E-Senza Technologies

Sensor to Sytem Connectivity

Jan 2012

Reducing energy consumption I Improving process efficiency I Meeting governmental regulations

Leveraging Power of Wireless®

VISION

To enable a smart & green planet

E-Senza aims to be the global leader in total energy efficiency solutions for industrial processes and commercial facilities based on its leading edge sensors to cloud framework using low power wireless networking technology.

About E-Senza

History & Key Milestones

2005

Amit Shah &
Mihaela Homana
Leave Siemens to start
E-Senza

2006

German **Industry Innovation Award**

First fully plug-and-play **Wireless Device Network** launched in **Market**

2007

Industrial wireless sensors launched

2008

Another Siemens professional Dr. Johannes Bleuel joins E-Senza

2009

E-Senza wins Red Herring 100 Europe award

E-Senza launched 3rd generation SenzaNET

Innovation Award of the **Initiative Mittelstand**

E-Senza achieves ISO9000 Certification

2010

Temperature Monitoring & **Energy** Management **emerge as** Clear Trends!

Sales Network expands to to **20** countries

Living Lab Global Showcase Award 2010

SenzaAnalyzer - Site Analyze Tool launched

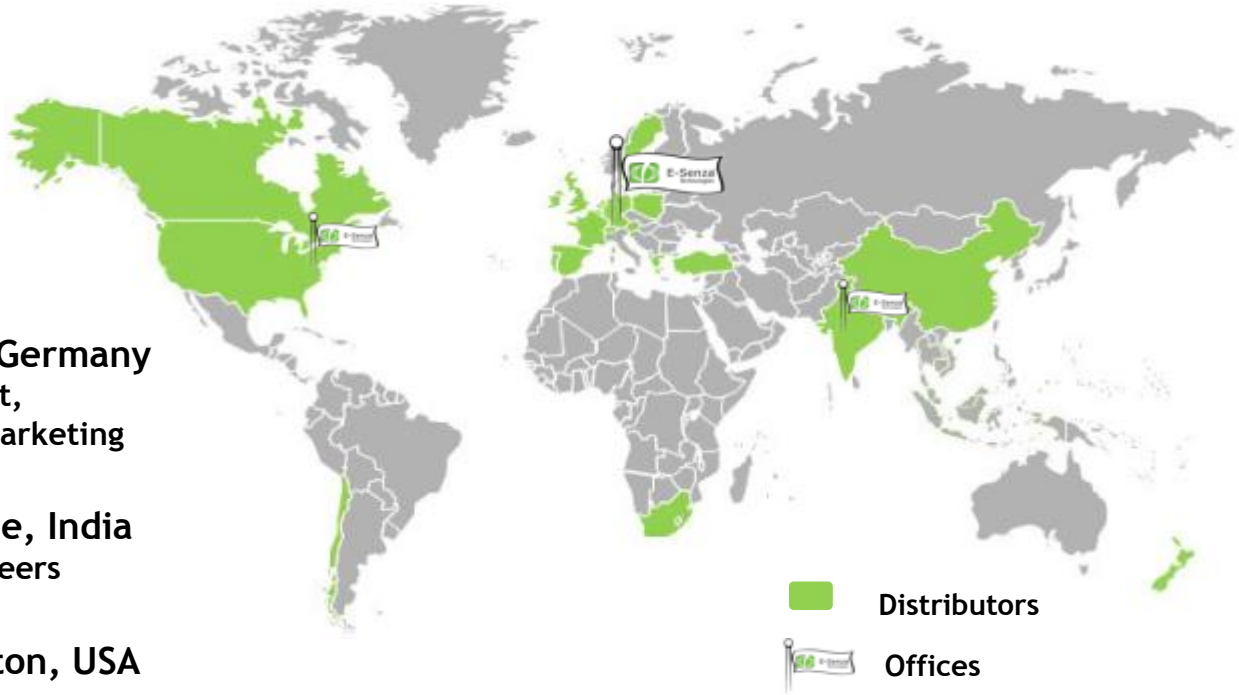
2011

TiE50 Award Winner

WiHART Gateway & Adapter achieves Interoperability

SenzaNET product line expanded to 13 various sensors products and 5 Gateways

Locations



- Head quarter in Konstanz, Germany
  - 13 people in development, manufacturing, sales & marketing
- Development center in Pune, India
  - 11 software & test engineers
- Satellite sales office in Boston, USA
- 15 Partners represent & sell E-Senza products in 25 countries today

