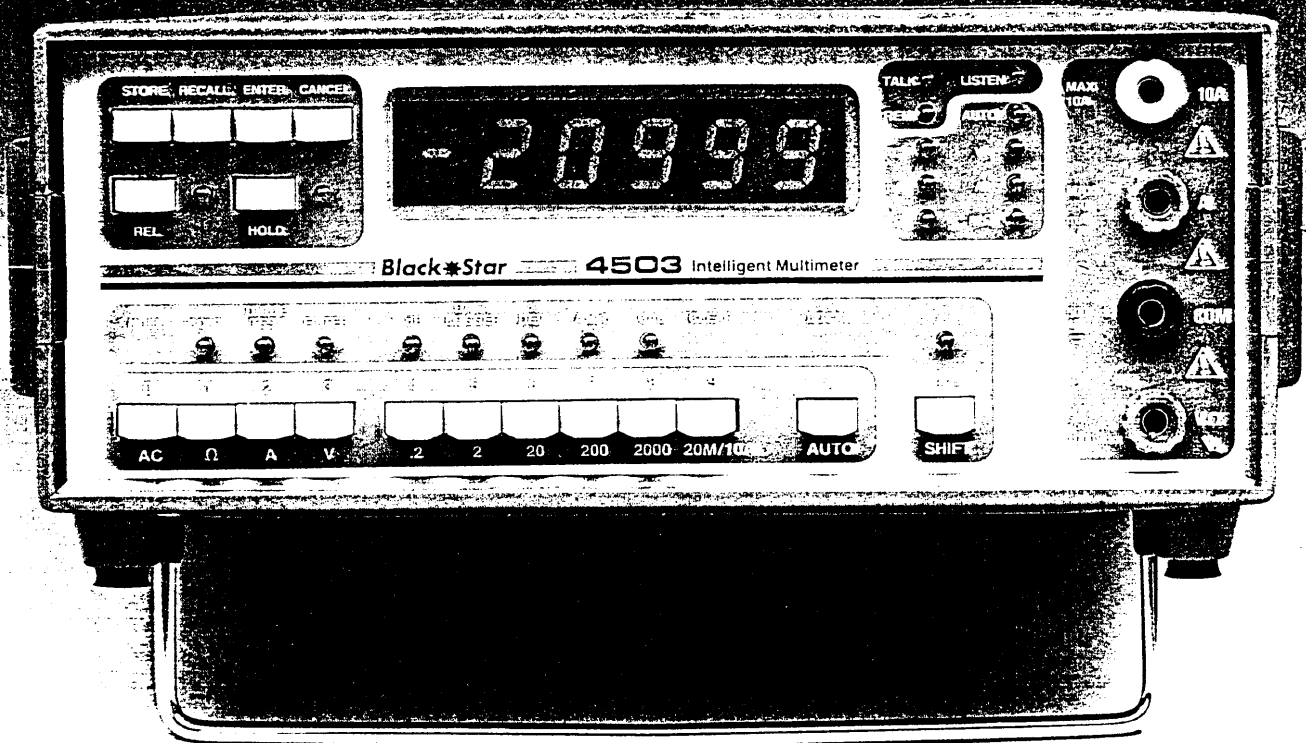


4503 intelligent multimeter

Full 'Talk and Listen' via built-in
IEEE488 and RS232
Interfaces



380-448

- Autoranging
- 0.03% basic accuracy
- True RMS
- Auto calibration
- Reading 3/sec
- 4½ digit LED

- 1000V DC, 750V AC
- 10A AC & DC
- 20MΩ Resistance
- Null, Hold, Continuity, Filter, Diode Test, dB, Data Logger, % Deviation, Ax+b, Rel

Black★Star



Designed and manufactured in Britain

4503 INTELLIGENT MULTIMETER

DC VOLTAGE

Range	Resolution	Accuracy
2V	100 μ V	$\pm 0.03\%$ rdg $\pm 0.01\%$ fs
2V	100 μ V	$\pm 0.03\%$ rdg $\pm 0.01\%$ fs
20V	1mV	$\pm 0.03\%$ rdg $\pm 0.01\%$ fs
200V	10mV	$\pm 0.03\%$ rdg $\pm 0.01\%$ fs
2000V	100mV	$\pm 0.05\%$ rdg $\pm 0.01\%$ fs

Maximum permissible input voltage: 1000V DC (2V range) 1000V DC (5 sec.)

Input Impedance: 10M Ω $\pm 0.25\%$

Normal mode rejection ratio: 60dB @ 50Hz

Common mode rejection ratio: 100dB @ 50Hz with 1k Ω imbalance

DC CURRENT

Range	Resolution	Accuracy	Voltage Burden	Max. Input
2mA	100nA	$\pm 0.1\%$ rdg $\pm 0.02\%$ fs	10 μ V/count	0.5A (fused)
20mA	10 μ A	$\pm 0.15\%$ rdg $\pm 0.02\%$ fs	10 μ V/count	0.5A (fused)
10A	1mA	$\pm 1\%$ rdg $\pm 0.02\%$ fs	< 15 μ V/count	20A (10 sec.)

