

Standard ASCII format (SAF)

TECHNICAL DESCRIPTION

Version 2.5

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Table of Contents

1 Introduction	5
1.1 Syntax used in specification.....	5
1.1.1 Column NULL	5
1.1.2 Column Format	5
2 File Format.....	6
2.1 EXH Line: Export header	7
2.2 TSH Line: Time series header	7
2.3 TSU Line: Time series unit (optional line)	8
2.4 TSM Line: Time series measurement (optional line)	9
2.5 TSV Line: Time series value	9
2.6 EXT Line: Export trailer.....	10
2.7 Methods to present time series values.....	11
2.7.1 Values with time stamps.....	11
2.7.2 Values with index	12

Version History

Version	Author	Reviewed	Published	Comments
1.0	AHA		16.04.2002	First version.
1.1	AHA		27.08.2003	Layout corrections
2.0	AHA		16.03.2004	New inhouse version 2. Added product code and references to TSH line. Support of importing indexed values added.
2.1	JHU	AHA	23.12.2005	New optional TSU Line added (has also influence to TSV line)
2.2	AHA		03.01.2006	New optional TSM Line added to define additional part for time series name. (TSM line is used only with TSU lines.
2.3	AHA		21.09.2007	Metering point, meter and measurement code and added to TSH line.
2.4	JVA	AHA	19.10.2007	Add more info for parameter use
2.5	RKU	AHA	21.09.2016	Updated to Enoro template

List of Figures

Figure 2-1 Example of SAF file	6
Figure 2-2 Example of EXH line	7
Figure 2-3 Example of TSH line	7
Figure 2-4 Example of TSU line	8
Figure 2-5 Example of TSM line	9
Figure 2-6 Example of TSV line	9
Figure 2-7 Example of EXT line	10
Figure 2-8 Example of shift to DST with CET	11
Figure 2-9 Example of shift from DST with CET	11
Figure 2-10 Example of TSV line without value timestamp	12

List of Tables

Table 1-1. Item description table	5
Table 2-1. EXH Item	7
Table 2-2. TSH Item	7
Table 2-3. TSU Item	8
Table 2-4. TSM Item	9
Table 2-5. TSV Item	9
Table 2-6. EXT Item	10

1 Introduction

This document describes the standard ASCII file format (SAF) for exporting and importing time series data.

1.1 Syntax used in specification

In this specification following abbreviations are used in tables.

Table 1-1. Item description table

XXX Item	Name	NULL	Format	Description
The slot of the value	Name of the data	Defines if the slot can be left empty or not	In which format the data should be presented	Description

1.1.1 Column NULL

N = Not null, mandatory

Y = Not mandatory

D = Dependent. Mandatory in certain use case.

1.1.2 Column Format

a=alphabetical, e.g. a3 means that data must be three letters (alphabets)

n=numeric, e.g. n2 means data must be presented with two numbers.

..X = Maximum amount of characters in data is informed with ..X, where the X is the amount of characters. E.g. an..6 means that data can be presented in maximum 6 characters which can be either letters or numbers.

Date = Date format is YYYYMMDDhhmmss+XX, where XX represents the UTC offset (e.g. +01 for CET, +02 for CET with DST)

2 File Format

Enoro SAF standard ASCII file format contains four types of lines.

Export header:	EXH	mandatory
Time series header:	TSH	
Time series unit:	TSU	optional, one per TSH row
Time series measurement:	TSM	optional, one per TSH row
Time series value:	TSV	corresponds to preceding TSH
Export trailer:	EXT	mandatory

The data items are separated with semicolon (;). The first line is always export header line (EXH) and the last line is always export trailer line (EXT). A file can contain multiple time series header (TSH) lines and TSH can contain multiple time series value (TSV) lines.

