

Business Service

Exchange of measurement data time series

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Document management

Version	Version date	Amendments	Author
0.1	26-06-2020	Initial version Prepared based on BRS Measurement Data and Complaints GV and Message Definition MeasurementSeries	EDSN
0.3	03-07-2020	Version for review	EDSN
0.6	17-07-2020	Review working group processed	EDSN
1.0	07-08-2020	Review from the sector processed Version for information	EDSN
1.3	18-08-2020	Review on v1.0 processed	EDSN
2.0	19-08-2020	Version for information	EDSN
2.3	26-08-2020	Review on v2.0 processed Notes on decimals for volume per period included Explanation of correlation Notification and Acknowledgement updated Use cases BRS (A20.031 and A20.033) included	EDSN
2.6	17-09-2020	Review on v2.3 processed Explanation of the use of decimals for volume per position for electricity and gas included Validation added for resolution in combination with connection type Validation changed/added for ProcessTypeID Explanation of validation and rejection by the MMC hub included Use cases BRS (A20.034 and A20.035) included	EDSN
2.9	21-10-2020	Review on v2.6 processed Use case BRS (A20.036) included	EDSN
3.0	28-10-2020	Version for information Volume changed from "Volume in whole numbers, with one 0 after the decimal point" to "Volume in whole numbers". Added check if a measurement data message is not correct	EDSN
3.1	13-01-2021	Control 999 added Reference to TenneT Technical Guide - Measurements & Allocations Documents added New BRS use case A20.010 (Transfer point MWNELK) added (RFC TR2021.4) Table of service features completed in chapter 6	EDSN
3.3	25-01-2021	Review on v3.1 processed	EDSN
3.6	15-02-2021	Review on v3.3 processed Control 200 expired Control 672 amended Control 681 modified Control 682 amended Check 704 amended Check 745 expired Check 754 expired Control 999 amended Table in section 1.4 completed	EDSN
4.0	18-02-2021	Version for information	EDSN
4.3	30-06-2021	RFC 249.4 processed: - Added section 4.3 about timeliness monthly message "allocation point electricity large consumption" toegevoegd RFC 249.5 processed: - Use case A20.038 added RFC TR2021.5 processed: - Validations added - Received_MarketDocument.mRID optional in Acknowledgement	EDSN

Version	Version date	Amendments	Author
		Added the 'retry' by provider to chapter 6 Corrected typo at 662 abd 663	
4.6	08-07-2021	Processed review on 4.3	EDSN
4.9	22-07-2021	Processed review on 4.6	EDSN
5.0	26-07-2021	Version for information	EDSN

Distribution history

Version	Dissemination date	Receivers
0.1	26-06-2020	EDSN Service Design
0.3	03-07-2020	GV measurement data working group, EDSN internal
0.6	17-07-2020	GV measurement data working group, NEDU
1.0	07-08-2020	GV measurement data working group, NEDU
1.3	18-08-2020	GV measurement data working group
2.0	19-08-2020	GV measurement data working group, NEDU
2.3	26-08-2020	GV measurement data working group
2.6	17-09-2020	GV measurement data working group, NEDU
2.9	21-10-2020	GV measurement data working group, NEDU
3.0	28-10-2020	GV measurement data working group, NEDU
3.1	13-01-2021	GV measurement data working group, EDSN internal
3.3	25-01-2021	GV measurement data working group, NEDU
3.6	15-02-2021	GV measurement data working group, NEDU, EDSN
4.0	18-02-2021	GV measurement data working group, NEDU, EDSN
4.3	30-06-2021	Working group Business Services A2.0, TenneT, EDSN
4.6	08-07-2021	Working group Business Services A2.0, TenneT, EDSN
4.9	22-07-2021	SR NEDU
5.0	26-07-2021	NEDU, TenneT, EDSN

Referenced documents

Requirements model

No.	Description	Version	Date	Author
1.	BRS Meetgegevens en reclamaties meetgegevens GV	4.0	26-07-2021	NEDU

Design frameworks and guidelines

No.	Description	Version	Date	Author
2.	NEDU EDSN Ontwerpkeuzes	3.9	15-04-2021	NEDU/EDSN
3.	TenneT Web Services guide	N/A	April 2020	TenneT
8.	Technical Guide - Measurements & Allocations Documents	1.0	31-03-2021	TenneT

Service descriptions and data model

No.	Description	Version	Date	Author
4.	EDSN Complex Data Type Specificatie	2.2	27-05-2020	EDSN
5.	EDSN Logical Data Type Specificatie	2.7	27-05-2020	EDSN
6.	ebIX® Code list	1.0A	June 2019	ebIX TC
7.	ISO 8601 for date and time stamping	1:2019	2019	ISO

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1 Introduction

1.1 Service description

The service description describes the agreements on the exchange of ¹time series of measurement data of a telemetry measurement:

- Allocation point for electricity for large-scale consumption
- Large-volume gas connection
- Net-to-net electricity transfer point ²
- Transfer point MWNET electricity
- Allocation point system balance electricity
- Interconnection point of gas distribution networks

To give the reader a good idea of the exchange, a detailed process description is included as well as an indication of the messages to be used. For a functional description of the process that supports this exchange, please refer to the *Business Requirement Specification Measuring Data and Complaints Measuring Data GV*[1].

1.2 Reading guide

This document describes the following aspects, including:

- Process *Exchange of measurement data time series*
- The exchange of this measurement data takes place via TenneT's MMC hub
- The syntactic validations by the MMC hub, the confirmation/rejection by the MMC hub
- The checks on the measurement data by the consumers (TSO, BRP, DSO)
- The confirmation/rejection of the measurement data by the consumers (TSO, BRP, DSO)
- XML message definitions.

For the functionality of the MMC hub, please refer to *TenneT Web Services guide*[3].

1.3 Starting points

The following principles were used in designing the service *Exchange of measurement data time series*:

- Date/time notation in XML messages according to *NEDU EDSN Design Choices*[2]
- The start and end date are in UTC and in accordance with the notation: YYYY-MM-DDThh:mm:ssZ
 Example of start and end date calendar day electricity (winter)
 2020-02-08T23:00:00Z / 2020-02-09T23:00:00Z;
 Example start and end date gas day (wintertime)
 2020-02-08T05:00:00Z / 2020-02-09T05:00:00Z;
 Example start and end date calendar day electricity (summer)
 2020-06-08T22:00:00Z / 2020-06-09T22:00:00Z;
 Example of start and end date of gas day (daylight saving time)
 2020-06-08T04:00:00Z / 2020-06-09T04:00:00Z;
- Wherever this service description refers to "large-scale" or "GV" connection/allocation point, this means a telemetered large-scale connection/allocation point or a telemetered Article 1 paragraphs 2 and 3 connection/allocation point (A1)
- Where this service description refers to "distribution system officer" or "DSO", this can also be read as "GDS owner" insofar as it concerns electricity wholesale connections
- Wherever this service description refers to "Connection", this means gas connection, gas distribution network coupling point, electricity grid-on-grid transfer point, MWNET transfer point or electricity allocation point.

