



# **Implementation Guidelines for ISO 20022 Interbank Messages**

SIC and euroSIC

Base Document

## General notes

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## About this document

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### Target audience

The "Implementation Guidelines for ISO 20022 Interbank Messages" are addressed to all participants of the Swiss RTGS systems SIC and euroSIC, using the ISO 20022 message standard.

### Purpose

The Implementation Guidelines consist of a base document (this document) with general information concerning all message types and various module documents – one each per ISO 20022 message type – with message-specific information, including information on the application-specific handling of individual elements. They specify the messages to be submitted to and delivered from the RTGS systems SIC and euroSIC in the ISO 20022 message standard.

### Amendment control

All the amendments carried out on this document are listed in an amendment record table showing the version, the date of the amendment, a brief amendment description and a statement of the sections concerned.

### Associated documents

Supplementary information to the Implementation Guidelines can be found in the documents listed in section 2.6 "Reference documents".

## Amendment control

All the amendments carried out on this document are listed below, with the version, the date of the amendment, a brief amendment description and a statement of the sections concerned.

Version	Date	Amendment description	Section
1.0	01.01.2014	First edition	all
1.1	31.03.2014	Section «Message transport for SEPA payment cancellation request» added	2.2.3
1.2	30.06.2014	Section «Duplicates checking» clarified by distinguishing between pacs and camt messages	3.1
1.3	16.04.2015	Document name changed, Logo replaced, Wording adapted to the terminology of the RTGS platform.	all
		Table 1 completed with Implementation Guideline for queries.	2.1
		Section «Queries» added.	2.2.4
		Section «Duplicates checking for cash management messages (camt)» completed with special case queries.	3.1.2

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# 1 Overview of documentation structure

These Implementation Guidelines are modular in structure:

- This base document contains general information applying to all messages.
- The module documents – one for each ISO 20022 message type – contain message-specific information, including information on the application-specific handling of certain elements.
- For each Implementation Guideline, an XML schema (XSD) and generic XML sample messages will be published.

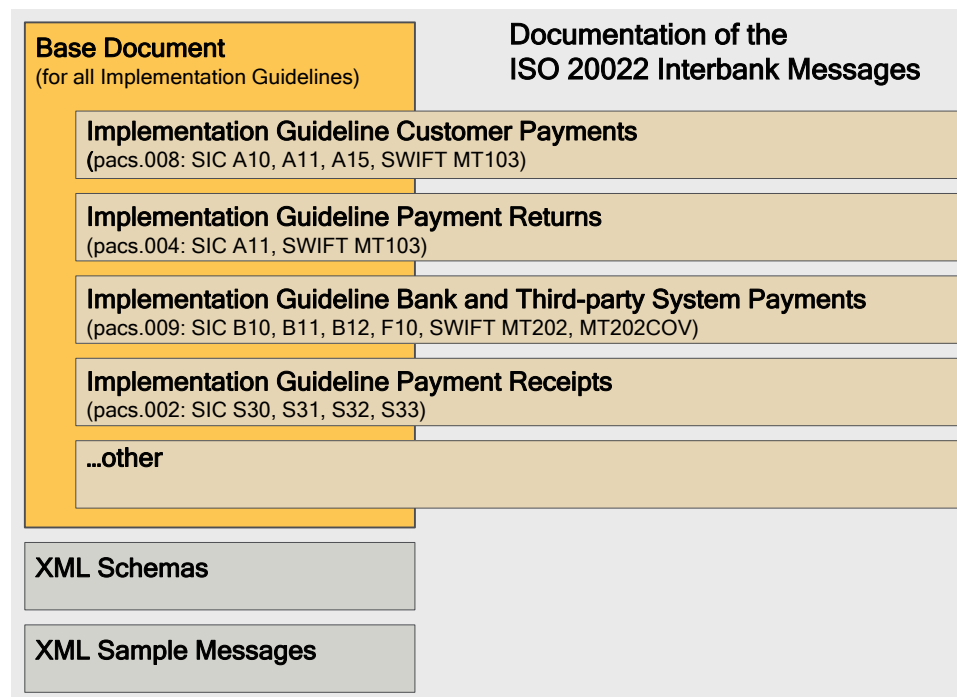


Figure 1: Documentation structure

## 2 General information

### 2.1 Message specifications

The message definitions for the RTGS systems are based on the ISO 20022 standard, version 2009 (similar to the EPC recommendations for SEPA). Some of the required messages for the RTGS systems are not yet defined as ISO 20022 messages. As a substitute for such messages the SWIFT MX messages specified in the SWIFT working group "CAMT MX" and published in the "MX Standards Release 2013" can be used (these messages are used for T2S/TARGET2). The EPC definitions for SEPA and those of the working group "High Value Payments" were, as far as possible, considered.

