

<b>General Information (Origin of Request)</b>		
<input type="checkbox"/> User Requirements (URD) <input checked="" type="checkbox"/> Other User Functional or Technical Documentation (SYS)		
<b>Request raised by:</b> 4CB	<b>Institute:</b> 4CB	<b>Date raised:</b> 05/10/2015
<b>Request title:</b> Change of fractional digit of SUM of securities		<b>Request ref. no:</b> T2S 0538 SYS
<b>Request type:</b> Common	<b>Urgency:</b> Normal	
<b>1. Legal/business importance parameter:</b> High	<b>2. Market implementation efforts parameter:</b> Low	
<b>3. Operational/Technical risk parameter:</b> High	<b>4. Financial impact parameter:</b> No cost impact	
<b>Requestor Category:</b> 4CB	<b>Status:</b> Authorised at Steering Level	

**Reason for change and expected benefits/business motivation:**

T2S validates quantities within settlement instructions and restrictions using the following three parameters configured for each security within Static Data:

- Minimum Settlement Unit (MSU): it defines the minimum quantity or nominal of a security that is eligible for settlement;
- Settlement Unit Multiple (SUM): it specifies the value by which all securities quantities or nominal must be divisible; the settlement quantity of any instruction must be a multiple of the SUM, unless it is equal to a Deviating Settlement Unit (DSU);
- Deviating Settlement Units (DSUs): it defines lot sizes outside of the SUM than can settle for a given security.

Definition and use of Fractional digits (FD)

In T2S, the number of decimal digits of the Settlement Unit Multiple (SUM) of a given securities defines the fractional digits (FD). As an example, a SUM of 100.25 has 2 digits after the decimal comma and therefore an FD = 2. The FD of the SUM of an ISIN is used to determine the number of decimals accepted in the settlement quantity of a settlement instruction or settlement restriction.

For each security expressed in units, the FD specified in the SUM by the user is also used to determine the FD of all the instructions, transactions and positions related to said security and is used internally in T2S to represent quantities of these securities in Securities Instructions (INxs), Securities Transactions (TRxs) and Securities Positions (SPs). The same principle applies for the securities specified in nominal, moreover the number of FD of the SUM corresponds to the number of decimals specified for the currency in which the ISIN is denominated.

For instance, a Security which has a SUM defined as 100.01 implies that all the positions for this Security will be interpreted by SETT as having a FD equal to 2. As a consequence, any change in the FD for the SUM attribute implies as well a change in the way LCMM and SETT interprets the related INxs and SPs and therefore it results in multiplying (if the FD of SUM is increased) or dividing (if the FD of SUM is decreased) the securities positions and the quantities in settlement instructions and transactions.

The change of SUM by the SME CSD is not automatically reported to other CSDs who hold the security positions and therefore investor CSDs cannot trigger the closure of positions before the change is applied. Therefore, an update to the SUM of a given securities within T2S, modifying the FD of the SUM may create inconsistencies on the internal representation of securities positions and pending settlement transactions quantities which remain based on the old value.

It has been confirmed that modifying the SUM of an ISIN could have an impact on the holdings. The impact is seen when the SUM is changed such that the FD in the new SUM is not the same as the FD in the old SUM. In such situations, adding X decimal positions in the SUM for a given ISIN implies that all positions for that ISIN will be divided by  $10^X$ , whereas removing X decimal positions from the SUM for a given ISIN implies that all positions for that ISIN will be multiplied by  $10^X$ . As an example changing value of SUM from 0.1 (one decimal) to 0.11 (two decimal) would decrease the holding by 10 times.

Interim solution

To avoid this, an interim solution has been implemented to address any unintentional modifications of the FD of the SUM for securities defined either with a settlement type of units or nominal. This solution is comprised of a check which

detects any FD changes and prevents them from impacting transactions and positions within settlement, allowing the T2S actor to correct and re-establish the original FD within the SUM. This is outlined in an operational procedure (Management of a change in SUM Fractional Digits) which includes an LLS procedure at LCMM/SETT level and the temporary setup of an intraday restriction on the concerned ISIN.