Sales & Support Network

Europe

France

Great Britain

Greece

Ireland

Netherlands

Poland

Portugal

Sweden

Australia

New Zealand

Australia

Asia

China

India

Israel

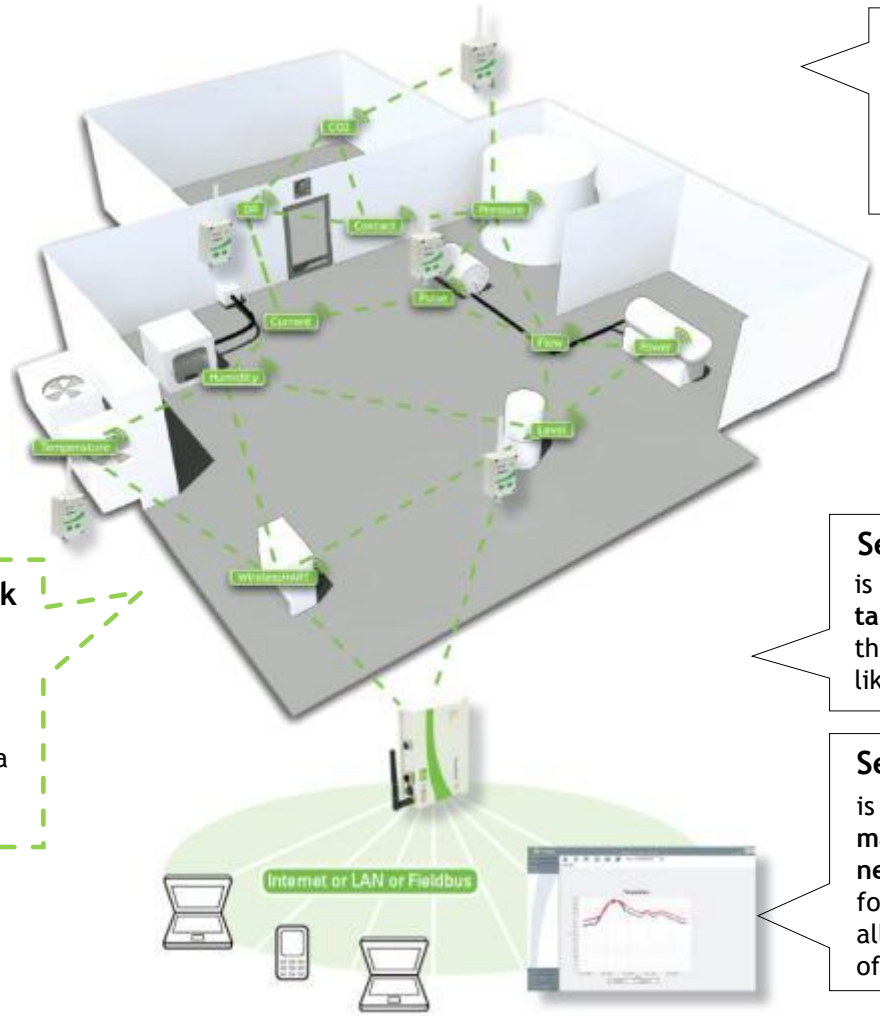
Turkey

Africa

South Africa

Product line

SenzaNET - Product Framework



SenzaBlock

are **battery operated wireless networking devices** that include pre-configured **sensors** like wireless temperature sensors or wireless adapters

SenzaHub

repeats wireless **signals** to enhance and **extend coverage**.

SenzaGate

is a **gateway** and **network master** device that **takes input** from the SenzaBlocks and **translates** that input for transport over **common protocols** like wired Ethernet, Modbus or GPRS.

SenzaWMS

is the software management system that **manages, visualizes and configures** the **network**, provides **monitoring information** for SenzaBlocks attached to the network and allows for **alarming, alerting and exporting** of device network information.

