

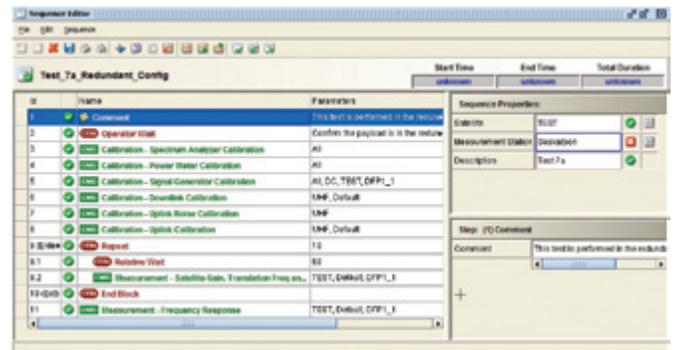
# In-orbit test systems

## Verifying payload performance

Satellite manufacturers and operators around the world have come to rely on Calian in-orbit test systems for all their needs in commissioning and testing satellite communications payloads.

Operating at UHF, L, C, X, Ku or Ka band, Calian IOTs are turnkey systems, automatically measuring and monitoring a wide range of satellite parameters, and operating continuously with a minimum of operator intervention.

Test algorithms, designed by and exclusive to Calian, yield fast and accurate measurements. Extensive use of commercial off-the-shelf hardware ensures reliability. The graphical user interface makes configuring and operating the IOT intuitive and user-friendly.

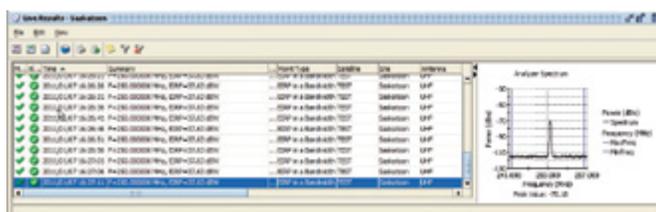
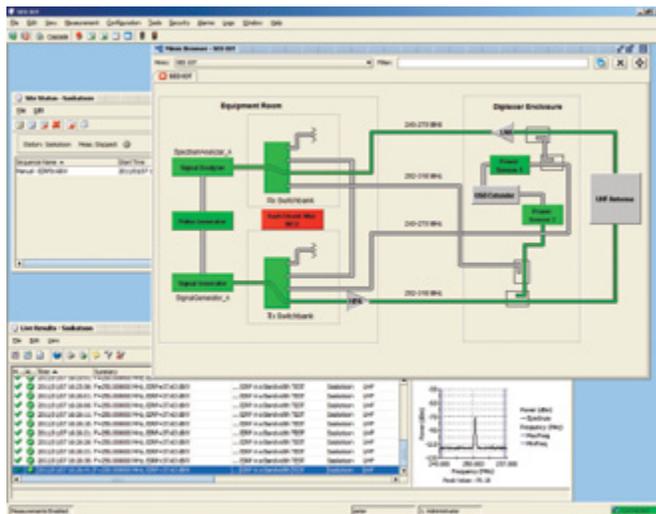


## System Overview

An operator gains access to the IOT system via the graphical user interface installed on the operator workstation. In preparation for an IOT campaign, the operator enters sequences of measurements to be performed, data on the satellites to be measured, as well as nominal calibration data.

During the campaign, the system operates in a fully automated mode, performing the measurement sequences specified. As measurements are performed, results are displayed along with the current system status. All supporting routine calibrations are fully automated. Easy-to-read measurement reports are generated in PDF format.

Our experienced and capable IOT engineers are available to provide support services to assist your testing and help ensure a successful IOT campaign.



## Measurements

IOT systems from Calian measure a broad range of parameters to confirm in-orbit performance of your payload, verify earth station functions, ensure proper system calibration, and monitor carrier and spectrum usage.

### IOT Measurements

- EIRP in a Bandwidth
- Satellite Gain & Translation Frequency (gain control, EIRP & frequency stability)
- Antenna Patterns
- Multi-Carrier EIRP & C/I
- Wideband Frequency Response
- Narrowband Frequency Response
- Beacon EIRP & Modulation Index
- Satellite G/T
- Group Delay Response
- Transponder Delay
- Spurious Outputs
- Gain Transfer Curve
- Uplink Carriers
- Satellite Phase Noise
- AM/PM Conversion and Transfer
- Third Order Intermodulation
- Noise Power Ratio (NPR)

### Spread spectrum IOT measurements

- Satellite Gain
- Frequency response\*
- Group Delay Response\*

### Earth Station Verification Measurements

- Transmit Antenna Pattern
- Transmit Antenna Gain
- Transmit Antenna Ratio
- Receive G/T

### Automated Calibrations

- Uplink Gain
- Cold Sky Noise
- Spectrum Analyzer
- Power Meter
- Downlink Gain

### CSM Measurements

- EIRP, Frequency and C/No
- Satellite Noise
- EIRP in a Bandwidth
- Spectrum Analysis (including spurious)

\*Measurements under development



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