

CEN

CWA 16926-64

WORKSHOP

January 2023

AGREEMENT

ICS 35.200; 35.240.15; 35.240.40

English version

**Extensions for Financial Services (XFS) interface
specification Release 3.50 - Part 64: Cash Dispenser
Module Class Interface - Programmer's Reference -
Migration from Version 3.40 (CWA 16926:2020) to
Version 3.50 (this CWA)**

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.

This CEN Workshop Agreement can in no way be held as being an official standard developed by CEN and its Members.

This CEN Workshop Agreement is publicly available as a reference document from the CEN Members National Standard Bodies.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

© 2023 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No.:CWA 16926-64:2023 E

Table of Contents

European Foreword	5
1. Introduction	9
1.1 Background to Release 3.50	9
1.2 XFS Service-Specific Programming	9
2. Cash Dispensers	10
3. References	11
4. Note Classification	12
5. Info Commands	13
5.1 WFS_INF_CDM_STATUS.....	13
5.2 WFS_INF_CDM_CAPABILITIES	18
5.3 WFS_INF_CDM_CASH_UNIT_INFO	23
5.4 WFS_INF_CDM_TELLER_INFO	30
5.5 WFS_INF_CDM_CURRENCY_EXP	32
5.6 WFS_INF_CDM_MIX_TYPES.....	33
5.7 WFS_INF_CDM_MIX_TABLE.....	34
5.8 WFS_INF_CDM_PRESENT_STATUS.....	35
5.9 WFS_INF_CDM_GET_ITEM_INFO	37
5.10 WFS_INF_CDM_GET_BLACKLIST	39
5.11 WFS_INF_CDM_GET_ALL_ITEMS_INFO	40
5.12 WFS_INF_CDM_GET_CLASSIFICATION_LIST	43
6. Execute Commands	45
6.1 WFS_CMD_CDM_DENOMINATE	45
6.2 WFS_CMD_CDM_DISPENSE	48
6.3 WFS_CMD_CDM_COUNT	52
6.4 WFS_CMD_CDM_PRESENT.....	55
6.5 WFS_CMD_CDM_REJECT	57
6.6 WFS_CMD_CDM_RETRACT	58
6.7 WFS_CMD_CDM_OPEN_SHUTTER	61
6.8 WFS_CMD_CDM_CLOSE_SHUTTER	62
6.9 WFS_CMD_CDM_SET_TELLER_INFO.....	63
6.10 WFS_CMD_CDM_SET_CASH_UNIT_INFO	64
6.11 WFS_CMD_CDM_START_EXCHANGE	66
6.12 WFS_CMD_CDM_END_EXCHANGE.....	68
6.13 WFS_CMD_CDM_OPEN_SAFE_DOOR.....	70
6.14 WFS_CMD_CDM_CALIBRATE_CASH_UNIT	71
6.15 WFS_CMD_CDM_SET_MIX_TABLE	73