SenzaNET Mesh Network

- Time synchronized
- Channel hopping
- Store and Foreward data network for reliable transmission

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SenzaBlock

I/O

- SenzaBlock adapters connect sensors wirelessly, without the expense and hassle of cabling
- Can be externally powered (12 – 24 VDC) or run on internal 3 VDC batteries, with a battery life of multiple years
- Real-time clock and time synchronization of all nodes assures accurate time stamping of individual measurements
- Circular buffer can internally log up to 1 kByte of sensor readings
- Embedded SenzaNET software provides logging and reporting, triggers/alarms, battery condition monitoring, and over-the-air configuration
- Choice of enclosure ratings (IP54 and IP65) and antenna options (internal and external)
- Up to 90% installation and commissioning cost savings over traditional cable-based solutions

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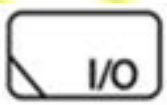
Wireless Sensors - SenzaBlock

Parameter	SB110-T	SB110-NTC	SB110-HT	SB110-DP	SB110-C	SB110-CT
Parameter	Temperature	Temperature	Humidity + Temperature	Differential Pressure	CO2	Current Transformer
Characteristics	-100 C - 400 C	-55 C - 125 C	-40 C - 125 C 10% - 90% rH	500 Pa	0 - 2000/5000/10000 ppm	80A-400A
	1 PT100 2-wired	optional with 3 Sensors (SB110-NTC-3)		Air leakage		Single or Three Phase

- **Multi-sensor node with Temperature, Humidity, Light and Movement sensors was implemented as a customer-design**
- **Products are based on digital sensor-interface**
- **Low-cost solution**

Wireless Adapter - SenzaBlock



I/O Channels	Specification	SB110-AI	SB110-AO	SB110-IO	SB110-PI	SB130	SB140
Pulse	2 kHz sampling frequency	-	-	-	2/0	4/2	-
Analog	0-20 mA, 4-20 mA, 0-2 VDC, 0-10 VDC[1]	2/0*	0/2	-	-	4/2	-
Digital	Optically isolated Max. 60 VDC/50 mA	-	-	2/2	-	4/2	-
Serial	RS-232 interface 19,200 to 115,200 bps	-	-	-	-	-	1/1

[1]0-10 VDC interface for output requires SenzaBlocks to be externally powered (12 – 24 VDC)

* X/y = "X" equals number of input channels & "Y" equals number of output channels available

- **Analog interfaces employ 12-bit ADC/DAC for accurate conversion**
- **PT100 interface has 24-bit ADC for accurate conversion**

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SenzaGate

- Provide protocol translation & connectivity between the SenzaNET network and backend systems
- Central node of the the wireless network: monitors, configures sensors & actuators
- Manages of up to 64 (extendible up to 255) SenzaBlock wireless sensors/adapter
- Wide choice of connectivity options: USB, RS232, RS485, Ethernet, GPRS and Wi-Fi
- Fieldbus connectivity to Profibus DPV1, ModbusTCP & CAN2.0
- Simple I/O options or Gateway with integrated Monitoring Software are also possible
- Externally powered (12 – 24 VDC)

