

# BusScope

## Test- and Simulation Platform

### GENERAL-PURPOSE TEST- AND SIMULATION PLATFORM FOR FLEXRAY

The BusScope is a general-purpose Test- and Simulation platform for FlexRay. Since it uses no dedicated communication controller for bus analysis and bus simulation, it can achieve high precision timing measurements ( $< 20\text{ns}$ ) and fine value resolution (1/10 bit length @ 10 MBit/s). Similarly for bus simulation the same precision can be archived, making BusScope highly suitable for timing and frame format test applications. Since no communication controller is used in the BusScope, no controller setup and no software, such as hardware driver and communication software layers, are necessary.

The BusScope consists of a programmable logic and a fast microcontroller for the communication with the host computer. Updates in the FlexRay protocol can be handled by simple updates of firm- and software. The hardware of the BusScope is not affected by updates, except the hardware necessary for the bus driver logic.



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### TECHNICAL SPECIFICATIONS

- Oscilloscope Trigger:
- ▶ Signal tap: directly on the bus line
  - ▶ Protocol: FlexRay 10 Mbit/s (CAN and LIN planned)
  - ▶ Trigger: Frame ID, Cycle ID, Glitch, Payload Length, Frame Type, Null/Sync Frame
  - ▶ Every Oscilloscope with external trigger input and suitable bandwidth can be used.
- Bus Analyzer:
- ▶ Direct Analysis of the bus line signal. No delay or signal changes introduced by a communication controller.
  - ▶ Protocol: FlexRay 10 Mbit/s (CAN and LIN planned)
  - ▶ Sampling rate: 100 MHz
  - ▶ Analysis: Time stamp, Frame ID, Null Frame, Sync Frame
  - ▶ Display: Tabular and graphical plot
  - ▶ Time stamp: Accuracy < 20 ns
- Bus Simulator:
- ▶ Offline definition of the frame format, the frame content and the transmission time point.
  - ▶ The Bus Simulator is the bus master (provides the sync frames).
  - ▶ Protocol: FlexRay 10 Mbit/s (CAN and LIN planned)
  - ▶ Simulation: Every timing and frame format fault, e.g.: CRC faults
  - ▶ Resolution: 1/10 bit width (10 ns @ 10 MHz bit rate)
- Repeatability:
- ▶ 100% because the Bus Simulator runs always the same predefined signal pattern at the same transmission time
- Software:
- ▶ Comfortable and fast setup of the BusScope via a comprehensive GUI.
  - ▶ Scope Trigger: Trigger setup of single events or group events (AND, OR)
  - ▶ Bus Analyser: Tabular and graphical display of the frame data
  - ▶ Bus Simulator: Setup of the frames down to 1/10 of a bit width
- Miscellaneous:
- ▶ Processor: ARM Mikrocontroller
  - ▶ Power Supply: 8 .. 30 Volt

### CONTACT

AIT Austrian Institute of Technology  
Safety & Security Department  
Donau-City-Straße 1, 1220 Vienna

#### DI (FH) ERWIN KRISTEN

Safe and Autonomous Systems  
Phone: +43(0) 50550 - 4122  
Fax: +43(0) 50550 - 4150  
E-mail: [erwin.kristen@ait.ac.at](mailto:erwin.kristen@ait.ac.at)  
Web: [www.ait.ac.at/safety\\_security](http://www.ait.ac.at/safety_security)

#### DR. MANFRED GRUBER

Head of Safe and Autonomous Systems  
Phone: +43(0) 50550 - 4183  
Fax: +43(0) 50550 - 4150  
E-mail: [manfred.gruber@ait.ac.at](mailto:manfred.gruber@ait.ac.at)  
Web: [www.ait.ac.at/safety\\_security](http://www.ait.ac.at/safety_security)