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WORKSHOP

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AGREEMENT

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English version

**Extensions for Financial Services (XFS) interface specification
Release 3.30 - Part 12: Camera Device Class Interface -
Programmer's Reference**

This CEN Workshop Agreement has been drafted and approved by a Workshop of representatives of interested parties, the constitution of which is indicated in the foreword of this Workshop Agreement.

The formal process followed by the Workshop in the development of this Workshop Agreement has been endorsed by the National Members of CEN but neither the National Members of CEN nor the CEN-CENELEC Management Centre can be held accountable for the technical content of this CEN Workshop Agreement or possible conflicts with standards or legislation.

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Table of Contents

European foreword.....	3
1. Introduction.....	6
1.1 Background to Release 3.30	6
1.2 XFS Service-Specific Programming.....	6
2. Banking Cameras	8
3. References	9
4. Info Commands.....	10
4.1 WFS_INF_CAM_STATUS	10
4.2 WFS_INF_CAM_CAPABILITIES.....	13
5. Execute Commands.....	15
5.1 WFS_CMD_CAM_TAKE_PICTURE.....	15
5.2 WFS_CMD_CAM_RESET	16
5.3 WFS_CMD_CAM_TAKE_PICTURE_EX.....	17
5.4 WFS_CMD_CAM_SYNCHRONIZE_COMMAND.....	19
6. Events.....	20
6.1 WFS_USRE_CAM_MEDIATHRESHOLD	20
6.2 WFS_EXEE_CAM_INVALIDDATA.....	21
7. C - Header file	22

European foreword

This CWA is revision 3.30 of the XFS interface specification.

This CEN Workshop Agreement has been drafted and approved by a Workshop of representatives of interested parties on March 19th 2015, the constitution of which was supported by CEN following the public call for participation made on 1998-06-24. The specification is continuously reviewed and commented in the CEN/ISSS Workshop on XFS. It is therefore expected that an update of the specification will be published in due time as a CWA, superseding this revision 3.30.

A list of the individuals and organizations which supported the technical consensus represented by the CEN Workshop Agreement is available from the CEN/XFS Secretariat. The CEN XFS Workshop gathered suppliers as well as banks and other financial service companies.

The CWA is published as a multi-part document, consisting of:

Part 1: Application Programming Interface (API) - Service Provider Interface (SPI) - Programmer's Reference

Part 2: Service Classes Definition - Programmer's Reference

Part 3: Printer and Scanning Device Class Interface - Programmer's Reference

Part 4: Identification Card Device Class Interface - Programmer's Reference

Part 5: Cash Dispenser Device Class Interface - Programmer's Reference

Part 6: PIN Keypad Device Class Interface - Programmer's Reference

Part 7: Check Reader/Scanner Device Class Interface - Programmer's Reference

Part 8: Depository Device Class Interface - Programmer's Reference

Part 9: Text Terminal Unit Device Class Interface - Programmer's Reference

Part 10: Sensors and Indicators Unit Device Class Interface - Programmer's Reference

Part 11: Vendor Dependent Mode Device Class Interface - Programmer's Reference

Part 12: Camera Device Class Interface - Programmer's Reference

Part 13: Alarm Device Class Interface - Programmer's Reference

Part 14: Card Embossing Unit Device Class Interface - Programmer's Reference

Part 15: Cash-In Module Device Class Interface - Programmer's Reference

Part 16: Card Dispenser Device Class Interface - Programmer's Reference

Part 17: Barcode Reader Device Class Interface - Programmer's Reference

Part 18: Item Processing Module Device Class Interface - Programmer's Reference

Parts 19 - 28: Reserved for future use.

Parts 29 through 47 constitute an optional addendum to this CWA. They define the integration between the SNMP standard and the set of status and statistical information exported by the Service Providers.

Part 29: XFS MIB Architecture and SNMP Extensions - Programmer's Reference

Part 30: XFS MIB Device Specific Definitions - Printer Device Class

Part 31: XFS MIB Device Specific Definitions - Identification Card Device Class

Part 32: XFS MIB Device Specific Definitions - Cash Dispenser Device Class

Part 33: XFS MIB Device Specific Definitions - PIN Keypad Device Class

Part 34: XFS MIB Device Specific Definitions - Check Reader/Scanner Device Class

Part 35: XFS MIB Device Specific Definitions - Depository Device Class

Part 36: XFS MIB Device Specific Definitions - Text Terminal Unit Device Class

Part 37: XFS MIB Device Specific Definitions - Sensors and Indicators Unit Device Class

Part 38: XFS MIB Device Specific Definitions - Camera Device Class

Part 39: XFS MIB Device Specific Definitions - Alarm Device Class

Part 40: XFS MIB Device Specific Definitions - Card Embossing Unit Class

Part 41: XFS MIB Device Specific Definitions - Cash-In Module Device Class

Part 42: Reserved for future use.

Part 43: XFS MIB Device Specific Definitions - Vendor Dependent Mode Device Class

Part 44: XFS MIB Application Management

Part 45: XFS MIB Device Specific Definitions - Card Dispenser Device Class

Part 46: XFS MIB Device Specific Definitions - Barcode Reader Device Class

Part 47: XFS MIB Device Specific Definitions - Item Processing Module Device Class

Parts 48 - 60 are reserved for future use.