The message specifications, which are binding on all RTGS system participants – who want to use ISO 20022 message standard – are described in the following Implementation Guidelines:

Implementation Guideline	ISO 20022 message	SWIFT MX message
Customer payments	pacs.008	
Payment returns	pacs.004	
Bank and third-party system payments	pacs.009	
Payment receipts	pacs.002	
Recapitulations	camt.052	
Settlement confirmation	camt.054	
SEPA return request*	camt.056	
SEPA return request rejection*	camt.029	
Cancellation		camt.008
Sight deposit account transfers (system managers)		camt.050
Clearing day information		camt.019
Cash management receipts		camt.025
Queries		camt.005 and camt.006

Table 1: Implementation Guidelines

\* This use case is currently only permitted for SEPA transactions in euroSIC.

The list shown in Table 1 will be updated if new Implementation Guidelines are produced for additional messages.

## 2.2 Message flows

### 2.2.1 Payments

The following diagram shows the message flows for payment messages between participants and the respective RTGS systems.

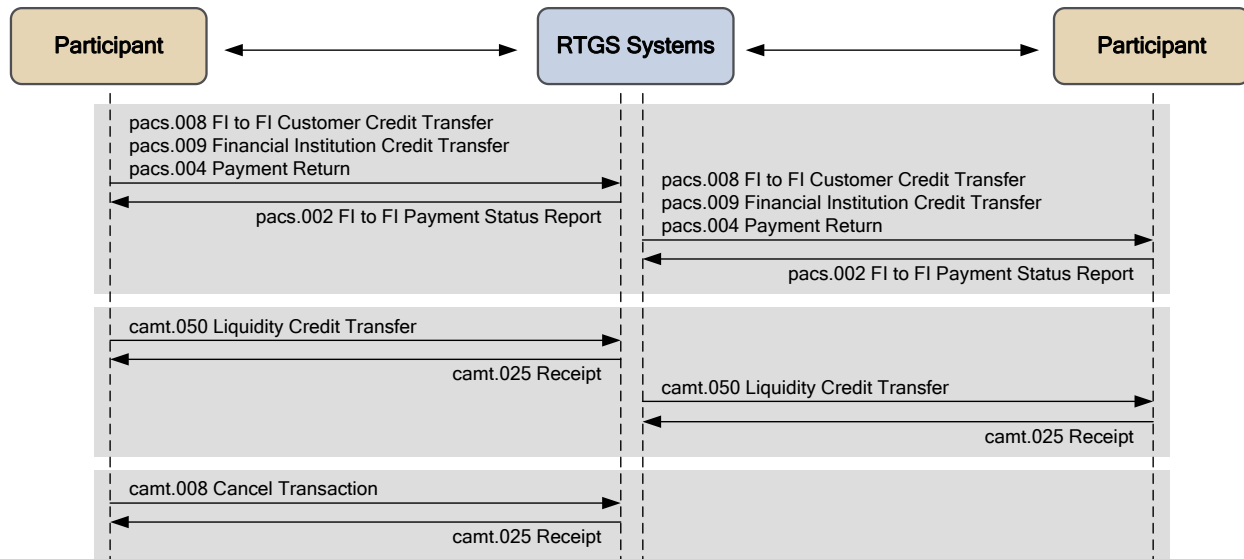


Figure 2: Message flows for payment messages

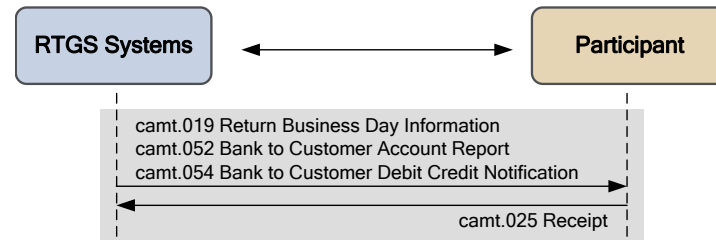
Example of a message flow:

1. A participant sends a pacs.008 message to the RTGS system.
2. The RTGS system acknowledges receipt by sending a pacs.002 to that participant.
3. The RTGS system settles the payment and then sends a pacs.008 message to the participant for whom the payment is intended.
4. This participant acknowledges receipt by sending a pacs.002 to the RTGS system.



## 2.2.2 Reconciliation and notification

The following diagram shows the message flows for reconciliation and notification messages between the respective RTGS systems and participants.



*Figure 3: Message flows for reconciliation and notification messages*

Example of a message flow:

1. The RTGS system sends a camt.054 message to a participant.
2. The participant acknowledges receipt by sending a camt.025 to the RTGS system.

### 2.2.3 Message transport for SEPA payment cancellation request

The following diagram shows the message flows for SEPA payment cancellation request and rejection of SEPA payment cancellation request. With these messages the RTGS system only validates the submitted messages and forwards them to the receiver, but does not really process the messages.

