

APPENDIX A. SPECIFICATIONS

Accuracy is expressed as \pm (% of reading + number of counts) at 18–28 °C unless otherwise specified. One count is equal to 0.0005 % of full scale.

A.1 DC VOLTAGE

A.1.1 DC Voltage Accuracy

Range	Resolution	Input Impedance	Accuracy		
			24 Hours (22–24°C)	90 Days (18–28°C)	1 Year (18–28°C)
20 mV*	0.1 μ V	> 10 G Ω	0.0040%+20	0.0060%+30	0.0080%+30
200 mV	1 μ V	> 10 G Ω	0.0025%+2	0.0040%+3	0.0060%+3
2V	10 μ V	> 10 G Ω	0.0015%+2	0.0025%+2	0.0030%+2
20V	0.1 mV	10 M Ω	0.0015%+2	0.0025%+2	0.0035%+2
200V	1 mV	10 M Ω	0.0015%+2	0.0025%+2	0.0035%+2
450V	10 mV	10 M Ω	0.0020%+2	0.0030%+2	0.0045%+2

* Not within scope of AUTO range.

A.1.2 Common Mode Rejection Ratio

Greater than 140 dB at dc, 50, or 60 Hz
(1 k Ω source imbalance).

A.1.3 Normal Mode Rejection Ratio

Greater than 60 dB at 50 or 60 Hz,
peak ac input less than 1/10 full scale,
dc + peak ac less than full scale.

A.1.4 Temperature Coefficient

$\pm(0.0005\% + 0.3 \text{ counts} + 0.2\mu\text{V})/^{\circ}\text{C}$ (0–18°C, 28–50 °C).

A.2 AC VOLTAGE**A.2.1 AC Voltage Accuracy**

Frequency	Accuracy *		
	200 mV Range	2V, 20V, 200V Ranges	450V Range
20–50 Hz	1.10 % + 150	1.10 % + 200	1.10 % + 100
50–100 Hz	0.40 % + 150	0.35 % + 100	0.35 % + 50
100 Hz–10 kHz	0.30 % + 300	0.25 % + 100	0.25 % + 50
10–20 kHz	1.00 % + 700	0.35 % + 500	0.35 % + 200
20–30 kHz	—	1.00 % + 700	1.00 % + 500
Resolution	1 μ V	10 μ V, 0.1mV, 1mV	10mV

* With sine wave input, greater than 10% of full scale.

A.2.2 Input Impedance

1 M Ω shunted by less than 60 pF.

A.2.3 Maximum Crest Factor

Maximum crest factor is 5.

A.2.4 Common Mode Rejection Ratio

Greater than 140 dB at dc, greater than 80 dB at 50 or 60 Hz (1 k Ω source imbalance).

A.3 RESISTANCE

A.3.1 Resistance Accuracy

Resistance accuracy is read with a 4-terminal connection. The 4-terminal connection can compensate for a resistance equal to 1% of the full scale range in each lead. For a 2-terminal connection, add a maximum offset of 100 mΩ.

Range	Resolution	Excitation Current	Accuracy		
			24 Hours (22–24°C)	90 Days (18–28°C)	1 Year (18–28°C)
200Ω	1 mΩ	1 mA	0.003%+3	0.006%+3	0.008%+4
2 kΩ	10 mΩ	1 mA	0.003%+2	0.005%+3	0.007%+3
20 kΩ	0.1Ω	10 μA	0.002%+2	0.005%+2	0.007%+3
200 kΩ	1Ω	10 μA	0.002%+2	0.005%+2	0.008%+3
2 MΩ	10Ω	1 μA	0.012%+3	0.025%+3	0.027%+3
20 MΩ*	100Ω	0.1 μA	0.035%+3	0.055%+4	0.065%+4

* Two-terminal only.

A.3.2 Temperature Coefficient

Range	Temperature Coefficient (% of Reading + # Counts)/°C
200Ω	0.0010 + 0.3
2kΩ – 200kΩ	0.0008 + 0.3
2MΩ	0.0020 + 0.3
20MΩ	0.0150 + 0.3

A.4 CURRENT

A.4.1 DC Current

A 0.1 Ω shunt is used on all ranges.

