

#### **TECHNICAL DATA**

# Fluke 120B Series Industrial ScopeMeter<sup>®</sup> Hand-Held Oscilloscopes



#### **KEY MEASUREMENTS**

Voltage, current and power waveforms with numerical values including harmonics, resistance, diode, continuity and capacitance measurements.

AUTOMATICALLY CAPTURE, VIEW AND ANALYZE COMPLEX WAVEFORMS Fluke Connect and View<sup>TM</sup> triggering automatically displays waveforms without having to adjust amplitude, timebase and trigger settings, while Intellaset<sup>TM</sup> technology analyzes the signal and automatically displays critical numerical readings, making troubleshooting faster than ever.

FLUKE CONNECT<sup>®</sup> COMPATIBLE\* View data locally on the instrument, or via Fluke Connect mobile app.

\*Not all models are available in all countries. Check with your local Fluke representative.

## Simplified testing, more insight and faster electro-mechanical troubleshooting

The compact ScopeMeter<sup>®</sup> 120B Series, is the rugged oscilloscope solution for industrial electrical and electro-mechanical equipment troubleshooting and maintenance applications. It's a truly integrated test tool, with oscilloscope, multimeter and high-speed recorder in one easy-to-use instrument. The ScopeMeter 120B Series also integrates with Fluke Connect<sup>®</sup> mobile app and FlukeView<sup>®</sup> for ScopeMeter software to enable further collaboration, data analysis and archiving of critical test information.

The 120B Series Industrial ScopeMeter Test Tools include innovative functions designed to help technicians troubleshoot faster and get the answers they need to keep their systems up and running. Display waveforms with Connect and View™ trigger and setup technology and automatically view related numerical measurements using Fluke IntellaSet™ technology, all without making manual measurement adjustments. With Recorder Event Detect capabilities, elusive intermittent events are captured and logged for easy viewing and analysis.

- Dual-input digital oscilloscope and multimeter
- 40 MHz or 20 MHz oscilloscope bandwidth
- Two 5,000-count true-rms digital multimeters
- Connect-and-View<sup>™</sup> trigger simplicity for hands-off operation
- IntellaSet<sup>™</sup> technology automatically and intelligently adjusts numerical readout based on the measured signal
- Dual-input waveform and meter reading recorder for trending data over extended periods
- Recorder Event Detect captures elusive intermittent signals on repetitive waveforms up to 4 kHz







- Shielded test leads for oscilloscope, resistance and continuity measurements
- Resistance, continuity, diode and capacitance meter measurements
- Power measurements (W, VA, VAR, PF, DPF, Hz)
- Voltage, current and power harmonics
- Check Industrial networks with BusHealth physical layer tests against defined reference levels
- Save or recall data and instrument setups
- Store instrument setups defined by a test sequence for routine maintenance or most often used test procedures.
- External optically isolated USB interface to transfer, archive and analyze scope or meter data
- Optional WiFi adapter connected to internal USB port to wirelessly transfer information to the PC, laptop or Fluke Connect<sup>®</sup> mobile app\*
- FlukeView<sup>®</sup> ScopeMeter<sup>®</sup> Software for Windows<sup>®</sup>
- Rugged design to withstand 3g Vibration, 30g shock, and rated IP51 according to EN/IEC60529
- Highest safety rating in the industry: safety rated for CAT IV 600 V
- Li-Ion rechargeable battery, seven-hours operation (with four-hour charge time)

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Fluke Connect-and-View<sup>™</sup> triggering with Auto Reading function using Fluke IntellaSet<sup>™</sup> technology gives you quick access to the data you need.

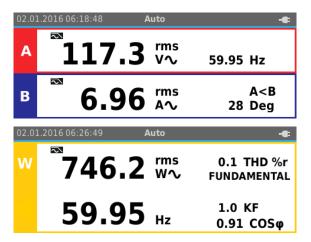
#### Connect-and-View™ triggering for an instant, stable display

Oscilloscope users know how difficult triggering can be. Using the wrong settings can lead to unstable waveform captures, and sometimes the wrong measurement data. Fluke's unique Connect-and-View<sup>™</sup> triggering technology recognizes signal patterns, and automatically sets up the correct triggering to provide a stable, reliable and repeatable display. Connect-and-View<sup>™</sup> triggering is designed to work with virtually any signal, including motor drives and control signalswithout adjusting parameters, or even touching a button. Signal changes are instantly recognized and settings are automatically adjusted, providing a stable display even when measuring multiple test points in quick succession.

#### IntellaSet"/AutoReading

The Auto Readings function with Fluke IntellaSet™ technology uses proprietary algorithms to intelligently analyze the measured waveform and automatically displays the most appropriate numerical measurements on screen, so you can get the data you need easier than ever before. As an example, when the measured waveform is a line voltage signal, the Vrms and Hz readings are automatically displayed, whereas if the measured waveform is a square wave, the Vpeak-peak and Hz readings are automatically displayed. Using IntellaSet<sup>™</sup> technology in conjunction with Connectand-View<sup>™</sup> automatic triggering you can be sure you're seeing not only the correct waveform, but the appropriate numerical reading as well. All without touching a button.

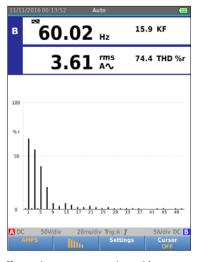




#### Industrial equipment needs a reliable power supply to operate properly, use the dual input to obtain key power measurements.

For single phase or 3-phase balanced systems, the dual inputs of the Industrial ScopeMeter® 120B Series can measure ac+dc rms voltage on channel A and ac+dc rms current on channel B. The Fluke 125B can then calculate; frequency, phase angle, active power (kW), reactive power (VA or var), power factor (PF) or displacement power factor (DPF) and can also calculate the power values for a 3-phase system where all phases have equal voltage and currents. This applies to both balanced system and resistive loads.

Easily obtain key power characteristics to validate a system power.



#### **Harmonics measurements**

Harmonics are periodic distortions of voltage, current, or power sine waves. Harmonics in power distribution systems are often caused by non-linear loads such as switched mode dc power supplies and adjustable speed motor drives. Harmonics can cause transformers, conductors, and motors to overheat. In the Harmonics function, the Test Tool measures harmonics to the 51st. Related data such as dc components, THD (Total Harmonic Distortion), and K factor are measured to provide a complete insight in to the electrical state of health of your loads.

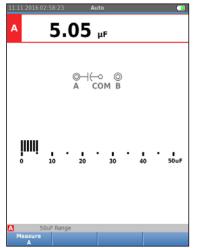


#### FlukeView<sup>®</sup> ScopeMeter<sup>®</sup> Software for Windows<sup>®</sup>

Get more out of your ScopeMeter 120B with FlukeView<sup>®</sup> Software:

- Store instrument's screen copies on the PC, in color
- Copy screen images into your reports and documentation
- Capture and store waveform data from your ScopeMeter on your PC
- Create and archive waveform references for easy comparison
- Copy waveform data into your spreadsheet for detailed analysis
- Use cursors for parameter measurement
- Add user text to instrument setups and send them to the instrument for operator reference and instructions

Harmonic spectrum overview with cursors to measure the distortion as a percentage of the fundamental.



A single test tool measures volts, ohms, amps or capacitance, in addition to displaying waveforms.

## One test lead to measure multiple electrical parameters

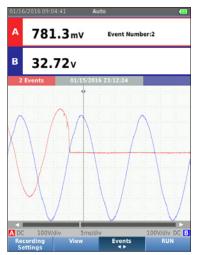
High frequency waveform, meter, capacitance and resistance measurements as well as continuity checks are all covered by single set of shielded test leads. No time is wasted finding or swapping leads.





