AutoPASS Requirement Specification

4.8 - OBU Manufacturer – CS Interface

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DOCUMENT REVISION HISTORY

The objective of the Document Revision history is to reflect the evolution of the document.

Version	Date	Author	Main changes
1.0	12-04-2011	Q-Free	Document based on 2.7.2 OBU Manufacturer – CS. Added Customer Data Shipment File Format.
2.0	23-04-2013	Per E Pedersli	New document name and number + minor corrections. Vehicle class is defined in the header, see table 3.2 and example 3.5 PAN number is defined in table 3.3 Example of OBU production file produced by CS, example 4.5

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1. DEFINITIONS, ABBREVIATIONS AND REFERENCES

The Terms and definitions used in this document shall comply with:

AutoPASS Requirement specification
2.1 – Terms and definitions

2. INTRODUCTION

This document specifies the interface between the On Board Unit (OBU) Manufacturer and the Central System (CS), see Figure 1. Information is transferred offline and there might be a significant time delay before information is processed by the receiver. All files shall therefore contain a version control, to accommodate for that the interface can be updated at a later stage. The filename convention and content is described in the following chapters.

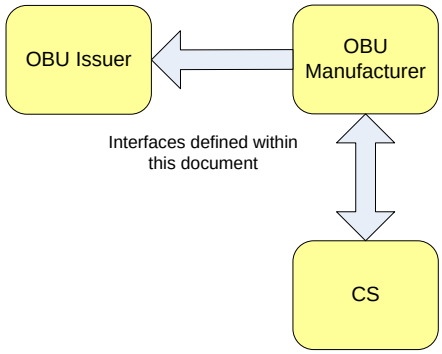

Figure 1 Interface between OBU Manufacturer, OBU Issuer and the Central System

All OBU Manufacturers shall use a common interface format in order to achieve that data are transferred smooth and efficiently in the system.

The interface shall be used for the distinct purposes:

- Transfer of OBU production related information from the OBU Manufacturer to the Central System and the OBU Issuer.
- Transfer of OBU Customer Data from the CS to the OBU Manufacturer.
- Transfer of OBU Customer Shipment Information from the OBU Manufacturer to the Central System.

It is not foreseen that the exchange of information will be based on direct online connection. Instead information will be distributed on various media like CD, exchange through e-mail and so on.

Information shall therefore be transferred in text files with the following character coding:

- OBU Production File: plain ASCII
- OBU Customer Shipment File: plain ASCII

The file to be used depends on the specific order from the Employer to the OBU Manufacturer. The OBU Production File applies in the case that the OBU Manufacturer shall produce OBUs for shipment in boxes to the Employer/OBU Issuer. For further information about this method of shipment see [3].

In the case the Employer orders the OBU Manufacturer to distribute the OBUs to the End User, the OBU Customer Shipment File applies. Information exchange in this case requires the following steps:

1. The Central System produces an OBU Customer Shipment File containing information about the End Users that shall receive an OBU.
2. The file is sent to the OBU Manufacturer.

3. The OBU Manufacturer produces the OBUs and uses the received file to assign which OBU has been sent to which specific End User
4. This produced file is sent to the Central System.

3. OBU PRODUCTION FILE

3.1 FILENAME

The filename shall be AAAAABBBBBYYYYMMDDSS.dat, where the filename is generated based on the fields given in Table 3.1

Table 3.1 - Filename fields

Field	Length	Data type	Description
AAAAA	5	Numeric	Identifies the OBU Manufacturer, see Table **6.1** in Section 6.
BBBBB	5	Numeric	OBU Issuer Identifier, allocated by the Employer.
YYYYMMDD	8	Numeric	Year, Month, and Day the file is generated in UTC time.
SS	2	Numeric	Sequence Number. 00-99. Increases with one if more than one file is produced for the specific OBU Issuer in the same day.

