



# basicFlexScope 3095

FlexRay Bus Analysis and Validation Tool



**basicFlexScope 3095** is a powerful bus analysis and validation tool for FlexRay networks and combines four functions in one device. In addition to a **bus analyser**, a **bus simulator**, and an **oscilloscope trigger** a **fault simulator** is also included. All functions can be simply and comfortably operated centrally via the included user software **FlexScope Control Center**.

Similar to a logic analyser, the bus data is sampled, and the entire FlexRay frame including frame reader, CRC checksums and data bits are recorded and checked for errors.

basicFlexScope 3095 is connected to the host PC system via a fast ethernet interface. The FlexRay bus is contacted by means of two nine-pin D-sub connectors and a BNC connector provides the trigger signal for the oscilloscope.



Communication protocol FlexRay 2.1

### Bus Analyser

- » Signal analysis directly of the bus via the bus driver
- » No signal delay or change through a communication controller
- » Protocol: FlexRay 10 Mbit/s  
Sampling: 100 MHz
- » Analysis: time stamp, frame ID, zero-frame, sync-frame, cycle-counter, payload, CRC
- » Display: raw data monitor and graphical display of signal values

### Bus Simulator

- » Offline definition of frames and sending time
- » Bus simulator is bus master (Sync Node)
- » Simulation: timing and format errors, CRC errors, signal errors (field error)
- » Resolution: 1/10 bit width  
(10 ns @ 10 Mbit/s)
- » Repeatability: 100%, because bus simulator always simulates the predefined frame sequence with the same time slot

### Oscilloscope Trigger

- » Signal pick-up directly on bus lane
- » Trigger functions: frame ID, cycle ID, glitch, payload length, frame type, zero/sync frame
- » Oscilloscope: each oscilloscope with external trigger input and  $\geq 100$  ms/s (recommended)

### Fault Simulator

- » Injection of predefined fault frames by direct bus lane switching
- » Simulated errors: frame faults in the time domain, bit and logic faults in the bit transmission layer
- » Accuracy: 1/10 bit width  
(10 ns at 10 Mbit/s)

Features

### Bus Analyser

The integrated bus analyser samples the FlexRay bus with ten times data rate allowing high-precision time stamps with an accuracy of  $< 20 \mu\text{s}$ . Working without a FlexRay communication controller enables basicFlexScope 3095 to analyse faults where the FlexRay controller under test switches to POC:halt (offline mode).

### Bus Simulator

The bus simulator can send predefined messages of arbitrary content which are deposited for every slot or cycle separately. This gives the opportunity to send faulty messages and analyse the behaviour of the complete FlexRay cluster under fault conditions.

### Oscilloscope Trigger

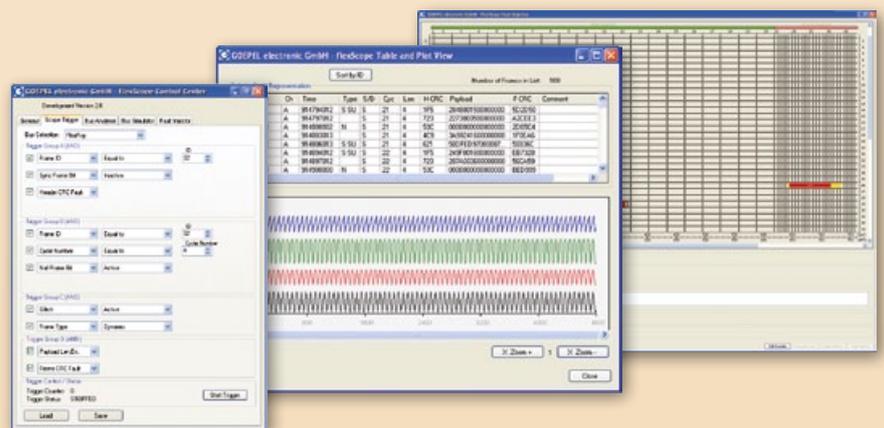
basicFlexScope 3095 has a trigger unit enabling the synchronisation of an external device to one or more complex trigger conditions, e.g. a standard oscilloscope without the requirement for additional hardware or software.

### Fault Simulator

basicFlexScope 3095 offers fault simulation by an integrated fault simulator which can replace arbitrary FlexRay frames by predefined fault frames. Here sending time (negative sending times as well) and message content are freely definable. Thus different FlexRay specific faults (e.g. late and early frames as well as short and long frames) can be generated.

### Application Software

basicFlexScope 3095 can be fast and easily parametrised and operated by means of the included **FlexScope Control Center** software. In addition to many features the software provides the opportunity to visualise messages and signal variations.



ISO 9001 certified

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