DMS

DMS
Data Mobile Solution

- DMS Analogue
- DMS Vibrating Wire
- DMS Digital
- DMS Gateway
- DMS Ext Node

Data Mobile Solution is a completed solution that mechanizes the procedure of monitoring geotechnical and structural sensors in testing various conditions like construction sites and mines.

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Data Mobile Solution

DMS (Data Mobile Solution) is composed of a number of nodes to which instruments are connected, and a gateway communicating with nodes through long range radio. Nodes are configured through an Android APP while the gateway have a web server on-board for the set up.

Even if a Node can't reach the Gateway directly, it can still send its data to the gateway via other Nodes in the network.This is possible with DMS Mesh, a patent-pending, wireless mesh data collection protocol that ensures reliable sensor data collection even in the harshest of environments. It automatically mitigates well-known wireless problems like signal blockages and interference, allowing the Nodes to reliably send their data to the Gateway every time. Every single radio transmission in the system is secured using AES-128 encryption to maximize security of the sensor data gathered by the system.

Moreover, DMS is a low power utilization framework that can reach up to 5 years battery life.The gateway can push data on a FTP server; remote connection to gateway is allowed for data download and set up.

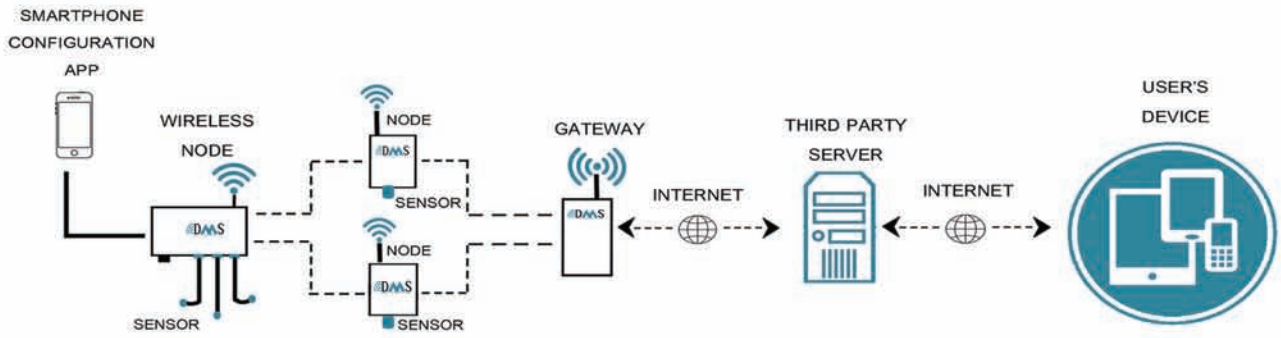
Why use DMS (Data Mobile Solution) ?

- Long-range communication of over 15km
- Truly low-power, 5 years of unattended runtime
- Supports most structural and geotechnical instruments
- User-friendly web software
- Remotely monitor hard-to-access infrastructures
- Eliminate the need for manpower-heavy traditional monitoring solutions
- Stay updated all the time through data management platform