Part 61: Application Programming Interface (API) - Migration from Version 3.20 (CWA 16374) to Version 3.30 (this CWA) - Service Provider Interface (SPI) - Programmer's Reference

Part 62: Printer and Scanning Device Class Interface - Migration from Version 3.20 (CWA 16374) to Version 3.30 (this CWA) - Programmer's Reference

Part 63: Identification Card Device Class Interface - Migration from Version 3.20 (CWA 16374) to Version 3.30 (this CWA) - Programmer's Reference

Part 64: Cash Dispenser Device Class Interface - Migration from Version 3.20 (CWA 16374) to Version 3.30 (this CWA) - Programmer's Reference

Part 65: PIN Keypad Device Class Interface - Migration from Version 3.20 (CWA 16374) to Version 3.30 (this CWA) - Programmer's Reference

Part 66: Check Reader/Scanner Device Class Interface - Migration from Version 3.20 (CWA 16374) to Version 3.30 (this CWA) - Programmer's Reference

Part 67: Depository Device Class Interface - Migration from Version 3.20 (CWA 16374) to Version 3.30 (this CWA) - Programmer's Reference

Part 68: Text Terminal Unit Device Class Interface - Migration from Version 3.20 (CWA 16374) to Version 3.30 (this CWA) - Programmer's Reference

Part 69: Sensors and Indicators Unit Device Class Interface - Migration from Version 3.20 (CWA 16374) to Version 3.30 (this CWA) - Programmer's Reference

Part 70: Vendor Dependent Mode Device Class Interface - Migration from Version 3.20 (CWA 16374) to Version 3.30 (this CWA) - Programmer's Reference

Part 71: Camera Device Class Interface - Migration from Version 3.20 (CWA 16374) to Version 3.30 (this CWA) - Programmer's Reference

Part 72: Alarm Device Class Interface - Migration from Version 3.20 (CWA 16374) to Version 3.30 (this CWA) - Programmer's Reference

Part 73: Card Embossing Unit Device Class Interface - Migration from Version 3.20 (CWA 16374) to Version 3.30 (this CWA) - Programmer's Reference

Part 74: Cash-In Module Device Class Interface - Migration from Version 3.20 (CWA 16374) to Version 3.30 (this CWA) - Programmer's Reference

Part 75: Card Dispenser Device Class Interface - Migration from Version 3.20 (CWA 16374) to Version 3.30 (this CWA) - Programmer's Reference

Part 76: Barcode Reader Device Class Interface - Migration from Version 3.20 (CWA 16374) to Version 3.30 (this CWA) - Programmer's Reference

Part 77: Item Processing Module Device Class Interface - Migration from Version 3.20 (CWA 16374) to Version 3.30 (this CWA) - Programmer's Reference

In addition to these Programmer's Reference specifications, the reader of this CWA is also referred to a complementary document, called Release Notes. The Release Notes contain clarifications and explanations on the CWA specifications, which are not requiring functional changes. The current version of the Release Notes is available online from <http://www.cen.eu/work/areas/ict/ebusiness/pages/ws-xfs.aspx>.

The information in this document represents the Workshop's current views on the issues discussed as of the date of publication. It is furnished for informational purposes only and is subject to change without notice. CEN makes no warranty, express or implied, with respect to this document.

The formal process followed by the Workshop in the development of the CEN Workshop Agreement has been endorsed by the National Members of CEN but neither the National Members of CEN nor the CEN-CENELEC Management Centre can be held accountable for the technical content of the CEN Workshop Agreement or possible conflict with standards or legislation. This CEN Workshop Agreement can in no way be held as being an official standard developed by CEN and its members.

The final review/endorsement round for this CWA was started on 2015-01-16 and was successfully closed on 2015-03-19. The final text of this CWA was submitted to CEN for publication on 2015-06-19. The specification is continuously reviewed and commented in the CEN Workshop on XFS. It is therefore expected that an update of the specification will be published in due time as a CWA, superseding this revision 3.30.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Comments or suggestions from the users of the CEN Workshop Agreement are welcome and should be addressed to the CEN-CENELEC Management Centre.

Revision History:

3.00	October 18, 2000	Initial release.
3.10	November 29, 2007	For a description of changes from version 3.00 to version 3.10 see the CAM 3.10 Migration document.
3.20	March 2, 2011	For a description of changes from version 3.10 to version 3.20 see the CAM 3.20 Migration document.
3.30	March 19, 2015	For a description of changes from version 3.20 to version 3.30 see the CAM 3.30 Migration document.

1. Introduction

1.1 Background to Release 3.30

The CEN/XFS Workshop aims to promote a clear and unambiguous specification defining a multi-vendor software interface to financial peripheral devices. The XFS (eXtensions for Financial Services) specifications are developed within the CEN (European Committee for Standardization/Information Society Standardization System) Workshop environment. CEN Workshops aim to arrive at a European consensus on an issue that can be published as a CEN Workshop Agreement (CWA).

The CEN/XFS Workshop encourages the participation of both banks and vendors in the deliberations required to create an industry standard. The CEN/XFS Workshop achieves its goals by focused sub-groups working electronically and meeting quarterly.

