New Eagle Data Logger

User Guide

V5.0

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Overview

Congratulations on your purchase of the New Eagle Data Logger. The logger was designed to be the most capable and lowest cost CAN data logger solution available. The logger is capable of logging at rates as low as 1ms, supports both 11bit and 29bit messages, and can be configured to meet the needs of your environment. Continue reading to learn about all of its capabilities. We understand that many of you will just want to start logging and learn later so we created a Quick Start section just for you!

	
New Eagle Data Logger – SD Side	New Eagle Data Logger – Connector Side


New Eagle Data Logger – SD Side

Kit Contents

The kit includes:

1. The New Eagle Data Logger

	
New Eagle Data Logger – SD Side	New Eagle Data Logger – Connector Side

2. The New Eagle Data Logger harness (Sold separately)


New Eagle Data Logger – SD Side

Quick Start

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Connect the device to the CAN bus	Setup
Read about the operational statuses and board components	LED's Or Board Components and Cables
Read about the data logging details	Data Logging
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Setup

The logger is ready to use out of the box and is configured for a bus baud rate of 250K. To start logging follow these simple steps:

1. Connect the logger with the harness (sold separately).
2. Connect the Delphi 10 pin connector to an open port on compatible J-Box.
3. Apply power to the CAN bus along with a key switch through the same J-Box.
4. Turn the key switch on and the logger will power on and begin logging all CAN data.

Connector Pins

Pin	Purpose	
1	Key switch *	The logger utilizes the presence of a key switch to determine when it can close a log session and power itself off. The default behavior can be overridden by wiring a power source to this pin. NOTE: Overriding the key switch prevents the unit from detecting when to close a log session and some data could be lost as a result.
2	VBatt *	The expects power on this pin unless it is alternatively supplied on Pin 1.
3	Ground	Must be wired to the appropriate system ground.
4	Not Used	
5	Not Used	
6	Digital Input	Can be used as a User Action button
7	CAN H	CAN high
8	CAN L	CAN low
9	RS232 Rx	Serial receive – Note that the system ground should also be used when wiring a serial connector to the logger
10	RS232 Tx	Serial transmit

*The logger is configured to utilize the combination of a key switch and VBatt to properly detect when it is safe to close a log session. Though this is the recommended configuration the logger can function without the use of a key switch. To eliminate the key switch remove power from pin 2 and place it on pin 1. BE AWARE THAT THE LOGGER CAN NO LONGER ENSURE PROPER FILE CLOSURES AND SOME DATA LOSS MAY OCCUR.

Harness

A harness is available is designed to mate the logger with a CAN bus environment that utilizes a Delphi 15326842 connector. The harness is pinned as follows:

Pin	Wire Color	Purpose
1	Violet	Key switch
2	Red	VBatt
3	Black	Ground
7	White	CAN H
8	Blue	CAN L

Logger Switches, LED's and More….

The logger is equipped with Switches and more. There are two sides to the logger. One side contains the connector for the harness, the reset button, and the state-of-health LED. The other side contains the slot for the SD card, the User-Action button, and two more LEDS that provide indications for logging and CAN bus activity.

LED's

	
State-of-Health LED	File System and CAN Status LED's

There are three LED's, two on the SD Card slot side and one on the connecter side.

LED	Location	Reference	Description
1	Connector Side	State-of-health	• Blinking Green = Normal operation • Red = Error, unit must be reset • Blinking Orange = Shutting down
2	SD Side – closest to SD	File System	• Blinking Orange = Waiting for SD Card • Orange = SD Card detected • Green = System is ready to log • Blinking Green = data is being logged • Blinking Red = SD Card is write protected • Red = File System Error – SD card may be full or needs to be replaced.
3	SD Side – closest to User Action Switch	CAN Status	• Green = Ready • Blinking Green = CAN Data present • Blinking Orange = Waiting for data • Blinking Red = CAN bus is in error passive state • Red = Error, unit must be reset

Reset Button

This is for use only as directed by a MoibilEyze support engineer. If inadvertently pressed, the unit can be reset by removing all power for 20 seconds.