¹ These are interval values with a time interval of 15 minutes, for example.

² Also for GDS.

1.4 Using the service *Exchanging measurement data time series*

The table below shows the type of connection for which the party responsible for metering must send a separate message about metering data time series to the grid operator and/or the programme responsible party. The table also contains a reference to the relevant use cases from the BRS[1].

The frequency is daily and monthly. Furthermore, the person responsible for the measurement shall send an update if new data has become available or if a justified review request has been submitted. In an update message, all measurement data for the relevant (gas) day will be made available again. This includes the measurement data that have not been changed.

Exchange	Measurement data provider	Consumer of measurement data			Type of connection	BRS Use case	Code ³
ELK							
Daily message "allocation point large-scale consumption of electricity"	MRP	TSO	DSO	BRP	Allocation point ELK TMT	A20.001 (DSO) A20.021 (BRP) A20.034 (TSO)	N10
Monthly message "allocation point large-scale consumption of electricity".	MRP	TSO	DSO	BRP	Allocation point ELK TMT	A20.002 (DSO) A20.022 (BRP) A20.035 (TSO)	N20
GAS							
Monthly report "high volume gas connection	MRP	TSO	DSO	-	Connection GAS TMT	A20.005 (DSO) A20.036 (TSO)	N30
Net-to-net transfer point ELK							
Daily message "net-to-net transfer point electricity"	MRP	TSO	DSO	-	Net-to-net transfer point ELK	A20.007 (DSO) A20.032 (TSO)	N11
Monthly message "net-to-net transfer point electricity"	MRP	TSO	DSO	-	Net-to-net transfer point ELK	A20.008 (DSO) A20.038 (TSO)	N21
Transfer point MWNET ELK							
Daily message "MWNET electricity transfer point".	MRP	-	DSO	-	Transfer point MWNET ELK	A20.010 (DSO)	N11
System balance ELK							
Daily message "allocation point system balance electricity" ⁴	MRP	TSO	-	-	Allocation point system balance ELK (5 minutes values)	A20.033 (TSO)	N12
Coupling point distribution networks GAS							
Monthly Message "Interconnection point for gas distribution networks".	MRP	TSO	-	-	Interconnection point of distribution networks GAS	A20.031 (TSO)	N31

³ See section 3.5 Application ProcessTypeID.

⁴ In deviation from 4.3.5.1, subsection a, the system operator of the national high-voltage grid can impose a measuring period that is smaller than the imbalance settlement period on the measurement responsible party for connected parties that supply electrical energy to the system operator of the national high-voltage grid for the purpose of the system balance by means of deployed regulating power, reserve power and emergency power.

1.5 List of abbreviations

Abbreviation	Description
A1	A connection which falls within the definition of Article 1 of the Electricity Act. This connection is treated as a large-scale consumption, while technically the connection is a small-scale consumption connection
EDSN	Energie Data Services Nederland B.V.
GDS	Closed distribution system
GV	Wholesale
TSO	Transmission System Operator
MMC-hub	Market-Market-Communication hub
MRP	Measurement Responsible Party
BRP	Balance Responsible Party
DSO	Distribution System Operator
SO	System Operator (DSO or TSO)
TMT	Telemetry (abbreviation used to distinguish between connections/allocation points with allocation method PRF and connections/allocation points with allocation method TMT)

1.6 Disclaimer

The terms of this disclaimer apply to this English service description.

In the event of any conflict between this English service description and the Dutch version of this service description, the Dutch service description will prevail.

2 Roles and responsibilities

2.1 Consumer

This service description describes how the consumers (TSO, BRP, DSO) receive the measurement data.

2.2 Provider

This service description describes how the provider (MRP) provides the measurement data.

2.3 RACI

The RACI below shows the roles and responsibilities for the service description *Exchange of measurement data time series*:

R (Responsible)	EDSN Business Integratie
A (Accountable)	To be determined!
C (Consulted)	NEDU-ICWE, ebIX Technical Committee, TenneT
I (Informed, NL: Inform)	ALV NEDU, EDSN

3 BPMN Exchange of measurement data time series

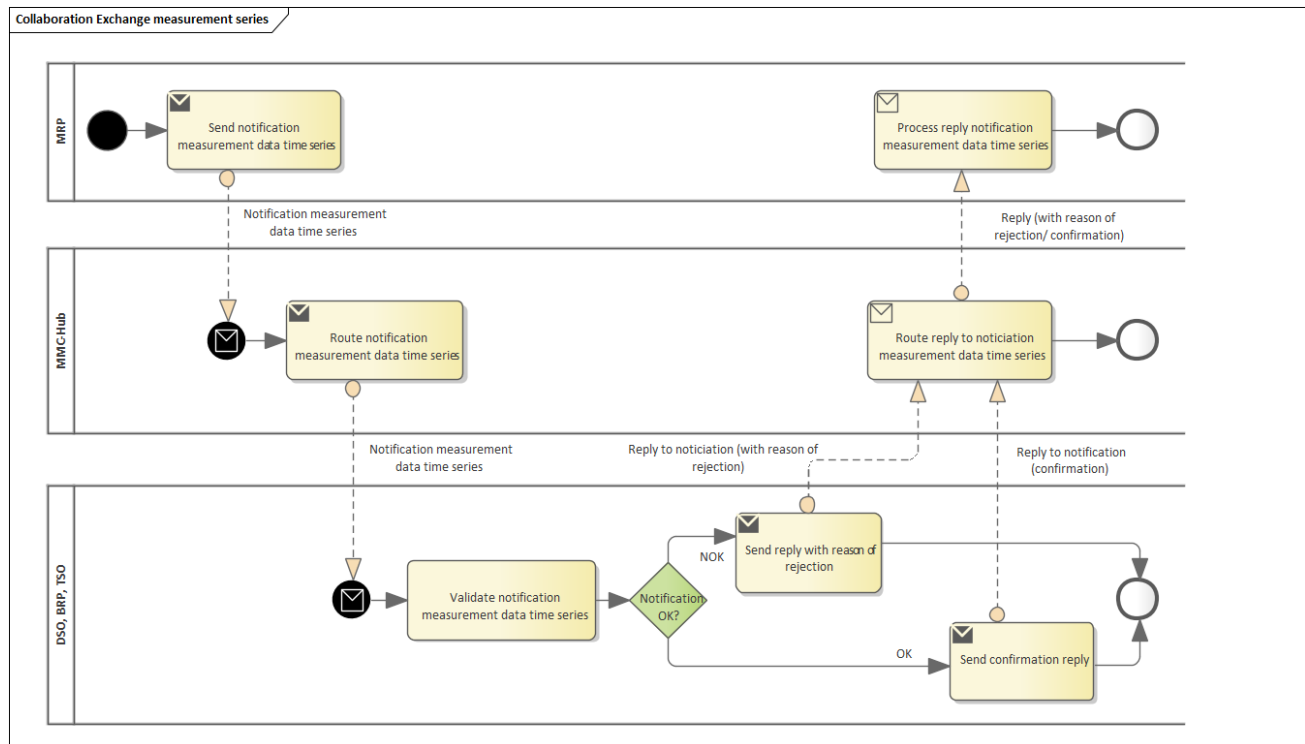


Figure 1 For detailed information on this process see BRS Measurement data and complaints GV[1].

