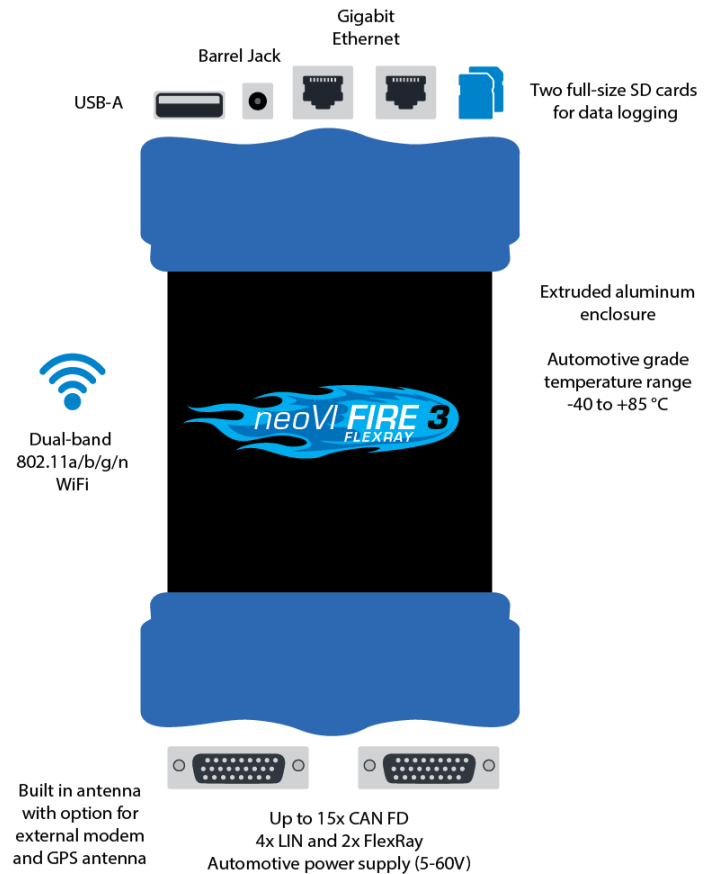
- Interact with the Bosch ERAY FlexRay core using Windows development tools such as Microsoft Visual Studio
- Develop FlexRay / handler ECU code on the PC
- Reconfigure FlexRay networks without using device programmers

## Configuration using neoVI Explorer

The FlexRay VNETZ has two dual-channel FlexRay nodes. The user can select whether the second FlexRay Physical layer is 1B or 2A in neoVI Explorer. There are five configurations the user may select: Single Channel Network (1A), Dual-Channel Network (1A, 1B), Two Single-Channel Networks (1A, 2A), Cold Start and Disable. In addition users can select 100 ohm, 2.6 kohm or none for termination on each network.

## Software Support

Create Your Application Using the Included Intrepid DLL API, J2534 API, RP1210 API, libicsneo Open Source API or SocketCAN kernel. For those who wish to write their own applications, the ValueCAN 4 includes a DLL and helpful examples for Python, Visual C++ and Visual Basic.



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## Standalone Logging, Scripting, and Simulation

In addition to working as a vehicle network adapter, the neoVI Fire 3 can also operate in standalone mode. It can run real-time scripts, log data to two removable full-size SD cards, and simulate ECUs and gateways -- all simultaneously! It is also possible to run a script to reflash ECUs standalone, without a computer, using data from the SD card.

The neoVI Fire 3 is capable of logging to two full-size SD cards, using real-time, fail-safe FAT32 storage for reliability and PC compatibility.

The neoVI Fire 3 also has a real-time clock for hardware timestamping of all messages. A robust power management system automatically powers down the neoVI Fire 3 and it wakes up again based on network activity or the connection of a PC.

## The Power of Scripting – CoreMini

If you need to support a proprietary protocol, set up a simulation to run in parallel with the data logger, or any other custom action, the CoreMini scripting environment allows for you to expand the base functionality to fit your unique needs. This makes the entire system very flexible and adaptable.

## Remote Connectivity and Location Services

The neoVI Fire 3 provides several ways of connecting remotely: external 4G data modem (RAD-4G), onboard dual-band 802.11a/b/g/n WiFi. In addition, the neoVI Fire 3 has a 10 Hz GPS accurate to within 2.5 meters. GPS is provided both as a fleet management tool and within the data logging session for correlating location to your test data.

## Pinout

### HD26-1

1	MISC 1
2	DW CAN 4 L
3	DW CAN 5 L
4	DW CAN 1 L
5	DW CAN 8 L
6	DW CAN 2 L
7	DW CAN 3 L
8	DW CAN 6 L
9	MISC 2
10	GND
11	MISC 3
12	DW CAN 4 H
13	DW CAN 5 H
14	DW CAN 1 H
15	DW CAN 8 H
16	DW CAN 2 H
17	DW CAN 3 H
18	DW CAN 6 H
19	BAT
23	MISC 4
21	DW CAN 7 L
22	LIN 01 / ISO K 01
23	LIN 02
24	EXT WAKE
25	ETH 01 ACTIVATE
26	DW CAN 7 H

