WBK12A™ & WBK13A™

8-Channel Programmable Low-Pass Filter Cards

Compatibility: ✔ WaveBook ✔ WBK10A

Features

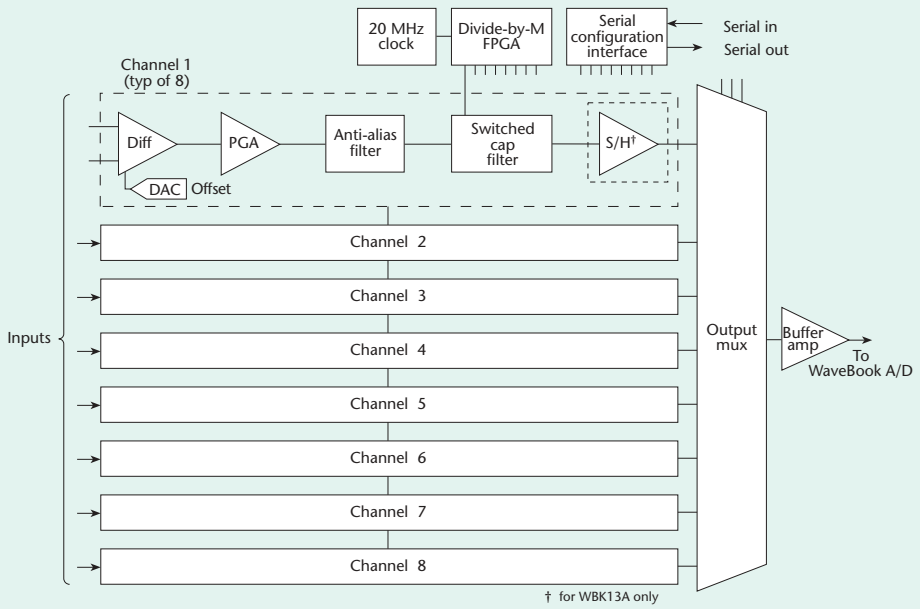
- **Eight channels of programmable low-pass anti-aliasing filtering**
- **Software-programmable 8-pole filters, configurable as elliptic or linear phase**
- **Programmable-cutoff frequencies from 400 Hz to 100 kHz**
- **Two cutoff frequencies per card, configurable in two 4-channel banks**
- **Full-scale programmable input ranges**
  - **Unipolar: +100 mV to +10V**
  - **Bipolar: ±50 mV to ±10V**
- **WBK13A provides eight input channels with simultaneous sampling**
- **WBK13A samples all system channels within 100 ns of one another**

The WBK12A and WBK13A provide eight channels of programmable low-pass filtering for the WaveBook data acquisition system

WBK12A™ and WBK13A™ are 8-channel programmable low-pass filter cards for use with the WaveBook™ portable data acquisition systems. These cards, which install* directly into any WaveBook system or WBK10A™ expansion module, provide programmable low-pass filtering over all channels. The WBK13A further enables the simultaneous sampling of all channels**. If simultaneous sample and hold is installed in multiple modules, then all channels are sampled within 100 ns of one another.

Low-Pass Filters. Each card provides eight input channels, arranged in two 4-channel banks; a different filter and cutoff frequency can be applied to each bank. The cards' filters can be software configured as either an 8-pole elliptic filter with cutoff frequencies of 400 Hz to 100 kHz, or an 8-pole linear phase filter with 400-Hz to 50-kHz cutoff frequencies.

WBK12A & WBK13A Block Diagram



* Must be factory installed and calibrated

** When using a WaveBook system with a WBK11A, WBK13A, WBK16/SSH, or WBK18 the per channel sample rate is $\frac{1\ \text{MHz}}{(n+1)}$ where n=number of active channels

WBK12A™ & WBK13A™

Specifications & Ordering Information

Cutoff Frequencies. The cards provide 5 to 512 cutoff frequencies within each octave (see chart below); these frequencies can be assigned to each bank. You can individually configure any channel to bypass the programmable filter entirely, resulting in a 1-pole low-pass filter at approximately 500 kHz.

Software Selectable Cutoff Frequencies	
Octave	**Number of Cutoff Frequencies**
400 to 780 Hz	512
780 to 1570 Hz	256
1.57 to 3.15 kHz	128
3.15 to 6.3 kHz	64
6.3 to 12.5 kHz	32
12.5 to 25 kHz	16
25 to 50 kHz	8
50 to 100 kHz	5

Simultaneous Sample and Hold. The WBK13A additionally provides per-channel simultaneous sample and hold. Simultaneous sampling of all channels occurs at the start of a scan sequence. The system then measures the output of each sample and hold amplifier at 1 µs/channel until all channels are measured.

Programmable Gain Amplifiers. With the WBK12A or WBK13A installed, gain ranges of the main product are adjusted automatically.

Ranges with Installation of WBK12A & WBK13A		
Range	**WaveBook**	**WBK10A**
Bipolar	±10V, ±5V, ±2V, ±1V ±0.5V, ±0.2V, ±0.1V	±10V, ±5V, ±2V, ±1V ±0.5V, ±0.2V, ±0.1V, ±0.05V
Unipolar	Not Available	0 to +10V, 0 to +5V, 0 to +2V, 0 to +1V, 0 to +0.5V, 0 to +0.2V, 0 to +0.1V

Specifications

Connector: Internal to the WaveBook (36-pin sockets mate with 36-pin connectors)
Channels: 8
Input Voltage Ranges: Software programmable prior to a scan sequence, see table above
Programmable Gain Amplifier
Gain Ranges: x1, 2, 5, 10, 20, 50, & 100
Low-Pass Filter: Software selectable, 8-pole filter
Low-Pass Filter Type:
Software selectable, elliptic or linear phase
Low-Pass Filter Frequency
Cutoff Range: 100 kHz, 75 kHz, 60 kHz…400 Hz, bypass defined as fc = 300 kHz/N where N = 3 to 750
Filter Grouping:
4 channels each in two programmable banks
Accuracy (typ):
With /516A: ±0.012% of reading; ±0.015% of range
With /512A: ±0.03% of reading; ±0.015% of range
CMRR: -80 dB typ
Aperture Uncertainty: 75 ps max
Voltage Droop: 0.01 mV/ms typ
THD: -65 dB (-70 dB typ)
DC Offset: ±2.5 mV (2 LSB) max at any cutoff frequency
Weight: 0.14 kg (0.3 lbs)
Power: Derived from WaveBook or WBK10A
WBK12: 0.45A @ 15V
WBK13: 0.50A @ 15V

Ordering Information

Description	Part No.
Programmable low-pass filter card for the WaveBook or WBK10A	WBK12A
Programmable low-pass filter card with simultaneous sample and hold amplifiers for the WaveBook or WBK10A	WBK13A

For complete information on accessories and cables, visit **www.iotech.com/acc**

Related Products

WaveBook Series p. 17
WBK10A p. 35