Industrial Gateways

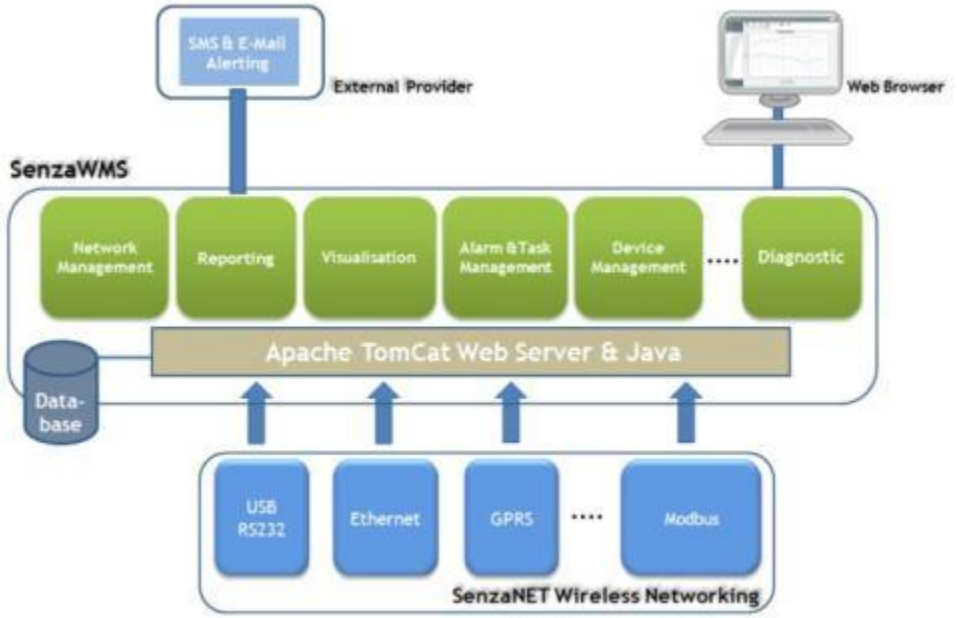



Interfaces	SG130	SG131	SG132	SG151
Power input	USB-powered	12 – 24 VDC	12 VDC	12 VDC
USB	Standard	Optional	Admin-Port	-
RS-232	Optional	Optional	-	-
RS-485	-	Optional	-	-
Ethernet	-	Standard	-	Standard
Profibus	-	Optional	-	-
Modbus	-	Optional	-	-
GSM/GPRS	-	Optional	-	-
Analog / digital IO	-	-	8-channel	-
SenzaWMS	Required	Required	Not required	Integrated

- **SenzaHub (SH140) serves as an inexpensive, autonomous range extender**
- **SenzaGate (SG130) additionally incorporates a USB port**
- **SenzaGate (SG131) provides connectivity options such as USB, RS232/485, Ethernet or GPRS**
- **SenzaGate (SG151) offers integrated SenzaWMS**

SenzaWMS Software Suite

- Comprehensive Device-, Network- and Data-Management (Server or Local Client)
- Enables central configuration, calibration, linearization, localization & monitoring of all devices
- Allows also for alarming, alerting & exporting of device network information
- Interfaces for data integration across diverse IT environments
- Web based Java Software
- Setting network parameter preferences in system configuration



SenzaWMS Software Suite

		SenzaWMS Enterprise	SenzaWMS Professional
Visualization	Data visualization and real-time statistics	✓	✓
	Network node location	✓	✓
	Network health monitoring	✓	✓
	Authentication and security	✓	✓
	Data export and automatic data backup	✓	✓
Alarms & Events	Alarm notification via SMS, E-Mail & Windows event log	✓	-
History	Historical routing graphs and management	✓	-
Network Routing	Network configuration	✓	✓
Administration	Custom device types	✓	-
	Device configuration	✓	✓
	Task management	✓	-
	Custom link list	✓	-
	Advanced system settings	✓	-
	Access control	✓	-
	Remote update	-	✓[1]

[1] This applies only to SenzaGate SG151

Markets & Solutions

Focus Markets / Applications

Plant Monitoring

- Condition Monitoring
- Process Monitoring
- Energy Efficiency

Data Center & Building Monitoring

- Data Center Monitoring
- Govermental Buildings, Offices,
- Public Buildings & Schools
- HAVC Monitoring
- Telecom Infrastructure

Temperature Monitoring

- Quick-Serve Restaurants
- Pharmaceutical Warehouses
- Cold Chains
- Green Houses
- Laboratories & Hospitals
- Museum

- ✓ Cost-efficient way to enhance visibility of critical parameters
- ✓ Improve energy & resource efficiency
- ✓ Condition Monitoring & Predictive Maintenance
- ✓ Compliance to Regulatory requirements

