

## AEROMAGNETIC DATA ACQUISITION & LOGGING SYSTEM

### *Magnetometer interface and counter for 2 sensors*

### *Magnetics and general-purpose data acquisition & recording*

### *Embedded GPS receiver (optional)*

*Compact, light, low power –  
133 x 133 x 216 mm  
+28VDC, 3.5A (typical)  
< 1.8 Kg*

### *Cost-effective, ideal for UAV installations*

- *Front-end sampling rates up to 1280 Hz*
- *Magnetometer processor: 0.32 pT resolution, < 0.1 pT system noise, ±10 ppb temp. stability*
- *User may customize Front End processing to specific installation requirements*
- *Interface for external GPS receiver: standard Embedded GPS receiver (typ. dual-frequency, L-band corrections): optional*
- *Data recording & output, up to 160 Hz*
- *Gating of magnetometer readings for concurrent use with EM systems*
- *General-purpose analog inputs (2), and embedded barometric-pressure & temperature sensors*
- *Data acquisition via Ethernet*
- *Real-time monitoring and user interface through any standard VGA display, and/or from any Windows device (via Ethernet)*
- *Features targeted to UAV applications*
- *State-of-the-art HW & FW architecture based on advanced 64/32-bit processors*
- *Real-time operating system (RTOS): QNX 6.5*
- *Two (2) years limited warranty*

The RMS Instruments' DAS52 is a powerful, versatile and rugged data acquisition and logging system ideally suited to magnetometry applications that do not require compensation for platform effects. Designed for use in demanding airborne and mobile geophysical and environmental surveying, it is a perfect fit for Unmanned Aerial Vehicle (UAV) installations because of its light weight, compact package, and low power consumption.

The DAS52 has its roots in the (D)AARC5XX family of real-time aeromagnetic compensation systems, for more than a decade the *de facto* standard in the geophysical exploration industry throughout the world. The system is built on the foundation of state-of-the-art, highly-reliable hardware, firmware, and signal processing which have been proven in a multitude of installations. Consistent with magnetometry, data acquisition from ancillary sensors is delivered with unparalleled performance, accuracy and reliability.

#### **Magnetics**

The DAS52 provides the interface and *counter* for two high-sensitivity self-oscillating cesium vapor magnetometers. Proprietary electronics and firmware ensure perfect synchronization, critical in gradiometer applications, and unparalleled performance. An embedded power/decoupler module decouples the Larmor signal from each magnetometer, while supplying power over the same cable.

#### **General-purpose data acquisition**

The DAS52 supports data acquisition via Gigabit-Ethernet, with up to 3 independent logical connections. With a suitable external converter/switch, the DAS52 can thus capture/record streaming data from various devices with either Ethernet or serial (RS232) output. The unit also supports two general-purpose differential, high-resolution analog inputs (e.g., radar/laser altimeter) and two dedicated to embedded barometric pressure and temperature sensors.



### GPS receiver

An interface for an external GPS receiver is standard. The DAS52 supports also an embedded GPS receiver (optional). A variety of receivers are available to satisfy different requirements in accuracy. One port on the receiver is used internally; an additional two ports are accessible by the user (for example, to interface to a navigation system). GPS data are appended to recorded and transmitted magnetics data packets. Timing throughout the system is tied to the PPS trigger from the GPS receiver.

### Remote control from Windows

A remote connectivity tool allows users full control and operation from a remote Windows-based system across an IP network.

The user interface of the DAS52 is seamlessly replicated in the Windows-based computer. The mouse and keyboard attached to the computer have the same effect as if they were directly connected to the unit.

### Data exporting software

The data files recorded by the DAS52 have a structure optimized for efficiency and performance. *ExportDAARC* is a comprehensive support software package included with the DAS52 which allows exporting data files to industry-standard formats (flat-ASCII, Geosoft's GBN).

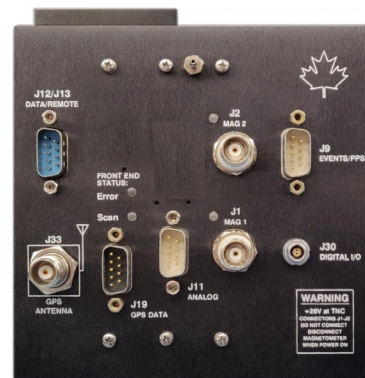
### System architecture

The underlying technology has a powerful architecture with dual processors, a proprietary magnetometer interface with outstanding performance, and top-quality industrial-grade electronics.

Front End sampling rates up to 1280 Hz and finely-tuned transfer functions deliver outstanding anti-aliasing characteristics, and may be customized by the user per the requirements of an installation.

The main program and real-time operating system (RTOS) reside in (solid-state) Flash memory. The RTOS is QNX 6.5 (or later) – deterministic, highly-reliable, and tailored to mission-critical applications.

The software includes an easy-to-use graphical user interface, and a rich set of utilities to analyze data and troubleshoot installations.



