



## WIRELESS AUTONOMOUS TELEMETRY SYSTEM

# WATS™

INVOCON, INC.

TECHNOLOGY PROFILE – MARCH 2003

### Invocon's Premier Miniature Synchronous Sensor

WATS is a synchronous, real-time, data acquisition and communications network. This system consists of up to five miniature Remote Sensor Units (RSUs), a System Interface Unit (SIU), and a Graphical User Interface (GUI). Each RSU contains the acquisition and networking electronics, excitation, signal conditioning, 12-bit analog-to-digital converters, radio, and battery. The two RSUs pictured contain internal accelerometers, and the package on the right is aerodynamically designed for external aircraft installation.



The system operates by transmitting data from the RSUs installed throughout the aircraft to the SIU with minimum latency. Digital data is transmitted over RS-232 to a laptop computer for immediate graphing and storage. The system operates in a real-time mode in which data is synchronized to within  $\pm 10\mu\text{s}$  between any two nodes. The system operates in two modes: Idle and Data.

**Idle mode:** The remote sensor remains in an extreme low power mode, occasionally communicating with the SIU to check for Data mode initiation. Idle mode consumes an average power of  $5\mu\text{A}$ .

**Data mode:** The remote sensor units will acquire and transmit data based on the synchronization sequencing sent from the System Interface Unit. Data mode consumes an average of  $5\text{mA}$  allowing for more than 24 hours of acquisition in Data mode.

#### Specifications

<b>DATA ACQUISITION RATE</b>	20 Hz.
<b>SYNCHRONIZATION</b>	Samples acquired within $\pm 10\mu\text{s}$ between any two nodes.
<b>PRIMARY SENSOR TYPES</b>	WATS can accommodate strain gages, RTDs, pressure sensors, accelerometers, or any other sensor with an active resistive element. (Where appropriate the sensor will be placed inside the WATS enclosure.)
<b>SENSOR INTERFACE</b>	Optional full-bridge completion configuration; 2.5V excitation; 12-bit A/D; factory programmable gain and filter parameters.
<b>INTERNAL TEMPERATURE</b>	10-bit A/D with 0.25°C resolution.
<b>POWER</b>	Battery powered, 2.8-4.0V input range. $5\mu\text{A}$ in Idle mode — 5mA (average) in Data mode.
<b>OPERATING TEMPERATURE RANGE</b>	0°C to +55°C (extended temperature units are available).
<b>BATTERY LIFE</b>	Standard internal battery supports over 24 hours in Data mode. <i>Other capacities and external batteries are available.</i>
<b>PACKAGING</b>	Snap enclosure with internal replaceable battery (3.3 x 3.3 x 1.5 cm). Aerodynamic casing with internal replaceable battery & antenna (13 x 4.1 x 1.1 cm). Other configurations, including ruggedized housing, are available.
<b>TRANSMISSION RANGE</b>	30m (line-of-sight)

For further information, contact Invocon, Inc.  
19221 IH 45 South, Suite 530, Conroe, TX 77385 USA  
Phone: 281-292-9903; Fax: 281-298-1717

[www.invocon.com](http://www.invocon.com)

E-mail: [ivc@invocon.com](mailto:ivc@invocon.com)

*System specifications subject to change without notice.*  
© 2004 Invocon Incorporated, All Rights Reserved.