3.1 Exchange of measurement data time series

The process for exchanging measurement data time series follows the following scenario:

1. The measurement responsible party sends the message "Notification of measurement data time series" to the MMC-hub
2. The MMC hub processes⁵ the received "Notification measurement data time series" message and routes the message to the receiver
3. The receiver checks the message "Notification measurement data time series"
4. The receiver sends the response "Confirmation/rejection of measurement data time series notification" to the MMC hub:
 - a confirmation reply, or
 - an answer with one or more rejections
5. The MMC-hub processes⁶ the reply and routes the message to the recipient.

⁵ A non-valid message is rejected by the MMC hub, see section 3.2.

⁶ A non-valid message is rejected by the MMC hub, see section 3.2.

3.2 Validations MMC hub

In response to the received message "Notification measurement data time series" and received message "Confirmation/rejection notification of measurement data time series", the MMC-hub performs the following validations:

Validation	Error message
XSD Validation: The message shall comply to the XSD rules	TEN-500001: [Error detail].
Unreadable message: The message shall be a valid XML layout	TEN-500001: [Error detail].
Others: All other faults	TEN-999999: Unhandled exception

If a message is rejected by the MMC-hub, the MMC-hub sends the error code and text to the submitter of the message concerned. For the functionality of the MMC-hub, please refer to the *TenneT Web Services guide*[3].

3.3 Checks on receiver

Following the received message "Notification measurement data time series" and the received message "Confirmation/rejection notification of measurement data time series" the recipient may perform the following checks⁷:

Validation	Error message in the SOAP response
The received XML message complies with the W3C XML 'well-formedness' specification.	TEN-500001: [Error detail]
The received XML message complies with the XML schema definition (XSD) of the receiver	TEN-500001: [Error detail]

Following the received message "Notification measurement data time series" the receiver performs the following checks:

Validation	Error message in the Acknowledgement
The integrity and/or confidentiality of the XML message is guaranteed (signing check).	Error code: 999 Error message: TEN-500021 – Incorrect message signing
The technicalMessageId in the SOAP header is unique.	Error code: 999 Error message: TEN-500023 – Unique identifier not unique or already processed

3.4 Checks on receiver for message "Notification measurement data time series"

In response to the time series notification message, the following checks and error messages shall be available to the recipient and shall be carried out insofar as they are mandatory or relevant for the processing by the recipient:

Control	Error message	Role	Code
Connection/grid area			
The EAN code-18 of the connection is a valid EAN code.	EAN code-18 is not valid.	BRP/SO	650
The EAN code-18 of the grid area is a valid EAN code.	EAN code-18 is not valid.	BRP/SO	651
The EAN code-18 of the connection is registered with the network operator during the entire message period.	The connection does not appear in the records of the grid operator.	SO	652
The EAN code-18 of the connection is administered in the connection register during the entire message period.	The connection does not appear in the connection register.	BRP	653
The EAN code-18 of the grid area is administered in the connection register during the entire message period.	The grid area does not appear in the connection register.	BRP/SO	654
The combination of source and sink grid area is correct throughout the message period.	Combination of source and sink grid area is not correct.	SO	680
According to the connection register, the MRP is registered as MRP on the connection during the entire message period.	MRP is not registered on the connection.	BRP/SO	655
According to the connection register, the BRP is registered as a BRP on the connection during the entire message period.	The BRP is not registered as a BRP on the connection.	BRP	656

⁷ The MMC-hub performs these checks. The recipient can choose to perform these checks as well.

The connection was not demolished during the entire period covered by the notice.	The connection has been demolished.	BRP/SO	657
The connection is a GV connection throughout the period to which the message relates.	The connection is not a GV connection.	BRP/SO	658
The product type in the message corresponds to the product type of the connection in the connection register.	The product type does not correspond to the product type of the connection.	BRP/SO	659
The period to which the message relates is at least 1 (gas) day in the past.	The measurement data are (partly) related to the future.	BRP/SO	660
The start date of the period is before the end date of the period.	Invalid time period.	BRP/SO	661
In the case of a monthly report for an electricity or gas connection, the period is a whole calendar month or gas month respectively. Or if the MRP was registered on the connection during only part of the calendar month or gas month respectively, that particular part of the calendar month or gas month respectively.	The period to which the message refers is not correct.	SO	662
The daily report with measurement data was delivered on time.	The daily report with measurement data was delivered too late.	BRP/SO	682
In the case of a daily electricity report, the period is exactly one calendar day.	The period to which the message refers is not correct.	BRP/SO	663
Time Series			
The resolution is appropriate for the product type.	The resolution does not fit the product type.	BRP	666
The resolution is in line with the agreements for this type of connection.	Resolution does not fit the type of connection.	BRP/SO	713
All products match the product type.	One or more products do not fit the product type.	BRP/SO	667
All energy units match the products.	One or more energy units do not fit the product(s).	BRP/SO	668
The number of positions of all time series matches the period and the resolution.	The number of positions is incorrect.	BRP/SO	671
The positions within a time series are delivered in order from low to high.	The order of the positions is incorrect.	BRP/SO	672
Each position in a time series occurs exactly once in the respective time series.	Double delivery of positions.	BRP/SO	673
A message for electricity contains both metering data for feed-in and feed-out.	Measurement data has not been supplied for all energy directions.	BRP/SO	674
A time series for a product in combination with a direction of delivery occurs only once in the message.	Multiple delivery of time series of a product combination in combination with delivery direction.	BRP/SO	675
The first position in a time series is "1".	First position does not start with 1.	BRP/SO	676
The volume does not exceed the maximum number of agreed decimal places.	Incorrect number of decimal places.	BRP/SO	677
The volume in the message is less than 200% of the volume that may be expected based on the registered physical capacity in the connection register.	The volume does not match the registered physical capacity.	BRP/SO	744
The combination of origin indication, validation status and repair method is a valid combination.	The combination of origin indication, validation status and repair method is not a valid combination.	BRP/SO	683
All volumes in the message are positive numbers (or zero).	Volume with negative value.	BRP/SO	686
Residual volume gas			
When supplying residual volume, there is a gas connection.	Delivery of residual volume is not possible for an electricity connection.	BRP/SO	679
Message header			
The MessageId in the SOAP header is unique.	A previous message has already been received with the same MessageID.	BRP/SO	669
The ProcessTypeID in the message header is filled with the correct code.	Incorrect or missing ProcessTypeID.	BRP/SO	681
The ProcessTypeID in the message header matches the recipient of the message.	ProcessTypeID does not match the recipient of the message.	BRP/SO	747
No message with a more recent creation date/time stamp has been received.	A message has already been received with a more recent creation date/time stamp.	BRP/SO	704

