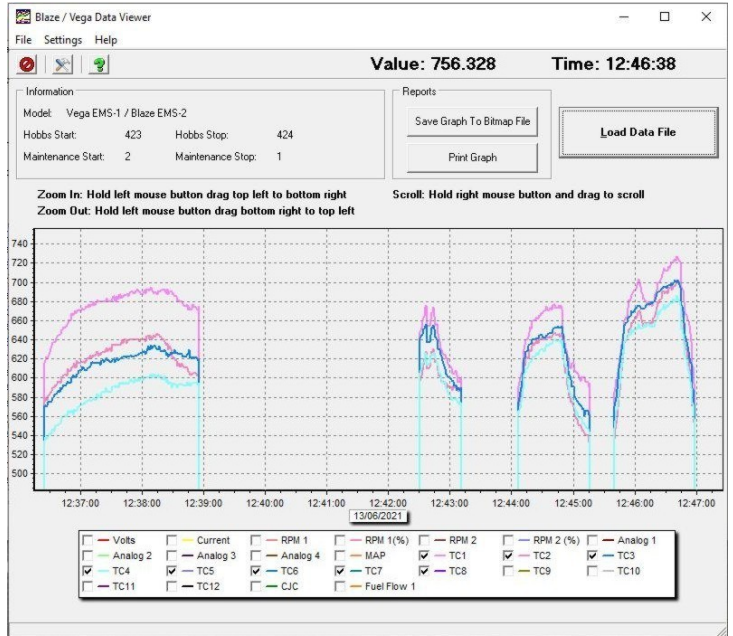


# LOG-1 / LOG-2

## Blaze / Vega Serial Data Logger

Datasheet – English 1.07



## Introduction

The LOG-1 is a datalogger for the Blaze and Vega range of instruments. Serial Information is received via the RS232 port and recorded to the SD card.

The data on the SD card is stored in a Comma Separated Values (.CSV) file that can easily be opened in a spreadsheet or text viewer type program or alternatively the data can be viewed using the free Blaze / Vega Data Viewer PC program.

The LOG-1 is housed in a space saving aluminum enclosure and is very easy to install.

The LOG-2 has all the features of the LOG-1 but includes a GPS receiver for position logging as well as it provides a NMEA output.