The interim solution, by definition a temporary one, relies on an LLS and corresponding manual processes which are not acceptable considering the systemic level of impact which the FD change may trigger.

#### Request for long term solution

This Change Request aims at providing for ISIN in units a long term solution which allows for the handling of FD changes to be propagated to LCMM and SETT without impacting INxs, TRxs and SPs. To avoid these impacts there is a need to update the internal representation of INxs, TRxs and SPs to conform to any change in the FD resulting from SUM modifications by the SME CSD.

Furthermore for ISIN in nominal a solution based on a check and alert in case of update of the FD shall be implemented.

This topic has already been discussed in the CRG and OMG.

This Change Request is accompanying the accepted defect with ticket number PBI000000155568 (It is not possible to submit changes to an ISIN because of format problems in the settlement units fields).

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#### **Description of requested change:**

##### **1. Automatic adjustment for ISINs in units**

The change of FD for a given security should not change the holdings in that security or the quantities in settlement instructions and transactions.

For securities expressed in units any change in the FD will be accomplished through an automatic adjustment of the internal recording of INxs, TRxs and SPs ensuring that their quantities remain unchanged.

The automatic adjustment described is performed by multiplying the internal integer representation of quantities by  $10^X$ , X being the difference between the old and the newly increased FD. This allows for the actual value of the INxs, TRxs and SPs to remain unchanged. These adjustments require the stability of settlement (that is to say no booking – changes in SPs) and are achieved by creating an internal FD (FD-S) associated with any given SP or TRx which is equal to the FD of the SUM at that moment.

The adjustment of the instructions and restrictions will be triggered in LCMM as soon as the new value of the SUM is applied in static data. The adjustment to TRxs and SPs will occur subsequent to the modifications made to INxs in LCMM and are triggered in SETT during the SOD. The FD-S is then aligned within new FD. Remainders that would have resulted from the division coming from a decrease in an FD will be prevented by maintaining the FD, as mentioned below, through the inclusion of the required trailing zeros.

#### Static data enhancements

In conjunction with the adjustment above Static Data Management will ensure that when SUM updates occur, FD increases are only applied during the EOD period (when no settlement activity is possible) and that FD decreases will be prevented by the automatic inclusion of trailing zeros. T2S ensures thru Static Data Management that decreases in the significant digits of the decimal portion of the SUM will not impact the actual FD stored by T2S, by adding the necessary trailing zeroes, thus ensuring that no remainders due to division occur during the position adjustments (e.g. when a SUM of x.abcd with FD=4 is updated to a SUM of x.abc with an FD of 3, Static Data Management will store it in T2S as a SUM of x.abcd0, preserving the FD stored in T2S as 4).

T2S will also guarantee thru Static Data Management that SUM updates resulting in an FD increase will be queued and then executed only during the EOD period, as it is already the case for updates of MSU, SUM and DSU of securities eligible for auto-collateralisation (CR-435) and updates of Final Maturity/Expiry date of securities (CR-471). This Static Data Management enhancement will reduce the complexity of the adjustments necessary in other domains and remove any need for redemptions or instruction cancellations by the T2S actors.

Modifications to the SUM which do not impact the FD will not be subject to these Static Data controls and will not necessitate adjustments of INxs, TRxs and SPs. These changes to T2S will also have no repercussions on the current instructing of the settlement instructions and settlement restrictions in either A2A or U2A mode.

Within LCMM and SETT, when necessary, the INxs, TRxs and SPs are then adjusted as being described above.

Additional Settlement check

Additional checks at the level of SETT will occur at the notification of an update of the SUM verifying if the new FD remains consistent with the internal FD of impacted TRxs and SPs and does not involve a decrease in the FD. This check also includes a confirmation of the stability of the settlement day period (EOD). When in violation of any of these checks the SUM update will not be propagated to settlement and an alert will be raised to the T2S operator.