All additions of new items for lines are done to the end of line to ensure compatibility of earlier implementations. In-house version number is changed when new items are added. Earlier implementations with earlier in-house version number do not necessary fill the separators for new items. It is recommended that the implementations should be done so that new items in the end of line or missing trailer separators are acceptable.

```
EXH;2;20010301200020+00;

TSH;AT0040000502000000000000001050884;1;15;MIN;kWh;4;200111200100+00;200111
200200+00;Ref1;Ref2;Ref3;Ref4;Ref5;Product;MPCode;Meter code;Meas code;

TSV;1;200111200100+00;10.2111;Measured;

TSV;2;200111200115+00;10.2222;Measured;

TSV;3;200111200130+00;10.2333;Measured;

TSV;4;200111200145+00;10.2444;Measured;

TSH;AT0040000502000000000000001050500;1;1;1;HOUR;MWh;8;200111200000+00;200111
200800+00;Ref1;Ref2;Ref3;Ref4;Ref5;Product;MPCode;Meter code;Meas code;

TSV;1;200111200000+00;20.2111;Measured;

TSV;2;200111200100+00;30.2222;Measured;

TSV;3;200111200200+00;40.2333;Measured;

TSV;4;200111200300+00;50.2444;Measured;

TSV;5;200111200400+00;60.2111;Measured;

TSV;6;200111200500+00;70.2222;Measured;

TSV;7;200111200600+00;80.2333;Measured;

TSV;8;200111200700+00;90.2444;Measured;

EXT;
```

Figure 2-1 Example of SAF file

2.1 EXH Line: Export header

EXH;2;20010301200020+00;

Figure 2-2 Example of EXH line

Table 2-1. EXH Item

EXH Item	Name	NULL	Format	Description
0	Line tag	N	a3	EXH=Export header
1	Inhouse version	N	an..6	Inhouse version number. Currently 2.
2	Export processing time	N	Date	Export processing time. Processing time of the export. YYYYMMDDhhmmss+XX XX represents the UTC offset (e.g. +01 for CET, +02 for CET with DST)

2.2 TSH Line: Time series header

TSH;AT0040000502000000000000001050884;1;15;MIN;kWh;4;200111200100+00;200111200300+00;Ref1;Ref2;Ref3;Ref4;Ref5;Product;MPCode;Meter code;Meas code;

Figure 2-3 Example of TSH line

Table 2-2. TSH Item

TSH Item	Name	NULL	Format	Description
0	Line tag	N	a3	TSH=Time series header
1	Time series id	N	an..90	Time series name
2	Time series type	N	n..2	Time series type. 0=non-interval time series 1=interval time series
3	Time series step	N	n..6	Time series step Fixed step for interval series. For non-interval series value is 0.
4	Step type	N	an..6	Step type: YEAR MONTH DAY WEEK HOUR MIN NULL for non-interval time series
5	Unit	N	an..6	Time series engineering unit.
6	Data count	D	n..9	Number of exported values.
7	Period start	N	Date	Start time of the reporting period. YYYYMMDDhhmm+XX For interval time series this is beginning time of the first interval. XX represents the UTC offset (e.g. +01 for CET, +02 for CET with DST)

8	Period stop	Y	Date	Stop time of the reporting period. YYYYMMDDhhmm+XX For interval time series this is ending time of the last interval. XX represents the UTC offset (e.g. +01 for CET, +02 for CET with DST)
9	Reference 1	Y	an..35	Additional reference 1, additional field for extra identification or other data transfer needs.
10	Reference 2	Y	an..35	Additional reference 2, additional field for extra identification or other data transfer needs.
11	Reference 3	Y	an..35	Additional reference 3, additional field for extra identification or other data transfer needs.
12	Reference 4	Y	an..35	Additional reference 4, additional field for extra identification or other data transfer needs.
13	Reference 5	Y	an..35	Additional reference 5, additional field for extra identification or other data transfer needs.
14	Product code	Y	an..35	Product code for time series
15	Metering point code	Y	an..35	Metering point code
16	Meter code	Y	an..35	Meter code
17	Measurement code	Y	an..35	Measurement or register code

2.3 TSU Line: Time series unit (optional line)

TSU;MWh;m³; °C; °C;m³/h;...

