Introduction

A Micro Analog 2 system comprises a chassis, a backplane and a set of printed circuit card modules (PCBs) which plug into the backplane through the front opening in the chassis. The rear panel carries all system connectors (power, input, output, USB.)

This system also includes a 9 pin CAN bus connector on the rear panel. The CAN bus connector carries two independent CAN bus channels

A key feature of the system is that up to 32 analogue CAN data samples from up to two independent busses are acquired amd synchronised with analogue input data .

More details of the Micro Analog 2 system can be found on the Fylde web site http://www.fylde.com.

This FE-358-USB module provides 16 analogue input channels and up to 32 CAN data input channels together with USB data acquisition for the FE-MM16 system.

USB Interface Module : Specification

Analog Inputs	Quantity	16 signals from eight dual channel transducer interface modules.
	Operating Range	±10.24 V relative to Analog 0 V. Note that these inputs signals remain available as system analog outputs on the 15 way D connectors at the rear of the FE-MM16. When a slot is not fitted with signal conditioning modules, ±10V signals may be acquired directly from the 15 way D connector.
CAN Inputs	Quantity	Up to 32 CAN analogue inputs may be specified.
	Sampling Rate	Each channel at 1 kS/s (Max 32 kS/s) (A CAN channel is a 16 bit sample extracted from a CAN message.)
	CAN Bus Rate	Up to 1 Mbit/s
	CAN Bus standard	CAN 2.0B
Digital Outputs	Quantity	4 signals.
	Level	+5 V push pull
Digital Inputs	Quantity	4 signals.
	Level	On > 3.3 V, Off < 0.7 V
A to D Conversion	Resolution	16 bits
	Range	±10 V
	Sampling Rate	Maximum 16 x 25 000 samples per second. or 8 channels at 50 000 samples per second.
	Offset	< ±5 mV
	Noise	< 2 mV pk-pk
	Crosstalk	-95 dB at 50 kS/s with 5k Hz sine wave input
	Absolute Gain Error	< 0.1%
Environment	Temp. Range	-40°C to +85°C operating. System startup to be at -15 °C or above. The module is conformally coated to avoid condensation effects.
Electrical	Power dissipation	0.75 W
Standards	USB	Universal Serial Bus Specification Revision 1.1
	EMC	The complete system complies with the requirements of the EMC directive 89/336/EEC ; the applicable standard is EN 61326.
	Safety	The completed system complies with the protective requirements of Low Voltage Directive 73/23/EEC and Amending Directive 93/68/EEC ; the applicable harmonised standard is EN 61010-1 (Industrial Equipment).

USB Interface Module : General Description.

An FPGA controls two 16 bit 8 channel ADCs which are continuously sampled at 50 kS/s on each channel. Data is buffered in a 4 Mbit (512k x 8) static RAM. On demand from the host the buffered data is USB block transferred using a FTDI 2232D FIFO device.

A second channel of the FTDI 2232D device is configured as a high speed (920 000 baud) USART. An ARM CORtex M4 pocessor acquires CAN data through its two independent CAN busses. A 1 kHz synchronisation signal from the FPGA causes all CAN samples to be sent via the USART to the FTDI 2232D which block transfers the data to the USB host. Digital I/O data is also transferred.

Host Device Driver Software.

The FTDI 2232D device driver is available for download from the FTDI website.

Data Acquisition Package Support.

A DLL interface is the API (Application Program Interface) The header file FE359USBLIB.c provides full details on how to use this DLL.

LabView programs are provided to demonstrate the DLL functions.