The senderID in de SOAP Header equals the SenderID in the Business Document Header.	senderID in de SOAP Header is niet gelijk aan SenderID in de Business Document Header.	BRP/SO	701
The receiverID in de SOAP Header equals the ReceiverID in the Business Document Header.	receiverID in de SOAP Header does not equal the ReceiverID in the Business Document Header.	BRP/SO	745
The contentType ⁸ in de SOAP Header is consistent with the ProcessTypeID in the Business Document Header.	contentType in the SOAP is not consistent with ProcessTypeID in the Business Document Header.	BRP/SO	754
Entire message			
Message is complete, correct and addressed to the correct recipient ⁹ .	free text field] ¹⁰	BRP/SO	999

⁸ See Technical Guide - Measurements & Allocations Documents[8] for further information how to fill the contentType.

⁹ Check for error message if a received message is not correct or not intended for that recipient and cannot be caught by one of the above checks.

¹⁰ An explanation of error code 999 should be entered in this text field.

3.5 Application ProcessTypeID for exchanging measurement data time series

As described in the *BRS Measurement Data and Reclamations Measurement Data GV*[1], the schedule for the time series can be used for different applications. In the EDSNBusinessDocumentHeader (functional header) in the message, the application should be specified at ProcessTypeID. Further explanation of the use of the EDSNBusinessDocumentHeader is included in the *NEDU EDSN Design Choices*[2].

Application	Code
Daily message "allocation point large-scale consumption of electricity"	N10
Daily message "net-to-net transfer point electricity"	N11
Daily message "MWNET electricity transfer point".	N11
Daily message "allocation point system balance electricity"	N12
Monthly message "allocation point large-scale consumption of electricity".	N20
Monthly message "net-to-net transfer point electricity"	N21
Monthly report "high volume gas connection"	N30
Monthly Message "Interconnection point for gas distribution networks".	N31

4 Functional parameters

4.1 Notification Exchange of measurement data time series

The following functional parameters are applied in *Exchange of measurement data time series*:

Given	Gas	Elek	1/n	Note	XML code
Message Reference	V	V	1	A UUID as a unique identifier of the message.	
EAN code connection	V	V	1	EAN 18 connection gas respectively allocation point electricity, net-to-net transfer point electricity, transfer point MWNET electricity, interconnection point distribution networks gas.	
EAN code measurer	V	V	1	EAN 13 of the measuring agent.	
Market role	V	V	1	Role of the person responsible for measurement.	MDR
EAN code grid area	A	A	1	EAN 18 grid area not included in a measurement data message for a grid-to-grid transfer point or for an interconnection point of gas distribution networks. In all other situations, the EAN 18 of the grid area is mandatory in a measuring data message!	
EAN code grid area source	A	A	1	EAN 18 grid area source only mandatory in a measurement data message for a net-to-net transfer point or for an interconnection point of gas distribution networks, see 4.1.1. In all other situations, the EAN 18 grid area source is not filled!	
EAN code grid area sink	A	A	1	EAN 18 grid area sink only required in a measurement data message for a net-to-net transfer point or for an interconnection point of gas distribution networks, see 4.1.1. In all other situations, the EAN 18 grid area sink is not filled!	
Product type	V	V	1	Allowed values (from ebIX Code list[6] and including a leading zero): Electricity Gas	023 027
Reference to review request	O	O	1	Reference to the related review request.	
Start date period	V	V	1	A periodic message is sent for each consecutive period that a party is active on a connection. Start date time is in UTC and in accordance with ISO 8601 notation[7]: YYYY-MM-DDThh:mm:ssZ	
End date period	V	V	1	End date time is in UTC and in accordance with ISO 8601 notation[7]: YYYY-MM-DDThh:mm:ssZ	
Energy type ¹¹			n		
Imbalance settlement period (electricity)/measurement period (electricity)/PTE (gas)	V	V	1	Resolution is in accordance with ISO 8601 notation[7] for Duration: Permissible values electricity: 5 minutes 15 minutes Permissible gas values: 60 minutes	PT5M PT15M PT60M
Product ID	V	V	1	Allowed values (from ebIX Code list[6]): Electricity: Active energy Reactive energy ¹² Gas: Natural gas	8716867000030 8716867000047 5410000100016

¹¹ The number of time series delivered by the measurer in a message depends on the product type:

Electricity, up to a maximum of four time series:

1. mandatory: volume of active energy (offtake)
2. mandatory: volume of active energy (feed-in)
3. optional: volume of reactive energy (offtake)
4. optional: volume of reactive energy (feed-in)

Gas, one time series:

1. mandatory: volume of natural gas

¹² Volume reactive energy will only be applied once the sector has agreed and the necessary code change is in place

Given	Gas	Elek	1/n	Note	XML code
Energy unit	V	V	1	Permissible active energy value: kWh Permissible value of reactive energy: Kvarh Permissible value of natural gas: m ³ _(n)	KWH K3 NM3
Energy direction ¹³	N/A	V	1	Allowed values (from ebIX Code list[6]): Decrease Feed	E17 E18
Volume per position			n	Subsequent positioning	
Position	V	V	1	Position in the series in whole numbers.	
Volume	V	V	1	Volume in whole numbers.	
Origin indicator	V	V	1	Allowed values: Measured Measured update Calculated Unmeasured "zero" ¹⁴ See BRS Appendix A Status of measurement data and meter readings[1].	MSR UMS CLC NMS
Validation status	A	A	1	Allowed values: Valid Not valid Manually approved See BRS Appendix A Status of measurement data and meter readings [1].	VLD NVL MNL
Repair method	A	A	1	Allowed values: Check meter Correction factor error Correction of installation error Interpolation at meter change Zero data when deenergised Correction based on meter readings Additional Information Reclamation BRP Reclamation NB Estimated See BRS Appendix A Status of measurement data and meter readings[1].	VMT CFF CIN IMC NCD CMR ENF RBR RGR GMR
Residual volume of gas (only for system operators)			1		
Volume	V	N/A	1	Volume in whole numbers.	
Product ID	V	N/A	1	Allowed values: Natural gas	5410000100016
Energy unit	V	N/A	1	Allowed values: m ³ _(n)	NM3
Energy direction ¹⁵	V	N/A	1	Allowed values (from ebIX Code list[6]): Decrease Feed	E17 E18

Mandatory fields (V) are always filled; optional fields (O) or dependent fields (A) if required for the context of the related measurement data message.

