DBK55™

8-Channel Frequency Input Module

Compatibility: ✔ LogBook ✔ DaqBook ✔ DaqLab ✔ DaqScan ✔ DaqBoard/2000 Series

Features

- **Provides eight frequency-measurement channels**
- **Programmable from 1 Hz to 950 kHz per channel**
- **Provides frequency resolution to 0.00025 Hz**
- **Accommodates low-level, high-level, or digital inputs**
- **Provides per-channel, user-configurable low-pass filters**

The DBK55™ frequency-input card provides IOtech's data acquisition systems with eight channels of frequency-measurement capability. The card measures the input signal's frequency and converts the frequency to a voltage, which can then be measured by the data acquisition system. The DBK55's output is read by the data acquisition system along with any other analog channels included in the analog scan group, allowing easy correlation of readings from the DBK55 with other test parameters. The DBK55 is particularly useful for making RPM measurements in applications such as automotive testing or the monitoring of flow meters. As many as 32 DBK55s can be connected to one data acquisition system for a total of up to 256 channels. The DBK55 accepts low- and high-level analog signals, as well as digital signals.

The DBK55 provides eight frequency inputs

Analog Inputs. The DBK55 accepts AC-coupled analog inputs up to 80V p-p. Each of its channels is equipped with a low-pass input filter that is jumper selectable for 100 kHz, 300 Hz, or 30 Hz. The module can accommodate 1 Hz to 100 kHz measurement of signals from 50 mV to 80V p-p.

Digital Inputs. The DBK55's digital inputs, which can measure signals from 0.001 Hz to 950 kHz, feature TTL Schmitt-trigger levels and can accept DC-coupled signals from -15V to +15V. The DBK55's

digital inputs are equipped with pull-up resistors for use with relays or switches.

Frequency Range. The DBK55 provides 12-bit resolution at any frequency from 1 Hz to 950 kHz. Its software programmable range selection feature allows you to define minimum and maximum frequencies for conversion. This range is set on a per-channel basis and can extend over the full range of the card or be reduced to a frequency difference of 1 Hz or 1% of the maximum input frequency,

DBK55 Frequency Input Module Block Diagram
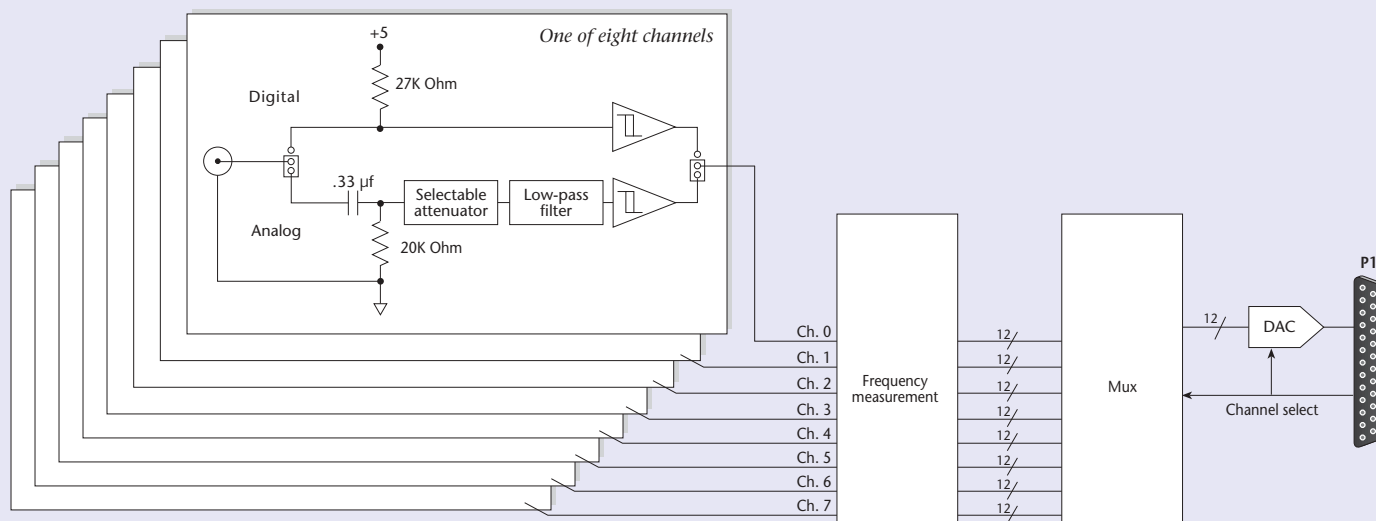
whichever is greater. For example, you can configure one channel for 59.5 Hz to 60.5 Hz, another for 495 kHz to 500 kHz, and yet another for 1 to 950 kHz. When frequencies from 1 Hz to greater than 500 Hz are measured, a corresponding output voltage is generated 250 to 500 times per second; when frequencies from 1 Hz to less than 500 Hz are measured, they are updated once per cycle.

