

The **Black Star 4503** Intelligent multimeter incorporates Full 'Talk and Listen' via built-in IEEE488 and RS232 Interfaces, enabling all ranges and functions(except 10A AC and DC) to be settable and controllable.

Serial and parallel polling are supported.

Instrument status, error messages and readings may be requested.

Supplied complete with demonstration RS232 Terminal program on 5¼" floppy disk for IBM and compatible PC's. (3½" disk optional).

Specifications:

DC Voltage:

Range	Resolution	Accuracy
0.4V	10µV	±0.03% rdg + 0.01%fs
4V	100µV	±0.03% rdg + 0.01%fs
40V	1mV	±0.03% rdg + 0.01%fs
400V	10mV	±0.03% rdg + 0.01%fs
1000V	100mV	±0.03% rdg + 0.01%fs

Maximum permissible input voltage: 1000V DC (.4V range 1000V DC 5 sec.)

Input impedance: 10MR ± 0.25%

Normal mode rejection ratio: 60dB @ 50Hz

Common mode rejection ratio: 100dB @ 50Hz with 1KR imbalance.

DC Current:

Range	Resolution	Accuracy	Voltage Burden	Max. Input
4mA	100nA	± 0.1% rdg ± 0.02% fs	40µV/count	0.5A (fused)
400mA	10µA	± 0.15% rdg ± 0.02% fs	40µV/count	0.5A (fused)
0 to 5A	1mA	± 1% rdg ± 0.01% fs	<15µV/count	20A (10 sec)
5A to 10A	1mA	± 2.5% rdg ± 0.01% fs	<15µV/count	20A (10 sec)

AC Voltage True RMS

Range	Resolution	Accuracy (> 10% fs)		
		45Hz-400Hz	400Hz-5kHz	5kHz- 20kHz
0.4V	10µV	±0.5%rdg ±0.1%fs	± 1%rdg ± 0.1%fs	± 3%rdg ± 0.1%fs
4V	100µV	±0.5%rdg ±0.1%fs	± 1%rdg ± 0.1%fs	± 5%rdg ± 0.1%fs
40V	1mV	±0.5%rdg ±0.1%fs	± 2%rdg ± 0.1%fs	± 5%rdg ± 0.1%fs
400V	10mV	±0.5%rdg ±0.1%fs	± 2%rdg ± 0.1%fs	± 5%rdg ± 0.1%fs
750V	100mV	± 1%rdg ±0.1%fs	± 7%rdg ± 0.1%fs	±15%rdg ± 0.1%fs

Accuracy for 0.4V range at low levels:

Level	Max. Frequency for <1% Error	Max. Freq. for <10% Error
10mV	6kHz	15kHz
3mV	1kHz	8kHz

Maximum permissible input voltage: 750V AC (0.4V range 1000V pk 10 sec)

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

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

AC Current True RMS

Range	Resolution	Accuracy 45Hz-1kHz	Voltage Burden	Max. Input
4mA	100nA	± 0.5% rdg ± 0.01% fs	40µV/count	0.5A(fused)
400mA	10µA	± 0.5% rdg ± 0.01% fs	40µV/count	0.5A (fused)
0 to 5A	1mA	± 1% rdg ± 0.01% fs	<15µV/count	20A (10 sec)
5A to 10A	1mA	± 2.5% rdg ± 0.01% fs	<15µV/count	20A (10 sec)

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

Resistance:

Range	Resolution	Accuracy	Excitation Current
0.4kR	10mR	± 0.1%rdg ± 0.02% fs	0.5mA
4kR	100mR	± 0.1%rdg ± 0.02% fs	0.1mA
40kR	1R	± 0.1%rdg ± 0.02% fs	10µA

400kR	10R	$\pm 0.15\%rdg \pm 0.02\% fs$	1 μ A
4000kR	100R	$\pm 0.3\%rdg \pm 0.03\% fs$	100nA
40MR	1kR	$\pm 0.1\%rdg \pm 0.04\% fs$	100nA

Max permissible input volts: 370V pk. Full scale V: 40MR 1V, 40mV other ranges

Autoranging Capability:

Autoranging on all voltage and resistance ranges and 4mA/400mA (AC and DC) current ranges.

Other Features:

- 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, 1Vfs
- Filter Averaging noise reduction filter
- dB Calculation error $\pm 0.02dB$. User selectable reference impedance
- Data Logger 250 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 freq. response)

Interfacing:

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

IEEE-488/GP-IB Subset Implementation

- SH1 Source handshake - complete capability
- AH1 Acceptor 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
- RL1 Remote/local - complete capability •PP2 Parallel poll - remote configuration
- DC1 Device clear - complete capability
- DT0 Device trigger - no capability
- C0 Not a controller

Controllable Functions:

All ranges and functions (except 10AAC and DC) are settable and controllable via the built-in IEEE488/GP-IB and RS232 interfaces. The string terminator may be selected, and the conditions under which an IEEE488/GP-IB service request is initiated. Serial and parallel polling are supported. Instrument status, error messages and readings may be requested.

General Features:

The accuracy specifications apply over a temperature of 18°C to 22°C typically for one year. Accuracy Temperature Coefficient: Typically $<0.1 \times$ applicable accuracy spec. per°C (10°C to 18°C, 22°C to 35°C)

Maximum Common Mode Input Voltage: 500V DC or peak AC.

Mains Input Voltage: 220/240V $\pm 10\%$

Display: 13mm LED, 6 Digit

Scale length: 4¾ digit, 40999 counts max

Polarity: Automatic

Reading Rate 3 per second. Zero: Automatic
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,

Mains lead,

Demonstration software.

Optional Accessories: Service manual, Carry case, Rack mounting kit.

Dimensions 219mm x 240mm x 98mm

Weight: 1.6Kg