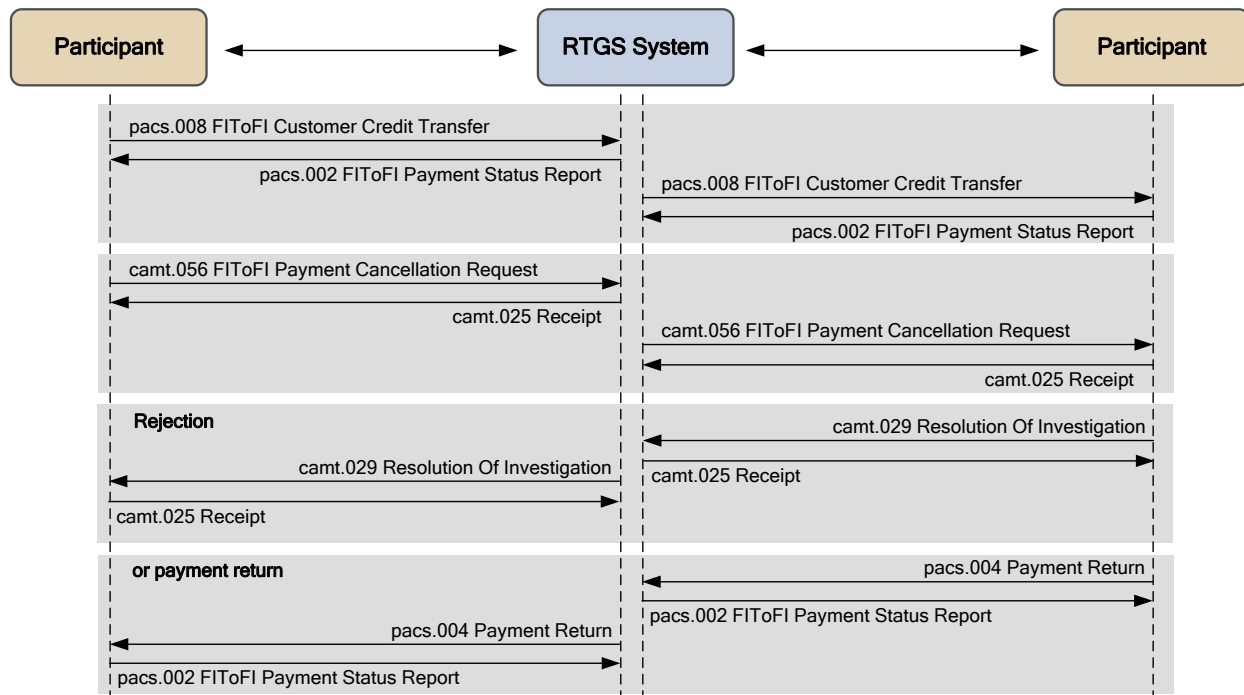


Figure 4: Message flows for SEPA payment cancellation requests

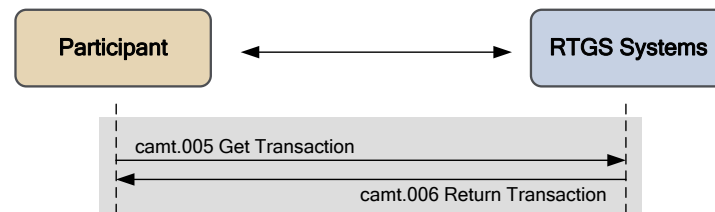
Example of a message flow (the SEPA payment cancellation request begins with step 3):

1. A participant sends a pacs.008 message to the RTGS system.
2. The RTGS system settles the payment and then sends a pacs.008 message to the participant for whom the payment is intended.
3. The debtor agent initiates a SEPA payment cancellation request (camt.056) according to the SEPA Rule Book.
4. The RTGS system forwards the SEPA payment cancellation request (camt.056) to the creditor agent.
5. The creditor agent decides to reject the SEPA payment cancellation request and sends a rejection of SEPA payment cancellation request (camt.029) to the RTGS system.
6. The RTGS system forwards rejection of SEPA payment cancellation request (camt.029) to the debtor agent.
7. As an alternative to the rejection the creditor agent may opt for a repayment return and sends a payment return (pacs.004) to the RTGS system.
8. The RTGS system settles the payment return and then sends a pacs.004 message to the participant for whom the payment return is intended.

## 2.2.4

## Queries

The following diagram shows the message flows for payment query messages between participants and the respective RTGS systems.



*Figure 5: Message flows for payment query messages*

Example of a message flow:

1. The participant sends a camt.005 payment query message to the RTGS system.
2. The RTGS system acknowledges receipt by sending a camt.006, containing either the query result or an error message, to the participant.

