LGR-5320 Series

Stand-Alone, High-Speed, Multifunction Data Loggers

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Features

- Up to 200 kS/s correlated sampling of all data
- 16 analog inputs up to ±30 V
- 16-bit resolution
- 16 industrial digital inputs up to 30 V
- Single Form C relay digital output configurable for triggering/alarming
- 4 counter inputs (quadrature available)
- 4 GB SD memory card included, supports up to 32 GB
- Multi-channel analog and digital triggering
- Push-button controls for field operation

Software

- Includes DAQLog™ software for easy setup, configuration, and data retrieval
- Multiple trigger and alarming functions
- Ability to save data in .csv format for easy import into Excel®

TECH BRIEFS
2010 Product of the Year

LGR-5320 Series of high-speed, stand-alone data loggers allow users to collect correlated analog and digital data without a computer

Overview

The LGR-5320 Series are high-speed, stand-alone data loggers for analog and digital signals. Each module offers 16 analog inputs, 16 digital inputs, one single Form C relay (0.5A) digital output for triggering/alarming, and four counter/encoder inputs. These devices allow users to collect high-speed correlated analog and digital data without a computer.

LGR-5320 devices perform high-speed, correlated measurements, up to 200 kS/s, directly to a Secure Digital (SD) or SDHC memory card. Utilizing the advanced analog and digital triggering options, users can collect data to monitor systems and events without dedicating a PC. The LGR-5320 loggers include easy-to-use DAQLog software to configure the devices and retrieve data via the USB interface or SD memory card.

Three models are available in the LGR-5320 Series. The LGR-5325 features up to ±10 V analog inputs, 100 kS/s sampling, four conventional counter inputs (non-quadrature), and single-channel trigger modes. The LGR-5327 features up to ±30 V analog inputs, 200 kS/s sampling, four quadrature encoder inputs, and multi-channel trigger modes. The LGR-5329 includes all the functionality of the LGR-5327 plus isolated digital inputs.

LGR-5320 Series Module Overview

Feature	LGR-5325	LGR-5327	LGR-5329
Sample rate*	100 kS/s	200 kS/s	200 kS/s
Analog inputs	16 SE/8 DE	16 SE/8 DE	16 SE/8 DE
Analog input range	up to ±10 V	up to ±30 V	up to ±30 V
Digital inputs**	16-channel TTL	16-channel TTL	16-channel industrial isolated
Counters	4 conventional	4 quadrature	4 quadrature
Triggering	single-channel	multi-channel	multi-channel

* Sample rates aggregate
** Each logger includes one single Form C relay output

Analog Input

16SE/8DE analog inputs are included on each data logger. The LGR-5325 features multiple analog input gain ranges up to ±10 V. The LGR-5327 and 5329 add a ±30 V analog input range for increased measurement capability. Each data logger provides 16-bit resolution.

Correlated, High-Speed Sampling

The LGR-5327 and LGR-5329 can sample input data at up to 200 kS/s while the LGR-5325 offers a 100 kS/s sample rate. Each module can sample all analog, digital, and counter data synchronously, making it easy to compare time between all channels.

Configuration, Data Storage, and Retrieval

Each data logger can be configured through the SD memory card or via the on-board USB port. Simply configure the logging session with the included DAQLog software. All logging parameters are captured on the SD memory card. A 4 GB SD memory card is included with each data logger. Memory cards up to 32 GB are supported for extended data collection. Data is retrieved by removing the SD memory card from the logger and uploading to a PC or by connecting to the USB port on the logger.

LGR-5320 Series

General Information

Triggering

LGR-5320 Series data loggers offer multiple triggering options for starting and stopping a data scan. These options vary by model. The LGR-5325 features single-channel analog and digital triggering. The LGR-5327 and LGR-5329 offer multi-channel and pattern triggering options. Multiple trigger options allow collection of only the desired data. External clocking is also supported.