### HD26-2

1	ETH 03 TX+
2	DW CAN 12 L
3	DW CAN 13 L
4	DW CAN 9 L
5	DW CAN 15 L
6	DW CAN 10 L
7	DW CAN 11 L
8	DW CAN 14 L
9	ETH 03 TX-
10	GND
11	ETH 03 RX+
12	DW CAN 12 H
13	DW CAN 13 H
14	DW CAN 09 H
15	DW CAN 15 H
16	DW CAN 10 H
17	DW CAN 11 H
18	DW CAN 14 H
19	VBAT
20	ETH 03 RX-
21	FLEXRAY 1A+
22	FLEXRAY 1A-
23	FLEXRAY 1B/2A+
24	FLEXRAY 1B/2A-
25	ETH 03 ACTIVATE / LIN 04
26	LIN 03

## Antenna

1	WI-FI
2	NC
3	GPS
4	WI-FI DIVERSITY



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## Protocol Support

- OBD
- J1939: Includes J1939 DBC, BAM, RTS/CTS
- UDS (ISO 14229):
  - Services include \$19, \$22, \$23, \$2A, \$2C
  - DBC, A2L (ASAP2 File), GDY, MDX, ODX support
  - CCP: Includes A2L (ASAP2 file) and ROB support
  - XCP: Includes A2L (ASAP2 file) and ROB support

## Networks / Inputs

- 2x FlexRay configurable for 1A± / 1B± (1 four wire) or 1A± / 2A± (2 two wire)
- 15 x Dual wire CAN (all baud rates supported)
  - 15x Dedicated Classical CAN / CAN FD
  - 2x switchable to SW CAN, LSFT CAN, or LIN
- 4x LIN / K Line / KW2K / ISO 9141
  - 6x Dedicated LIN
  - 2x switchable to SW CAN, LSFT CAN, or LIN
- 3x Ethernet Interfaces
  - 2x RJ-45s available directly on the neoVI Fire 3 body
  - 1x RJ-45 port additionally available when utilizing provided adapter cable

## Device Specifications

- Low power consumption
- Comatose: 500 microamps
- Fast wake: 70 milliamps
- Power supply: 5-60V operation
- LEDs: 10 programmable tri-color LEDs
- 2 LEDs for legacy status; 2 user buttons
- Temperature range: -40°C to +85°C
- On-board UPS for safe shutdown of data logger
- Dimensions: 13.60cm by 11.22cm by 3.97cm
- LEDs (user programmable): 10 programmable tri-color LEDs
- SD card: 2 card slot support for up to 2 TB of storage; card formatted using FAT32 for PC compatibility
- DAQ Ethernet
- Vehicle connectors: 26-pin male HD D-sub
- One-year limited warranty
- Field-upgradeable flash firmware

- General purpose I/O: 4 MISC IO (0-40V); can be configured as analog/PWM IO
- General purpose I/O rate report interval: 10 Hz to 1 kHz; or based on digital change
- USB host for RAD-IO2 or neoVI MIC2
- Standalone mode for use in scripting, receiving messages, transmitting messages, expressions, I/O and transport layers J2534 and RP1210 A/B compatible for CAN / ISO15765-2:2016 (CAN FD)
- Battery-backed real-time clock (RTC)

## Timing Specifications

- 64-bit timestamping to an accuracy of 25 nanoseconds on all networks
- Simultaneous operation on all CAN/LIN networks
- Transmit message double-buffering on all networks, allowing back-to-back message transmission

## Network Specifications – CAN

- 15 x ISO CAN FD channels
- CAN 2.0B compatible for all CAN networks
- 15 dedicated ISO 11898 Dual Wire CAN FD physical layers (TJA1043)
- LSFT CAN mode: 2 Low Speed Fault Tolerant CAN physical layers (TJA1055)
- SW CAN mode: 2 Single Wire CAN physical layers GMW3089 / SAE J2411(MC33897)
- Up to 1 Mb/s software-selectable baud rate for arbitration phase (auto baud capable)
- Up to 8 Mb/s software-selectable baud rate for data phase (auto baud capable)
- Listen-only mode support

## Network Specifications – LIN / K Line / KW2K / ISO 9141

- Up to 4x LIN (Local Interconnect Network)
- Full support for LIN 1.X, 2.X and J2602
- LIN J2602 / 2.X compatible physical layer
- Software-enabled 1K LIN Master Resistor per channel
- LIN Bus Monitor Mode identifies errors: Sync Break Error State and Length, Sync Wave Error, Message ID parity, TFrameMax/ Slave Not Responding, Checksum Error and Transmit Bit Errors
- LIN Bus Master Mode operates at same time as LIN Bus Monitor
- LIN Bus Slave simulation, with or without an LDF file
- LIN Bus hardware schedule table with support for LIN diagnostics
- Initialization Waveforms, including Fast Init, Five Baud, and Custom Software-selectable baud rate

## Ordering Information

Part Number	Description
neoVI-Fire3-fr	neoVI Fire 3 FlexRay channel with CAN and LIN

Specifications subject to change; please contact Intrepid for the latest information. All trademarks are the property of their respective owners.

\* Two configurable channels can be configured to support a choice of SW CAN, LSFT CAN, LIN, or DoIP activation

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