## 2.3 Representation of XML messages

The logic structure of XML messages is a tree structure. This can be represented in various ways: in diagrams, tables or text. Representation in text is suitable for actual examples of messages, while tables and diagrams are mainly suitable for giving an overview of XML schemas. The abbreviations used in the Implementation Guidelines for ISO 20022 interbank messages are based on the schema for Swiss XML message specifications.

XML editors which have the option of graphical representation use symbols which may look slightly different depending on the type of editor (the illustrations in this document were produced using the editor XMLSpy from Altova GmbH). The main symbols are briefly introduced in Appendix A.

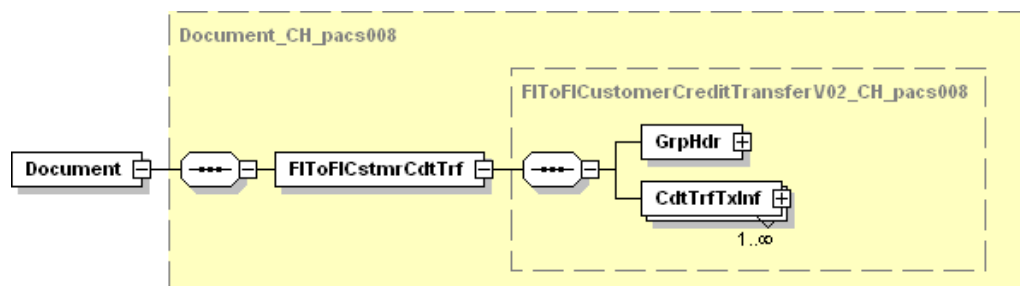


Figure 6: Example of graphical representation of an XML message

The following conventions apply to the presentation of Implementation Guidelines for ISO 20022 interbank messages:

### Description of XML elements

In some publications, the names of XML elements are written as a single concept with no spaces, for example "*CreditTransferTransactionInformation*". In the interests of legibility, spaces are generally used in this document.

### Data in tables

The tables contain information from the ISO 20022 Standard (Message Item, XML Tag, Multiplicity). The tables also contain information about the Swiss ISO 20022 payment standard as it applies to the RTGS systems.

The "Definition" column always contains, on the first line, the English name of the technical element (in bold). The second line contains the German name (in italics). The rest of the text describes the use of the element; the column "Payment Type-specific Definition" contains more information about its use.

The other columns show how that information is reproduced in the SIC and SWIFT FIN standard.

### Colours used in the tables

The column headings are marked in orange for the information about the ISO 20022 standard and beige for the information about the Swiss ISO 20022 payment standard for SIC<sup>4</sup>. Elements containing at least one sub-element are marked in light yellow in the ISO 20022 columns.

### Representation of the tree structure in the tables

So that it is possible to tell where in the tree structure an element comes, the hierarchy level is indicated by preceding "+" signs in the Message Item. For example, the IBAN for the "Debtor Account" is shown as follows:

```
Credit Transfer Transaction Information
+Debtor Account
++Identification
+++IBAN
```

## 2.4 Representation of terms from the ISO standard

In order to be able to distinguish better between terms from the ISO standard and business elements, the Implementation Guidelines for ISO 20022 interbank messages use the following representation conventions:

- All terms relating to the underlying ISO standard are written in *italics*.  
Exceptions: In the tables of technical definitions that are generated automatically, it is not possible to show individual terms in italics and in headings no italic style is used.
- XML tags are also written in angle brackets. (Example: The transaction status is reported using the `<ReqHdlg>` element. This may only contain the sub-element `<StsCd>`.)  
Exception: XML tags separated by forward slashes in path names are written without angle brackets. (Example: The type of reference number can be identified in the `CdtTrfTxInf/RmtInf/Strd/CdtrRefInf/Tp/CdOrPrtry/Cd` element.)
- Names of XML elements are written between quotation marks.  
(Example: The *"Instructing Agent"* is used together with the *"Transaction Identification"* element and the *"Message Identification"* for duplicate checking.