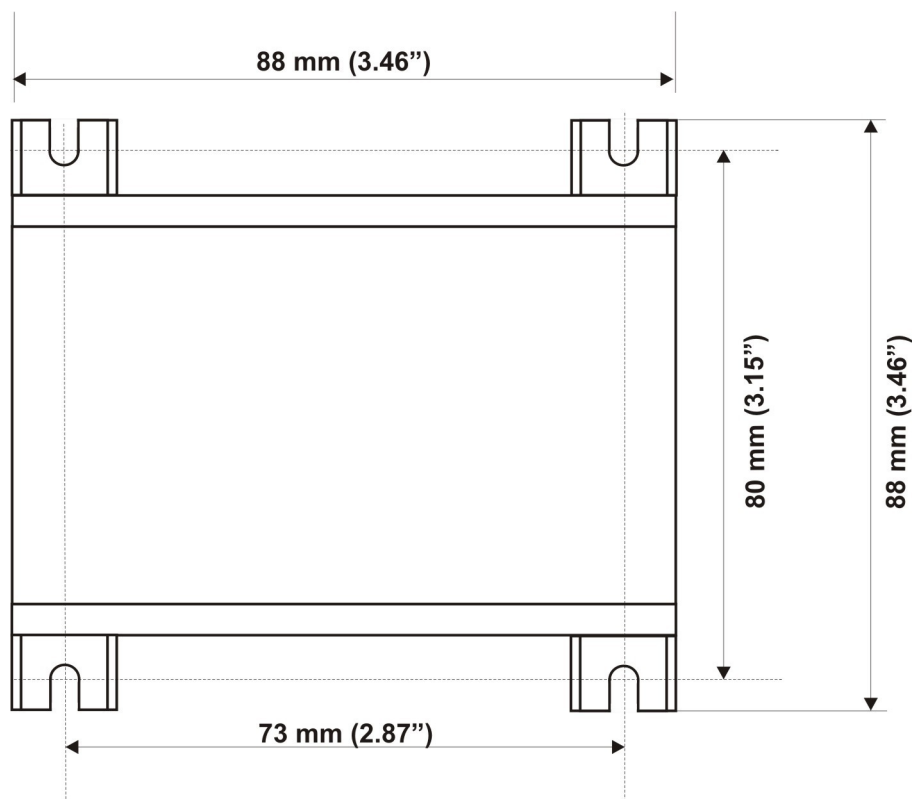
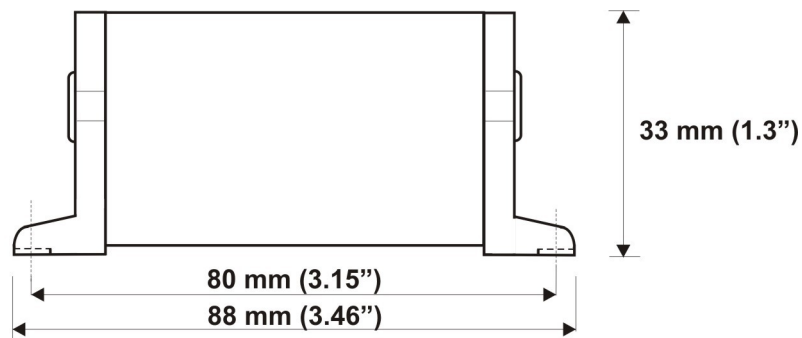
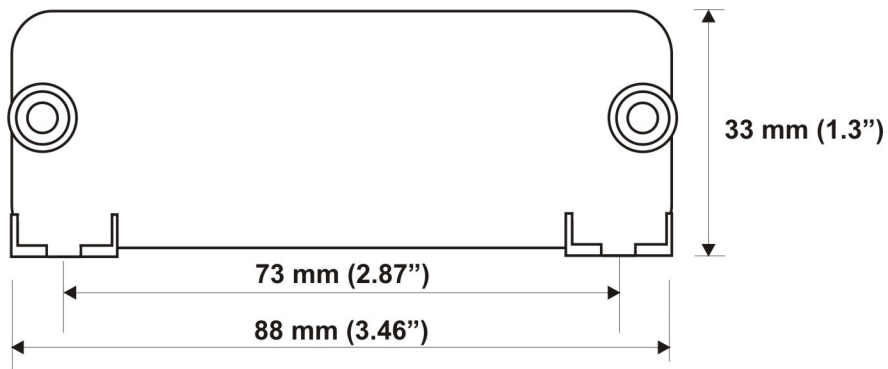
## 1 Features

- Dual RS232 ports to log data from 2 Blaze or Vega instruments
- Data is stored in a Comma Separated Values file (.CSV) onto a SD card
- Free PC data viewer program
- Supports all SD cards (Both normal and HC SD cards)
- 8-30VDC switch mode power supply with built in over voltage and reverse voltage protection
- Extremely easy to install
- Space saving aluminium enclosure
- Contains a GPS receiver for position logging and provides a NMEA output (LOG-2 only)
- 1 Year Warranty

