


<b>Report</b>			 <b>ELEKTRONIK GMBH</b>
MCD Elektronik GmbH Hoheneichstr. 52 – 75217 Birkenfeld Tel. +49-7231 78405-0 – Fax: +49-7231 78405-10 Managing Director: Bruno Hörter	Release Date: 29.03.2018	Page 1 von 6	
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<b>For immediate publication</b>	Queries to: Verena Hörter, Verena.Hoerter@mcd-elektronik.de		


## Controlled Stress

### Examination of Infotainment Systems

When operating RunIn- and screening test systems, it is often to examine many similar devices. The samples are addressed and stimulated simultaneously through CAN, LIN, RS-232 or I<sup>2</sup>C. In addition, audio signals in infotainment systems must be permanently monitored and currents and voltages under different stress conditions must be monitored and documented as well. Usually appropriate hardware is very complex and expensive but due to this flexible system that can be changed now.

The fact that all the devices have to be tested, in this case with a CAN or LIN configuration, makes it impossible to use a common bus for all devices to be tested simultaneously. The use of many standardized CAN / LIN Bus interfaces or other bus interfaces can be quite expensive and when carrying out concurrent or simultaneous tests of many samples, it would not make sense to implement, from a technical perspective. Multiplexing of the bus signals is complicated and due to the given timing requirements and cycle times, which lie in the milli-second range, it is not implemented.

With the "Screening Box" MCD wants an alternative to the above approaches (see picture 1). Such devices, 40 mm wide, can be lined up on a DIN rail where the voltage- and bus-supply by the DIN rail Bus connector (RS-485) is carried out. Through its USB interface, all screening boxes are accessible per Din rail. This interface takes place in both the parameterization of the boxes and transferring the data to MCD's "TestManager". This system plays a supporting role in many of the manufacturer projects, because it already supports the preparation and execution of the tests in the planning phase. The application engineers can therefore perform the tests with a sample at their desk and qualify. Due to the scalable application of the test, it is then easily transferred to the required number of samples.

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## The Core of the Box


Two CAN interfaces with both low-speed and high-speed transceivers provide 11-bit and 29-bit support. The LIN interface is designed for master and slave operation as well as remote software controllable scheduling. Both RS-232 and RS-485 interfaces are available to control the sample. Out of eight digital outputs, two are PWM capable up to 10 kHz switching frequency and 10 bit resolution. The threshold voltage of the eight digital inputs is programmable in the range of 0 V to 30 V; on two inputs one can perform frequency measurements up to 200 kHz.

For the measurement of audio signals, there are four differential analog inputs (0-30 V), 12-bit resolution, supplemented by two analog outputs to 0 V to 10 V, load capacity up to a maximum of 10 mA, and 10 bit resolution. For indirect current measurement via shunts there is a differential input with a measuring range of 0 mV to 50 mV and a programmable gain.

LED's on the front indicate the operating status of the screening box. By a connectable HMI module with two-line LC display and rotary encoder, the test box can act as a stand-alone solution. A non-volatile memory on the module secures the adjustment parameters. All boxes can be configured synchronously via the USB interface. For de-coupling the samples of the measurement control, USB interfaces are electrically isolated. Through customized updates of the firmware, the boxes automatically customize to new tasks. Cyclic messages can be sent and received via the various bus systems.


## Practical Test

The first use of the newly developed screening boxes tested up to 48 Infotainment systems (Figure 2). Two sets of 24 test devices were thereby placed on mobile trolleys, and contacted via a mechanical device. The screening boxes automatically recognize an inserted, contacted DUT and start the test cycle independently. Each inserted infotainment system now