3.2 FILE HEADER

The OBU Production File shall be coded in plain ASCII and shall contain a header consisting of the fields given in Table 3.2

Table 3.2 - OBU Production File Header

Field Name	Length	From-To	Data Type	Description
Header Magic	1	1	'H'	Static Magic Value 'H'
Separator	1	2	';'	Static text
File Type Identifier	3	3-5	Numeric	Unique Identifier for the type of file. For OBU Production Files this value must be 005, see Table 6.2 in Section 6.
Separator	1	6	';'	Static text
File Data Type Identifier	2	7-8	Numeric	Type of Data the File Contains, see Table 6.3 in Section 6
Separator	1	9	';'	Static text
Interface Revision	3	10-12	Numeric	Interface Specification Version this file complies with, see Table 6.2 in Section 6.
Separator	1	13	';'	Static text
Creation date	8	14-21	YYYYMMDD	Year, Month, and Day the file is generated in UTC time
Separator	1	22	';'	Static text
OBU Manufacturer	5	23-27	Numeric	Identifies the OBU Manufacturer, see Table 6.1 in Section 6.
Separator	1	28	';'	Static text
OBU Issuer Identifier	5	29-33	Numeric	Identifies the OBU issuer, allocated by the Employer.
Separator	1	34	';'	Static text
Vehicle Class	2	35-36	Numeric	Define the vehicle class for this OBU production batch
Separator	1	37	';'	Static text
Number of OBU Production records	6	38-43	Numeric	Number of OBU Production Data records in the file.
Line terminator	2	44-45	"\r\n"	Windows line termination (CR + LF)

3.3 FILE INFORMATION: COMMENTS FIELD

Directly after the header line generated in accordance with Table 3.2 there can optionally be placed lines starting with "//" which can contain additional information from the OBU Manufacturer like contact details, production address etc. This information shall be assumed to be only informative and are only included to give the possibility to provide information to humans reading the file. Such lines of information shall be less than 256 characters and shall be terminated with the same line terminator type as given in Table 3.2.

3.4 FILE BODY

OBU Production Data records shall follow directly after the header and contain the following:

- Pallet number: Packaging information consisting of a unique number.
- Box number: The box where the OBU is located consisting of a unique number.
- Colour: The colour of the OBU, see Table 6.6 in Section 6 for colour codes.
- 1 digit reserved for future use
- OBU Country Code
- OBU Issuer Identifier
- OBU Serial Number
- Luhn checksum
- OBU Production Date

The full format for the record is specified in Table 3.3Table .

Table 3.3 - OBU Production Data record

Field Name	Length	From-To	Data type	Description
Pallet number	11	1 -11	AMMMMMSSSSS	Pallet number where the OBU is located. This shall be a unique number from the OBU Manufacturer, see Table 6.4 in Section 6.
Separator	1	12	';'	Static text
Box number	12	13-24	AMMMMMSSSSSS	The number of the box where the OBU is located. This shall be a unique number from the OBU Manufacturer, see Table 6.5 in Section 6.
Separator	1	25	';'	Static text
Colour	4	26-29	Chars	See Table 6.6 in Section 6.
Separator	1	30	';'	Static text
Reserved	1	31	'0'	Reserved for future use
OBU Country Code	3	32-34	Numeric	ISO 3166-1 numeric code. For Norway this shall be 578. Character 1-3 of PAN
OBU Issuer Identifier	5	35-39	Numeric	OBU Issuer Identifier for this OBU. Character 4-8 of PAN
OBU Serial Number	10	40-49		Serial number for this OBU. Character 9-x of PAN
Luhn checksum	1	50	Numeric	This is the control digit of the OBU number calculated from all 18 digits (OBU Country Code, OBU Issuer Identifier, OBU Serial Number) If PAN has 19 characters this position contains the 19th character
Separator	1	51	';'	Static text
OBU Production	8	52-57	YYYYMMDD	Year, Month, and Day the OBU was

Date				produced in UTC time.
Line terminator	2	58-59	“\r\n”	Windows line termination (CR + LF)