## 2 Specifications

<b>SD Card</b>	
<b>Capacity</b>	Normal and HC cards supported
<b>Output file format</b>	Comma Separated Values (.CSV)
<b>Electrical</b>	
<b>Supply Voltage</b>	8 to 30VDC switch mode power supply with built in over voltage and reverse voltage protection
<b>Supply Current</b>	Typically 30mA @ 12Vdc
<b>General</b>	
<b>Status LEDES</b>	<p>Green LED Flashing: Receiving data Off: Receiving no data</p> <p>Orange LED Flashing: Logging to SD card Solid: SD card error / Write protect Off: Not logging to SD card</p> <p>Red LED Flashing: Power / SD card Present Solid: Power</p>
<b>Serial Interface</b>	2x RS232 ports
<b>Weight</b>	Approx. 140 grams without cables
<b>Environmental:</b>	
<b>Operating temperature</b>	-10°C to 50°C (14°F to 122°F)
<b>Storage temperature</b>	-40°C to 80°C (-40°F to 176°F)
<b>Operating and storage humidity</b>	<85% RH non-condensing
<b>GPS Settings (LOG-2 only)</b>	57600 8,N,1 (RS232 Port 1)
<b>NMEA Outputted Sentences</b>	GPRMC GPGGA GPVTG GPGLL GPGSV GPGSA

### 3 Dimensions



## 4 Installation

### 4.1 Cable Connections

Main connector (D9 connector: Unit Female, Cable Male)

D9 Pin	Color	Function
2	Blue	RS232 RXD Port 1 (Input)
5	Red	8-30Vdc (Power)
7	Brown	RS232 RXD Port 2 (Input)
9	Black	Ground

### 4.2 Status LEDs

3 LEDs provide status indication.

#### Green LED

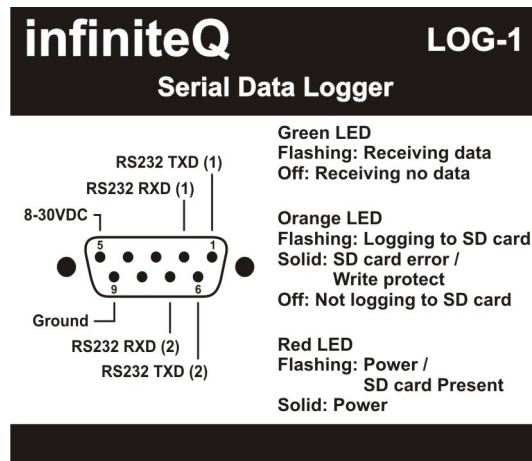
Flashing: Receiving data  
Off: Receiving no data

#### Orange LED

Flashing: Logging to SD card  
Solid: SD card error / Write protect  
Off: Not logging to SD card

#### Red LED

Flashing: Power / SD card Present  
Solid: Power



## 5 Setting the Data loggers Date & Time

There are 3 ways the data logger can set its internal clock.

#### Method 1:

The LOG-1 date and time will automatically be set if the received data has the date and time field. The Blaze EMS-2 / INFO-2 / FLIGHT-3 and Vega EMS-1 / INFO-1 will automatically set the time.

#### Method 2:

The date and time can be set from a file on the SD card called time.txt. This file must be in the root directory and will be read on power up. The file must be deleted once the date and time has been accepted as consecutive power ups will continually set the clock to the time in the file. The format of the data in the time.txt file is as follows:  
dd/mm/yyyy hh:mm:ss

#### Method 3:

The date and time can also be set from the internal GPS (LOG-2 only).

## 6 Output File Format (Comma Separated Values (.CSV))

The LOG-1 will create a Comma Separated Values (.csv) file with the date as the filename. A new file is created every time the date changes. The file is created in the root directory of the SD card. A separate file is created for the data received from the second serial port. This file will have the date as the file name followed by \_2.csv.

### 6.1 Message type 1 (Blaze EMS-2 / Vega EMS-1)

Message Type: 1

Date & Time:

Hobbs Minutes: Hobbs time in minutes

Maintenance Time: Maintenance time in hours

Volts: Volts in V

RPM 1: RPM 1 value

RPM 1 (%): RPM 1 value in percentage

RPM 2: RPM 2 value

RPM 2 (%): RPM 2 value in percentage

Analog Channel 1 Type:

- 0=Off
- 1=Pressure
- 2=Temperature
- 3=Current
- 4=Fuel Level

Analog Channel 1:

