DSB ToTV and uToTV Functionality

Functional Specification Document

Author: Derivatives Service Bureau
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Version: **1.1**

Contents

Preface

Change History

Date	Change	Version	Author	Revision Details
27 May 2017	Creation	1.0	Kuhan T	
9 August 2017	Update	1.1	Natalia Kozlovich	Incorporated Industry feedback and added detailed workflows

1 Introduction

1.1 Document Purpose

The purpose of this document is to set out the functional specification to extend the Derivatives Service Bureau (DSB) service to include Traded on a Trading Venue (ToTV) and underlying Traded on a Trading Venue (uToTV) indicators as requested by the industry via the Product Committee and broader consultation.

The draft ToTV and uToTV Functional Specification Document (v1.0) published on 28th June 2017 sought industry feedback on three key aspects: (a) the DSB's ToTV/ uToTV functionality, (b) industry appetite for the derivation of the sub-class by the DSB and (c) industry appetite for the provision of non-OTC data by the DSB. This version of the ToTV and uToTV Functional Specification Document seeks to clarify workflows based on commentary received by the DSB in the course of the consultation process.

1.2 Background

The DSB core service is to provide ISINs for OTC derivatives. The key focus of this service extension is to assist with the process of identifying those ISINs that are Traded on a Trading Venue (ToTV) and those that have an underlying Traded on a Trading Venue (uToTV).

In addition, the expectation is for ESMA's reference data system (FIRDS) to publish key ESMA attributes alongside each of the entries in the system and for ESMA to publish LIS and SSTI data as part of the transparency reporting system. Many of the new business processes across the industry that require ISINs also use this ESMA published data. The DSB service aims to bring those different datasets together to facilitate the access to that data from a single source.

The ToTV and uToTV indicators, as well as the other ESMA sourced data will be available alongside the ISIN.

1.3 Response Highlights

The DSB has received 23 responses to the draft functional specification, nine were questions about aspects of the document and 13 were focused on feedback. Feedback providers included one trade association, six sell-side organisations, four buy-side institutions and two vendors.

General feedback to each question raised in the previous ToTV and uToTV Functional Specification Document is set out below, with specific matters addressed in the body of this document.

Inclusion of non-OTC data: The previous paper asked whether the industry saw value in the DSB also providing ToTV information for non-OTC instruments so that the information would be available in a single place along with the rest of the service. Responses received: 31% agreed, 8% disagreed and 61% silent.
DSB Decision: The DSB will investigate the additional work required to undertake the provision of this data pool in addition to the core DSB OTC service with final decision by the DSB Board taking into account industry feedback.

Provision of sub-class: The previous paper asked whether the DSB should provide sub-class identification for OTC ISINs as part of the DSB ToTV service. Responses received: 23% agreed, 8% disagreed and 69% silent.

DSB Decision: In-line with the feedback received, the DSB will investigate the provision of sub-class, but as a low priority item. This means provision for Day 1 is unlikely.

Using FIRDS to determine ToTV: The previous paper asked whether the FIRDS data should be the determinant of ToTV status. Responses received: 15% agreed, 15% disagreed and 70% were silent. Of the 15% of industry participants who disagreed, none suggested any alternative means of sourcing ToTV data.
DSB Decision: The DSB will use the FIRDS data to determine ToTV/uToTV (in the absence of a viable alternative for a service requested by industry) but remain mindful that additional sources may need to be incorporated at a future date once viable sources have been identified.

Core ToTV/ uToTV data attributes:

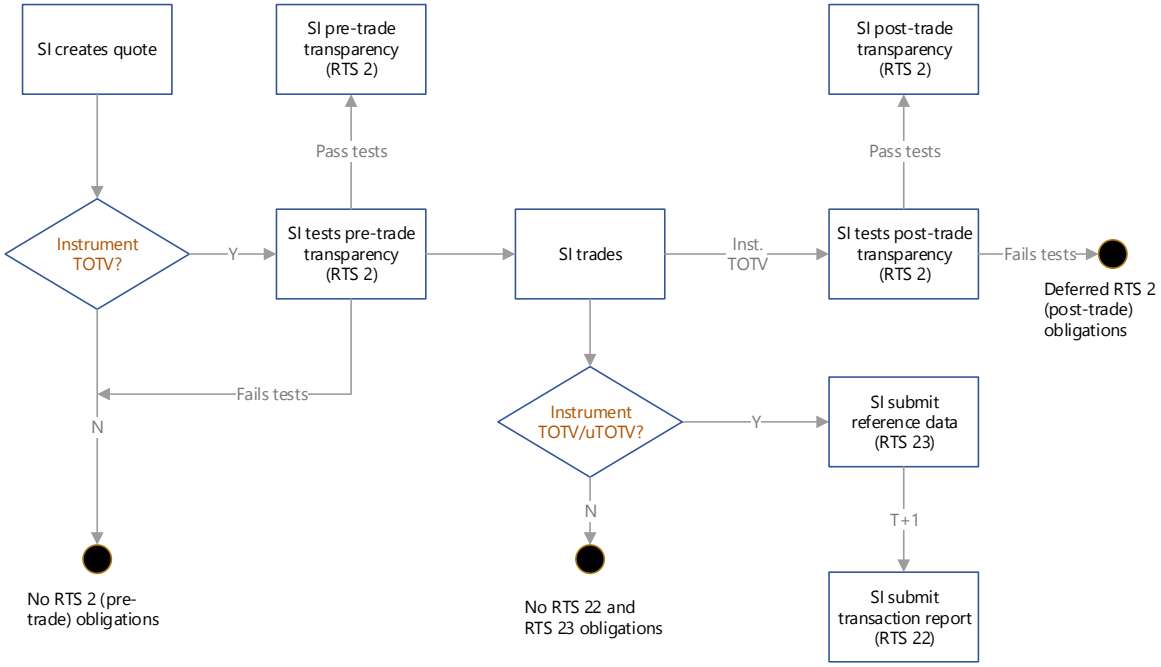
(i) The general feedback on the uToTV functionality was that if an Index has at least one constituent that is ToTV, an instrument with that index underlying will be uToTV.
(ii) A number of industry participants requested the inclusion of Effective Dates for ToTV/uToTV flags to identify the date on which a trade first became eligible for reporting.

DSB Decision: The uToTV functionality will be implemented on the above basis and Effective Dates for ToTV/uToTV flags will be added to reflect the feedback received.

File Download timing: Several participants raised a concern about whether the file download provides ToTV information at a sufficient point in time for anyone using File Download as a single source of data of the ToTV information.
DSB Decision: The DSB will investigate the request, understand the impact on performance and the cost of making the file download available after the ToTV/uToTV flags have been computed. This analysis will be performed in parallel to the initial implementation with the expectation that any timing change will occur after the initial go-live. This approach allows the DSB to limit the spectrum of changes required before January 2018 and to focus on delivery of the core ISIN functionality.

1.4 High Level Workflow

The below is an example of one type of high level workflow for a systematic internalizer (SI) quoting and then trading an instrument, demonstrating some of the ways the ToTV flag might be used.



The test for ToTV at the pre-trade stage determines whether there are any MiFID II reporting or transparency obligations. The additional fields being considered for the MiFID II Dataset will provide the criteria for the pre-trade transparency tests.

The test for ToTV or uToTV at the post-trade stage determines whether there are any further MiFID II reporting or transparency obligations. The additional fields being considered for the MiFID II Dataset will provide the criteria for the post-trade transparency tests.

2 Scope

2.1 Instrument Scope

Following Industry feedback, the DSB MiFID II Dataset service will be available for the full scope of instruments submitted to ESMA under MiFID II Article 27 / RTS 23 obligations to allow trading venues and systematic internalizers to submit reference data.

The DSB MiFID II Dataset service will be available for

- all the products for which the DSB issues ISINs. This is currently defined using a combination of CFI Code (ISO 10962: 2015) Letter #2: Group (R-Rates, E-Equity, C-Credit, F-Foreign Exchange and T-Commodities) and CFI Code Letter #1: Category (H-Non-listed and complex options; S-Swaps and F-Forwards).
- Pending DSB Board ratification, the following is the DSB assumption for treatment of non-OTC ISINs. The DSB defines non-OTC products as those not issued by the DSB, but received as part of the FIRDS file. This includes but is not limited to Equities, Fixed Income, Listed Derivatives.
  For non-OTC products, the DSB will store the ISIN, its underlying and the associated MiFID II Dataset.