3.5 EXAMPLE

The following provides an example of how the file looks like.

```
H;005;01;001;20081010;00002;00007;01;10
//Comment that can be added
//All comments shall follow directly before
//the OBU Production Data records
//No comments can be intermingled with the OBU records
32001000001;320010000001;grey;0578000070002000011;20081009
32001000001;320010000001;grey;0578000070002000029;20081009
32001000001;320010000001;grey;0578000070002000037;20081009
32001000001;320010000001;grey;0578000070002000045;20081009
32001000001;320010000001;grey;0578000070002000052;20081009
32001000001;320010000001;grey;0578000070002000060;20081009
32001000001;320010000001;grey;0578000070002000078;20081009
32001000001;320010000001;grey;0578000070002000086;20081009
32001000001;320010000001;grey;0578000070002000094;20081009
32001000001;320010000001;grey;0578000070002000102;20081009
```

4. OBU Customer Shipment File

The OBU Customer Shipment File is to be used for the Transfer of OBU Customer Data between the CS and the OBU Manufacturer.

4.1 Filename

The filename shall be AAAAABBBBBYYYYMMDDSS.dat, where the filename is generated based on the fields given in Table 3.1. The field AAAAA will be set to 00000 when the file is generated from the Central System.

4.2 File Header

The OBU Customer Shipment File shall be coded in plain ASCII and shall contain a header consisting of the fields given in Table 3.2. The field OBU Manufacturer will be set to 00000 and the File Data Type Identifier will be set to 02 when the file is generated from the Central System. The field “Number of OBU Production records” indicates how many OBUs are expected to be produced.

4.3 File Information: Comments field

Directly after the header line generated in accordance with Table 3.2 there can optionally be placed lines starting with “//” which can contain additional information from the OBU Manufacturer like contact details, production address etc. This information shall be assumed to be only informative and are only included to give the possibility to provide information to humans reading the file. Such lines of information shall be less than 256 characters and shall be terminated with the same line terminator type as given in Table 3.2.

4.4 File body

OBU Production Data records shall follow directly after the header and contain the following:

- Client Number
- Name
- Address 1
- Address 2
- Post Code
- Post Office
- Country Code
- Old OBU Country Code
- Old OBU Issuer Identifier
- Old OBU Serial Number
- Licence Plate
- New OBU Country Code
- New OBU Issuer Identifier
- New OBU Serial Number
- Luhn checksum
- OBU Production Date

The full format for the record is specified in Table 4.1. The fields New OBU Country Code, New OBU Issuer Identifier, New OBU Serial Number, Luhn checksum and OBU Production Date will be blank when the file is produced by the CS.

Table 4.1 - OBU Customer Shipment File record

Field Name	Length	Data type	Description
Client Number	1-12	Numeric	A unique number identifying the client in the Central System. The Client Number may be repeated more than once in each file.
Separator	1	';'	Static text
Name	1-255	Chars	The name of the client
Separator	1	';'	Static text
Address1	0-255	Chars	The address to the client where the OBU is to be shipped
Separator	1	';'	Static text
Address2	0-255	Chars	Additional shipping address information
Separator	1	';'	Static text
Post Code	0-15	Chars	The post code for the shipping address
Separator	1	';'	Static text
Post Office	0-60	Chars	The post office for the shipping address
Separator	1	';'	Static text
Country Code	3	Numeric	The country code for the shipping address. ISO 3166-1 numeric code. For Norway this shall be 578.
Separator	1	';'	Static text
Old OBU Country Code	3	Numeric	ISO 3166-1 numeric code. For Norway this shall be 578.
Old OBU Issuer Identifier	5	Numeric	OBU Issuer Identifier for this OBU.
Old OBU Serial Number	10	Numeric	Serial number for this OBU.
Separator	1	';'	Static text
Licence Plate	0-15	Chars	The licence plate of the vehicle the new OBU is to be placed in when the customer receives it.
Separator	1	';'	Static text
New OBU Country Code	3	Numeric	ISO 3166-1 numeric code. For Norway this shall be 578.
New OBU Issuer Identifier	5	Numeric	OBU Issuer Identifier for this OBU.
New OBU Serial Number	10	Numeric	Serial number for this OBU.
Luhn checksum	1	Numeric	This is the control digit of the new OBU number calculated from all 18 digits (OBU Country Code, OBU Issuer Identifier, OBU Serial Number)
Separator	1	';'	Static text
OBU Production Date	8	YYYYMMDD	Year, Month, and Day the OBU was produced in UTC time.
Line terminator	2	"\r\n"	Windows line termination (CR + LF)

4.5 Example

The following provides an example of how the file looks like.