## Fluke Connect mobile app compatibility

Automated industrial machinery is harder than ever to trouble shoot. It's not enough to just know where you have to test, vou also have to know what to look for—and that can be hard without baseline measurement data or access to subject matter experts. The Fluke Connect® Assets wireless system of software and wireless test tools enables technicians to reduce maintenance costs and increase uptime with accurate equipment records and maintenance data that is easy to interpret, and share. Compare and contrast test point measurement data and trends so you can better understand signal characteristics and changes over time. And, by storing maintenance data on the Fluke Cloud<sup>™</sup> you can enable team members to access it from wherever and whenever they need to so you can get advice or approvals in the field and get your systems up and running faster than ever before.



Quickly step through recorded events to identify and troubleshoot intermittent faults.

#### Use the comprehensive recorder modes to help find intermittent faults with ease

The toughest faults to find are those that happen only once in a while-intermittent events. They can be caused by bad connections, dust, dirt, corrosion or simply broken wiring or connectors. Other factors, like line outages and sags or the starting and stopping of a motor, can also cause intermittent events resulting in equipment shutdowns. When these events happen, you may not be around to see it. But, your Fluke ScopeMeter® Test Tool will. You can either plot the minimum and maximum peak measurement values or record the waveform trace. And, with expandable micro SD memory, recording sessions can be done for up to 14 days. This recorder is even more powerful with the addition of Recorder Event Detect, which makes detecting and logging intermittent faults easier than ever. Just set a threshold on a meter reading or scope trace and deviations are tagged as unique events. You no longer need to search through masses of data to pinpoint faults, and can quickly step from one tagged event to the next, while still having access to the full data set.

BUS RS-232				EIA-232
Activity: O O O				тіт
			LOW	HIGH
V-Level High	$\bigcirc$	8.3	3.0	15.0V
V-Level Low	$\bigcirc$	-8.3	-15.0	-3.0V
DataД	$\bigcirc$	104.50	N/A	N/A µs
Data Baud	$\bigcirc$	9566 b	ps	
Rise	õ	1.6	N/A	27.0%
Fall	$\bigcirc$	1.3	N/A	27.0%
Distortion Jitter	$\odot$	0.5	N/A	5.0%
Distortion Overshoot	$\bigcirc$	0.0	N/A	N/A%

Quickly understand industrial field bus signal physical layer analog characteristics.

#### Industrial Bus Health Test verifies electrical signal quality on industrial buses

Bus Health Test analyzes the electrical signals on the industrial bus or network and gives a clear "Good", "Weak" or "Bad" indication mark for each of the relevant parameters, presented next to the actual measurement value. Measured values are compared to standard values based on the selected bus types (CAN-bus, Profi-bus, Foundation Field, RS-232 and many more), or, unique reference values can be set if different tolerances are required. The Fluke 125B can validate the quality of the electrical signals as soon as they are passed along the network, without looking at the data content. Additionally, the 125B checks the signal levels and speed, transition times and distortion, and compares these to the appropriate standards to help you find errors such as improper cable connections, bad contacts, incorrect grounding or improper terminators.



## **Specifications**

Oscilloscope mode		
Vertical		
Frequency response - dc coupled	without probes and test leads (with BB120)	123B: dc to 20 MHz (-3 dB) 124B and 125B: dc to 40 MHz (-3 dB)
	with STL120-IV 1:1 shielded test leads	DC to 12.5 MHz (-3 dB) / dc to 20 MHz (-6 dB)
	with VP41 10:1 Probe	123B: dc to 20MHz (-3 dB) 124B and 125B: dc to 40 MHz (-3 dB)
Frequency response - ac coupled	without probes and test leads	<10 Hz (-3 dB)
(lf roll off)	with STL120-IV 1:1 shielded test leads	<10 Hz (-3 dB)
	with VP41 10:1 Probe	<10 Hz (-3 dB)
Rise time, excluding probes, test leads	123B <17.5 ns 124B and 125B <8.75 ns	
Input impedance	without probes and test leads	1 MΩ//20 pF
	with BB120	1 MΩ//24 pF
	with STL120-IV 1:1 shielded test leads	1 MΩ//230 pF
	with VP41 10:1 Probe	5 MΩ//15.5 pF
Sensitivity	5 mV to 200 V/div	
Analog bandwidth limiter	10 kHz	
Display modes	А, -А, В, -В	
Max. input voltage A and B	direct, with test leads, or with VP41 Probe	600 Vrms CAT IV, 750 Vrms maximum voltage.
	with BB120	600 Vrms
Max. floating voltage, from any terminal to ground	600 Vrms CAT IV, 750 Vrms up to 400Hz	
Horizontal	·	
Scope modes	Normal, Single, Roll	
Ranges (Normal)	Equivalent sampling	123B: 20 ns to 500 ns/div,
		124B and 125B: 10 ns to 500 ns/div
	Real time sampling	1 μs to 5 s/div
	Single (real time)	1 μs to 5 s/div
	Roll (real time)	1s to 60 s/div
Sampling rate (for both channels	Equivalent sampling (repetitive signals)	up to 4 GS/s
simultaneously)	Real time sampling 1 µs to 60 s/div	40 MS/s
Trigger		
Screen update	Free run, on trigger	
Source	А, В	
Sensitivity A and B	@ DC to 5 MHz	0.5 divisions or 5 mV
	@ 40 MHz	123B: 4 divisions
		124B and 125B: 1.5 divisions
	@ 60 MHz	123B: N/A
		124B and 125B: 4 divisions
Slope	Positive, negative	
Advanced scope functions		
Display modes	Normal	Captures up to 25 ns glitches and displays analog-like persistence waveform.
	Smooth	Suppresses noise from a waveform.
	Glitch off	Does not capture glitches between samples
	Envelope	Records and displays the minimum and maximum of waveforms over time.
Auto set (Connect-and-View™)	Continuous fully automatic adjustments of ampli hold-off. Manual override by user adjustment of	



#### **Dual input meter**

The accuracy of all measurements is within  $\pm$  (% of reading + number of counts) from 18 °C to 28 °C.

Add 0.1x (specific accuracy) for each °C below 18 °C or above 28 °C. For voltage measurements with 10:1 probe, add probe uncertainty +1 %. More than one waveform period must be visible on the screen.

