

subBOX Crack™ DATA SHEET

General Features

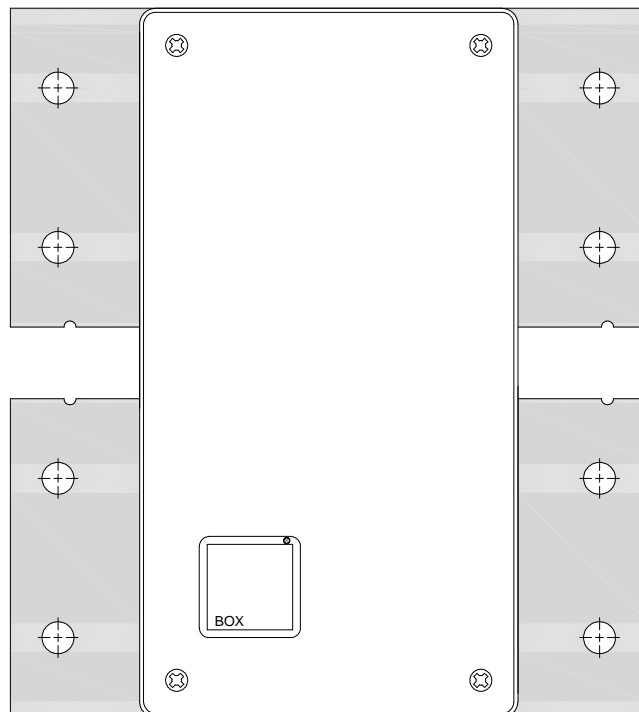
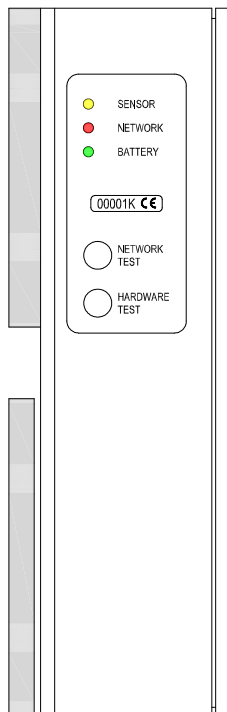
- Ability to measure true displacement in millimetres.
- Simple screw fixing points
- Single button activation
- RoHS compliant
- Environmental friendly – IP rated
- Low power technology
- Integral battery compartment

Typical Applications

- Building Subsidence Monitor
- Measuring crack development on road bridges
- Displacement measurement in X / Y

Hardware Features

- 6 x 1.5v Alkaline battery operation
- Low Standby Current
- Quad Band GSM Technology
- Data transfer via SMS
- 3 Modes of Operation
 - Sleep Mode
 - Wake-up Mode – measured samples taken every 8 hours
 - Transmit Mode – every 24 hrs
- Electronic measuring device with no mechanical parts
- Patented Sensor Technology using RF to measure displacement
- Instant measurement with no sensor warm up time



Electrical Characteristics

Parameter	Conditions	Min	Typ	Max	Units
Battery	Battery Life		2	4	Years
	Battery Capacity		5.4		Ah
	Battery quantity / type			6	AA
	Battery Voltage		7.5		Volts
	Supply Current		0.5		Amps
	Sleep		70		uA
	Active		60		mA
	Transmitting			250	mA
Sensor	RF Measuring frequency		1		MHz
	Excitation Voltage	5.1	5.5	7.5	Volts
	Communication RS232 baud		9600		bps
	Excitation Current		40		mA
	Absolute measuring range	0		20	mm
	Measurement from fixed datum	-10		+10	mm
	Accuracy	30	50	150	microns
	Free position away from subBOX			12	mm
Environmental	Temperature	-15		+45	°C
	Humidity non-condensing	20		80	%
Form Factor	Enclosure, ABS plastic CO free		67		IP
	Dimensions	178	95	56	mm
	Weight		0.6		Kg
GSM Modem	European use	900		1800	MHz
	US / Canada use	850		1900	MHz
	SMS message frequency every		24		hrs
	Power	1		2	Watts

As the subBOX Crack™ is a battery powered device it has been designed in such a way to extend this life to a maximum to meet above specification at 25 °C unless otherwise specified.

Product Description

The subBOX Crack™ has been designed to measure movement in the X and Y planes between a fixed point and a free point. This measurement is to represent any displacement increasing or decreasing in the X / Y plane when mounted on a building, bridge or any fixed dwelling made out of brick / stone or cement type of aggregates. The subBOX Crack™ monitors this information every 8 hours and updates using GSM messaging service (SMS) to a data collection site at BOX Telematics Limited (BOX DCS – data collection services) whose roll is to display the information as a tabular format for customer manipulation for further analysis.