**2- Check without automatic adjustment for ISINs in nominal**

The change of fractional digits, due to a change in the denomination currency for securities denominated in face amount, and the change of settlement type from face amount to units or vice versa are not included in the scope of the change request.

A change in the FD for securities of settlement type nominal and a change in the settlement type itself are considered as very remote cases and will be addressed through an LLS procedure.

To accommodate the changes outlined in this CR, the existing interim solution (already deployed in production and described above) must be modified to only prevent FD changes for securities where the settlement type has changed or is nominal, since for these types of changes an ad-hoc operational procedure should be followed.

**Submitted annexes / related documents:**

[https://www.ecb.europa.eu/paym/t2s/progress/pdf/tg/crg/crg47/07.inc164770\\_clarification\\_fractional\\_digit\\_management.pdf](https://www.ecb.europa.eu/paym/t2s/progress/pdf/tg/crg/crg47/07.inc164770_clarification_fractional_digit_management.pdf)

**Proposed wording for the UDFS Change request:**

UDFS section 1.6.3.3.3 – Validity of static data objects

The following footnote shall be added in table 140, with specific reference to the update of Securities:

“In case of Securities expressed in units, if the requested update implies an increase of the number of decimal positions for the Settlement Unit Multiple value, T2S will queue the securities update and only apply it during the EOD procedure of the current day.”

UDFS page 1103, section 3.3.6.2 (SecurityMaintenanceRequest V01)

MESSAGE ITEM	DATA TYPE / CODE	BUSINESS RULES
Unit	RestrictedFINDecimalNumber	DSU1704
/Document/SctyMntncReq/UpdTp/UpdTp/Modfy/FinInstrmAttrbts/SttlmInf/MinMltpQty/Unit		

UDFS page 1100, section 3.3.6.2.2 (The T2S-specific schema)

The following text shall be added in the “T2S-Use” annotation for the “/Document/SctyMntncReq/UpdTp/UpdTp/Modfy/FinInstrmAttrbts/SttlmInf/MinMltpQty/Unit“- element in the reda.007 schema stored in MyStandards repository:

“In case of Securities expressed in units, if the requested update implies a decrease of the number of decimal positions for the Settlement Unit Multiple value, T2S will automatically include trailing zeroes that allows keeping the number of decimal positions unchanged.”

UDFS section 4.1 (Index of Business Rules and Error Codes)

BR NAME	DESCRIPTION	INBOUND MESSAGE	REPLY MESSAGE	CODE USE	REASON CODE	ERROR TEXT
DSU1704	<u>When performing a Security Update request of a Security expressed in units, if the request contains updates to the Settlement Unit Multiple increasing the number of decimal positions, and it is submitted outside of the End of Day period, the request is queued and executed at the start of the End of Day period.</u>	reda.007	reda.029	-	QUED	

**Proposed wording for the UHB Change request:**

UHB page 713, section 2.5.2.7 (Security – New/Edit Screen)

Settlement Unit Multiple (as unit)	<p>Enter the settlement unit multiple of the security as unit. Required format is: max. 18 digits incl. decimal point (thereof max 917 decimal places and decimal point). The number of decimals of the SUM should define the maximum number of decimals that may be needed in the security lifecycle (e.g. for corporate actions).</p> <p><u>In case the requested update implies a decrease of the number of decimal positions for the Settlement Unit Multiple value, T2S will automatically include a number of trailing zeroes that allows keeping the number of decimal positions unchanged.</u></p> <p>The field is visible and mandatory if the field settlement type is set to 'Unit'. References for error messages [ ] 2371]:</p> <ul style="list-style-type: none"> <li>  DSC1300</li> <li>  DSC1800</li> <li>  DSU1030</li> <li>  DSU1031</li> <li>  DSU1301</li> <li>  DSU1700</li> <li>  <u>DSU1704</u></li> <li>  DSU1800</li> </ul>
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#### UHB page 720, section 2.5.2.7 (Security – New/Edit Screen)

