

### New Generation Telemetry Strain Gauge Acquisition Module & Handheld

#### Features



- 2 way radio system for data integrity
- Very low power consumption for long battery life
- Very small size - 18 x 40 x 7mm including signal conditioning module
- Worldwide licence exempt 2.4 GHz radio
- Option of hand held remote display or PC interface for data capture
- Remote power on/off (sleep/wake)
- 120 metre (400 feet) range maximum
- Simple configuration and calibrated via PC using base station with Telemetry Toolkit software
- Internal or external antenna options



#### Introduction

The T24-SA is a high performance strain gauge to radio telemetry converter module, offering precision measurement with high performance two-way telemetry.

Usable around the globe on licence-free 2.4GHz frequency, the T24 range avoids local radio interference to ensure data integrity and security. For use in any measuring applications, from torque to weight, vibration to flow, the T24 offers users a complete solution to your measurement requirements.

The modules form part of a simple measurement system that offers the opportunity to collect measurements from a variety of sources, enabling accurate and immediate data collection without the requirement for

and labour intensive cabling operations.

Transmitting from a strain acquisition module on 2.4 GHz to a variety of receivers including a user friendly simple 2 button handheld T24-HS which captures this data and displays it providing a line of sight communication range of typically 120 metres. The T24-HS also performs the function of waking the T24-SA when it is turned on and sending it to deep sleep module when it is turned off.

The wide temperature operating range and the robust technology ensures that the module it is not susceptible to harsh physical or electrical environments. Options include internal or external antenna, and a growing range of receiver modules.

#### Specifications

##### General Radio

	Min	Typical	Max	Units
Licence		Licence Exempt		
Modulation method		MS (QPSK)		
Radio type		Transceiver (2 way)		
Data rate		250		K bits/sec
Radio Frequency	2.4000		2.4835	GHz
Power		1		mw
Range RAD24i (Integrated antenna)			120 (400)	Metres (feet) *
Range RAD24e (External antenna)			200 (650)	Metres (feet) *
Channels (DSSS)		16		

\* Maximum range achieved in open field site with T24-SA at a height of 3 metres above ground and T24-HS held at chest height pointing towards the T24-SA.

##### T24-SA - Embedded Strain Gauge Digitiser

Specification with 1000R bridge, 2.5mV/V, at 3V supply at 25 Deg C

Measurement	Min	Typical	Max	Units
Strain Gauge Excitation System			4 Wire	
Strain Gauge Excitation Voltage	4.5	5	5.25	VDC
Strain Gauge Drive Capability	85	-	5000	Ohms
Strain Gauge Sensitivity (FR)	3.2	3.3	3.4	+/-mV/V
Offset Temperature Stability		1	4	ppm/C
Gain Temperature Stability		3	5	ppm/C
Offset Stability with Time		20	80	ppm of FR (1)
Gain Stability with Time			30	ppm of FR (2)
Non Linearity before Linearization		5	25	ppm of FR
Internal Resolution		16,000,000/ 24		Resolution/Bits
Noise Free where Sample Time < 10mS		50,000 / 15.5		Resolution/Bits
Noise Free where Sample Time < 50mS		65,000 / 16		Resolution/Bits

Noise Free where Sample Time < 100mS		150,000 / 17.25		Resolution/Bits
Noise Free where Sample Time < 1000mS		250,000 / 18		Resolution/Bits
Noise Free where Sample Time > 1000mS		400,000 / 18.75		Resolution/Bits
<b>Electrical</b>	<b>Min</b>	<b>Typical</b>	<b>Max</b>	<b>Units</b>
Power Supply voltage	2.1	3.0	3.6	V dc
Power Supply ripple			50	mV ac pk-pk
<b>Power Supply current</b>	<b>Min</b>	<b>Typical</b>	<b>Max</b>	<b>Units</b>
Normal Mode (1K Bridge)		60	65	mA
Standby / Low power mode		5	20	uA
<b>Environmental</b>	<b>Min</b>	<b>Typical</b>	<b>Max</b>	<b>Units</b>
Operating temperature range	-40		+85	C
Storage temperature	-40		+85	C
Humidity	0		95	%RH

### T24-HS - Handheld Reader

<b>Electrical</b>	<b>Min</b>	<b>Typical</b>	<b>Max</b>	<b>Units</b>
Power Supply voltage	2.4	3.0	3.6	V dc
<b>Power Supply</b>	<b>Min</b>	<b>Typical</b>	<b>Max</b>	<b>Units</b>
Active		35	40	mA
Low power mode		120	160	uA
Estimated Battery life using 2Ahr batteries:				
Standby mode (Powered off)		1.5		Years
Continuous operation		40		Hours

Use a pair of alkaline AA batteries. Due to the higher voltage requirements of this device NiMH and NiCad batteries are not recommended.

<b>Environmental</b>	<b>Min</b>	<b>Typical</b>	<b>Max</b>	<b>Units</b>
IP rating		IP65		
Operating temperature range	-10		+50	C
Storage temperature	-40		+85	C
Humidity	0		95	%RH

### Module Transmits & Receives giving:

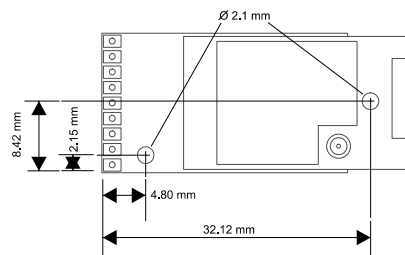
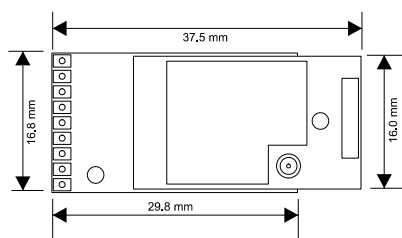
1. Full error detection and correction
2. Ability to switch to low power modes
3. Calibration & configuration via radio telemetry
4. Ability to be switched from sleep to operating mode via radio
5. Calibration stored within the module
6. Remote battery check

### Product Order Codes

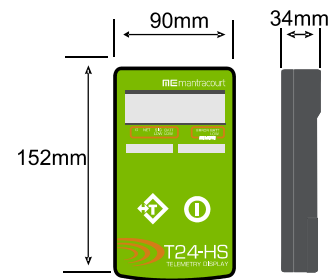
T24-SAi	Strain Gauge Acquisition Module internal antenna	T24-HS	Handheld Reader Simple
T24-SAE	Strain Gauge Acquisition Module with socket for external antenna	T24-HA	Handheld Reader Advanced
T24-VAi	Voltage Acquisition Module internal antenna	T24-BSu	Base Station USB
T24-VAe	Voltage Acquisition Module with socket for external antenna	T24-BSi	Base Station Industrial
T24-IAi	Current Acquisition Module internal antenna	T24-SO	Serial Output
T24-IAe	Current Acquisition Module with socket for external antenna	T24-BC1	Battery Charger
T24-SAFi	'Fast' Strain Gauge Acquisition Module internal antenna	T24-ACM	Single Channel Acquisition Connectivity Module
T24-SAFe	'Fast' Strain Gauge Acquisition Module with socket for external antenna	T24-PR1	Thermal Printer

### Mechanical Dimensions

#### T24-SA - PCB Module

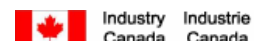


#### T24-HS



### Approvals

**CE**, Complies with EMC directive. 2004/108/EC  
The Radio Equipment and Telecommunications Terminal Equipment (R&TTE) Directive, 1999/5/EC.



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