Oscilloscope CAN XL Protocol Introduction and Decoding Test

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1 Introduction

As data communication in automotive and industrial applications grows, the traditional CAN protocol can no longer meet the higher data rate requirements. The traditional CAN protocol has limitations in data rate and bus load capacity, making it difficult to meet high-bandwidth and high-real-time application scenarios. To address this, CAN XL (Controller Area Network eXtended Large), the third-generation CAN protocol, emerges. CAN XL achieves a data transmission rate of up to 20 Mbit/s at the physical layer, and the single frame data length is extended to a 2048 byte data field, significantly improving communication efficiency. Mapping Ethernet frames to CAN XL frames and integrating them into the Ethernet environment can adapt to higher data transmission rates and more complex application scenarios.

2 CAN XL protocol

Since its introduction in 1986, the CAN protocol has been widely used in the automotive industry, and has gradually evolved into three generations of protocols: CAN 2.0, CAN FD and CAN XL. According to the ISO OSI layer model, CAN applications usually cover the physical layer, data link layer and application layer. Figure 1 shows the typical architecture of the bottom layer of the CAN protocol. The PMA layer converts the logical signal into the physical level CAN_H and CAN_L signals, and passes them to the PMD sublayer through the MDI interface. The PMD sublayer completes the actual driving and receiving on the physical medium.

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North American Headquarters

SIGLENT Technologies America, Inc
6557 Cochran Rd Solon, Ohio 44139
Tel: 440-398-5800
Toll Free:877-515-5551
Fax: 440-399-1211
info@siglent.com
www.siglentamerica.com/

European Sales Offices

SIGLENT TECHNOLOGIES EUROPE GmbH
Staetzlinger Str. 70
86165 Augsburg, Germany
Tel: +49(0)-821-666 0 111 0
Fax: +49(0)-821-666 0 111 22
info-eu@siglent.com
www.siglenteu.com

Asian Headquarters

SIGLENT TECHNOLOGIES CO., LTD.
Blog No.4 & No.5, Antongda Industrial Zone,
3rd Liuxian Road, Bao'an District,
Shenzhen, 518101, China.
Tel:+ 86 755 3661 5186
Fax:+ 86 755 3359 1582
sales@siglent.com
www.siglent.com/ens