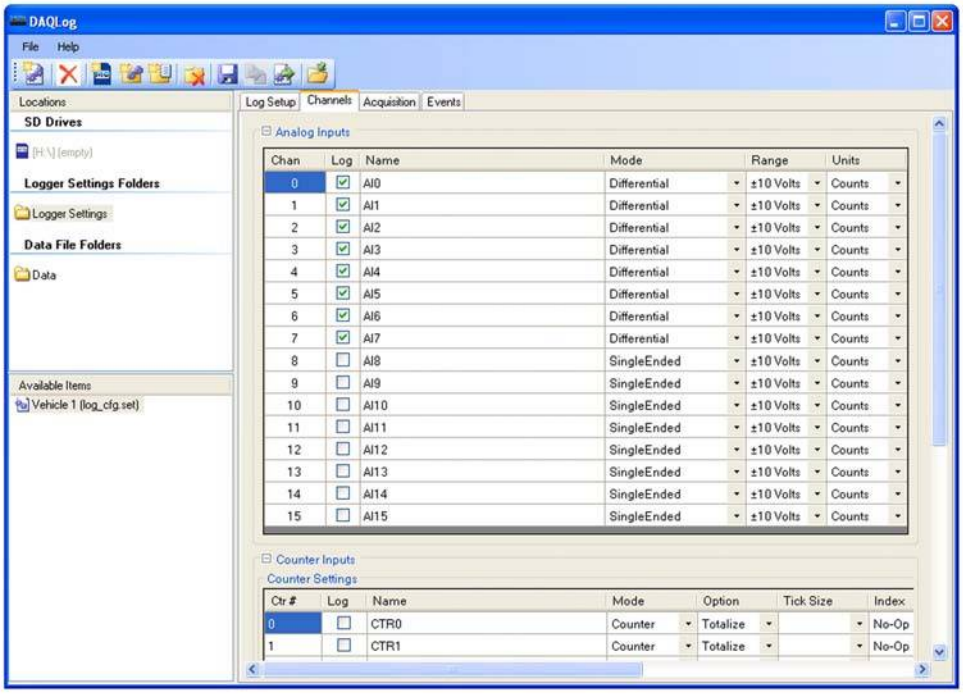
Digital I/O

16 digital inputs are included with each data logger. These inputs can be sampled synchronously with analog input data. The LGR-5325 and LGR-5327 feature up to 28 V digital inputs while the LGR-5329 features up to 30 V digital inputs. The digital inputs on the LGR-5329 also provide 500 VDC isolation.

Each data logger also features one digital output relay channel. The Form C relay can be programmed via the included DAQLog software to alarm when desired conditions are met.

Counters

Four counter inputs are built into the LGR-5320 Series. The LGR-5325 features conventional up/down counters. The LGR-5327 and LGR-5329 include quadrature and conventional counter inputs. Multiple count modes are also supported.



Included DAQLog software for configuration, channel setup, logging parameters, and data retrieval

Push Button Logging Controls

Onboard one touch logging controls are featured on each module for quick and simple operation. These controls can be used for a variety of functions including:

- Configuration loading from SD memory card
- Start/stop logging
- Force trigger/user event
- Device reset
- Control of status LEDs

LEDs on each module provide instant logging and trigger status and activity state.

DAQLog Software

DAQLog Software is an easy to use application included with each LGR-5320 Series data logger. DAQLog uses a spreadsheet style interface that allows simple setup of channel and logging parameters.

DAQLog includes the following functions:

- Data logger configuration
- Channel setup
- Trigger setup
- Data conversion
- Scan rate and acquisition length
- Trigger, event, and alarm parameters

Data can be saved in .csv format for easy import into Excel®.