The subBOX Crack™ operates by a single 2 second press on the front membrane keypad marked as hardware test. A red network test LED will illuminate through the membrane keypad to acknowledge this condition after which it will start flashing to indicate that it is initialising.

During this initialising phase the unit will flash the sensor yellow LED to indicate that the crack sensor has now been powered up and the X / Y value is being validated. A valid reading will keep the yellow led illuminated solid whereas if no valid reading has been read then the yellow led will continue to flash after it has logged to its memory either no reading read as -99.99, -99.99 or 99.99, 99.99 for hardware failure (crack sensor) within the unit.

Once a reading has been recorded the unit will determine if this has taken the first reading in a 24Hr period or the third before entering sleep mode.

The unit will now auto configure its clock to wake up the next 8 Hrs to take a measurement before going back to sleep mode.

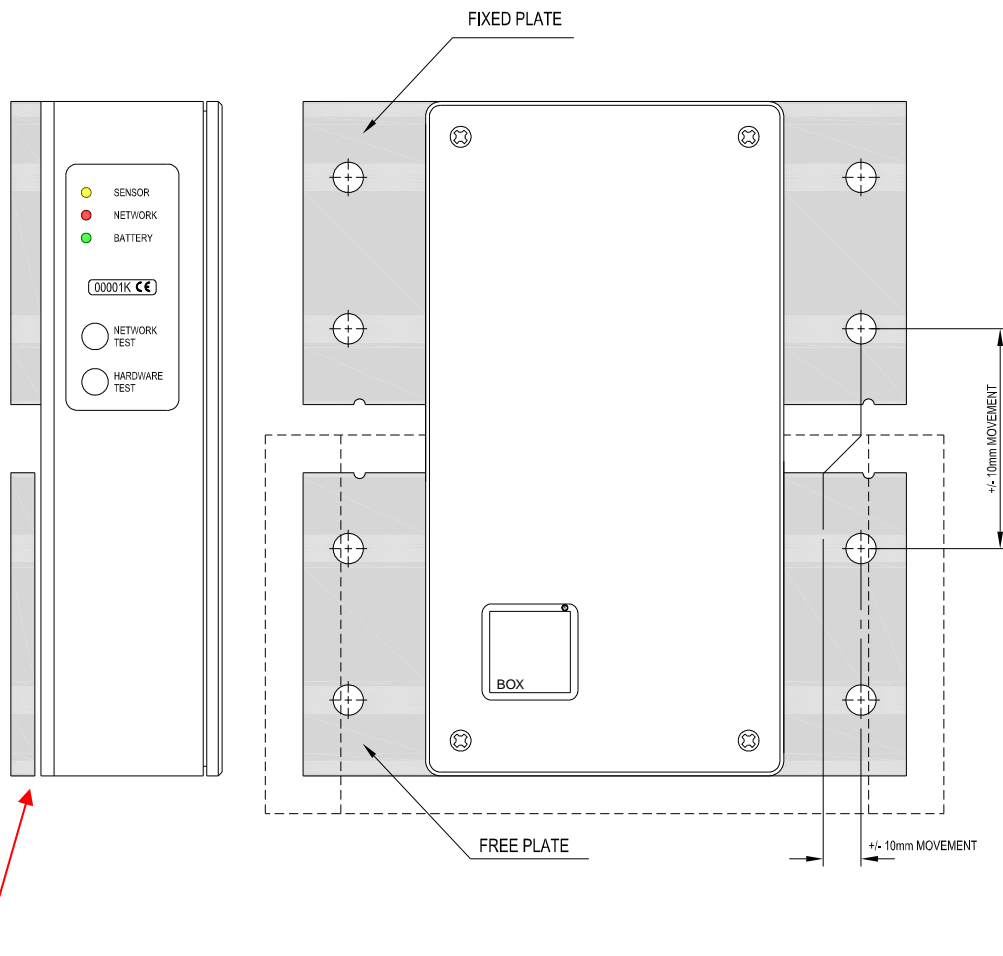
Once three readings have been taken then on the third reading it will flash a green LED to try to register to the network and send the SMS to the BOX gateway with all three readings taken in the last 24 Hr period before entering sleep mode (all LED's OFF).

To switch off the unit a simple 1 second press (on the hardware test button) when the unit is powered up will shutdown the unit and stay in this state until a 2 second press has been initiated to re-power up.

Performance

The subBOX Crack™ unit is linear within the range of $\pm 0.15\text{mm}$ in X and $\pm 0.1\text{mm}$ in Y over the specified range of $\pm 10\text{mm}$ at the nominal puck height of less than 10mm .

The accuracy is true within the dotted outline below showing the movement of the free plate with respect to the fixed unit. The position of the free plate shown below is the datum point where the sensor will read 0.00mm in X and 0.00mm in Y plane, area from free plate up to dotted lines is calibrated.

