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Find the *Measurement Computing / IOtech WBK10* at our website: *Click HERE*

Important Notice! WaveBook/516E Users

WBK option cards for WaveBook/516E are installed at the factory per customer order. Users are not to remove or install cards for these products as the cards are not "plug-and-play" for these devices and erroneous signal values could result. If you desire to remove or add a card to WaveBook/516E contact the factory or your service representative.

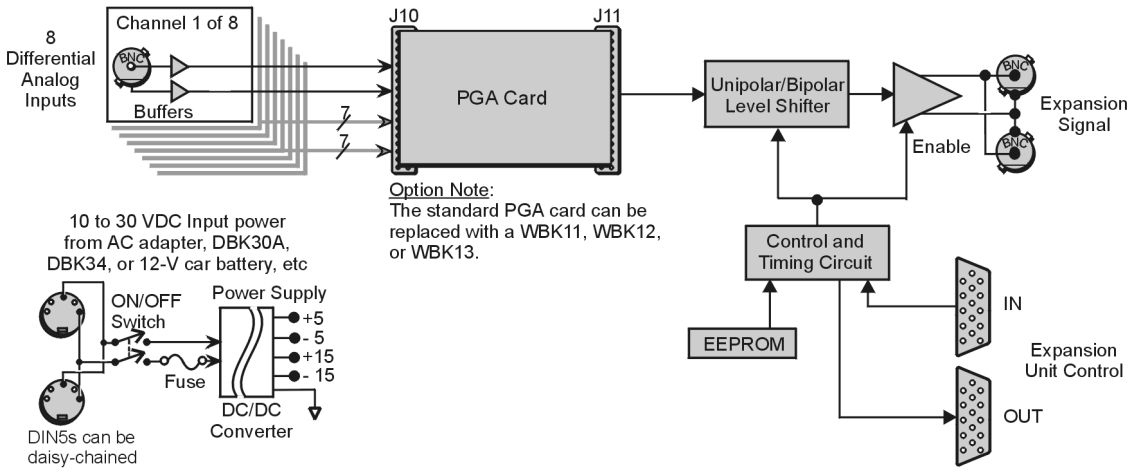
Important Notice! WaveBook/516, /516A, /512A, and WBK10A Users

With exception of the WBK30 option, WBK option cards for WaveBook/516, /516A, /512A, and WBK10A are installed at the factory per customer order. Users are not to remove or install cards for these products [other than WBK30 series cards] as the cards are not "plug-and-play" for these devices and erroneous signal values could result. If you desire to remove or add a card to these products, contact the factory or your service representative.

The WBK10A Analog Expansion Module can be used to provide WaveBook with 8 additional differential-analog-inputs. The WBK10A is equipped with a programmable gain instrumentation amplifier (PGA) and, like the WaveBook, has a built-in expansion bus.

Up to eight WBK10A modules can be cascaded together for a system capacity of 72 differential channels. Each module is capable of supporting a WBK11A, WBK12A, or WBK13A option card.

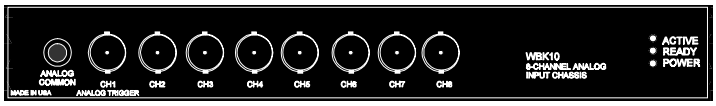
Note: WBK10A can be ordered with a PGA, WBK11A, WBK12A, or a WBK13A card installed.



WBK10A Block Diagram

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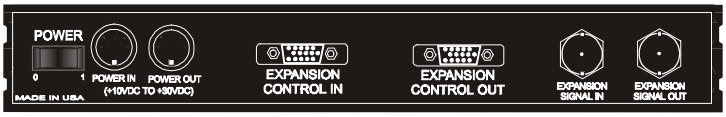
The **front panel** has the following connectors and indicators:



WBK10A Front Panel

- 1 Analog Common binding post for reference.
- 8 BNC connectors for analog inputs. Channels are labeled 1 through 8.
- 3 Status LEDs (Active, Ready, Power).

The **rear panel** has a power switch and the following connectors:



WBK10A Rear Panel

- 2 DIN5 connectors [one for Power In, one for Power Out]
- 1 HD-15M Expansion Control In
- 1 HD-15F Expansion Control Out
- 2 BNC connectors [one for analog Expansion Signal In, one for analog Expansion Signal Out]



Reference Notes:

➢ Setup information pertaining to power, expansion control, and expansion signal connections is contained in the *System Setup and Power Options* chapter of the *WaveBook User's Manual* (p/n 489-0901).