2.2 MiFID II Dataset Scope

The DSB will import the following classifications, flags and thresholds from FIRDS and other ESMA sources on the basis these are available:

RTS 2 Reference Data Attribute Name	Example Value
MiFID II Last Update Date	2017-06-09
Liquidity Flag	TRUE
Pre-Trade Large in Scale (LIS) Threshold	300,000
Pre-Trade Size Specific to The Instrument (SSTI)	250,000
Post-Trade Large in Scale (LIS) Threshold	1,500,000
Post-Trade Size Specific to The Instrument (SSTI)	1,250,000

According to RTS2 chapter 4 article 13 section 8, the currency for LIS and SSTI thresholds is EUR.

The DSB will derive the following key attributes:

Derived Attribute Name	Example Value
Traded on a Trading Venue	TRUE
ToTV Effective Date	2017-06-09
Underlying Traded on a Trading Venue	FALSE
uToTV Effective Date	2017-06-09
On FIRDS Flag	TRUE

Following industry feedback, ToTV Effective Date and uToTV Effective Date will be stored as part of the ISIN metadata so that users can identify the date on which a trade first became eligible for reporting.

ToTV Effective Date will be the earliest Effective Date of all the ToTV Effective Dates that relevant Trading Venues reported to ESMA for a particular ISIN.

uToTV Effective Date will be the earliest Effective Date of all the underlying ToTV Effective Dates that relevant Trading Venues reported to ESMA for a particular ISIN.

The JSON structure for ISIN records will be enriched to have an additional section for MiFID II Dataset attributes. The JSON structure for ISIN requests will remain unaltered. As a reminder, DSB JSON templates are separated into “request” and “record” for each product definition.

Constraints

- The imported RTS 2 reference data fields are based on the DSB’s expectations of the fields that will be published by FIRDS. Once ESMA publishes the file specifications, the DSB will revisit this list of attributes with a view to providing as comprehensive a set as is possible.

- A FIRDS sample is expected to be made available in Q4 2017 which will allow the DSB to conduct a final analysis, reconfirm the expected dataset and understand if any revisions to the DSB's assumptions and/or data attributes are required

3 Key Requirements

3.1 System requirements

Below are the set of key system requirements for the DSB MiFID II Data Service:

#	Requirement	Description	Frequency
1.1	Add MiFID II Dataset	Against each ISIN, the system will hold the relevant MiFID II Dataset. This dataset is defined in section 2.2 and will include the ToTV and uToTV flags.	Ongoing
1.2	No ISIN Change	When the values or the list of attributes included in the MiFID II Dataset change, the system will not consider this a change or update to the ISIN definition, e.g. ISIN Status or ISIN Last Update DateTime will not be affected.	Ongoing
1.3	Update ToTV Flag	For each ISIN, the system will update the ToTV flag (following the process specified in section 5). Note, this frequency will be equal to the rate at which FIRDS is updated.	Daily (=FIRDS frequency)
1.4	Update uToTV Flag	For each ISIN, the system will update the uToTV flag (following the process specified in section 5).	Daily (=FIRDS frequency) and On Creation
1.5	Update MiFID II Dataset	For each ISIN, the system will update the additional MiFID II Dataset (following the process specified in section 5).	Daily (=FIRDS frequency)
1.6	Instrument Expiry Update	The DSB will mark all OTC derivatives with Expiry Date < Today as having ISIN Status = Expired. The ToTV/uToTV/onFIRDS flags will be left intact so that the users could retrieve the last ToTV status before the instrument expired. This is to be confirmed with the PC	Daily

3.2 User requirements

Below are the set of key user requirements for the DSB MiFID II Data Service:

#	Requirement	Description	Frequency
2.1	MiFID II Dataset Access	The MiFID II Dataset will be available via all the existing connectivity methods to the DSB: • GUI • File Download • ReST API • FIX API	Ongoing
2.2	ISIN Request	When a user requests an ISIN using the set of attributes as specified in the appropriate product definition, in addition to returning the full ISIN record, the system will return the associated MiFID II Dataset.	On request
2.3	Search	When a user searches for an ISIN using either a set of attributes or the ISIN itself, the record returned will include the MiFID II Dataset.	Ad-hoc
2.4	Search by MiFID II Dataset	The MiFID II Dataset will be fully searchable alongside the ISIN definition attributes. The DSB search function uses Apache Lucene Query Parser Syntax. A user-guide for the DSB's search capability is available via the GUI: 	Ad-hoc
2.5	Updates to real-time FIX subscribers	FIX users subscribing to real-time updates from the DSB will receive the ISIN record if any of the MiFID II Dataset attributes change.	Ongoing

4 ToTV/uToTV Proposed Solution

The DSB evaluated industry feedback on various alternative solutions before arriving at the proposal detailed below.

This section provides the definitions for each of the DSB derived attributes within the MiFID II Dataset.

4.1 DSB's ToTV Flag

- If the instrument is in the FIRDS file and the MIC identifies an approved European trading venue, then the ToTV Flag will be set to True
- Approved European trading venues include EU regulated markets, Multilateral Trading Facilities (MTF) and Organised Trading Facilities (OTF).
- Note that OTC ISINs will only be updated if there is a full match between FIRDS and DSB data (as defined in section 10.2)

4.2 ToTV Effective Date

- The ToTV effective date will be the earliest date among all the ToTV Effective Dates that Trading Venues reported to ESMA for a particular ISIN.
- The DSB will use the FIRDS "Date of Admission to Trading or Date of First Trade" attribute[1] to derive the ToTV effective date.

4.3 DSB's uToTV Flag

- If the instrument has a single underlier and that underlying instrument is ToTV (as defined in section 4.1) then the instrument is uToTV
- If the instrument has multiple underliers and any of the underlying instruments is ToTV (as defined in section 4.1) then the instrument is uToTV
- If at least one constituent of an underlying index of the instrument is ToTV, the instrument will be uToTV.

4.4 uToTV Effective Date

- The uToTV effective date will be the earliest Effective Date among all the underlying ToTV Effective Dates that Trading Venues reported to ESMA for a particular ISIN.