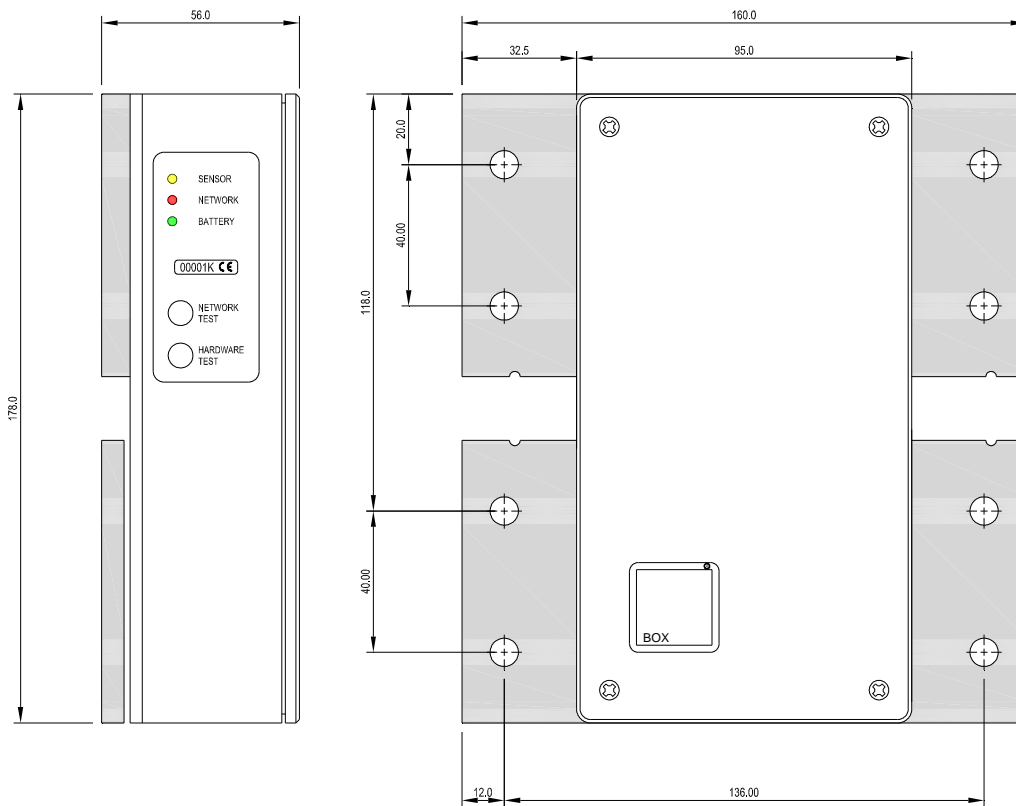


The free plate does not mechanically fix to the bottom of the subBOX Crack™ unit and for continual operation must not be more than 1 and 5mm away from the base.

Ordering Information

Description	Product Code
subBOX Crack™	B91000/01
Replacement Battery 1.5V AA @ 2.7Ah	E20002

Mechanical Details



Safety

Read carefully data sheet / user installation notes before using the subBOX Crack™.

For each situation please follow the specific instructions or consult your onsite safety executive for approval of use within the environment.

The subBOX Crack™ is a GSM radio transmitter and receiver. When it is powered, it will send and receive radio frequency (RF) signals operating on the 850, 900, 1800 and 1900MHz frequency bands. Operating the subBOX Crack™ close to other electrical equipment such as television, phone, radios and personal computer, may cause interference.

Interference

The subBOX Crack™, like all wireless devices, is subject to interferences that may reduce its performance for the reliable transmission of data at all times and can be adversely affected by weather conditions and other temporary or permanent phenomena or obstructions that are outside of the control of Box

Data Collection Servers (DCS)

The DCS is not guaranteed to be continuously available at all times and is liable to interruptions that are outside of the control of Box telematics limited.

Road Safety

Do not use the subBOX Tilt™ while driving. In case of use on cars, it is necessary to check that electronic equipment is shielded against RF signal. Do not place the subBOX Tilt™ over the air bag or in the air bag deployment area.

Hospital Safety

Do not use the subBOX Crack™ near health equipment, especially pacemaker and hearing aids, to avoid potential interferences. The subBOX Crack™ is a not mobile phone; do not use it in direct contact with the human body. Remove Power to the subBOX Crack™ in hospitals, and in any other type of medical centres. Hospitals or health care facilities may be using equipment that could be sensitive to external RF energy.

Explosive Materials

Do not use the subBOX Crack™ in refuelling points, near fuel or chemicals. Do not use the subBOX Crack™ where blasting is in progress. Observe restrictions, and follow any regulation or instruction. Use approved accessories and replacement parts only. Do not connect incompatible products.

Included Battery

- Only use supplied battery with the subBOX Crack™.