- Pressure in psi
- Temperature in Degrees C
- Current in A
- Fuel Level in Liters

Analog Channel 2 Type:

- 0=Off
- 1=Pressure
- 2=Temperature
- 3=Current
- 4=Fuel Level

Analog Channel 2:

- Pressure in psi
- Temperature in Degrees C
- Current in 0A
- Fuel Level in Liters

Analog 3 Channel Type:

- 0=Off
- 1=Pressure

2=Temperature

3=Current

4=Fuel Level

Analog Channel 3: Pressure in psi  
Temperature in Degrees C  
Current in A  
Fuel Level in Liters

Analog Channel 4 Type:

0=Off

1=Pressure

2=Temperature

3=Current

4=Fuel Level

Analog Channel 4: Pressure in psi  
Temperature in Degrees C  
Current in A  
Fuel Level in Liters

Manifold Pressure: Manifold pressure in mBar

Current: Current in A

CJC: Cold junction temperature in Degrees Celsius

TC1: Thermocouple channel 1 in Degrees Celsius

TC2: Thermocouple channel 2 in Degrees Celsius

TC3: Thermocouple channel 3 in Degrees Celsius

TC4: Thermocouple channel 4 in Degrees Celsius

TC5: Thermocouple channel 5 in Degrees Celsius

TC6: Thermocouple channel 6 in Degrees Celsius

TC7: Thermocouple channel 7 in Degrees Celsius

TC8: Thermocouple channel 8 in Degrees Celsius

TC9: Thermocouple channel 9 in Degrees Celsius

TC10: Thermocouple channel 10 in Degrees Celsius

TC11: Thermocouple channel 11 in Degrees Celsius

TC12: Thermocouple channel 12 in Degrees Celsius

Fuel flow: Fuel Flow in Liters per Hour

Calculated fuel level: Calculated fuel Level in Liters

#### Example CSV data:

1,11/05/2020,11:01:39,423,2,13.4,1000,16,1000,16,1,5.4,2,54,3,10.2,2,23,1013,10.3,20,689,699,679,700,702,685,134,15  
5,150,145,140,160,51.4,34

## 6.2 Message type 2 (Blaze TC-5 / Vega TC-4)

Message Type:	2
Date & Time:	
CJC:	Cold junction temperature in Degrees Celsius
TC1:	Thermocouple channel 1 in Degrees Celsius
TC2:	Thermocouple channel 2 in Degrees Celsius
TC3:	Thermocouple channel 3 in Degrees Celsius
TC4:	Thermocouple channel 4 in Degrees Celsius

### Example CSV data:

```
2,11/05/2020,09:15:25,21,678,700,145,160
```

## 6.3 Message type 3 (Blaze INFO-2 / Vega INFO-1)

Message Type:	3
Date & Time:	
G-Force:	G-Force in G
Volts:	Volts in V
Current:	Current in A
OAT:	OAT temperature in Degrees Celsius

### Example CSV data:

```
3,11/05/2020,09:11:06,1.0,13.2,3.4,24
```

## 6.4 Message type 4 (Blaze TC-6)

Message Type:	4
Date & Time:	
CJC:	Cold junction temperature in Degrees Celsius
TC1:	Thermocouple channel 1 in Degrees Celsius
TC2:	Thermocouple channel 2 in Degrees Celsius
TC3:	Thermocouple channel 3 in Degrees Celsius
TC4:	Thermocouple channel 4 in Degrees Celsius
TC5:	Thermocouple channel 5 in Degrees Celsius
TC6:	Thermocouple channel 6 in Degrees Celsius
TC7:	Thermocouple channel 7 in Degrees Celsius
TC8:	Thermocouple channel 8 in Degrees Celsius
TC9:	Thermocouple channel 9 in Degrees Celsius
TC10:	Thermocouple channel 10 in Degrees Celsius
TC11:	Thermocouple channel 11 in Degrees Celsius
TC12:	Thermocouple channel 12 in Degrees Celsius