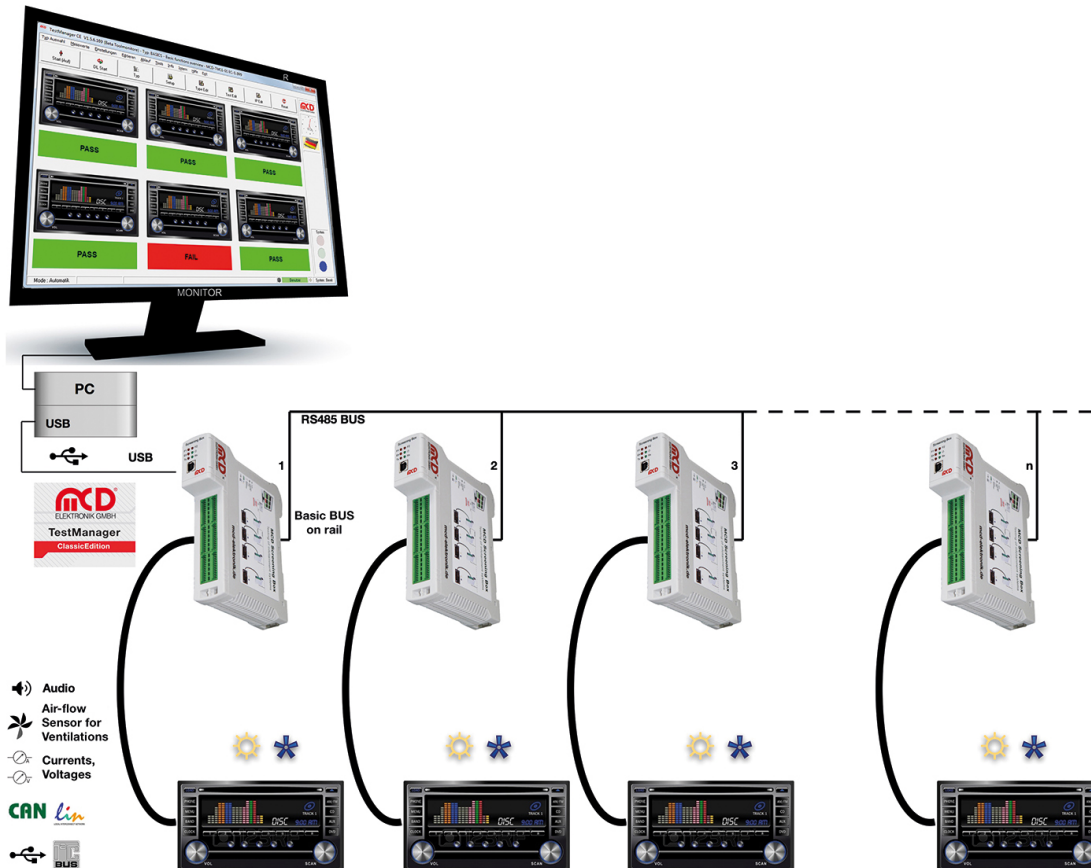
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goes through the testing process cyclically until the test time is reached. The measured values belonging to the sample are identified by a bar code and stored in a database. You can assign the temperature and the time, and the evaluation of the data is done via the "Data Manager", which already processes the incurred measurement data during testing and displays it statistically. During the test, the sample is cyclically supplied with the CAN Bus-sequences which are necessary for sustainability. The various stages of the device fans are reviewed and evaluated on air flow sensors. The recorded currents in the different operating modes are also recorded and checked. Here, particular emphasis is placed on the quiescent current of the sample, which hardly drains the battery of the vehicle when the vehicle is turned off. During operation, the audio signals of the sample are continuously tested and checked for errors. By using the newly developed box, the tasks were clearly distributed at the planning stage of the system. The control program "TestManager" handles the test sequence, the data of the screening boxes, assigns the samples and stores the values in a database. The entire run, independent from measurements in the screening boxes, also produce the cyclic signals for the CAN and LIN Buses.


The boxes are equipped with an interface to an optional HMI keypad panel, so that the units can also be used for control of EOL or manual function testers. The box is also suitable for use as a gateway for control units with many bus connections.