6.16	WFS_CMD_CDM_RESET	74
6.17	WFS_CMD_CDM_TEST_CASH_UNITS	76
6.18	WFS_CMD_CDM_SET_GUIDANCE_LIGHT	78
6.19	WFS_CMD_CDM_POWER_SAVE_CONTROL	80
6.20	WFS_CMD_CDM_PREPARE_DISPENSE	81
6.21	WFS_CMD_CDM_SET_BLACKLIST	82
6.22	WFS_CMD_CDM_SYNCHRONIZE_COMMAND	83
6.23	WFS_CMD_CDM_SET_CLASSIFICATION_LIST	84
7.	Events	85
7.1	WFS_SRVE_CDM_SAFEDOOROPEN	85
7.2	WFS_SRVE_CDM_SAFEDOORCLOSED	86
7.3	WFS_USRE_CDM_CASHUNITTHRESHOLD	87
7.4	WFS_SRVE_CDM_CASHUNITINFOCHANGED	88
7.5	WFS_SRVE_CDM_TELLERINFOCHANGED	89
7.6	WFS_EXEE_CDM_DELAYEDDISPENSE	90
7.7	WFS_EXEE_CDM_STARTDISPENSE	91
7.8	WFS_EXEE_CDM_CASHUNITERROR	92
7.9	WFS_SRVE_CDM_ITEMSTAKEN	93
7.10	WFS_SRVE_CDM_COUNTS_CHANGED	94
7.11	WFS_EXEE_CDM_PARTIALDISPENSE	95
7.12	WFS_EXEE_CDM_SUBDISPENSEOK	96
7.13	WFS_EXEE_CDM_INCOMPLETEDISPENSE	97
7.14	WFS_EXEE_CDM_NOTEERROR	98
7.15	WFS_SRVE_CDM_ITEMSPRESENTED	99
7.16	WFS_SRVE_CDM_MEDIADETECTED	100
7.17	WFS_EXEE_CDM_INPUT_P6	101
7.18	WFS_SRVE_CDM_DEVICEPOSITION	102
7.19	WFS_SRVE_CDM_POWER_SAVE_CHANGE	103
7.20	WFS_EXEE_CDM_INFO_AVAILABLE	104
7.21	WFS_EXEE_CDM_INCOMPLETERTRACT	105
7.22	WFS_SRVE_CDM_SHUTTERSTATUSCHANGED	106
7.23	WFS_SRVE_CDM_ITEMSINSERTED	107
8.	Sub-Dispensing Command Flow	108
9.	Rules for Cash Unit Exchange	111
10.	Events Associated with Cash Unit Status Changes	112
10.1	One Physical Cash Unit Goes LOW	112
10.2	Last Physical Cash Unit Goes LOW	113
10.3	One Physical Cash Unit Goes INOP	114
10.4	Last Physical Cash Unit Goes EMPTY	115

11. Multiple Dispense Command Flow.....	116
12. Appendix E – Cash Dispenser E2E Authentication	118
12.1 Secure Dispense Data Parameter Example Data.....	118
12.2 Secure Dispense Command Flow: - Dispense and Present.....	120
12.3 Secure Dispense Command Flow – Dispense Only with no Present.....	122
12.4 Secure Dispense Command Flow: - Dispense Completes With Error Followed by an Additional Dispense and Present	123
12.5 Secure Dispense Command Flow: - User does not remove bills. Dispense, Present and Retract	125
12.6 Secure Dispense Command Flow: - Authentication Process Timeout	127
13. C - Header file	128

European Foreword

This CEN Workshop Agreement has been developed in accordance with the CEN-CENELEC Guide 29 “CEN/CENELEC Workshop Agreements – The way to rapid consensus” and with the relevant provisions of CEN/CENELEC Internal Regulations – Part 2. It was approved by a Workshop of representatives of interested parties on 2022-11-08, the constitution of which was supported by CEN following several public calls for participation, the first of which was made on 1998-06-24. However, this CEN Workshop Agreement does not necessarily include all relevant stakeholders.

The final text of this CEN Workshop Agreement was provided to CEN for publication on 2022-11-18.

The following organizations and individuals developed and approved this CEN Workshop Agreement:

- AURIGA SPA
- CIMA SPA
- DIEBOLD NIXDORF SYSTEMS GMBH
- FIS BANKING SOLUTIONS UK LTD (OTS)
- FUJITSU TECHNOLOGY SOLUTIONS
- GLORY LTD
- GRG BANKING EQUIPMENT HK CO LTD
- HITACHI CHANNEL SOLUTIONS CORP
- HYOSUNG TNS INC
- JIANGSU GUOGUANG ELECTRONIC INFORMATION TECHNOLOGY
- KAL
- KEBA HANDOVER AUTOMATION GMBH
- NCR FSG
- NEXUS SOFTWARE
- OBERTHUR CASH PROTECTION
- OKI ELECTRIC INDUSTRY SHENZHEN
- SALZBURGER BANKEN SOFTWARE
- SECURE INNOVATION
- SIGMA SPA

It is possible that some elements of this CEN/CWA may be subject to patent rights. The CEN-CENELEC policy on patent rights is set out in CEN-CENELEC Guide 8 “Guidelines for Implementation of the Common IPR Policy on Patents (and other statutory intellectual property rights based on inventions)”. CEN shall not be held responsible for identifying any or all such patent rights.

