RMS INSTRUMENTS
Data Recording Systems

6877-1 Goreway Drive
Mississauga, Ontario
Canada L4V 1L9

Tel: (905) 677-5533
Fax: (905) 677-5030
Web: www.rmsinst.com
e-mail: rms@rmsinst.com

GR33A GRAPHIC RECORDER

The model GR33A Chart Recorder is a microprocessor based oscillographic recorder implementing proven thermal array writing technology. Sharp images are produced on plain, high temperature grade, white thermal paper. A simple paper drive mechanism provides high reliability with *VERY LOW MAINTENANCE*. The GR33A has an unsurpassed performance record for precision and versatility in data recording.

Unique Features

- **1 – 32 CHANNELS (16 BIT), 6 EVENTS ON A 12 5/8 IN. (321 mm) CHART**
- **LOW PROFILE AND LIGHTWEIGHT**
- **SIMULTANEOUS ANALOG, DIGITAL AND MESSAGE RECORDING**
- **STAND ALONE AND/OR FULLY PROGRAMMABLE FROM HOST COMPUTER**
- **TRANSIENT RECORDING, UP TO 31 KHz SAMPLING**
- **28 VDC, 115 OR 220 VAC OPERATION**

Additional Outstanding Features

- Real time calendar clock – battery backed
- 22 types of self printing grids
- Variable time marker or time dependant grid
- Crystal controlled chart speed
- Chart speed derived from any analog channel
- External frequency control of chart speed
- Half/full step operation
- 4 setup tables
- 2 programmable header messages
- Parameter table printout
- Programmable signal identification labels
- Voltmeter display and printing capability
- Self testing with status messages
- Various methods of plotting signals
- Programmable channel sensitivities
- Serial output of trace and transient data
- Signal trace positioning anywhere on the chart
- Automatic even separation of the ‘ON’ channels
- Built in test features
- 15 digital filter types for each channel
- Individual offset voltage on each channel
- Auto-null capability for each channel
- Programmable polarity
- Partition chart with up to 15 boundaries
- Individual signals can be programmed to wrap, ignore or stop at boundaries or chart edges
- ‘Hi-Lo’ set points with alarm and printed messages
- Thermocouple and RTD linearization
- Event counters and markers
- Remote chart ON/OFF
- Ability to use 2nd analog input module
- ARINC interface support

Multiple Operating Modes

Stand Alone Operation

The GR33A can operate as a conventional strip chart recorder when the optional 32 channel Analog Input Module is installed (RMS4185A). All of the items listed in the features list, as well as the control functions and parameter settings, are easily performed with the unique control panel. For example, any of the 32 channels can be keyed ON or OFF, any channel can be freely positioned across the chart, and different sensitivities can be assigned to each channel.

Computer Controlled

The GR33A recorder can be totally controlled from a host computer with or without an RMS4185A Analog Input Module installed. All of the front panel control functions can be performed remotely via the serial or parallel ports (both standard), or the optional IEEE-488 interface. Not only can control functions and messages be sent, but signal traces can also be produced directly from digital data, without the necessity of using D/A's to convert back to analog. The host can disable the control panel if local control is not desired.

While under computer control, the user has complete access to all of the GR33A's Chart Recorder, Alphanumeric, and Raster Graphics capabilities. Traces can be produced from digital data while simultaneously printing messages, or print text as a line printer. Control is permitted even to the extent of accessing the 1240 individual printing elements to produce Raster Graphic images.

Analog/Digital Modes

The GR33A is not restricted to Stand Alone or Computer Controlled operation but can also be used in a combined mode. Signal traces can be produced from analog signals (via the RMS4185A Analog Input Module) as well as from digital data (via the parallel/serial ports or the optional IEEE-488 module).

While in this mode, messages can be readily printed for correlation with external events. The GR33A can be producing traces from analog and digital sources, writing messages, and at the same time, send the data via the serial port to a computer.

PC Compatible Software

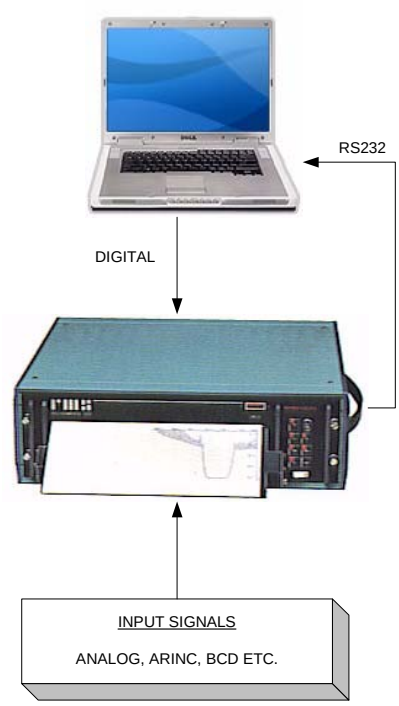
CDW33 is an advanced Windows-based operator interface for control and setup of the GR33A, that also provides real-time data monitoring and logging.