### Example CSV data:

```
4,11/05/2020,09:11:06,20,689,699,679,700,702,685,134,155,150,145,140,160
```

## 6.5 Message type 5 (Blaze ALT-6 / Vega ALT-5)

Message Type:	5
Date & Time:	
Altitude:	Altitude in feet (Referenced to 1013.25mB)
Altitude:	Altitude in feet (Corrected to local pressure)
Local Pressure:	Local pressure in millibars
Vertical Speed:	Vertical Speed in ft/min

### Example CSV data:

```
5,11/05/2020,11:01:39,1302,1302,1013,121
```



## 6.6 Message type 6 (Blaze ASV-2 / Blaze Airdata-1 / Vega ASV-1)

Message Type: 6  
Date & Time:  
Altitude: Altitude in feet (Referenced to 1013.25mB)  
Altitude: Altitude in feet (Corrected to local pressure)  
Local Pressure: Local pressure in millibars  
Vertical Speed: Vertical Speed in ft/min  
Airspeed: Airspeed in mph

### Example CSV data:

```
6,11/05/2020,11:01:39,1302,1302,1013,121,78
```

## 6.7 Message type 7 (Blaze ASI-5 / Vega ASI-4)

Message Type: 7  
Date & Time:  
Airspeed: Airspeed in mph

### Example CSV data:

```
7,11/05/2020,11:01:39,87
```

## 6.8 Message type 8 (Blaze TP-4 / Vega TP-3)

Message Type: 8

Date & Time:

Analog Channel 1 Type:

0=Off

1=Pressure

2=Temperature

3=Current

5=Volts

Analog Channel 1: Pressure in psi

Temperature in Degrees C

Current in A

Volts in V

Analog Channel 2 Type:

0=Off

1=Pressure

2=Temperature

3=Current

5=Volts

Analog Channel 2: Pressure in psi

Temperature in Degrees C

Current in A

Volts in V

Analog Channel 3 Type:

0=Off

1=Pressure

2=Temperature

3=Current

5=Volts

Analog Channel 3: Pressure in psi

Temperature in Degrees C

Current in A

Volts in V

Analog Channel 4 Type:

0=Off

1=Pressure

2=Temperature

3=Current

5=Volts

Analog Channel 4:      Pressure in psi  
                                 Temperature in Degrees C  
                                 Current in A  
                                 Volts in V

**Example CSV data:**

8,11/05/2020,11:01:39,1,5.4,2,54,3,10.2,5,13.7

## 6.9 Message type 9 (Blaze RPM-2 / Vega RPM-1)

Message Type:          9  
Date & Time:  
Hobbs Minutes:         Hobbs time in minutes  
Maintenance Time:     Maintenance time in hours  
RPM 1:                  RPM 1 value  
RPM 1 (%):             RPM 1 value in percentage  
RPM 2:                  RPM 2 value  
RPM 2 (%):             RPM 2 value in percentage

**Example CSV data:**

9,11/05/2020,11:01:39,423,2,1000,16,1000,16

## 6.10 Message type 10 (Blaze MAP-4 / Vega MAP-3)

Message Type:          10  
Date & Time:  
Hobbs Minutes:         Hobbs time in minutes  
Maintenance Time:     Maintenance time in hours  
RPM:                    RPM value  
RPM (%):                RPM value in percentage  
Manifold Pressure:     Manifold pressure in mBar  
Temperature:            Temperature in Degrees Celsius

**Example CSV data:**

10,11/05/2020,11:01:39,423,2,1000,16,1040,21

## 6.11 Message type 11 (Blaze FF-5 / Vega FF-4)

Message Type:	11
Date & Time:	
Fuel Flow 1:	Fuel Flow 1 in Liters per Hour
Fuel Flow 2:	Fuel Flow 2 in Liters per Hour
Fuel Level 1:	Fuel Level 1 in Liters
Fuel Level 2:	Fuel Level 2 in Liters
Fuel Pressure:	Fuel pressure in psi

