

## Strain Gauge or Load Cell Digitiser Module

### Features

- New Generation Extremely High Performance & Low Cost
- Baud rates to 230k
- High speed to 500 Readings/Sec
- ±15KV ESD protected
- Real mV/V calibration
- Extreme Noise Immunity 5 x heavy industrial level
- Transducer Calibration
- Remote Shunt Calibration
- Very high stability (*Capable of 6000 Divisions OIML*)
- Peak and Trough Recording
- Compatible with previous Version 2 DSC
- Programmable dynamic filter



- Wide operating voltage (5.4V - 18V)
- DC Excitation for longer cable lengths
- Diagnostics LED
- Protocols: MANTRABUS II, Modbus RTU, MantraCAN, CANopen, ASCII (ask for details)

### Introduction

The 2<sup>nd</sup> Generation DSC is a high performance digital signal conditioner with a host of additional features for the precision measurement of strain gauge transducers. The card style unit is designed to be mounted along

side the majority of sensors providing a 'digital' load cell with the benefit of very high stability and a RS485 or RS232 output.

### Standard Characteristics

- System Calibration
- Transducer Calibration
- Self Diagnostics
- Sensor Operation Limit Alarms
- Reverse Polarity Protected
- Fieldbus Compatibility
- High Performance
- Continuous Auto Zero Operation
- RS485 or RS232 Communication available
- 3 Year Manufacturers Warranty
- Full CE Approval
- Capable of ATEX Approval

### Options

- Temperature Compensation via external sensor
- OEM Application software through Bootloader, allowing special functions to be programmed via RS485/232
- RS232-RS485 Convertor
- Alternative Sensitivities (1-20mV/V)
- IP65 / NEMA 4 Enclosure with screw termination (DSJ1 Product Sheet 43)

### Specifications

Product Description	DSCH High Stability			DSCS Industrial Stability			Units
	Min	Typ	Max	Min	Typ	Max	
Bridge Excitation	4.5	5	5.25	4.5	5	5.25	VDC
Bridge Impedance	320	350	5,000	320	350	5,000	Ohms
Sensor Impedance up to 18v Supply	320	350	5,000	320	350	5,000	Ohms Δ
Sensor Impedance up to 12v Supply	120	350	5,000	120	350	5,000	Ohms Δ
Bridge Sensitivity	-3	+3		-3	+3		mV/V
Offset Temperature Stability		1	4		5	10	ppm/C
Gain Temperature Stability		3	5		30	50	ppm/C
Offset Stability with Time		0.002	0.008		0.0035	0.016	%FR ·
Gain Stability with Time			30			300	ppm of FR / 1 <sup>st</sup> Year
Non Linearity		0.0005	0.0025		0.0005	0.0025	% FR
Internal Resolution		16 Million			16 Million		Counts/Divisions
Resolution @ 1Hz (Noise Stable)	◆	400,000			100,000		Counts/Divisions
Resolution @ 10Hz (Noise Stable)	◆	120,000			40,000		Counts/Divisions
Resolution @ 100Hz (Noise Stable)	◆	50,000			10,000		Counts/Divisions
Resolution @ 500Hz (Noise Stable)	◆	18,000			5,000		Counts/Divisions
Optional							
Temperature Measurement Resolution		0.1					°C
Temperature Measurement Accuracy		1					°C

Notes: · From original offset at any time. ◆ Stability over 100 second period. Δ Subject to supply voltage. See Electrical Specification overleaf.

<b>Electrical</b>							
Power Supply Voltage	5.4	12	18	5.4	12	18	V dc
Power Supply Noise/Ripple			100			100	mV ac pk-pk
Power Supply Current (350R Bridge)		45	60		45	60	mA
Power @ 10V Supply (350R Bridge)		350			350		mW
Sensor Impedance up to 18v Supply	320	350	5,000	320	350	5,000	ohms
Sensor Impedance up to 12v Supply	120	350	5,000	120	350	5,000	ohms
Excitation System		4 wire			4 wire		
<b>Environmental</b>							
Operating temperature range	-40		85	-40		85	°C
Operating temperature range for OIML 6000d	-10		55				°C
Storage temperature	-40		85	-40		85	°C
Humidity	0		95	0		95	%RH Non Condensing
<b>Communications</b>							
RS485/232 Data Rate	2,400		230k	2,400		230k	Baud
CAN Bit Rate	10K		1M	10K		1M	Bits/Sec

Note: Update speeds are selectable to 1, 2, 5, 10, 20, 50, 60, 100, 200, 300, 500 Samples/Sec

### The benefits to the transducer user/system supplier

Mantracourt has identified the following points which demonstrate how strain gauge transducers users will benefit.