4.5 DSB's On FIRDS Flag

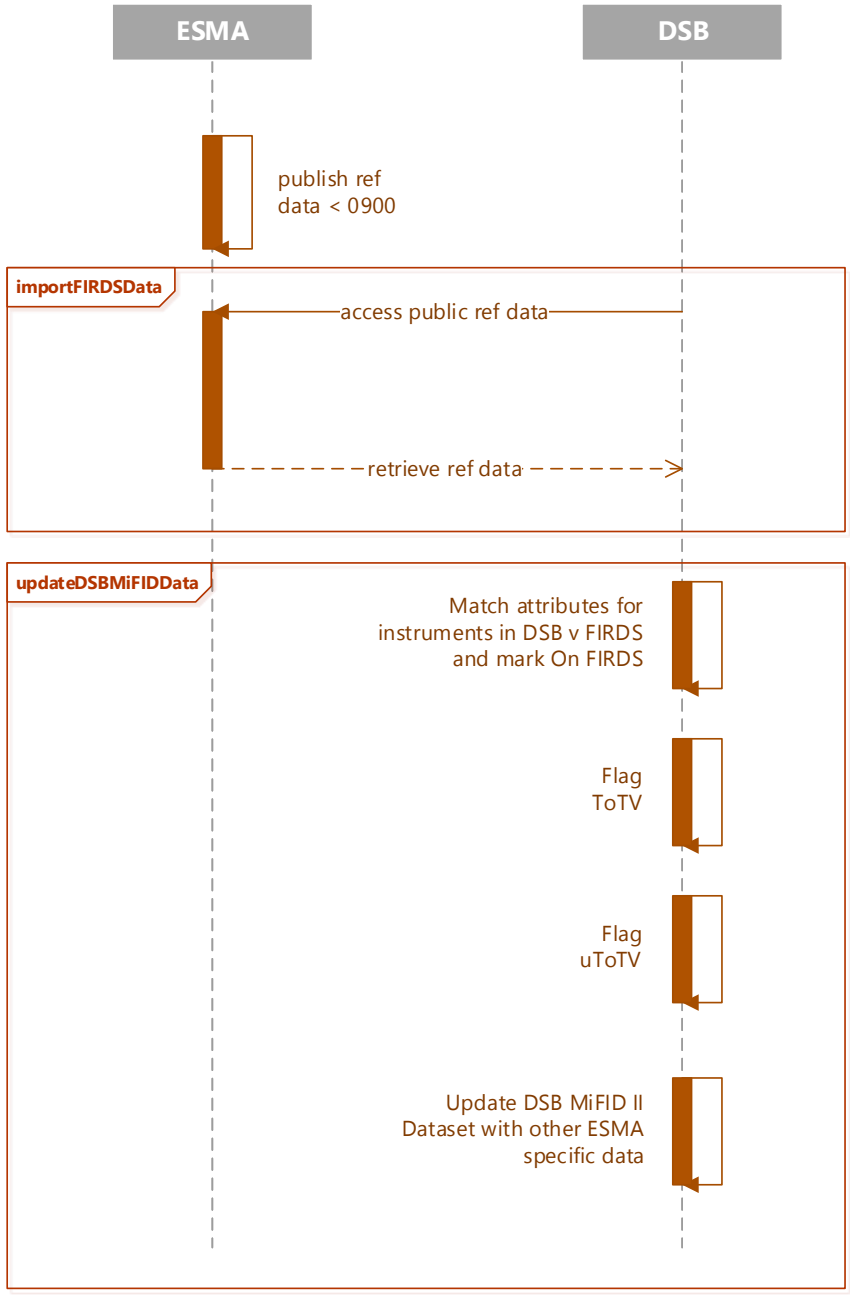
- If the instrument is present in FIRDS, this flag will be set to True. There needs to be a full match between the FIRDS data and the DSB data in order for an OTC ISIN to be marked as On FIRDS.
- All creation of OTC ISINs will produce an ISIN with an On FIRDS equal to False
- All creation of non-OTC ISINs will produce an ISIN with an On FIRDS equal to True

5 System Workflows

5.1 High-Level Create MiFID II Dataset

The below workflow presents the steps the DSB will follow to create the MiFID II Dataset.

[1] As defined in section 2.3.4.2.11 https://www.esma.europa.eu/sites/default/files/library/2016-1522_firds_reference_data_reporting_instructions.pdf



Step	Description
Access public reference data	**Assumptions** • ESMA enables systematic retrieval of public reference data • FIRDS public data contains a mixture of data from European Trading Venues and Systematic Internalisers • ESMA publishes and maintains RTS 2 Thresholds and liquidity flag • ESMA publishes and maintains a set of approved MIC codes for European Trading Venues and Systematic Internalizers • ESMA publishes a delta of new instruments or changes in instrument reference data each day **Description**

Step	Description
	Daily, the system accesses ESMA's instrument reference data service. This must be executed as soon as ESMA publish their new set of data (<= 0900) **Constraints** The DSB will not provide MiFID II data for ISINs that are not in FIRDS
Retrieve reference data	**Assumptions** • For OTC ISINs, Reference data is keyed on all attributes listed in 10.2 • For non-OTC ISINs, Reference data is keyed on ISIN • RTS 2 Thresholds and liquidity flag are retrieved for each ISIN **Description** The system imports the instrument reference data and updates the DSB cache of ESMA data.
Match attributes for instruments in DSB vs FIRDS and mark On FIRDS	**Description** For OTC ISIN, match the set of attributes (as defined in 10.2 for every asset class) to the FIRDS data. If there is a match, set On FIRDS to True. If there is no match, the DSB will log that FIRDS record as having "data issues" (as defined in 5.4). **Constraints** Where the ISIN has been issued by the DSB and the attributes held in FIRDS do not match the attributes the DSB holds, the DSB will not mark the ISIN as ToTV unless there are other records in the FIRDS data from different Trading Venues/SI's that do match DSB's data. Where FIRDS attributes allow a free entry input text field (e.g. Underlying index name from RTS 23 field 28) and the DSB has an enumerated list for the same attribute, the DSB is assuming that the industry will be reporting the DSB's data for those fields to ESMA in order to ensure a correct match.
Flag ToTV	**Assumptions** • DSB will have access to an up-to-date list of MICs for approved trading venues in the EU. The DSB will source the list from ESMA prior to running the FIRDS daily update. **Description** If the MIC equals a valid European trading venue, set the ToTV flag to TRUE in the DSB MiFID II Dataset.
Flag uToTV	**Assumptions** • ISIN has an underlying ISIN or Index **Description** If the underlying is ToTV or at least one constituent of an underlying index is ToTV, the instrument will be marked as uToTV. The DSB will identify constituents and the ISINs associated with each by …
Update DSB MiFID II Dataset with other ESMA specific data	**Assumptions** MiFID II Dataset attributes are in FIRDS as stated in the Attribute Scope section. **Description**

Step	Description
	Update the DSB MiFID II Dataset with all new values for the attributes stated in the Attribute Scope section.

5.2 Key Constraints

- Mismatch of data fields amongst multiple FIRDs records – at instrument or underlying instrument level

  The DSB will run a data integrity check prior to updating DSB OTC ISIN with ToTV/uToTV flags and associated MiFID II Dataset. The DSB will only use OTC ISIN records from FIRDS where a complete record matched DSB criteria (as defined in 10.2). Furthermore, any records within the FIRDS Reference Data System with an Inconsistency Indicator set to True will be disregarded by the DSB.

  Attributes such as Underlying index name (RTS field28) for which ESMA accepts a free entry input text field as opposed to the DSB's enumerated list, the DSB is assuming that the industry will be reporting the DSB's data for those fields to ESMA.
  The DSB is not the golden source for non-OTC ISINs, therefore an ISIN record will be created using the FIRDS data.
  When a sample file from FIRDS is made available, the DSB will use it to test assumptions and further strengthen data validation processes as required.
  The DSB expects the MiFID II Dataset to be provided as part of FIRDS Transparency System per ISIN and to be the same for multiple Trading Venues /SI's reporting the same ISIN.

- Access to updated European MIC / SI list

  The DSB expects to have access to up-to-date files from ESMA for approved European trading venues and SI's. The DSB will use this data to derive ToTV/uToTV flags.
  The DSB will cache a local copy of approved European Trading Venues and SI's daily from ESMA prior to running the daily update from FIRDS.

- FIRDS sample data format assumptions

  As part of preparations for production, the DSB is assuming that a FIRDS sample will be made available in Q4 2017 which will allow the DSB to conduct a final analysis, reconfirm the expected dataset and understand if any revisions to the DSB's assumptions and/or data attributes are required.

- Expected timing of the FIRDS file, data processing time required by the DSB and dataset update publication expectation assumptions

  The DSB expects a set of files from FIRDS daily at 8am CET.
  The DSB will start the process of determining ToTV/uToTV as soon as the files from FIRDS are received for that day. As the ToTV/uToTV flags being set, any FIX subscribers will be notified and the information will become available via the GUI Search function and REST API.
  The end of day download file will incorporate the information after midnight the following day.

5.3 Outstanding Issues

This section describes the remaining issues where clarity is still required.

5.3.1 uToTV for Instruments where underlying is an Index

As set out in 4.3, for instruments with an underlying index, if at least one constituent of an underlying index of the instrument is ToTV, the instrument will be uToTV.

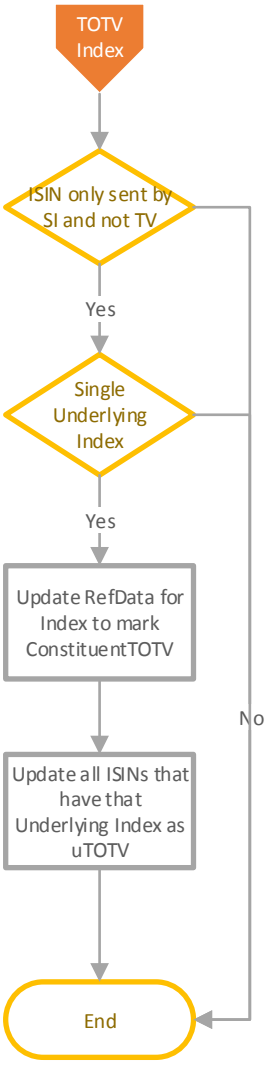
The DSB needs to identify all indices that have at least one constituent ToTV and maintain this flag on the index reference data record so that all instruments having such index as an underlying could have their uToTV flag marked accordingly.