### Example CSV data:

11,11/05/2020,06:37:51,5.4,6.5,34,40,4.5

## 6.12 Message type 12 (Blaze AHRS-2/4 MAG-2 / Vega AHRS-1/3 MAG-1)

Message Type:	12
Date & Time:	
Bank Angle:	Bank Angle in degrees
Pitch angle:	Pitch Angle in degrees
Yaw Angle:	Yaw Angle in 0.1 degrees
Slip:	Slip Center=0, Slip left=-50, Slip Right=50
Attitude Status:	bit 2 set = AHRS overrange
Heading:	Heading in degrees
G-Force:	G-Force in g

### Example CSV data:

12,11/05/2020,06:37:51,1.0,6.2,2.0,24,0,23.4,1.0

## 6.13 Message type 13 (Blaze Flight-3)

Message Type:	13
Date & Time:	
Hobbs Minutes:	Hobbs time in minutes
Maintenance Time:	Maintenance time in hours
Altitude:	Altitude in feet (Referenced to 1013.25mB)
Altitude:	Altitude in feet (Corrected to local pressure)
Local Pressure:	Local pressure in millibars
Vertical Speed:	Vertical Speed in ft/min
Airspeed:	Airspeed in mph
RPM:	RPM value
RPM (%):	RPM value in percentage
Fuel Flow:	Fuel Flow in Liters per Hour
Fuel Level:	Fuel Level in Liters
Volts:	Volts in V
Current:	Current in A
OAT:	OAT temperature in Degrees Celsius

### Example CSV data:

13,11/05/2020,11:01:39,423,2,319,319,1013,1450,84,1000,16,5.7,55,13.9,8.9,21

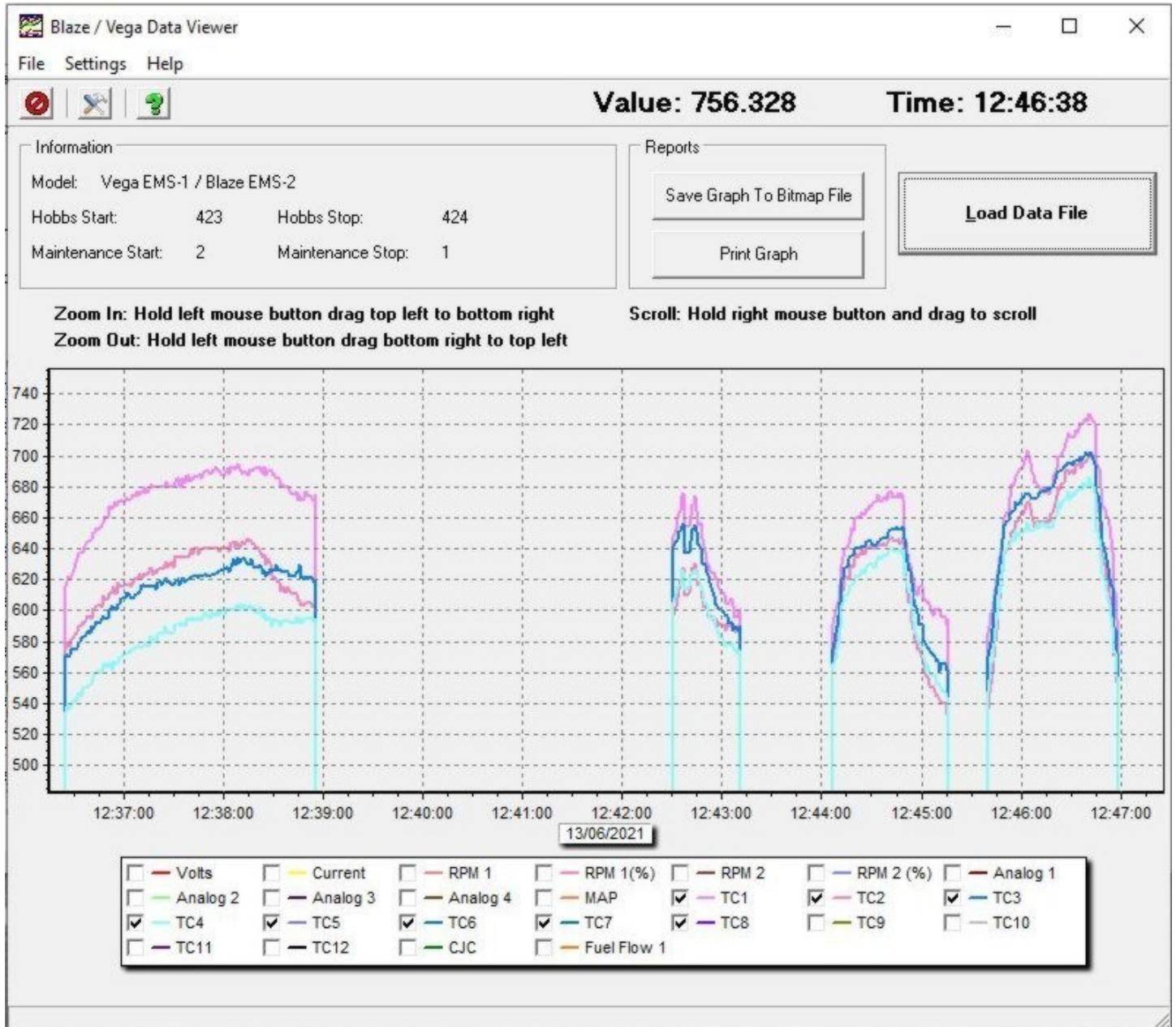
## 6.14 GPS data logging (LOG-2 only)

