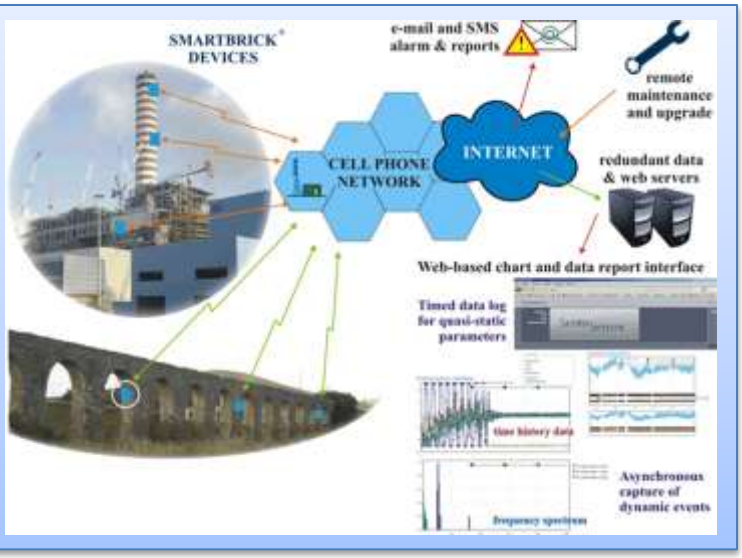
The "Smartbrick" device is a self-sufficient compact monitoring system. Its peculiar characteristics make it a perfect solution for structural health monitoring.

Structural monitoring with SMARTBRICK

The "Smartbrick" is a wireless autonomous structural health monitoring system. Its small size and compact housing comprises: the sensor conditioning and data acquisition system, some embedded sensors (temperature sensor, biaxial tiltmeter triaxial accelerometer) and also pre-conditioned inputs for external sensors of common use.
The "Smartbrick" device has the unique feature of detecting and logging even dynamic events as vibrations, shocks and small earthquakes because equipped with an extremely sensitive dynamic seismic embedded trigger. The"Smartbrick" device doesn't require external power source due to the primary battery pack and two emergency battery packs. Optionally a solar panel for recharging an auxiliary battery is available.
The data acquisition system features a GPRS modem capable to connect through the standar cell-phone network infrastructure. Smartbrick can broadcast data and alarm or warning messages (SMS, e-mails).

The "Smartbrick" device is suitable for structural monitoring of:

- ✓ buildings and hystorical structures
- ✓ tanks and pipes
- ✓ tunnels
- ✓ infrastructures
- ✓ bridges and viaducts



TECHNICAL SPECIFICATIONS

"Smartbrick"

DATA ACQUISITION SYSTEM		
Connectivity quad-band GPRS		
Transmitter output power	2W (850-900 MHz) / 1W (1800-1900 MHz)	
Receiver sensitivity	-107 dBm (850-900 MHz) / - 108 dBm (1800-1900 MHz)	
Power supply		
Primary battery pack	Li-$SOCl_2$ or Li-MnO_2 up to 13000 mAh	
Rechargeable battery	non spillable Lead accumulator 6V 4400 mAh (optional)	
Emergency battery	Li-$SOCl_2$ or Li-MnO_2 up to 13000 mAh	
Battery charger input	9 ÷ 24V 400mA max	
Main programmable functions		
Data acquisition interval		from 10 minutes to 45 days
Execution interval for other tasks(data broadcast, self-test, clock synchronization)		from 6 hours to 45 days
Delay for asynchronous data broadcast after relevant seismic event data acquisition		from 2 minutes to 250 hours
Dynamic data acquisition	sampling speed	1 ÷ 4100 Hz (total)
	acquired samples	64 ÷ 32768 samples (total)
	data processing	FFT with user configurable thresholding
HOUSING		
Outer dimensions	125 × 250 × 125 mm	
Ingress protection	IP67 (optional IP68 protected against continuous submersion)	
Certifications	ATEX optional	

EMBEDDED SENSORS		
Temperature sensor	Resolution	0.1 °C
	Absolute accuracy	± 1.8 °C
Tilt sensor	Instrumented axes	2 (roll and pitch)
	Resolution	0.001 °
	Drift (-20 ÷ +80°C)	± 0.06 °
Accelerometer	Instrumented axes	3
	Dynamic range	±1500mg (x, y) / ±600mg (z)
	Bandwidth (-3dB)	0.2 ÷ 65 Hz
	Integral noise	7 mg_{pk-pk} ("Low Noise" option)
Seismic- impact trigger	Threshold level	18 ÷ 150 mg_{pk} configurable
	Bandwidth (±20%)	0.4 ÷ 30 Hz
Tamper sensor	Magnetic reed switch type (requires optional protection cage)	

PRE-CONDITIONED INPUTS FOR ADDITIONAL EXTERNAL SENSORS
5 Inputs 12bit available for fast sampling dynamic data acquisition
1 Bipolar voltage input
5 High resolution inputs 24bit configurable for bridge sensors , ½ or ¼ bridge
1 Serial port preconfigured for high resolution laser telemetry sensor 0,01mm
Dedicated inputs: anemometer, hygrometer, pluviometer, external temperature sensor, external bi-axial tiltmeter
Dedicated input for **Acoustic Emission** sensor

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