The DSB has identified a process to define a subset of indices that have a constituent ToTV. The process will only identify indices that are the only underlier in instruments that have only been reported to ESMA by Systematic Internalisers.

An ISIN can be in the FIRDS file multiple times, and it could belong to one of the following buckets:

1. ISINs that have been reported by Trading Venues only
2. ISINs that have been reported by Trading Venues and Systematic Internalisers
3. ISINs that have been reported by Systematic Internalisers only

From the above, we can deduce that for any ISIN that has a single underlying index, and which has been reported by Systematic Internalisers only, its underlying index must contain at least one constituent that is ToTV, otherwise it would not be reported to FIRDS. The DSB could then update all instruments that have that index as an underlying with uToTV flag set to True:



However, the above process will only identify a subset of indices. The DSB is currently working to define a process to identify all indices that have at least one constituent ToTV to provide a complete uToTV indication process.

5.3.2 Single Name Credit Default Swaps with LEI underlier

The current product definition for Single Name CDS permits either an LEI or an ISIN as the underlier. This presents two potential risks for the uToTV process:

- It is currently not possible to assess whether a particular issuer identified with an LEI is ToTV
- The same essential instrument but with two different ISINs can be created in two ways: one with the ISIN and one with the LEI – in the current model, the instrument with an ISIN underlier might be marked as uToTV whereas the instrument with an LEI underlier will not be marked as uToTV

The challenge for a Single Name CDS being created using either an ISIN or an LEI as an underlier is being addressed by the DSB Product Committee. The DSB will refine its approach after the DSB Product Committee makes its decision on these points.

5.4 FIRDS Daily Update

The DSB assumes that it will be possible to receive daily files from the FIRDS Reference Data System to determine ToTV/uToTV and from the FIRDS Transparency Systems to update the MiFID II Dataset (LIS, STTI, Liquidity).

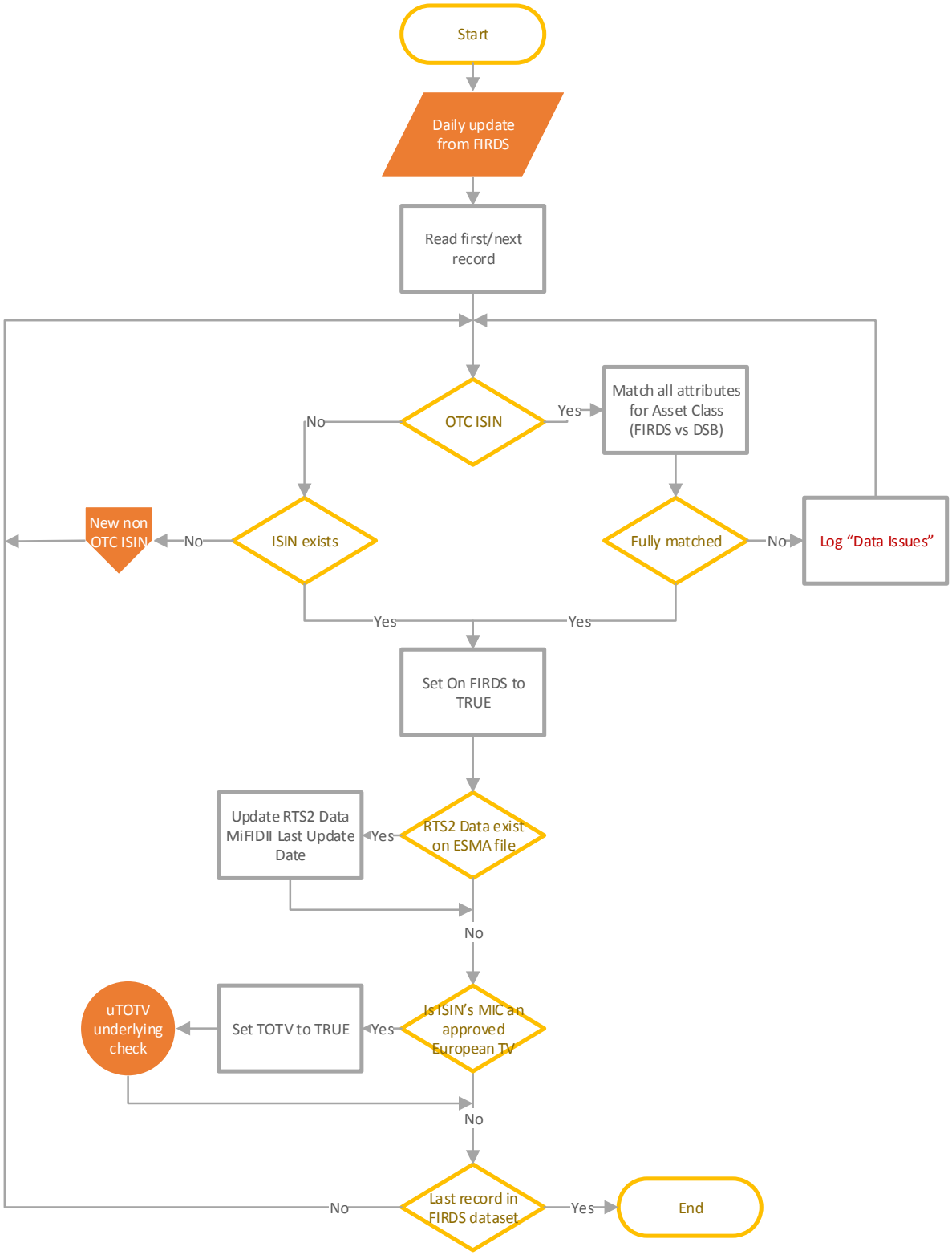
The DSB expects the ESMA FIRDS Transparency file to be unique per ISIN.

The DSB will then process every record in the FIRDS file skipping those records where ESMA has marked the record with Inconsistency Indicator[2] set to True. For OTC ISINs, the DSB will match attributes it holds against the ISIN to the FIRDS data (as defined in 10.2) and only records that are fully matched, will be updated from FIRDS. The records where there is a mismatch will be logged as having "Data Issues" and not impact further daily processing by the DSB.

For non-OTC ISINs, if an ISIN is not yet known to the DSB, it will be logged as a new entry in the DSB's non-OTC ISIN dataset (as defined in 5.6).

The DSB will then set On FIRDS to True for all DSB ISINs that do not have any 'data issues' and if thresholds (e.g. LIS, SSTI, Liquidity) exist in the FIRDS data for that ISIN, will update MiFID II Dataset. The DSB will then run ToTV check:

[2] As defined in section 2.3.4.2.50 https://www.esma.europa.eu/sites/default/files/library/2016-1523_firds_transparency_reporting_instructions.pdf


Start
Daily update from FIRDS
Read first/next record
OTC ISIN
No
Yes
Match all attributes for Asset Class (FIRDS vs DSB)
New non OTC ISIN
No
ISIN exists
Fully matched
No
Log "Data Issues"
Yes
Yes
Set On FIRDS to TRUE
Update RTS2 Data MiFIDII Last Update Date
Yes
RTS2 Data exist on ESMA file
No
uTOTV underlying check
Set TOTV to TRUE
Yes
Is ISIN's MIC an approved European TV
No
No
Last record in FIRDS dataset
Yes
End

5.4.1 uToTV underlying check

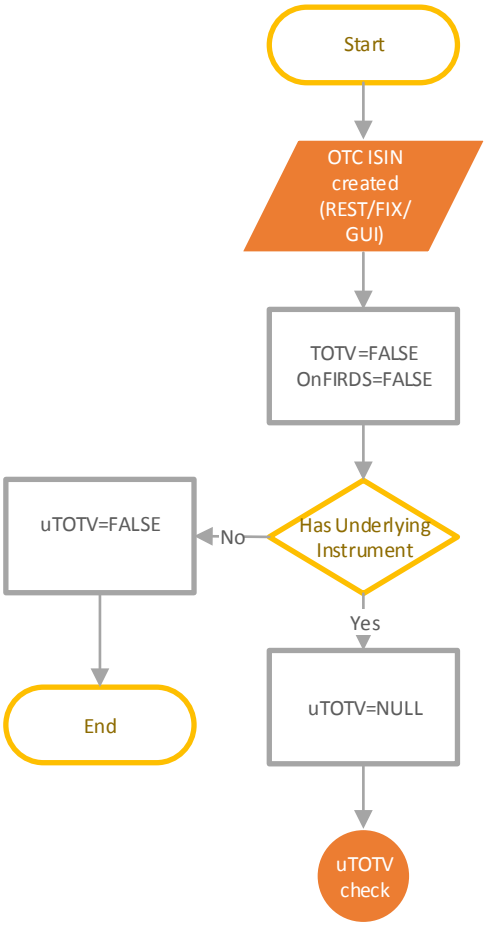
For every ISIN that is set to ToTV, set uToTV=True for all records that have this ISIN as underlying and uToTV=False

5.5 New OTC ISIN

For a newly created DSB OTC ISIN, ToTV and On FIRDS flags will be always set to False.

