



RELEASE NOTES

DAARC500 DAS & Adaptive Aeromagnetic Real-Time Compensator

Host Firmware Release RMS1936-02-E

These release notes contain important information about the new firmware and how it will affect the performance of instruments in which it is installed. The notes include information about enhancements, adaptive changes, and corrections to known problems. Please read this documentation carefully.

Compatibility:

(D)AARC500 Front End – Requires firmware RMS1877-03-C or later

1. Remote control from Windows

A new remote connectivity tool for the DAARC500 allows users full control and operation of the unit from a remote Windows-based system, across an IP network.

The user interface system of the DAARC500 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 DAARC500.

This technology facilitates flexible architectures for complex systems that incorporate the DAARC500. A single computer/laptop can be used to control and operate the DAARC500 and other instruments (e.g., gamma-ray spectrometer, gravity system, etc.). Naturally, any other Windows applications can also be running simultaneously. This remote connectivity is also very useful for training and remote support purposes.

The tool comprises firmware embedded in the DAARC500, and software running on the Windows machine. This software is an application from QNX Software Systems named *Phindows*¹. The technology underlying Phindows includes advanced compression schemes, as well as data and font caching. This results in very efficient performance over Ethernet-based IP connections. The computational burden imposed on the host computer is minimum.

Figure 1 illustrates typical connections and data flow. In the example shown, the DAARC500 is a *server* in the connection with a Phindows client running on the Control & User Interface Computer, and a *client* acquiring real-time data from the gamma-ray

¹ *Phindows* (which stands for "Photon in Windows"), allows access to the 'Photon' micro-GUI in a QNX-based system, from a Windows machine.

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spectrometer. Figure 2 shows a screen-shot of an actual DAARC500 user interface running concurrently with other Windows programs.

The Host firmware in the DAARC500 includes the support required for the remote connectivity. This is implemented through the Ethernet port on the DAARC500's rear panel.

Host computer requirements

Operating system: Minimum recommended is Windows XP, with DirectX 9.0c.

Windows Vista and Windows 7 are also supported.

Phindows is known to work with versions of Windows as old as Windows 98 and Windows NT 4.0 (but some features may not be available in older versions of Windows).

One free Ethernet interface (100/1000 Mbps).

Availability:

- The underlying software that relays information to/from the Windows system running Phindows, is included in Host firmware RMS1936-02-E (or later).
- A unique license/key is required for every host computer running Phindows.

One license is included with the purchase of every new DAARC500 unit.

Additional licenses must be purchased separately – please contact RMS Instruments and request information on the *License/Key for Phindows*.

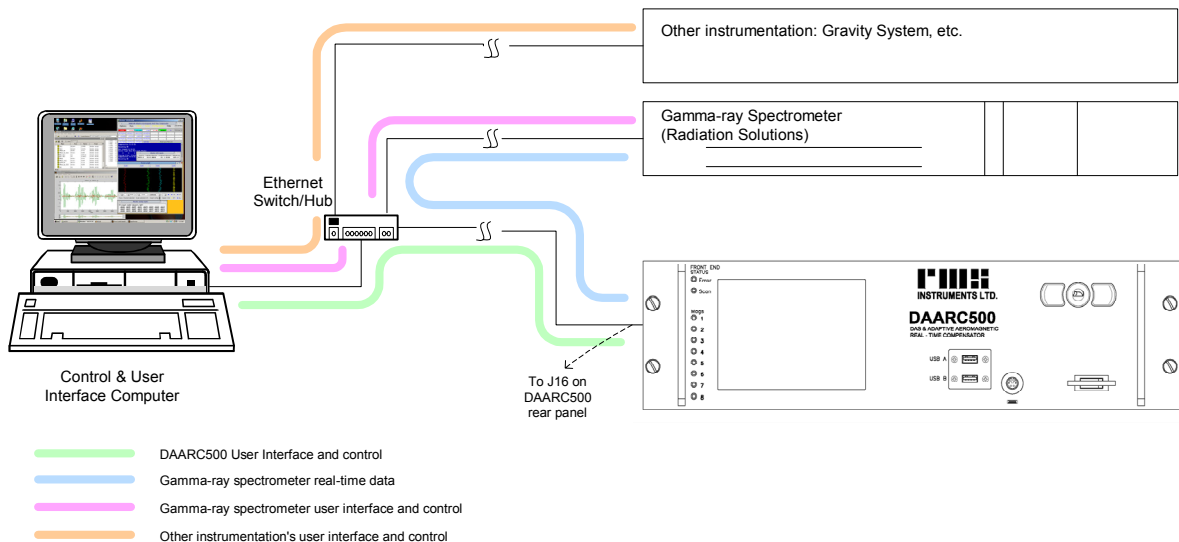


Figure 1 – Single device remotely controlling and operating a DAARC500 and other instruments, over a TCP/IP Ethernet-based network

