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**White Paper:**  
**Mandatory Features**

The TWAIN Working Group  
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This document replaces the Chapter 5 section "Requirements for a Source to be TWAIN-Compliant," on page 5-18 of the TWAIN 2.1 specification.

## TWAIN Mandatory Features

The following list of triplets and capabilities map out the minimum required set of features that all Sources must offer programmatically to be TWAIN compliant.

Further in this paper, additional mandatory capabilities are listed based on the value set for a Capability that has been implemented, or when a Source with a specific feature is being used.

Operations	Version Required
DG_CONTROL / DAT_CAPABILITY / MSG_GET	1.5
DG_CONTROL / DAT_CAPABILITY / MSG_GETCURRENT	1.5
DG_CONTROL / DAT_CAPABILITY / MSG_GETDEFAULT	1.5
DG_CONTROL / DAT_CAPABILITY / MSG_RESET	1.5
DG_CONTROL / DAT_CAPABILITY / MSG_SET	1.5
DG_CONTROL / DAT_EVENT / MSG_PROCESSEVENT	1.5
DG_CONTROL / DAT_IDENTITY / MSG_GET	1.5
DG_CONTROL / DAT_IDENTITY / MSG_OPENDS	1.5
DG_CONTROL / DAT_IDENTITY / MSG_CLOSED	1.5
DG_CONTROL / DAT_PENDINGXFERS / MSG_ENDXFER	1.5
DG_CONTROL / DAT_PENDINGXFERS / MSG_GET	1.5
DG_CONTROL / DAT_PENDINGXFERS / MSG_RESET	1.5
DG_CONTROL / DAT_SETUPMEMXFER / MSG_GET	1.5
DG_CONTROL / DAT_STATUS / MSG_GET	1.5
DG_CONTROL / DAT_USERINTERFACE / MSG_DISABLED	1.5
DG_CONTROL / DAT_USERINTERFACE / MSG_ENABLED	1.5
DG_CONTROL / DAT_XFERGROUP / MSG_GET	1.5
DG_IMAGE / DAT_IMAGEINFO / MSG_GET	1.5
DG_IMAGE / DAT_IMAGELAYOUT / MSG_GET	1.5
DG_IMAGE / DAT_IMAGELAYOUT / MSG_GETDEFAULT	1.5
DG_IMAGE / DAT_IMAGELAYOUT / MSG_RESET	1.5
DG_IMAGE / DAT_IMAGELAYOUT / MSG_SET	1.5
DG_IMAGE / DAT_IMAGEMEMXFER / MSG_GET	1.5
DG_IMAGE / DAT_IMAGENATIVEXFER / MSG_GET	1.5
DG_CONTROL / DAT_CAPABILITY / MSG_QUERY SUPPORT	1.9
DG_CONTROL / DAT_USERINTERFACE / MSG_ENABLED *	1.9
* Support <b>both</b> UI and Programmatic Control Through: (Show UI == TRUE) [UI Control] (Show UI == FALSE) [Programmatic Control]	
DG_CONTROL / DAT_CAPABILITY / MSG_RESETALL	1.91
DG_CONTROL / DAT_CAPABILITY / MSG_GET *	2.0
*For TW_BOOL capabilities return enumerations when the Application is 2.0 or greater. Return one value when the application less than 2.0	

<b>Capabilities</b>	<b>Requirements</b>	<b>Version Required</b>
CAP_SUPPORTEDCAPS	MSG_GET required	1.5
CAP_UICONTROLLABLE	MSG_GET required	1.5
CAP_XFERCOUNT	All MSG_* operations required	1.5
ICAP_COMPRESSION	All MSG_GET* operations required	1.5
ICAP_BITDEPTH	All MSG_* operations required	1.5
ICAP_BITORDER	All MSG_* operations required	1.5
ICAP_PLANARCHUNKY	All MSG_GET* operations required	1.5
ICAP_PHYSICALHEIGHT	All MSG_GET* operations required	1.5
ICAP_PHYSICALWIDTH	All MSG_GET* operations required	1.5
ICAP_PIXELFLAVOR	All MSG_GET* operations required	1.5
ICAP_PIXELTYPE	All MSG_* operations required	1.5
ICAP_UNITS	All MSG_* operations required	1.5
ICAP_XFERMECH	All MSG_* operations required	1.5
ICAP_XRESOLUTION	All MSG_* operations required	1.5
ICAP_YRESOLUTION	All MSG_* operations required	1.5
CAP_DEVICEONLINE	MSG_GET required	1.6
CAP_UICONTROLLABLE	( Value = TRUE )	1.9