OBU Customer Shipment File record produced by the CS

```
H;005;03;001;20081010;00002;00008;3
//Comment that can be added
//All comments shall follow directly before
//the OBU Production Data records
//No comments can be intermingled with the OBU records
80100001;Ola Norman;Norgesveien 3;;0743;Oslo;578;578000080001000001;RH00302;;
80100001;Ola Norman;Norgesveien 3;;0743;Oslo;578;578000080001000002;RP01528;;
80100002;Kari Norman;Norgesveien 4;;0742;Oslo;578;578000080001000003;RH25794;;
```

OBU Customer Shipment File record produced by the OBU Manufacturer

```
H;005;03;001;20081010;00002;00008;3
//Comment that can be added
//All comments shall follow directly before
//the OBU Production Data records
//No comments can be intermingled with the OBU records
80100001;Ola Norman;Norgesveien 3;;0743;Oslo;578;578000080001000001;RH00302;578000080002000019;20110208
80100001;Ola Norman;Norgesveien 3;;0743;Oslo;578;578000080001000002;RP01528;578000080002000027;20110208
80100002;Kari Norman;Norgesveien 4;;0742;Oslo;578;578000080001000003;RH25794;578000080002000035;20110209
```

5. References

[1] 2 1 - AutoPASS - Terms and definitions version 3.1

[2] ISO 14816:2005 Road transport and traffic telematics -- Automatic vehicle and equipment identification -- Numbering and data structure

[3] 2.7.1 On Board Unit - Technical and physical requirements.

6. Appendix

The list of OBU Manufacturers is given in Table 6.1. The OBU Manufacturer code is in accordance with CEN ENV ISO 14816 [3].

Table 6.1 - **OBU Manufacturer** Code

OBU Manufacturer code	Description
00006	Q-free ASA
00032	Lyng Elektronikk AS
00042	Norbitech AS

Table 6.2 contains specific information about the File Type Identifier to be used in the OBU Production File.

Table 6.2 - File Type Identifier

File Type Identifier	Version number	Description
005	001	OBU Production File - Initial version

Table 6.3 contains the specific information about the File Data Type Identifier to be used in the OBU Production File

Table 6.3 - File Data Type Identifier

File Type Identifier	File Data Type Identifier	Description
005	01	OBU Production File
005	02	OBU Customer Shipment File Generated By The CS
005	03	OBU Customer Shipment File Generated By The OBU Manufacturer

Table 6.4 gives the format for the pallet number field.

Table 6.4 - Pallet number

Field part	Description
A	A shall have the value: • A=0 for the OBU Manufacturer • A=1 for Drift Operator
MMMMM	MMMMM shall have the value: • If the data is created by the OBU Manufacturer is shall contain the OBU Manufacturer code, see Table 6.1. • If the data is supplied by the Drift Operator is shall contain the Operator ID
SSSSS	Unique sequence number for the pallet. The OBU Manufacturer/Drift Operator shall never reuse the number for another shipment within the AutoPASS system.

Table 6.5 gives the format for the box number field.

Table 6.5 - Box number

Field part	Description
A	A shall have the value: • A=0 for the Manufacturer • A=1 for Drift Operator
MMMMM	MMMMM shall have the value: • If the data is created by the OBU Manufacturer is shall contain the OBU Manufacturer code, see Table 6.1. • If the data is supplied by the Drift Operator is shall contain the Operator ID
SSSSSS	Unique sequence number for the box. The OBU Manufacturer/Drift Operator shall never reuse the number for another shipment within the AutoPASS system.

To serve specific purposes the OBU's might be purchased in various colours. Table 6.6 identifies the colours and colour codes.

Table 6.6 - OBU Colour scheme

Colour	Description
grey	Standard AutoPASS OBU
yell	Yellow