PRODUCT SUMMARY

- 5-10 Analogue Sensor channels
- 8 Digital Input/output channels
- 2 Serial channels
- 6 Sensor Power Supplies
- Stand-alone – Battery/Solar
- GPRS Modem built-in
- IP65 weather proof enclosure

Includes

- GPRS/GSM modem
- 5Ah battery
- Solar regulator
- SIM Card
- Removable SD data cards
- Antenna

KEY FEATURES

- Sensor data collection, filtering, dispatch and alerting
- Sensor device management
- Mains free and optimized for ultra low power management. Can be powered by internal or external battery + small solar panel or other renewable energy source
- Smart power (can intelligently provide power to sensors and instruments)
- Internal diagnostics include internal & external battery/ solar voltage, CPU temperature, GSM signal strength & quality & data volumes

KEY BENEFITS

- Real time information from remote sensors and instruments
- Enables organizations to incorporate sensor information into enterprise applications
- Low power and mains free
- Data available on the web
- A hosted solution therefore no IT infrastructure required
- A complete solution to enable rapid implementation
- Flexibility to start small and grow to global enterprise scale deployments

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Product Information: Micro Monitoring Service Point (micro MSP)

The Ibexis Micro MSP is designed for those applications where a small footprint but full functionality is required. It is the ultimate small Remote Telemetry Unity (RTU) where IO monitoring is required but size is an issue. Combining the small size and ease of installation of a "logger", with the features of a highly sophisticated RTU, our Micro MSP offers a low cost monitoring solution where there is limited installation space.

It is a complete solution in a single small box which is mains free and can intelligently power your sensors.

Just connect your sensors to view live data on web!

A Complete Solution

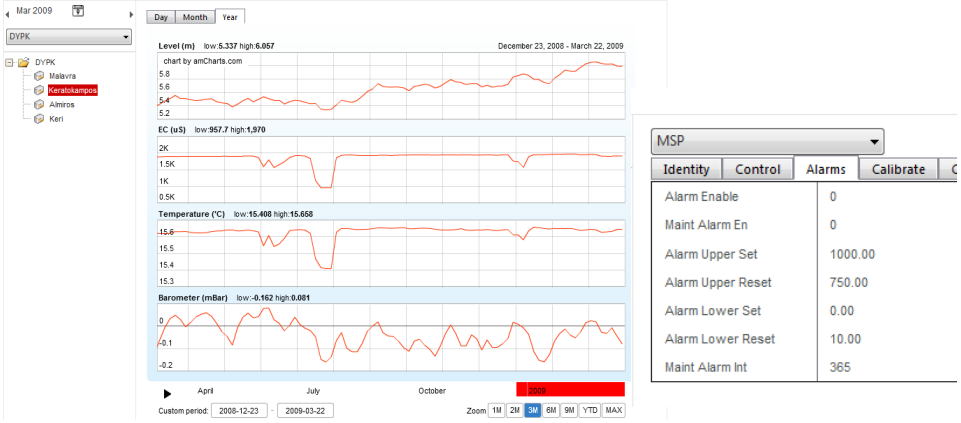
The micro MSP incorporates into a single unit analogue, digital and serial sensor interfaces, a 20 channel data-logger, local data storage, smart power management, batteries, a solar regulator, a GPRS modem, antenna and a SIM card. The MSP is a highly intelligent unit that supports a wide range of interfaces and protocols, and can intelligently control and power your sensors. Built from the ground up as a single integrated solution, the MSP connects the physical world of field based sensors, instruments and controls with the world of information systems.

Rugged and Mains Free

The micro MSP is rugged and designed to last in the field at least five years. It consumes very little power, operating from an internal re-chargeable lithium battery and supplemented by solar power or other renewable energy source. Data is transmitted from site to Ibexis central servers via the integrated GPRS modem. It uses an optimized and secure protocol which is proven to be both robust and reliable, unlike alternatives such as SMS messaging.

Data Services and Web Applications

Micro MSP solutions include a range of data services and web applications. Included in the monthly data charge are all cellular data charges, sensor data hosting and archive along with a range of web based configuration, analysis and reporting applications. The micro MSP can be remotely configured from the Ibexis website where both live and historic sensor data can be viewed. Secure web based applications include tabular and graphical data, charting, maps, SMS and email alerting tools. There are also facilities for data export in a variety of formats including CSV, Excel and XML.