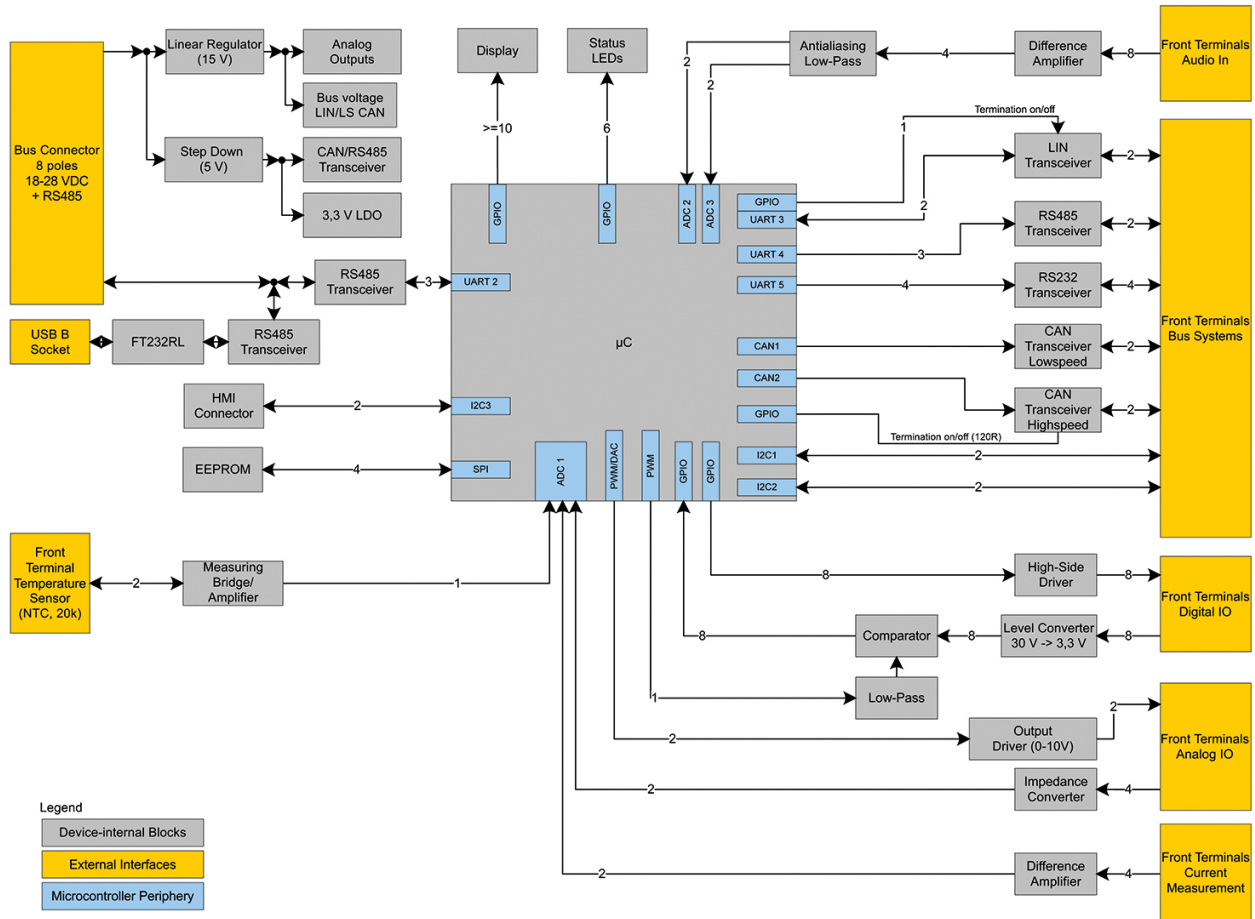
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Pictures:



Picture 1: MCD's slim Screening Boxes are the functional midpoint of RunIn- and Screening-Tests.

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Picture 2: The interface variety of MCD's „Screening Box“ allows various applications.


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### About MCD Elektronik GmbH:

MCD Elektronik GmbH was founded in 1983 and currently employs 80 people. The owner-managed company is headquartered in Birkenfeld, near Pforzheim, Germany. MCD Elektronik is active in Germany, Hungary, and China, and delivers to 48 countries around the world.

MCD Elektronik GmbH manufactures measurement and test systems for electronic production for their customers, who include OEMs and their

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suppliers in the automotive sector, companies in machine and systems design, medical technology, energy-electronics, quality technology, sensor manufacturing, and aerospace. The company relies on innovative customer-specific complete solutions - developed and realized by a team of highly qualified specialists.