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Software and Network Configuration SatLink Modem Networking System		

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## 1. INTRODUCTION

### 1.1 Purpose & Scope

This technical note describes the facilities and the environment for software and network configuration of components in the SatLink Modem Networking System (SMNS), following the guidance provided in [1]. The present document applies for SatLink release 19.

### 1.2 References

- [1] FCC Guidance on Software and Network Configuration of non-SDR devices to ensure Compliance, 594280 D01 Software Configuration Control v02r01
- [2] SatLink System Description, doc 200502
- [3] ETSI EN 301545-2 DVB-RCS2 lower layers
- [4] User Guide SatLink VSAT, doc 101557
- [5] User Guide SatLink FLS, doc 200197
- [6] User Guide SatLink RLS, doc 105905
- [7] User Guide SatLink 8575 FLTx, doc 200953
- [8] Operators Guide SatLink NMS and Hub, doc 104980

## 2. SATLINK MODEM NETWORKING SYSTEM

The SatLink Modem Networking System (SMNS), described in [2], offers IP networking over satellite. A SatLink hub connects with SatLink VSATs (Very Small Aperture Terminal) over geostationary satellites. The hub is an integration of a baseband SatLink hub interconnecting with satellite frequency equipment by wire-bound conducted emission at L-band frequencies. The hub is typically hosted at a larger satellite teleport. Similarly, at user sites a SatLink VSAT is an integration of a SatLink VSAT Modem Unit (VMU) interconnecting with equipment operating at satellite frequencies through conducted emission at L-band frequencies.

The SMNS includes digitally controlled SatLink modems that are managed by the network operator with respect to generation of signal carriers that are transmitted at satellite frequencies. These signal carriers are generated with the necessary quality for satellite radio emission by block up-conversion from L-band frequencies, amplification, and radio emission to satellites.

The modems are supported by firmware upgrade with new firmware provided by the equipment manufacturer.

## 3. HUB AND HUB COMPONENTS

The baseband SatLink hub has one or several modulators that do conducted emission at L-band. Two types of such components can be used:

- SatLink 8560 FLS, modulator emitting in the frequency range 950-1750 MHz
- SatLink 8575 FLTx, modulator emitting in the frequency range 950-2200 MHz

These components are digital processing devices. There is operator access for management and control in addition to traffic interfaces. Direct management and control are described in [5] and [7]. There is discretionary operator access with differentiated access control, with hierarchical multi-level access, distinguishing between:

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- User
- Installer
- Superuser

Direct management and control of a hub unit are essentially only required at installation and upgrade. Runtime operation of a hub unit is effectuated by an authorized operator, usually via the hub console and the Network Management System (NMS), described in [8]. This includes configuration of specific frequencies to be used for satellite transmission from the hub and satellite transmission from the connected VSATs. The hub console and the NMS both have discretionary hierarchical multi-level access for authorized operators.

Firmware upgrade can be done by an operator with sufficient credentials through direct management of a unit. Such upgrade of the hub components is managed through direct support from the manufacturer.

#### 4. VSAT MODEM UNIT (VMU)

The SatLink VMU does intended conducted emission at L-band on the Tx connector and is a digital processing device. Different types of VMUs may be in use:

- SatLink 2000, emitting in the frequency range 950-1450 MHz
- SatLink 2900, emitting in the frequency range 950-1750 MHz
- SatLink 2910, emitting in the frequency range 950-1750 MHz

The VMU has differentiated access for configuration and management, distinguishing between:

- User
- Installer
- Superuser

Two types of conducted L-band emission are available with the VMU:

1. A limited period of continuous emission for VSAT power lineup at VSAT installation
2. Emission during operation of the satellite link

Type 1 emission can be turned on for a limited period by an authorized operator with at least “installer” privileges and credentials, conditioned by that the VMU is also receiving the continuous forward link satellite signal outbound from the SatLink hub. Type 2 emission is effectuated under runtime control from the SatLink hub when the VSAT has been confirmed to be correctly installed, is enabled for transmission, and is connected to the outbound satellite feed from the hub, the forward link. Otherwise, the VMU does not emit. The latter scheme is an implementation of the emission control scheme depicted in [3].

Firmware upgrade of a VMU can be done by an authorized operator having sufficient credentials, through direct management of a unit under the described access control. Upgrade is integrity protected by a cryptographic signature embedded with the new firmware to allow the operator to ensure that the new firmware is provided by the equipment manufacturer. Such upgrade may alternatively be done remotely by the network operator over-the-air, alternatively by IP multicast concurrently upgrading several VMUs receiving the multicast, as desired.