## Mandatory Features Dependencies

### SUPPORTED GROUPS

When source supports:	Must support:	Version intro:
DF_DS2	DG_CONTROL / DAT_ENTRYPOINT / MSG_SET	2.0

### CUSTOM CONTENT

When source supports:	Must respond to:	Mandatory capability:	Version intro:
Custom Content	DG_CONTROL / DAT_CAPABILITY MSG_GET MSG_GETLABEL MSG_GETLABELENUM	CAP_CUSTOMINTERFACEGUID	2.1

### ICAP\_PIXELTYPE

When value is:	Must respond to:	Mandatory capability:	Version intro:
TWPT_BW	DG_CONTROL / DAT_CAPABILITY All MSG_*	ICAP_BITDEPTHREDUCTION	1.5

### ICAP\_BITDEPTHREDUCTION

When value is:	Must respond to:	Mandatory capabilities:	Version intro:
TWBR_HALFTONE	DG_CONTROL / DAT_CAPABILITY All MSG_*	ICAP_HALFTONES	1.0
TWBR_CUSTHALFTONE	DG_CONTROL / DAT_CAPABILITY All MSG_*	ICAP_CUSTHALFTONE	1.0
TWBR_THRESHOLD	DG_CONTROL / DAT_CAPABILITY All MSG_*	ICAP_THRESHOLD	1.5

### ICAP\_XFERMECH

When value is:	Must support	Version intro:
TWSX_FILE	ICAP_IMAGEFILEFORMAT	1.0
	DG_CONTROL / DAT_SETUPFILEXFER / MSG_GET, MSG_SET	
	DG_IMAGE / DAT_IMAGEFILEXFER / MSG_GET	

## ICAP\_SUPPORTEDSIZES

<b>When source supports:</b>	<b>Must respond to:</b>	<b>Mandatory capability:</b>	<b>Version intro:</b>
Document Scanning using Fixed Frame Sizes	DG_CONTROL / DAT_CAPABILITY All MSG_*	ICAP_SUPPORTEDSIZES	1.0

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## Document Feeders

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Basic document feeder devices are those that have paper trays to hold one or more documents for transfer. Unique aspects of a document feeder include the ability to transfer more than one image, the typical inability to re-scan the same page twice, and the fact that if there is no paper loaded, it is usually impossible to scan.

### ALL DOCUMENT FEEDERS

<b>When source is a:</b>	<b>Must respond to:</b>	<b>Mandatory capabilities:</b>	<b>Version intro:</b>
Document Feeder	DG_CONTROL / DAT_CAPABILITY All MSG_GET*	CAP_FEEDERENABLED CAP_PAPERDETECTABLE CAP_AUTOFEED	1.0 1.6 1.0

### CAP\_PAPERDETECTABLE

<b>When value is:</b>	<b>Must respond to:</b>	<b>Mandatory capability:</b>	<b>Version intro:</b>
TRUE	DG_CONTROL / DAT_CAPABILITY All MSG_GET*	CAP_FEEDERLOADED	1.0

### CAP\_AUTOFEED

<b>When value is:</b>	<b>Must provide <i>advanced paper handling</i> through:</b>	<b>Version intro:</b>
FALSE	CAP_EXTENDED CAPS CAP_FEEDPAGE CAP_CLEARPAGE CAP_REWINDPAGE	1.0 1.0 1.0 1.0

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## Special Case

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### ADF/FLATBED COMBO SCANNER

<b>When source is a:</b>	<b>Must respond to:</b>	<b>Mandatory capability:</b>	<b>Version intro:</b>
Flatbed / ADF combo scanner	DG_CONTROL / DAT_CAPABILITY All MSG_ *	CAP_AUTOMATICSENSEMEDIUM	2.1

### DUPLEX

<b>When source supports:</b>	<b>Must respond to:</b>	<b>Mandatory capabilities:</b>	<b>Version intro:</b>
Duplex scanning	DG_CONTROL / DAT_CAPABILITY All MSG_ *	CAP_DUPLEX CAP_DUPLEXENABLED	1.7 1.7

### PRINTERS

<b>When source controls:</b>	<b>Must respond to:</b>	<b>Mandatory capabilities:</b>	<b>Version intro:</b>
Any printer type device	DG_CONTROL / DAT_CAPABILITY All MSG_ *	CAP_PRINTERENABLED CAP_PRINTER	1.8 1.8

### ICAP\_PRINTERMODE

<b>When source supports:</b>	<b>Must respond to:</b>	<b>Mandatory capability:</b>	<b>Version intro:</b>
CAP_PRINTERSTRING	DG_CONTROL / DAT_CAPABILITY All MSG_ *	CAP_PRINTERMODE	1.8
CAP_PRINTERSUFFIX	DG_CONTROL / DAT_CAPABILITY All MSG_ *	CAP_PRINTERMODE	1.8

