

DC-BUS Test Environment

1. General

The DC-BUS Test environment allows testing the SIG60 devices in emulated operating environment in the lab. The powerline communication test environment setup is described in figure 1.

The test environment consists of two SIG60 evaluation boards (EVB), two SIG60-USB interfaces and PC test software. A DC-Line attenuator is an optional tool that attenuates the SIG60 signal according to the setting of its switches.

At the transmitting side, the SIG60-USB interface generates repeatedly a predefined test message [a b c ...x y z] saving the need for a second PC. The test message transferred to the SIG60 EVB that is then modulated over the powerline. When connected to a PC, the test software allows the user to generate its own message.

At the receiving side, the SIG60 EVB decoded messages from the powerline and transfers it to the SIG60-USB interface and to a PC. The DC-BUS test software receives these predefined messages, and perform BER statistic including error byte, miss byte, and noise byte counting indications. An optional DC-Line attenuator can be used for testing the communication in variable attenuation levels as in real powerline environment. When connecting the SIG60 directly to a power supply (figure 1a), it is recommended to add an inductor to avoid strong attenuation due to the power supply filtering capacitors.

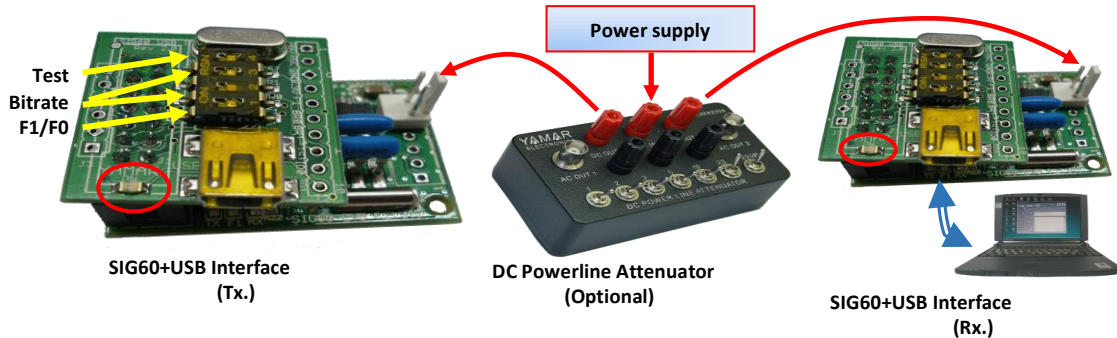


Figure 1 - DC-BUS Test Environment

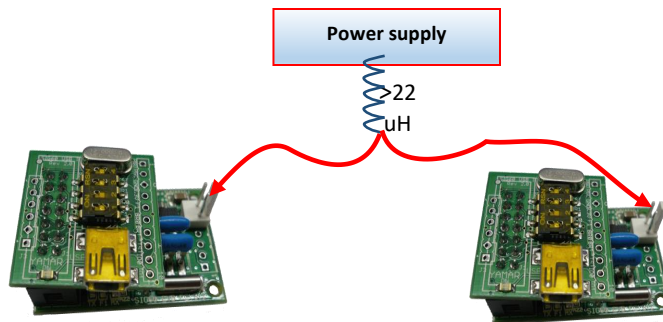


Figure 1a - DC-BUS Test Environment without DC Powerline attenuator

2. Setup Environment Building Blocks

2.1. DC-BUS Test Program

The software emulates a UART/LIN host, enabling the activation of message transmission and reception over DC power lines via the test environment. In the receiving side, the software checks the communication performance (Byte Error Rate).

The PC program interfaces with DC-BUS devices through its standard USB port. It is a primary tool for the evaluation, testing, and demonstration of the DC-BUS communication. Figure 2 shows the operation display of the test program. A dedicated SIG61 mode allows activation of the SIG61 evaluation boards and devices.

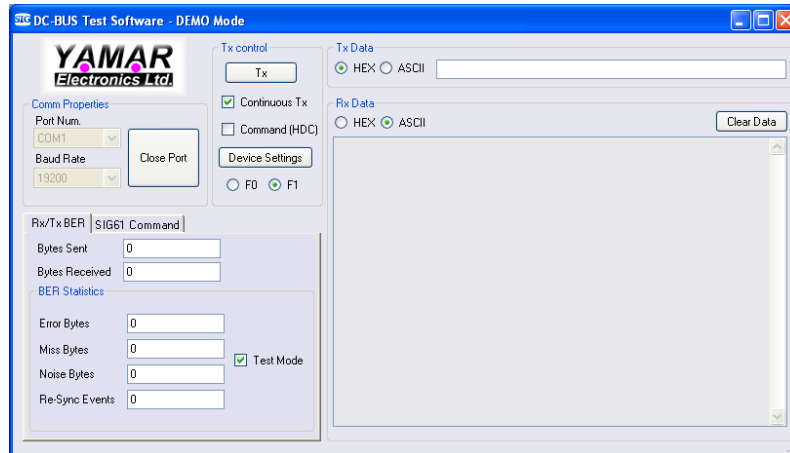


Figure 2 - The DC-BUS Test Program Display

2.2. DC-Line Attenuator

The DC-Line attenuator is used for testing communication performance over the powerline in the lab. The attenuator allows adding attenuation to the AC modulated signal over the battery power lines (DC-Lines) keeping the DC voltage level unchanged. Figure 3 shows the DC line Attenuator.



Figure 3 - DC-Line Attenuator

2.3. SIG60 Evaluation Boards

The SIG60 evaluation boards were designed to operate the SIG60 device in a system. Multiple SIG60 boards can communicate over a vehicle's DC power line using UART or LIN protocol. See <http://www.yamar.com/product/sig60-evb/>

2.4 SIG60 USB Interface

The SIG60-USB Interfaces the PC with the SIG60 evaluation board. The board is connected as a piggy bag on top of the SIG60 board. It allows control of the SIG60 evaluation boards via the PC software by adding the Break Sync at the beginning of a message.

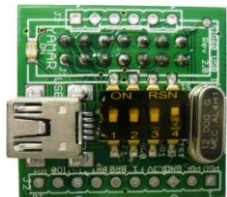


Figure 4 - SIG60EVB with USB Interface

2.5 SIG61 Evaluation Boards

The SIG61 operates as a standalone smart slave on the DC powerline network. The SIG61 has 8 digital inputs and 8 digital outputs. On board switches allow configuration of its bit rate, Id, operating frequency, etc. See <http://www.yamar.com/product/sig61-evb/>