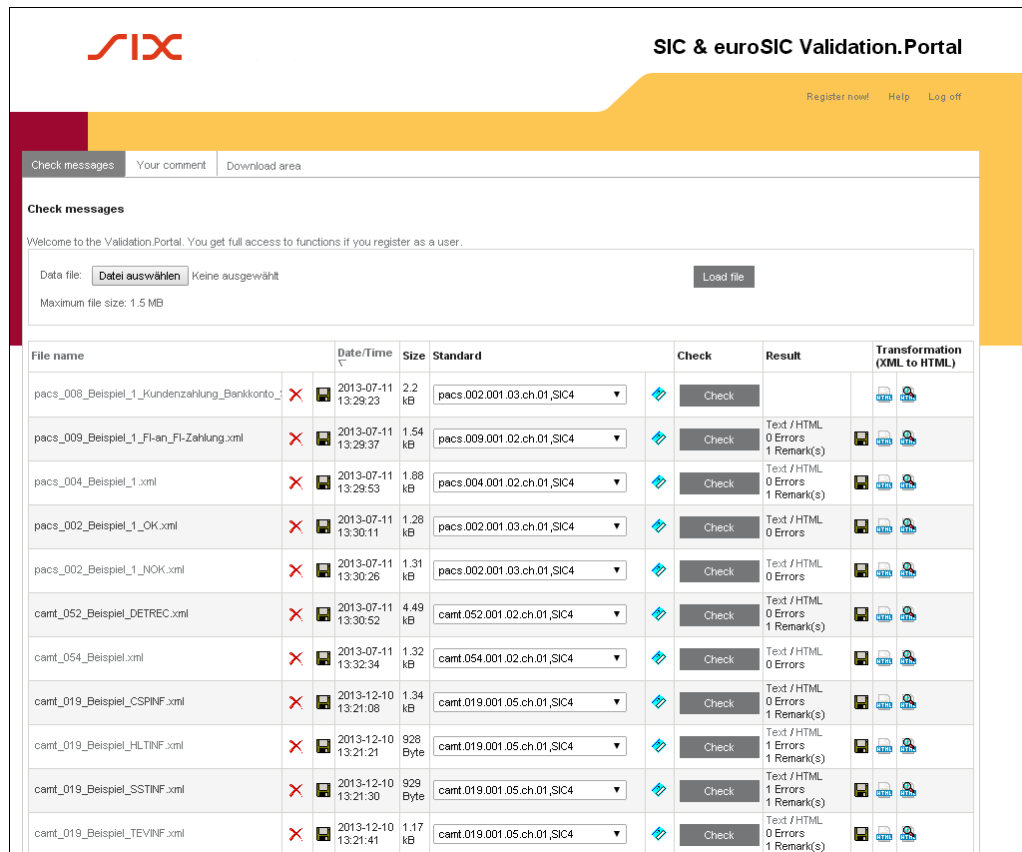
## 2.5 Validation portal

The implementation of RTGS system messages according to the ISO 20022 message standard is supported by a central validation platform.

The aims of this platform are:

- to encourage consistent use of the ISO 20022 message standard, especially the Implementation Guidelines, by all financial institutions and software providers.
- to support software engineers during the implementation.
- to avoid errors and problems in delivering and receiving ISO 20022 messages.
- to provide a central upstream validation point as the basis for the mandatory tests between financial institutions and RTGS systems.

All ISO 20022 messages for which Implementation Guidelines have been published are supported by the validation portal:



File name	Date/Time	Size	Standard	Check	Result	Transformation (XML to HTML)
pac008_Beispiel_1_Kundenzahlung_Bankkonto_...	2013-07-11 13:29:23	2.2 kB	pac002.001.03.ch.01.SIC4			
pac009_Beispiel_1_Fi-an-Fi-Zahlung.xml	2013-07-11 13:29:37	1.54 kB	pac009.001.02.ch.01.SIC4		Text / HTML 0 Errors 1 Remark(s)	
pac004_Beispiel_1.xml	2013-07-11 13:29:53	1.88 kB	pac004.001.02.ch.01.SIC4		Text / HTML 0 Errors 1 Remark(s)	
pac002_Beispiel_1_OK.xml	2013-07-11 13:30:11	1.28 kB	pac002.001.03.ch.01.SIC4		Text / HTML 0 Errors	
pac002_Beispiel_1_NOK.xml	2013-07-11 13:30:26	1.31 kB	pac002.001.03.ch.01.SIC4		Text / HTML 0 Errors	
cam0052_Beispiel_DETREC.xml	2013-07-11 13:30:52	4.49 kB	cam0052.001.02.ch.01.SIC4		Text / HTML 0 Errors 1 Remark(s)	
cam0054_Beispiel.xml	2013-07-11 13:32:34	1.32 kB	cam0054.001.02.ch.01.SIC4		Text / HTML 0 Errors	
cam0019_Beispiel_CSPINF.xml	2013-12-10 13:21:08	1.34 kB	cam0019.001.05.ch.01.SIC4		Text / HTML 0 Errors 1 Remark(s)	
cam0019_Beispiel_HLTINF.xml	2013-12-10 13:21:21	928 Byte	cam0019.001.05.ch.01.SIC4		Text / HTML 1 Errors 1 Remark(s)	
cam0019_Beispiel_SSTINF.xml	2013-12-10 13:21:30	929 Byte	cam0019.001.05.ch.01.SIC4		Text / HTML 1 Errors 1 Remark(s)	
cam0019_Beispiel_TEVINFIN.xml	2013-12-10 13:21:41	1.17 kB	cam0019.001.05.ch.01.SIC4		Text / HTML 0 Errors 1 Remark(s)	