### ENDORSER

<b>When source controls:</b>	<b>Must respond to:</b>	<b>Mandatory capability:</b>	<b>Version intro:</b>
Endorser	DG_CONTROL / DAT_CAPABILITY All MSG_ *	ICAP_SUPPORTEDEXTIMAGEINFO CAP_ENDORSER	2.1 1.7

## Production Quality High Speed/Volume Scanners

Production Quality High Speed/Volume scanners have greater demands on TWAIN. With diverse features like bar code reading, imprinting and compressions, they require much more attention to detail. Production drivers should be prepared to serve applications that wish to achieve complete programmatic control of all typical and custom features and this requires a VERY robust TWAIN implementation.

Mid- and High-volume scanners must support the following operational triplets:

DG\_CONTROL / DAT\_USERINTERFACE / MSG\_ENABLEDSUIONLY

DG\_CONTROL / DAT\_CUSTOMSDATA / MSG\_GET & MSG\_SET

### INTERNAL IMAGE BUFFER

<b>When source supports:</b>	<b>Must respond to:</b>	<b>Mandatory capabilities:</b>	<b>Version intro:</b>
Transfer of multiple images ahead of retrieval	DG_CONTROL / DAT_CAPABILITY All MSG_*	CAP_AUTOSCAN CAP_MAXBATCHBUFFERS CAP_CLEARBUFFERS	1.6 1.8 1.8

### ICAP\_UNDEFINEDIMAGESIZE

<b>When source supports:</b>	<b>Must respond to:</b>	<b>Mandatory capability:</b>	<b>Version intro:</b>
ICAP_AUTOSIZE	DG_CONTROL / DAT_CAPABILITY All MSG_*	ICAP_UNDEFINEDIMAGESIZE	2.0
ICAP_AUTOMATICBORDERDETECTION	DG_CONTROL / DAT_CAPABILITY All MSG_*	ICAP_UNDEFINEDIMAGESIZE	1.8
ICAP_AUTOMATICLENGTHDETECTION	DG_CONTROL / DAT_CAPABILITY All MSG_*	ICAP_UNDEFINEDIMAGESIZE	2.1
ICAP_AUTOMATICROTATE	DG_CONTROL / DAT_CAPABILITY All MSG_*	ICAP_UNDEFINEDIMAGESIZE	1.8
ICAP_FLIPROTATION	DG_CONTROL / DAT_CAPABILITY All MSG_*	ICAP_UNDEFINEDIMAGESIZE	1.8

## ICAP\_COMPRESSION

When value is:	Must respond to:	Mandatory capabilities:	Version intro:
TWCP_JPEG	DG_CONTROL / DAT_CAPABILITY All MSG_GET*	ICAP_JPEGPIXELTYPE ICAP_JPEGQUALITY	1.5 1.9

When value is:	Must respond to:	Mandatory capabilities:	Version intro:
TWCP_GROUP32D	DG_CONTROL / DAT_CAPABILITY All MSG_GET*	ICAP_CCITTKFACTOR	1.0

## EXTENDED IMAGE INFO

When source supports:	Must respond to:	Mandatory capabilities:	Version intro:
Extended image info	DG_CONTROL / DAT_CAPABILITY MSG_GET	ICAP_EXTIMAGEINFO ICAP_SUPPORTEDEXTIMAGEINFO	1.7 2.1
		<b>Mandatory values:</b>	
Extended image info	DG_CONTROL / DAT_EXTIMAGEINFO	TWEI_DOCUMENTNUMBER TWEI_PAGENUMBER TWEI_CAMERA TWEI_FRAMENUMBER TWEI_FRAME TWEI_PIXELFLAVOR	1.9 1.9 1.9 1.9 1.9 1.9
		<b>Mandatory value:</b>	
Extended image info and duplex	DG_CONTROL / DAT_EXTIMAGEINFO	TWEI_PAGESIDE	2.1

## PATCH CODE DETECTION\*

When source controls:	Must respond to:	Mandatory capabilities:	Version intro:
Patch Code Detection	DG_CONTROL / DAT_CAPABILITY All MSG_*	ICAP_PATCHCODEDETECTIONENABLED ICAP_SUPPORTEDPATCHCODETYPES CAP_JOBCONTROL	1.8 1.8 1.7

\* Note: Source must also fill in the extended EOJ field of the TW\_PENDINGXFERS structure when CAP\_JOBCONTROL is enabled. See DG\_CONTROL / DAT\_PENDINGXFERS / MSG\_ENDXFER