Real-Time Clock

The logger is equipped with a real-time clock that is set at the factory prior to shipping and is maintained using an internal battery. The battery has an expected life of 10 years but may need to be replaced sooner. It is safe to open the unit (with the harness removed) to replace the battery. The logger requires a CR2032 battery.

User Action Button

The user action button is located on the SD side and can be used to insert a [User Action] stamp into the log file whenever the user desires.

The User Action button can also be utilized to close an active logging session, eliminating the need to key the system off to close the session. Press and hold the User Action button until the File System LED turns off. It is safe to remove the SD card when the light goes off. To put the logger back into logging mode hold the User Action button again until the LED turns or blinks green.

SD Card Slot

The SD Card slot accepts standard SD cards. The system is compatible with most SD Cards with a maximum capacity of 8GB. The LED's can be consulted to indicate if the inserted card is supported.

An SD card has been provided and contains security information required for the proof-of-concept to function. The SD card must be returned with the unit when the evaluation period is complete.

Serial Port

The logger has a serial port that can be used to view detailed trace information from the software. The information can be useful in troubleshooting problems.

The serial port configuration values are:

Parameter	Value
Baud Rate	115200
Data	8 bit
Parity	None
Stop Bit	1
Flow Control	None

See the Connector Pins section of this guide for details about the pins needed to utilize the serial output.

Data Logging

The logger utilizes a standard SD card up to 8GB. The logger looks for the presence of an SD Card at start up. If one isn't present the File System LED will blink orange to indicate that it's waiting for an SD card. An SD card can be inserted at any time and the File System LED will change to reflect the new status.

By default the logger is configured to log all data using a baud rate of 250K. A configuration file can be used to change the baud rate or filter the CAN data. See the Configuration File section for more details.

Closing a log session

The logger utilizes the keyswitch pin to determine when to start and stop. The key switch indicates to the logger that it is safe to close the session file. The logger keeps itself powered while it closes the session and then allows itself to shut down.

The User Action button can also be used to close a session and initiate a new session. Simply hold the User Action button until the File System LED turns off. Then hold it again until the LED turns or blinks green to initiate a new session.

Log Files

The logger has two type of logging mechanisms which are described below.

Standard

The system creates log files using utilizes the loggers date and time. The date serves as the main folder and the time serves as the file name within the folder. The logger will continue to run until there isn't any space available for creating new files. The result is that all data is maintained until removed from the SD card. This is an ideal mechanism for an engineering environment.

Circular

This mode utilizes a total of five files named LOG_001.MEL through LOG_005.MEL. At startup the logger will rename LOG_004.MEL to LOG_005.MEL, LOG_003.MEL to LOG_004.MEL, LOG_002.MEL to LOG_003.MEL, and finally, LOG_001.MEL to LOG_002.MEL. It will then utilize LOG_001.MEL for the active session. The result is a circular mechanism and is ideal for production environments.

File Layout

All lines are terminated with the standard \r\n (0x0D, 0x0A) characters.

Reference	Description
[Header]	Indicates the start and end of the header data.
Header	Contains revision information and the configuration details used for the log file: MobilEyzeLogger=Vx.x BusSpeed=250K Baud Filter=0x170,0x170,F (there can be up to 10 filters)
Data	Data lines formatted with the following format string: %08x,%01d,%01d,%02x,%02x,%02x,%02x,%02x,%02x,%02x,%02x, %d,%d\r\n Represented with id's it looks like: MsgId, Extended, Size, Byte[0], Byte[1], Byte[2], Byte[3], Byte[4], Byte[5], Byte[6], Byte[7], Time,Delta\r\n Where: MsgId : The message id Extended : T if it's an extended message, F otherwise Size: The number of bytes of data received in the message Byte[0..7]: The data received in the message Time: The # of milliseconds since the application started. Delta: The millisecond delta from the time of the last message.
[End]	Indicates the end of the data for that session.

