Introduction to CAN-to-Fiber Media Converters

Introduction to CAN

CAN is a serial communications bus defined by the International Standardization Organization (ISO). The CAN serial bus was introduced in 1986 as the “Automotive Serial Controller Area Network,” a multimaster message broadcast system that specifies a maximum signaling rate of 1 Mbps. It was soon discovered that CANbus worked extremely well for many other applications, including weaving machines, elevator systems in large buildings, ships, trains, aircraft, x-ray machines and other medical equipment, logging equipment, tractors and combines, coffee makers, and major appliances. CAN systems are extremely versatile. Technicians find it easy to repair or replace computer hardware in a CAN system without affecting the rest of the network in any way, and design engineers can easily modify existing CAN systems for other uses by adding or removing network nodes.

Why CAN-to-Fiber Media Converters?

Many applications require connecting large numbers of CAN devices in a complex environment. However, since there is a limit to the driving capability of CANbus, users may not be able to set up as many CAN devices as they would like. In addition, variations in the allowed segment lengths, which result from the fact that different types of wire are used, poses additional limitations. Note that device numbers and segment lengths are dictated by the ISO 11898-2 standard.

CAN converters are used to get around the limitation on the number of CAN devices and the upper limit of segment lengths. Most installers use optical fiber to extend to longer transmission distances since the fiber will not corrupt the CANbus signal. CAN-to-fiber converters not only can solve the problem of extending transmission distance, but will also guarantee more secure data transmission and will not limit the number of CAN devices that can be used. The ICF-1170I series CAN-to-fiber converter that secures data transmission by using fiber optic transmission to provide complete isolation and protection against EMI. The ICF-1170I series can separate and protect critical segments of the system from the rest of the CAN network and is protocol independent, allowing it to work with all of the different CAN protocols and frame lengths.

Overview of the ICF-1170I CAN-to-Fiber Converter

The ICF-1170I series CAN-to-fiber converters provide secure data transmission by using fiber optic transmission to provide complete isolation and protection against EMI. The ICF-1170I series can separate and protect critical segments of the system from the rest of the CAN network and is protocol independent, allowing it to work with all of the different CAN protocols and frame lengths.

Typical CAN application that uses a CAN-to-fiber converter
Special Features

Fiber Test Mode

The ICF-1170I supports a special feature called Fiber Test Mode, which is easily activated with a DIP switch on the ICF-1170I’s outer panel. Fiber Test Mode can be used to test the fiber cable between two ICF-1170I units, and provides a simple way to determine if the fiber cable is transmitting data correctly.

When in Fiber Test Mode, the fiber transceiver (TX) will continuously send out a data signal and the “Fiber TX” LED will light up. On the other side of the connection, when the ICF-1170I fiber transceiver (RX) receives the data signal from the TX side, the “Fiber RX” LED will light up.

If both the “Fiber TX” and “Fiber RX” LEDs light up at the same time, it means the fiber transmission between the two converters is okay, and the fiber cable is connected properly. If the test fails, you should check the fiber cable and fiber connectors to determine the cause of the transmission error.

Fiber optic communication is working properly when both the TX and RX LEDs will light up.

Redundant Power

To help ensure that your system works non-stop, the ICF-1170I CAN-to-fiber converter comes with a built-in redundant power input that is activated automatically when the primary power input fails. In addition, an alarm contact will be activated when the redundant power input is activated.

Isolation Protection

A special feature of the ICF-1170I CAN-to-fiber converter is its 2 KV isolation protection to protect the converter in environments with high electromagnet activity.