Technical Note

Electronic Product Marking for ELT

Doc. Number: ESO-321432
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Modified on: 2019-06-21
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1. Scope

This technical note describes how product marking should be implemented for ELT products with special focus on optically/RF electronically readable solutions. The guidelines provided in this document apply to complete assemblies as well as to their components. The definition of the level to which components shall be marked however is not in the scope of this note and depending on the specific case. Nevertheless, in principle all components that can exist as independent entity such as Line Replaceable Units and spare parts should be marked (either directly or on their containers).

2. Product Marking for ELT

The ELT document *ESO-193324 Configuration Management and Documentation Management Process Requirements for E-ELT Contracts v3 and v4* applicable to most of the ELT contracts, defines in chapter 5.3 *Name Plates and Product Marking* how contractors of the ELT project should mark their produced items:

[R-CM-33] *Nameplates shall contain, as a minimum, the following information:*
a. Item name
b. OEM item number
c. OEM serial number (if applicable)
d. Manufacturing month and year
e. OEM company name (name of manufacturer)
f. an electronically readable code (e.g., barcode, QR code or equivalent to be defined by ESO) containing the information indicated in bullets a to e above.

This technical note addresses the bullet "f" above providing some implementation details

3. (Optically) Electronically Readable Code

An established "Data Matrix Code" standard, readable by commercial devices, should be adopted. Although the specific type/format is not constrained the following standard are encouraged:
-ISO / IEC 16022, Data Matrix barcode symbology specification
-ECC200, Standard Data Matrix type
-ISO/IEC 646, Encoding structure

In order to harmonize the electronic marking within the ELT products the information contained in the Data Matrix Code shall have the following format:

<OEM company name># <Item name>#<OEM Item number>#<OEM serial number>#<Manufacturing month and year>

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Example (an ESO internal production is considered, therefore the OEM item number matches the ELT Product Tree, though this matching is not a requirement):

Expressed as a sequence of ASCII characters (as it will appear on the reader):

"ESO#WH_Control_Module_PCB#5941210#1001#08/18"

Definition:
ESO	OEM company name
#	Delimiter
WH_Control_Module_PCB	Item name
#:	Delimiter
5941210	OEM Item number
#	Delimiter
1001	OEM serial number
#	Delimiter
08/18	Manufacturing month/year

4. RFID Tags

In case RFID Tags are foreseen (generally for custom-made Printed Circuit Boards), they should comply with the following requirements:

- Type: Passive
- Frequency range: UHF (865 – 928 MHz)
- EPC (Electronic Product Code) Memory minimum capacity: 96 bits (12bytes)
- User Memory minimum capacity: 512 bits

The following information shall be stored in the EPC memory ('0x' indicating hexadecimal representation)

<0x3><OEM company code><0xFF><OEM item number><0xFF><OEM serial number><0xFF><Manufacturing month and year>

Example (represented as a string of hexadecimal digits):

3E5FF5941210FF1001FF0818

Content (Hexadecimal)	Length (bytes)	Meaning
0x03	0.5	Code structure identifier (unique within the ELT)
0xE5	1	ESO identifier (SE will maintain the list of identifiers)

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0xFF	1	Delimiter
0x5941120	3.5	WH item number as Binary Coded Decimal (BCD
0xFF	1	Delimiter
0x1001	2	Serial number as Binary Coded Decimal
0xFF	1	Delimiter
0x08	1	Month of manufacture as Binary Coded Decimal
0x18	1	Last two digits of the year of manufacture as Binary Coded Decimal

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