Submit	<p>This function enables you to create or edit a security.</p> <p>After a security creation request is completed a prompt is shown with the following request: 'Do you want to configure the issuer now?'</p> <p>In case you click on the 'Yes' button you will be redirected to the new CSD link screen with the following prefilled items:</p> <ul style="list-style-type: none"> <li>● ISIN field with Security-ISIN value;</li> <li>● Link type field is with ISSUER value;</li> <li>● Valid from with business date;</li> <li>● Issuer investor parent BIC and issuer investor BIC with user - related parent BIC (if the creating user is a CSD user, otherwise the "Issuer Investor" fields are empty).</li> </ul> <p>Next screens:</p> <ul style="list-style-type: none"> <li>● <i>Security CSD links – search/list screen</i> (if you confirm the 'CSD Link' confirmation prompt)</li> <li>● <i>Securities – search/list screen</i></li> </ul> <p>References for error messages:</p> <ul style="list-style-type: none"> <li>● DSC1001</li> <li>● DSC1013</li> <li>● DSC1021</li> <li>● DSC1022</li> <li>● DSC1024</li> <li>● DSC1025</li> <li>● DSC1026</li> <li>● DSC1027</li> <li>● DSC1028</li> <li>● DSC1029</li> <li>● DSC1032</li> <li>● DSC1040</li> <li>● DSC1252</li> <li>● DSC1254</li> <li>● DSC1256</li> <li>● DSC1257</li> <li>● DSC1700</li> </ul>
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  - DSU1702
  - DSU1704
  - DSU1800
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UHB section 6.4.2.167 (Security – New/Edit Screen)

Reference for error message	Field or Button	Error Text	Description
<u>DSU1704</u>	<ul style="list-style-type: none"> <li>Settlement Unit Multiple (as unit)</li> </ul>	<u>Securities update has been queued and will be executed during the End of Day period.</u>	<u>When performing a Security Update request, if the request contains updates to the Settlement Unit Multiple increasing the number of decimal positions, and it is submitted outside of the End of Day period, the request is queued and executed at the start of the End of Day period.</u>

High level description of Impact:

Outcome/Decisions:

- \* CRG meeting on 28 October 2015: The Change Review Group recommended to launch the detailed assessment on the Change Request.
- \* Advisory Group’s advice on 4 November 2015: Following a written procedure, the AG was in favour of launching the detailed assessment on the Change Request.
- \* CSG resolution on 5 November 2015: Following a written procedure, the CSG was in favour of launching the detailed assessment on the Change Request.
- \* OMG on 5 November 2015: During a written procedure from 29 October to 5 November 2015, the Operations Managers Group did not identify any operational impact of the Change Request.
- \* CRG teleconference on 23 November 2015: The Change Review Group recommended the approval of the Change Request and recommended the inclusion of the Change Request in Release 1.1.
- \* Joint CRG/OMG/PMG workshop on 27 November 2015: It was agreed that the Change Request should include the related defect identification.
- \* PMG meeting on 1 December 2015: The Project Managers Group was in favour of adding the Change Request to Release 1.1.
- \* OMG on 1 December 2015: During a written procedure from 24 November to 1 December 2015, the Operations Managers Group reviewed the detailed assessment on the Change Request and did not identify any operational impact. The OMG also was in favour of adding the Change Request to Release 1.1.
- \* Advisory Group’s advice on 8 December 2015: The AG was in favour of approving the Change Request and including it in Release 1.1.
- \* CSD Steering Group’s resolution on 9 December 2015: The CSG took the resolution to approve the Change Request and to include it in Release 1.1.

