

EMCtools

Fiber optic transceiver Microbox

FlexRay, CAN-FD, High Speed CAN,
Low Speed CAN, LIN, K-Line,
Low Speed Single Wire CAN,
J1850, J1708, SENT, RS232



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EMCtools – lab life made easy

Introduction and use

Functional tests e.g. in test-labs often require insulated FlexRay, CAN- (Controller Area Network) and LIN-busses (Local Interconnect Network) to control the device under test. For this purpose special transceivers are available. They allow bidirectional data transmission of signals via fiber optic cables and can be used during susceptibility tests at high field strength. Quite often these transceivers use enhanced filtering at the electrical bus connectors. This filtering affects signals and may have major effect on emission tests.

Our *EMCtools* Microbox was designed for emission and susceptibility tests. Using multilayer technology and sophisticated circuit design full CAN/LIN compliance and the ability to perform tests at electromagnetic fields of 270V/m and above could be achieved. The handy plastic housing allows tests with limited test space.

The *EMCtools* Microbox uses standard multimode fiber optic cables and allows direct connection to the electric bus (e.g. CAN-/LIN-Cab) via SUB-D female connectors.

In combination with a second Microbox or one channel of our *EMCtools* Canbox a complete optical CAN/LIN-bus connection can easily be arranged.

It is possible to build mixed CAN/LIN-bus lines with other fiber optic CAN/LIN transceiver products as described in "compatibility" in technical data below.

Versions

EMCtools provides different Microbox versions:

1. EMCtools Microbox FlexRay
2. EMCtools Microbox CAN FD (Flexible Datarate)
3. EMCtools Microbox High Speed CAN
4. EMCtools Microbox Low Speed CAN
5. EMCtools Microbox Low Speed Single Wire CAN
6. EMCtools Microbox LIN
7. EMCtools Microbox K-Line (can also be used for L-Line)
8. EMCtools Microbox J1850 (class B – single wire, VPW)
9. EMCtools Microbox J1708
10. EMCtools Microbox SENT

Technical data

max. Bitrate:	Flexray:	10Mbit/s
	CAN FD	max. 1 MBit/s (standard CAN) CAN FD (flexible datarate) max. 10 MBit/s
	HS-CAN:	max. 1 MBit/s (standard CAN) CAN FD (flexible datarate) max. 2 MBit/s
	LS-CAN:	125 kBit/s
	SW LS-CAN:	33 kbit as per J2411 / 100kBis/s in High Speed mode
	LIN:	20 kBit/s
	K-Line:	10,4 kbit/s
	J1850:	10,4 kbit/s
	J1708:	9.6 kBit/s
	SENT:	30 kBit/s - unidirectional
signal delay:	HS-CAN: typ. 220ns - complete Setup:	2 x Microbox TJA1044GTJ, 10m fiber optic cable
	CAN FD: typ. 195ns - complete Setup:	2 x Microbox TJA1044GTJ, 10m fiber optic cable
power supply:	9 – 15V DC, 50mA	
fiber optic:	F-SMA, standard multimode optical fiber 62,5/125µm or 50/125µm	
	optional: F-ST connector	
bus-connector:	9-pin Sub-D	
bus options setting by jumpers:		
	FlexRay:	termination - infinite, 90R
	HS-CAN /FD:	termination - infinite, 120R, 60R, common mode stabilization network
	LS-CAN:	termination - 1k, 560R, 390R, 300R, 120R, 100R
	LS SW-CAN:	termination - 9k1, 3k9, 1k8, 1k, 800R, 270R
	LIN:	LIN-master (pull-up 1kOhm) or LIN-slave (no pull-up) and bus capacitor 1nF/220pF
	K-Line:	510Ω pull up, Bus capacitor 470pf – 8,4nF selectable in steps
	J1850-bus:	bus load - additional 1 primary node, 1 – 36 secondary nodes selectable in steps
	SENT:	Available Input Voltage Threshold V_{IH} : 3.7V, 3.4V, 2.9V, 2.5V, 2.0V (+/- 5%)
ambient temperature:	storage/operation: -40°C – 85°C (-40 - 185 °F)	