T400SG-SSE
Satellite Signal Emulator

RT LOGIC
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The RT Logic T400 Real Time Satellite Signal Emulator (T400SG-SSE) generates a high fidelity RF signal stream that precisely replicates the data channel of a satellite downlink. This provides a valuable tool for hardware-in-the-loop test and training and risk reduction for development and test of ground user equipment.

The T400SG-SSE software and firmware can be customized to replicate the data format and timing of the satellite payload. A high speed digitizer generates an RF representation of the signal that is output at an IF of 70, 266, or 1200 MHz. This signal, in turn, can be upconverted to a broad range of frequency bands (UHF, L, S, C, X, Ku). When combined with the T400CS Channel Simulator, the signal output achieves another level of realism by providing physics compliant, phase-continuous real-time carrier and Doppler shift, range delay, range attenuation, fading, and noise.

The T400SG-SSE provides a comprehensive test and training capability without the expense of dedicated satellite time and without compromising the flexibility and capability of the actual satellite RF payload. This enables developers to design and test ground user equipment against a high fidelity representation of the actual satellite. Additionally, the T400SG provides a robust, flexible, low cost training capability that can help bring new users up to speed quickly or provide refresher training for experienced users.

Product Description

The T400SG-SSE can be housed in a T400 Frequency Conversion (FC) chassis which includes RF and compact PCI (cPCI) modules controlled by a cPCI CPU running Microsoft Windows 7. The flexible plug-and-play architecture allows for a wide variety of configurations to meet specific customer needs. In the minimum, single channel configuration, the CPU controls a single high-speed digitizer that generates the satellite signal at an IF of 70, 266, or 1200 MHz. This can be upconverted, as desired, to UHF, L, S, C, X, or Ku bands with the appropriate RF upconversion modules.

A critical element of the T400SG-SSE product is the open software architecture that allows the user to customize the satellite signal format. Alternatively, RT Logic engineers can develop the signal structure as well. This f/w front end generates a digital baseband signal that drives the output of a high speed digitizer.

Key Features

The T400SG-SSE can be programmed to generate the specific data format of a satellite communications payload. Key applications include:
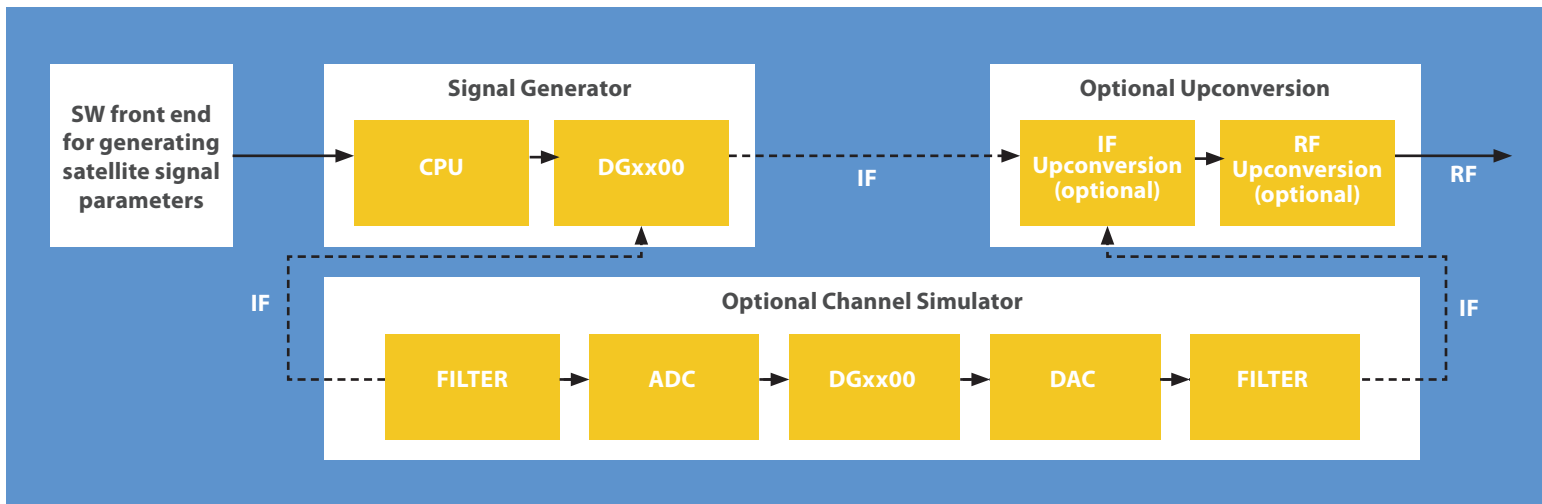
Development and test of Ground System Equipment (GSE)

✓ Allows developers of space system GSE to design and test prototype systems against a high fidelity representation of the satellite payload

✓ Serves as signal source for in-factory GSE acceptance testing or pre-launch end-to-end testing in advance of the delivered satellite system

✓ Enables developers to build custom or proprietary data interfaces using open architecture

Training

✓ 2RU form factor can easily be added to a teleport or earth station

✓ Allows high fidelity, on-site training for new users—without the expense of dedicated satellite assets

✓ Not limited to canned software simulations, trainers can program signal environment to represent any number of scenarios

SPECIFICATIONS AND FEATURES SUBJECT TO CHANGE.

Configuration Options

T400SG-SSE architecture is highly flexible and accommodates a wide range of configurations in response to customer requirements.

- Form factor: 1 RU or 2 RU depending on number of channels and required upconversion

- Signal format: customer defined, programmed by either the customer or RT Logic

- Output frequency: IF of 70, 266, or 1200 MHz; UHF; L; S; C; X; Ku

- Number of channels:

  - **85 MHz Instantaneous Bandwidth Option (RTL-T400SG-SSE-01):** Each DG5500 generates up to 8 independent channels within the 85MHz instantaneous BW; additional DG5500s can be added

  - **500 MHz Instantaneous Bandwidth Option (RTL-T400SG-SSE-02):** Each DG6000 generates up to 2 independent channels within the 500MHz instantaneous BW; additional DG6000s can be added

- Channel simulation: can add an additional DG5500 or DG6000 to replicate physics based effects

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