## BARCODE DETECTION

<b>When source controls:</b>	<b>Must respond to:</b>	<b>Mandatory capabilities:</b>	<b>Version intro:</b>
Bar Code Detection	DG_CONTROL / DAT_CAPABILITY All MSG_*	ICAP_EXTIMAGEINFO ICAP_BARCODEDETECTIONENABLED ICAP_SUPPORTEDBARCODETYPES	1.7 1.8 1.8

## ALARMS

<b>When source controls:</b>	<b>Must respond to:</b>	<b>Mandatory capability:</b>	<b>Version intro:</b>
Audible alarms	DG_CONTROL / DAT_CAPABILITY All MSG_*	CAP_ALARMS	1.8
Alarm volume	DG_CONTROL / DAT_CAPABILITY All MSG_*	CAP_ALARMVOLUME	1.8

## MICR DETECTION

<b>When source supports:</b>	<b>Must respond to:</b>	<b>Mandatory capabilities:</b>	<b>Version intro:</b>
Reading Micr data	DG_CONTROL / DAT_CAPABILITY All MSG_*	ICAP_EXTIMAGEINFO ICAP_SUPPORTEDEXTIMAGEINFO CAP_MICRENABLED	1.7 2.1 2.0

## Permanent Storage/Retrieval Devices

Permanent storage/retrieval devices are unique in that more than one image is stored and the dimensions and bit depth may vary from image to image. These devices could be just a database of images, or a PCMCIA card from a Digital Camera. Such devices need features for browsing the available images, retrieve properties and select sets of images for transfer.

### PERMANENT STORAGE/RETRIEVAL

When source supports:	Required operations:	Version intro:
Permanent Storage Retrieval	DG_CONTROL / DAT_FILESYSTEM / MSG_COPY, MSG_DELETE, MSG_CREATEDIRECTORY, MSG_AUTOMATICCAPTURED, MSG_FORMATMEDIA, MSG_GETFIRSTFILE, MSG_GETINFO, MSG_GETNEXTFILE, MSG_RENAME	
	<b>Must respond to:</b>	<b>Mandatory capability:</b>
	DG_CONTROL / DAT_CAPABILITY All MSG_*	ICAP_IMAGEDATASET
		1.7

### ANNOTATION

When source supports:	Must respond to:	Mandatory capability:	Version intro:
Annotation	DG_CONTROL / DAT_CAPABILITY All MSG_*	CAP_AUTHOR CAP_CAPTION CAP_TIMEDATE	1.0 1.0 1.0

### FLASH

When source supports:	Must respond to:	Mandatory capability:	Version intro:
Flash	DG_CONTROL / DAT_CAPABILITY All MSG_*	ICAP_FLASHUSED2	1.8

### AUDIO DEVICES

When source supports:	Must respond to:	Mandatory capability:	Version intro:
Audio snippets to be associated with an image	DG_CONTROL / DAT_CAPABILITY All MSG_*	ACAP_XFERMECH	1.8

When source supports:	Must respond to:	Version intro:
Transfer of Audio snippets	DG_CONTROL / DAT_XFERGROUP / MSG_SET with a value of DG_AUDIO	
	<b>And support these operations:</b>	
	DG_AUDIO/DAT_AUDIOFILEXFER/MSG_GET DG_AUDIO/DAT_AUDIONATIVEXFER/MSG_GET	

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## Portable Capture Devices

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Portable capture devices are very similar to permanent storage and retrieval devices in that they typically store a number of images, however they differ in that they often have real time capture opportunities and limitations related to battery life and lenses. Examples of such devices would be Digital Camera's and Camcorders.

### ASYNCHRONOUS DEVICE EVENTS

<b>When source supports:</b>	<b>Must respond to:</b>	<b>Mandatory capability:</b>	<b>Version intro:</b>
Asynchronous Device Events	DG_CONTROL / DAT_CAPABILITY All MSG_*	CAP_DEVICEEVENT	1.8

### STREAM IMAGES

<b>When source supports:</b>	<b>Must respond to:</b>	<b>Mandatory capability:</b>	<b>Version intro:</b>
Stream of images for Live Preview	DG_CONTROL / DAT_CAPABILITY All MSG_*	CAP_CAMERAPREVIEWUI	1.8

### AUTOMATIC CAPTURE

<b>When source supports:</b>	<b>Must respond to:</b>	<b>Mandatory capability:</b>	<b>Version intro:</b>
Automatic capture	DG_CONTROL / DAT_CAPABILITY All MSG_*	CAP_AUTOMATICCAPTURE CAP_TIMEBEFOREFIRSTCAPTURE CAP_TIMEBETWEENCAPTURES	1.8 1.8 1.8