Figure 7: Validation portal for ISO 20022 interbank messages

The scope of the validation portal is as follows:

- Software providers and financial institutions can upload created messages to the validation portal via the Web.
- The validation results are made available to view and download in the form of a description of the generated test results (text and HTML).
- In the description that is generated showing the validation results, a distinction is made between "Errors" and "Notes". Whereas messages containing "Errors" will generally be rejected by the RTGS systems, "Notes" are intended to draw attention to possible discrepancies in the validated message from the recommendations in the Implementation Guidelines. "Notes" should not lead to a message being rejected.
- Providing interactive documentation.
- Download area for Implementation Guidelines, schemas and sample messages.
- Simplified representation of the graphical structure of the tested messages to support business departments.

The validation portal can be accessed under <https://validation.iso-payments.ch/SIC4>. For full utilisation of the validation portal prior registration is required.

## 2.6 Reference documents

Ref	Document	Title	Source
[1]	SIC/euroSIC Handbooks	<ul style="list-style-type: none"> <li>Swiss RTGS Handbook</li> <li>Swiss Handbook for SWIFT Payments</li> <li>Swiss Handbook for SEPA Credit Transfers</li> </ul>	SIX Interbank Clearing
[2]	Swiss Business Rules Customer - Bank	ISO 20022 Payments – Swiss Business Rules for Payments and Cash Management for Customer-to-Bank Messages	SIX Interbank Clearing
[3]	Swiss Implementation Guidelines Customer - Bank	ISO 20022 Payments – Swiss Implementation Guidelines for Customer-to-Bank Messages Credit Transfer (Payment Transactions)	SIX Interbank Clearing
[4]	EPC115-06	SEPA Credit Transfer Scheme Inter-Bank Implementation Guidelines Version 7.0	EPC
[5]	EPC132-08	SEPA Credit Transfer Scheme Customer-To-Bank Implementation Guidelines Version 7.0	EPC
[6]	EPC142-08	EPC Guidance on the use of the future ISO Standard for the Structured Creditor Reference Version 1.0	EPC
[7]	Payments External Code Lists	Inventory of External Payment Code Lists	ISO
[8]	SWIFT Handbooks	SWIFT User Handbook	SWIFT
[9]	Payments Maintenance 2009	Message Definition Report, Approved by the Payments SEG on 30 March 2009, Edition September 2009	ISO

Table 2: Reference documents

Organisation	Link
SIX Interbank Clearing	<a href="http://www.iso-payments.ch">www.iso-payments.ch</a> <a href="http://www.sepa.ch">www.sepa.ch</a> <a href="http://www.six-interbank-clearing.com">www.six-interbank-clearing.com</a>
ISO	<a href="http://www.iso20022.org">www.iso20022.org</a>
EPC	<a href="http://www.europeanpaymentscouncil.eu">www.europeanpaymentscouncil.eu</a>
SWIFT	<a href="http://www.swift.com">www.swift.com</a>

Table 3: Links to the relevant Internet pages



## 3 Business specifications for interbank messages

### 3.1 Duplicates checking

#### 3.1.1 Duplicates checking for payment messages (pacs)

The RTGS systems carry out duplicates checking on 2 levels:

- Message level (A-Level)
- Payment or transaction level (B-Level)

The two checks are carried out independently of each other.

The RTGS systems only support individual transactions. This means that, for the payment to be executed, there must be no mistakes at either message level or transaction level.

The duplicates checking is carried out on both levels within the value dates permitted in the RTGS systems. The period therefore extends over 5 days before the value date, the current value date at the time of delivery and 2 value dates back.

If a duplicate is detected during checking at message level and/or transaction level, the payment is rejected.

The duplicates checking for payment messages (pacs.008, pacs.009, pacs.004) is always carried out in association with identification of the participant making the payment (*Instructing Agent*).

The following pairs of elements are therefore used for duplicates checking:

Level	Element pair
Message level	<i>Instructing Agent/Message Identification</i>
Payment or transaction level	<i>Instructing Agent/Transaction Identification (pacs.008 and pacs.009) respectively Return Identification (pacs.004)</i>

Table 4: Levels for duplicates checking for payment messages (pacs)

#### 3.1.2 Duplicates checking for cash management messages (camt)

The duplicates checking for cash management messages (camt.029, camt.056) is only carried out on message level, in association with identification of the instructing participant (*Assigner*).

The following pair of elements is therefore used for duplicates checking:

Level	Element pair
Message level	<i>Assigner/Identification</i>

Table 5: Levels for duplicates checking for cash management messages (camt)

#### Special case queries camt.005

For payment query messages no duplicates checking is carried out.

### Special case sight deposit account transfers (system manager) camt.050

The duplicates checking is similar to payment messages in association with identification of the participant making the payment (*Debtor*).

