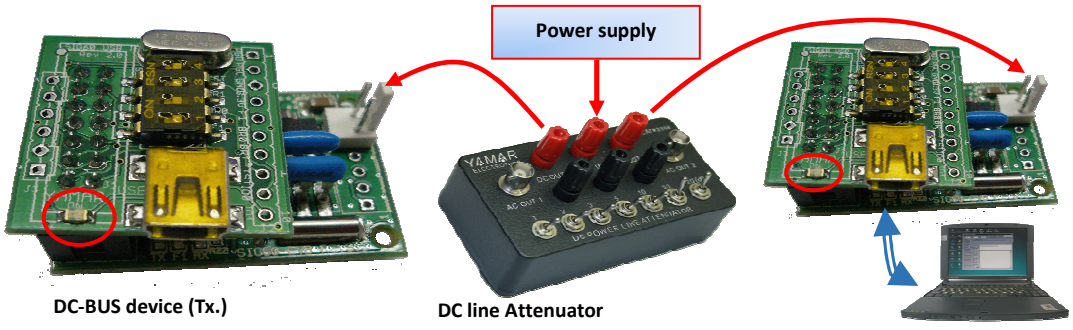
How to test Communication Performance over DC Power Line?

Communication performance over DC power lines (DC-BUS) depends mainly on the attenuation of the power lines in the frequency range of the devices used for communication. Each power line has its own attenuation. Testing DC-BUS devices on one power line does not guarantee the performance on other power lines. Therefore, Yamar developed a test environment for Lab use that provide close results to actual measurements as in real applications.

The communication performance is tested in a special test environment based on the experience gained during years of practical DC-BUS devices field and laboratory tests. The environment consists of two DC-BUS communication devices connected to a DC line attenuator. The DC-line Attenuator is a key element in the environment, providing measurable communication performance versus power line attenuation levels.

Test Environment description

In one side, a reference-transmitting DC-BUS device generates test messages; modulate it to high frequency signals that are conducted to the DC line attenuator. The DC line attenuator attenuates this signal according to the attention switches setting. On the other side, the receiving device under test demodulate the signals to real data. PC software compare the Tx and Rx messages and detects and count communication errors.



DC-power line attenuator description

The attenuator consist of a DC path to provide DC power to both devices, while another AC path attenuates the modulated signal generating by the transmitting device according to the setting of the attenuator switches. The performance is the maximal attenuation that the devices still communicate with BER better than 10E-5. For further information, see the DC-line Attenuator page.

Conclusion

This environment saves many hours of field tests during DC-BUS system development as well as a QC of products using DC-BUS.

Different types of DC-BUS devices are available for such communication. Depending on the communication speed, the used frequencies ranging from 100KHz to 30MHz.