If the ISIN has an Underlying instrument, uToTV flag will be set to NULL when the DSB ISIN is created, and immediately after the ISIN is created its uToTV status will be checked and updated accordingly. This means that FIX subscribers might first receive an ISIN with uToTV NULL and shortly after - the same ISIN with uToTV set to False/True.

ISINs that have no Underlying will be created with uToTV equals False.



The Non-OTC ISINs will be retrievable and searchable in the same way as an OTC ISIN.

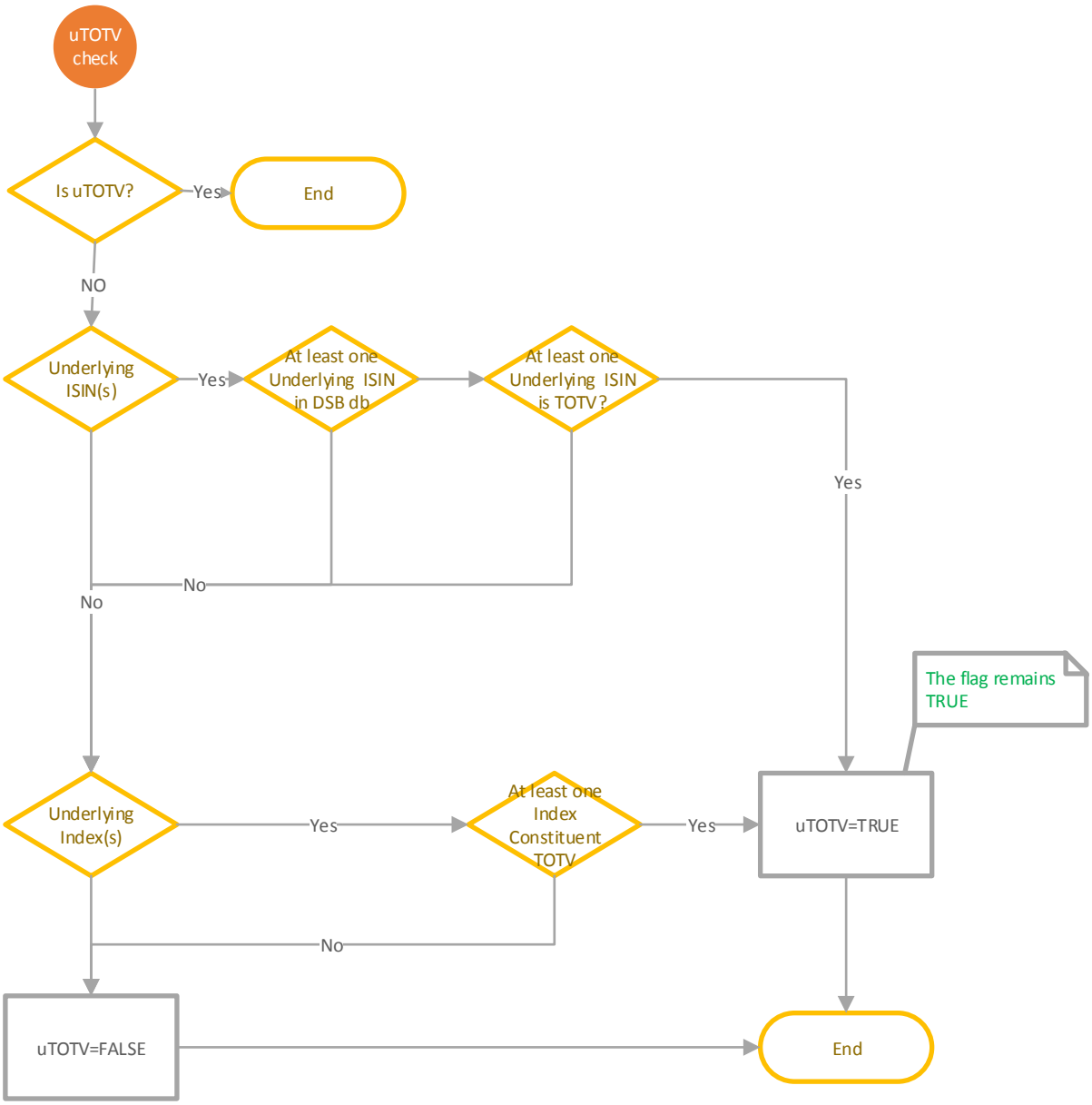
As the OTC ISIN is part of the ToTV determination process, the DSB does not expect the ToTV flag to change until the following day's FIRDS data is received.

5.5.1 uToTV check

For instruments that have no Underlying, the uToTV flag will be set to False.

The DSB will run the uToTV check that will determine the uToTV flag value for all new OTC or non-OTC instruments.

For every instrument for which the DSB already has Underlying in the DSB database, the uToTV will be defined shortly after ISIN Creation. For those ISINs for which the DSB has not got the Underlying, the uToTV will be defined as part of the FIRDS daily update:



For instruments with multiple underlying ISINs, if at least one underlying ISIN is ToTV, the instrument is deemed uToTV.

For instruments with single underlying index, if at least one index constituent is ToTV, the instrument is deemed uToTV.

For instruments with multiple underlying index, if at least one index has at least one constituent that is ToTV, the instrument is deemed uToTV.

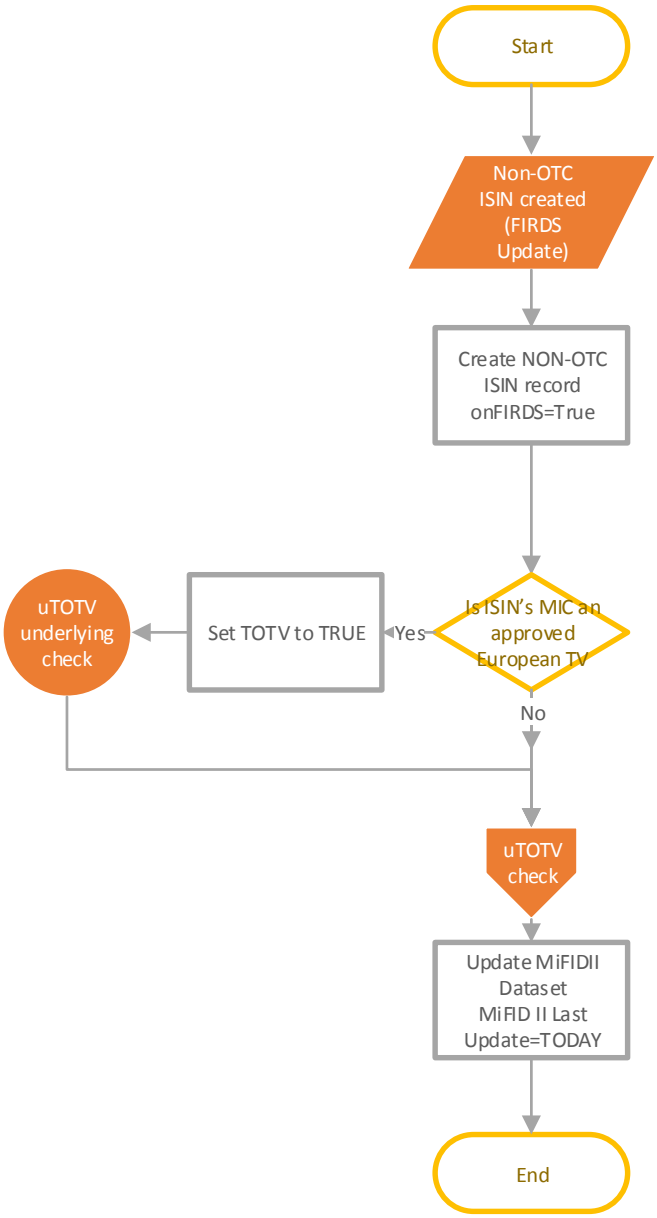
Once an instrument is marked as uToTV, it will remain uToTV.