Impair 8   Def volcage (VDC)   Ranges S00 mV, S V, S0 V, S00 V, 750 V   Accuracy 4 (0.5 % +5 counts)   Common mode rejection (CMRR) S000 counds   Trie=mix voltages (V ac and V ac +60 m) S000 counds   Trie=mix voltages (V ac and V ac +60 m) S000 counds   Trie=mix voltages (V ac and V ac +60 m) S000 mix 8 V, S0 V, S00 V, 750 V   Accuracy for S % to 100 % of 14 to 20 KHz ± (1 % +10 counts)   Trie=mix voltages (V ac and V ac +60 m) ± (2.5 % +16 counts)   Accuracy for S % to 100 % of 14 to 20 KHz ± (1 % +10 counts)   Trie=mix voltages (V ac and V ac +60 m) ± (1 % +10 counts)   Accuracy Nation (S 0 KEZ)   Common mode rejection (GMRH)   >100 dB @ dc   >000 counts   S0 dB @ 50, 60, or 400 Hz   Fold @ ac = 26 dB @ 50, 60, or 400 Hz   Fold @ ac = 26 dB @ 50, 60, or 400 Hz   Fold @ ac = 26 dB @ 50, 60, or 400 Hz   Fold @ ac = 26 dB @ 50, 60, or 400 Hz   Fold @ ac = 26 dB @ 50, 60, or 400 Hz   Fold @ ac = 26 dB @ 50, 60, or 400 Hz <td colsp<="" th=""><th>5</th><th>±</th><th></th></td>	<th>5</th> <th>±</th> <th></th>	5	±	
Ranges     BOO NV, 5 V, 50 V, 500 V, 750 V       Accuracy     ± (0.5 % + 5 counts)       Common mode rejection (CMRR)     3000 dB @ do, 500 dB @ 50, 60, or 400 Hz       Full scale reading     500 mV, 5 V, 50 V, 500 V, 750 V       Accuracy for 5 % to 100 % of range (DC coupled)     DC to 60 Hz (V ac+40)     ± (1 % +10 counts)       Ranges     500 mV, 5 V, 50 V, 500 V, 750 V     Accuracy for 5 % to 100 % of thz (V ac+40)     ± (1 % +10 counts)       Constray for 5 % to 100 % of range (DC coupled)     DC to 60 Hz (V ac+40)     ± (1 % +10 counts)       Common mode rejection (GMRR)     >100 AB @ do	Input A and input B			
Accuracy   ± (0.5 % +5 counts)     Common mode rejection (CMRR)   >100 dB @ dc, 560 dB @ 50, 60, or 400 Hz     Full scale reading   5000 row, 5 V, 50 V, 500 V, 750 V     Accuracy for 5 % to 100 % of range (DC coupled)   ± (1 % +10 counts)     Accuracy for 5 % to 100 % of range (DC coupled)   ± (1 % +10 counts)     Accuracy for 5 % to 100 % of range (DC coupled)   ± (1 % +10 counts)     Accuracy for 5 % to 100 % of range (AC cd coupled)   500 dB @ dc     DC rejection (cnly VAG)   >S0 dB     DC rejection (cnly VAG)   >S00 dB @ dc     >100 dB @ dc   >     >000 dB @ dc   >     S000 counts, reading is independent of any signal crest factor.     Posk      Modes   Max peak, Min peak, or pk-to-pk     Ranges   500 counts, reading is independent of any signal crest factor.     Posk      Ranges   S00 counts     Full scale reading   S00 counts.     Full scale reading   S00 counts     Full scale reading   S00 counts     Frequency fange   18 Hz, 10 Hz, 100 Hz, 1 HHz, 10 HHz, 10 HHz, 10 HHz, and 50 MHz     Full scale reading   50.00 kRPM     Accuracy   1.1 Hz to 5	DC voltage (VDC)			
Common mode rejection (CMRR)   >>100 dB @ dc, >60 dB @ 50, 60, or 400 Hz     Full scale reading   S000 rounts     Trae-min voltages (V ac and V ac-V d)   It are min voltages (V ac and V ac-V d)     Ranges   S00 mV, 5V, 500 V, 750 V   It are min voltages (V ac and V ac-V d)     Accuracy for 5% to 100 % of tar V ac-V d)   It are to 6Hz (V ac+4c)   ± (1 % +10 counts)     Accuracy for 5% to 100 % of tar V ac-V d)   50 dB @ dc   It are to 6Hz (V ac)     Common mode rejection (CMRR)   >500 dB @ dc   -     Common mode rejection (SMRR)   >500 dB @ dc   -     S000 counts, reading is independent of any signal crest factor.   -   -     Peak   -   -   -   -     Modes   Max peak, or pk-to-pk   -   -   -   -     Ranges   500 mV, 5V, 50 V, 500 V, 2200 V   -	Ranges	500 mV, 5 V, 50 V, 500 V, 750 V		
Full scale reading 5000 rounts   True-mu voltages (V ac and V ac-vel)   Ranges 500 mV, 5 V, 50 V, 500 V, 750 V   Accuracy for 5 % to 100 % of range (IAC or coupled) DC to 60 Hz (V ac) ± (1 % +10 counts)   Accuracy for 5 % to 100 % of range (IAC or coupled) DC to 60 Hz (V ac) ± (1 % +10 counts)   Accuracy for 5 % to 100 % of range (IAC or coupled) 500 Hz (V ac) ± (1 % +10 counts)   Accuracy for 5 % to 100 % of range (IAC or coupled) 500 Hz (V ac) ± (2.5 % +18 counts)   DC rejection (only VAC) >50 dB -   Commo mode rejection (CMRR) 500 dB @ Co. -   Full scale reading 5000 counts, reading is independent of any signal crest factor.   Post - -   Modes Max peak, Min peak, or pk-to-pk   Ranges 500 mV, 5 V, 50 V, 500 V, 2200 V   Accuracy Peak-to-Peak 10 % of full scale   Full scale reading 500 counts   Trequency fiely -   Ranges 138: 1 Hz, 10 Hz, 100 Hz, 1 Hz, 100 Hz, 1 MHz, 10 MHz, and 50 MHz   Frequency range 15 Hz (1 Hz) to 30 Mz in continuous autoset   Frequency range 16 Hz (1 Hz) to 30 Mz in continuous autoset   Full scale reading 50.00 kRPM   Accuracy 15 Hz (1 Hz) to 30 Mz in continuous autoset   Frequency range	Accuracy	± (0.5 % +5 counts)		
True-rms voltages (V ac and V ac+dc)       Ranges     500 mV, 5 V, 50 V, 500 V, 750 V       Accuracy for 5 % to 100 % of range (DC coupled)     DC to 60 Hz (V ac)     ± (1 % +10 counts)       It Rz to 60 Hz (V ac)     ± (1 % +10 counts)     trease (DC coupled)       DC rejection (only VAC)     >50 dB     ± (2.5 % +15 counts)       Common mode rejection (CMRR)     >100 dB @ dc     ± (2.5 % +15 counts)       Pull scale reading     >500 ocunts, reading is independent of any signal creat factor.       Peak     Accuracy Name Pack or DN, 50 V, 500 V, 200 V       Accuracy     Accuracy Peak-to-Peak       Accuracy Peak-to-Peak     10 % of full scale       Accuracy     Accuracy Peak-to-Peak     10 % of full scale       Ful scale reading     500 counts     5% of full scale       Frequency filz)     T238: 1 Hz, 10 Hz, 100 Hz, 1 KHz, 10 K	Common mode rejection (CMRR)	>100 dB @ dc, >60 dB @ 50, 60, or 400 Hz		
Ranges     500 mV, 5 V, 50 V, 500 V, 500 V       Accuracy for 5 % to 100 % of range (I/C coupled)     DC to 60 Hz (V ac)     ± (1 % +10 counts)       Accuracy for 5 % to 100 % of range (I/C coupled)     60 Hz to 20 kHz     ± (2.5 % +15 counts)       Accuracy for 5 % to 100 % of range (I/C coupled)     50 Hz to 20 kHz     ± (2.5 % +15 counts)       DC rejection (only VAC)     >50 dB     Counts)       Common mode rejection (GMRR)     5000 counts, reading is independent of any signal	Full scale reading	5000 counts		
Accuracy for 5 % to 100 % of range (AC or coupled)     DC to 60 Hz (V ac+dc)     ± (1 % + 10 counts)       Accuracy for 5 % to 100 % of range (AC or de coupled)     60 Hz to 20 kHz     ± (1 % + 10 counts)       Accuracy for 5 % to 100 % of range (AC or de coupled)     60 Hz to 20 kHz     ± (2 % + 10 counts)       Accuracy for 5 % to 100 % of range (AC or de coupled)     500 Lto 20 kHz     ± (2 % + 10 counts)       DC rejection (only VAC)     >50 dB     =       Common mode rejection (CMR)     >100 dB @ dc     =       >60 dB @ 80, 60, or 400 Hz     =     =       Pull scale reading     5000 counts, reading is independent of any signal creat factor.     =       Post     -     -     -     -       Modes     Max peak, Min peak, or pk-to-pk     -     -     -       Ranges     500 or v, 5 V, 50 V, 2200 V     -     -     -     -       Accuracy Peak-to-Peak     10 % of full scale     -	True-rms voltages (V ac and V ac+	+dc)		
range (bC coupled)   1 Hz to 60 Hz (V ac)   ± (1 % + 10 counts)     Accuracy for 5 % to 100 % of range (AC or dc coupled)   50 Hz to 20 kHz   ± (2.5 % + 15 counts)     DC rejection (only VAC)   >50 dB   =     Store and the coupled)   >50 dB @ 50, 60, or 400 Hz   =     Pull scale reading   5000 counts, reading is independent of any signal cest factor.     Peak    =     Modes   Max peak, Min peak, or pk-to-pk     Ranges   500 mV, 5 V, 50 V, 50 V, 50 V, 200 V     Accuracy Max peak or Min peak   5 % of full scale     Accuracy Peak-to-Peak   10 % of full scale     Pull scale reading   500 counts   500 counts     Frequency [Hz]   Tage: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz, 10 MHz, and 50 MHz   10 % of full scale     Pull scale reading   500 counts   =   10 % of full scale     Frequency range   15 Hz (1 Hz) to 50 MHz in continuous autoset   10 % of full scale   10 % of MHz     Frequency range   15 Hz (1 Hz) to 50 MHz in continuous autoset   =   10 % to 50 % +2 counts   10 % thz, 1 % thz, 10 0 Hz, 1 kHz, 10 0 Hz, 1 % thz, 10 0 Hz, 2 MHZ, 10 MHz, 2 M HZ, 2 % to 50 % +2 counts   10 % to 50 % +2 counts   10 % to 50 % +2	Ranges	500 mV, 5 V, 50 V, 500 V, 750 V		
Accuracy for 5 % to 100 % of ang (V ac)   ± (1.% + 10 counts)     Accuracy for 5 % to 100 % of ang (V ac)   ± (2.5 % + 18 counts)     DC rejection (only VAC)   >50 dB     Common mode rejection (CMRR)   >100 dB @ dc     >60 dB g @ 60, 60, or 400 Hz   >     Full scale reading   5000 counts, reading is independent of any signal crest factor.     Polk      Modes   Max peak, Min peak, or pk-to-pk     Ranges   500 mV, 5 V, 50 V, 200 V     Accuracy Max peak or Min peak   5 % of full scale     Accuracy Max peak or Min peak   5 % of full scale     Accuracy Peak-to-Peak   10 % of full scale     Frequency fall   500 counts     Frequency fall   1238: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz, 10 MHz, and 50 MHZ     124B and 125B: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 10 kHz, 10 MHz, and 70 MHz   10 000 counts     Frequency range   15 Hz (1 Hz) to 50 MHz in continuous autoset   4ccuracy     Kib   10 000 counts   10 % to 8 %   5counts)     Frequency range   15 Hz (1 Hz) to 30 MHz in continuous autoset   10 Hz     Max reading   5 % to 88 %   5 Hz (1 Hz) to 30 MHz in continuous autoset   10 Hz     Prequency ra		DC to 60 Hz (V ac+dc)	± (1 % +10 counts)	