Release 3.30 of the XFS specification is based on a C API and is delivered with the continued promise for the protection of technical investment for existing applications. This release of the specification extends the functionality and capabilities of the existing devices covered by the specification, but it does not include any new device classes. Notable enhancements include:

- Enhanced reporting of Shutter Jammed Status and a new Shutter Status event for CDM, CIM and IPM.
- Addition of a Synchronize command for all device classes, in order to allow synchronized action where necessary.
- Directional Guidance Light support.
- Addition of a CIM Deplete Command.
- Support for EMV Intelligent Contactless Readers.
- Support in PIN for Encrypting Touch Screen.
- PIN Authentication functionality.
- New PIN Encryption Protocols added for Chinese market.
- PIN TR34 standard supported.

1.2 XFS Service-Specific Programming

The service classes are defined by their service-specific commands and the associated data structures, error codes, messages, etc. These commands are used to request functions that are specific to one or more classes of Service Providers, but not all of them, and therefore are not included in the common API for basic or administration functions.

When a service-specific command is common among two or more classes of Service Providers, the syntax of the command is as similar as possible across all services, since a major objective of XFS is to standardize function codes and structures for the broadest variety of services. For example, using the **WFSExecute** function, the commands to read data from various services are as similar as possible to each other in their syntax and data structures.

In general, the specific command set for a service class is defined as a superset of the specific capabilities likely to be provided by the developers of the services of that class; thus any particular device will normally support only a subset of the defined command set.

There are three cases in which a Service Provider may receive a service-specific command that it does not support:

The requested capability is defined for the class of Service Providers by the XFS specification, the particular vendor implementation of that service does not support it, and the unsupported capability is **not** considered to be fundamental to the service. In this case, the Service Provider returns a successful completion, but does no operation. An example would be a request from an application to turn on a control indicator on a passbook printer; the Service Provider recognizes the command, but since the passbook printer it is managing does not include that indicator, the Service Provider does no operation and returns a successful completion to the application.

The requested capability is defined for the class of Service Providers by the XFS specification, the particular vendor

implementation of that service does not support it, and the unsupported capability *is* considered to be fundamental to the service. In this case, a WFS_ERR_UNSUPP_COMMAND error is returned to the calling application. An example would be a request from an application to a cash dispenser to dispense coins; the Service Provider recognizes the command but, since the cash dispenser it is managing dispenses only notes, returns this error.

The requested capability is *not* defined for the class of Service Providers by the XFS specification. In this case, a WFS_ERR_INVALID_COMMAND error is returned to the calling application.

This design allows implementation of applications that can be used with a range of services that provide differing subsets of the functionalities that are defined for their service class. Applications may use the **WFSGetInfo** and **WFSAsyncGetInfo** commands to inquire about the capabilities of the service they are about to use, and modify their behavior accordingly, or they may use functions and then deal with WFS_ERR_UNSUPP_COMMAND error returns to make decisions as to how to use the service.

2. Banking Cameras

This specification describes the functionality of the services provided by the Camera (CAM) services under XFS, by defining the service-specific commands that can be issued, using the **WFSGetInfo**, **WFSAsyncGetInfo**, **WFSExecute** and **WFSAsyncExecute** functions.

Banking camera systems usually consist of a recorder, a video mixer and one or more cameras. If there are several cameras, each camera focuses a special place within the self-service area (e.g. the room, the customer or the cash tray). By using the video mixer it can be decided, which of the cameras should take the next photo. Furthermore data can be given to be inserted in the photo (e.g. date, time or bank code).

If there is only one camera that can switch to take photos from different positions, it is presented by the Service Provider as a set of cameras, one for each of its possible positions.

3. References

- | |
|--|
| 1. XFS Application Programming Interface (API)/Service Provider Interface (SPI), Programmer's Reference
Revision 3.30 |
|--|

4. Info Commands

4.1 WFS_INF_CAM_STATUS

Description This command reports the full range of information available, including the information that is provided by the Service Provider.

Input Param None.

Output Param LPWFSCAMSTATUS lpStatus;

```
typedef struct _wfs_cam_status
{
    WORD                fwDevice;
    WORD                fwMedia[WFS_CAM_CAMERAS_SIZE];
    WORD                fwCameras[WFS_CAM_CAMERAS_SIZE];
    USHORT              usPictures[WFS_CAM_CAMERAS_SIZE];
    LPSTR               lpszExtra;
    WORD                wAntiFraudModule;
} WFS_CAM_STATUS, *LPWFSCAMSTATUS;
```

fwDevice

Specifies the state of the Camera device as one of the following flags:

Value	Meaning
WFS_CAM_DEVONLINE	The device is online (i.e. powered on and operable).
WFS_CAM_DEVOFFLINE	The device is offline (e.g. the operator has taken the device offline by turning a switch).
WFS_CAM_DEVPOWEROFF	The device is powered off or physically not connected.
WFS_CAM_DEVNODEVICE	There is no device intended to be there; e.g. this type of self service machine does not contain such a device or it is internally not configured.
WFS_CAM_DEVHWERROR	The device is inoperable due to a hardware error.
WFS_CAM_DEVUSERERROR	The device is inoperable because a person is preventing proper operation.
WFS_CAM_DEVBUSY	The device is busy and not able to process an execute command at this time.
WFS_CAM_DEVFRAUDATTEMPT	The device is present but is inoperable because it has detected a fraud attempt.
WFS_CAM_DEVPOTENTIALFRAUD	The device has detected a potential fraud attempt and is capable of remaining in service. In this case the application should make the decision as to whether to take the device offline.

fwMedia [...]

