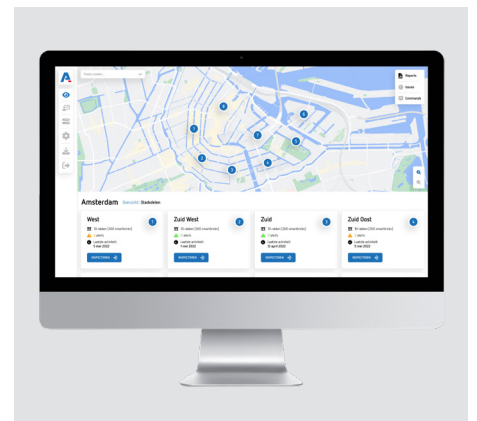
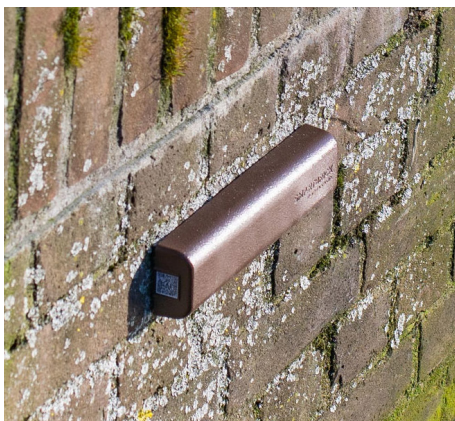




# SMARTBRICK®

Smart structural health monitoring solution for civil infrastructures such as buildings, quay walls and bridges

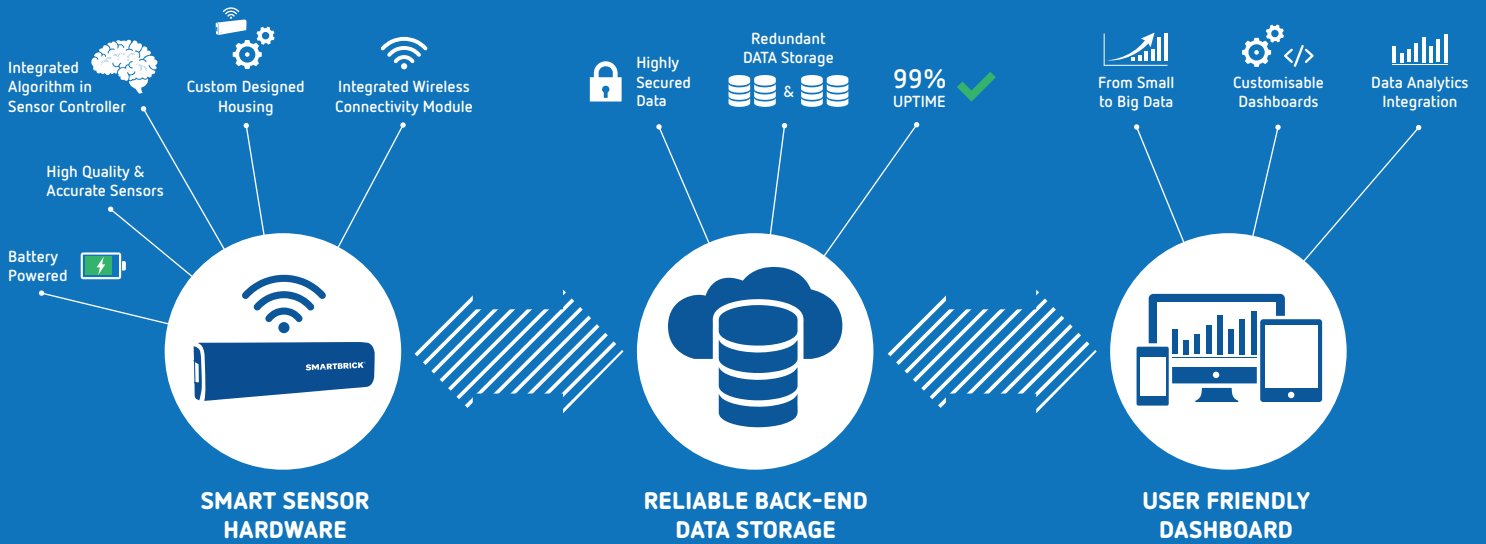


We provide confidence for visionary engineers

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**ALTHEN**  
SENSORS & CONTROLS

# YOUR END-TO-END INDUSTRIAL IOT SOLUTION PARTNER



## SMARTBRICK SOLUTION

SmartBrick is a new IoT sensor designed for accurate and affordable monitoring of civil infrastructure. SmartBrick detects and monitors inclination and other physical parameters with high accuracy. It transmits this data wirelessly to an online platform. The combination of accurate daily measurements, integrated AI and ultra-low power consumption makes SmartBrick a unique scalable measurement system. Creating a fully wireless, easy-to-implement, battery-driven and low-cost measurement solution.

