



ANALOG REMOTE CONTROL

The LD series incorporates analog remote control for all modes of operation. When “external voltage” is selected the level becomes linearly proportional to the voltage applied to the remote control inputs on the rear panel.

A waveform can be used as the control voltage allowing complex load conditions to be simulated using, for example, an arbitrary waveform generator, such as the Aim-TTi TGF3000 series or a true arbitrary generator from the TGA series.

Alternatively, a logic signal can be used to switch between levels. When “external TTL” is selected, the level is switched between the two defined levels in response to an external logic signal.

LABVIEW & IVI DRIVER

An IVI driver for Windows is included with all P models in the LD series. This provides support for common high-level applications such as LabView*, LabWindows*, and KeysightVEE*.

COMPREHENSIVE BUS REMOTE CONTROL

To meet a wider variety of needs, the P models in the LD series add a comprehensive array of digital bus interfaces. USB, RS-232, GPIB and LAN with LXI support are all provided as standard.

Each of the digital bus interfaces provides full control and read-back of settings and status. The interfaces are at ground potential and are opto-isolated from the terminals.



A standard RS-232/RS-423 interface is provided for use with legacy systems with a baud rate of 9600. The serial interface remains in common usage and is perfectly satisfactory for the control of load devices.



The GPIB interface is compliant with IEEE-488.1 and IEEE-488.2. GPIB remains a widely used interface for system applications. The interface subsets provided are: SH1, AH1, T6, L4, SR1, RL2, PP1, DC1, DT0, C0, E2.



USB provides a simple and convenient means of connection to a PC and is particularly appropriate for small system use. A standard USB 2.0 driver is provided which operates as a virtual COM port and supports Windows 2000 and above including Win 8 and 10.



The LAN interface uses a standard 10/100 base-T Ethernet hardware connection with ICMP and TCP/IP Protocol for connection to a Local Area Network or direct connection to a single PC. This interface supports 1.4 LXI core 2011 and is highly appropriate for system use because of its scalable nature and low cost interconnection.



The LAN interface is LXI compliant. LXI (LAN eXtensions for Instrumentation) is the next-generation, LAN-based modular architecture standard for automated test systems managed by the LXI Consortium, and is expected to become the successor to GPIB in many systems. For more information on LXI go to: www.aimtti.com/go/lxi

MODEL		LD400 & LD400P	LDH400P
MAXIMUM INPUT RATINGS			
Current	Rear panel	80A	16A
	Front panel	30A	
Voltage:		80V	500V
(Max while conducting current)			
Power:	Continuous	400W up to 28°C. 360W at 40°C	400W up to 28°C. 360W at 40°C
	Short term	(1) 600W up to 28°C	
Minimum Operating Voltage:		<2V at 80A	10V
Minimum Effective Resistance:		25mΩ	1Ω
Off State Leakage:		<10mA	<5mA
(Including voltage sense circuit input resistance)			
Reverse Polarity:		80A	16A
(Diode will conduct)			
Isolation Voltage:		±300Vdc	CAT II (300V)
(Either load input to chassis ground)			
Input Terminals: (Safety terminals)	Rear panel input	5mm diameter wire or 8mm spades 80A 4mm plugs at 30A	4mm plugs at 16A
	Front panel input	4mm diameter wire, 6.5mm spades or 4mm plugs at 30A	
EXTERNAL VOLTAGE SENSE (LD400 & LD400P ONLY)			
Connection:		Terminal block on rear panel. Sense selection by slide switch.	
Input Impedance:		680kΩ each input to load negative	
Max. Sense Offset:		6V (allowance for backing-off supply for zero volt operation)	
OPERATING MODES			
CC MODE			
Range:	Low	0-8A	0-16A
	High	0-80A	
Accuracy:		± 0.2% ± 30mA	± 0.2% ± 30mA
Resolution:	Low	1mA	1mA
	High	10mA	
Regulation:		< 30 mA for 90% load power change (Volts > 2V)	< 30 mA for 90% load power change (Volts > 25V)
Temperature Coefficient:		< (±0.02% ± 5 mA) per °C	< (±0.02% ± 5 mA) per °C
(2) Slew Rate Range:	Low	<2.5A per s to >250A per ms	<5A per s to >500A per ms
	High	<25A per s to >2500A per ms	
Minimum Transition Time:		(3) 50µs	(4) 50µs
CP MODE			
Range:		0-400W (or 600W)	0-400W
Accuracy:		± 0.5% ± 2V ± 30 mA	± 0.5% ± 2V ± 30 mA (Volts > 25V)
Resolution:		100mW	100mW
Regulation:		< 2% over 5V to 75V source voltage change (using remote sense)	< 2% over 25V to 550V source voltage change
Temperature Coefficient:		< (± 0.1% ± 5 mA) per °C	< (± 0.1% ± 5 mA) per °C