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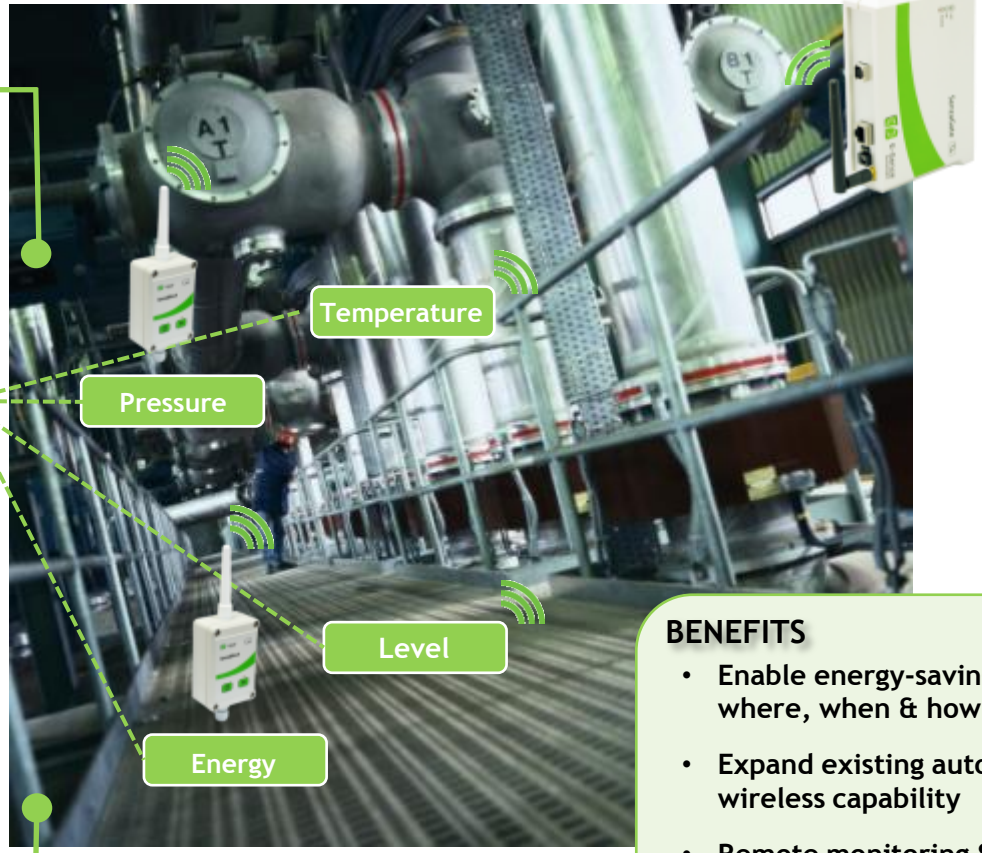
Smart Factories

Flexible **expandable, simple & reliable** wireless data collection

- Easy to deploy wireless sensors
- Run on battery for years
- Comprehensive, consistent & accurate data



From **simple cable replacement** to **complete integration** into the most complex plants & automation systems

Modbus I Profibus I GPRS I Ethernet I USB I RS232/485

Energy-intensive plant **processes** such as heat, steam or compressed air

BENEFITS

- **Enable energy-saving decisions by understanding where, when & how much energy is used**
- **Expand existing automation solution with a wireless capability**
- **Remote monitoring & control**

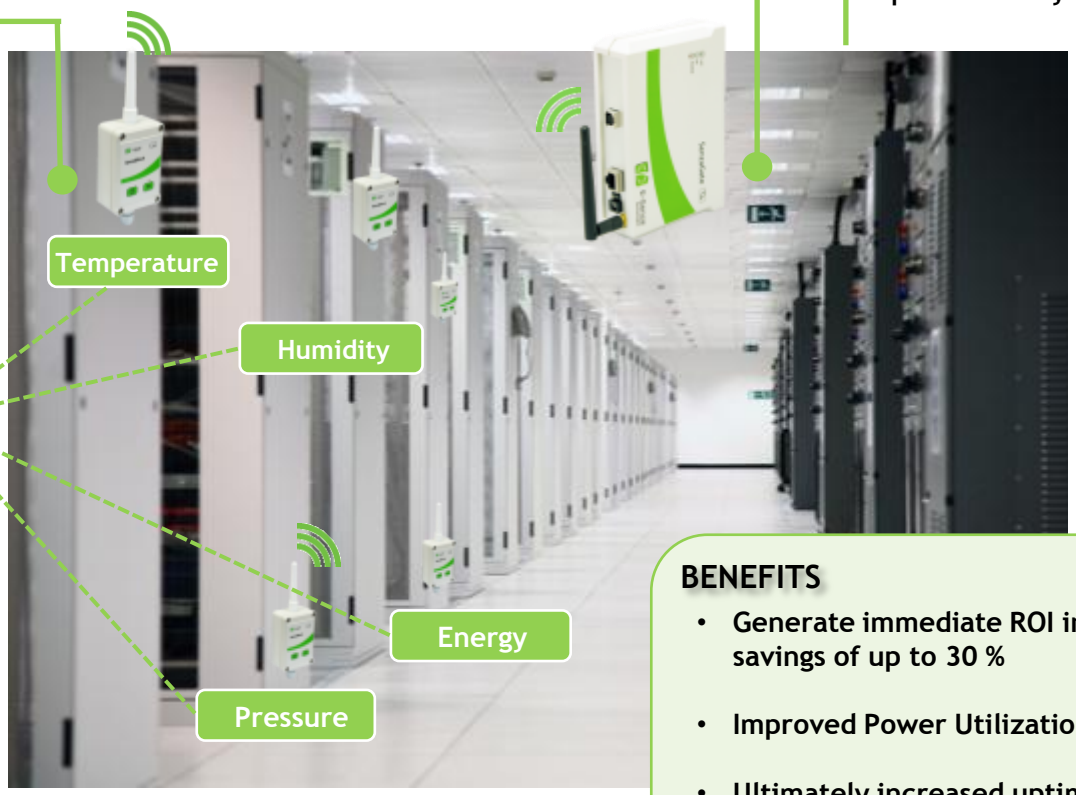
SI*, Plant operators, ESCO's & Solutions providers**