range (ÅC or dc coupled)     >50 dB       Common mode rejection (CMRR)     >50 dB @ dc       >60 dB @ 50, 60, or 400 Hz     >       Full scale reading     5000 counts, reading is independent of any signal crest factor.       Peak        Modes     Max peak, Min peak, or pk-to-pk       Ranges     500 nV, 5 V, 50 V, 500 V, 200 V       Accuracy     Accuracy Max peak or Min peak     5 % of full scale       Accuracy Max peak or Min peak     5 % of full scale       Accuracy Peak-to-Peak     10 % of full scale       Full scale reading     500 counts       Frequency (Hz)     123B: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz, 10 MHz, and 50 MHz       Tages     124B and 125B: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz, 10 MHz, and 70 MHz       Frequency range     15 Hz (1 Hz) to 50 MHz in continuous autoset       Accuracy @ H z to 1 MHz     ± (0.5 % + 2 counts)       Pull scale reading     50.000 kRPM       Accuracy     1 (Hz) to 30 MHz in continuous autoset       Frequency range     15 Hz (1 Hz) to 30 MHz in continuous autoset       Puls width (PULSE)     2 % to 98 %       Frequency range     15 Hz (1 Hz) to 30 MHz in continuous autoset	range (DC coupled)	1 Hz to 60 Hz (V ac)	± (1 % +10 counts)	
Common mode rejection (CMRR)     >100 dB @ dc       >60 dB @ 50, 60, or 400 Hz       Full scale reading     5000 counts, reading is independent of any signal crest factor.       Peak		60 Hz to 20 kHz	± (2.5 % +15 counts)	
>60 dB @ 50, 60, or 400 Hz     Full scale reading   5000 counts, reading is independent of any signal crest factor.     Peak     Modes   Max peak, Min peak, or pk-to-pk     Ranges   500 mV, 5 V, 50 V, 50 V, 2200 V     Accuracy   Accuracy Max peak or Min peak   5 % of full scale     Accuracy   Accuracy Peak-to-Peak   10 % of full scale     S00 counts   Frequency (Hz)   10 % of full scale     Ranges   123B: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 10 kHz, 10 MHz, and 50 MHz   124B and 125B: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 10 MHz, and 70 MHz     Frequency range   15 Hz (1 Hz) to 50 MHz in continuous autoset   4ccuracy   4 (0.5 % +2 counts)     Full scale reading   10 000 counts   10 000 counts   10 000 counts     RPM    4 (0.5 % +2 counts)   10 Hitz   10 000 counts     RPM    5 % of 98 %   15 Hz (1 Hz) to 30 MHz in continuous autoset   10 Hz   11 Hz     Puls width (PULSE)    15 Hz (1 Hz) to 30 MHz in continuous autoset   10 Puls cole counts   10 Puls cole counts     Ampeore (LMP)   15 Hz (1 Hz) to 30 MHz in continuous autoset   10 N/A in mV/A, 10 mV/A,	DC rejection (only VAC)	>50 dB		
Full scale reading5000 counts, reading is independent of any signal crest factor.PeakModesMax peak, Min peak, or pk-to-pkRanges500 mV, 5 V, 50 V, 200 VAccuracyAccuracy Max peak or Min peak5 % of full scaleAccuracy Max peak or Min peak5 % of full scaleAccuracy Peak-to-Peak10 % of full scaleFull scale reading5000 countsFrequency [H2]Images123B: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz, 10 MHz, and 50 MHzRanges123B: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz, 10 MHz, and 70 MHzI stal reading10 % 06 countsFrequency range15 Hz (1 Hz) to 50 MHz in continuous autosetAccuracy @1 Hz to 1 MHz± (0.5 % +2 counts)Pull scale reading50.00 kRPMAccuracy± (0.5 % +2 counts)Duty cycle [PULSE]ImageRange2 % to 98 %Frequency range15 Hz (1 Hz) to 30 MHz in continuous autosetPuls exidin (PULSE)ImagePuls exide reading10 % 19 % 03 0MHz in continuous autosetPuls exide reading10 % 10 80 MHz in continuous autosetPuls exide reading10 % 10 30 0MHz in continuous autosetPuls exide reading10 Kz (1 Hz) to 30 MHz in continuous autosetPuls exide reading10 Kz (1 Hz) to 30 MHz in continuous autosetPuls exide reading10 Kz (1 Hz) to 30 MHz in continuous autosetPuls exide reading10 Mz (A 00 mV/A, 10 MZ, 10 mV/A, 10 MZ, 10 MZ,	Common mode rejection (CMRR)	>100 dB @ dc		
Peak   Max peak, Min peak, or pk-to-pk     Ranges   500 mV, 5 V, 50 V, 500 V, 200 V     Accuracy   Accuracy Max peak or Min peak   5 % of full scale     Accuracy   Accuracy Peak-to-Peak   10 % of full scale     Full scale reading   500 counts   500 mV, 5 V, 50 V, 200 V     Prequency (Hz)   Ranges   123B: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz, 10 MHz, and 50 MHz     Ranges   123B: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz, 10 MHz, and 70 MHz     Prequency range   15 Hz (1 Hz) to 50 MHz in continuous autoset     Accuracy   ± (0.5 % +2 counts)     Full scale reading   50.00 kRPM     Accuracy   ± (0.5 % +2 counts)     Duty cycle (PULSE)   Frequency range     Range   2 % to 98 %     Frequency range   15 Hz (1 Hz) to 30 MHz in continuous autoset     Pulse width (PULSE)   Frequency range     Prequency range   15 Hz (1 Hz) to 30 MHz in continuous autoset     Full scale reading   1000 counts     Max reading   1000 counts     Mase   1000 counts     Frequency range   15 Hz (1 Hz) to 30 MHz in continuous autoset     Full scale reading   10000 counts		>60 dB @ 50, 60, or 400 Hz		
ModesMax peak, Min peak, or pk-to-pkRanges500 mV, 5 V, 50 V, 500 V, 2200 VAccuracyAccuracy Max peak or Min peak5 % of full scaleAccuracyAccuracy Peak-to-Peak10 % of full scaleFull scale reading500 countsFrequency (Hz)I23B: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 10 kHz, 1 MHz, 10 MHz, and 50 MHzRanges123B: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 10 kHz, 10 kHz, 1 MHz, 10 MHz, and 70 MHzFrequency range15 Hz (1 Hz) to 50 MHz in continuous autosetAccuracy @1 Hz to 1 MHz± (0.5 % +2 counts)Full scale reading10 000 countsRPMI0000 countsRange50.00 kRPMAccuracy± (0.5 % +2 counts)Duty cycle (PULSE)I5 Hz (1 Hz) to 30 MHz in continuous autosetRange2 % to 98 %Frequency range15 Hz (1 Hz) to 30 MHz in continuous autosetPulse width (PULSE)I5 Hz (1 Hz) to 30 MHz in continuous autosetFrequency range15 Hz (1 Hz) to 30 MHz in continuous autosetPulse width (PULSE)I5 Hz (1 Hz) to 30 MHz in continuous autosetFrequency range15 Hz (1 Hz) to 30 MHz in continuous autosetPulse width (PULSE)I5 Hz (1 Hz) to 30 MHz in continuous autosetWith current clampIs angesScale factors0.1 mV/A, 10 mV/A, 100 mV/A, 400 mV/A, 1V/A, 10 mV/A, 100 mV/A, 400 mV/A, 1V/A, 10 mV/A, 10 mV/A, 10 mV/A, 400 mV/A, 1V/A, 10 mV/A, 10 mV/A, 10 mV/A, 10 mV/A, 400 mV/A, 1V/A, 10 mV/A, 10 mV/A, 400 mV/A, 1V/A, 10 mV/A, 10 mV/A, 400 mV/A, 1V/A, 10 mV/A, 10 mV	Full scale reading	5000 counts, reading is independent of any signal	crest factor.	
Ranges500 mV, 5 V, 50 V, 500 V, 2200 VAccuracyAccuracy Max peak or Min peak5 % of full scaleAccuracy Peak-to-Peak10 % of full scaleFull scale reading500 countsFrequency [H2]Table Table Tab	Peak			
AccuracyAccuracy Max peak or Min peak5 % of full scaleAccuracy Peak-to-Peak10 % of full scaleFull scale reading500 countsFrequency (H2)ImagesRanges123B: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz, 10 MHz, and 50 MHz124B and 125B: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz, 10 MHz, and 70 MHzFrequency range15 Hz (1 Hz) to 50 MHz in continuous autosetAccuracy @1 Hz to 1 MHz± (0.5 % +2 counts)Full scale reading10 000 countsRPMMax reading50.000 kRPMAccuracy± (0.5 % +2 counts)Duty cycle (PULSE)Range2 % to 98 %Frequency range15 Hz (1 Hz) to 30 MHz in continuous autosetPulse width (PULSE)Frequency range15 Hz (1 Hz) to 30 MHz in continuous autosetPulse width (PULSE)With current clampRangesRangessame as V dc, V ac, V ac+dc, or PEAKScale factors0.1 mV/A, 10 mV/A, 100 mV/A, 400 mV/A, 400 mV/A, 10 V/A, 10 mV/A, 100 mV/A, 400 mV/A, 10 V/A, 10 mV/A, 10 mV/A, 100 mV/A, 400 mV/A, 10 V/A, 10 mV/A, 10 mV/A, 100 mV/A, 400 mV/A, 10 V/A, 10 mV/A, 100 mV/A, 400 mV/A, 10 V/A, 10 mV/A, 100 mV	Modes	Max peak, Min peak, or pk-to-pk		
Accuracy Peak-to-Peak10 % of full scaleFull scale reading500 countsFrequency (Hz)I23B: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz, 10 MHz, and 50 MHzRanges123B: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz, 10 MHz, and 70 MHzFrequency range15 Hz (1 Hz) to 50 MHz in continuous autosetAccuracy @1 Hz to 1 MHz± (0.5 % +2 counts)Full scale reading10 000 countsRPMMax reading50.00 kRPMAccuracy± (0.5 % +2 counts)Duty cycle (PULSE)Range2 % to 98 %Frequency range15 Hz (1 Hz) to 30 MHz in continuous autosetPulse width (PULSE)Frequency range15 Hz (1 Hz) to 30 MHz in continuous autosetPulse width (PULSE)Frequency range15 Hz (1 Hz) to 30 MHz in continuous autosetPulse scalar reading1000 countsAmperes (AMP)With current clampRangesScale factors0.1 mV/A, 10 mV/A, 100 mV/A, 400 m	Ranges	500 mV, 5 V, 50 V, 500 V, 2200 V		