Range	Resolution	Accuracy
200 mA	1 μ A	0.05% + 50
2A, \leq 1A	10 μ A	0.05% + 5
> 1A	10 μ A	0.1% + 5

A.4.2 AC Current

A 0.1 Ω shunt is used on all ranges.

Frequency	Accuracy	
	200mA Range	2A Range
20 – 50Hz	0.7 + 250	0.7 + 200
50 – 1kHz	0.65 + 150	0.6 + 150
1 – 5kHz	0.50 + 100	0.5 + 150
Resolution	1 μ A	10 μ A

Accuracy from 5 kHz to 20 kHz is typically
 \pm (0.80 % + 300 counts) for the 200 mA range and
 \pm (0.70 % + 300 counts) for the 2 A range.

Maximum crest factor is 5.

A.5 FREQUENCY

A.5.1 Frequency Gate Timing

Range	Resolution	Gate
200 kHz	1 Hz	1 second
2 MHz	10 Hz	100 ms
20 MHz	100 Hz	100 ms
25 MHz	1000 Hz	100 ms

A.5.2 Accuracy

$\pm (0.005\% \text{ rdg.} + 2 \text{ counts})$, all ranges (18–28°C).

A.5.3 Input Impedance

1 M Ω in parallel with 30 pF.

A.5.4 Sensitivity

200 mV

A.6 TEMPERATURE

A.6.1 Temperature Accuracy

Range	Resolution	Accuracy*
–200°C to +250°C	0.1°C	$\pm 0.3^\circ\text{C}$
–328°F to +482°F	0.1°F	$\pm 0.5^\circ\text{F}$

* Does not include RTD probe accuracy.

Temperature measurement is made with a 4-wire RTD. The DP 100 provides direct connection for a PT-100 type device. Temperature conversion uses the DIN 43760 curve ($\alpha = 0.00385$).

A.6.2 Short Circuit Current

1 mA

A.7 ENVIRONMENTAL**A.7.1 Operating Temperature**

0 to 50°C (32°F to 122°F)

A.7.2 Storage Temperature

-25°C to 70°C (-13°F to 158°F)

A.7.3 Humidity

Operates to 93% R. H., 0 to 40°C (non-condensing).

A.7.4 Vibration

1.6g, 10–150 Hz per IEC 68-2.

A.7.5 Shock

Half-sine, 10g, per IEC 68-2.

A.7.6 Altitude

Operates to 15,000 feet.

A.8 GENERAL**A.8.1 Size**

3 in (76 mm) x 8.5 in (216 mm) x 10 in (254 mm).

A.8.2 Weight

3.5 lb (1.6 kg).

A.8.3 AC Power

88 to 132V or 176 to 264V (configured internally),
47 to 63 Hz, 4 watts max.

A.8.4 Battery Power

Internal Nickel Cadmium battery module, 10 hour minimum operating time; recharge in 12 to 16 hours.

A.8.5 Warmup Time

15 minutes (nominal) to rated specifications.

A.8.6 Front Panel Connections

HI, LO, HI Sense, LO Sense, Current Input.

A.8.7 Maximum Input Voltage

HI to LO: 450V dc or ac rms, any function or range, except current. Any terminal to ground: 500V dc or ac rms.

A.8.8 Maximum Input, Current Ranges

2 Amperes ac rms or dc (front panel fuse).

A.8.9 Selectable Functions

AC/DC voltage and current.

Resistance (2-terminal and 4-terminal).

Frequency.

Temperature (4-terminal).

AUTO/manual ranging.

PRINT, FILTER, BAUD (serial data rate), and CAL (calibration) auxiliary functions.

A.8.10 Display

Liquid Crystal Display (LCD) with a 0.5 inch (13 mm) character height.

A.8.11 Annunciators

Measurement functions: AC, DC, V, I, R, 4T, F, and T.

Units of measure: M, k, m, V, A, Ω , Hz, °C, and °F.

Low battery: 

Uncalibrated: UNCAL.

Remote operation: REM.

Auto-ranging mode: AUTO.

Auxiliary function carets: ▼.

A.8.12 Reading Rate

3 readings per second.