LGR-5320 Series

General Information

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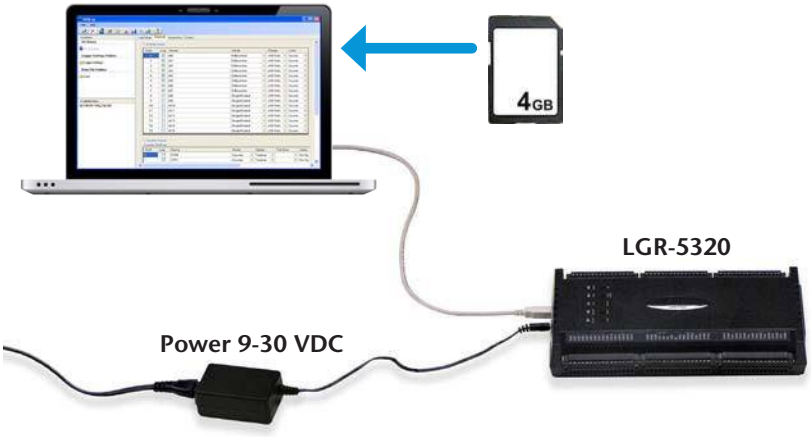
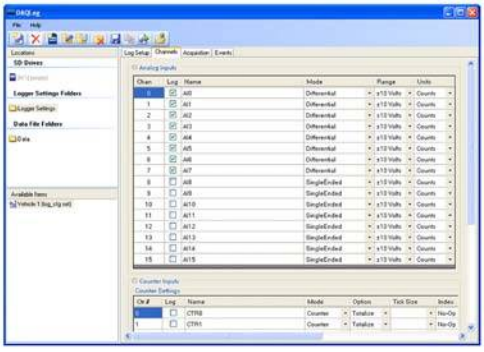
Configuration, Data Logging, and Retrieval

Configuration via USB or SD Memory Card





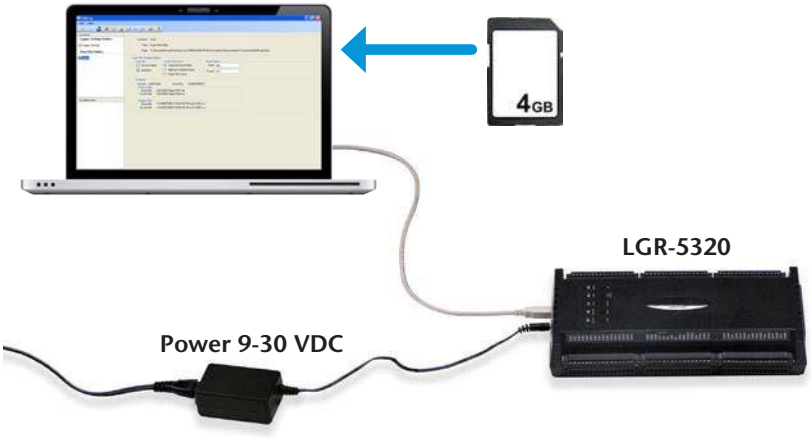
Logging parameters are configured via DAQLog software. The LGR-5320 Series data logger can be setup via USB or by inserting the SD memory card into a PC.

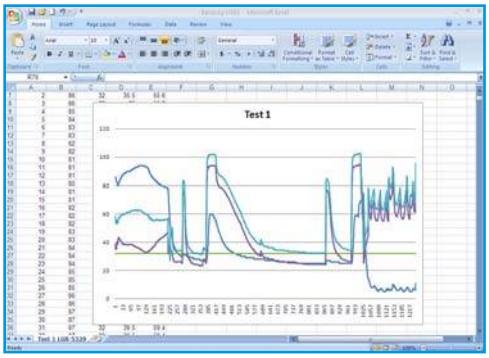
Data rate, scan length, channel parameters, triggers, and alarms are all quickly and easily configured using spreadsheet style setup pages in DAQLog.

Data Logging

The LGR-5320 Series will log data when pre-defined trigger conditions are met. You can also start/stop logging and set trigger, alarm, and event conditions with the push-button controls located on top of the module.

Data Retrieval and Analysis





Retrieval of data can be done by connecting the logger to a PC via USB or by removing the SD memory card and inserting it into a PC.

Once data is uploaded to a PC, the .csv file can be opened in programs such as Excel.

LGR-5320 Series
Specifications

All specifications are subject to change without notice.
Typical for 25°C unless otherwise specified.