The following pairs of elements are therefore used for duplicates checking:

Level	Element pair
Message level	<i>Debtor/Message Identification</i>
Payment or transaction level	<i>Debtor/Transaction Identification (&lt;InstrId&gt;)</i>

Table 6: Levels for duplicates checking for sight deposit account transfers (camt.050)

## 3.2 Representation conventions

### 3.2.1 Representation conventions for amount fields

In an XML context, different forms of representation are permitted in amount fields. To ensure smooth processing, the following representation is specified:

- No use of leading or closing filler characters (space, white space, zero, plus sign).

### 3.2.2 Representation conventions for date fields

In an XML context, different forms of representation are permitted in date fields. To ensure smooth processing, the following representation is specified:

#### ISODate

- Representation in accordance with W3C specifications  
<http://www.w3.org/TR/xmlschema11-2/#date>
- Entering time zones is not supported in the RTGS systems. Dates are interpreted as the local date (Switzerland) or as the RTGS system date. Entering a time zone in an incoming message will result in it being rejected.

#### ISODateTime

- In contrast to the W3C specifications (<http://www.w3.org/TR/xmlschema11-2/#dateTime>), only the following form of representation is supported by the RTGS systems:

Form of representation	Interpretation in the RTGS systems
Local time (YYYY-MM-DDThh:mm:ss) Example: 2012-07-06T10:46:48	The time entered is interpreted as local time and counts as the relevant time for all subsequent processing steps.

Local time means the current time zone in Switzerland, taking account of summer/winter time (UTC+2 or UTC+1).

All other ways of representing time supported by the "ISODateTime" data type will lead to the submitted message being rejected when it is validated by the RTGS systems.

### 3.3 Character set

In ISO 20022 XML messages, characters from the Unicode character set UTF-8 (8-Bit Unicode Transformation Format) may generally be used (message has to be UTF-8 encoded). In XML messages for the RTGS systems, only the SWIFT character set is permitted:

The following characters, corresponding to the SWIFT character set, are accepted as in the EPC Guidelines:

a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z  
A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z  
0, 1, 2, 3, 4, 5, 6, 7, 8, 9  
. (full stop)  
, (comma)  
: (colon)  
' (apostrophe, also accepted as an escape character &apos;)  
+ (plus)  
- (minus)  
/ (slash)  
( (open round bracket)  
) (closed round bracket)  
? (question mark)  
space

#### Validation of permitted characters on schema level

Compliance with the above mentioned restrictions in text elements is provided by character patterns in the schema. Different characters are permitted, depending on the usage of the element:

- **Text fields in general:**
  - If the string begins with one or several spaces, it must necessarily be followed by at least an other permitted character, which however must not be a space.
  - Pattern: [ ]\*[A-Za-z0-9+?/:()\\.,'-]\*
- **Mandatory references:**
  - *Message Identification* (A-Level)
  - *Transaction Identification* (B-Level)
  - No spaces are permitted.
  - Pattern: [A-Za-z0-9+?/:()\\.,'-]\*

- **Acknowledgement of incorrect elements in pacs.002 and camt.025:**
  - *Additional Information* (AddtlInf)
  - Contains the @ character to indicate attributes in the XPath.
  - No spaces are permitted.
  - Pattern: [A-Za-z0-9+?/:()@\\.,'\\-]\*
- **Proprietary codes (Prtry) and other identifications:**
  - The first character must not be a space.
  - Pattern: [A-Za-z0-9+?/:()\\.,'\\-][A-Za-z0-9+?/:()\\.,'\\-]\*

All text elements have a minimum length of one character in the schema. In conjunction with the defined pattern it is ensured that no technically empty elements can be sent (<element> </element> or <element/>).

### 3.4 Truncation during conversion

When SIC or FIN message standards are sent by the RTGS systems to participants, it can happen that the ISO 20022 message that was submitted originally contains data elements which cannot, or cannot all, be transferred to the message which is to be delivered (truncation). In such cases, only those data elements are sent with the relevant SIC or FIN message which are permitted by whichever message standard is being used for the message being delivered.

Elements which could be affected by a possible truncation are shown in the tables of technical specifications for messages (see the Implementation Guidelines for the relevant messages) with an appropriate text comment. Advice is also given in which types of data constellations a truncation can be expected and how this can be avoided.

## Appendix A: Symbols for graphical XML representation

### Expand and collapse symbols

Wherever parts of the tree structure can be expanded or collapsed, expand and collapse symbols are added to the symbols in the graphical representation. These consist of a small square containing either a plus sign or a minus sign.