Specifies the state of the recording media of the cameras. A number of indexes are defined below. The maximum *fwMedia* index is WFS_CAM_CAMERAS_MAX.

fwMedia [WFS_CAM_ROOM]

Specifies the state of the recording media of the camera that monitors the whole self-service area. Specified as one of the following flags:

Value	Meaning
WFS_CAM_MEDIAOK	The media is in a good state.
WFS_CAM_MEDIAHIGH	The media is almost full (threshold).
WFS_CAM_MEDIACFULL	The media is full.
WFS_CAM_MEDIANOTSUPP	The device does not support sensing the media level.
WFS_CAM_MEDIAUNKNOWN	Due to a hardware error or other condition, the state of the media cannot be determined.

fwMedia [WFS_CAM_PERSON]

Specifies the state of the recording media of the camera that monitors the person standing in front of the self-service machine. Specified as one of the following flags:

Value	Meaning
WFS_CAM_MEDIAOK	The media is in a good state.
WFS_CAM_MEDIAHIGH	The media is almost full (threshold).
WFS_CAM_MEDIAFULL	The media is full.
WFS_CAM_MEDIANOTSUPP	The device does not support sensing the media level.
WFS_CAM_MEDIAUNKNOWN	Due to a hardware error or other condition, the state of the media cannot be determined.

fwMedia [WFS_CAM_EXITSLOT]

Specifies the state of the recording media of the camera that monitors the exit slot(s) of the self-service machine. Specified as one of the following flags:

Value	Meaning
WFS_CAM_MEDIAOK	The media is in a good state.
WFS_CAM_MEDIAHIGH	The media is almost full (threshold).
WFS_CAM_MEDIAFULL	The media is full.
WFS_CAM_MEDIANOTSUPP	The device does not support sensing the media level.
WFS_CAM_MEDIAUNKNOWN	Due to a hardware error or other condition, the state of the media cannot be determined.

fwCameras [...]

Specifies the state of the cameras. A number of cameras are defined below. The maximum camera index is WFS_CAM_CAMERAS_MAX.

fwCameras [WFS_CAM_ROOM]

Specifies the state of the camera that monitors the whole self-service area. Specified as one of the following flags:

Value	Meaning
WFS_CAM_CAMNOTSUPP	The camera is not supported.
WFS_CAM_CAMOK	The camera is in a good state.
WFS_CAM_CAMINOP	The camera is inoperative.
WFS_CAM_CAMUNKNOWN	Due to a hardware error or other condition, the state of the camera cannot be determined.

fwCameras [WFS_CAM_PERSON]

Specifies the state of the camera that monitors the person standing in front of the self-service machine. Specified as one of the following flags:

Value	Meaning
WFS_CAM_CAMNOTSUPP	The camera is not supported.
WFS_CAM_CAMOK	The camera is in a good state.
WFS_CAM_CAMINOP	The camera is inoperative.
WFS_CAM_CAMUNKNOWN	Due to a hardware error or other condition, the state of the camera cannot be determined.

fwCameras [WFS_CAM_EXITSLOT]

Specifies the state of the camera that monitors the exit slot(s) of the self-service machine. Specified as one of the following flags:

Value	Meaning
WFS_CAM_CAMNOTSUPP	The camera is not supported.
WFS_CAM_CAMOK	The camera is in a good state.
WFS_CAM_CAMINOP	The camera is inoperative.
WFS_CAM_CAMUNKNOWN	Due to a hardware error or other condition, the state of the camera cannot be determined.

usPictures [...]

Specifies the number of pictures stored on the recording media of the cameras. A number of indexes are defined below. The maximum *usPictures* index is WFS_CAM_CAMERAS_MAX.

Index	Meaning
WFS_CAM_ROOM	The camera that monitors the whole self-service area.
WFS_CAM_PERSON	The camera that monitors the person standing in front of the self-service machine.
WFS_CAM_EXITSLOT	The camera that monitors the exit slot(s) of the self-service machine.

lpszExtra

Pointer to a list of vendor-specific, or any other extended, information. The information is returned as a series of “*key=value*” strings so that it is easily extensible by Service Providers. Each string is null-terminated, with the final string terminating with two null characters. An empty list may be indicated by either a NULL pointer or a pointer to two consecutive null characters.

wAntiFraudModule

Specifies the state of the anti-fraud module as one of the following values:

Value	Meaning
WFS_CAM_AFMNOTSUPP	No anti-fraud module is available.
WFS_CAM_AFMOK	Anti-fraud module is in a good state and no foreign device is detected.
WFS_CAM_AFMINOP	Anti-fraud module is inoperable.
WFS_CAM_AFMDEVICEDETECTED	Anti-fraud module detected the presence of a foreign device.
WFS_CAM_AFMUNKNOWN	The state of the anti-fraud module cannot be determined.

Error Codes Only the generic error codes defined in [Ref. 1] can be generated by this command.

Comments Applications which require or expect specific information to be present in the *lpszExtra* parameter may not be device or vendor-independent.

In the case where communications with the device has been lost, the *fwDevice* field will report WFS_CAM_DEVPOWEROFF when the device has been removed or WFS_CAM_DEVHWERROR if the communications are unexpectedly lost. All other fields should contain a value based on the following rules and priority:

1. Report the value as unknown.
2. Report the value as a general h/w error.
3. Report the value as the last known value.

4.2 WFS_INF_CAM_CAPABILITIES

Description This command is used to retrieve the capabilities of the camera system.