The SmartBrick permanently monitors changes, damage and imminent danger of collapse. With SmartBrick it is possible to make solid predictions about the state and condition of civil infrastructure. Uncertainty, panic, and all sorts of ad-hoc emergency constructions are things from the past. It is possible to predict and manage maintenance activities and help you to prioritize them, no more surprises! AI and the algorithm provide machine learning. As a result the SmartBrick measuring system will continuously improve itself.

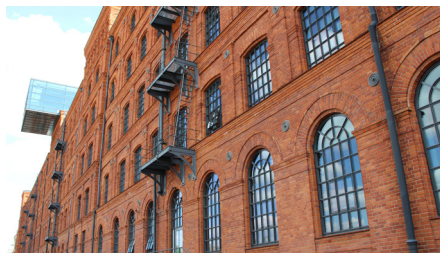
SmartBrick can be attached to any surface using epoxy. It will start monitoring right away (Stick & Play). The data is displayed in a low-code big-data dashboard, where users can analyse large amounts of data independently or have it analysed automatically by AI.

## APPLICATIONS



### QUAY WALLS

Heavy freight traffic that has been driving over the often historic quays for decades, and numerous vessels in the canals cause subsidence of the soil. In some cities the quay walls are also coping with rotting foundation piles. SmartBrick continuously monitors quay walls for potential collapse and guarantees accurate maintenance priorities plus predictions.



### BUILDINGS

Buildings and houses can subside due to all kinds of circumstances. Excessive loads on a specific section, compaction of peat and clay soils, washing away of load-bearing soil, traffic and insufficient groundwater. The SmartBrick solution is designed for permanent and accurate monitoring of buildings.



### INFRASTRUCTURE

Human activity is causing subsidence in large areas. Primary causes are the lowering of the ground-water level and the construction of residential areas and civil infrastructure on soft soil. With SmartBrick it is possible to monitor all our infrastructure in a cheaper and more efficient way. If a structures starts to move, smartbrick will detect it.

# SMARTBRICK TECHNICAL SPECIFICATIONS



GENERAL SPECIFICATIONS		
Processor	64MHz, Arm Cortex-M33 Arm Cryptocell 310	
Battery life	Two readings per day > 5 years (up to 10 yrs)	
Power source	Battery	3.6V / 3.6Ah
Memory	CPU Flash	1MB
	RAM	256kB
Enclosure	Material	PC Kingfa JH850 UV
	Dimensions	211mm x 50mm x 36mm (wall brick size)
	Mounting	Glue or Screws
	Protection	IP68
Environmental	Operating range -x...+ y °C	
	Max. humidity x% non condensing	

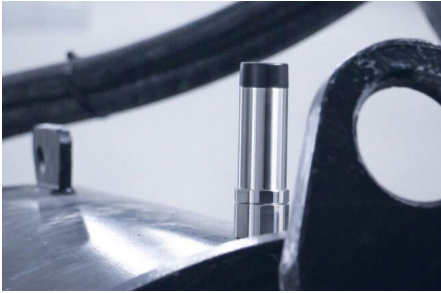
CONNECTIVITY MULTIMODE LTE-M/NB-IOT MODEM	
Bands	Certified LTE bands activated: B1, B2, B3, B4, B5, B8, B12, B13, B14, B17, B18, B19, B20, B25, B26, B28 and B66
Security	Arm Cryptocell 310 security and authentication
Antenna	Internal ceramic PCB
Power	Max. 23dBm @ 700-2200MHz
RS sensitivity	LTE-M: -108 dBm
Device management	Remotely wireless programmable (two way communication)

TILT MEASUREMENT	
Range	±50°
Accuracy	±0.01°
Resolution	≤0.003°
Linearity	≤1% (within ±20° range)
	≤5% (within ±20...±50° range)
Drift	≤0.01° Long Term

TEMPERATURE & VIBRATION MEASUREMENT	
Range Temperature	-40 .... 50°C
Accuracy	±0,2°C
Resolution	±0,2°C
Linearity	≤1% (within ±20° range)
	≤5% (within ±20...±50° range)
Drift	≤0.05° Long Term

EMBEDDED FUNCTIONS		
Measurement	Battery	Low Battery Level
	Network	RSSI
	Sensors	Temp / RH
Acceleration	XYZ direction ±1G	
Reed contact	Initiates measurement and cloud synchronization	
Lightning	Reasonable Surge protection due indirect lightning strike	

# OTHER ALTHEN INDUSTRIAL IOT SOLUTIONS



## SMARTMONITORING

With SmartMonitoring our customers can monitor any room or machine 24/7, without expensive wired equipment.



## SMARTCRACKR

The SmartCrackr accurately and remotely monitors a crack in three dimensions. Easy installation and online monitoring.



## YOUR CUSTOM IOT SOLUTION?

Are you looking for a custom IoT sensor solution? Contact us to see how we can help.



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