- ⊕ Expand symbol: if you click on the plus sign the tree structure is expanded so subsequent symbols (attributes or so-called child elements) are displayed. The expand symbol then changes to a collapse symbol.
- ⊖ Collapse symbol: if you click on the minus sign, the tree structure is collapsed again, i.e. the subsequent symbols disappear again. The collapse symbol then changes to an open symbol again.

### Elements


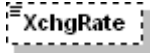
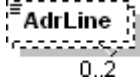


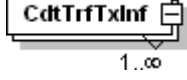

Elements are shown as rectangles containing the name of the element. For mandatory elements, the rectangle is shown with a continuous line, for optional elements the line is dotted.

For complex elements, which, unlike simple elements could contain attributes or other elements (child elements), the rectangle has an expand or collapse symbol on the right.

Three little lines in the top left corner of the rectangle indicate that the element contains data (otherwise the element contains child elements).

Elements which are allowed to occur more than once are shown as 2 superimposed rectangles. Bottom right, you can see the minimum and maximum number of occurrences.

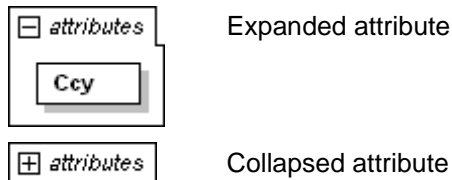
Examples:

	Mandatory simple element
	Optional simple element
	Optional simple element which can occur a maximum of twice
	Mandatory complex element (with child elements) with collapsed tree structure
	Mandatory complex element (with child elements) with expanded tree structure
	Mandatory complex element (with child elements) which can occur any number of times
	Mandatory complex element (with attributes)

## Attributes

Attributes are also shown as rectangles, containing the name of the attribute. They are surrounded by a box containing the word "attributes" and an expand or collapse symbol. For mandatory attributes, the rectangle is drawn with a continuous line, for optional attributes the line is dotted.

Example:



## Choice

To the right of a choice symbol, the connecting lines branch off to the possible elements, of which only one can be present in the XML message.



## Sequence

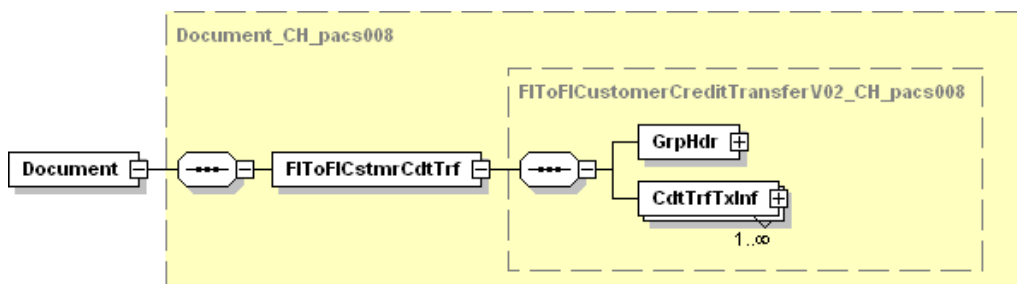
To the right of a sequence symbol, the connecting lines branch off to the elements which are to be used in the XML message in the order shown (optional elements and attributes can of course also be omitted).



## Frame

For increased clarity, all the child elements, attributes and other information belonging to a complex element are surrounded by a dotted frame with a yellow shaded background.

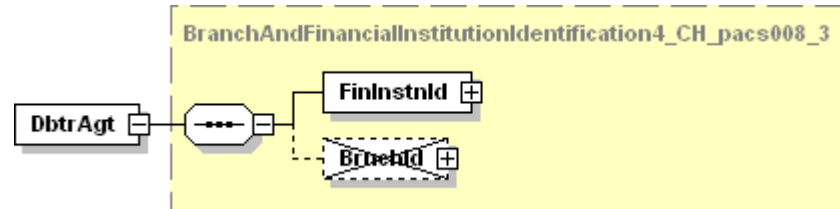
Example:



### Elements not used in Switzerland

Elements not used in Switzerland are struck through on the diagram.

Example:



## Appendix B: Definitions of terms

Term	Definition
Use case	A use case describes the interaction between the user and the system that is required in order to achieve a technical objective on the part of the user. The description is in general terms, not related to the specific technical solution. Use cases effectively meet the requirements of the participants.
Direct routing	For certain messages or payment types in favor of PostFinance, the RTGS system checks whether the creditor's account is saved in the master data for a participant. If it is, the payment is routed by the RTGS system directly to that participant and not to PostFinance.
Concatenation	In concatenation, one external identification (e.g. IID) is connected to another external identification of the same type. Payments in favor of a concatenated identification are automatically routed in the RTGS system to the other identification. Concatenation is a preliminary stage before cancellation.
Payment type	One ISO 20022 message can show several forms of payment. To distinguish between these, different payment types are defined (e.g. ISR payment, cash outpayment order).

Table 7: Definitions



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