

# U3-HV – High Voltage



## **HV (High-Voltage) Version:**

Same features as the LV version except:

- First 4 Flexible I/O are Changed to Dedicated HV Analog Inputs.
- 4 HV Inputs have  $\pm 10$  Volt or  $-10/+20$  Volt Range.
- 12 LV Inputs (Flexible I/O) Still Available, for 16 Total Analog Inputs.

## **Flexible I/O:**

The first 16 I/O lines (FI0 and EI0 ports) on the LabJack U3-LV can be individually configured as digital input, digital output, or analog input. In addition, up to 2 of these lines can be configured as timers, and up to 2 of these lines can be configured as counters. On the U3-HV, the first 4 flexible I/O are replaced with dedicated high-voltage analog inputs.

The first 8 flexible I/O lines (FI00-FI07) appear on built-in screw terminals. The other 8 flexible I/O lines (EI00-EI07) are available on the DB15 connector.

For more information about the flexible I/O see Section 2.5 of the User's Guide. For data rate information see Section 3.1. The User's Guide can be found on the [U3 Support page](#).

## **Analog Inputs:**

The LabJack U3 has up to 16 [analog inputs](#) available on the flexible I/O lines. Single-ended measurements can be taken of any line compared to ground, or differential measurements can be taken of any line to any other line.

Analog input resolution is 12-bits. The range of single-ended low-voltage analog inputs on the U3-LV is typically 0-2.4 volts or 0-3.6 volts, and the range of differential analog inputs is typically  $\pm 2.4$  volts (pseudobipolar only). For valid measurements, the voltage on every analog input pin, with respect to ground, must be within -0.3 to +3.6 volts.

On the U3-HV, the first 4 flexible I/O are replaced with dedicated high-voltage analog inputs. The input range of these channels is  $\pm 10$  volts or -10/+20 volts. The remaining 12 flexible I/O are still available as described above, so the U3-HV has 4 high-voltage analog inputs and up to 12 low-voltage analog inputs.

Command/response (software timed) analog input reads typically take 0.6-4.0 ms depending on number of channels and communication configuration. Hardware timed input streaming has a maximum rate that varies with resolution from 2.5 ksamples/s at 12-bits to 50 ksamples/s at about 10-bits.

For more information about the analog inputs see Section 2.6 and Appendix A of the User's Guide. For data rate information see Sections 3.1 and Sections 3.2. The User's Guide can be found on the [U3 Support page](#).

## **Analog Outputs:**

The LabJack U3 has 2 [analog outputs](#) (DAC0 and DAC1) that are available on the screw terminals. Each analog output can be set to a voltage between 0 and 5 volts with 10-bits of resolution.

The analog outputs are updated in command/response mode, with a typical update time of 0.6-4.0 ms depending on communication configuration. The analog outputs have filters with a 3 dB cutoff around 16 Hz, limiting the frequency of output waveforms to less than that.

For more information about the analog outputs see Section 2.7 and Appendix A of the User's Guide. For data rate information see Section 3.1. The User's Guide can be found on the [U3 Support page](#).

## **Digital I/O:**

The LabJack U3 has up to 20 [digital I/O](#) channels. 16 are available from the flexible I/O lines, and 4 dedicated digital I/O (CI00-CI03) are available on the DB15 connector. Each digital line can be individually configured as input, output-high, or output-low. The digital I/O use 3.3 volt logic and are 5 volt tolerant.

Command/response (software timed) reads/writes typically take 0.6-4.0 ms depending on communication configuration. The first 16 digital inputs can also be read in a hardware timed input stream where all 16 inputs count as a single stream channel.

For more information about the digital I/O see Section 2.8 and Appendix A of the User's Guide. For data rate information see Sections 3.1 and 3.2. The User's Guide can be found on the [U3 Support page](#).

## **Timers:**

Up to 2 flexible I/O lines can be configured as timers. The timers are very flexible, providing options such as PWM output, pulse/period timing, pulse counting, and quadrature input.

For more information about the timers see Section 2.9 and Appendix A of the User's Guide. The User's Guide can be found on the [U3 Support page](#).

## **Counters:**

Up to 2 flexible I/O lines can be configured as 32-bit [counters](#).

For more information about the counters see Section 2.9 and Appendix A of the User's Guide. The User's Guide can be found on the [U3 Support page](#).

### **I/O Protection:**

All I/O lines on the U3 are protected against minor overvoltages. The FIO lines can withstand continuous voltages of up to  $\pm 10$  volts, while the EIO/CIO lines withstand continuous voltages of up to  $\pm 6$  volts.

### **High Channel Count Applications:**

By using USB hubs, many LabJacks can be interfaced to a single PC, providing an inexpensive solution for high channel count applications.