Datalogger ASCII Format

Version 0.1

Introduction

Datalogger has the option of outputting to an ASCII-formatted file. It isn't the most efficient use of storage space (no more than 75% efficient, but usually lower in most cases), it does have the advantage of being human-readable and Notepad-friendly.

The file extension is **.dla** for **D**ata**l**ogger **A**SCII.

Contents

Overall structure

Every line of the file is a message, and therefore each message is separated by a newline '\n'.

Each message consists of an opcode, optionally a timestamp, and optionally a payload. Each of these are separated by a space.

Message formats

Basic

Message layout:

Opcode	Payload

Opcode: Type of message
Payload: Any additional information, meaning depends on opcode

For example, "`PRM INIT 00000000 8002`" would have opcode ="`PRM`" and payload="`INIT 00000000 8002`"

Timestamped

Message layout:

Opcode	Timestamp	Payload

Opcode: Type of message
Timestamp: Time the event in this message happened, in ASCII hex. May also optionally include an accuracy parameter which means how accurate (in +/- time units) the timestamp is. The main timestamp is separated from the accuracy parameter with a slash '/'. If no accuracy parameter exists, assume the timestamp is exact.
Payload: Any additional information, meaning depends on opcode

For example, "`CM 00001037/01 0 00 8 40E 54,8D,63,3D,00,00,00,00`" would have opcode="`CM`", timestamp="`00001037/01`" (meaning recorded at time 00001037 with +/- 1 time unit accuracy), and payload="`0 00 8 40E 54,8D,63,3D,00,00,00,00`"

Opcodes

BOVF – SD Card Write Buffer Overflow

This indicates a SD Write Buffer overflow condition. There is data lost between the timestamp of this message to the timestamp of the next message.

This is a Timestamped message.

This has no payload.

CM – Received CAN Message

This describes a received CAN message.

This is a Timestamped message.

The payload layout is:

Channel ID	Header	DLC	ID	Payload

Channel ID: CAN Channel ID the message was received on
Header: Currently unused – reserved at 00
DLC: Data Length Code, the number of bytes in the Payload
ID: CAN ID, in ASCII hex – can either be a Standard ID or Extended ID
Payload: Payload of the CAN message, in ASCII hex bytes separated by commas

COVF – CAN Receive Buffer Overflow

This indicates a CAN receive buffer overflow condition. There is data lost between the timestamp of the last received CAN message and this message.

This is a Timestamped message.

The payload layout is:

Channel ID

Channel ID: CAN Channel which overflowed

CRD – SD Card information

CRD describes the information about the SD card this file was recorded onto. This information is directly read from the SD Card's registers, and more detailed information may be found in the SD Card Simplified Physical Layer Spec.

This is a Basic message.

The payload layout is:

MID	OID	PNM	PRV	PSN	MDT

MID: Manufacturer ID, in ASCII hex
OID: OEM / Application ID, in ASCII
PNM: Product Name, in ASCII
PRV: Product Revision, in ASCII
PSN: Product Serial Number, in ASCII hex

MDT: Manufacturing Date, in (month)(year), where month is the 3-letter month abbreviation and year is a ASCII hex digit offset from the year 2000.

PRM – Recording Parameters

PRM describes the recording parameters, and may include information on the hardware, firmware, SD card, and meaning of measurements (like time units).

This is a Basic message.

The payload layout is:

Parameter	Value

Parameter: The recording parameter

Value: The value of the recording parameter

For example, "`PRM TIMEBASE 1/1024s`" means the "`TIMEBASE`" parameter is set to "`1/1024s`".

MNT – SD Card mounted

This tells when the SD card was mounded.

This is a Timestamped message.

This has no payload.

PS – Statistical performance measurement

This describes a statistical voltage measurement – the summary of many different samples of a voltage line.

This is a Timestamped message.

The payload layout is:

Channel ID	Samples	Min	Avg	Max

Measurement: The measurement, currently defined ones are:

Measurement Value	Description
LPTM	**L**oo**p** **T**i**m**ing – measurement of how long each main loop takes

Samples: The number of samples taken in this statistical measurement

Min: The minimum of all the samples

Avg: The average (arithmetic mean) of all the samples

Max: The maximum of all the samples

VS – Statistical voltage measurement

This describes a statistical voltage measurement – the summary of many different samples of a voltage line.

This is a Timestamped message.

The payload layout is:

Channel ID	Samples	Min	Avg	Max

Channel: The Voltage Measurement Channel ID for this measurement
Samples: The number of samples taken in this statistical measurement
Min: The minimum of all the samples
Avg: The average (arithmetic mean) of all the samples
Max: The maximum of all the samples

All measurements in the voltage base defined for the channel.

Parameters

CANCHA

Defines a CAN channel

The Value field layout is:

Channel Id	Channel Name	Additional parameters

Channel Id: The Channel ID used to refer to this channel in messages
Channel Name: The human-readable name for this channel
Additional Parameters: Ignore for now, none defined

FMT

The file format

The Value field layout is:

Format Ver

Format Ver: The file format version this file is recorded in

SW

The firmware version of the recording device

The Value field layout is:

Version

Version: The firmware version of the recording device – note that this may span multiple words and should be read until the end of the line.

HW

The hardware version of the recording device

The Value field layout is:

Version

Version: The hardware version of the recording device

TIMEBASE

The time base used for recording timestamps – all timestamps are in these units.

The Value field layout is:

Timebase

Timebase: The timebase

Timebase Value	Description
1/1024s	1/1024ths of a second.

VOLTMEAS

Defines a voltage measurement channel

The Value field layout is:

Channel Id	Channel Name	Voltage Base	Resolution

Channel Id: The Channel ID used to refer to this channel in measurements

Channel Name: The human-readable name for this channel

Voltage Base: Voltage base (units) for this measurement channel

Voltage Base Value	Description
mV	Millivolts
1/1024vdd	1/1024 of the microcontroller V_{dd} (i.e. from a 10-bit ADC)
1/4096vdd	1/4096 of the microcontroller V_{dd} (i.e. from a 12-bit ADC)

Resolution: The resolution of the measurement – what is the minimum increment in voltage base between subsequent values