Analog input

A/D Converter: 16-bit successive approximation type
Input Ranges: Software selectable per channel;
5325: ±10 V, ±5 V, ±1 V
5327, 5329: ±30 V, ±10 V, ±5 V, ±1 V
Number of Channels: 8 differential/16 single-ended, software configurable
Input Configuration: Multiplexed
Absolute Max Input Voltage
5325: CH_x to AGND, ±25 V max (power ON/OFF)
5327, 5329: CH_x to AGND, ±38 V max (power ON/OFF)
Input Impedance
5325: ±10 V, ±5 V, ±1 V range, 10 GΩ (power ON), 1 kΩ (power OFF)
5327, 5329: ±30 V range, 1 MΩ (power ON), 1 GΩ (power OFF);
±10 V, ±5 V, ±1 V range, 10 GΩ (power ON), 1 GΩ (power OFF)
Input Leakage Current: ±100 pA
Input Capacitance: ±30 V range, 90 pf; ±10 V, ±5 V, ±1 V range, 55 pf
Max Working Voltage (signal+ common mode): ±30 V range, ±30.05 V;
±10 V, ±5 V, ±1 V range, ±10.2 V
Common Mode Rejection Ratio: fin = 60 Hz, ±30 V range, 65 dB min;
fin = 60 Hz, all other ranges, 75 dB min
Crosstalk: DC to 25 kHz, adjacent differential mode channels, -80 dB
ADC Resolution: 16 bits
Input Bandwidth (-3 dB): All input ranges, 450 kHz min
Input Coupling: DC
Max Sample Rate
5325: 100 kHz
5327, 5329: 200 kHz
A/D Pacing Sources: See input sequencer section
Warm Up Time: 30 minutes, min
Absolute Accuracy: All ranges, 0.07% FSR
Noise: Differential mode, 2 LSB rms

Analog Input Calibration

Calibration Method: Factory calibration
Calibration Interval: 1 year

Triggering

Mode
External Digital via DTRIG (pin 76): Software configurable for rising or falling edge
External Analog via ATRIG (pin 78): See external analog trigger
5327, 5329:
Multi-Channel Analog: Level-sensitive based on acquired data. Up to 16 channels may be used as independent trigger sources.
Digital Pattern Trigger: Trigger when a user-defined 1 to 16 bit digital pattern is matched on the DIN0-DIN15 pins. Programmable mask bits.
External Digital Trigger Latency
Non-Pretrigger Acquisition: 100 ns typical, 1 µs max
Pretrigger Acquisition: 1 scan period max
External Trigger Pulse Width: 1 µs min
Internal Trigger Latency: 2* (1/per-channel sample rate)

External Analog Trigger

External Analog Trigger Source: ATRIG input (pin 78)
Analog Trigger Input Ranges
5325: ±10 V
5327, 5329: ±30 V, ±10 V, software selectable
Absolute Maximum Input Voltage
5325: ATRIG_IN to AGND, ±25 V max (power ON/OFF)
5327, 5329: ATRIG_IN to AGND, ±38 V max (power ON/OFF)
Input Impedance
5325: ±10 V range, 10 GΩ (power ON), 1 kΩ (power OFF)
5327, 5329: ±30 V range, 1 MΩ (power ON), 1 GΩ (power OFF);
±10 V range, 10 GΩ (power ON), 1 GΩ (power OFF)
Trigger Modes: Configurable for positive or negative slope, level
Trigger/Hysteresis Resolution: 12 bits, 1 in 4096
Trigger/Hysteresis Levels: ±10 V/4096 or ±30 V/4096, software selectable
Trigger/Hysteresis Accuracy: ±2% of reading, ±50 mV offset
Latency: 1.5 µS
Full Power Bandwidth (-3 dB): 1 MHz

Digital Input

Number of Inputs: 16 channels
5325
Input Type: TTL
Input Voltage Range: 0 to +28 V
Input Characteristics: 47 kΩ pull-down resistor, 39.2 kΩ series resistor
Max Input Voltage Level: 0 to +32 V (power ON/OFF)
Min High Level Input Voltage Threshold: 2.0 V max
Max Low Level Input Voltage Threshold: 0.8 V min
5327
Input Type: TTL
Input Voltage Range: 0 to +28 V
Input Characteristics: 47 kΩ pull-down resistor, 39.2 kΩ series resistor
Max Input Voltage Level: 0 to +32 V (power ON/OFF)
Min High Level Input Voltage Threshold: 2.0 V max
Max Low Level Input Voltage Threshold: 0.8 V min
Event Logging: Change of state, pattern recognition; event time stamped using real time clock
5329
Input Type: Industrial
Input Voltage Range: 0 to +30 V
Input Characteristics: Resistor divider 39.2 kΩ series resistor and 10 kΩ shunt resistor connected to IGND
Max Input Voltage Level: +36 V (power ON/OFF)
Min High Level Input Voltage Threshold: 10.04 V max
Max Low Level Input Voltage Threshold: 3.85 V min
Event Logging: Change of state, pattern recognition; event time stamped using real time clock
Isolation: 500 VDC min