DMS

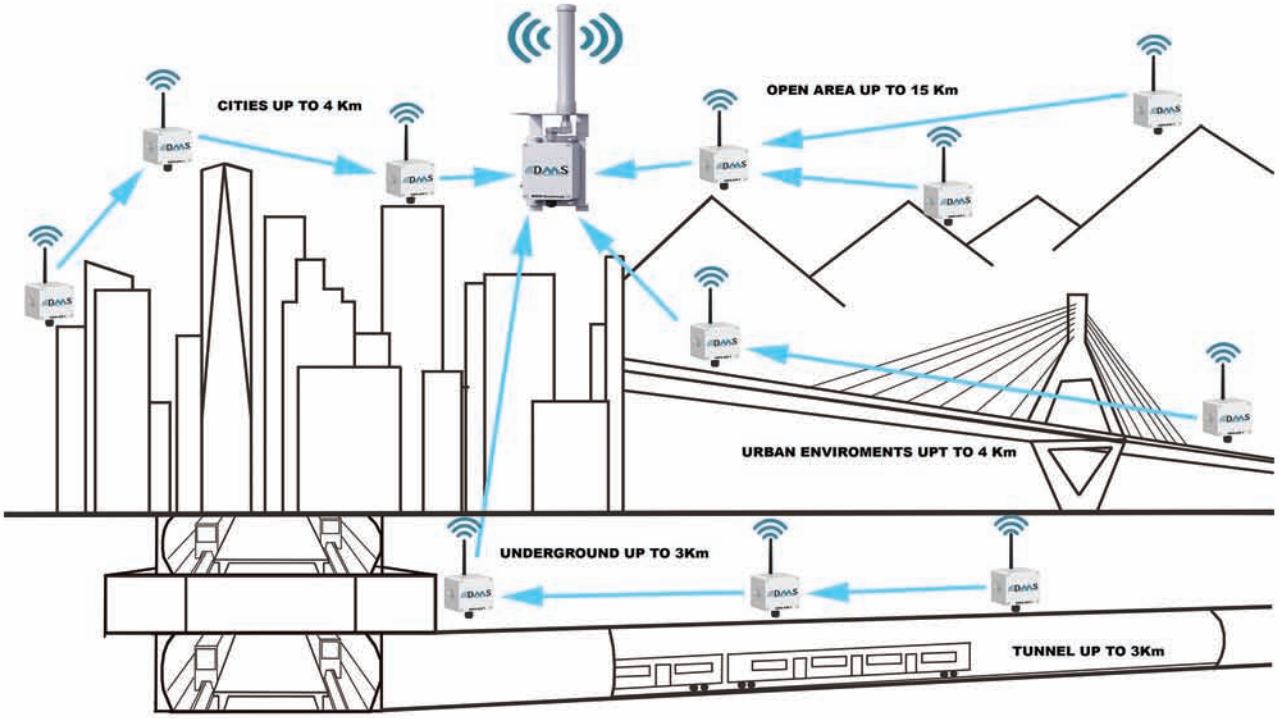
How It Works

DMS is easy to set up and use. All types of geotechnical and structural sensors can be interfaced with the system for automated monitoring.



Why use a Mesh ?

Having a realiable,long-range,wireless mesh-based data securing system allows for monitoring of sensors that are deployed in deep tunnels and very large construction sites without using numerous gateways and signal amplifiers.



The DMS Mesh network allows all our Nodes to talk to each other,thus allowing them to relay other Nodes' data to the gateway.Challenging sites like deep tunnels and large mines can be monitored easily with a multi-hop wireless mesh network.

15 km	3 km	4 km
in line-of-sight environments	in tunnels and underground setting	in cities and urban environments

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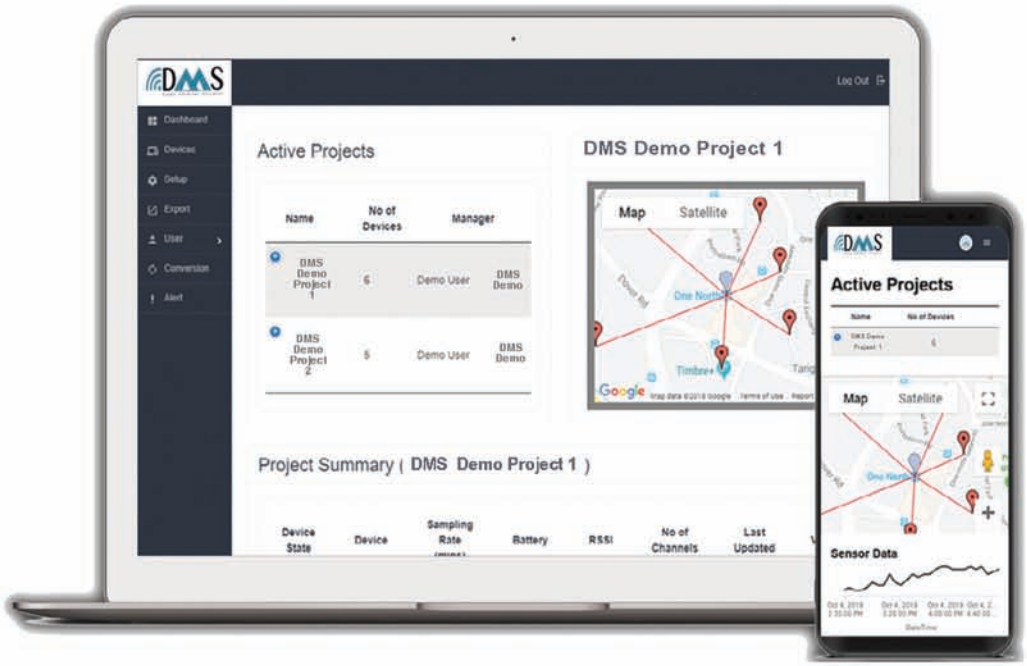
Software & Configuration Mobile