¹³ For the product type of gas, the offtake category of the connection determines whether there is an import or purchase. Energy direction is therefore not a factor in the time series for gas.

¹⁴ Unmetered "zero" is used by the MRP as origin indication status for the zeros it is obliged to send on feed-in if not metered.

¹⁵ For GGV/GXX connections, the following applies for the energy direction of the residual volume of gas:

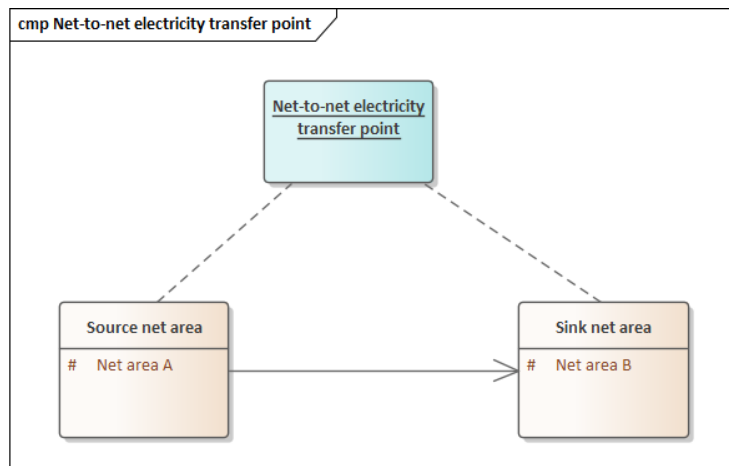
- for residual volume to be added to the hourly volumes purchased, the energy direction is "Consumption"
- for residual volume to be subtracted from the hourly volumes consumed, the energy direction is "Feed-in"

The following applies to GIS/GIN connections regarding the energy direction of the residual volume of gas:

- for residual volume to be added to the hourly input volumes, the energy direction is "Feed-in"
- for residual volume to be subtracted from the hourly volumes fed in, the energy direction is "Decrease"

4.1.1 Explanation of the use of Sink and Source at grid-to-grid transfer point electricity

For a net-to-net electricity transfer point, we distinguish a Source grid area and a Sink grid area. The message for a grid-to-grid transfer point electricity is sent by the metering responsible party to both system operators of the relevant Source or Sink grid area. If the energy flows from Source to Sink, this is indicated by the energy direction "Decrease". When the energy flows from Sink to Source, this is indicated by the energy direction "Feed-in"¹⁶.



	From	Energy direction
Source → Sink	Network area A → Network area B	Decrease
Source ← Sink	Network area B → Network area A	Feed

4.1.2 Explanation of the use of Sink and Source at the interconnection point of gas distribution networks

At an interconnection point for distribution networks, we also recognise a Source grid area and a Sink grid area, but an interconnection point for distribution networks knows only one energy direction. If the energy flows from Source to Sink, the message corresponding to the coupling point with the energy direction "offtake" is sent. When the energy flows from Sink to Source, the message corresponding to the connection point with energy direction "Feed-in" is sent. The message for a coupling point of distribution networks gas is sent by the measurement responsible party to the transmission system operator.

4.1.3 Explanation of the use of decimals for Volume per position

The volume per imbalance settlement period/measurement period/PTE is in whole numbers!

The measurement responsible party shall apply a so-called "intelligent truncate" whereby the fractional part of the volume for the imbalance settlement period/measurement period/PTE is added to the volume of the next imbalance settlement period/measurement period/PTE, within the total 24-hour period (day for electricity or gas day for gas).

Example for electricity:

From	To	Position	Measured volume	Fractional part	Fractional share previous period	Volume exchanged	Fractional part next period
2020-02-08T 22:15:00Z	2020-02-08T 22:30:00Z	94	1056.660	0.660	0.120	1056	0.780
2020-02-08T 22:30:00Z	2020-02-08T 22:45:00Z	95	1063.340	0.340	0.780	1064	0.120
2020-02-08T 22:45:00Z	2020-02-08T 23:00:00Z	96	1057.690	0.690	0.120	1057	0.000 ¹⁷

¹⁶ Calculated from the grid area defined as source!

¹⁷ In case of a day transition, the fractional part is not taken into account for the next imbalance settlement period/measurement period/PTE and is therefore set to 0.000.

Example for gas:

From	To	Position	Measured volume	Fractional part	Fractional share previous period	Volume exchanged	Fractional part next period
2020-02-08T 02:00:00Z	2020-02-08T 03:00:00Z	22	312.510	0.510	0.020	312	0.530
2020-02-08T 03:00:00Z	2020-02-08T 04:00:00Z	23	318.490	0.490	0.530	319	0.020
2020-02-08T 04:00:00Z	2020-02-08T 05:00:00Z	24	320.840	0.840	0.020	320	0.000 ¹⁸

4.2 Response Exchanging measurement data time series

The response consists of an acknowledgement or a rejection:

Given	Gas	Elek	1/n	Note	XML code
Reference response message	V	V	1	A UUID as a unique identifier of the message.	
Message Notification Reference	A ¹⁹	A ²⁰	1	A UUID as unique identifier of the acknowledged or rejected notification message ²¹ .	
Date/time response message	V	V	1	Date time is in UTC and in accordance with ISO 8601 notation[7]: YYYY-MM-DDThh:mm:ssZ	
Confirmation/rejection code	V	V	n	If confirmed (not rejected!), code "000" must be returned in the response. If rejected, at least one code for rejection must be returned in the response (see section 3.3 and 3.4).	000 Code for rejection: see section 3.3 and 3.4
Explanation of the rejection	O	O	n	Optional explanation of the rejection.	

Mandatory fields (V) are always filled; optional fields (O) or dependent fields (A) if required for the context of the related measurement data message.

4.2.1 Explanation of the correlation of the response to the notification

Correlation on the following levels:

1. Through the EDSNBUSINESSDOCUMENTHEADER, the technical Notification and Acknowledgement is established if this information is provided by the requester²²;
2. Via the message attribute (UUID), the mandatory process correlation between Notification and Acknowledgement is established. This attribute should also be used in a revision request as a reference to the measurement data message.

Additionally, a correlation may apply on the level of the SOAP header, see the document MMC Technical Guide – Measurements & Allocations Documents [8].

4.3 Timeliness monthly message “allocation point electricity large consumption”

Between 12:00 and 23:59, the measurement responsible party sends the monthly messages “allocation point electricity large consumption” (with code N20) and “net-to-net transfer point electricity” (with code N21) to the system operator. This to minimize disturbance of the sending and processing of the daily messages “allocation point electricity large consumption” (with code N10) and “net-to-net transfer point electricity” (with code N11).

