Connected Vehicle Security Infrastructure

FESN Generation Specification

Version 1.0
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Revision History:

Version	Revision Date	Description of Change	Affected Sections	Author
0.1	7/12/17	Initial Draft		Dmitriy Ansolis [dansolis]
0.2	8/23/17	Added FESN prefix tables	3	Dmitriy Ansolis [dansolis]
0.3				Dmitriy Ansolis [dansolis]
0.4	10/18/17	Changed "ESN" to "FESN" Added more detail about FESN generation		Dmitriy Ansolis [dansolis]
0.5	11/21/17			Dmitriy Ansolis [dansolis]
0.6	1/21/18	Fixed typo	Intro	Dmitriy Ansolis [dansolis]
1.0	1/22/19	Published official release	No changes	Dmitriy Ansolis [dansolis]

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1 Introduction

1.1 Overview

The introduction of the SYNC infotainment system in 2006 necessitated development of security infrastructure to manage the complexities involved with software installation, code signing, telematics messages and other features/requirements. The flow of security objects involved creation of keys at the supplier site that were sent to Ford in a secure data feed. In particular, FESNs (Ford Electronic Serial Numbers) were created at supplier sites and sent to Ford. *Note: In many previously written security specifications, the FESN is referred to as ESN.*

For many new vehicle programs, the flow of security provisioning packages is being reversed (see *Key Packaging Specification* for details), and FESNs will be generated by Ford and provided to supplier sites. In addition, the format of the FESN strings has been revised. This document specifies the new FESN format.

1.2 Document Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119.

2 Generation of FESNs

2.1 Format

The following 8-character string format will be used:
   VVVXXXXX
where:

- **VVV** is a three-character fixed prefix denoting a unique Supplier/Site/Major Product combination.
  - **V** is a Base-36 character (using characters 0-9 and A-Z)
  - For reasons related to backward compatibility, the first character of the prefix will be limited to a small subset of the Base-36 character set
- **XXXXX** is a Base-36 serial number (using characters 0-9 and A-Z).
  - Using a five-character serial number, 60,466,176 units can be produced for each Supplier/Site/Major Product combination.
- All alpha characters (A,B,C… Z) will be limited to uppercase only.
- The first three characters of the FESN **(VVV)** will be assigned by Ford for each unique Supplier/Site/Major Product combination.

2.2 Source of FESNs

For modules that require provisioning of security material generated by Ford, the FESN will also be generated by Ford. The FESN will be provided as part of the security provisioning package. See *Key Packaging Specification* for more information.

For modules that do not require security material generated by Ford, the supplier will generate FESNs. Ford will assign a three-character prefix (**VVV**) and provide it to the supplier, and the supplier will generate unique five-character serial numbers (**XXXXX**).

In both cases, FESNs will follow the format described in Section 2.1.

If all 60,466,176 unique serial numbers for a particular prefix are used up, a new prefix will be assigned by Ford for the Supplier/Site/Major Product combination.

2.3 Requirements for FESN Generation

- Uniqueness: For a given prefix (**VVV**), each five-character serial number (**XXXXX**) should only be used/generated once.
- Order: The five-character serial numbers (**XXXXX**) should be generated in sequence (incremented one by one), not randomly.

2.4 End of Line (EOL) Flow

The FESN will be written to DID 0xF17F at the supplier site.

For modules that send a supplier feed to Ford, the FESN will be sent as part of the feed.
At Ford EOL (eCATs), the FESN will be read from DID 0xF17F and sent to GIVIS along with the VIN.