MODEL		LD400 & LD400P	LDH400P
OPERATING MODES			
CP MODE CONT.			
(2) Slew Rate Range:		< 40W per s to > 6000W per ms	60W per s to 6000W per ms
Minimum Transition Time:		(3) 150µs	(4) 150µs
CR MODE			
Range:	Low	0.04-10Ω	50Ω-10kΩ
	High	2-400Ω	
Accuracy:		±0.5% ± 2 digits ± 30 mA	±0.5% ± 2 digits ± 30 mA (Volts > 25V)
Resolution:	Low	0.01Ω	1Ω
	High	0.1Ω	
Regulation:		< 2% for 90% load power change (Volts > 2V using remote sense)	< 2% for 90% load power change (Volts > 25V)
Temperature Coefficient:		< (±0.04% ± 5 mA) per °C	< (±0.04% ± 5 mA) per °C
(2) Slew Rate Range:	Low	< 1Ω per s to 100Ω per ms	1Ω per ms to 100Ω per µs
	High	< 40Ω per s to 4000Ω per ms	
Minimum Transition Time:		(3) 150 µs	(4) 150 µs
CG MODE			
Range:	Low	< 0.01-1A/V	0.001-1 A/V
	High	< 0.2-40A/V	
Accuracy:		± 0.5% ± 2 digits ± 30 mA	± 0.5% ± 2 digits ± 30 mA (Volts > 25V)
Resolution:	Low	1mA/V	1 mA/V
	High	0.01A/V	
Regulation:		< 2% for 90% load power change (Volts > 2V using remote sense)	< 2% for 90% load power change (Volts > 25V)
Temperature Coefficient:		< (±0.04% ± 5mA) per °C	< (±0.04% ± 5mA) per °C
(2) Slew Rate Range:	Low	<0.1A/V per s to >10A/V per ms	<0.1A/V per s to >10A/V per ms
	High	<4A/V per s to >400A/V per ms	
Minimum Transition Time:		(3) 150µs	(4) 150µs
CV MODE			
Range:	Low	Vmin-8V	N/A
	High	Vmin-80V	
(V min depends on current, typically <2V at 80A)			
Accuracy:		± 0.2% ± 2 digits	
Resolution:	Low	1mV	
	High	10mV	
Regulation:		< 30mV for 90% load power change (using remote sense)	
Temperature Coefficient:		<(0.02% + 1mV) per °C	
(2) Slew Rate Range:	Low	0.8V per s to >80V per ms	
	High	<8V per s to >800V per ms	
Minimum Transition Time:		(3) 150µs	