DMS,data management and configuration software, can be used to visualize and analyze the data.The software system also allows to manage the sensor network, automate reporting,set smartphone push notifications or email alerts if readings cross pre-set thresholds and even upload the sensor data to a third-party server.



All DMS Nodes can be set up at the site using smartphone application that comes free with the system.

1. Provides step by step instructions on setting up sensors.
2. Displays whether the radio signal is good enough for nodes to reach other Nodes or the Gateway.
3. Takes on-site sensor readings to help with sensor verifications and recording initial sensor readings
4. Shows the battery conditions of the Nodes.
5. Automatically obtain the geocoordinates of the Nodes in the site while setting up.

DMS Analogue

DMS Analogue is able to manage up to 4 instruments with different output such as Voltage, current loops (mA),Wheatstone bridges and Thermistors.Each channel can be individually configured by the user and the power supply to the sensors is given by the node.

MODELS

DMS AN-1-V4.0	1 Bi-axial sensor support + thermistor channel
DMS AN-4-V4.0	4 Bi-axial sensor support + 4 thermistor channels

TECHNICAL SPECIFICATIONS

Memory	128KB Flash, 20KB Ultra-low-leakage SRAM
On board sensors	Internal temperature sensor (accuracy ±2°C)
Analog differential	Voltage (Uni-axial) Voltage (Bi-axial) 4-20 mA Current loop (2 wires) 4-20 mA Current loop (3-4 wires) Thermistor Wheatstone bridge (6 wires)
Display / Keyboard	LED – System status indication Push button key – for system test function execution
USB Device Port	USB 2.0 full speed (A connector) 5V, max 500 mA for Mobile OTG
IDC10 Connector	Only for system programming
Long range RF Module	ISM Band 902 – 928MHz @ 14dBm ISM Band 863 -870MHz @ 14dBm Extended temperature range (-40° to 85°C) 1/4λ stub antenna with SMA connector
Software	USB OTG connected ANDROID compatible App for Device Setup, Network Monitoring

PHYSICAL FEATURES

Box Dimension(W×L×H)	
DMS AN-1-V4.0	100×100×80mm
DMS AN-4-V4.0	220×140×80mm
Operating temperature	-30 to +70°C (batteries -20 to+60°C)
Storage temperature	-40 to +85°C (batteries 0 to +40°C)
Protection	IP66
Humidity	+80%
Overvoltage category	I
Pollution degree	2
Sound Levels	< 74dBA
Maximum height of use	3000m

TYPICAL BATTERY LIFETIME

Node Type	Number of Batteries	Expected Battery Life		
		5 min Sampling	15 min Sampling	1 hour Sampling
DMS AN-1-V4.0	1	6 months	2 years	5 years
DMS AN-4-V4.0	2	6 months	2 years	5 years

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DMS Vibrating Wire

DMS Vibrating Wire Nodes come in two formats: 1sensor (DMS-VW-1) and 8 sensor (DMS-VW-8).
It can be used to monitor many types of vibrating wire sensors.

MODELS

DMS-VW-1	1 Vibrating wire sensor support + thermistor channel
DMS-VW-8	8 Vibrating wire sensor support + 8 thermistor channels

TECHNICAL PECIFICATIONS

Memory	128KB Flash, 20KB Ultra-low-leakage SRAM
On board sensors	Internal temperature sensor (accuracy ±2°C)
Analog differential	Each sensor channel is able to acquire data from the following sensors: Vibrating wire sensor Thermistor
Display / Keyboard	LED – System status indication Push button key – for system test function execution
USB Device Port	USB 2.0 full speed (A connector) 5V, max 500 mA for Mobile OTG
IDC10 Connector	Only for system programming
Long range RF Module	ISM Band 902 – 928MHz @ 14dBm ISM Band 863 – 870MHz @ 14dBm Extended temperature range (-40° to 85°C) 1/4λ stub antenna with SMA connector
Software	USB OTG connected ANDROID compatible App for Device Setup, Network Monitoring

