



MIND

— **MIND**
READOUT

READOUT UNITS
AND DATALOGGERS



MIND READOUT

Mind is the new portable and compact multichannel readout unit able to read all Sisgeo instruments, both analogue and digital. It is compact, rugged, with IP65 protection class and it is supplied with a specially designed carrying bag.

The BLE (Bluetooth Low Energy) wireless technology permits a fast and safe communication with Mind App, with a very low batteries' consumption.

Mind is fully managed by Mind App which is compatible with Android operating system and sooner with iOS. Thanks to its App, Mind is a fast and light system for a quick and handy interface with the instruments, furthermore the data storage and sharing is made simpler and immediate.

Mind App is also useful to read and utilize the QRcode placed on every analog Sisgeo instrument, having the identification, calibration and reading information always available.

MAIN ADVANTAGES

- Long battery life: minimum 8 hours continuously
- Supplied with Calibration Report issued following high level metrologic procedures
- High accuracy and resolution
- Simultaneous display of electrical and engineering measures
- Real time charts
- Quick read for immediate readings without configuration
- Multiplexers reading
- One-touch reading of digital gauge arrays
- Biaxial analogue sensors reading with simultaneous temperature displaying
- Geolocation and search engine for sites and sensors
- Display the plot of vibrating wire sensor signal's spectrum with peak value



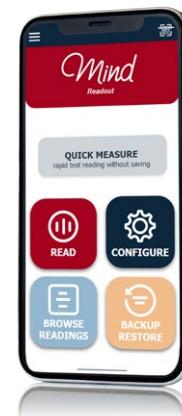
Meet the essential requirements of RED Directive 2014/53/EU,
Certified for extended environmental conditions: altitude up to 3000m

MIND APP

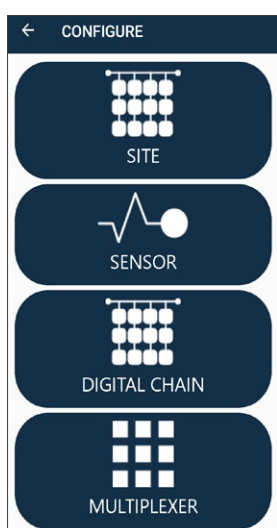
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Minimum Device Specifications
(device not supplied by SISGEO)

Bluetooth Low Energy BLE 4.2
APPLE iOS 14 or higher
Android OS 9 (suggested Android OS 10 or higher)



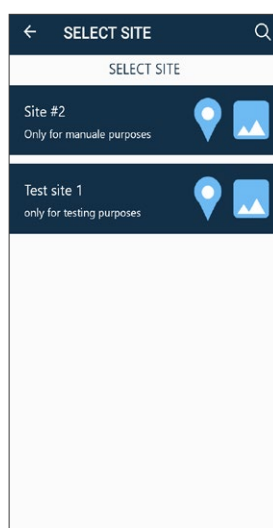
APP OVERVIEW



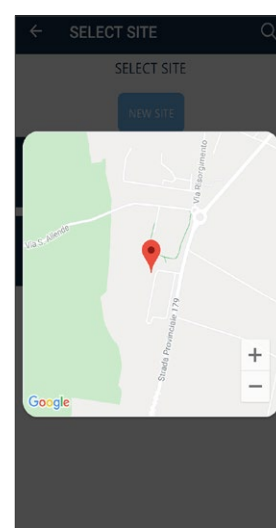
Instruments configuration main page



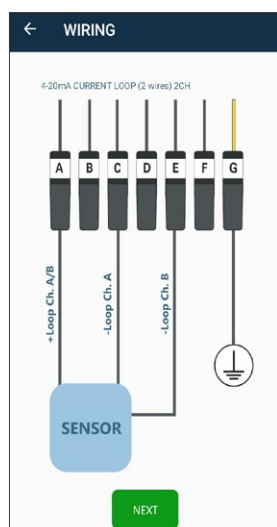
QR code scanner for automatic configuration of analog sensors



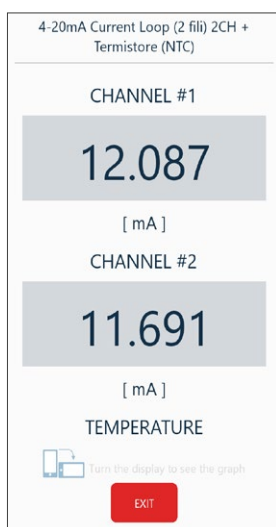
List of site with selectable icons to have info of geographical positioning and related picture.