Full scale reading   500 counts     Frequency (Hz)   I23B: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 10 kHz, 10 MHz, and 50 MHz     Ranges   124B and 125B: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz, 10 MHz, and 70 MHz     Frequency range   15 Hz (1 Hz) to 50 MHz in continuous autoset     Accuracy @1 Hz to 1 MHz   ± (0.5 % +2 counts)     Full scale reading   10 000 counts     RPM   50.00 kRPM     Accuracy   ± (0.5 % +2 counts)     Duty cycle (PULSE)   50.00 kRPM     Range   2 % to 98 %     Frequency range   15 Hz (1 Hz) to 30 MHz in continuous autoset     Pulse width (PULSE)   15 Hz (1 Hz) to 30 MHz in continuous autoset     Full scale reading   1000 counts     Amperes (AMP)   1000 counts     With current clamp   Ranges   same as V dc, V ac, V ac, V ac, C on PEAK     Scale factors   0.1 mV/A, 10 mV/A, 100 mV/A, 400 mV/A, 10/A, 100 mV/A, 400 mV/A, 10/A, 10 mV/A, 100 mV/A, 400 mV/A, 10/A, 10/A, 100 mV/A, 400 mV/A, 10/A, 10/A, 100 mV/A, 400 mV/A, 10/A, 10/A, 10/A, 100 mV/A, 400 mV/A, 10/A,	Accuracy	Accuracy Max peak or Min peak	5 % of full scale	
Frequency (Hz)   I23B: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz, 10 MHz, and 50 MHz     I24B and 125B: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz, 10 MHz, and 70 MHz   Frequency range     I5 Hz (1 Hz) to 50 MHz in continuous autoset   IS Hz (1 Hz) to 50 MHz     Accuracy @1 Hz to 1 MHz   ± (0.5 % +2 counts)     Full scale reading   10 000 counts     RPM   IS HZ (1 Hz) to 50 MPZ     Accuracy   ± (0.5 % +2 counts)     Duty cycle (PULSE)   IS HZ (1 Hz) to 30 MPZ in continuous autoset     Range   2 % to 98 %     Frequency range   15 Hz (1 Hz) to 30 MHz in continuous autoset     Pulse width (PULSE)   IS Hz (1 Hz) to 30 MHz in continuous autoset     Full scale reading   1000 counts     Amperes (AMP)   IS Hz (1 Hz) to 30 MHz in continuous autoset     Full scale reading   1000 counts     Amperes (AMP)   Ranges     Scale factors   0.1 mV/A, 1 mV/A, 10 mV/A, 400 mV/A, 10 V/A, 10 mV/A, 400 mV/A, 1 V/A, 10 mV/A, 100 mV/A, 400 mV/A, 1 V/A, 10 mV/A, 10 mV/A, 400 mV/A, 1 V/A, 10 mV/A, 10 mV/A, 400 mV/A, 1 V/A, 10 mV/A, 10 mV/A, 0 mV/A, 0 mV/A, 1 MZ, 0 MZ, 400 mV/A, 1 V/A, 10 mV/A, 0 MZ, 400 mV/A, 1 MZ, 0		Accuracy Peak-to-Peak	10 % of full scale	
Ranges123B: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 10 kHz, 10 MHz, and 50 MHz124B and 125B: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz, 10 MHz, and 70 MHzFrequency range15 Hz (1 Hz) to 50 MHz in continuous autosetAccuracy @1 Hz to 1 MHz± (0.5 % +2 counts)Full scale reading10 000 countsRPMMax reading50.00 kRPMAccuracy± (0.5 % +2 counts)Duty cycle (PULSE)Range2 % to 98 %Frequency range15 Hz (1 Hz) to 30 MHz in continuous autosetPulse width (PULSE)Frequency range15 Hz (1 Hz) to 30 MHz in continuous autosetFull scale reading1000 countsMuscel areading1000 countsWith current clampRangesRangessame as V dc, V ac,		500 counts		
124B and 125B: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz, 10 MHz, and 70 MHzFrequency range15 Hz (1 Hz) to 50 MHz in continuous autosetAccuracy @1 Hz to 1 MHz± (0.5 % +2 counts)Full scale reading10 000 countsRPM50.00 kRPMAccuracy± (0.5 % +2 counts)Duty cycle (PULSE)Range2 % to 98 %Frequency range15 Hz (1 Hz) to 30 MHz in continuous autosetPulse width (PULSE)Frequency range15 Hz (1 Hz) to 30 MHz in continuous autosetFull scale reading1000 countsMax reading1000 countsWith current clamp15 Hz (1 Hz) to 30 MHz in continuous autosetFull scale reading1000 countsAngeres (AMP)Same as V dc, V ac, V ac+dc, or PEAKScale factors0.1 mV/A, 1 mV/A, 10 mV/A, 100 mV/A, 400 mV/A, 1V/A, 10 mV/A, 100 mV/A, 400 mV/A, 1V/A, 10 mV/A, 100 mV/A, 400 mV/A, 1V/A, 10 mV/MA				
Frequency range15 Hz (1 Hz) to 50 MHz in continuous autosetAccuracy @1 Hz to 1 MHz± (0.5 % +2 counts)Full scale reading10 000 countsRPM50.00 kRPMAccuracy± (0.5 % +2 counts)Duty cycle (PULSE)Range2 % to 98 %Frequency range2 % to 98 %Frequency range15 Hz (1 Hz) to 30 MHz in continuous autosetPulse width (PULSE)Frequency range15 Hz (1 Hz) to 30 MHz in continuous autosetFull scale reading1000 countsMuth current clampRangesRangessame as V dc, V ac, V ac+dc, or PEAKScale factors0.1 mV/A, 10 mV/A, 100 mV/A, 400 mV/A, 1V/A, 10 mV/A, 100 mV/A, 400 mV/A, 1V/A, 10 mV/mA	Ranges			
Accuracy @1 Hz to 1 MHz   ± (0.5 % +2 counts)     Full scale reading   10 000 counts     RPM	_		z, 100 kHz, 1 MHz, 10 MHz, and 70 MHz	
Full scale reading   10 000 counts     RPM   In Counts     Max reading   50.00 kRPM     Accuracy   ± (0.5 % +2 counts)     Duty cycle (PULSE)   Image     Range   2 % to 98 %     Frequency range   15 Hz (1 Hz) to 30 MHz in continuous autoset     Pulse width (PULSE)   Image     Frequency range   15 Hz (1 Hz) to 30 MHz in continuous autoset     Full scale reading   1000 counts     Amperes (AMP)   Image     With current clamp   Ranges   same as V dc, V ac, V ac+dc, or PEAK     Scale factors   0.1 mV/A, 10 mV/A, 10 mV/A, 100 mV/A, 400 mV/A, 1 V/A, 10 mV/A, 10 mV/A, 10 mV/A, 10 mV/A, 1 MZ, 10 mV/A, 10 mV/A, 1 MZ, 10 mV/A, 10 mV/A, 10 mV/A, 1 MZ, 10 mV/A, 10 mV/A, 1 MZ, 10 mV/A, 10 MZ, 1 MZ, 10 MZ, 1 MZ, 10 MZ, 1 MZ, 10 MZ, 1 MZ, 1 MZ, 10 MZ, 1				
RPM     Max reading   50.00 kRPM     Accuracy   ± (0.5 % +2 counts)     Duty cycle (PULSE)     Range   2 % to 98 %     Frequency range   15 Hz (1 Hz) to 30 MHz in continuous autoset     Pulse width (PULSE)     Frequency range   15 Hz (1 Hz) to 30 MHz in continuous autoset     Full scale reading   1000 counts     Amperes (AMP)   Vith current clamp     Ranges   same as V dc, V ac, V ac+dc, or PEAK     Scale factors   0.1 mV/A, 10 mV/A, 100 mV/A, 400 mV/A, 1 V/A, 10 mV/mA	-			
Max reading50.00 kRPMAccuracy± (0.5 % +2 counts)Duty cycle (PULSE)Range2 % to 98 %Frequency range2 % to 98 %9 lse width (PULSE)Prequency range15 Hz (1 Hz) to 30 MHz in continuous autosetPulse width (PULSE)Frequency range15 Hz (1 Hz) to 30 MHz in continuous autoset9 lse width (PULSE)With current clampRangesRangessame as V dc, V ac, V ac+dc, or PEAKScale factors0.1 mV/A, 1 mV/A, 10 mV/A, 400 mV/A, 1 V/A, 10 mV/A, 400 mV/A, 1 V/A, 10 mV/mA		10 000 counts		
Accuracy   ± (0.5 % +2 counts)     Duty cycle (PULSE)     Range   2 % to 98 %     Frequency range   15 Hz (1 Hz) to 30 MHz in continuous autoset     Pulse width (PULSE)     Frequency range   15 Hz (1 Hz) to 30 MHz in continuous autoset     Full scale reading   1000 counts     Amperes (AMP)   1000 counts     With current clamp   Ranges   same as V dc, V ac, V ac+dc, or PEAK     Scale factors   0.1 mV/A, 1 mV/A, 100 mV/A, 400 mV/A, 1 V/A, 10 mV/A, 100 mV/A, 100 mV/A, 1 V/A, 10 mV/A, 100 mV/A, 1 V/A, 10 mV/A, 10 mV/A, 100 mV/A, 1 V/A, 10 mV/A, 100 mV/A, 1 V/A, 10 mV/A, 1 MA		50.00 KRDM		
Duty cycle (PULSE)     Range   2 % to 98 %     Frequency range   15 Hz (1 Hz) to 30 MHz in continuous autoset     Pulse width (PULSE)	, i i i i i i i i i i i i i i i i i i i			
Range   2 % to 98 %     Frequency range   15 Hz (1 Hz) to 30 MHz in continuous autoset     Pulse width (PULSE)				
Frequency range   15 Hz (1 Hz) to 30 MHz in continuous autoset     Pulse width (PULSE)     Frequency range   15 Hz (1 Hz) to 30 MHz in continuous autoset     Full scale reading   1000 counts     Amperes (AMP)   In the transmission of the transmission of trans		2 % to 98 %		
Pulse width (PULSE)     Frequency range   15 Hz (1 Hz) to 30 MHz in continuous autoset     Full scale reading   1000 counts     Amperes (AMP)   Images     With current clamp   Ranges     Scale factors   0.1 mV/A, 1 mV/A, 10 mV/A, 100 mV/A, 400 mV/A, 1 V/A, 10 mV/MA     Accuracy   same as V dc, V ac, V ac+dc, or PEAK	· ·			
Frequency range   15 Hz (1 Hz) to 30 MHz in continuous autoset     Full scale reading   1000 counts     Amperes (AMP)   Images     With current clamp   Ranges     Scale factors   0.1 mV/A, 1 mV/A, 10 mV/A, 100 mV/A, 400 mV/A, 1 V/A, 10 mV/mA     Accuracy   same as V dc, V ac, V ac+dc, or PEAK				
Amperes (AMP)     With current clamp   Ranges   same as V dc, V ac, V ac+dc, or PEAK     Scale factors   0.1 mV/A, 1 mV/A, 10 mV/A, 100 mV/A, 400 mV/A, 1 V/A, 10 mV/mA     Accuracy   same as V dc, V ac, V ac+dc, or PEAK	· · ·	15 Hz (1 Hz) to 30 MHz in continuous autoset		
With current clamp   Ranges   same as V dc, V ac, V ac+dc, or PEAK     Scale factors   0.1 mV/A, 1 mV/A, 10 mV/A, 100 mV/A, 400 mV/A, 1 V/A, 10 mV/mA     Accuracy   same as V dc, V ac, V ac+dc, or PEAK	Full scale reading	1000 counts		
Scale factors 0.1 mV/A, 1 mV/A, 10 mV/A, 100 mV/A, 400 mV/A, 1 V/A, 10 mV/mA   Accuracy same as V dc, V ac, V ac+dc, or PEAK	Amperes (AMP)	·		
1 V/A, 10 mV/mA   Accuracy   same as V dc, V ac, V ac+dc, or PEAK		Ranges	same as V dc, V ac, V ac+dc, or PEAK	
Accuracy same as V dc, V ac, V ac+dc, or PEAK		Scale factors		
		Accuracy	same as V dc, V ac, V ac+dc, or PEAK	



