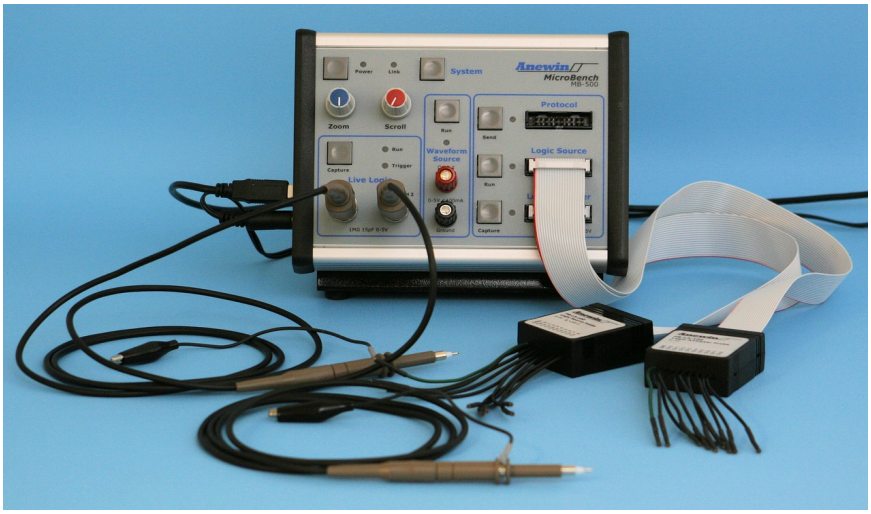
Providing tools for –
Embedded Engineers
Digital Designers

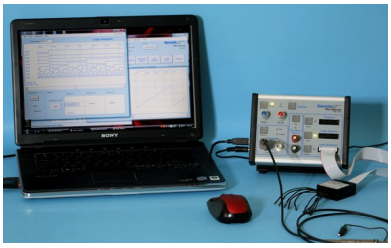
MicroBench™ MB-500A

a complete digital tool set Technical Data



Five test tools in one compact, affordable instrument:

- Live Logic™
- Logic source pattern generator
- Logic analyzer
- Arbitrary waveform generator
- Protocol interactive test



(PC and mouse not included)

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System Specifications

System Event Inputs and Outputs	Live Logic, Logic Analyzer, Logic Source, Waveform Source, Protocol A, Protocol B, System button
PC Integration	USB interface, PC Application and front panel control
System Configuration	Save/Restore current configuration and data
User Scripts (Option)	System control language, .NET interface
Power	7.5V @ ≤1A, ≤7.5W
Data File Formats	Human readable text files, CSV spreadsheet compatible format or plain text
Timebase Accuracy	±100 ppm
Input Over Voltage Protection	±15V max on logic and protocol inputs, ±30V max on Live Logic 10X probe tip,
Output Protection	Protected against short to ground or short to 0 - 5V power supply
Physical dimensions without stand	13cm x 17cm x 6cm (5.1in x 6.7in x 2.4in)
Physical dimensions with stand	15cm x 17cm x 16cm (5.9in x 6.7in x 6.3in)
Weight, MB-500 with stand	1.2kg (2.6lb)

System Requirements

Operating System	Windows 10, 8.1, 7
Processor	≥3GHz
Memory	≥1GB RAM
Free disk space	≥10MB

Live Logic Specifications

Channels	2
Input Range	0-16V (10X probe tip)
Input Impedance	10MΩ
Sample Rate	400MS/s
Time Resolution	2.5ns
Threshold Range and Resolution	0-10V, 50mV resolution
Max Event Samples	2048
Max Capture Time	>90 minutes
Probe	10x passive probe, BNC instrument connection
Protocol Decode	I2C, SPI, RS-232, LIN
Acquisition Modes	Single, Continuous

Live Logic Voltmeter Specifications

Inputs	2
Input Range	0-16V (10X probe tip)
Resolution	100mV
Accuracy	±5 %
Probe	Live Logic 10X probes

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Logic Analyzer Specifications

