# MT941/4A

µDAS Data Logger + 4 Analogue Channels

MAGNETI MARELLI

The µDAS (Micro DAS) data acquisition system is Magneti Marelli's entry level data logger. A light and extremely compact unit, it is ideal for applications where size and weight constraints are particularly severe.

Input to the data logger is via a CAN data bus from external add-on sensor modules together with speed and distance measurements provided by three internal input capture channels and 4 single-ended analogue 0-5V inputs. In the new memory structure, derived from the Formula 1 Black Box data logger, the data is split up into laps as it is recorded allowing individual laps to be downloaded as required. An improved serial port driver and an automatic download function provide quick and easy access to the data.
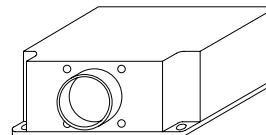
When combined with the Magneti Marelli MT940 programmable dashboard (4 analogue inputs) and Magneti Marelli engine control unit, it provides a simple and economic acquisition and control system for motor sports and in-vehicle testing. The modular nature of the µDAS architecture means that the system can be easily expanded to suit the exact user requirements, with the possibility to log up to a maximum of 63 channels via external CAN expansion modules.

Technical data

Digital Inputs

Input Capture (wheel speed & RPM)
wheel speed	IC1 & IC3	
RPM (pull-up to 12 V)	IC2	
Conversion	4.34028	µs/LSB
Threshold	2	VMax Frequency
(typical)	9	kHz
3 channels (typical)	(for each) 3	kHz

Counter (distance)
Source	IC1 & IC3	
Representation	16-bit signed integer	

Track Marker
re-arm delay	10	s

Analogue Channels

No.	4	
Input Voltage	0>5	V dc
Input Impedance	>10	MΩ
Input Filter	1 pole 100	Hz
Resolution	10	bit
Precision	± 2	LSB
Offset Error	450	µV
CMRR	85	dB
Over voltage Protection	± 50V / 1	ms
Tx data (CAN)	200	Hz

Internal Channels

Compound Speed
EITHER
= mean(IC1 | IC3) IF ∆velocity < 3%
OR
= max (IC1 | IC3) IF ∆velocity > 3%

Compound Distance .... 16-bit signed integer
N.B. max distance counter value.......... 32767
EITHER
= mean(ΣIC1 & ΣIC3) IF ∆velocity < 3%
OR
= max (ΣIC1 | ΣIC3) IF ∆velocity > 3

Data Acquisition

Memory	450	kByte
Sampling freq.	1>100	Hz
Channels	max	63
Speed TX	max 57600	Baud

CAN Addresses (MT941/A only)

Data throughput (approx) .... 15000 bytes/s

	Map1 .... to .... Map 8	
	............Default	
AIN1	60	88
AIN2	61	89
AIN3	62	90
AIN4	63	91

Electrical / Mechanical

Supply	8>18	V dc
	130	mA
Operating Temperature	-20+85	°C
Shock	50	g
	10	ms
Vibration	10	g
	0...500	Hz
Dimensions	84x33x105	mm
Weight	270	g
Container	Black anodised aluminium	IP66

Ordering Information

Description		Order code
MT941/4A	µDAS Data Logger + Data analysis SW + Flying connector with 4 S.E. analogue inputs	83816017100

*default : µDAS = **CLOSED** ; 4 S.E. analogue internal module = **OPEN, addr. 84***

Typical Configuration

The figure shows a schematic diagram of a basic data acquisition system. More complex systems can easily be built up using external sensor modules also available from Magneti Marelli.

Sensor data measured at the ECU and dashboard inputs is relayed to the µDAS over the CAN bus. Sampling frequencies, sensor linearisations and a start trigger are all configured via software prior to acquisition. Any of the channels available to the µDAS may be displayed on the dashboard. Engine RPM and two wheel speeds are measured directly by the logger. Measuring two wheel speeds allows the µDAS to compensate for wheel lock up and correct the speed and distance values derived from the pick-up (MT953) signals.