Figure 2-4 Example of TSU line

Table 2-3. TSU Item

TSU Item	Name	NULL	Format	Description
0	Line tag	N	a3	TSU = Time series unit
1	Unit 1	N	an...9	Time series value 1 unit
2	Unit 2	Y	an...9	Time series value 2 unit
3	Unit 3	Y	an...9	Time series value 3 unit
4	Unit 4	Y	an...9	Time series value 4 unit
5	Unit 5	Y	an...9	Time series value 5 unit
n	Unit n	Y	an...9	Time series value n unit

Note! This is supported only in the import use-case and for District heating utility.

2.4 TSM Line: Time series measurement (optional line)

TSM;M1;M2;M3;M4;M5;...

Figure 2-5 Example of TSM line

Note! If optional TSU Line is used, TSM line must be used for time series naming convention. Time series naming convention will be <Time series id>_<Measurement n>.

Example:

TSH;AT0040000502000000000000001050884;1;15;MIN;kWh;4;.....
TSU;MWh;m³;°C;°C;m³/h;
TSM;M1;M2;M3;M4;M5;

Time series will be named as:

AT0040000502000000000000001050884_M1
AT0040000502000000000000001050884_M2
AT0040000502000000000000001050884_M3
AT0040000502000000000000001050884_M4
AT0040000502000000000000001050884_M5

Table 2-4. TSM Item

TSM Item	Name	NULL	Format	Description
0	Line TAG	N	A3	TSM = Time series measurement
1	Measurement 1	N	an...9	Measurement 1
2	Measurement 2	Y	an...9	Measurement 2
3	Measurement 3	Y	an...9	Measurement 3
4	Measurement 4	Y	an...9	Measurement 4
5	Measurement 5	Y	an...9	Measurement 5
n	Measurement n	Y	an...9	Measurement n

Note! This is supported only in the import use-case and for District heating utility.

2.5 TSV Line: Time series value

TSV;1;200111200100+00;10.2000;Measured;12.000;Uncertain;13.543;Measured

Figure 2-6 Example of TSV line

Note! If optional TSU Line is present every unit will have own Value/Status pair. See TSM line for time series naming convention.

Table 2-5. TSV Item

TSV Item	Name	NULL	Format	Description
0	Line tag	N	a3	TSV=Time series value
1	Index	D	n..9	Index number for the value.

2	Value timestamp	D	Date	Value timestamp. YYYYMMDDhhmm+XX For interval time series this is beginning time of interval. XX represents the UTC offset (e.g. +01 for CET, +02 for CET with DST)
3	Value 1	N	n..15	Value 1 Decimal delimiter is dot (.)
4	Status 1	N	an..12	Value 1 status.
5	Value 2	Y	n..15	Value 2 Decimal delimiter is dot (.)
6	Status 2	Y	an..12	Value 2 status.
n-1	Value n	Y	n..15	Value n Decimal delimiter is dot (.)
n	Status n	Y	an..12	Value n status.

2.6 EXT Line: Export trailer

EXT ;

Figure 2-7 Example of EXT line

Table 2-6. EXT Item

EXT Item	Name	NULL	Format	Description
0	Line tag	N	a3	EXT=Export trailer.

The minimum set of items defining report interval and values is the following:

- Report interval start with UTC offset (TSH: Period start)
- Value time stamp with UTC offset (TSV: Value timestamp)

The following items are optional but recommended to use when possible:

- Report interval stop with UTC offset (TSH: Period stop)
- Data count of values (TSH: Data count)
- Value index (TSV: Index)

2.7.2 Values with index

There are no time stamps provided for each value, but values are presented with index numbers.

When index method is used, values for each step inside report interval must be provided.

```
...
TSH;AT0040000502000000000000001050884;1;1;HOUR;kWh;;200402260000+01;;Ref1;R
ef2;Ref3;Ref4;Ref5;Product;
...
TSV;1;;10.2111;Measured;
TSV;2;;10.2222;Measured;
TSV;3;;10.2333;Measured;
TSV;4;;10.2444;Measured;
...

```

Figure 2-10 Example of TSV line without value timestamp

The minimum set of items defining report interval and values is the following:

- Report interval start with UTC offset (TSH: Period start)
- Data count of values (TSH: Data count)
- Value index (TSV: Index)

The following items are optional but recommended to use when possible:

- Report interval stop with UTC offset (TSH: Period stop)