¹⁸ In case of a gas day transition, the fractional part is not taken into account for the next imbalance settlement period/measurement period/PTE and is therefore set to 0.000.

¹⁹ If the integrity and/or confidentiality of the XML message cannot be guaranteed, the recipient must be able to send a rejection to the sender of the corresponding message without the reference of the received message. Due to compromised integrity or confidentiality there is no proper way to retrieve this information.

²⁰ If the integrity and/or confidentiality of the XML message cannot be guaranteed, the recipient must be able to send a rejection to the sender of the corresponding message without the reference of the received message. Due to compromised integrity or confidentiality there is no proper way to retrieve this information.

²¹ Is the Measurement_Series.mRID of the MeasurementSeriesNotification message.

²² CorrelationID can be filled by the provider of volumes and meter readings. If filled, the receiving party (consumer) must specify this CorrelationID in the response to the provider. See Design Choices[2] for an explanation of the use of CorrelationID.

5 Sequence Diagram

5.1 Note

The sequence diagram shows the parties and services as an object with a so-called "lifeline". The interaction between these objects is shown by arrows as one or more messages between objects. The messages in the sequence diagram are explained in more detail in the chapter Information Model. Further details on message standards and application methods are described in *NEDU EDSN Design Choices*[2].

5.2 Exchange of measurement data time series

The sequence diagram below concerns the offering of *Exchange of measurement data time series* by the measurement manager to the MMC-hub. The MMC hub takes care of routing, preparing and forwarding the relevant measurement data to the receiver.

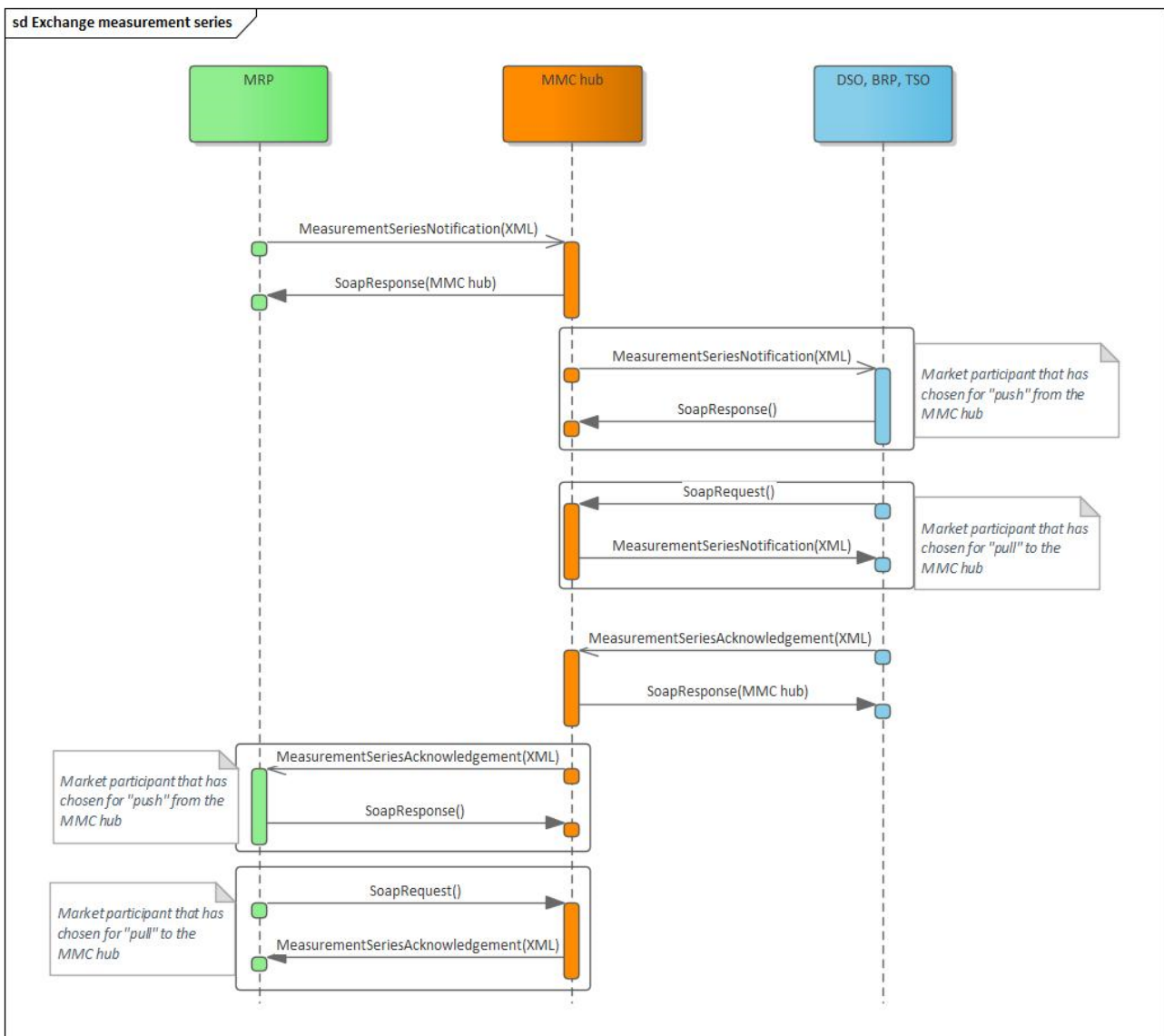


Figure 2 The sequence diagram for exchanging measurement data time series between MRP and TSO, BRP and DSO via the MMC-hub

6 Service characteristics *Exchanging measurement data time series*

Exchange of measurement data time series (MeasurementSeries)	
Service	MeasurementSeries - Exchange of measurement data time series
DSO service ID	BSCMF0061
Description	Exchanging measurement data of time series between MRP (provider) and the TSO, BRP, DSO (consumer)
Service transaction pattern	Notification/Acknowledgement
Precondition(s)	<i>Notify Exchange of Measurement Data Time series</i> are submitted by a party that has been authorised and authenticated for this purpose.
Trigger	MRP provides <i>Notify Exchange of Measurement Data time series</i> to MMC hub.
Post condition(s)	<i>Notify Time Series Measurement Data Exchange</i> rejected - or <i>Notification Exchange of measurement data time series</i> performed.
Service use ²³	
Pattern of use	N/a
Average load	N/a
Peak load	N/a
Period peak load	N/a
Retry by provider	
Period of inactivity	N/a
Max. consumer response time	95% of the incoming Notifications must be answered by the consumer by means of an Acknowledgement within 60 minutes.
Max. response time Soap response MMC hub	See MMC Technical Guide - Measurements & Allocations Documents[8].
Time-out	See MMC Technical Guide - Measurements & Allocations Documents[8].
Retry	The sender (provider of the measurement data) only performs a 'retry' if he did not receive a positive HTTP response from de MMC-hub. If the recipient (consumer of the measurement data) after the max. response time still did not receive a response, we advise to contact the recipient to find out the reason behind. If necessary after that the administrator of the MMC-hub can be contacted. After coordination, a resend of the Notification can be chosen as a follow-up action.
Webservice	
WSDL	See MMC Technical Guide - Measurements & Allocations Documents[8].
Version	See MMC Technical Guide - Measurements & Allocations Documents[8].
Date	See MMC Technical Guide - Measurements & Allocations Documents[8].
Soap address	See MMC Technical Guide - Measurements & Allocations Documents[8].