-	ptional temperature probe			
Range		200 °C/div (200 °F/div)		
Scale factor		1 mV/°C and 1 mV/°F		
Accuracy	as V dc (add temp. probe uncertainty	as V dc (add temp. probe uncertainty)		
Decibel (dB)				
0 dBV	1 V			
0 dBm (600 Ω /50 Ω)	1 mW referenced to 600 $\Omega$ or 50 $\Omega$			
dB on	V dc, V ac, or Vac+dc			
Full scale reading	1000 counts			
Crest factor (CREST)				
Range	1 to 10			
Full scale reading	90 Counts			
Phase				
Modes	A to B, B to A			
Range	0 to 359 degrees			
Resolution	1 degree			
Power (125B only)				
Configurations	1 phase / 3 phase 3 conductor balan mode only)	ced loads (3 phase: fundamental component only, AUTOSET		
Power factor (PF)	Ratio between watts and VA range -	0.00 to 1.00		
Watt	RMS reading of multiplying correspon	nding samples of input A (volts) and input B (amperes)		
	Full scale reading	999 counts		
VA	Vrms x Arms			
	Full scale reading	999 counts		
VA reactive (var)	√((VA) <sup>2</sup> -W <sup>2</sup> )			
	Full scale reading	999 counts		
Vpwm				
Purpose	to measure on pulse width modulate	d signals, like motor drive inverter outputs		
Principle	readings show the effective voltage is periods of the fundamental frequency	based on the average value of samples over a whole number of y		
Accuracy	as Vrms for sinewave signals			
Input A to common				
Ohm (Ω)				
Ranges	123B and 124B	500 $\Omega$ , 5 kΩ, 50 kΩ, 500 kΩ, 5 MΩ, 30 MΩ		
	125B	50 Ω, 500 Ω , 5 kΩ, 50 kΩ, 500 kΩ, 5 MΩ, 30 MΩ		
Accuracy	$\pm$ (0.6 % + 5 counts) 50 Ω ±(2 % + 2	20 counts)		
Full scale reading	50 $\Omega$ to 5 M $\Omega$ – 5000 counts, 30 M $\Omega$ -	50 $\Omega$ to 5 M $\Omega$ – 5000 counts, 30 M $\Omega$ – 3000 counts		
Measurement current	0.5 mA to 50 nA, decreases with inc	reasing ranges		
Open circuit voltage	<4 V			
Continuity (Cont)				
Веер	<(30 $\Omega$ ± 5 $\Omega$ ) in 50 $\Omega$ range			
веер	0.5 mA			
Measurement current	0.5 IIIA			
•	≥1 ms			
- Measurement current				
Measurement current Detection of shorts of		>2.8 V		
Measurement current Detection of shorts of Diode	≥1 ms	>2.8 V <4 V		
Measurement current Detection of shorts of Diode	≥1 ms @0.5 mA			