A.8.13 Interface

RS-232 serial interface for direct connection to serial printer, CRT terminal, or remote computer. Connector is a 9-pin, sub-miniature D connector. 500V isolation from input signals.

A.8.14 Electromagnetic Immunity

IEC 801, CISPR 11, VDE 0871 Class B.

A.8.15 Standards

IEC Document 66E (Draft) Installation Category II, Pollution Degree I, ANSI/ISA-S82.01, VDE 0411/100 and CSA Bulletin 556B.

Specifications effective March, 1990.

Subject to change without notice.

APPENDIX B. ACCESSORIES

To order accessories from the list below, contact Analogic Corporation, Peabody, MA or your nearest Analogic sales office or representative (see Appendix D, ANALOGIC SALES AND SERVICE OFFICES).

In the continental U.S.A.:

Telephone (outside Mass.)	1-800-343-8333
Telephone (inside Mass.)	(508) 977-3000, X3871 or X3879
Telex	681-7180
FAX	(508) 532-6097, or
Order Entry Sales	(508) 531-1266

International:

Analogic GmbH	Telephone 49-6122-70060
Analogic Ltd	Telephone 44-3-44-860111

Accessory	Model Number
DP-Link Control Software:	
For IBM PC/AT and Compatibles	3 1/2" disk PC-M3
	5 1/4" disk PC-M5
	Cable PC-MC
For Apple Macintosh	3 1/2" disk PC-A3
	Cable PC-AC
Test Lead Adapter Kit	T-1
BNC/Banana Adapter	T-BA
10X Probe (frequency measurement only)	FX-10
1X Probe (all measurements)	FX-1
Air Temperature Probe	TPA
Surface Temperature Probe	TPS
General Purpose Temperature Probe	TPL

Accessory	Model Number
AC/DC Clamp-on Current Probe	CG-100
20A Current Shunt	CS-20
Carrying Case	CC-S
Replacement Battery Pack	100-BP
DC Voltage Calibrator	8200
IEEE 488-to-RS232 Interface Adapter	48-100
User's Manual	82-5045
Service Manual	82-5053
DP-Link User's Guide:	
For IBM PC/AT and Compatibles	82-5049
For Apple Macintosh	82-5051

APPENDIX C. ASCII CODES

ASCII Char	Decimal	ASCII Char	Decimal	ASCII Char	Decimal
NUL	0	RS	30	<	60
SQH	1	US	31	=	61
STX	2	SPACE	32	>	62
ETX	3	!	33	?	63
EOT	4	"	34	@	64
ENQ	5	#	35	A	65
ACK	6	\$	36	B	66
BELL	7	%	37	C	67
BS	8	&	38	D	68
HT	9	'	39	E	69
LF	10	(40	F	70
VT	11)	41	G	71
FF	12	*	42	H	72
CR	13	+	43	I	73
SO	14	,	44	J	74
SI	15	-	45	K	75
DLE	16	.	46	L	76
DC1	17	/	47	M	77
DC2	18	0	48	N	78
DC3	19	1	49	O	79
DC4	20	2	50	P	80
NAK	21	3	51	Q	81
SYN	22	4	52	R	82
ETB	23	5	53	S	83
CAN	24	6	54	T	84
EM	25	7	55	U	85
SUB	26	8	56	V	86
ESC	27	9	57	W	87
FS	28	:	58	X	88
GS	29	;	59	Y	89

ASCII Char	Decimal	ASCII Char	Decimal
Z	90	n	110
[91	o	111
\	92	p	112
]	93	q	113
^	94	r	114
_	95	s	115
`	96	t	116
a	97	u	117
b	98	v	118
c	99	w	119
d	100	x	120
e	101	y	121
f	102	z	122
g	103	{	123
h	104		124
i	105	}	125
j	106	~	126
k	107	RUBOUT	127
l	108		
m	109		

APPENDIX D. ANALOGIC SALES AND SERVICE OFFICES

FACTORY

Analogic Corporation

8 Centennial Drive
Peabody, MA 01960

Telephone: (508) 977-3000, or
1-800-343-8333

Telex: 681-7180

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(508) 531-1266

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