An optical (MT906/B & MT907/B) lap marker should be used to create fixed reference points in your race data. µDAS will partition the data into laps as it is recorded and save each lap time and number in a special header string. Having the data already organised into laps means that you can select and download individual laps of interest (or simply use the 'Best Lap' option to pick out the quickest one). Finally, an automatic download function saves you valuable time by triggering the data transfer as soon as the PC cable is connected and downloading only the latest data.

ECU/CAN Interface

CAN Modules

Lap Marker Input

Dash Board

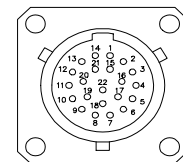3 Input Capture

PC / RS232
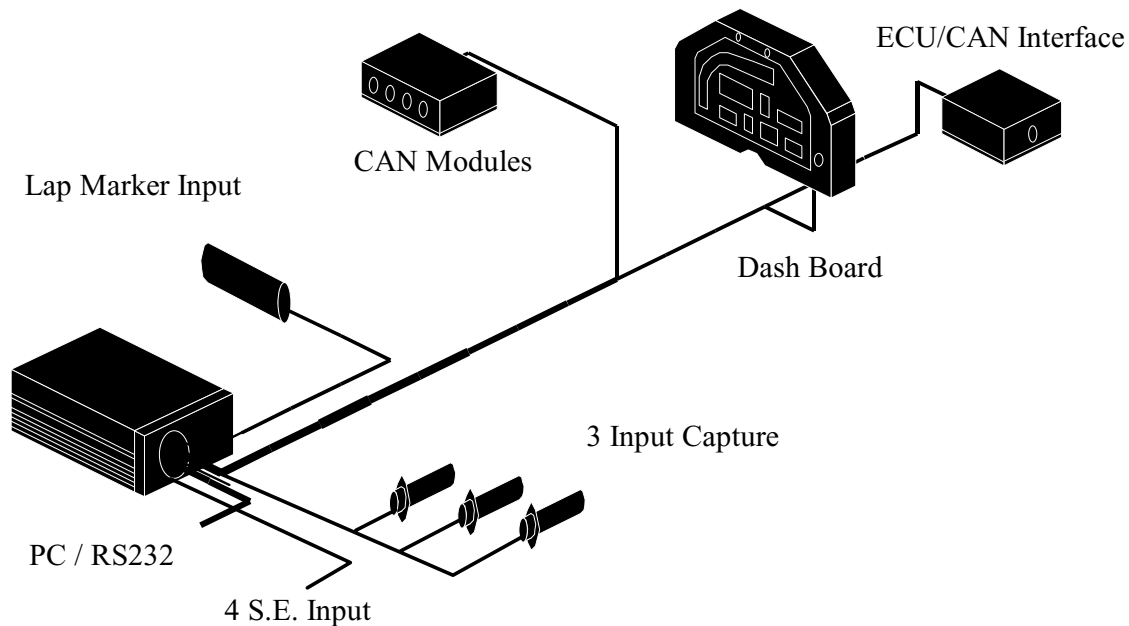
4 S.E. Input

Principal Features

- 450 Kbytes memory.
- Sampling frequencies up to 100 Hz
- CAN interface for connection to a wide range of expansion modules.
- Up to 63 independently programmable channels (byte or word) on CAN network.
- 4 x 5 V analogue inputs.
- Engine speed input.

- 2 wheel-speed inputs with intelligent wheel-lock correction algorithm.
- Track marker input.
- Memory architecture structured in laps.
- Bundled data analysis software WintaxJ for in-depth vehicle and engine performance monitoring.
- Data download to PC via serial RS232 at 57600 baud.

Connector Pin Out

PIN	name	description
1	+ VBatt	Positive supply
2	Speed1	Input Capture 1
3	RPM	Input Capture 2
4	Speed2	Input Capture 3
5	Trag	Track marker i/p
6	WP	Code load (do not connect)
7	Can P	CAN positive
8	Can N	CAN negative
9	TX232	RS232
10	RX232	RS232
11>14	(AIN1..AIN4)	(Analog inputs 1 > 4)
15	Vref	Ref. voltage 5V d.c
16>22	GND	System GND

BENDIX
SJT00RT−12−35
22 POLI