

# 1752A Programmer's Quick Reference Card



This card summarizes programming information for the 1752A measurement and control modules.

## 1752A-010 Analog Measurement Processor Subroutines (AIOLIB)

### BOARD FUNCTIONS

**ADCAL(board%,calibration%)** Enable/disable automatic self-calibration.  
calibration = 0: disable  
calibration = non-zero: enable (default)

**ADSYNC(board%,sync%)** Set sync mode.  
sync = 0: asynchronous (default)  
sync = 1: 50/60 Hz, external  
sync = 2: 400 Hz, external  
sync = 50: 50 Hz, internal  
sync = 60: 60 Hz, internal  
sync = 400: 400 Hz, internal

**ADSTAT(board%,SY%,CA%)** Get calibration and sync mode status.

### CHANNEL FUNCTIONS

**AIMODE(channel%,mode%)** Set an input channel to single-ended or differential mode.  
mode = 1: single-ended (default)  
mode = 2: differential

**AIENBL(channel%,enable%)** Set an input channel to be read or skipped.  
enable = 0: skip  
enable = non-zero: read (default)

**AIRNGE(channel%,range%)** Select the range for an input channel.  
range = 1: 10 volts (default)  
range = 2: 1 volt  
range = 3: 65 mA  
range = 4: 4 to 20 mA, returned as 0 to 100%

**AIFLTR(channel%,filter%)** Select the filter for an input channel  
 $0 \leq \text{filter} \leq 255$  (default = 1)

**AISSET(channel%,mode%,enable%,range%,filter%)** Set all parameters for an input channel.  
(see parameters above)

**AISTAT(channel%,MO%,EN%,RA%,FI%)** Get the status of an input channel.

### READ FUNCTIONS

**AIREAD(channel%,RE)** Read an input channel in floating-point format.  
**AISCAN(first%,last%,set%,AR())** Take sets of readings in floating-point format.  
**AISCNI(first%,last%,set%,BR())** Take sets of readings in integer format.

## 1752A-012 Counter/Totalizer Subroutines (DIOLIB)

### SETUP FUNCTIONS

CTFREQ(channel%,source%, gatetime%)	Set up a channel for frequency measurement. (default)  source = 1: TTL (default) source = 2: Analog  gatetime = 1: 3.28 msec, 305.2 Hz (default) gatetime = 2: 26.21 msec, 38.15 Hz gatetime = 3: 209.7 msec, 4.769 Hz gatetime = 4: 3.355 sec, 0.2999 Hz
CTTIME(channel%,source%,slope%)	Set up a channel for time measurement.  source = 1: TTL source = 2: Analog source = 3: Gate 1, Gate 2  If source is 1 or 2:  slope = 1: + edge to a + edge slope = 2: - edge to a - edge slope = 3: + edge to a - edge slope = 4: - edge to a + edge  If source is 3:  slope = 1: +G2 to +G2 (enabled by a +G1 before each +G2) slope = 2: +G1 to +G2, fast (1.2 $\mu$ s to 6.7 sec) slope = 3: +G1 to +G2, slow (819 $\mu$ s to 3.82 hr) slope = 4: -(G1&G2) to -(G1&G2) slope = 5: +(G1&G2) to -(G1&G2) fast slope = 6: +(G1&G2) to -(G1&G2) slow
CTTOTL(channel%,gate%,initial)	Set up a channel for totalizing or counting events.  gate = 1: No external gating gate = 2: +G1 to +G2 gate = 3: +(G1&G2) to -(G1&G2)  $-8,388,608 \leq \text{initial} \leq 8,388,607$
CTTRCF(channel%,type%)	Select the trigger type for a channel.  type = 1: No trigger (default) type = 2: Rising edge of external trigger input type = 3: Falling edge of external trigger input type = 4: Software trigger
CTMODE(channel%,mode%)	Put a channel in continuous or single measurement mode.  mode = 0: single mode = non-zero: continuous (default)

### MEASUREMENT FUNCTIONS

CTRDY(channel%,RD%)	See if a reading is available at a channel.  RD = 0: unavailable RD = 1: available
CTTRGR(channel%)	Trigger a measurement or enable totalizing.
CTREAD(channel%,RE)	Read a single channel.
CTSCAN(first%,last%,set%,AR())	Read a group of channels.

