Model 6757
16 –Bit Digital Interface Option

INSTRUCTION MANUAL

Revision 2, September 09, 2005

CAMBRIDGE TECHNOLOGY, INC.
109 Smith Place
Cambridge, MA 02138
U.S.A.

TEL.617-441-0600 FAX.617-497-8800
www.camtech.com

The 6757 digital input option employs a 16-bit digital-to-analog converter or DAC. This DAC converts the digital signal presented at its input into an analog voltage. This voltage is proportional to the 16-bit "word" sent.

**Caution: The 6757 contains sensitive electronic components that may be static sensitive. Please use anti-static methods when handling all electronic components and assemblies.

With the system power off, align the 8-pin row of pins at the back of the 6757 Digital Input Module with the appropriate header on the servo card. Make sure that all eight pins in the back and the four pins in the front of the module line up correctly and firmly press the module until fully seated.

Install the 6013-1-xxx cable into the 30-pin header on the top of the input module. Use care to align the key tabs on the header to the slots on the cable's plug. All the digital signals are brought in through this cable via the 30-pin connector, J1. Refer to the 6757 schematic for the pinout of the 30-pin connector.

The converter used on the 6757 is Linear Technology's LTC1597-1ACG. The dac converts its 16-bit TTL signal into an analog voltage from +10 volts to -10 volts as shown below:

dac count = 0_{10}	VDAC = -10 volts	position = full CCW angle
dac count = 32768_{10}	VDAC = 0 volts	position = center
dac count = 65535_{10}	VDAC = +10 volts	position = full CW angle

For a more detailed description of this DAC, please go to the Linear Technology, Inc. website at: www.linear.com.

The 6757 board has pullup/pulldown resistors to center the scanners when the inputs are sent to a "high Z" state or left unconnected. The DACs have true 16-bit monotonicity that is crucial for many high resolution applications. The DAC inputs are fully double buffered and the data can be strobed in by action of the /CS, and /LDAC lines. Refer to the schematic for locations of these signals.

Initialize the digital input by setting /CLR line low. In this state, no data line changes or changes to the CS or LDAC lines will cause any changes in the DAC's output. To write to the module, send the digital word to the 16 data lines, bring the /CLR line high, and the /CS line low. This will store the digital signal in the first buffer of the DAC.

At this time, the digital signal has still not yet been presented to the DAC output. To do this, bring the /LDAC line low. This action stores the digital signal into the second buffer of the DAC.

Both the /CS and /LDAC lines are level triggered, so the DAC can be made transparent (it follows the input in real time) by just setting both low at the same time and holding them there.

Sometimes it is advantageous to have an X/Y system move both scanners at the same instant. To perform this, the double buffering feature of the DAC is used. Follow the initial procedures as described above except leave both /LDAC lines high. Write data into both channels using the /CS lines also as described above. The data for both channels is now stored in the DAC input buffers, but not yet sent to the DAC outputs. Then bring both channels' /LDAC lines low at the same time. This allows both DACs to respond simultaneously.

The maximum data rate may be limited by the length of interface cable and by the termination method chosen. The 6757 has 100ohm resistors in series with 100pF capacitors to Gnd to minimize ringing and transients for a cable approximately 120 inches long. Trial and error with the system at integration will be required to determine the maximum data rate possible.

Included Drawings:

1. 6757 Schematic D06725
2. 6013-1-xxx Cable Assembly Drawing D06599