## DAS52 SPECIFICATIONS

### Magnetometer Inputs:

Two high-sensitivity magnetometers:

Cs: Typ. 70 kHz – 350 kHz

### Magnetic Field Range:

Per the magnetometer's range; e.g.: [1]

CS-3, CS-L, CS-VL: 15,000–105,000 nT

G-822A, G-823A: 20,000–100,000 nT

### Front End (FE):

Time base: > 100 MHz, OCXO

Resolution: 0.32 pT [2]

System noise:  $\sigma < 0.1$  pT [3]

Temperature stability:  $\approx \pm 10$  ppb [4]

Sampling rate: 160, 640, 800 or 1280 Hz – user-selectable

Transfer function (bandwidth): 1.6 Hz, 3.25 Hz, 6.4 Hz, 9.8 Hz, 20 Hz,  $0.16F_{SH}$ ,  $0.13F_{SH}$  or Custom – user-selectable

### Optional Filter (Host):

User-selectable, 0.4–3.0 Hz BW

### Data Output & Recording:

$F_{SH}$ : 10, 20, 40, 80, 160 Hz (GPS-PPS or internal synch.); external-trigger

Serial port: 115.2 kbps, ASCII/Binary

Ethernet: TCP/IP packets, ASCII/Binary

Recording media: embedded Flash SSD ( $\geq 32$  GB), USB Flash disk

External display (VGA)

### Event Inputs:

PPS trigger signal from external GPS

Two general-purpose latched event inputs

LS-TTL levels, edge-sensitive

Event tags included with output data

Accuracy: per Front End sampling rate

### Embedded Baro. Pressure & Temp.:

Differential inputs, 16-bit ADC

600 to 1100-mbar;  $\pm 5$  mbar total accuracy

$-50$  to  $+100^\circ\text{C}$  range;  $\pm 1^\circ\text{C}$  abs. error

### EM Gating:

For concurrent use with EM systems

LS-TTL input with pull-up

### FE-Sampled Analog:

Two differential inputs

16-bit resolution, self-calibrating ADC

Input range:  $\pm 5$  Volts

Input resistance: 1 M $\Omega$ , typical

### Data Acquisition via Ethernet:

10/100/1000Base-TX

Real-time, streaming data (TCP/IP)

Three independent logical connections

Sampling & recording:  $F_{SH}$  or submult.

### Synch. to External Devices:

One pulse-train output

Rate:  $F_{SH}/X$ , with  $1 \leq X \leq 255$

Low-going control; > 10- $\mu\text{sec}$  width

### Remote Control:

Optional: From any Windows-based computer, via Ethernet – full user I/F

Via serial (RS232) port – ASCII cmdns.

### Indicators, General-Purpose I/O:

2 LEDs for mag. input status

2 LEDs for Front End status

Three USB 2.0

10/100/1000Base-TX Ethernet (RJ45)

VGA video (15-pin D-sub)

### GPS Receiver:

Standard: Interface to any GPS receiver with NMEA GGA output via RS232 (115.2 kbps,  $\leq 10$  Hz), PPS (LS-TTL, 5V-tolerant LV-TTL)

Optional: Embedded receiver – dual-freq., GPS+GLONASS+QZSS, L1/L2, SBAS L1, PPP+Single-Point+DGPS-PNT, L-Band corrections (Others: BeiDou, RTK posit., etc.)

Magnetics data tagged with GPS time, lat., long., altitude, and auxiliary data  
Up to 10 Hz

### Power:

+28VDC (Range: +19 to +36VDC)

2.5A plus, for each mag. sensor, 1–1.5A [5] during warm-up, 0.5A thereafter

Absolute maximum: +50VDC, < 100 msec

### Environmental –

**Operating Temperature:**  $-10$  to  $+50^\circ\text{C}$

**Storage Temperature:**  $-20$  to  $+55^\circ\text{C}$

**Relative Humidity:** 0 to 99%, non-cond.

**Altitude:** 0–6,000 m (0–20,000 ft)

**Size (W x H x D):** 133 x 133 x 216 mm

**Weight:** < 1.8 Kg

### Notes:

[1] Per manufacturer's specs. at print time.

[2] 1.6-Hz BW, 625-ms integ.

[3] Typical; 1.6-Hz BW, 625-ms integ., 10 Hz.

[4] Within operating temperature range. Over  $-20$  to  $+70^\circ\text{C}$ , <  $\pm 35$  ppb.

[5] Dependent on type/model of magnetometer sensors.

Specifications per Host FW  $\geq$  RMS11164-01-F,

FE FW  $\geq$  RMS1877-05-D, HW Rev.  $\geq$  3.20,

and subject to change without notice – Jan 2026.

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For more information on this and other products, contact:

Distributed by:



RMS 2025 Inc.  
5875 Whittle Road  
Mississauga, Ontario  
L4Z 2H4, Canada

rms@rmsinst.com  
<http://www.rmsinst.com>  
Tel.: (905) 677-5533