Capacitance (CAP)	
Ranges	50 nF, 500 nF, 5 μF, 50 μF, 500 μF
Full scale reading	5000 counts
Measurement current	500 nA to 0.5 mA, increases with increasing ranges
Advanced meter functions	
Zero Set	Set actual value to reference
AutoHold (on A)	Captures and freezes a stable measurement result. Beeps when stable. AutoHold works on the main meter reading, with thresholds of 1 Vpp for AC signals and 100 mV for DC signals.
Fixed decimal point	Activated by using attenuation keys.
Cursor Readout (124B and 125B)	
Sources	А, В
Single vertical line	Average, min and max readout
	Average, min, max and time from start of readout (in ROLL mode; instrument in HOLD)
	Min, max and time from start of readout (in RECORDER mode; instrument in HOLD)
	Harmonics values in POWER QUALITY mode.
Dual vertical lines	Peak-peak, time distance and reciprocal time distance readout
	Average, min, max and time distance readout (in ROLL mode; instrument in HOLD)
Dual horizontal lines	High, low and peak-peak readout
Rise or fall time	Transition time, 0 %-level and 100 %-level readout (manual or auto leveling; auto leveling only possible in single channel mode)
Accuracy	As oscilloscope accuracy

#### Recorder

The recorder captures meter readings in Meter Recorder mode or continuously captures waveform samples in Scope Recorder mode. The information is stored on internal memory or on optional SD card (with the 125B or 124B).

The results are displayed as Chart recorder display that plots a graph of min and max values of Meter measurements over time or as a waveform recorder display that plots all the captured samples.