* System Integrator, ** Energy Service Company

Data Center Monitoring

Flexible **expandable, simple & reliable** wireless data collection

Integration with data center **monitoring software** platforms is **quick and easy**



- Easy to deploy wireless sensors
- Run on battery for years
- Comprehensive, consistent & accurate data

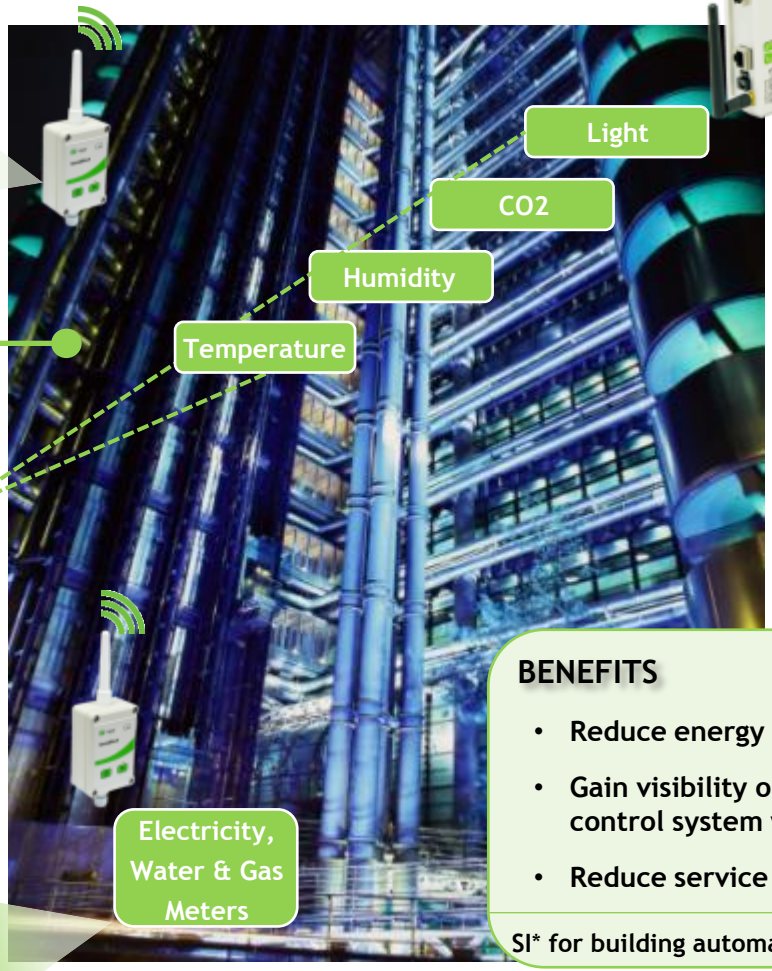
BENEFITS

- **Generate immediate ROI in terms of energy savings of up to 30 %**
- **Improved Power Utilization Efficiency (PUE)**
- **Ultimately increased uptime**