Input Param None.

Output Param LPWFSCAMCAPS lpCaps;

```
typedef struct _wfs_cam_caps
{
    WORD                wClass;
    WORD                fwType;
    WORD                fwCameras[WFS_CAM_CAMERAS_SIZE];
    USHORT              usMaxPictures;
    WORD                fwCamData;
    USHORT              usMaxDataLength;
    WORD                fwCharSupport;
    LPSTR               lpzExtra;
    BOOL                bPictureFile;
    BOOL                bAntiFraudModule;
    LPDWORD              lpdwSynchronizableCommands;
} WFS_CAMCAPS, *LPWFSCAMCAPS;
```

wClass

Specifies the logical service class as WFS_SERVICE_CLASS_CAM.

fwType

Specifies the type of the camera device; only current value is:

Value	Meaning
WFS_CAM_TYPE_CAM	Camera system.

fwCameras [...]

Specifies which cameras are available. A number of cameras are defined below. The maximum camera index is WFS_CAM_CAMERAS_MAX.

fwCameras [WFS_CAM_ROOM]

Specifies whether the camera that monitors the whole self-service area is available. Specified as one of the following flags:

Value	Meaning
WFS_CAM_NOT_AVAILABLE	This camera is not available.
WFS_CAM_AVAILABLE	This camera is available.

fwCameras [WFS_CAM_PERSON]

Specifies whether the camera that monitors the person standing in front of the self-service machine is available. Specified as one of the following flags:

Value	Meaning
WFS_CAM_NOT_AVAILABLE	This camera is not available.
WFS_CAM_AVAILABLE	This camera is available.

fwCameras [WFS_CAM_EXITSLOT]

Specifies whether the camera that monitors the exit slot(s) of the self-service machine is available. Specified as one of the following flags:

Value	Meaning
WFS_CAM_NOT_AVAILABLE	This camera is not available.
WFS_CAM_AVAILABLE	This camera is available.

usMaxPictures

Specifies the maximum number of pictures that can be stored on the recording media.

fwCamData

Specifies, if data can be added to the picture. Specified as a combination of the following flags:

Value	Meaning
WFS_CAM_NOTADD	No data can be added to the picture.
WFS_CAM_AUTOADD	Data is added automatically to the picture.

WFS_CAM_MANADD

Data can be added manually to the picture using the field *lpSzCamData* in the WFS_CMD_CAM_TAKE_PICTURE command.

usMaxDataLength

Specifies the maximum length of the data that is displayed on the photo. Zero, if data cannot be manually added to the picture.

fwCharSupport

One or more flags specifying the Character Set supported by the Service Provider:

Value	Meaning
WFS_CAM_ASCII	ASCII is supported for execute command data values.
WFS_CAM_UNICODE	UNICODE is supported for execute command data values.

lpSzExtra

Pointer to a list of vendor-specific, or any other extended, information. The information is returned as a series of “*key=value*” strings so that it is easily extensible by Service Providers. Each string is null-terminated, with the final string terminating with two null characters. An empty list may be indicated by either a NULL pointer or a pointer to two consecutive null characters.

bPictureFile

Specifies whether the WFS_CMD_CAM_TAKE_PICTURE_EX command, which enables applications to specify the file path and name of a picture to be taken, is supported.

bAntiFraudModule

Specifies whether the anti-fraud module is available. This can either be TRUE if available or FALSE if not available.

lpdwSynchronizableCommands

Pointer to a zero-terminated list of DWORDs which contains the execute command IDs that can be synchronized. If no execute command can be synchronized then this parameter will be NULL.

Error Codes

Only the generic error codes defined in [Ref. 1] can be generated by this command.

Comments

Applications which require or expect specific information to be present in the *lpSzExtra* parameter may not be device or vendor-independent.

5. Execute Commands

5.1 WFS_CMD_CAM_TAKE_PICTURE

Description This command is used to start the recording of the camera system. It is possible to select which camera or which camera position should be used to take a picture. Data to be displayed on the photo can be specified using the *lpzCamData* or *lpzUNICODECamData* parameter.

Input Param LPWFSCAMTAKEPICT lpTakePict;

```
typedef struct _wfs_cam_take_picture
{
    WORD                wCamera;
    LPSTR               lpzCamData;
    LPWSTR              lpzUNICODECamData;
} WFS_CAMTAKEPICT, *LPWFSCAMTAKEPICT;
```

wCamera

Specifies the camera that should take the photo as one of the following flags:

Value	Meaning
WFS_CAM_ROOM	Monitors the whole self-service area.
WFS_CAM_PERSON	Monitors the person standing in front of the self-service machine.
WFS_CAM_EXITSLOT	Monitors the exit slot(s) of the self-service machine.

lpzCamData

Specifies the text string to be displayed on the photo. If the maximum text length is exceeded it will be truncated. In this case or if the text given is invalid an execute event WFS_EXEE_CAM_INVALIDDATA is generated. Nevertheless the picture is taken.

lpzUNICODECamData

Specifies the UNICODE text string to be displayed on the photo. If the maximum text length is exceeded, it will be truncated. In this case or if the text given is invalid an execute event WFS_EXEE_CAM_INVALIDDATA is generated. Nevertheless the picture is taken.