The Workshop participants have made every effort to ensure the reliability and accuracy of the technical and non-technical content of CWA 16926-5, but this does not guarantee, either explicitly or implicitly, its correctness. Users of CWA 16926-5 should be aware that neither the Workshop participants, nor CEN can be held liable for damages

CWA 16926-64:2023 (E)

or losses of any kind whatsoever which may arise from its application. Users of CWA 16926-5 do so on their own responsibility and at their own risk.

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

Part 19: Biometrics Device Class Interface - Programmer's Reference

Parts 20 - 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

Part 48: XFS MIB Device Specific Definitions - Biometrics Device Class

Parts 49 - 60 are reserved for future use.

Part 61: Application Programming Interface (API) - Migration from Version 3.40 (CWA 16296:2020) to Version 3.50 (this CWA) - Service Provider Interface (SPI) - Programmer's Reference

Part 62: Printer and Scanning Device Class Interface - Migration from Version 3.40 (CWA 16296:2020) to Version 3.50 (this CWA) - Programmer's Reference

Part 63: Identification Card Device Class Interface - Migration from Version 3.40 (CWA 16296:2020) to Version 3.50 (this CWA) - Programmer's Reference

Part 64: Cash Dispenser Device Class Interface - Migration from Version 3.40 (CWA 16296:2020) to Version 3.50 (this CWA) - Programmer's Reference

Part 65: PIN Keypad Device Class Interface - Migration from Version 3.40 (CWA 16296:2020) to Version 3.50 (this CWA) - Programmer's Reference

Part 66: Check Reader/Scanner Device Class Interface - Migration from Version 3.40 (CWA 16296:2020) to Version 3.50 (this CWA) - Programmer's Reference

Part 67: Depository Device Class Interface - Migration from Version 3.40 (CWA 16296:2020) to Version 3.50 (this CWA) - Programmer's Reference

Part 68: Text Terminal Unit Device Class Interface - Migration from Version 3.40 (CWA 16296:2020) to Version 3.50 (this CWA) - Programmer's Reference

Part 69: Sensors and Indicators Unit Device Class Interface - Migration from Version 3.40 (CWA 16296:2020) to Version 3.50 (this CWA) - Programmer's Reference

Part 70: Vendor Dependent Mode Device Class Interface - Migration from Version 3.40 (CWA 16296:2020) to Version 3.50 (this CWA) - Programmer's Reference

Part 71: Camera Device Class Interface - Migration from Version 3.40 (CWA 16296:2020) to Version 3.50 (this CWA) - Programmer's Reference

Part 72: Alarm Device Class Interface - Migration from Version 3.40 (CWA 16296:2020) to Version 3.50 (this CWA) - Programmer's Reference

Part 73: Card Embossing Unit Device Class Interface - Migration from Version 3.40 (CWA 16296:2020) to Version 3.50 (this CWA) - Programmer's Reference

Part 74: Cash-In Module Device Class Interface - Migration from Version 3.40 (CWA 16296:2020) to Version 3.50 (this CWA) - Programmer's Reference

Part 75: Card Dispenser Device Class Interface - Migration from Version 3.40 (CWA 16296:2020) to Version 3.50 (this CWA) - Programmer's Reference

Part 76: Barcode Reader Device Class Interface - Migration from Version 3.40 (CWA 16296:2020) to Version 3.50 (this CWA) - Programmer's Reference

Part 77: Item Processing Module Device Class Interface - Migration from Version 3.40 (CWA 16296:2020) to Version 3.50 (this CWA) - Programmer's Reference

Part 78: Biometric Device Class Interface - Migration from Version 3.40 (CWA 16296:2020) to Version 3.50 (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: <https://www.cencenelec.eu/areas-of-work/cen-sectors/digital-society-cen/cwa-download-area/>.