MODEL	LD400 & LD400P	LDH400P
TRANSIENT CONTROL		
TRANSIENT GENERATOR		
Pulse Repetition Rate:	Adjustable from 0.01Hz (100 seconds) to 10kHz	
Pulse Duty Cycle:	1% to 99% (percentage of period at Level A)	
Setting Accuracy:	±1 %	
Slew Rate Control:	The slew rate control applies to all changes of level whether caused by manual selection, remote control or the transient generator. The level change is a linear slew between the two level settings. The range available in each mode is shown previously.	
Setting Accuracy:	± 10% (on linear part of slope, excluding high frequency aberrations)	
Variation in Level Settings:	± 5 digits of specified setting resolution for present mode and range.	
OSCILLATOR SYNC OUTPUT		
Connection:	Terminal block on rear panel. Opto-isolated open collector output conducts during Level B phase of internal transient generator.	Terminal block on rear panel. Lo terminal output grounded to chassis internally. TTL/CMOS (5V) output. Conducts during Level B phase of internal transient generator.
Ratings:	Max offstate voltage: 30V. Collector current: 2mA (typical).	TTL/CMOS
DROPOUT VOLTAGE		
	The load will cease to conduct if the applied voltage falls below the Dropout Voltage setting; active in all modes. The Dropout Voltage setting is also the threshold for the Slow Start facility and acts as an offset voltage in Constant Resistance mode.	
Setting Accuracy:	± 2% ± 20mV	± 2% ± 200mV
Slow Start:	If Slow Start is enabled, the load will not conduct any current until the source voltage reaches the Dropout Voltage setting; it will then ramp the controlled variable up (in CC, CP and CG modes) or down (in CR and CV* modes) to the Level setting at a rate determined by the Slew Rate setting.	
*LD400 & LD400P models only		
METER SPECIFICATIONS		
Display Type:	256 x112 pixel graphic LCD with white LED backlight.	
MEASURED VALUES		
Volts & Amps:	Measured values of current through and voltage across the load.	
Watt & Ohms:	Power and equivalent load resistance, calculated from Volts and Amps.	
Voltage Accuracy:	± 0.1% ± 2 digits	± 0.1% ± 0.02%FS
Current Accuracy:	± 0.2% ± 3 digits	± 0.2% ± 0.04%FS
CURRENT MONITOR OUTPUT		
Output Terminals:	4mm safety sockets on front panel or terminal block on rear panel.	BNC (chassis grounded) on front panel or terminal block on rear panel.
Output Impedance:	600Ω nominal, for >1MΩ load (e.g. oscilloscope)	
Scaling:	50mV per Amp (4V full scale)	250mV per Amp (4V full scale).
Accuracy:	± 0.5% ± 5mV	
CURRENT MONITOR OUTPUT		
Common Mode Range:	± 3V dc max (5)	Chassis ground referenced
Bandwidth Limit (-3dB):	-	40kHz

MODEL	LD400 & LD400P	LDH400P
PROTECTION		
Excess Power:	The unit will attempt to limit the power to approx 430W; if this fails the unit will trip into the fault state at about 460 Watts. If intermittent mode operation is enabled, these levels are 610W and 630W.	The unit will attempt to limit the power to approx 430W; if this fails the unit will trip into the fault state at about 460W.
Protection Current:	The input is disabled if the measured current exceeds a user set limit.	
Excess Current:	The unit will trip into the fault state at nominally 92A.	The unit will trip into the fault state at nominally 20A. The unit is protected by fuses that protect the unit against currents that exceed 20A. This is primarily as a protection against high power sources with a current capability of >20A being connected to the load with reverse polarity.
Protection Voltage:	The input is disabled if the measured voltage exceeds a user set limit.	
Excess Voltage:	The unit will conduct a current pulse (to absorb inductively generated spikes) for 1ms at about 90V. The unit will trip into the fault state at nominally 106V. Surge suppressors will start to conduct above 120V.	The unit will conduct a current pulse (to absorb inductively generated spikes) for 1ms at about 510V. The unit will trip into the fault state at nominally 530V. Surge suppressors will start to conduct at typically 800V ± 20%.
Temperature:	The unit will trip into the fault state if the heatsink temperature exceeds safe levels.	
Reverse Polarity:	N/A	The unit will trip into the fault state if a reverse current is drawn that exceeds 200mA. The unit is protected by fuses that protect the unit against currents that exceed 20A.
REMOTE CONTROL (P MODELS ONLY)		
EXTERNAL CONTROL INPUT CHARACTERISTICS		
Connection:	Terminal block on rear panel.	Terminal block on rear panel. Lo terminal input grounded to chassis internally.
Input Impedance:	400kΩ each input to load negative.	10kΩ. Input protected against excess input voltages up to 50V.
Common Mode Range:	± 100V to load negative.	Chassis ground referenced
EXTERNAL ANALOG VOLTAGE CONTROL		
Operating Mode:	The applied voltage sets the operating level within the range.	
Scaling:	4 Volts full scale.	4 Volts full scale (250mV per Amp).
Accuracy:	± 2% ± accuracy of range.	
Common Mode Rejection:	Better than -66dB	Better than -76dB