Meter readings		
Measurement Speed	Maximum 2 measurements/s	
Record Size (min, max, average)	2 M readings for 1 channel	
Recorded Time Span	2 weeks	
Maximum number of events	1024	
Waveform record		
Maximum sample rate	400 K sample/s	
Size Internal memory	400 M samples Recorded Time	
Span internal memory	15 minutes at 500 μs/div	11 hours at 20 ms/div
Record Size SD card	1.5 G samples	
Recorded Time Span SD card	11 hours at 500 μs/div	14 days at 20 ms/div
Maximum number of events	64	



Power Quality (125B only)			
Readings	Watt, VA, var, PF, DPF, Hz		
Watt, VA, var ranges (auto)	250 W to 250 MW, 625 MW, 1.56 GW		
	when selected: total (%r) $\pm$ (2 % + 6 counts)		
	when selected: fundamental (%f)	± (4 % + 4 counts)	
DPF	0.00 to 1.00		
PF	0.00 to 1.00, ± 0.04		
Frequency range	10.0 Hz to 15.0 kHz	40.0 Hz to 70.0 Hz	
Number of Harmonics	DC to 51		
Readings / Cursor readings (fundamental 40 Hz to 70 Hz)	V rms / A rms /Watt	each harmonic from fundamental maybe selected for individual readings	

Includes frequency of fundamental, phase Angle and K-factor (in Amp and Watt)

Bus health tester (Fluke 125B only)			
Туре	Subtype	Protocol	
AS-i	NEN-EN50295		
CAN	ISO-11898		
Interbus S	RS-422	EIA-422	
Modbus	RS-232	RS-232/EIA-232	
	RS-485	RS-485/EIA-485	
Foundation Fieldbus	H1	61158 type 1, 31.25 kBit	
Profibus	DP	EIA-485	
	PA	61158 type 1	
RS-232	EIA-232		
RS-485	EIA-485		
Miscellaneous			
Display	Туре	5.7-inch color active matrix TFT	
	Resolution	640 x 480 pixels	
Waveform Display	Vertical	10 div of 40 pixels	
	Horizontal	12 div of 40 pixels	
Power	External	via Power Adapter BC430	
	Input voltage	10 V DC to 21 V DC	
	Power consumption	5 W typical	
	Input connector	5 mm jack	
	Internal	via Battery Pack BP290	
	Battery power	Rechargeable Li-Ion 10.8 V	
	Operating time	7 hours with 50 % backlight brightness	
	Charging time	4 hours with test tool off, 7 hours with test tool on	
	Allowable ambient temp	0 to 40 °C (32 to 104 °F) during charging	
Memory	Internal memory can store 20 data sets (screen waveform and setup)	Micro SD card slot with optional SD card (max size of 32 GB)	
Mechanical	Size	259 mm x 132 mm x 55 mm (10.2 in x5.2 in x 2.15 in)	
	Weight	1.4 kg (3.2 lb) including battery pack	



Interface	Optically isolated	Transfer screen copies (bitmaps), settings and data
	USB to PC/laptop	OC4USB optically isolated USB adapter/cable, (optional), using FlukeView® software for Windows®.
	Optional WiFi adapter	Fast transfer of screen copies (bitmaps), settings and data to PC/laptop, tablet, smartphone, etc. A USB port is provided for attaching the WiFi dongle. Do not use the USB port with a cable for safety reasons.
Environmental		
Environmental	MIL-PRF-28800F, Class 2	
Temperature	Battery Operation	0 to 40 °C (32 to 104 °F)
	Power Adapter Operation	0 to 50 °C (32 to 122 °F)
	Storage	-20 to 60 °C (-4 to 140 °F)
Humidity (Operating)	@ 0 to 10 °C (32 to 50 °F)	noncondensing
	@ 10 to 30 °C (50 to 86 °F)	95 %
	@ 30 to 40 °C (86 to 104 °F)	75 %
	@ 40 to 50 °C (104 to 122 °F)	45 %
Storage	@ -20 to 60 °C (-4 to 140 °F)	noncondensing
Altitude	Operating at 3 km (10 000 feet)	CAT III 600 V
	Operating at 2 km (6 600 feet)	CAT IV 600 V
	Storage	12 km (40 000 feet)
EMC electromagnetic compatibility	International	IEC 61326-1: Industrial, CISPR 11: Group 1, Class A
	Korea (KCC)	Class A Equipment (Industrial Broadcasting & Communication Equipment)
	USA (FCC)	47 CFR 15 subpart B. This product is considered an exempt device per clause 15.103.
Wireless radio with adapter	Frequency range	2412 MHz to 2462 MHz
	Output power	<100 mW
Enclosure protection	IP51, ref: EN/IEC60529	
Safety	General	IEC 61010-1: Pollution Degree 2
	Measurement	IEC 61010-2-033: CAT IV 600 V/CAT III 750 V
Max. input voltage input A and B	Direct on input or with leads	600 Vrms CAT IV for derating
	With Banana-to BNC Adapter BB120	600 Vrms for derating
	Max. floating voltage from any terminal to ground	600 Vrms CAT IV, 750 Vrms up to 400 Hz

	Fluke 123B	Fluke 124B	Fluke 125B
Functions			
Full function dual input scope and meter	•	•	•
Oscilloscope bandwidth MHz	20	40	40
Meter and Scope Recorder	•	•	•
Scope cursor measurements		•	•
Power and harmonics measurements			•
Bus health			•
Included accessories			
10:1 voltage probe		•	•
i400S AC Current Clamp			•



### **Ordering information**

Fluke-123B Industrial ScopeMeter® Hand Held Oscilloscope (20 MHz)

Fluke-123B/S Industrial ScopeMeter<sup>®</sup> Hand Held Oscilloscope (20 MHz)\*

Fluke-124B Industrial ScopeMeter® Hand Held Oscilloscope (40 MHz)

Fluke-124B/S Industrial ScopeMeter® Hand Held Oscilloscope (40MHz)\*

Fluke-125B Industrial ScopeMeter® Hand Held Oscilloscope (40MHz)

Fluke-125B/S Industrial ScopeMeter<sup>®</sup> Hand Held Oscilloscope (40MHz)\*

**Includes:** Li-Ion battery pack, charger/power adapter, 2 shielded test leads with ground leads, black test lead, red and blue hook clips, banana to BNC adapter, and WiFi USB adapter\*\*

\*Fluke 120B/S versions also include soft carry case, FlukeView™ for Windows® software, magnetic hanger, and screen protector.

\*\*WiFi USB adapter NOT available in all countries. Check with your local Fluke representative.

**STL120-IV** Shielded Test Lead Set 600 V CAT IV **HC120-II** Set of 2 hook clips

**BB120-II** Set of 2 banana to BNC adapter **VPS41** Voltage probe set 40MHz 600 V CAT IV **C120B** Soft Carrying Case For 120B Series **SP120B** Screen Protector For 120B Series **SCC120B** Accessory Kit 120B Series **OC4USB** Fluke OC4USB USB Interface Cable

Fluke 80i 110s Fluke 80i-110s AC/DC Current Clamp

Fluke i1000s Fluke i1000s AC Current Probe Fluke i1010 Fluke i1010 AC/DC Current Clamp Fluke i200s Fluke i200s AC Current Clamp Fluke-i3000s Fluke i3000s AC Current Clamp Fluke i3000s Flex 24 Fluke i3000s Flex-24 AC Current Clamp, 610 mm (24 in.) Fluke i300s Flex 36 Fluke i3000s Flex-36 AC Current Clamp, 915 mm (36 in.) Fluke i30s Fluke i30s AC/DC Current Clamp Fluke-i310s Fluke i310s Current Probe Fluke i400s Fluke i400s AC Current Clamp Fluke i410 Fluke i410 AC/DC Current Clamp Fluke i55 Fluke i55 AC Current Clamp



# 

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Fluke Connect is not available in all countries.

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