Micro MSP

remote sensing made simple

Analogue Channels

The inputs can be single-ended, differential or floating.

The following maximums apply:

- 2-wire floating or differential : 5* inputs
- 3-wire and 4-wire differential or floating : 5* inputs
- Single ended common referenced 2-wire: 10* inputs

*Upgradable to 40 single ended, or 20 differential/floating via CEM unit

Input Ranges

The MSP's fundamental inputs are voltage, current, resistance and frequency. All measurements are derived from these.

Voltage Full Scale /	Resolution	Current Full Scale /	Resolution	Resistance Full Scale /	Resolution
20 mV	3 uV	200 uA	0.3 uA	80 Ω	1 mΩ
40 mV	3 uV	400 uA	0.3 uA	160 Ω	1 mΩ
80 mV	3 uV	800 uA	0.3 uA	320 Ω	1 mΩ
160 mV	3 uV	1.6 mA	0.3 uA	640 Ω	1 mΩ
320 mV	5 uV	3.2 mA	0.5 uA	1.25 KΩ	2 mΩ
640 mV	10 uV	6.4 mA	1.0 uA	2.5 KΩ	4 mΩ
1.25 V	20 uV	12.5mA	2.0 uA	5 KΩ	8 mΩ
2.5 V	40 uV	25.0 mA	4.0 uA	10 KΩ	16 mΩ

1. at 10 samples/ second
2. Voltage or current mode Is selectable and 2, 3 or 4-wire.
3. Resistance measurement with 250uA current source.

Accuracy

Measurement	5°C to 45°C	– 40°C to 85°C
DC Voltage	0.001%	0.01%
DC Current	0.05%	0.1%
DC Resistance	0.1%	0.15%

Accuracy is % of reading ±0.01% of full scale.

Sampling

- Digital filtering for 50/60Hz noise rejection
- Maximum sample speed: 1Hz (for 10 channels)
- Effective resolution: 16 bits
- Common mode rejection: 100dB typical
- Line series mode rejection: >90dB
- Input impedance: >1MΩ
- Linearity: 0.001%

Output Power Supplies (Sensor Excitation)

- Includes 6 regulated power supplies (2 upgradable).
- Scheduled on / off times to meet sensor requirements
- Standard configuration (included)
  - 1 x 12V 5W regulated DC
  - 3 x 3.3V regulated DC *
  - 1 x Always on 3.3V regulated DC*
  - 1 x precision current-source 250uA *
- Upgradable using optional "power supply plug-ins". 5V, 12V and 24V available.
- Or use switched external supply, (typically 12V lead-acid.)

Analogue Sensors

Supports a wide range of sensors including, but not limited to, those listed below:-

Resistor Temperature Dependant (RTD)

- PT100, PT1000
- Resistance range: 10Ω to 10KΩ

Monolithic Temperature Sensors

- Types supported: LM34 - 60, AD590, 592, TMPxx
- LM135, 235, 335

Strain Gauge and Bridge Sensors

- Configurations: ¼, ½ & full bridge
- Excitation: voltage or current

4-20mA Current Loop

- Internal 100R shunt or external shunt resistor
- 3 and 4-wire

Digital Channels

There are 8 digital channels, which are all software configurable as inputs, outputs or counters.

Input/Output

- Digital Inputs: logic level (max 10V)
- Digital Outputs- logic output (3.3V @ 3mA)

Counters

- **Low Speed Event Counter:** 16 bit, max 10 Hz. Operates continuously, accumulating event counts. Applications include tipping bucket rain-gauge.
- **High Speed Frequency Counter:** 16 bit, max 10 KHz, (optional 100KHz). Spot frequency sample measurement. Applications include wind speed and RPM.
- **Accuracy:** 0.003% (5°C to 45°C) 0.01% (-40°C to 85°C)

Serial Channels

Used for data-logging with instruments and smart sensors.

- **Inputs**: 2 x Serial Ports (in addition to host port)
- **Interfaces**:
  1x RS232, RS422 or RS485
  1x RS232, or SDI-12
- **Flow Control**: Hardware (RTS/CTS), or None
- In-built switchable Serial Power Supply
- **Baud rate**: 300 to 115200

Virtual Channels

Create additional derived or calculated channels using mathematical functions.

- Combine values from analogue, digital and serial sensors using expressions involving variables and functions.
- An extensive range of functions are available

System

- ARM 926 32bit processor, 32Mb flash
- Real-time multi-tasking operating System.
- Indicators: 3 x LEDs for Activity, GSM, and Battery.
- Firmware Upgradeable via RS232 host port.