## 1752A-011 Analog Output Subroutines (AIOLIB)

AOCRNT(channel%,amps)

Output current on a channel (in amps)

$0.0 \leq \text{amps} \leq 0.020475$  (default = 0)

AOVLTG(channel%,volts)

Output voltage on a channel (in volts)

$-10.2375 \leq \text{volts} \leq 10.2375$  (default = 0)

## 17XXA-002 Parallel Interface Subroutines (PIBLIB)

### BIT FUNCTIONS

CHKBIT(port%,bit%,bool%)

Return the boolean value of a bit.

CLRBIT(port%,bit%)

Clear a bit on a port.

SETBIT(port%,bit%)

Set a bit on a port.

### READ/WRITE FUNCTIONS

RDWORD(port%,bool%)

Read a word at a port.

WTWORD(port%,word%)

Write a word to a port.

RDBLK(port%,block%,count%)

Read to a port from an array.

WTBLK(port%,block%,count%)

Write to a port from an array.

FRDBLK(port%,block%,count%)

Same as RDBLK, but faster.

FWTBLK(port%,block%,count%)

Same as WTBLK, but faster.

### PORT FUNCTIONS

POPEN(port%,mode%,mask%,  
timeout%)

Open a port with direction of data flow set by mask.

mode = 0: No Handshake

mode = 1: Hndshkin

mode = 2: Hndshkout

mode = 3: Strobeout

$-32768 \leq \text{mask} \leq +32767$

$0 \leq \text{timeout} \leq 32767$

PCLOSE(port%)

Close a port.

## **Error Messages**

### **17XXA-002 PARALLEL INTERFACE ERRORS**

- 1200     PIB software drivers not linked with FDOS
- 1201     Port not available
- 1202     Illegal function call
- 1203     Port already open
- 1204     Port not opened
- 1205     Attempted write to a read-only bit
- 1206     Attempted read from a write-only bit
- 1207     Port timed out
- 1220     Illegal port number
- 1221     Illegal mode
- 1222     Illegal bit value

### **1752A-010 ANALOG MEASUREMENT PROCESSOR ERRORS**

- 1500     AIOLIB software drivers have not been linked with FDOS.
- 1503     The Analog Measurement Processor is not installed.
- 1504     Illegal Analog Measurement Processor board address.
- 1505     The analog input channel is not installed.
- 1506     Illegal analog input channel number.
- 1507     (Warning) The analog input channel has been changed to differential mode.
- 1508     Illegal parameter for the ADSYNC function.
- 1509     Illegal parameter for setting the input mode of an analog input.
- 1510     Illegal parameter for setting the range of an analog input channel.
- 1511     Illegal parameter for setting the filter of an analog input channel.
- 1512     Illegal parameter for the number of sets of readings to be taken.
- 1513     (Warning) The specified analog input channel has been disabled.
- 1514     (Warning) The input to an analog input channel is out of range.
- 1515     (Warning) The filter value has been truncated to power of two.
- 1516     The external sync input is not present.
- 1519     The first channel parameter is greater than the last channel parameter.
- 1520     Analog Measurement Processor has had an overspeed failure.
- 1521     Analog Measurement Processor configuration has been corrupted.
- 1522     Analog Measurement Processor has had a calibration error.
- 1523     Analog Measurement Processor has had a system error.
- 1524     (Warning) The analog input channel has been changed to the 10V range.
- 1525     Analog Measurement Processor does not respond.

### **1752A-011 ANALOG OUTPUT ERRORS**

- 1500     AIOLIB software drivers have not been linked with FDOS.
- 1501     The analog output channel is not installed.
- 1502     Illegal analog output channel number.
- 1517     Illegal parameter for the AOVLTG function.
- 1518     Illegal parameter for the AOCRNT function.

### **1752A-012 COUNTER/TOTALIZER ERRORS**

- 1600     DIOLIB software drivers have not been linked with FDOS.
- 1601     The Counter/Totalizer channel is not installed.
- 1602     Illegal Counter/Totalizer channel number.
- 1603     The first channel parameter is greater than the last channel parameter.
- 1604     Illegal parameter for designating the source.
- 1605     Illegal parameter for setting the slope combination for CTTIME.
- 1606     Illegal parameter for setting the gate time for the CTFREQ function.
- 1607     Illegal parameter for selecting the external gating for totalizing.
- 1608     The initial value parameter for totalizing was out of range.
- 1609     Illegal parameter for selecting the trigger type.
- 1610     (Warning) The function specified has no effect on totalizing.
- 1611     (Warning) The reading for the specified channel is out of range.