➢ For detailed WaveView information, refer to the *WaveView Document Module* that is included on the data acquisition CD. The document can be accessed using the <View PDFs> button on the CD's opening screen.

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Specifications - WaveBook/516, /516A, /516E, and WBK10A

Analog Specifications

For either a stand alone WaveBook, or for a WBK10A with a WaveBook

Channel Capacity:

WaveBook/516E: 8 built-in voltage channels, expandable up to 72 channels via WBK options. In addition, WaveBook/516E can accommodate up to 3 WaveBook/516A, /512A, or WBK40 options, in any combination. Each added on WaveBook can be expanded up to 72 channels. The maximum WBK41 capacity is 224 T/C channels, 4 analog output channels, 272 digital I/O channels, and 6 counter/timer channels.

WaveBook/516 and /516A: 8 differential, expandable up to 72 differential

BNC Input Connectors: Center conductor is Channel Hi, outer conductor is Channel Low

Input Voltage Ranges (DC Specifications)

	Standard Unit			With WBK11A (Note 3)			With WBK12A/13A (Note 3)			
Voltage Range	Accuracy (Note 2) One Year, 18-28°C		Input Noise LSB rms DC-500KHz (typical)	Accuracy (Note 2) One Year, 18-28°C		Input Noise LSB rms DC-500KHz (typical)	Accuracy (Note 2) One Year, 18-28°C		Input Noise LSB rms (typical)	
	± % reading	± % range		± % reading	± % range		± % reading	± % range	1KHz Filter	Filter Bypass
0 to +10V	.012%	.008%	2	.012%	.008%	2	.012%	.008%	2.2	2.2
0 to +5V (10A) 0 to +4V (516)	.012%	.009%	2	.012%	.009%	2	.012%	.009%	2.2	2.2
0 to +2V	.012%	.012%	3	.012%	.012%	3	.012%	.012%	2.2	3
0 to +1V (10A only)	.012%	.018%	3	.012%	.018%	3	.012%	.018%	2.2	3
0 to +.5V				.018%	.033%	6	.018%	.033%	2.2	6
0 to +.2V				.018%	.08%	8	.018%	.08%	2.2	12
0 to +.1V				.018%	.16%	15	.018%	.16%	2.2	20
-10 to +10V	.012%	.008%	2	.012%	.008%	2	.012%	.008%	2.2	2.2
-5 to +5V	.012%	.008%	2	.012%	.008%	2	.012%	.008%	2.2	2.2
-2 to +2V	.012%	.009%	2	.012%	.009%	2	.012%	.009%	2.2	3
-1 to +1V	.018%	.012%	3	.018%	.012%	3	.018%	.012%	2.2	3.3
-.5 to +.5V (10A only)	.018%	.018%	5	.018%	.018%	6	.018%	.018%	2.2	6
-.2 to +.2V				.018%	.033%	8	.018%	.033%	2.2	12
-.1 to +.1V				.018%	.08%	15	.018%	.08%	2.2	20
-.05 to +.05V (10A only)				.018%	.16%	26	.018%	.16%	4	40

Notes: 1. Specifications assume differential input scan, unfiltered.
2. Accuracy specification is exclusive of noise.
3. Unipolar ranges are not available for WaveBook/516, /516A, or /516E when a WBK11A, WBK12A, or WBK13A option is installed. Unipolar ranges are available with WBK10A and any option.

System Performance: one year, 18-28°C unless otherwise noted

Differential Nonlinearity: ±2 LSB max

Total Harmonic Distortion (10Hz-20KHz): -84dB typical

Signal to Noise and Distortion (SINAD, 10Hz-20KHz): -74dB typical

Temperature Coefficient of Accuracy (0-18 and 28-50°C):

With PGA and WBK11A: ± (.002% + 0.6 LSB)/°C typical, -10 to +10V range

With WBK12A/13A: ± (.002% + 1 LSB)/°C typical, -10 to +10V range

Input Resistance: 5MΩ (single ended); 10MΩ (differential), in parallel with 30pF

Bias Current: <400 nA (0 to 35°C)

Common Mode Rejection: >70dB minimum; >80dB typical; DC-20KHz

Input Bandwidth: DC to 500KHz

Hostile Channel-to-channel Crosstalk (5Vrms input signal, DC-100KHz): -88dB typical

Over-Voltage Protection: ±35 V relative to analog common

Note: Specifications are subject to change without notice.