Real Time Clock

- Internal Battery Backup
- Normal resolution: 18mS
- Accuracy: ±1 min/year (5°C to 45°C)
  ±4 min/year (-40°C to 85°C)

Input Protection

- All inputs have electrostatic protected to IEC61000-4-2.
- +/- 15KV contact and air discharge
- Overvoltage protection. Inputs clamped to 10V

Data Storage Memory

- Removable SD Card (included)
- Non-volatile local storage of measurement data, events, alarms and system configuration
- Capacity: 1 GB micro SD card. Optional 2, 4 GB.
- Approx 100 Million data points

Local Host Communications

- **USB:** USB 1.1 (virtual COM port)
- **RS232** Speed: 115,200 baud, with Hardware (RTS/CTS).
- 8 data bits /1 stop, No parity.

GSM / GPRS Modem

- Built -in
- Quad Band GSM 900/1800/850/1900 MHz
- GPRS Class 10
- Sensitivity Rx -102dBm / TX +33/30dBM
- Approvals: R&TTE, CE, GCF, FCC, PTCRB, RTE, AT&T

Physical and Environment

- **Temperature range**: –40°C to 85°C industrial grade*
  *reduced battery life outside range –20°C to 50°C
- **Humidity**: 0-100% non-condensing
- **Construction**: ABS, IP65 Weather proof enclosure.
- **Dimensions**: : 120 x 80 x 40 mm
- **Weight**: < 1kg
- **ROHS** compliant
- **CE conformity** to 89/3 36/EEC.

Power Supply

Internal Batteries

- Internal battery: 3.6Vdc 5Ah Lithium Ion
- Optional Internal Battery upgrade to 10Ah
- Peak Power: 12W (3.6Vdc 1.5A)

External Supplies

- (Optional) External Supply 5-30Vdc

Solar Regulator

- Built-in solar regulator for the internal battery
- Supports solar panels up to 20W
- (Optional) Solar Regulator plug-in for 25W+ panels

Firmware Features

Input Processing

Independently configurable processing of all input sources. Includes:

- Calibration (slope/offset)
- Filtering of analogue and de-bounce of digital sensors
- Range checking
- Configurable settling time before sample taken.
- All Data, events and alarms are time-stamped
- Readings can be compensated, derived or transformed using expressions involving variables and built functions.
- Events and alarms are time-stamped

Scheduling

- **Standard**: automatic scheduled sampling at intervals between 1 minute and 1 day.
- **Extended Averaging:** continuous sampling and averaging as often as every 5 seconds. Reading logged at intervals between 1 minute and 1 day
- **On Demand** A sample can be requested, and returned outside the schedule. "Take a sample now"

Alarms

- Each device's alarms can be enabled or disabled.
- Each device has four configurable "reading alarm" thresholds: Critical-High, Critical-Low, Warning-High and Warning-Low. In addition there is a "service-due" alarm for maintenance management.
- Appropriate, time-stamped "Alarm" messages are sent when the corresponding thresholds are exceeded.
- "Alarm Clear" messages are only sent when the reading returns below the "Warning" threshold level, providing a hysteresis "dead-band".
- All events and alarms logged, and stored.

Configuration

- Remote configuration and non-volatile storage of static configuration data.
- Includes: sampling interval, upload interval, calibration and range settings, modem settings, alarm and event thresholds, etc.

Accessories Included

- Resource CD: includes windows configuration software and user manual.
- USB cable
- Global SIM Card
- GSM/GPRS Antenna
- 5Ah Lithium-Ion Battery

Optional Accessories

A range of accessories are available, including:-

- Power supply plug-ins. 5V, 12V and 24V.
- Internal Battery upgrades. to 10Ah
- Heavy duty Solar Regulator for 25W+ Solar Panels
- High gain Antennas
- GPS

For further information, or for useful downloads, visit the Ibexis web site

Warranty: All *Ibexis* products are covered by a 1 year warranty on workmanship and parts.
Specifications: Ibexis Ltd reserves the right to change product specifications at any time without notice.
Quality Statement: Ibexis operates a Quality Management System. Ibexis supplies its customers with products which are fit for their intended purpose, are safe to use, perform reliably to specification, represent excellent value for money, and are backed up by fast and effective customer support.

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