Standardization of total field magnetometers

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A b s t r a c t: Specifications and features of standard scalar magnetometers for Observatory use are proposed:
– Measurement of magnetic flux density in nT units in digital form
– Computer control of parameters of measurement (via serial link)
  – reading interval length
  – timing of measurement
  – rate of readings
  – data collection and storage
– Absolute accuracy of measurement 0.1 nT, sensitivity better than 0.1 nT
– Temperature range of operation -40°C to +50°C
– Internal time base stability to support high absolute accuracy: aging 1-2 ppm/year stability over temperature range of operation 1-2ppm
– Possibility to synchronize internal time base with the Global Positioning System (GPS) time (UTC time)
– Uninterrupted periodic operation with 5 sec minimum interval of measurement
– Ability to determine precise timing (beginning and the end) of the actual measurement of magnetic flux density
– Long term operation (several years between repairs)
– Low interference with other Observatory instrumentation

Other features like: low power, low weight, small sensor/electronics size, simplicity of operation, operation on demand are also desirable.

It is hoped that the above recommendations will start a discussion and eventual acceptance of the standards by IAGA and/or Intermagnet.

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