Update Rates. Since the DBK55's resolution is 12 bits regardless of the range selected, update times vary depending upon the range selected. For ranges from 1 Hz to the user-defined maximum upper range boundary, the voltage conversion update will occur every 2 to 4 ms or the period of the input frequency, whichever is greater. With a range of 0 to 10 kHz, the DBK55 will update every 2 to 4 ms. If the range is 0 to 60 Hz, the output will update every cycle or 16.6 ms. As the conversion range becomes more narrow—for example, from 49 to 51 Hz—the time to resolve the 2 Hz differential to 12-bit resolution increases; in this example, the conversion time would be approximately 59 ms.

Incoming Signal Noise. In addition to its low-pass filter, the DBK55 has a predefined hysteresis level built into each channel; this helps eliminate false counting caused by high-frequency noise. A programmable debounce is provided with times of 0.6 ms, 2.5 ms, and 10 ms; this is for electromechanical devices such as switches or relays, which bounce or chatter while switching.

Auto-Calibration. The DBK55 is automatically calibrated upon initialization to compensate for data acquisition system errors and to ensure system accuracy.

Specifications

Dimensions: 285 mm W x 220 mm D x 45 mm H (11" x 8.5" x 1.75")
Weight: 1.13 kg (2.5 lbs.)
Operating Temperature: -30°C to +70°C
Connector: DB37 male, mates with P1★; BNC connectors for signal inputs
Number of Channels per Module: 8
Maximum Modules per System: 32
Frequency-to-Voltage Ranges: Programmable from 1 Hz to 950 kHz
Accuracy: 0.1%
Temperature Coefficient: 10 ppm for every degree outside the range of 0° to 50°C
Low-Pass Filters: 300 Hz and 30 Hz
Debouncing: off 0.6, 2.5, and 10 ms

Input Characteristics
Low-Level Analog Signals
    Minimum: 100 mV guaranteed (50 mV typ)
    Maximum: 80V p-p sine wave
    Minimum Slew: 5V/s
    Hysteresis: 15 mV
    Impedance: AC-coupled (0.33 µF), in series with 20K Ohm to ground; see block diagram
High-Level Analog Signals
    Minimum: 1.25V guaranteed, 0.75V typ
    Maximum: 80V p-p sine wave
    Minimum Slew: 50V/s
    Hysteresis: 250 mV
    Impedance: AC-coupled (0.33 µF), in series with 20K Ohm to ground
Digital Signals
    Input Voltage: -15V to +15V
    Threshold Voltage (low): 0.8V typ, 0.5V min
    Threshold Voltage (high): 1.6V typ, 2.1V max
    Hysteresis: 400 mV min
    Pulse Width (high or low): 520 ns min
    Input Impedance: 27K Ohm pull-up to +5V in parallel with 50 pF
Power Consumption: 950 mW

Ordering Information

Description	Part No.
8-channel frequency-to-voltage input card	DBK55

Accessories & Cables

Rack mount kit	RackDBK3
Shielded P1 T cable for use with DaqBook/2020, LogBook/360, and WBK40/41	CA-255-4T
Shielded P1 T cable for use with DaqBook/2001, DaqBook/2005, LogBook/300, DaqLab/2001, and DaqLab/2005	CA-255-2T
Ribbon cable for use with DaqScan	CA-37-x

Note: The CA-37-x ribbon cable can also be used in lieu of the CA-255-x molded T cables.

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

Related Products

PC Data Acquisition Hardware