The *lpzUNICODECamData* field should only be used if the Service Provider supports UNICODE. The *lpzCamData* and *lpzUNICODECamData* fields are mutually exclusive.

Output Param None.

Error Codes In addition to the generic error codes defined in [Ref. 1], the following error codes can be generated by this command:

Value	Meaning
WFS_ERR_CAM_CAMNOTSUPP	The specified camera is not supported.
WFS_ERR_CAM_MEDIAFULL	The recording media is full.
WFS_ERR_CAM_CAMINOP	The specified camera is inoperable.
WFS_ERR_CAM_CHARSETNOTSUPP	Character set(s) supported by Service Provider is inconsistent with use of <i>lpzCamData</i> or <i>lpzUNICODECamData</i> fields.
WFS_ERR_CAM_FILEIOERROR	Directory does not exist or File IO error while storing the image to the hard disk.

Events In addition to the generic events defined in [Ref. 1], the following events can be generated by this command:

Value	Meaning
WFS_USRE_CAM_MEDIATHRESHOLD	The state of the recording media reached a threshold.
WFS_EXEE_CAM_INVALIDDATA	The text string given is too long or in some other way invalid.

Comments None.

5.2 WFS_CMD_CAM_RESET

Description	Sends a service reset to the Service Provider.
Input Param	None.
Output Param	None.
Error Codes	Only the generic error codes defined in [Ref. 1] can be generated by this command.
Events	Only the generic events defined in [Ref. 1] can be generated by this command.
Comments	This command is used by an application control program to cause a device to reset itself to a known good condition.

5.3 WFS_CMD_CAM_TAKE_PICTURE_EX

Description This command is used to start the recording of the camera system. It is possible to select which camera or which camera position should be used to take a picture. Data to be displayed on the photo can be specified using the *lpzCamData* or *lpzUNICODECamData* parameter.

Input Param LPWFSCAMTAKEPICTEX lpTakePictEx;

```
typedef struct _wfs_cam_take_picture_ex
{
    WORD                wCamera;
    LPSTR               lpzCamData;
    LPWSTR              lpzUNICODECamData;
    LPSTR               lpzPictureFile;
} WFS_CAMTAKEPICTEX, *LPWFSCAMTAKEPICTEX;
```

wCamera

Specifies the camera that should take the photo as one of the following flags:

Value	Meaning
WFS_CAM_ROOM	Monitors the whole self-service area.
WFS_CAM_PERSON	Monitors the person standing in front of the self-service machine.
WFS_CAM_EXITSLOT	Monitors the exit slot(s) of the self-service machine.

lpzCamData

Specifies the text string to be displayed on the photo. If the maximum text length is exceeded it will be truncated. In this case or if the text given is invalid an execute event

WFS_EXEE_CAM_INVALIDDATA is generated. Nevertheless the picture is taken.

lpzUNICODECamData

Specifies the UNICODE text string to be displayed on the photo. If the maximum text length is exceeded, it will be truncated. In this case or if the text given is invalid an execute event

WFS_EXEE_CAM_INVALIDDATA is generated. Nevertheless the picture is taken.

The *lpzUNICODECamData* field should only be used if the Service Provider supports UNICODE. The *lpzCamData* and *lpzUNICODECamData* fields are mutually exclusive.

lpzPictureFile

Specifies the full path and file name of the image to be taken by a camera device. The file name includes the image format specific file extension. The Service Provider is responsible for converting the image into the required format.

This value is terminated with a single null character and cannot contain UNICODE characters.

Output Param None.

Error Codes In addition to the generic error codes defined in [Ref. 1], the following error codes can be generated by this command:

Value	Meaning
WFS_ERR_CAM_CAMNOTSUPP	The specified camera is not supported.
WFS_ERR_CAM_MEDIAFULL	The recording media is full.
WFS_ERR_CAM_CAMINOP	The specified camera is inoperable.
WFS_ERR_CAM_CHARSETNOTSUPP	Character set(s) supported by Service Provider is inconsistent with use of <i>lpzCamData</i> or <i>lpzUNICODECamData</i> fields.
WFS_ERR_CAM_FILEIOERROR	Directory does not exist or File IO error while storing the image to the hard disk.

Events In addition to the generic events defined in [Ref. 1], the following events can be generated by this command:

Value	Meaning
WFS_USRE_CAM_MEDIATHRESHOLD	The state of the recording media reached a threshold.

CWA 16926-12:2015 (E)

WFS_EXEE_CAM_INVALIDDATA

The text string given is too long or in some other way invalid.

Comments None.

5.4 WFS_CMD_CAM_SYNCHRONIZE_COMMAND

Description This command is used to reduce response time of a command (e.g. for synchronization with display) as well as to synchronize actions of the different device classes. This command is intended to be used only on hardware which is capable of synchronizing functionality within a single device class or with other device classes.

The list of execute commands which this command supports for synchronization is retrieved in the *lpdwSynchronizableCommands* parameter of the WFS_INF_CAM_CAPABILITIES.

This command is optional, i.e. any other command can be called without having to call it in advance. Any preparation that occurs by calling this command will not affect any other subsequent command. However, any subsequent execute command other than the one that was specified in the *dwCommand* input parameter will execute normally and may invalidate the pending synchronization. In this case the application should call the WFS_CMD_CAM_SYNCHRONIZE_COMMAND again in order to start a synchronization.