OEM's*, SI, ESCO's*** & Solutions providers

* Original Equipment Manufacturer, ** System Integrator, ** * Energy Service Company

Building Monitoring



Flexible **expandable, simple & reliable** wireless data collection

- Easy to deploy wireless sensors
- Run on battery for years
- Comprehensive, consistent & accurate data

- Instant access & **visualization** to all **data**
- Transmitting **control commands** for initiating specific actions
- Wireless adapters can be **connected** to existing **building control system**

BENEFITS

- **Reduce energy consumption by up to 30%**
- **Gain visibility on assets & supply building control system with comprehensive data**
- **Reduce service and maintenance costs**

SI* for building automation, ESCO's & Solutions providers**

* System Integrator, ** Energy Service Company

E-Senza Technologies

Temperature Monitoring

Flexible **expandable, simple & reliable** wireless data collection

- Reporting **simplifies** compliance
- Alerts & **alarms** allow instantaneous communication of **out of range conditions** via on-screen, email or **SMS**

- Easy to deploy wireless sensors
- Run on battery for years
- Comprehensive, consistent & accurate data

Ready to use solution for **monitoring temperature** in food, health & pharmaceutical industries

BENEFITS

- **Get critical information in real time, delivered anytime, on demand or automatically**
- **Compliance with governmental regulations**
- **Increased efficiency of organization & reduce labour costs**

Food processing & Quick-serve restaurants, & SI*

* System Integrator

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Customer References

Selected Customer References

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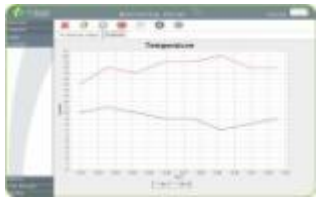
Application References and Case Studies

Remote Monitoring



Rotating machine

Wireless Metering

Energy Efficiency

Temperature Humidity Level

HACCP/FDA Compliance

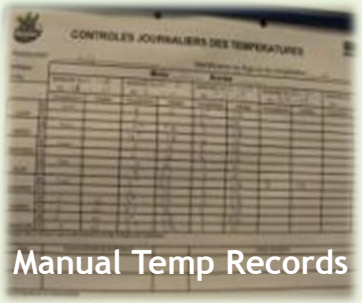
Smart Homes

Wind Power Plant

System-integration

Museum

Refrigeration Monitoring in Amusement Parks


Manual Temp Records


SenzaBlocks


SenzaGate

CHALLENGE

- Automated tracking of temperature for compliance to hygiene standards to the manual process they have been following

SOLUTION

- Customer gets online temperature information, ensures that all temperature changes are recorded and alerted immediately
- One wireless mesh network installed at each restaurant
- Gateway node connected control center via GPRS/ Ethernet
- 80 Restaurant with 300 Modules in 12 Parks across France doing online Temperature Monitoring

BENEFITS

- **Improved regulatory compliance and reduced labor costs**

HACCP Compliance in Quick-Serve Restaurant

CHALLENGE

- Customer has to work within the guidelines of HACCP regulations, which require archival of all temperature data for a period of one year

SOLUTION

- Each cold room was equipped with one or more SenzaBlocks for temperature monitoring
- The wireless nodes sent every 10 minutes the measured values to the gateway, displayed in real-time and all relevant data are stored automatically for one year
- If temperature is exceeded or the cold room door is open longer than 30 minutes an SMS alarm will be generated

BENEFITS

- **Customer can guarantee a 24 hour monitoring in compliance with HACCP and at the same time minimize manual efforts and human errors**

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Data Collection in for Quality in Factory

CHALLENGE

- Largest Pharma Machinery Producer needed to monitor the sealing-process of every individual bottle as it is new FDA-stipulation to test 100% instead of samples testing
- Needed Quality of Service very high >99,9% maintenance free & a reaction time of 50ms

SOLUTION

- SenzaNET was selected as it offered almost 6Sigma reliability
- SenzaBlocks with wireless power were installed into rotating parts of machinery
- SenzaGate communicated via ProfiBus-DPV1 interface to Siemens S7 PLC System