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

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 CDM 3.10 Migration document.
3.20	March 2, 2011	For a description of changes from version 3.10 to version 3.20 see the CDM 3.20 Migration document.
3.30	March 19, 2015	For a description of changes from version 3.20 to version 3.30 see the CDM 3.30 Migration document.
3.40	December 06, 2019	For a description of changes from version 3.30 to version 3.40 see the CDM 3.40 Migration document.
3.50	November 18, 2022	For a description of changes from version 3.40 to version 3.50 see the CDM 3.50 Migration document.

1. Introduction

1.1 Background to Release 3.50

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 3.50 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:

- Addition of E2E security
- PIN Password Entry

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 for Execute commands or `WFS_ERR_UNSUPP_CATEGORY` error for Info commands is returned to the calling application. An example would be a request from an application to a cash dispenser to retract items where the dispenser hardware does not have that capability; the Service Provider recognizes the command but, since the cash dispenser it is managing is unable to fulfil the request, 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` for Execute commands or `WFS_ERR_INVALID_CATEGORY` error for Info commands 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 error returns to make decisions as to how to use the service.

2. Cash Dispensers

This specification describes the functionality of an XFS compliant Cash Dispenser Module (CDM) Service Provider. It defines the service-specific commands that can be issued to the Service Provider using the **WFSGetInfo**, **WFSAsyncGetInfo**, **WFSExecute** and **WFSAsyncExecute** functions.

Persistent values are maintained through power failures, open sessions, close session and system resets.

This specification covers the dispensing of items. An “item” is defined as any media that can be dispensed and includes coupons, documents, bills and coins. However, if coins and bills are both to be dispensed separate Service Providers must be implemented for each.

All currency parameters in this specification are expressed as a quantity of minimum dispense units, as defined in the description of the **WFS_INF_CDM_CURRENCY_EXP** command.

There are two types of CDM: Self-Service CDM and Teller CDM. A Self-Service CDM operates in an automated environment, while a Teller CDM has an operator present. The functionality provided by the following commands is only applicable to a Teller CDM:

WFS_CMD_CDM_SET_TELLER_INFO
WFS_INF_CDM_TELLER_INFO

It is possible for the CDM to be part of a compound device with the Cash-In Module (CIM). This CIM\CDM combination is referred to throughout this specification as a “Cash Recycler”. For details of the CIM interface see [Ref. 3].

If the device is a Cash Recycler then, if cash unit exchanges are required on both interfaces, the exchanges cannot be performed concurrently. An exchange on one interface must be complete (the **WFS_CMD_CDM_END_EXCHANGE** must have completed) before an exchange can start on the other interface. The **WFS_ERR_CDM_EXCHANGEACTIVE** error code will be returned if the correct sequence is not adhered to.

The CIM interface can be used for all exchange operations on recycle devices, and the CIM interface should be used if the device has recycle units of multiple currencies and/or denominations (including multiple note identifiers associated with the same denomination).

The event **WFS_SRVE_CDM_COUNTS_CHANGED** will be posted if an operation on the CIM interface affects the cash unit counts which are available through the CDM interface.

The following commands on the CIM interface may affect the CDM counts:

WFS_CMD_CIM_CASH_IN
WFS_CMD_CIM_CASH_IN_END
WFS_CMD_CIM_CASH_IN_ROLLBACK
WFS_CMD_CIM_RETRACT
WFS_CMD_CIM_SET_CASH_IN_UNIT_INFO
WFS_CMD_CIM_END_EXCHANGE
WFS_CMD_CIM_RESET
WFS_CMD_CIM_REPLENISH
WFS_CMD_CIM_CASH_UNIT_COUNT

3. References

- | |
|---|
| 1. XFS Application Programming Interface (API)/Service Provider Interface (-SPI), Programmer's Reference, Revision 3.50 |
| 2. ISO 4217 at http://www.iso.org |
| 3. XFS Cash-In Module Device Class Interface, Programmer's Reference, Revision 3.50 |

This document is a preview generated by EVS