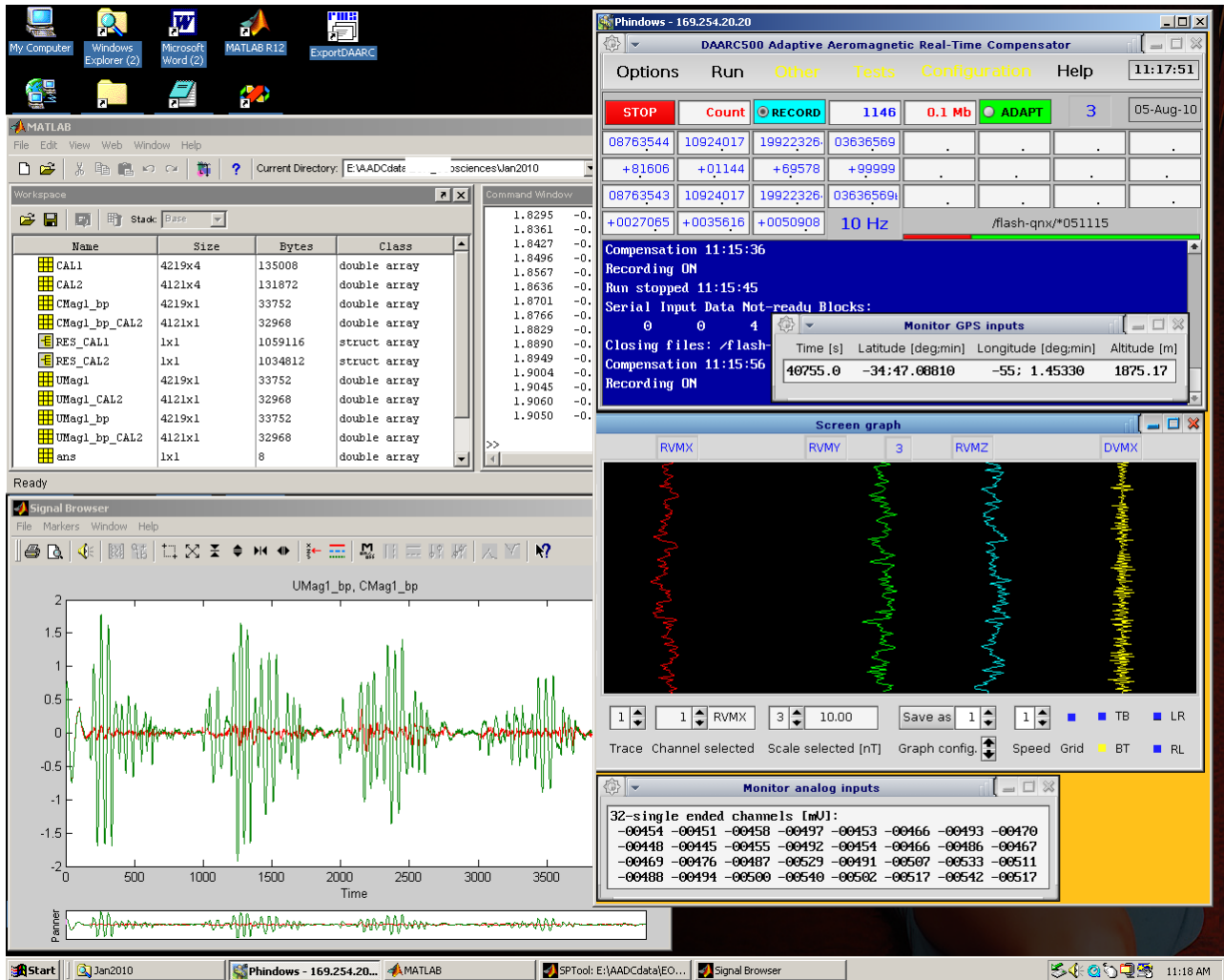


Figure 2 – Screenshot of DAARC500 user interface running on a Windows-based computer

2. The firmware includes a new protocol for receiving serial data.

The protocol is similar to the original *ASCII* protocol. It also identifies the start of a *block* through a *preamble*, but instead of defining a fixed length, it defines a *terminating* character that marks the end of the block. The protocol, thus, can handle variable-length *ASCII* data blocks.

The new protocol (referred to as *ASCII-T*), first identifies the pre-*amble* sequence, skips the number of bytes specified by the *offset* parameter, and then acquires and records all incoming data bytes, up to and including the *terminator*.

3. Various code optimizations have resulted in the system now being able to record serial and Ethernet (TCP/IP) data, during both compensated run mode, and calibration mode. In the past, these data ('s' files and 't' files) could not be recorded during calibration mode.

4. The field for Event #3, in the *event input tags* in recorded and/or transmitted data blocks, is now used to encode error/warning messages. This provides a form of redundancy, allowing (unambiguous) identification of error conditions that may have been missed by the operator/pilot during flight.

Note that this disables the original function of the Event #3 input, as an *event input marker*. The functionality of the other event inputs (Events #0, #1 and #2), remains unchanged.

5. The Host firmware now supports four general-purpose analog inputs in the RMS4915 Fluxgate Magnetometer Interface Module. This is in addition to the standard analog inputs (16 differential, or 32 single-ended channels) supported through the RMS4941 Analog Input Module.

These Front-End-sampled analog inputs are sampled at the same rate (up to 1280 Hz), and processed in the same manner, as all other magnetics signals are. The inputs are differential, digitized with 16-bit resolution, and have a $\pm 5V$ input range.

Although at present this function provides only the additional general-purpose inputs, in future firmware releases this capability will be used for advanced enhancements to the compensation algorithms.

The function is optional, and licensed separately. Contact RMS Instruments for details.

6. A new *auto-start* option allows the system to automatically start in *compensated run mode* after power is turned on. This is typically used in installations without an operator, and without remote control from an external computer. Immediately after power up, the unit will go directly into compensated run mode and start sampling and processing signals, and generating compensated output.
7. The system now prompts for confirmation before starting calibration mode. This protects users from starting a new calibration accidentally.
8. The recording of all non-magnetics data is now started at the same point relative to the trigger, when using the external-PPS mode.
9. The desktop menu can now also be accessed by clicking on a box labeled *desktop menu*, located in the bottom-left corner of the screen. This alternative is offered for the benefit of operators using a touch-screen display. In some cases, such touch-screens will not offer a means to generate a mouse "right-click".