5.6 New Non-OTC ISIN

Non-OTC instruments will be created only as part of processing of the FIRDS daily update. Essentially, all ISINs in the FIRDS file that are not in scope of the DSB (as defined in 2.1) and for which the DSB is not a source, will be recorded to the DSB database as non-OTC. That will include but will not be limited to Equities, cash Fixed Income and Listed Derivatives.

All non-OTC ISIN records will be created with the On FIRDS flag set to True. The DSB will run the ToTV check and set ToTV accordingly. Then if the instrument has an Underlying, the DSB will run the uToTV check and set uToTV accordingly. For instruments that have no Underlying, the uToTV flag will be set to False. The DSB will then enrich the non-OTC record with MiFID II metadata (as defined in 2.2).

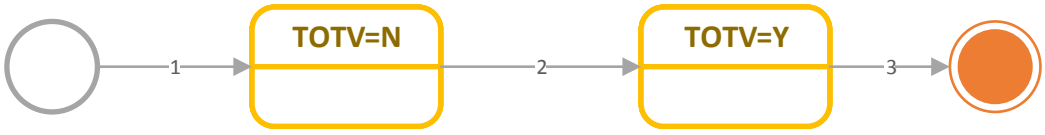
For non-OTC ISINs, the DSB will store the ISIN, Underlying and the associated MiFID II Dataset.


Start
Non-OTC ISIN created (FIRDS Update)
Create NON-OTC ISIN record onFIRDS=True
Is ISIN's MIC an approved European TV
Yes
Set TOTV to TRUE
uTOTV underlying check
No
uTOTV check
Update MiFIDII Dataset MiFID II Last Update=TODAY
End

5.7 State transitions ToTV

ToTV OTC ISIN

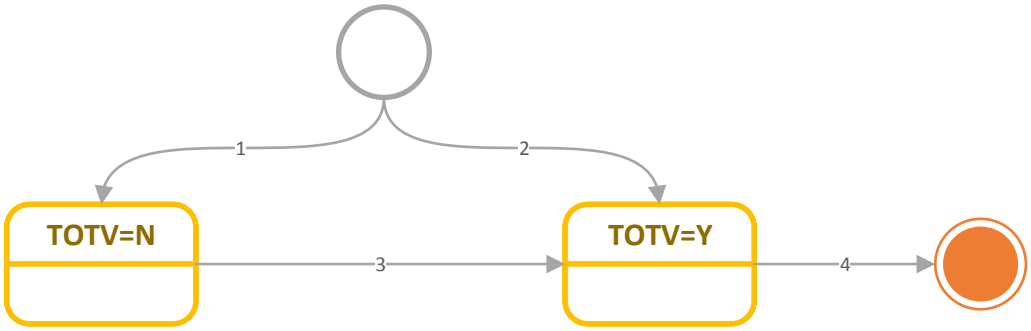
The ToTV flag for an OTC ISIN can have the following state transitions



1. New DSB OTC ISIN:
   - The ToTV flag is always False at creation
2. Daily Update from FIRDS/ ESMA File Download for MICs:
   - The DSB ISIN is the FIRDS dataset, it is a full match to the DSB data for that ISIN and the MIC is an approved European trading venue
   - Existing OTC ISIN gets ToTV set as MIC is now an approved European venue
3. ISIN that has been marked ToTV, remains flagged ToTV

ToTV non-OTC ISIN

The ToTV flag for a non-OTC ISIN can have the following state transitions

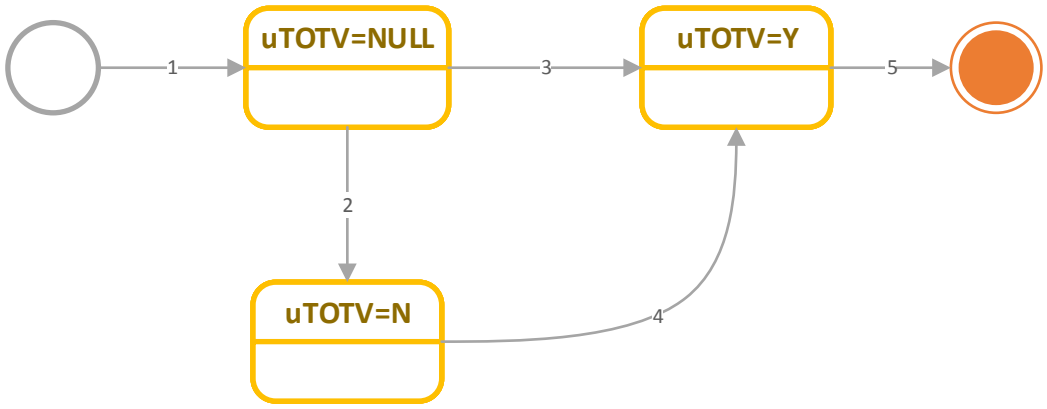


1. Daily Update from FIRDS:
   - Non-OTC ISIN record is created. MIC is not an approved European venue.
2. Daily Update from FIRDS:
   - Non-OTC ISIN is created. MIC is an approved European venue.
3. ESMA File Download for MICs/Daily Update from FIRDS:
   - Existing Non-OTC ISIN gets ToTV set as MIC is now an approved European venue
4. ISIN that has been marked ToTV, remains flagged ToTV

5.8 State transitions uToTV

uToTV ISIN

The uToTV flag can have the following state transitions (the same the OTC and non-OTC ISINs)

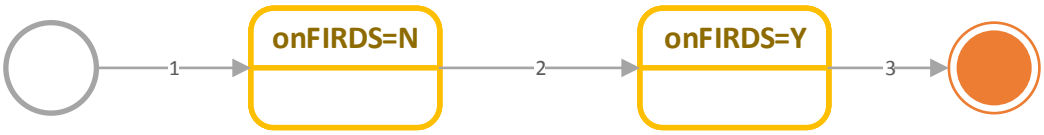


1. New ISIN:
   - ISIN is created and the uToTV flag is first set to NULL
2. uToTV check:
   - Instrument has no Underlying ISIN/Index or it has Underlying ISIN but it is not ToTV or it has Underlying Index and none of its constituencies is ToTV
3. uToTV check:
   - Instrument has at least one Underlying ISIN that is ToTV or the instrument has Underlying Index and at least one of its constituencies is ToTV
4. Daily Update from FIRDS:
   - The DSB ISIN is the FIRDS dataset, it is a full match to the DSB data for that ISIN and the Instrument has an Underlying ISIN that is ToTV or it has Underlying Index and at least one of its constituencies is ToTV
5. ISIN that has been marked uToTV, remains flagged uToTV

5.9 State transitions OnFIRDS

On FIRDS OTC ISIN

The OnFIRDS flag for an OTC ISIN can have the following state transitions



1. New DSB OTC ISIN:
   - The OnFIRDS flag is always False at creation
2. Daily Update from FIRDS:
   - The DSB ISIN is the FIRDS dataset and it is a full match to the DSB data for that ISIN
3. ISIN that has been marked onFIRDS, remains flagged onFIRDS