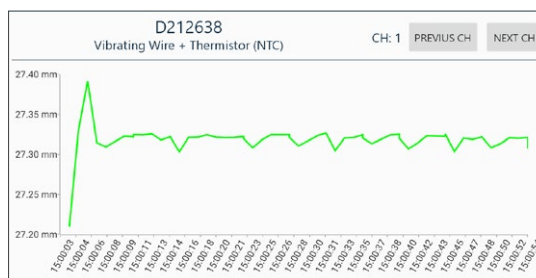
Site/sensor localization from Google Map®



Guided clips wiring connection



Instrument reading page with both biaxial 4-20mA current loop channels reading. The temperature measure is displayed scrolling down.



Graph of connected sensor's readings. It is generated just turning the mobile device in horizontal position.

MIND READOUT PHYSICAL FEATURES

Material / Weight	Aluminum / 1 Kg
IP class ⁽¹⁾	IP65
Overall dimensions	205x128x45 mm
Operating temperature	-30 to +70 °C (battery -20 to +60°C)
Storage temperature	-40 to +85°C (battery: -20 to +30°C max 1 year, -20 to +45°C max 3 months)
Relative humidity	Operating: 15 - 93% RH Storage: 10 - 75% RH

⁽¹⁾ IP65 protection class is granted with closed connectors (i.e. with their own cap or with the cable connected) and with the on/off button not pressed.



SISGEO COMPATIBLE INSTRUMENTS

Uniaxial 4-20mA current loop 2-wire gauges	Ratiometric 6-wire gauges	Vibrating wire gauges
Biaxial 4-20 mA current loop 2-wire gauges	RTD PT-100 temperature gauges	Vibrating wire + NTC Thermistor gauges
Biaxial 4-20 mA current loop 2-wire gauges + Thermistor	NTC Thermistor temperature gauges	Digital gauges or arrays with RS-485 Modbus RTU array

OTHER COMPATIBLE SENSORS

Uniaxial and biaxial 4-20mA transmitter (3-wire)	Ratiometric 4-wire gauge (6-wire connection)	Uniaxial and biaxial voltage gauges
Uniaxial and biaxial 4-20mA transmitter (3-wire) + Thermistor	Resistive strain gauge 1/2 bridge	Uniaxial and biaxial potentiometers
Uniaxial and biaxial 4-20mA transmitter (4-wire) + Thermistor	Resistive strain gauge 1/4 bridge	Uniaxial and biaxial servo-inclinometer gauges

TECHNICAL SPECIFICATIONS⁽¹⁾

A - ANALOG INPUTS

Number of channels	3
Analog-to-Digital Conversion (ADC)	Resolution: 24bit, sampling rate: 2.5 Hz per channel with 50/60 Hz mains frequency rejection, Modulation method sigma-delta
Input impedance	> 10 k Ω

A.1 - MEASUREMENT TYPES

A.1.1 - 4-20mA current loop (2 wires)

Range Resolution Accuracy	0-24 mA 1 μ A at range 20 mA 2.4 μ A (max error at 2 Hz sample rate)
Internal shunt resistor	100 Ω
Power supply	24V DC, 12V DC, external (selectable by the software, up to 100 mA)
Temperature drift	< 10 ppm / $^{\circ}$ C, range -30 $^{\circ}$ C to +70 $^{\circ}$

A.1.2 - Wheatstone full bridge (6 wires, with sensing)

Range resolution accuracy	\pm 62.5mV/V 0.001 mV/V 0.005mV/V (range \pm 15 mV/V) and 0.05 mV/V (range \pm 62.5 mV/V)
Power supply (up to 80 mA)	5 Vdc, external
Max and min bridge resistance	Max 10 k Ω - min 200 Ω
Temperature drift	< 10 ppm / $^{\circ}$ C, range -30 $^{\circ}$ C to +70 $^{\circ}$ C

A.1.3 - Platinum RTD (Pt100)

Range resolution accuracy	-150 $^{\circ}$ C to +150 $^{\circ}$ C 0.1 $^{\circ}$ C 0.3 $^{\circ}$ C
Power supply	1 mA
Temperature drift	< 10 ppm / $^{\circ}$ C, range -30 $^{\circ}$ C to +70 $^{\circ}$ C

A.1.4 - Thermistor (NTC 3 k Ω @ 25 $^{\circ}$ C)

Range resolution accuracy	-50 $^{\circ}$ C to +150 $^{\circ}$ C 0.1 $^{\circ}$ C 0.2 $^{\circ}$ C (max error at 2 Hz sample rate)
Power supply	2-100 μ A
Temperature drift	< 10 ppm / $^{\circ}$ C from 0 to 150 $^{\circ}$ C < 20 ppm / $^{\circ}$ C from 0 to -30 $^{\circ}$ C < 100 ppm/ $^{\circ}$ C from -30 $^{\circ}$ C to -50 $^{\circ}$ C;

A.1.5 - Vibrating Wire sensors

Range accuracy	300 to 6000 Hz 0.01% FS
Excitation sine wave signal	Up to 10 Vpp (selectable by the software)
Resolution	0.01Hz at range 300÷1000Hz 0.02Hz at range 1000÷3000Hz 0.1Hz at range 3000÷6000Hz
Temperature drift	<10ppm/ $^{\circ}$ C (-30 $^{\circ}$ C to +70 $^{\circ}$ C)

(1) The information and data in the "Technical specifications" table refer to tests performed with a calibrated control unit in an environment with controlled temperature and humidity, and using signal generators with cables shorter than 5 m.