Channels	9
Input Range	0-5V
Input Impedance	>1MΩ
Sample Rate	100MS/s
Time Resolution	10ns
Threshold Range	0-5V
Threshold Resolution	10 bits (4.88mV)
Max Event Samples	2048
Max Capture Time	>45 minutes
Acquisition Modes	Single, Continuous
Protocol Decode	I2C, SPI, RS-232
Trigger	3-level sequence, including pattern match, stable duration, or System Event

Logic Source Specifications

Channels	9
Logic Low Level (V_{OL})	0-4.5V ($V_{OL} < V_{OH}$)
Logic High Level (V_{OH})	0-4.5V ($V_{OH} > V_{OL}$)
Output Resolution	4.88mV
Output Accuracy	50mV typical
Data Rate	100MS/s
Time Resolution	10ns
Max Vectors	1020
Vector Duration	30ns-40ms
Max Non-repeating Waveform	>40 seconds
Generation Modes	Single, On Event, Continuous
Waveform Sequence Control Commands	Goto, loop, wait for event, jump if event, jump if not event, stop, generate output event

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Waveform Source Specifications

Channels	Single output on red binding post, ground reference on black binding post
Output Range	0-5V
Data Rate	250kS/s, or 1MS/s in fast mode
Time Resolution	4µs, or 200ns in fast mode
Max Vectors	1020
Single Vector Duration	8µs-16s, or 1µs-0.8s in fast mode
Output Resolution	10 bits (4.88mV)
Generation Modes	Single, On Event, Continuous
Max Non-repeating Waveform Duration	>4 hours
Custom Waveform Sequence Control commands	Goto, loop, wait for event, jump if event, jump if not event, stop, generate output event
Slew Rate	1V/µs typical
Generated Waveforms	Sine, Triangle, Pulse, RC (exponential), battery discharge, DC (power supply)
Battery Emulation Types	Alkaline, Ni-Cd, Li-ion, Ni-MH
Max Output Current	100mA, full output range into 50Ω load
Capacitive Load	Output stable into large capacitive loads with reduced slew rate

Protocol Device Specifications

Devices	I2C, SPI, or Trigger I/O, each with specific protocol probe
Signal Range	0-5V

I2C Protocol Master/Slave

Device Modes	Master or Slave
Signals	SCK, SDA (open collector, bidirectional), GND
Max Transactions	64
Bytes per transaction	1-8
SDA Input Logic Threshold	0-5V (4.88mV resolution)
Master Commands	Start, stop, read, write, wait, wait for event, send event, goto, exit
Master Clock Rate	100KHz, 400KHz
Master functions	Stop on NACK, stop on timeout
Slave Capture Modes	Continuous, Single (stop when memory full), Until Event
Slave Address	X (respond to all addresses or respond to selected address
Slave Read Data	User settable 1-8 bytes for all reads
Slave Functions	Stop on timeout, show/hide start-stop

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	commands, show/hide restart commands

SPI Protocol Master/Slave

Device Modes	Master Single-Step, Master On Event, Slave
Signals	SDI, SDO, master SCK & SEL, slave SCK & SEL
Max Transactions	128
Message Length	8, 16, 24, 32 bits
SDO Logic Low Level	0-4.4V (V_{OL} < V_{OH})
SDO Logic High Level	0.1-4.5V
SDO Output Resolution	4.88mV
SDO Output Accuracy	50mV typical
SDI Logic Threshold	0-5V (4.88mV resolution)
Trigger	Single level with don't care bits (X)
Master Clock Rates	10KHz-25MHz
Sequence Commands	Goto 0, jump to sequence, stop, generate event
Master Functions	MSB/LSB first, clock polarity, SEL polarity, skip jump on trigger
Slave Functions	MSB/LSB first, clock polarity, SEL enable, SEL polarity, skip jump on trigger
Max Slave Clock Rate	25MHz

Trigger I/O Protocol

Outputs	3, each from any of 7 System Events
Output Logic Levels	Settable Logic High and Low levels, 0-4.5V
Event Output Functions	Positive logic or Invert
Inputs	3, each can source Protocol A or B System Events
Input Threshold	0-5V (4.88mV resolution)
Event A Functions	Select input signal
Event B Functions	Logical combination of 3 event input signals

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