Configuration File

The application can be configured using a simple text file that can be created manually (see the Configuration File Format section below for details).

File Name

The configuration file must be named LOGGER.MEC.

Parameters

The following table describes the parameters for the configuration file.

Parameter	Format	Default	Comment
BusSpeed	See comment	250K	Must be one of the following: 100K | 125K | 250K | 500K | 1M
Filter	SMSGID,EMSGID,EXT	0x0,0x7FF,S 0x0,0x1FFFFFFF,E	All standard messages All extended messages Where: SMSGID = start id EMSGID = end id EXT = E for extended S for standard
OutputDebugToCAN	T/F	F	Trace messages will be echoed to the CAN bus. CANId is required for this feature.
UseErrorPassiveDetection	T/F	F	When set to 'T'rue the logger will look for error passive conditions. It must periodically broadcast a message to determine the state. CANId is required for this feature. The broadcast message consists of a single byte message with the value of 0x55.
CANId	0x##	0xFE	The id to use when talking on the bus. The user should take care to choose an ID that is safe to transmit on the CAN bus. Error Passive Detection is disabled if this value isn't supplied.
LogType	C/S	S	C=Circular S = Standard
AutoFlush	T/F	F	Protects logged data from power loss. When set to 'T' the logger issues a flush command with each write. NOTE: This can impact performance for some SD cards. See our website for a list of the best performing SD cards.

Configuration File Format

The configuration file is a standard text file containing parameters that are used to configure the application. Each parameter must be entered on a separate line followed by an = sign, followed by the value, terminated by Carriage Return (0x0A) and Line Feed(0x0D) characters .

The following represents the content of a configuration file containing the default values:

```
BusSpeed=250K
Filter=0x0,0x1ef,S
Filter=0x0,0x1fbffff,E
OutputDebugToCAN=T
UseErrorPassiveDetection=F
CANId=0xfe
```

Updating the Date and Time

The unit ships from the factory with its date and time set from the factory using GMT time. The default date and time settings can be overridden. This section describes the necessary procedure for changing the date and time settings.

Date Time CAN Message

The date and time can be set by sending the logger a CAN message that contains the date/time in a 4 byte unix epoch format (See http://www.epochconverter.com/). Following are the details for the CAN Message:

Message Id = 0x101 (11-Bit Message)

Message Length = 4

Data	Description
0	Epoch date time (LSB)
1	Epoch date time
2	Epoch date time
3	Epoch date time (MSB)

Preparing the module for the Date Time CAN Message

The module must be put in "Test Mode" in order for it to process the Date Time CAN Message using the following steps:

1. Power the unit off.
2. Hold the User Action button and power the unit on.
3. Hold the User Action button for at least three seconds. The module indicates that it's in test mode when all the lights are orange. The lights will remain orange for three seconds.
4. The module is ready for the Date Time CAN message when the lights begin alternating colors.
5. Send the Date Time CAN Message. The unit will respond with a 0x201 and the data reflects the modules date and time.
6. Power the unit off.
7. The date and time have been set.

Upgrading Firmware

The unit's firmware can be updated using an SD Card. Follow these easy steps:

1. Obtain the latest firmware from our website or the Reseller Package (currently DataLogger_Version_1.020.zip).
2. Unzip the contents to a folder of your choice.
3. Copy the file with that contains B4.1 (currently DataLogger_DataLoggerRevB4.1.bin) to an SD card.
4. Rename the file on the SD card to Firmware.bin
5. Make sure the logger is powered off and insert the SD card into the logger.
6. Turn power on – you will see the State-of-Health pin turn solid green for a short moment. It will then change to blinking green when the new application is loaded.
7. Test by logging data and observing the version number in the log file.