**EUROSYSTEM ANALYSIS – GENERAL INFORMATION**

<b>Impact On T2S</b>	<b>Static data management</b>		<b>Interface</b>	
		Party data management		Communication
	x	Securities data management		Outbound processing
		T2S Dedicated Cash account data management		Inbound processing
		Securities account data management		
		Rules and parameters data management		
	<b>Settlement</b>		<b>Liquidity management</b>	
	x	Standardisation and preparation to settlement		Outbound Information Management
		Night-time Settlement		NCB Business Procedures
		Daytime Recycling and optimisation		Liquidity Operations
		Daytime Validation, provisioning & booking	<b>LCMM</b>	
		Auto-collateralisation	x	Instructions validation
	x	Transversal Settlement Day		Status management
	<b>Operational services</b>			Instruction matching
		Data Migration		Instructions maintenance
		Scheduling	<b>Statistics, queries reports and archive</b>	
		Billing		Report management
		Operational monitoring		Query management
				Statistical information
				Legal archiving
		All modules (Infrastructure request)		
		No modules (infrastructure request)		
		Business operational activities		
	Technical operational activities			

<b>Impact on major documentation</b>		
<b>Document</b>	<b>Chapter</b>	<b>Change</b>
Impacted GFS chapter		
Impacted UDFS chapter	§.1.6.3.3.3 Table 140 §. 3.3.6.2 (SecurityMaintenanceRequest V01) §. 3.3.6.2.2 (The T2S-specific schema) §.4.1 (Index of Business Rules and Error Codes)	See changes described above.
UHB	§.2.5.2.7 Security – New/Edit Screen §.6.4.2.167 Security – New/Edit Screen	Inclusion of new business rule code reference. Inclusion of new business rule details.
External training materials		
Other documentations		
Links with other requests		
Links	Reference	Title

**OVERVIEW OF THE IMPACT OF THE REQUEST ON THE T2S SYSTEM AND ON THE PROJECT**

Summary of functional, development, infrastructure and migration impacts

The automated adjustment solution requires modifications to numerous T2S modules. These include:

- Static Data Management:
  - Modification for processing SD updates increasing FD that are received by T2S out of the EOD period.
  - Modification for processing SD updated decreasing FD in a way to keep FD unchanged.
- LCMM:
  - The revalidation process should be enhanced in order to have a specific treatment to the SUM

<p>updates related to fractional digits.</p> <ul style="list-style-type: none"> <li>○ Modifications to address the adjustment of settlement instructions and settlement restrictions after a change of decimals of the SUM of a security denominated in units.</li> </ul> <ul style="list-style-type: none"> <li>● Settlement:             <ul style="list-style-type: none"> <li>○ Checks to confirm that FD updates are valid and authorised</li> <li>○ Adjustments of transaction (stemming from adjustments of settlement instructions and settlement restrictions) and position quantities for valid FD increases</li> <li>○ Modification of interim solution to only prevent SUM FD updates for securities with a settlement type of nominal.</li> </ul> </li> </ul> <p><b>Static Data Management</b></p> <p>A new business rule is required in order to ensure that Securities updates that increase FD are queued and then executed only during the EOD period. Furthermore, additional business logic is required (as data processing) in order to ensure that Securities updates that decrease FD are automatically complemented by adding a number of trailing zeroes keeping FD unchanged.</p> <p><b>LCMM</b></p> <p>Enhance the Intraday revalidation processes to identify the SUM updates related to ISINs denominated in units in order to give those static data changes the foreseen treatment.          Ensure that FD increases are applied to instructions as soon as possible so that instruction matching occurs with equivalent FDs.          Implemented CR 475 “Consistency in the number of decimals” does not need any update.</p> <p><b>Settlement</b></p> <p>Checks within Settlement will ensure that SUM updates resulting in FD changes correspond to the defined criteria (that is FD increases during EOD for securities with settlement type units). FD modifications failing these checks will result in alerts to the T2S operator requiring LLS procedures. Valid FD updates, for transactions and positions whose FD differs from the newly increased FD, will result in adjustments whereby the related quantities are multiplied by the appropriate factor of 10. An interim solution currently prevents FD changes for all ISINs, regardless of the securities type, from propagating to Settlement and impacting transactions and positions. This must be modified to only occur only when the ISIN is of securities type nominal.</p>
Summary of project risk
No.
Security analysis
Ongoing.