²³ To be agreed with TenneT.

Operation		
User	MRP-er	
Function	Submission <i>Notification Exchange of measurement data time series</i>	
Soap action	See WSDL	
Input message	MeasurementSeriesNotification	
XSD	MeasurementSeriesNotification_2p0	
Output message	MeasurementSeriesAcknowledgement	
XSD	MeasurementSeriesAcknowledgement_3p1	

7 Information model

7.1 Note

The information model is shown as a class diagram. Each class diagram is followed by a table with the description of the elements, except for the class diagrams of "empty" messages exchanged for acknowledgement.

Multiplicities are indicated with the elements. Notation 0..1 means that the element optionally occurs once, 1..1 means that the element occurs once (mandatory). Notation 0...* means that the element may optionally occur more than once. Notation 1..* means that the element may occur one or more times (mandatory).

Data types determine which type of value an element can contain. The data types are subdivided into:

- **Composite data types (CDT):** a composition of several (fixed) elements, which are reused more often (e.g. address)[4].
- **Logical data types (LDT):** a defined set of properties of the element such as minimum length, maximum length, pattern[5].

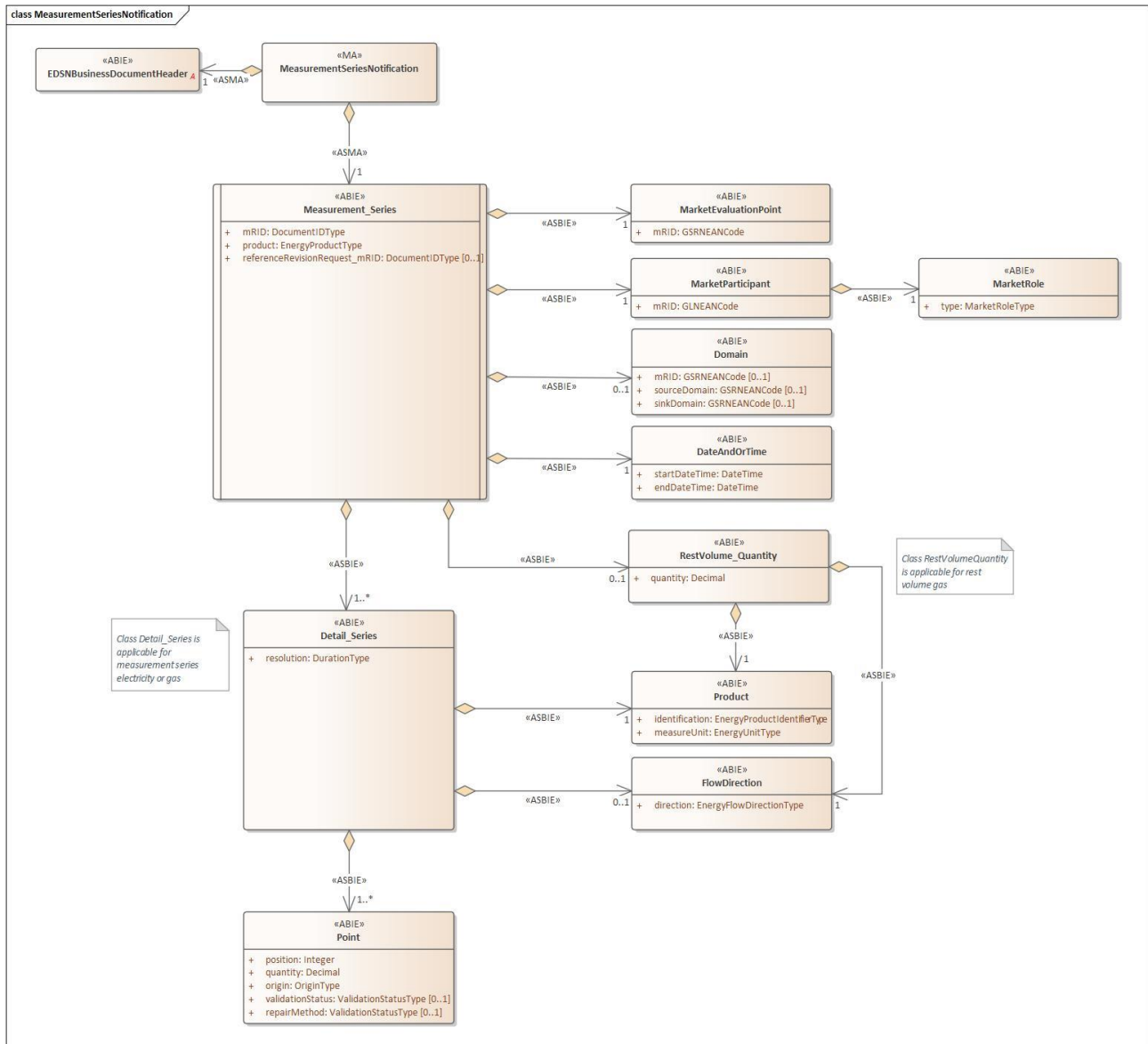
For more information on data types, please refer to *NEDU EDSN Design Choices*[2].

Detailed information on the values of the data types is available as a PDF document on myEDSN:

- EDSN Complex Data Type Specification (CDT).
- EDSN Logical Data Type Specification (LDT).

These documents also describe the values of the data types used in other information models.

