

MinGeo Declination Inclination Digital Station (DS)

MinGeo Ltd. developed a new kind of cableless, digital DIM instrument, named MinGeo Declination Inclination Digital Station (DS). A classical theodolite equipped with a modified to steel free single-axis magnetometer (known as Declination Inclination Magnetometer or DIM) is used to carry out absolute magnetic measurements. The complete DS system is composed of an electronic theodolite, a single-axis fluxgate sensor, an Android tablet, and our proprietary DS Android app. All the electronic components are powered with 5V DC.



In the DS system a single-axis fluxgate sensor is fixed on the telescope and connected to the proprietary MinGeo DS control unit. The digital angle encoder is used to scan precise graduation marks on the theodolite's circles. The vertical encoder is fixed on the pendulum of the theodolite to eliminate reading differences caused by minor levelling errors. The overall simple construction of the system and the low power consumption of the electronics allowed us to integrate with its electronics battery and mount directly on the telescope. This way, everything moves together with the sensor during the measurement procedure and any magnetic moment is canceled out. Measurement data are transmitted to a tablet via Bluetooth 4.0 BLE to ensure easy operation and data recording/processing. The measurement is initialized by a small non-magnetic remote controller.

A 10" tablet is used to display and store UTC timestamp, fluxgate sensor, horizontal and vertical angular measurement values together with many additional data, such as session identifier, battery status of the magnetometer and that of the tablet, actual and next telescope positions, BT connection quality, etc. All data are stored in tablet, and at the end of the measurement procedure, the data can be downloaded easily. A bar display and an audio signal both help the operator to find the measurement range.



Benefits

- Faster observation time than any previous model
- Push-button device
- Automatic calculation of magnetic meridian
- High accuracy in absolute magnetic observation
- No observational error
- A bar display or/and an audio signal with ± 3000 nT range on 10" tablet to easily find the null positions
- Template manager for observation
- More sophisticated absolute measurement
- Preliminary data processing
- Comfortable angular reading at Magnetic Equator

Applications

- Earth's magnetic field Measurements
- Reference measurements of the variometers at observatories
- Repeat station survey
- Compass & rangefinder calibration
- In field referencing in oil and gas exploration

DS Android application

- All data recording done by pushing the button on the remote controller
- Fluxgate sensor and angle values can be seen any situation , simultaneously
- Autofill for predictable angles at 'null' and 'residual' methods
- Automatic Magnetic Meridian Calculation
- Output angular formats: 'gon' or 'dms'
- Enables manual input of scalar magnetometer data
- GSM90 or GSM19 scalar magnetometer can be connected

Main technical parameters

- **Angular resolution: 5" = 1.5 mgon**
- Magnetic resolution: 0.1 nT
- Fluxgate sensor alignment better than $\pm 3' = \pm 55.6$ mgon
- Magnetic scale factor: $1.0 \pm 3\%$
- Magnetic measuring range: ± 3000 nT
- Instrument offset better than ± 10 nT
- Instrument operation time: 8+ hours
- Operating temperature: 0 °C to 40 °C
- **Achievable measurement accuracy:**
maximum low frequency error between
absolute magnetic observations ± 2.5 nT

Standard accessories

- Android 10 tablet with DS app, GPS, 10" display, Bluetooth 4.0 BLE
- Remote controller
- Steep sighting prism for telescope
- Sunfilter for telescope
- Simple nonmagnetic servicing tools
- Plummet
- Universal charger (mains/5V DC)
- Plastic transport case
- Certificates and manuals on tablet

Weight & Dimensions

- Instrument: 4.8 kg
- Instrument in plastic case: 9.2 kg
- Height of instrument: 33.4 cm
- Case: 55 x 65 x 35 cm
- Tripod: 5.6 kg, 16 x 16 x 160 cm

Optional accessories

- Wooden steel free tripod (for field use)
- Industrial rugged tablet



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