CDW33 maintains GR33A configurations as ordinary disk-based files. In *real-time mode,* changes made to the configuration are immediately transmitted to the GR33A. The *edit* mode allows the configuration to be modified off-line, with or without a GR33A connected.

Configuration variables and functions are conveniently grouped in clear forms and tables. In addition to basic system and per-channel configuration, settings for the optional ARINC and Transient Digitizer modules have their own forms, and are stored as part of the CDW33 configuration file.

Data transmitted by the GR33A can be monitored on-screen and simultaneously logged to disk in real-time. Graphs can be easily defined to plot a specific channel, and they may be configured, sized and positioned with great flexibility. Convenient controls are provided for on-line adjustment of scaling and offset.

CDW33 can be run on Windows NT 4.0, Windows 2000, and Windows XP.



RS232 Output Port

The GR33A has, as standard, a serial output port for transmission; all 32 channels are transmitted, whichever their source (analog or digital) we well as some ancillary data. When the optional RMS4185A Analog Input Module is installed, the 16 bit data can be sent in ASCII or binary format to a computer, remote terminal, or an additional recording device.

Data from the optional RMS4450 Transient Digitizer Module and RMS4429A ARINC Interface can also be transmitted for further analysis.

Four Setup Tables

All recording parameters are stored in the nonvolatile memory and are retained during power down. The GR33A has FOUR separate setup tables which the user can recall quickly.

This is especially useful when a series of tests or measurements require different recorder configurations. The setup table at power-up will be the last one which was selected from the keyboard or a host computer.

Additional configurations can also be downloaded from files when the GR33A is used with a host computer

Operator Control Panel

The operation of the GR33A is generally controlled by the unique, compact control panel. The single rotary control scrolls through the parameters and functions, eliminating the numerous front panel controls usually found on multi-channel chart recorders.

Paper Transport

The paper transport slides out and is easily loaded in a few seconds. It also has an internal takeup spool as a standard feature

Chart Annotation

The GR33A provides, upon command from the keyboard or host computer, a complete printout of all the recorder parameters. There are also two 132 character programmable header messages. This message can also be used to indicate the scaling across the chart.. Once the header messages are entered, they are retained in the nonvolatile memory. In addition, a 40 character horizontal message and four 32 character vertical messages can be sent under computer control, with the position on the chart being programmable.

Optional Modules

Analog Input

The RMS4185A module provides 32 differential analog voltage inputs, with a range of ±10 volts and 16 bit resolution (300 microvolts). The maximum chart sensitivity can be set to 10 millivolts per inch or cm with ±10 volts suppression. The module is microprocessor based, and under software control, the calibration is ensured by continually performing self tests which automatically adjust the gain and zero suppression. There are 15 digital filters (low pass, high pass, spike-reject and averaging) which may be applied to any channel. Channels may be individually programmed for auto-nulling, setpoints, linearization, offsets etc.

There are 6 TTL/CMOS compatible or switch closure event inputs for marking the chart. Two of the events have presettable counters which are periodically printed on the edges of the chart. Another event input can be used to remotely turn the chart ON/OFF, or cause a header message to be printed.

The recorder chart speed can also be controlled by either an external frequency or an analog channel.

ARINC Interface

The RMS4429A microprocessor based module allows traces to be produced from data received via the ARINC bus.

The module supports 4 independent channels that can be configured to decode the following ARINC formats: 429 (high & low speed), 419, 561, 568, 571, 575 and 579. The user has the ability to extract specific data from the bus by programming equipment I.D. labels and data masks into the module. Up to 16 traces can be derived in this manner, and the trace data produced is also available at the serial output port in ASCII or binary format.

IEEE-488 Bus Interface

The RMS4088 permits the GR33A to operate under a host computer as a listener on an IEEE-488 compatible bus.

20 Digit BCD Input

The RMS4137 module provides for 20 parallel BCD inputs (80 lines from which the data my be recorded as signal traces or as alphanumeric characters.

RMS4450 Waveform and Transient Digitizer

This feature provides up to 512K bytes of memory (256K standard) for the capturing of transient and high frequency data. The digitizer functions in conjunction with the RMS4185A Analog Input Module.