BENEFITS

- **Wireless enabled to measure data from previously not reachable areas thus fulfilling FDA regulatory requirements**

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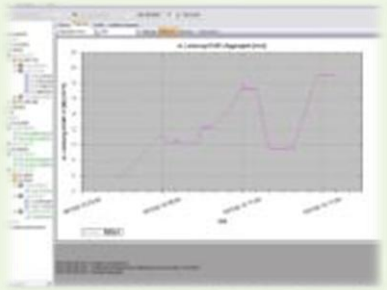
Data Collection for Energy Efficiency in Plants



SenzaGate

CHALLENGE

- Customer needed a solution for simple industrial process data collection
- The wireless communication should be flexible, expandable, simple and easy adaptable to current circumstances

SOLUTION

- SenzaBlock current monitors and I/O adapters were attached to various machines in a plastics manufacturing plant
- Data was collected and sent over a self-organizing wireless network based on SenzaNET framework to a gateway

BENEFITS

- **Based on the improved monitoring and process understanding specific energy saving measures were implemented**

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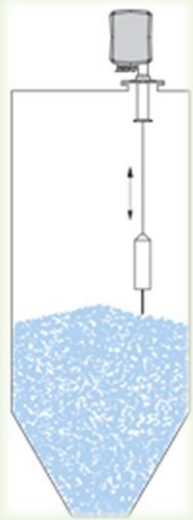
Tank Level Monitoring in Animal Farms

SenzaBlock



CHALLENGE

- Customer needed a wireless solution for continuous monitoring the level of food in silos

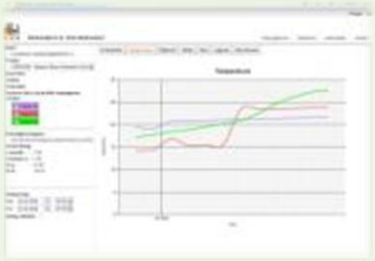
SOLUTION

- SenzaBlocks were an ideal answer to easily realize such an upgrade in order to quickly and flexibly start monitoring the tank level
- Different weather protection models allow installation in free nature
- Level information data delivered directly to the central office through GPRS connection

BENEFITS

- **Due to optimized logistics huge savings could be achieved & Manual efforts for data collection, wiring and aintenance costs could be eliminated**

Remote Monitoring Service for the Construction Industry



CHALLENGE

- Build a remote monitoring & process management system called “CONCREMOTE”
- B|A|S Research & Technology is a high-qualified research and knowledge institute in the building sector and a specialist in the concrete and asphalt sector

SOLUTION

- Parameters important to concrete drying like temperature could be collected locally and transmitted to a central collection point
- Monitoring concrete anywhere due to the flexibility of wireless!

BENEFITS

- **Reduces installation costs and increases process efficiency at construction & Savings in time and costs are up to 80%**

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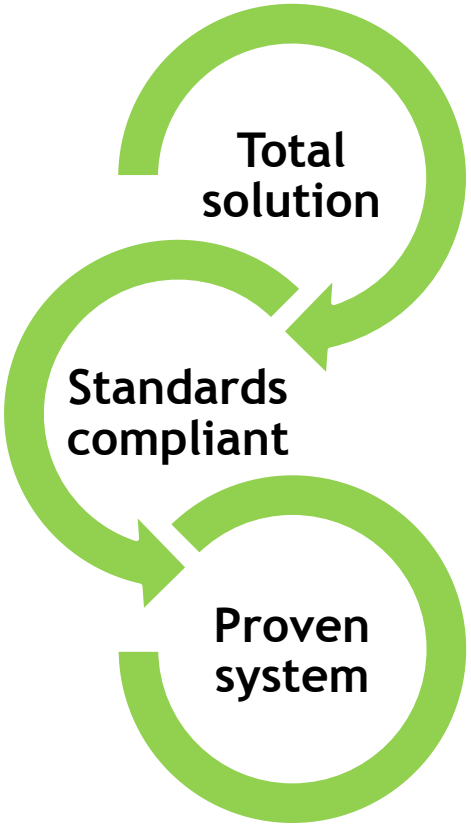
Why E-Senza?



Contact Us

Thank You

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