On FIRDS non-OTC ISIN

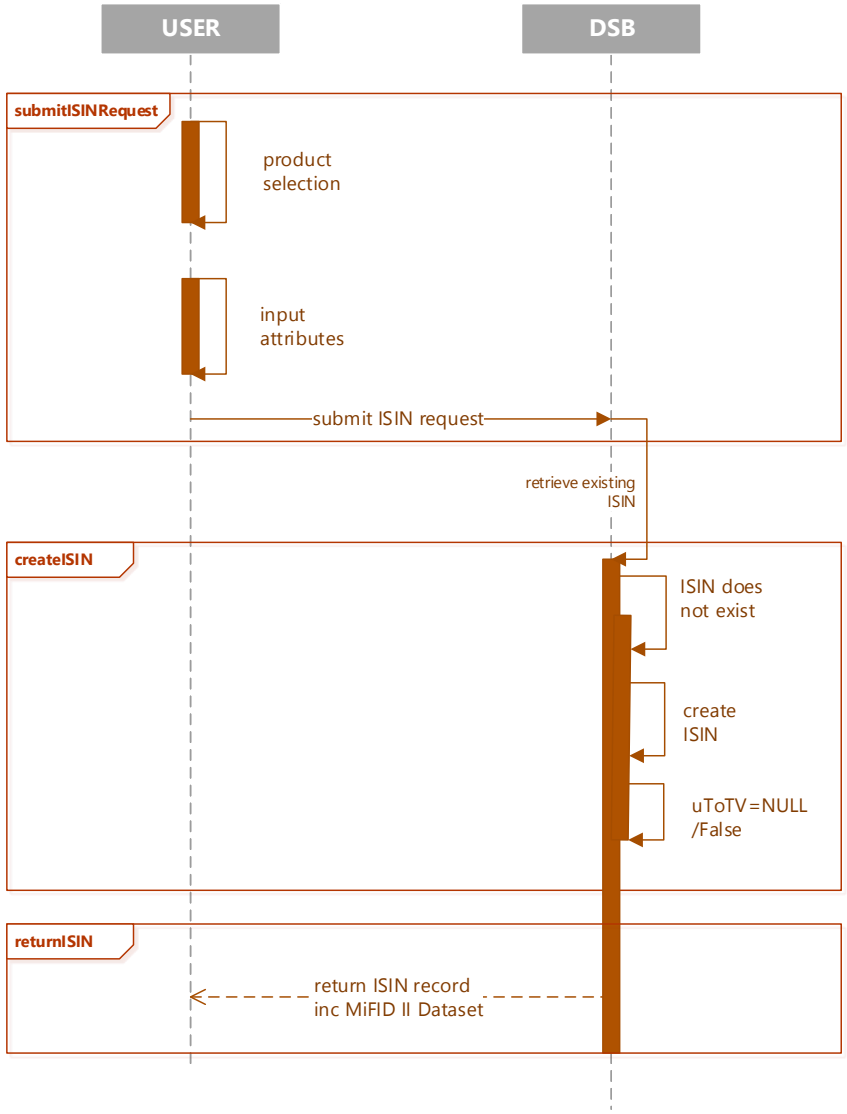
The OnFIRDS flag for a non-OTC ISIN can have the following state transitions

1. Daily Update from FIRDS:
   - Non-OTC ISIN is always created with the OnFIRDS flag set to True
2. ISIN that has been marked onFIRDS = True, remains flagged onFIRDS = True

6 User Workflows

6.1 ISIN Request

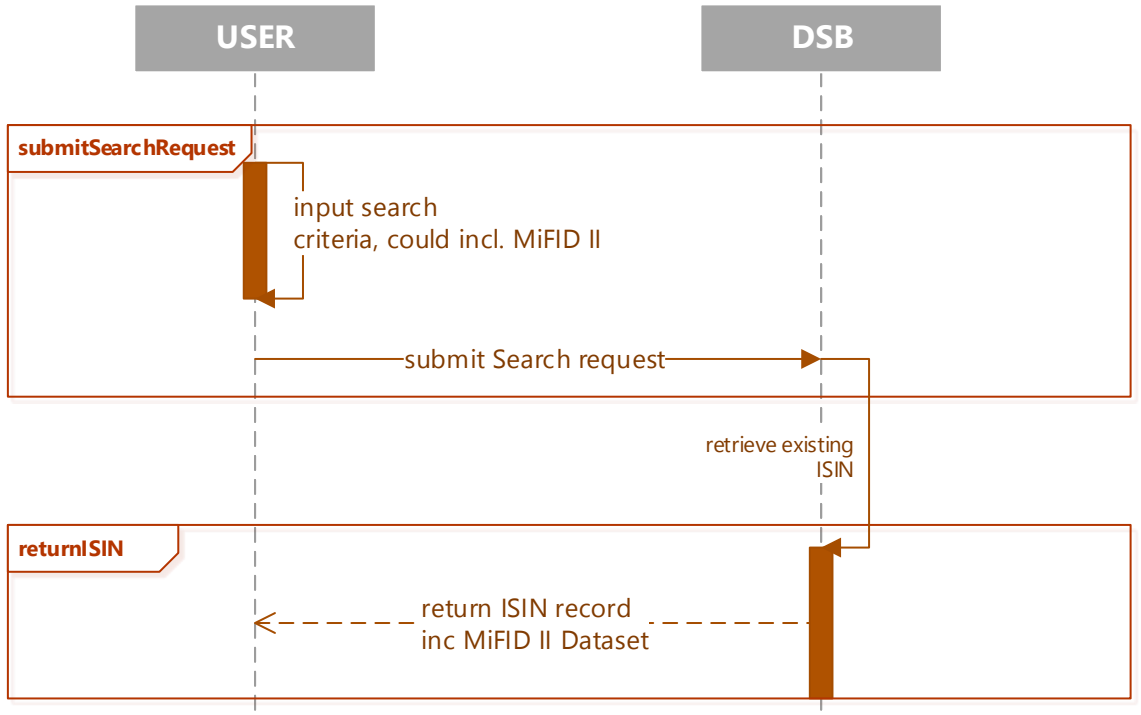
The below presents the steps the DSB will follow for a user requesting an ISIN using a complete set of attributes as specified by the appropriate request template / product definition.



Step	Description
Product Selection, Input Attributes and submit ISIN request	**Assumptions** • User submits syntactically valid set of values for product definition • User's connection is consistent and secure **Description** User selects the correct product template using Asset Class, Instrument Type and Product to define which attributes they must populate. They populate all the input attributes with values and then submit to the DSB.
Retrieve existing ISIN	**Assumptions** **Description** The user submits the user attributes and after normalizing the data the DSB searches through the existing ISIN instruments and retrieves the full record if there's a match.
ISIN does not exist	**Assumptions** • All required user input DSB OTC ISIN data is present and correct **Description** If the ISIN does not exist, the DSB begins the create ISIN process.
Create ISIN	**Assumptions** • ISIN does not already exist • User has permissions to create an ISIN **Description** The DSB goes through the normal creation processes for generating a new ISIN and its associated data to create a complete record. • ToTV=False • OnFIRDS=False • If Instrument has no Underlying, uToTV=False • If Instrument has an Underlying, uToTV=NULL
Return ISIN record and return MiFID data for ISIN	**Description** Return the full ISIN record along with the MiFID II Dataset.
Display on same page	**Description** Render the ISIN record and alongside it the MiFID II data points.

6.2 Search by Attributes

The below presents the steps the DSB will follow for a user running a search by attributes (via FIX, REST API or GUI)



Step	Description
Submit Search request	**Assumptions** • User submits syntactically valid search request • User's connection is consistent and secure **Description** The user searches by attributes that can be a mixture of MiFID II attributes and core ISIN attributes or the ISIN
Retrieve existing ISIN and MiFID data	**Description** The user submits search attributes and the DSB searches through the existing ISIN instruments and retrieves any ISIN record where there is a match. Every ISIN record is returned with the MiFID II data points alongside it.
ISIN does not exist	**Description** If there are no ISIN records that meet search conditions, "Zero results" message is returned

7 Technical Detail

This section includes the technical implementation detail of the MiFID II Data Service as required by the DSB User base.