The GPS data is appended to the end of the above messages. The appended GPS data is in the format.

Latitude:	Latitude in decimal degrees
Longitude:	Longitude in decimal degrees
SOG:	Speed over ground in MPH
COG:	Course over ground. Degrees true
Altitude:	Altitude in feet
Fix mode:	1= No Fix, 2= 2D, 3=3D
PDOP:	Position dilution of precision
HDOP:	Horizontal dilution of precision
VDOP:	Vertical dilution of precision

# 7 Blaze / Vega Data Viewer PC Program

The recorded data file can be viewed using the free Blaze / Vega Data Viewer PC program. The program can be downloaded from the MGL Avionics website.



## 8 LOG-2 GPS NMEA Output

The LOG-2 will output the following NMEA GPS sentences on RS232 port 1. The line settings are 8,N,1 57600 baud.

GPRMC:	Recommended Minimum Specific GNSS Data
GPGGA:	Global Positioning System Fix Data
GPVTG:	Course and speed information relative to the ground
GPGLL:	Geographic position, latitude, longitude
GPGSV:	The number of GPS satellites in view satellite ID numbers, elevation, azimuth and SNR values.
GPGSA:	GPS receiver operating mode, satellites used in the position solution, and DOP values.

## 9 Warranty

This product carries a warranty for a period of one year from date of purchase against faulty workmanship or defective materials, provided there is no evidence that the unit has been mishandled or misused. Warranty is limited to the replacement of faulty components and includes the cost of labor. Shipping costs are for the account of the purchaser.

**Note:** Product warranty excludes damages caused by unprotected, unsuitable or incorrectly wired electrical supplies and or sensors, and damage caused by inductive loads.

## 10 Disclaimer

Operation of this instrument is the sole responsibility of the purchaser of the unit. The user must make themselves familiar with the operation of this instrument and the effect of any possible failure or malfunction.

