

Digilent Synchronous Parallel Interface (DSTM) Programmer's Reference Manual

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Introduction

This document describes the programming interface of the Digilent Synchronous Parallel Interface (DSTM) subsystem for version 2 of the Digilent Adept software system. It describes the capabilities of the DSTM subsystem and the API functions used to access its features. For information regarding the signals and transfer protocol, please refer to the *Digilent Synchronous Parallel Interface (DSTM)* document available on www.digilentinc.com.

The Digilent Synchronous Parallel Interface is available on many Digilent FPGA system boards. It uses an 8-bit bidirectional parallel data bus and nine handshaking lines to control the data transfer. The data transfer speed that can be achieved depends on the particular communications subsystem and the implemented gate array logic.

In the following description, the term “host” represents the host PC running the Adept 2 application. Signals from the host are controlled by the Digilent communication interface. The term “device” refers to the logic implemented in the gate array of the system board.

All DSTM API calls return a Boolean value: TRUE if the call is successful, FALSE if not successful.

DSTM API Functions

The following API functions make up the DSTM interface.

DstmGetVersion (char * szVersion)

Parameters

szVersion - pointer to buffer to receive version string

This function returns a version number string identifying the version number of the DSTM DLL. The symbol `cchVersionMax` declared in `dpcdecl.h` defines the longest string that can be returned in *szVersion*.

DstmGetPortCount (HIF hif, INT32 * pcprt)

Parameters

hif - open interface handle on the device
pcprt - pointer to variable to receive count of ports

This function returns the number of DSTM ports supported by the device specified by *hif*.

DstmGetPortProperties (HIF hif, INT32 prtReq, DWORD * pdprp)

Parameters

hif - open interface handle on the device
prtReq - port number to query
pdprp - pointer to variable to return port property bits

This function returns the port properties bits for the specified DSTM port. The port properties bits indicate the specific features of the DSTM specification implemented by the specified port.

DstmEnable (HIF hif)

Parameters

hif - open interface handle on the device

This function is used to enable the default DSTM port (port 0) on the specified device. This function must be called before any functions that operate on the DSTM port may be called for the specified device.

DstmEnableEx (HIF hif, INT32 prtReq)

Parameters

hif - open interface handle on the device
prtReq - DSTM port number

This function is used to enable a specific port on devices that support multiple DSTM ports. This function must be called before any functions that operate on the DSTM port can be called. The *prtReq* parameter specifies the port number of the DSTM port to enable.

DstmDisable (HIF hif)*Parameters*

hif - open interface handle on the device

This function is used to disable and end access to the currently enabled DSTM port on the specified interface handle.

DstmIO (HIF hif, BYTE * rgbOut, DWORD cbOut, BYTE * rgbIn, DWORD cbIn, BOOL fOverlap)*Parameters*

hif - open interface handle on the device
rgbOut - pointer to the buffer to receive data from the device
cbOut - number of bytes to read from the device
rgbIn - pointer to the buffer containing data to send from the host to the device
cbIn - number of bytes to send to the device

The DstmIO function performs a DSTM data transfer. *cbOut* specifies the number of bytes to send from the host to the device. The data to send is contained in the *rgbOut* buffer. *cbIn* specifies the number of bytes to read to the host from the device. The data will be placed in the *rgbIn* buffer. This call can be performed immediately after enabling a DSTM port on the device.

DstmIOEx (HIF hif, BYTE * rgbOut, DWORD cbOut, BYTE * rgbIn, DWORD cbIn, BOOL fOverlap)*Parameters*

hif - open interface handle on the device
rgbOut - pointer to the buffer to receive data from the device
cbOut - number of bytes to read from the device
rgbIn - pointer to the buffer containing data to send from the host to the device
cbIn - number of bytes to send to the device

The DstmIOEx function performs a high-speed DSTM data transfer. *cbOut* specifies the number of bytes to send from the host to the device. The data to send is contained in the *rgbOut* buffer. *cbIn* specifies the number of bytes to read to the host from the device. The data will be placed in the *rgbIn* buffer.

DstmIOEx offers faster device-to-host transfer rates than DstmIO. This API requires that the device send the same number of bytes to the host as specified by *cbIn*. The gate array logic needs to be configured with this upload byte count prior to the DstmIOEx transfer. This can be done by using a predetermined upload size or by using another data transfer method, such as the DEPP interface, to specify the upload size.