7.2 Notification Exchange of Measurement Data Time Series (MeasurementSeriesNotification)



DateAndOrTime

XML element	Data type	Multiplicity	Description	Functional parameter
startDateTime	DateTime	1..1	Start date/time of the period as per ISO 8601 YYYY-MM-DDThh:mm:ssZ.	Start date period
endDateTime	DateTime	1..1	End date/time of the period as per ISO 8601 YYYY-MM-DDThh:mm:ssZ.	End date period

Detail_Series

XML element	Data type	Multiplicity	Description	Functional parameter
resolution	DurationType	1..1	The definition of the number of units of time that compose an individual step within a period.	Imbalance settlement period (electricity)/measurement period (electricity)/PTE (gas)

Domain

XML element	Data type	Multiplicity	Description	Functional parameter
mRID	GSRNEANCode	0..1	The unique identification of the domain.	EAN code grid area
sourceDomain	GSRNEANCode	0..1	The unique identification of the source domain.	EAN code grid area source
sinkDomain	GSRNEANCode	0..1	The unique identification of the sink domain.	EAN code grid area sink

FlowDirection

XML element	Data type	Multiplicity	Description	Functional parameter
direction	EnergyFlowDirectionType	1..1	The identification of the direction.	Energy direction

MarketEvaluationPoint

XML element	Data type	Multiplicity	Description	Functional parameter
mRID	GSRNEANCode	1..1	The identification of the evaluation point.	EAN code connection

MarketParticipant

XML element	Data type	Multiplicity	Description	Functional parameter
mRID	GLNEANCode	1..1	The identification of a party in the energy market.	EAN code measurer

MarketRole

XML element	Data type	Multiplicity	Description	Functional parameter
type	MarketRoleType	1..1	The identification of the role played by a market player.	Market role

Measurement_Series

XML element	Data type	Multiplicity	Description	Functional parameter
mRID	DocumentIDType	1..1	A unique identification of the time series.	Message Identifier (UUID)
product	EnergyProductType	1..1	The identification of the energy product (electricity, gas etc.)	Product type
referenceRevisionRequest_mRID	DocumentIDType	0..1	Reference to an earlier received revision request	Reference to review request

Point

XML element	Data type	Multiplicity	Description	Functional parameter
position	Integer	1..1	A sequential value representing the relative position within a given time interval.	Position
quantity	Decimal	1..1	The principal quantity or the accepted offer quantity identified for a point.	Volume
origin	OriginType	1..1	The identification of the origin	Origin indicator
validationStatus	ValidationStatusType	0..1	The identification of the validation status	Validation status
repairMethod	ValidationStatusType	0..1	The identification of the repair method.	Repair method

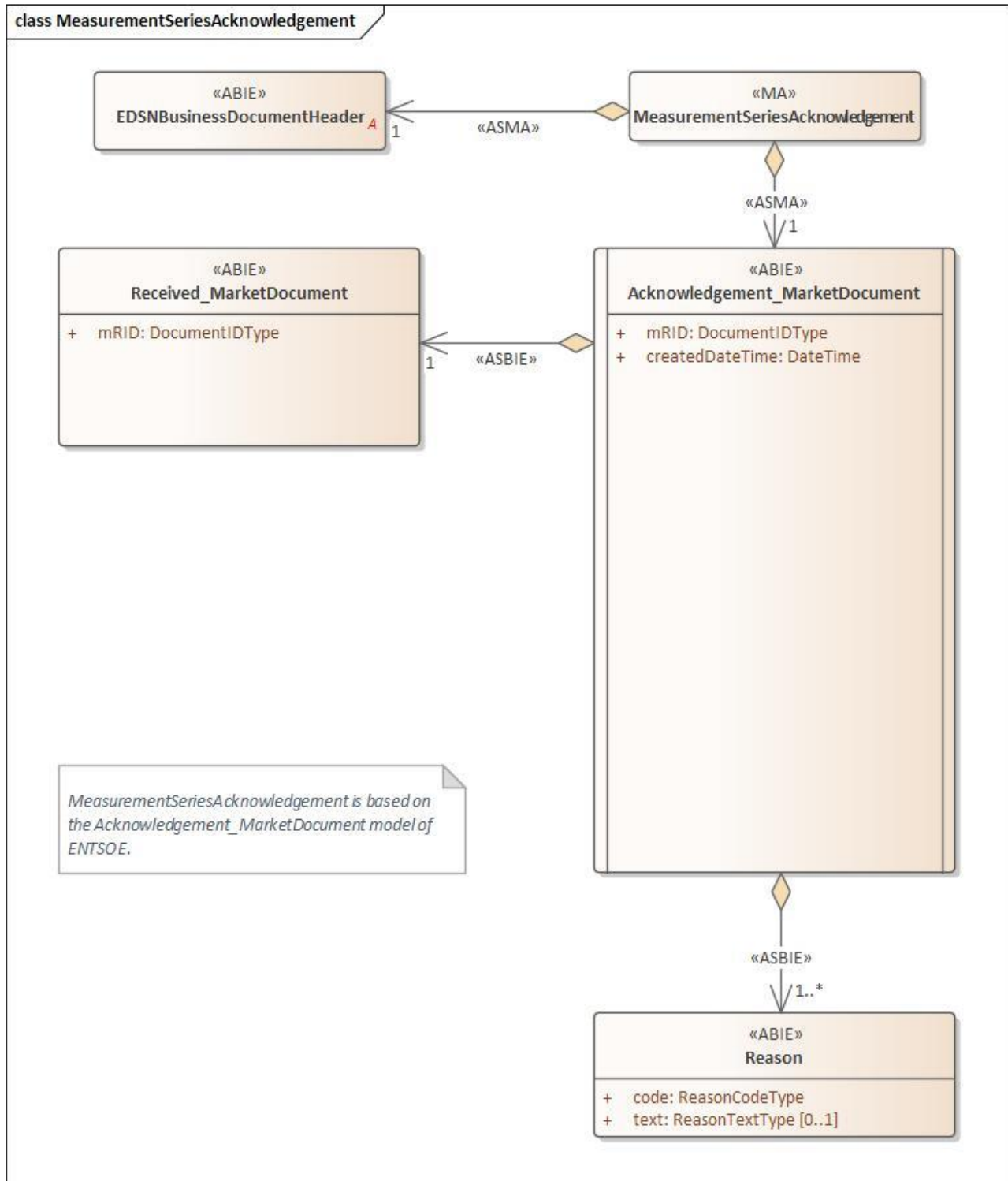
Product

XML element	Data type	Multiplicity	Description	Functional parameter
identification	EnergyProductIdentifierType	1..1	The unique identification of the product.	Product ID
measureUnit	EnergyUnitType	1..1	The identification of the measure unit.	Energy unit

RestVolume_Quantity

XML element	Data type	Multiplicity	Description	Functional parameter
quantity	Decimal	1..1	The quantity value. The association role provides the information about what is expressed.	Residual volume of gas

7.3 Confirmation/rejection of measurement data time series (MeasurementSeriesAcknowledgement)



Acknowledgement_MarketDocument

XML element	Data type	Multiplicity	Description	Functional parameter
mRID	DocumentIDType	1..1	The unique identification of the document being exchanged within a business process flow.	Message Identifier (UUID)
createdDateTime	DateTime	1..1	The date and time of the creation of the document.	

Reason

XML element	Data type	Multiplicity	Description	Functional parameter
code	ReasonCodeType	1..1	The motivation of an act in coded form.	Confirmation/rejection code
text	ReasonTextType	0..1	The textual explanation corresponding to the reason code.	Explanation of confirmation/rejection

Received_MarketDocument

XML element	Data type	Multiplicity	Description	Functional parameter
mRID	DocumentIDType	1..1	The unique identification of the document being exchanged within a business process flow.	Notification message identifier (UUID)