**1. Plug-in-and-go-sensor**

No need for a separate instrument, DSC provides a direct output in engineering units from a standard Strain Gauge, - *save cost and space.*

**2. Simple to use**

The Strain Gauge manufacturer can supply the sensor pre-calibrated for system offset, gain, hysteresis and scale parameters.

**3. Outstanding performance to cost ratio**

19 bit (500,000 divisions) and 0.001% noise immunity ideal for high precision process weighing applications such as batching, at a fraction of the cost of many instrument solutions

**4. Low cost of Strain Gauge ownership**

Use with low cost 2 pair twisted cabling - *reduce set-up costs.*

- Digital storage of calibration details, means the system will not need regular re-calibration - *save maintenance costs.*
- In-service replacement of a faulty/damaged Strain Gauge is possible by simply down loading the stored calibration details to a new cell. *Save maintenance time and cost by not having to empty a vessel and re-apply test weights.*

**5. Universal systems compatibility**

Fieldbus connectivity ensures interoperability with existing/future process control equipment

**6. Non-expert maintenance**

Self diagnostics alerts user to common Strain Gauge faults such as over-range.

### Support Modules

Instrument Explorer Software VisualLink & VisualLink lite free PC software	RS232 - RS485 Convertor DSC Evaluation Kits	DSJ1 IP65 Enclosure with Field Terminals
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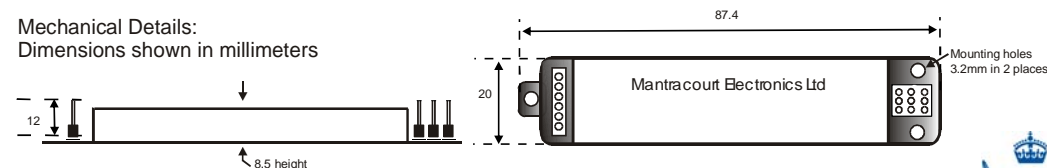
### Product Order Codes

Description	Product Code	Description	Product Code
High Stability RS232		Industrial Stability RS232	
ASCII Protocol	DSCH2ASC	ASCII Protocol	DSCS2ASC
MANTRABUS Protocol	DSCH2MAN	MANTRABUS Protocol	DSCS2MAN
MODBUS Protocol	DSCH2MOD	MODBUS Protocol	DSCS2MOD
High Stability RS485		Industrial Stability RS485	
ASCII Protocol	DSCH4ASC	ASCII Protocol	DSCS4ASC
MANTRABUS Protocol	DSCH4MAN	MANTRABUS Protocol	DSCS4MAN
MODBUS Protocol	DSCH4MOD	MODBUS Protocol	DSCS4MOD
High Stability CAN		Industrial Stability CAN	
CANopen Protocol	DSCHCOP	CANopen Protocol	DSCSCOP
MantraCAN Protocol	DSCHMCAN	MantraCAN Protocol	DSCSMCAN

### CE & Environmental

Storage temperature	-40 to +85°C	EMC Emissions	BS EN 55011:1998
Operating temperature	-40 to +85°C		
Relative humidity		EMC Immunity	BS EN 61000-42:1995
Safety/Low Voltage Directive	95% maximum non condensing 73/23/EEC amended by 93/68/EEC		BS EN 61000-4-3:2002
EMC Directive	BS EN 61010-1:2001, IEC 1010-1-1990 89/336/EEC Basic Standard BS EN 61326:1998		BS EN 61000-4-4:2004 BS EN 61000-4-11:2004

Mechanical Details:  
Dimensions shown in millimeters



Designed, Manufactured & Supported in the UK



Ⓒ In the interest of continued product development, Mantracourt Electronics Limited reserves the right to alter product specifications without prior notice.