B - DIGITAL RS485 INPUTS

Max number of gauge per array	according to the consumption of each type of sensor and if configured in Always-on mode or in Timed mode
Interface and Protocol	RS485, MODBUS RTU
Power supply (up to 500 mA)	24 V DC

C - COMMUNICATION WITH DEVICE

BLE (Bluetooth Low Energy) 5.2	band: 2.4 GHz ISM Band (2402-2480 MHz) - power: 4dBm Max
Led	Different colors for local notifications

D - ON-BOARD DIAGNOSTIC SENSORS

D.1 - INTERNAL TEMPERATURE	Range: -40°C to +125°C Resolution: 0.1°C Accuracy: ±1°C (-10°C to +85°C)
D.2 - INTERNAL HUMIDITY	Range: 0 to 100%RH Resolution: 0.1% RH Accuracy: ±5% (0 to 95%RH)
D.3 - BATTERY VOLTAGE MONITOR	Range: 0 to 18 V Resolution: 0.1 V Accuracy: ±5% FS

E - BATTERIES

Battery type - Voltage and capacity	Li-Ion rechargeable batteries - 7.4V - 2.6Ah
Operating time with Li-Ion batteries	min. 8h (constant use, 24 Vdc @ 20 mA x 2 @ 25 °C)
Charging temperature range	0°C to +45°C

F - BATTERY CHARGER

Input voltage	50-60 Hz 90-264 Vac
IP Class and temperature range	IP41 (for internal use only), Operating: -25°C to +40 °C
Max output power	10 W

G - OTHER COMPATIBLE SENSORS⁽²⁾

G.1 - 4-20mA transmitters (3-4 wires)

Range Resolution Accuracy	0-24 mA 1 µA at range 20 mA 2.4 µA (max error at 2 Hz sample rate)
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G.2 - Voltage 4 wires, differential

Range Resolution Accuracy	±12V 1 mV at range ±12 V 4 mV at range ±12 V
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G.3 - Servo inclinometers

Range resolution accuracy	±5V 1 mV at range ±10 V 2 mV at range ±10 V
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G.4 - 1/2 Wheats. bridge (5 wires, with sensing)

Range resolution accuracy	±62.5 mV/V 0.005 mV/V 0.05 mV/V (max error at 2 Hz sample rate)
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G.5 - 1/4 Wheats. bridge (3 wires, w/o sensing)

Range resolution accuracy	±62.5 mV/V 0.005 mV/V 0.05 mV/V
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G.6 - Potentiometers

Range resolution accuracy	5V 1 mV at range ±5 V 1 mV at range ±5 V (max error at 2 Hz sample rate)
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(2) full and complete technical specifications available on request

ACCESSORIES AND SPARE PARTS

JUMPER CABLE OECAV08V2J0

Jumper cable for MIND connection to an instrument supplied with military connector.



SWITCH BOX JUMPER CABLE OECAV08V2S0

Jumper cable for MIND connection to a switch terminal box.



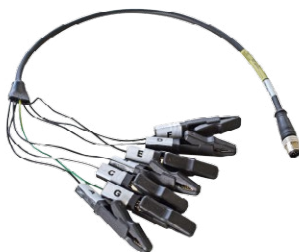
MUX BOX-MIND JUMPER CABLE OECAVMINDMU

Jumper cable for direct connection from MIND to multiplexer boxes. NOTE: only new MUX BOX with M12 connector can be read with MIND. Old MUX-BOX with MIL connector which could be read with New Leonardo cannot be read with MIND.



6-CLIPS SENSOR CABLE (SPARE) OECAV8P6A00

Jumper cable with 6 alligator clips for instrument reading on signal cable wires.



MIND CARRYING BAG (SPARE) OMIND1BAG00

Specially designed carrying bag for MIND readout. It includes shoulder belt.



BATTERY CHARGER (SPARE) OECABMIND00

Charger for Li-Ion batteries.
Input voltage 90-264 Vac, 50-60 Hz IP rate IP41
Max output power 10 W



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TECHNICAL ASSISTANCE

SISGEO offers customers e-mail and phone assistance to ensure proper use of instruments and readout and to maximize performance of the system.

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