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PGA Filter

Filter Type: 20KHz low pass, Butterworth, 5-pole filter

WBK11A Functions

Input Voltage Ranges: Software programmable prior to a scan sequence
Aperture Uncertainty (SSH): 75ps max
Voltage Droop (SSH): 0.01mV/ms typ

WBK12A, WBK13A Functions

Input Voltage Ranges: Software programmable prior to a scan sequence
Low Pass Filter Type: Software selectable, 8-Pole elliptic or linear phase
Anti-Aliasing Filters: Single-pole pre and post filters, automatically set depending on filter frequency selected
Low-Pass Filter Frequency Cutoff Range: 100KHz, 75KHz, 60KHz…400Hz, bypass (fc=300KHz/N where N=3 to 750
Filter Grouping: 4 Channels each in two programmable banks
Aperture Uncertainty (SSH): 75ps max
Voltage Droop (SSH): 0.01mV/ms typ

Triggering

Channel 1 Analog Trigger

Input Signal Range: -10 to +10V
Input Characteristics and Protection: Same as channel inputs
Latency: 300ns

Multi-Channel Analog Trigger (up to 72 channels):

Range: Selectable per channel to input range
Latency: 2us/channel, plus 4us maximum

TTL Trigger:

Input Signal Range: 0-5V
Input Characteristics: TTL-compatible with 10K ohm pull-up resistor
Input Protection: Zener clamped –0.7 to +5V
Latency: 300ns

Software Trigger

Latency: 100us typical

Pulse Trigger

Input Signal Range: 0-5V
Input Characteristics: 75 ohms
Input Protection: ±10V maximum
Minimum Pulse Width: 100ns
Latency: 300ns

External Clock

Connector: Available on DB25 digital input
Input Signal Range: 5V TTL compatible
Input Characteristics: 50K ohms pull up (to +5V) in parallel with 50pF
Input Protection: Zener clamped –0.7 to +5V
Delay: **200ns**
Signal Slew Rate Requirement: 20V/us minimum
Rate: Up to 1MHz
Divisor ratio: Divide by 1 through 255, selectable
Clock Counter Accuracy: <0.02% error
Clock Counter Range: 0.01Hz to 100KHz

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Sequencer

Operation: Programmable for channel, gain, and for unipolar/bipolar range in random order

Depth: 128 location

Channel-to-Channel Rate: 1.0-1.1us/channel, all channels equal

Maximum Repeat Rate: 1MHz

Minimum Repeat Rate: 100 seconds per scan

Expansion Channel Sample Rate: Same as on-board channels

High-Speed Digital Inputs/General-Purpose Outputs

Connector: DB25 Female

Configuration: 16 TTL-compatible pins, selectable for input or output

Input Characteristics: TTL-compatible

Output Characteristics: ALS TTL output in series with 33 ohms

Output Updates: Outputs may be changed via program control

Input/Output Protection: Diode clamped to ground and +5V

Period Counter

Operation: Internal counter calculates and reports the external clock's period; counter can be read with each scan

Clock Counter Accuracy: <0.02% error

Clock Counter Range: 0.01 Hz to 100 kHz

General Specifications

Warm-up: 30 minutes to rated specifications

Environment:

Operating: 0-50°C, 0-95% RH (non-condensing)
Storage: -20 to 70°C

Power Consumption:

/516E: 1.8A max @ 15 VDC

/516, /516A & /512A: 1.4A max @ 15VDC

Input Power Range: 10 VDC to 30 VDC

Input Power Fuse F201: 4A MINI ATO; See chapter 9 for fuse replacement instructions.

Vibration: MIL STD 810E, Category 1 and 10

PC Communication:

/516E: 10/100BaseT Ethernet

/516, /516A & /512A: Enhanced Parallel Port (EPP)

Channel Capacity:

/516E: 8 built-in voltage channels, expandable up to 72 channels via WBK options. In addition, WaveBook/516E can accommodate up to 3 WaveBook/516A, /512A, or WBK40 options, in any combination. Each added on WaveBook can be expanded up to 72 channels. The maximum WBK41 capacity is 224 T/C channels, 4 analog output channels, 272 digital I/O channels, and 6 counter/timer channels.

/516, /516A & /512A: 8 built-in voltage channels, expandable up to 72 channels via WBK options

Dimensions:

/516E: 285 mm wide x 220 mm deep x 70 mm high (11 x 8.5 x 2.70 inches)

/516, /516A & /512A: 285 mm wide x 220 deep x 45 mm high (11 x 8.5 x 1.75 inches)

Weight:

/516E: 1.9 kg (4.2 lbs)

/516, /516A & /512A: 1.5 kg (3.3 lbs)

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