Input Param LPWFSCAMSYNCHRONIZECOMMAND lpSynchronizeCommand;

```
typedef struct _wfs_cim_synchronize_command
{
    DWORD dwCommand;
    LPVOID lpCmdData;
} WFS_CAMSYNCHRONIZECOMMAND, *LPWFSCAMSYNCHRONIZECOMMAND;
```

dwCommand

The command ID of the command to be synchronized and executed next.

lpCmdData

Pointer to data or a data structure that represents the parameter that is normally associated with the command that is specified in *dwCommand*. For example, if *dwCommand* is WFS_CMD_CAM_TAKE_PICTURE then *lpCmdData* will point to a WFSCAMTAKEPICT structure. This parameter can be NULL if no command input parameter is needed or if this detail is not needed to synchronize for the command.

It will be device-dependent whether the synchronization is effective or not in the case where the application synchronizes for a command with this command specifying a parameter but subsequently executes the synchronized command with a different parameter. This case should not result in an error; however, the preparation effect could be different from what the application expects. The application should, therefore, make sure to use the same parameter between *lpCmdData* of this command and the subsequent corresponding execute command.

Output Param None.

Error Codes In addition to the generic error codes defined in [Ref. 1], the following error codes can be generated by this command:

Value	Meaning
WFS_ERR_CAM_COMMANDUNSUPP	The command specified in the <i>dwCommand</i> field is not supported by the Service Provider.
WFS_ERR_CAM_SYNCHRONIZEUNSUPP	The preparation for the command specified in the <i>dwCommand</i> with the parameter specified in the <i>lpCmdData</i> is not supported by the Service Provider.

Events Only the generic events defined in [Ref. 1] can be generated by this command.

Comments None.

6. Events

6.1 WFS_USRE_CAM_MEDIATHRESHOLD

Description This user event is used to specify that the state of the recording media reached a threshold.

Event Param LPWORD lpwMediaThreshold;
lpwMediaThreshold
 Specified as one of the following flags:

Value	Meaning
WFS_CAM_MEDIAOK	The recording media is a good state.
WFS_CAM_MEDIAHIGH	The recording media is almost full.
WFS_CAM_MEDIAFULL	The recording media is full.

Comments None.

6.2 WFS_EXEE_CAM_INVALIDDATA

Description	This execute event is used to specify that the text string given was too long or in some other way invalid.
Event Param	None.
Comments	None.

7. C - Header file

```

/*****
 *
 * xfscam.h      XFS - Camera (CAM) definitions
 *
 *              Version 3.30   (March 19 2015)
 *
 *****/

#ifndef __INC_XFSCAM__H
#define __INC_XFSCAM__H

#ifdef __cplusplus
extern "C" {
#endif

#include <xfscapi.h>

/* be aware of alignment */
#pragma pack (push, 1)

/* values of WFSCAMCAPS.wClass */

#define WFS_SERVICE_CLASS_CAM (10)
#define WFS_SERVICE_VERSION_CAM (0x1E03) /* Version 3.30 */
#define WFS_SERVICE_NAME_CAM "CAM"

#define CAM_SERVICE_OFFSET (WFS_SERVICE_CLASS_CAM * 100)

/* CAM Info Commands */

#define WFS_INF_CAM_STATUS (CAM_SERVICE_OFFSET + 1)
#define WFS_INF_CAM_CAPABILITIES (CAM_SERVICE_OFFSET + 2)

/* CAM Execute Commands */

#define WFS_CMD_CAM TAKE_PICTURE (CAM_SERVICE_OFFSET + 1)
#define WFS_CMD_CAM RESET (CAM_SERVICE_OFFSET + 2)
#define WFS_CMD_CAM TAKE_PICTURE_EX (CAM_SERVICE_OFFSET + 3)
#define WFS_CMD_CAM SYNCHRONIZE_COMMAND (CAM_SERVICE_OFFSET + 4)

/* CAM Messages */

#define WFS_USRE_CAM MEDIATHRESHOLD (CAM_SERVICE_OFFSET + 1)
#define WFS_EXEE_CAM INVALIDDATA (CAM_SERVICE_OFFSET + 2)

/* values of WFSCAMSTATUS.fwDevice */

#define WFS_CAM_DEVONLINE WFS_STAT_DEVONLINE
#define WFS_CAM_DEVOFFLINE WFS_STAT_DEVOFFLINE
#define WFS_CAM_DEVPPOWEROFF WFS_STAT_DEVPPOWEROFF
#define WFS_CAM_DEVNODEVICE WFS_STAT_DEVNODEVICE
#define WFS_CAM_DEVHWERROR WFS_STAT_DEVHWERROR
#define WFS_CAM_DEVUSERERROR WFS_STAT_DEVUSERERROR
#define WFS_CAM_DEVBUSY WFS_STAT_DEVBUSY
#define WFS_CAM_DEVFRAUDATTEMPT WFS_STAT_DEVFRAUDATTEMPT
#define WFS_CAM_DEVPOTENTIALFRAUD WFS_STAT_DEVPOTENTIALFRAUD

/* number of cameras supported/length of WFSCAMSTATUS.fwCameras field */

#define WFS_CAM_CAMERAS_SIZE (8)
#define WFS_CAM_CAMERAS_MAX (WFS_CAM_CAMERAS_SIZE - 1)

/* indices of WFSCAMSTATUS.fwMedia[...]
   WFSCAMSTATUS.fwCameras [...]
   WFSCAMSTATUS.usPictures[...]
   WFSCAMCAPS.fwCameras [...]
   WFS_CAMTAKEPICT.wCamera */