This instrument is not certified by the FAA. Fitting of this instrument to certified aircraft is subject to the rules and conditions pertaining to such in your country. Please check with your local aviation authorities if in doubt. This instrument is intended for ultralight, microlight, home built and experimental aircraft. Operation of this instrument is the sole responsibility of the pilot in command (PIC) of the aircraft. This person must be proficient and carry a valid and relevant pilot's license. This person has to make themselves familiar with the operation of this instrument and the effect of any possible failure or malfunction. Under no circumstances does the manufacturer condone usage of this instrument for IFR flights.

### **IMPORTANT NOTICE:**

You must make your own determination if the products sold by MGL Avionics are safe and effective for your intended applications. MGL Avionics makes no representations or warranties as to either the suitability of any of the products we sell as to your particular application or the compatibility of any of the products we sell with other products you may buy from us or anywhere else, and we disclaim any warranties or representations that may otherwise arise by law. Also, we offer no specific advice on how to install any of the products we sell other than passing along anything that may have been provided to us by the manufacturer or other issues. If you are in need of further information or guidance, please turn to the manufacturer, FAA Advisory Circulars and guidance materials, the Experimental Aircraft Association, or other reputable sources.

**Continuing development sometimes necessitates specification changes without notice.**



## Instruments in the *Stratomaster Blaze* series

<b>AHRS-2</b>	Artificial Horizon and Magnetic Compass Indicator
<b>AHRS-4</b>	Self contained Artificial Horizon and Magnetic Compass Indicator
<b>ALT-6</b>	Altimeter and Vertical Speed Indicator (VSI)
<b>ALT-7</b>	Altimeter and Vertical Speed Indicator (VSI) with a transponder compatible RS232 & parallel Gillham code output
<b>ASI-5</b>	Airspeed Indicator (ASI)
<b>ASV-2</b>	Altimeter, Airspeed (ASI) and Vertical Speed Indicator (VSI)
<b>EMS-2</b>	Engine Monitoring System
<b>FF-5</b>	Fuel Computer
<b>FLIGHT-3</b>	Primary Flight Instrument
<b>INFO-2</b>	Information Display (G-Force meter, UTC and Local Time, Slip Indicator, Outside Air Temperature (OAT), Battery Voltage, Current and charge display, Flight Timer & Flight Log, Stopwatch, Countdown Timer and Alarm)
<b>MAG-2</b>	Magnetic Compass Indicator
<b>MAP-4</b>	Manifold Pressure and RPM Indicator
<b>RPM-2</b>	Universal Engine / Rotor RPM Indicator
<b>TC-5</b>	4 Channel Thermocouple (EGT/CHT) Indicator
<b>TC-6</b>	12 Channel Thermocouple (EGT/CHT) Indicator
<b>TP-4</b>	4 Channel Universal Analog Input (Pressure/Temperature/Current/Volts) Indicator

## Instruments in the *Stratomaster Vega* series

<b>AHRS-1</b>	Artificial Horizon and Magnetic Compass Indicator
<b>AHRS-3</b>	Self contained Artificial Horizon and Magnetic Compass Indicator
<b>ALT-5</b>	Altimeter and Vertical Speed Indicator (VSI)
<b>ASI-4</b>	Airspeed Indicator (ASI)
<b>ASV-1</b>	Altimeter, Airspeed (ASI) and Vertical Speed Indicator (VSI)
<b>EMS-1</b>	Engine Monitoring System
<b>FF-4</b>	Fuel Computer
<b>INFO-1</b>	Information Display (G-Force meter, UTC and Local Time, Slip Indicator, Outside Air Temperature (OAT), Battery Voltage, Current and charge display, Flight Timer & Flight Log, Stopwatch, Countdown Timer and Alarm)
<b>MAG-1</b>	Magnetic Compass Indicator
<b>MAP-3</b>	Manifold Pressure and RPM Indicator
<b>RPM-1</b>	Universal Engine / Rotor RPM Indicator
<b>TC-4</b>	4 Channel Thermocouple (EGT/CHT) Indicator
<b>TP-3</b>	4 Channel Universal Analog Input (Pressure/Temperature/Current/Volts) Indicator