7.1 MiFID II Dataset Data Types

Below are the data types specified for the MiFID II Dataset with example values:

RTS 2 Reference Data Attribute Name		Example Value	Source
MiFID II Last Update Date	Date	2017-06-09	FIRDS
Liquidity Flag	String	TRUE	FIRDS
Pre-Trade Large in Scale (LIS) Threshold	Integer	300,000	ESMA Transparency System
Pre-Trade Size Specific to The Instrument (SSTI)	Integer	250,000	ESMA Transparency System
Post-Trade Large in Scale (LIS) Threshold	Integer	1,500,000	ESMA Transparency System
Post-Trade Size Specific to The Instrument (SSTI)	Integer	1,250,000	ESMA Transparency System
Traded on a Trading Venue	Boolean	TRUE	DSB Derived
ToTV Effective Date	Date	2017-06-09	DSB Derived
Underlying Traded on a Trading Venue	Boolean	FALSE	DSB Derived
uToTV Effective Date	Date	2017-06-09	DSB Derived
On FIRDS Flag	Boolean	TRUE	DSB Derived

7.2 GUI Access

The MiFID II Dataset will be another group of attributes returned alongside the ISIN record on request or search by a user.

One point to note is that the MiFID II Dataset attributes can be used in any search being executed by a user via the current interface.

7.3 ReST and FIX Access

The MiFID II Dataset will be visible to users as an additional data group alongside the ISIN record:

```
"MiFIDIIDataset" :                    {
    "MiFIDIILastUpdateDate":     '20170909'
    "PreTradeLIS":               300000
    "PreTradeSSTI":              250000
    "PostTradeLIS":              1500000
    "PostTradeSSTI":             1250000
    "Liquidity":                 true
    "TOTV":                      true
    "TOTVEffectiveDate":         '20170909'
    "uTOTV":                     false
    "uTOTVEffectiveDate":        '20170909'
}
```


Note that changes in the MiFID II Dataset values will trigger an update record to FIX subscribers.

7.4 File Download

Access to ToTV/uToTV and associated MiFID II Dataset attributes will also be available via the existing file download capability.

Any ISINs that have been created/updated today, will be accessible from File Download the following day. The files will include an additional section for MiFID II Dataset/ToTV attributes. The DSB does not intend to change the file download folder structure and it will continue to be by asset class and date.

8 ToTV Timelines

FIRDS is expected to publish Reference Data at 0800 CET daily and the DSB will complete its ToTV/uToTV process once the files for the day have been made available.

For uToTV for OTC ISINs, in addition to completing a test during the ToTV batch process, the DSB will test uToTV after the ISIN is created. Rather than placing the uToTV test on the critical path, the DSB intends to return the new ISIN with uToTV set to Null and then will follow that return with an updated ISIN (for FIX subscribers) containing the results of the uToTV test.

9 Capacity

Out of all the non-functional requirements, the DSB finds that capacity of records within ESMA may have significant implications on the system.

The DSB assumptions on capacity can be found in the Final Report for the Technology and Operations Consultation Paper 1 http://www.anna-web.org/wp-content/uploads/2016/12/DSBTO-CP001-Final-Report-v1.1.pdf

The system must handle all records that are available in FIRDS according to the process defined above. Therefore, the implementation plan will be based on a scalable design (i.e. application, processors, disk space, and network utilization and any others) to allow the FIRDS daily file to be processed within a short timeline.

10 Appendix

10.1 Sources of Data for ToTV/uToTV Determination

The DSB has considered several options for sourcing the data for ToTV / uToTV determination:

10.1.1 Source 1 – Utilize FIRDS data

Use FIRDS to define ToTV. If the ISIN is present in the FIRDS database and the reporting MIC is an approved Trading Venue then the ISIN is ToTV.

A ToTV service can use a combination of FIRDS, using the MIC and the ISIN, with the DSB ISIN Database (because ISIN granularity is greater than the RTS 23 product attributes) to identify which products are considered ToTV and uToTV.

10.1.1.1 Challenges

1. FIRDS is only available T+1. Depending on how Trading Venues approach reference data reporting, there is the possibility that some instruments will not be transparent on the day of their greatest liquidity due to the inclusion of the expiry date within the product definition.
2. Trades or quotes that occur on a trading venue after 1800 on T do not need to be reported as reference data which means, potentially, there will be products that are ToTV but will not be treated as such until T+2.
3. ESMA has stated that FIRDS should not be used as the Golden Source of data, therefore relying exclusively on this source may cause regulatory concern

10.1.2 Source 2 – Utilize Post-trade disclosure data

Collate APA and trading venues published post-trade data and combine the information in real-time to drive ToTV for all DSB OTC ISINs.

ToTV can use a combination of APA data, using the MIC and the ISIN (where available) with the DSB ISIN Database to identify which products are ToTV and uToTV.

10.1.2.1 Challenges

1. Some APA post-trade disclosure data will have the ISIN plus some transactional data. However, some APA post-trade disclosure data will not have the ISIN. Indeed, there's no requirement for them to publish sufficient data to create an ISIN. Given that ToTV is defined including the ISIN, this means that the set of data published by an APA without an ISIN cannot be assessed as being ToTV or not.
2. Some transactions submitted for post-trade disclosure will be subject to deferrals – some of these deferrals can extend to T+2; any collection of post-trade disclosure data 'real-time' will not necessarily contain these products.
3. APA pre-trade transparency data has no requirement to use the ISIN or, in fact, publish any detailed product attributes for a quote. Again, since the ISIN is included in the ToTV discussion, any pre-trade data that does not already voluntarily have the ISIN is unlikely to be useful in determining ToTV.
4. There is no requirement for an SI or a Trading Venue to use an APA for pre-trade transparency. Collection of pre-trade data from the APAs will be incomplete and therefore will not provide the full set of ToTV products in real-time.

10.1.3 Source 3 – Utilize ISIN Creation Data

The DSB could look at amending the ISIN request interaction by adding a flag for all users to indicate whether the ISIN will be 'available to trade' on a trading venue.

This would capture all new instruments in real-time for ToTV.

10.1.3.1 Challenges

1. Requires a change in the DSB technical implementation and those of the entire industry
2. Investment Firms might consider revealing that intention as a breach of confidentiality and that might put their own trading strategies at risk.
3. There would have to be a reconciliation at the end of the day to ensure ISINs declared as ToTV by an investment firm had, in fact, also been requested and marked by a trading venue.

10.2 Asset Class ToTV Attributes

Below are the sets of attributes for each asset class that will be used in the first instance for defining Traded on a Trading Venue.

10.2.1 Rates

ISO Attribute	RTS23 Field#
Identification	1
Full Name	2
Classification Type	3
Commodity Derivative Indicator	4
Notional Currency	13
Expiry date	24
Price Multiplier	25
Underlying instrument ISIN	26
Option Type	30
Option Exercise Style	33
Delivery type	34
ISO Reference Rate	40
Reference Rate Term Unit	41
Reference Rate Term Value	41
ISO Other Leg Reference Rate	45
Other Leg Reference Rate Term Unit	46
Other Leg Reference Rate Term Value	46

10.2.2 Credit

ISO Attribute	RTS23 Field#
Identification	1
Full Name	2
Classification Type	3
Commodity Derivative Indicator	4
Notional Currency	13
Expiry date	24
Price Multiplier	25
Underlying instrument ISIN	26
Underlying instrument LEI	27
ISO Underlying Instrument Index	28

Underlying Instrument Index Term Unit	29
Underlying Instrument Index Term Value	29
Option Type	30
Option Exercise Style	33
Delivery type	34

10.2.3 Foreign Exchange

ISO Attribute	RTS23 Field#
Identification	1
Full Name	2
Classification Type	3
Commodity Derivative Indicator	4
Notional Currency	13
Expiry date	24
Price Multiplier	25
Option Type	30
Option Exercise Style	33
Delivery type	34
Other Notional Currency	47
FX Type	48

10.2.4 Equities

ISO Attribute	RTS23 Field#
Identification	1
Full Name	2
Classification Type	3
Commodity Derivative Indicator	4
Notional Currency	13
Expiry date	24
Price Multiplier	25
Underlying instrument ISIN	26
ISO Underlying Instrument Index	28
Option Type	30
Strike Price	31
Option Exercise Style	33
Delivery type	34

10.2.5 Commodities

ISO Attribute	RTS23 Field#
Identification	1
Full Name	2
Classification Type	3

Commodity Derivative Indicator	4
Notional Currency	13
Expiry date	24
Price Multiplier	25
Underlying Instrument ISIN	26
Underlying Instrument Index	28
Option Type	30
Option Exercise Style	33
Delivery type	34
Base Product	35
Sub Product	36
Additional Sub Product	37
Transaction Type	38
Final Price type	39