AC VOLTAGE TRUE RMS

Range	Resolution	Accuracy (>10% fs)	5KHz-20KHz
2V	100 μ V	$\pm 0.5\%$ rdg $\pm 0.1\%$ fs	$\pm 3\%$ rdg $\pm 0.1\%$ fs
2V	100 μ V	$\pm 0.5\%$ rdg $\pm 0.1\%$ fs	$\pm 5\%$ rdg $\pm 0.1\%$ fs
20V	1mV	$\pm 0.5\%$ rdg $\pm 0.1\%$ fs	$\pm 5\%$ rdg $\pm 0.1\%$ fs
200V	10mV	$\pm 0.5\%$ rdg $\pm 0.1\%$ fs	$\pm 5\%$ rdg $\pm 0.1\%$ fs
2000V	100mV	$\pm 1\%$ rdg $\pm 0.1\%$ fs	$\pm 15\%$ rdg $\pm 0.1\%$ fs

Accuracy for 2V range at low levels:

Level	Max. Frequency for < 1% Error	Max. Frequency for < 10% Error
10mV	6KHz	15KHz
3mV	1KHz	8KHz
1mV	250Hz	2KHz

Maximum permissible input voltage: 750V AC (2V range) 1000V μ k 10 sec.), 10⁶V \times Hz

Common mode rejection ratio: 40 dB @ 50Hz with 1k Ω imbalance

Crest Factor: < 5 @ fs for < 3% increase in error

AC CURRENT TRUE RMS

Range	Resolution	Accuracy 45Hz-1kHz	Voltage Burden	Max. Input
2mA	100nA	$\pm 0.5\%$ rdg $\pm 0.1\%$ fs	10 μ V/count	0.5A (fused)
20mA	10 μ A	$\pm 0.5\%$ rdg $\pm 0.1\%$ fs	10 μ V/count	0.5A (fused)
10A	1mA	$\pm 1.5\%$ rdg $\pm 0.1\%$ fs	< 15 μ V/count	20A (10 sec.)

Crest Factor: < 2 @ fs for < 2% increase in error

RESISTANCE

Range	Resolution	Accuracy	Excitation Current
2k Ω	10m Ω	$\pm 0.1\%$ rdg $\pm 0.02\%$ fs	0.5mA
2k Ω	100m Ω	$\pm 0.1\%$ rdg $\pm 0.02\%$ fs	0.1mA
20k Ω	1 Ω	$\pm 0.1\%$ rdg $\pm 0.02\%$ fs	10 μ A
200k Ω	10 Ω	$\pm 0.15\%$ rdg $\pm 0.02\%$ fs	1 μ A
2000k Ω	100 Ω	$\pm 0.3\%$ rdg $\pm 0.03\%$ fs	100nA
20M Ω	1k Ω	$\pm 1\%$ rdg $\pm 0.04\%$ fs	100nA

Maximum permissible input voltage: 370V pk

AUTORANGING CAPABILITY

Autoranging on all voltage and resistance ranges and 2mA/200mA (AC and DC) current ranges.

OTHER FUNCTIONS

NULL	Removes residual offset on DC voltage and resistance ranges
HOLD	Display hold
CONTINUITY	Audible continuity test
DIODE TEST	Diode forward voltage measured with excitation current 1mA, 1V/fs
FILTER	Averaging noise reduction filter
dB	Calculation error ± 0.02 dB. User selectable reference impedance
DATA LOGGER	100 reading logger. User settable sample interval
% DEVIATION	Deviation in % from user selected nominal reference value
Ax + b	Scale and offset measurement. User selected scale factor and offset
REL	Allows user to make relative measurements

CALIBRATION

Closed case, fully automatic, via IEEE-488 or RS232 (except AC frequency response).

INTERFACING

Full IEEE-488/GP-IB talker/listener. Also RS232. Interfaces built-in.

IEEE-488/GP-IB SUBSET IMPLEMENTATION

SH1	Source handshake — complete capability
AH1	Accepter handshake — complete capability
T5	Basic talker + serial poll + talk only mode + unaddress if MLA
TE0	Extended talker — no capability
L4	Basic listener + unaddress if MTA
LE0	Extended listener — no capability
SR1	Service request — complete capability
RR1	Remote/local — complete capability
PL2	Parallel poll — remote configuration
DC1	Device clear — complete capability
DT0	Device trigger — no capability
CO	Not a controller

CONTROLLABLE FUNCTIONS

All ranges and functions (except 10A AC and DC) are settable and controllable via the built-in IEEE-488/GP-IB and RS232 interfaces. The string terminator may be selected, and the conditions under which an IEEE-488/GP-IB service request is initiated. Serial and parallel polling are supported. Instrument status, error messages and readings may be requested.

GENERAL

The accuracy specifications apply over a temperature of 18°C to 22°C typically for 1 year.
 Accuracy, Temperature Coefficient: Typically < 0.1 x applicable accuracy spec. per °C (110°C to 18°C, 22°C to 35°C)
 Maximum Common Mode Input Voltage: 500V DC or peak AC.
 Mains Input Voltage: 220/240V (110V set internally) $\pm 10\%$
 Display: 13mm LED, 6 digit
 Scale Length: 4 1/2 digit, 20999 counts max.
 Reading Rate: 3 per sec.
 Operating Temperature Range: 5°C to 40°C, 10% to 80% RH.
 Supplied Accessories: Built-in IEEE-488/GP-IB and RS232 Interfaces, Instruction Manual, Spare Fuse, Test Lead Set.
 Optional Accessories: Service Manual, Carry Case
 Size: 219mm x 240mm x 98mm (product only)
 300mm x 300mm x 116mm (packed)
 Weight: 2.3kg (product only) 2.6kg (packed)

Designed and Manufactured by:

BLACK STAR LTD.

4 Harding Way
 St. Ives, Huntingdon
 Cambs. PE17 4WR, England
 Tel: (0480) 62440
 Telex: 32762 Fax: (0480) 495172

Available from:

Black Star reserve the right to alter specifications without notice.