```

```

#define      WFS_CAM_ROOM                      (0)
#define      WFS_CAM_PERSON                    (1)
#define      WFS_CAM_EXITSLOT                  (2)

/* values of WFSCAMSTATUS.fwMedia */

#define      WFS_CAM_MEDIAOK                   (0)
#define      WFS_CAM_MEDIAHIGH                 (1)
#define      WFS_CAM_MEDIAFULL                 (2)
#define      WFS_CAM_MEDIAUNKNOWN              (3)
#define      WFS_CAM_MEDIANOTSUPP              (4)

/* values of WFSCAMSTATUS.fwCameras */

#define      WFS_CAM_CAMNOTSUPP                (0)
#define      WFS_CAM_CAMOK                    (1)
#define      WFS_CAM_CAMINOP                  (2)
#define      WFS_CAM_CAMUNKNOWN              (3)

/* values of WFSCAMCAPS.fwType */

#define      WFS_CAM_TYPE_CAM                  (1)

/* values of WFSCAMCAPS.fwCameras */

#define      WFS_CAM_NOT_AVAILABLE             (0)
#define      WFS_CAM_AVAILABLE                (1)

/* values of WFSCAMCAPS.fwCamData */

#define      WFS_CAM_NOTADD                    (0)
#define      WFS_CAM_AUTOADD                  (1)
#define      WFS_CAM_MANADD                    (2)

/* values of WFSCAMCAPS.fwCharSupport */

#define      WFS_CAM_ASCII                     (0x0001)
#define      WFS_CAM_UNICODE                   (0x0002)

/* values of WFSCAMSTATUS.wAntiFraudModule */

#define      WFS_CAM_AFMNOTSUPP                (0)
#define      WFS_CAM_AFMOK                    (1)
#define      WFS_CAM_AFMINOP                  (2)
#define      WFS_CAM_AFMDEVICEDETECTED        (3)
#define      WFS_CAM_AFMUNKNOWN              (4)

/* XFS CAM Errors */

#define WFS_ERR_CAM_CAMNOTSUPP                 (- (CAM_SERVICE_OFFSET + 0))
#define WFS_ERR_CAM_MEDIAFULL                 (- (CAM_SERVICE_OFFSET + 1))
#define WFS_ERR_CAM_CAMINOP                   (- (CAM_SERVICE_OFFSET + 2))
#define WFS_ERR_CAM_CHARSETNOTSUPP            (- (CAM_SERVICE_OFFSET + 3))
#define WFS_ERR_CAM_FILEIOERROR               (- (CAM_SERVICE_OFFSET + 4))
#define WFS_ERR_CAM_COMMANDUNSUPP             (- (CAM_SERVICE_OFFSET + 5))
#define WFS_ERR_CAM_SYNCHRONIZEUNSUPP         (- (CAM_SERVICE_OFFSET + 6))

/*=====*/
/* CAM Info Command Structures */
/*=====*/

typedef struct _wfs_cam_status
{
    WORD          fwDevice;
    WORD          fwMedia[WFS_CAM_CAMERAS_SIZE];
    WORD          fwCameras[WFS_CAM_CAMERAS_SIZE];
    USHORT        usPictures[WFS_CAM_CAMERAS_SIZE];
    LPSTR         lpszExtra;
    WORD          wAntiFraudModule;

```

CWA 16926-12:2015 (E)

```
} WFSCAMSTATUS, *LPWFSCAMSTATUS;

typedef struct _wfs_cam_caps
{
    WORD            wClass;
    WORD            fwType;
    WORD            fwCameras[WFS_CAM_CAMERAS_SIZE];
    USHORT          usMaxPictures;
    WORD            fwCamData;
    USHORT          usMaxDataLength;
    WORD            fwCharSupport;
    LPSTR           lpszExtra;
    BOOL            bPictureFile;
    BOOL            bAntiFraudModule;
    LPDWORD         lpdwSynchronizableCommands;
} WFSCAMCAPS, *LPWFSCAMCAPS;

/*=====*/
/* CAM Execute Command Structures */
/*=====*/

typedef struct _wfs_cam_take_picture
{
    WORD            wCamera;
    LPSTR           lpszCamData;
    LPWSTR          lpszUNICODECamData;
} WFSCAMTAKEPICT, *LPWFSCAMTAKEPICT;

typedef struct _wfs_cam_take_picture_ex
{
    WORD            wCamera;
    LPSTR           lpszCamData;
    LPWSTR          lpszUNICODECamData;
    LPSTR           lpszPictureFile;
} WFSCAMTAKEPICTEX, *LPWFSCAMTAKEPICTEX;

typedef struct _wfs_cam_synchronize_command
{
    DWORD           dwCommand;
    LPVOID          lpCmdData;
} WFSCAMSYNCHRONIZECOMMAND, *LPWFSCAMSYNCHRONIZECOMMAND;

/* restore alignment */
#pragma pack (pop)

#ifdef __cplusplus
} /*extern "C"*/
#endif

#endif /* __INC_XFSCAM__H */
```