Digital Output

Number of Outputs: 1
Type: Mechanical relay, NEC ED2/EF2 series
Relay Configuration: 1 Form C
Relay Contact Resistance: 0.075 Ω
Relay Contact Operate Time: 3 mS (excluding bounce)
Relay Contact Release Time: 2 ms (excluding bounce)
Relay Insulation Resistance: 1000 MΩ at 500 VDC
Relay Contact Ratings
Max Switching Voltage: 220 VDC/250 VAC
Max Switching Current: 1.0 A
Max Carrying Current: 2.0 A

LGR-5320 Series

Specifications and Ordering Information

Counters

5325

Counter Type: Conventional
Number of Channels: 4
Inputs: Counter, Up/Down, Gate
Resolution: Fixed 32-bit or as sized by the modulo register
Count Modes: Up/down, period/frequency, Modulo n
De-Bounce Times (programmable): 16 steps from 500 ns to 25 ms; positive or negative edge sensitive; glitch detect mode or de-bounce mode
Time-Base Accuracy: 50 ppm
Input Voltage Range: 0 to 5.5 V
Input Type: TTL
Input Characteristics: 49.9K pull-down resistor
Max Input Voltage Range: -0.5 V to +7.0 V
Input High Voltage: 2.0 V
Input Low Voltage: 0.8 V

5327, 5329

Counter Type: Quadrature and conventional (x1, x2, x4)
Number of Channels: 4
Inputs: Phase A+/A-, Phase B+/B-, Index ±
Resolution: Fixed 32-bit or as sized by the modulo register
Count Modes: Quadrature, up/down, period/frequency, Modulo n
De-Bounce Times (programmable): 16 steps from 500 ns to 25 ms; positive or negative edge sensitive; glitch detect mode or de-bounce mode
Time-Base Accuracy: 50 ppm
Receiver Type: Quad differential receiver
Configuration: Each channel consists of Phase A input, Phase B input and Index input; each input switch selectable as single-ended or differential
Differential: Phase A, Phase B and Index (+) inputs at user connector routed to (+) inputs of differential receiver. Phase A, Phase B and Index (-) inputs at user connector routed to (-) inputs of differential receiver.
Single-Ended: Phase A, Phase B and Index (+) inputs at user connector routed to (+) inputs of differential receiver. Phase A, Phase B and Index (-) inputs at user connector routed to ground. (-) Inputs of differential receiver routed to +3 V reference.
Common Mode Input Voltage Range: ±12 V max
Differential Input Voltage Range: ±12 V max
Input Sensitivity: ±200 mV
Input Hysteresis: 50 mV typ
Input Impedance: 12 kΩ min
Absolute Maximum Input Voltage: Differential, ±14 V max

Power

External Power Supply: +9 V min, +30 V max

Environmental

Operating Temperature Range: 0 to 55 °C
Storage Temperature Range: -40 to 85 °C
Humidity: 0 to 90% non-condensing

Mechanical

Dimensions: 9.5″ L x 5.0″ W x 1.75″ H

Shock and Vibration Specifications

Mechanical Shock

Operating: 50 g, 3 msec half sine; 30 g, 11 msec half sine; 3 hits per face for a total of 18 hits (18 hits at 50 g, 18 hits at 30 g)
Standard: IEC 60068-2-27

Random Vibration

Frequency Hz: 10-500
Vibration Level: 5 g_{rms}
Test Time: 100 minutes/axis
Standard: IEC 60068-2-64

Ordering Information

Description	Part No.
Stand-alone, high-speed 100 kS/s, multifunction data logger; includes a 4 GB SD memory card, USB cable, and external power supply	LGR-5325
Stand-alone, high-speed 200 kS/s, multifunction data logger; includes a 4 GB SD memory card, USB cable, and external power supply	LGR-5327
Stand-alone, high-speed 200 kS/s, multifunction data logger with isolated digital inputs; includes a 4 GB SD memory card, USB cable, and external power supply	LGR-5329

Accessories

DIN-rail kit	ACC-202
DST kit with 6 detachable screw terminals	ACC-216
Replacement external power supply	TR-70U