



1 **TYPE EXAMINATION CERTIFICATE**

2 Component intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

3 Type Examination Certificate Number: Sira 06ATEX4154U

4 Component: DLCxyyyy Embedded Digitiser Module

5 Manufacturer: Mantracourt Electronics Ltd.

6 Address: The Drive  
Farringdon  
Exeter  
EX5 2JB  
UK

7 This component and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

8 Sira Certification Service certifies that this component has been found to comply with the Essential Health and Safety Requirements that relate to the design of Category 3 components, which are intended for use in potentially explosive atmospheres. These Essential Health and Safety Requirements are given in Annex II to European Union Directive 94/9/EC of 23 March 1994.


9 The examination and test results are recorded in confidential report number R52A15161A.

10 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule of this certificate, has been assessed by reference to:  
EN 60079-15:2005

11 The sign 'U' is placed after the certificate number to indicate that the product assessed is a component and may be subject to further assessment when incorporated into equipment. Any special conditions for safe use are listed in the schedule to this certificate.

12 This TYPE EXAMINATION CERTIFICATE relates only to the design of the specified component, and not to specific components subsequently manufactured.

13 The marking of the component shall include the following:

 II 3G  
Ex nA II

Project Number 52A15161  
Date 4 August 2006  
C. Index: 12

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C Ellaby  
Certification Officer

**Sira Certification Service**

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## SCHEDULE

### TYPE EXAMINATION CERTIFICATE NUMBER:

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#### 13 DESCRIPTION OF COMPONENT

The DLCxyyy Embedded Digitiser Module is a miniature digitizing circuit, measuring 20 mm diameter, 10 mm deep. The device comprises two PCBs, stacked one on top of the other. The device provides input signal conditioning for full bridge strain gauge circuits and with an output to a CAN bus. It is certified as a component intended for incorporation into suitably-certified load cells, pressure transducers, inclinometers or any certified device where strain gauges are used, with a minimum ingress protection class of IP54. No enclosure is supplied.

Operating from DC power in the range of 5.5 V to 18 V, the DLCxyyy provides an excitation supply for one or more connected strain gauge bridges with a combined impedance of no less than 83  $\Omega$ . For operational reasons, the maximum supply voltage for such a load is 9 V, although compliance is not affected at voltages up to 18 V. The returning signal from the strain gauge bridge(s) is digitized and passed to the microprocessor for onward transmission to the CAN bus. Additional features include a shunt calibration facility and the ability to connect to a DALLAS-MAXIM "1-wire" digital thermometer, for temperature compensation purposes.

The incoming power supply is stabilized by a low-volt-drop regulator and is passed to the strain gauge bridge for excitation purposes. The returning signal from the strain gauge bridge is fed into an auto-zeroing low noise amplifier and then onwards to a Sigma Delta 24-bit A-D converter, running at a sampling rate of up to 4.8 kHz. The bridge excitation voltage is also fed to the A-D converter as a reference voltage so that the measurement is truly ratiometric. An optional digital thermometer may be connected external to the DLCxyyy and provides an input to the microprocessor for the purposes of temperature compensation of zero and span errors. The output signal and any of the internal configuration parameters can then be made available over a standard two-wire CANbus communications port.

Although the DLCxyyy is a component certified as 'Ex nA', it is possible that it may be used within circuits that are 'nL'. In this case, further information concerning the internal capacitance and inductance may be required. The total capacitance (taking into account tolerance) is 11.5  $\mu$ F, of which no more than 2.7  $\mu$ F is at the supply voltage and the rest at the regulated voltage of 5 V. The regulator is rated at 20 V. All capacitance is prevented from appearing at the supply terminals by a diode, rated at 40 V. The circuit contains a number of filters, with negligible inductance.

#### 14 DESCRIPTIVE DOCUMENTS

14.1	Drawing	Sheet	Rev.	Date	Title
	DLCCAN-1	1 to 2	1.0	26 July 06	General assembly
	DLCCAN-3*	1 of 1	1.0	26 July 06	Marking
	ME3006	1 to 2	2.01	26 July 06	Schematic

\* This drawing was amended by Sira on 4 August 2006

#### 14.2 Report number R52A15161A

Date 4 August 2006

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#### 15 SPECIAL CONDITIONS FOR SAFE USE

- 15.1 For hazardous area use, the DLCxyyyy shall be installed in a suitably-certified device that provides an ingress protection of IP54 minimum.
- 15.2 The voltage range is 5.5 Vdc to 18 Vdc: provision shall be made external to the device to prevent transient voltages exceeding 40% above the maximum rated voltage.
- 15.3 The DLCxyyyy has been assessed for an ambient range of -40°C to +85°C.
- 15.4 The maximum temperature rise of the DLCxyyyy under worst-case load conditions (83  $\Omega$ ) is 99 K at 10% above the maximum voltage of 18 V. If the voltage is limited to 9 V, the maximum temperature rise is 36 K. All components, including the hottest component (the voltage regulator) are smaller than 10 cm<sup>2</sup>.
- 15.5 The maximum load that may be connected to the DLCxyyyy is four load cells in parallel, with a minimum paralleled resistance of 85  $\Omega$ .
- 15.6 The capacitance at the supply voltage is 2.66  $\mu$ F and the total capacitance in the circuit is 11.505  $\mu$ F. For compliance as 'nA', there are no safety components on which compliance depends. However, if incorporated into a circuit with overall protection 'nL', the following components may be required as safety components:
- REG1 – L4931-series 5 V voltage regulator – maximum voltage 20 V
  - D1 – SD103 Schottky diode – maximum voltage 40 V

#### 16 ESSENTIAL HEALTH AND SAFETY REQUIREMENTS (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in report number R52A15161A.

#### 17 CONDITIONS OF CERTIFICATION

- 17.1 The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.
- 17.2 Holders of type-examination certificates are required to comply with the production control requirements defined in Article 8 of directive 94/9/EC.

Date 4 August 2006

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