PHYSICAL FEATURES

Box Dimension (W×L×H)	
DMS-VW-1	100×100×80mm
DMS-VW-8	220×140×80mm
Operating temperature	-30 to +70°C (batteries -20 to+60°C)
Storage temperature	-40 to +85°C (batteries 0 to +40°C)
Protection	IP66
Humidity	+80%
Overvoltage category	I
Pollution degree	2
Sound Levels	< 74dBA
Maximum height of use	3000m

TYPICAL BATTERY LIFETIME

Node Type	Number of Batteries	Expected Battery Life		
		5 min Sampling	15 min Sampling	1 hour Sampling
DMS-VW-1	1	1 years	3 years	>5 years
DMS-VW-8	2	8 months	>2 years	>5 years

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DMS Digital

DMS digital node can manage 3 channels of maximum 2 digital sensors per channel for RS232,RS485,and SDI-12.

MODELS

DMS-DG-3-V2.0 Supports three communication hardware protocols ports

TECHNICAL PECIFICATIONS

Memory	128KB Flash, 20KB Ultra-low-leakage SRAM
On board sensors	Internal temperature sensor (accuracy ±2°C)
Digital Inputs	RS232 Serial Port RS485 Full / Half Duplex Serial port 2 SDI-12 Bidirectional Ports or Programmable Interrupt driven GPIO Digital communication supported sensors
Display / Keyboard	LED – System status indication Push button key – for system test function execution
USB Device Port	USB 2.0 full speed (A connector) 5V, max 500 mA for Mobile OTG
IDC10 Connector	Only for system programming
Long range RFModule	ISM Band 902 – 928MHz @ 14dBm ISM Band 863 -870MHz @ 14dBm Extended temperature range (-40° to 85°C) 1/4λ stub antenna with SMA connector
Software	USB OTG connected ANDROID compatible App for Device Setup, Network Monitoring and troubleshooting

PHYSICAL FEATURES

Box Dimension (W×L×H)	220×140×80mm
Operating temperature	-30 to +70°C (batteries -20 to+60°C)
Storage temperature	-40 to +85°C (batteries 0 to +40°C)
Protection	IP66
Humidity	+80%
Overvoltage category	I
Pollution degree	2
Sound Levels	< 74dBA
Maximum height of use	3000m

TYPICAL BATTERY LIFETIME

Sensors	Number of Batteries	Expected Battery Life		
		5 min Sampling	15 min Sampling	1 hour Sampling
10	2	6 months	1.5 years	5 years
20	2	4 months	10 months	2.5 years
30	2	2 months	6 months	1 year

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DMS Gateway

The gateway receive readings from the nodes and push data through the internet or third party servers.

MODELS

DMS-GW-V2.0	Gateway Node with built in server software
Box Dimension (W×L×H)	160×100×80 mm

TYPICAL BATTERY LIFETIME

Backup battery will support standby mode (RF only) for 6 Weeks

TECHNICAL SPECIFICATIONS

Memory	512MB LPDDR2 SDRAM
On board sensors	Internal temperature sensor (accuracy ±2°C)
Display / Keyboard	4 LEDs – System status indication Push button key – for system test function execution
Network interfaces	Integrated 3G Modem & Antenna (HSDPA, EDGE, GPRS) quad band Ethernet over USB 2.0
GPS	GNSS High Sensitivity GPS module (excluding antenna)
Long range RF Module	ISM Band 902 – 928MHz @ 14dBm ISM Band 863 – 870MHz @ 14dBm Extended temperature range (-40° to 85°C). 1/2 λ stub antenna with N type connector
USB Device Port	USB 2.0 full speed (A connector) 5V,
Software	DMS Management Server built on top of Linux OS
Typical battery	Backup battery will support standby mode
Operating time	(RF only) for 6 Weeks

DMS Ext Node

DMS Ext nodes can be used in setting where nodes are in disengage areas,and hence unable to discover a system path to reach to the gateway.An Ext Node can be put between nodes and gateways to permit the nodes to transmit with the gateway.

DMS-Ext	Amplifier signal node
Box Dimension (W×L×H)	160×100×80mm
Operating temperature	-40 to +85°C (batteries -20 to+60°C)

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