Number of interface modules supported

GR33A-1	23-32 VDC version can support up to 5 modules
GR33A-2	110 or 220 VAC version can support a maximum 2 modules.

Recording Paper

Plain thermal sensitive roll paper 12.625 in. (321 mm) wide by 200 ft. (60 m) long

RMS2030-2 Black image

RMS2030-3 Black image perforated every 8.5 in. (216 mm)

Product Support

RMS INSTRUMENTS has built a reputation for supplying reliable products and customer support by combining a high level of design excellence with a practical modular construction. These easily removed sub-assemblies on the plug-in Interface Modules allow for quick access for maintenance.

GR33A Graphic Recorder Specifications

MODELS:	GR33A-1, 23-32 VDC GR33A-2, 110 or 220 VAC ±20%, 47-440 Hz
RECORD:	**Size:** 12.4 in. (315 mm) record on 12.625 in. (321 mm) paper **Signal Traces:** up to 32 user defined with no excursion restrictions. Alphanumeric and Graphics capability **Resolution:** 100 x 200 dots/in (~ 4 x 8 dots/mm) **Recording Method:** Thermal array technology consisting of 1240 individual 0.008 in 90.2 mm) printing elements on 0.01 in (0.254 mm) centers
PAPER TRANSPORT:	**Paper Viewing Area:** 3.3 in. (84 mm) using internal take-up spool, 5.3 in. (134.6 mm) using RMS3307 Writing Platen **Drive Mechanism:** Roller type, driven by crystal controlled stepper motor with an internal take-up spool **Paper Speed:** 800 speeds (programmable in./sec or mm/sec) up to 0.320 in./sec, in 0.001 in./sec increments or 8.00 mm/sec in 0.01 mm/sec increments. Paper speed may also be determined by a host computer, external variable frequency or by any analog channel of the optional RMS4185A Analog Input Module. **Paper Advance:** Paper may be advanced at 1 in/sec (25.4 mm/sec) without printing. P**aper Level:** 4 segment LED bargraph paper level indicator using solid state level sensor.
SERIAL DIGITAL INTERFACE:	**Two RS-232C ports:** a) set-up and control from host computer b) data output: ASCII or binary format; transmission interval 1 – 255 [x50 msec] 8 data bits with programmable parity, RTS (request to send) and CTS (clear to send) handshake lines **Transfer Rate:** 300 to 19.2 kbps **Connector:** Two DE-9P (9-pin) located on the rear panel.
PARALLEL DIGITAL INTERFACE:	8 input lines, 8 output lines, active low or high input strobe, active low output strobe, active low and high Busy outputs, all TTL compatible. **Connector:** Two DE-9P (9 pin) located on the rear panel
BURN-IN TESTING:	12 hours at 0ºC to 50ºC
INSTALLATION:	**Size:** Rack Mountable, 19.0 x 5.25 in (482.6 x 133.4 mm). Overall depth 19.3 in (490 mm), extending 17.5 in (445 mm) behind mounting surface **Weight:** 24.5 lbs (11.2 Kg) excluding options
POWER REQUIREMENT:	Less than 100 watts typical
ENVIRONMENT:	**Operating Temperature:** 0ºC to +50ºC **Storage Temperature:** -40ºC to +60ºC **Extreme Operating Temperature**: -20ºC to +55ºC **Humidity:** 5% - 95% non-condensing **Altitude:** to 50,000 feet (15,228 m) GR33A-1
MTBF:	8900 hours Per MIL_HDBK-217C Environment: Airborne transport inhabited Ambient Temperature: +35ºC, Temp. rise 5ºC
EMI:	Per MIL-STD-461A
VIBRATION:	10 cycles of 6 hour cycles, each cycle consists of 4 hours at +40ºC with 10 minutes of vibration at 1 g, 60 Hz every hour, and one hour cold sycle to 0ºC
STANDARD ACCESSORIES:	User's Guide on CD-ROM, all mating connectors, and two rolls RMS2030-2 recording paper
OPTIONAL ACCESSOSRIES:	CDW33 Control and Display for Windows NT, 2000 and XP RMS3305 GR33A-1 Optional Cooling Fan (recommended with more than 1 optional module) RMS3355 Desktop Enclosure RMS4200 Termination Panel (for customer's signal conditioning) ATB33/34 Automatic Test Box GR33A User's Guide – printed copy GR33A/34A Maintenance Manual – printed copy

Consult the factory for the latest options and customized recorder configurations.

Specifications are subject to change without notice.
December 2007