



Cortex NuRoN

Virtualized Software Modem
For satellite Command & Control



Safran Data Systems' **Cortex NuRoN Software Modem** supports any satellite from check-out to In-orbit operations. Matching any architecture wishes, NuRoN enables virtualization and centralization of signal processing. Running on standard x86 servers, NuRoN is private or public cloud compatible and offers the utmost flexibility and scalability to ramp up with your company growth. Benefitting from the industry-standard Cortex heritage makes NuRoN the risk-free and easy to deploy Command & Control software modem.



Communication & Relay Satellites



Earth Observation Satellites

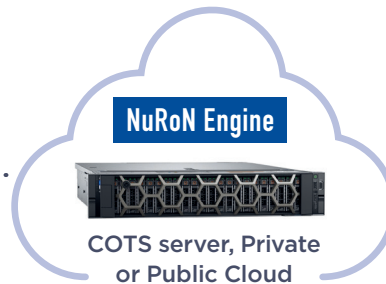


Launch Vehicle Telemetry



Digitizer

VITA-49
RF over IP
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LAN or WAN



NuRoN Engine

COTS server, Private or Public Cloud

HARDWARE AGNOSTIC

COTS Digitizer
COTS Server

LAN/WAN RESILIENT

Lossless transmission protocol
Network Bandwidth reduction

SDR-BASED SW MODEM

Multi-Mission (LEO, MEO, GEO)
Radio validation, RF compatibility,
In-orbit operations

ARCHITECTURE AGNOSTIC

Virtualized or distributed architecture
Private or Public cloud compatible

RANGING OVER WAN

Ranging over WAN capable

CORTEX HERITAGE

Cortex ICD and configuration management (CTX & MCS files)
Already compatible with most common Space Control Centers

Cortex NuRoN

PROCESSING CAPABILITIES

> DOWNLINK

Telemetry

Telemetry Channels Up to 4
 Modulation FM, PM, BPSK, (S)(O)QPSK, 8PSK, GMSK
 Demodulation Rate 1kbps to 20Mbps
 CCSDS Decoding Viterbi, Reed Solomon, Derandomization, LDPC
 Acquisition Threshold $E_b/N_0 < 0\text{dB}$
 BER Degradation $< 1\text{ dB}$ (Digitizer dependent)

NarrowBand Recorder

2 channels VITA49 Record & Replay

> UPLINK

Uplink channels Up to 2

Telecommand

Modulation PM, FM, BPSK, FSK(+HBB), BPSK+AM
 Bit Rate 10bps to 512kbps
 Advanced Capabilities CCSDS COP-1, Carrier Sweeping

Telemetry Simulation

Data Generation File, Replay, Random Data, LAN
 Modulation FM, PM, BPSK,(S)(O)QPSK, 8PSK, GMSK
 Modulation Rate Up to 1Mbps
 CCSDS Encoding Viterbi, Reed Solomon, Randomization, LDPC

> RANGING

Ranging Standard ESA-Tone/Code/Like,
 USB-Tone, INMARSAT-Tone, LMCO-Tone

> SERVER REQUIREMENTS

OS Windows 10
 Hypervisor for VM environment VMWare ESXI 6.5
 CPU 2 core at 2 GHz (for 1 Mbps demod)
 8 core at 3 GHz (for 20 Mbps demod)
 RAM 16Go
 Connectivity 1xEthernet 1/10Gbps
 Network 1/10Gbps

MISCELLANEOUS

> TOOLS

Measurements BER, E_b/N_0 , Frequency, Doppler
 Signal Retrieval Doppler Compensation, Automatic Ambiguity Resolution
 Signal Monitoring Spectrum & Constellation Display

> MONITORING & CONTROL

ICD Cortex ICD (STI 100013), RESTfull API, SLE
 Monitoring & Control Remote, Local, Web-Based GUI
 Data output TCP-IP frames, from CADU to TM packets, HDLC

> RFOIP STREAM

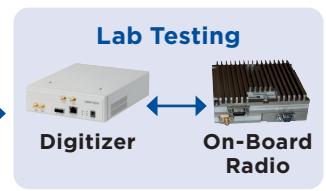
Protocol VITA49 over UDP or TCP, UHD
 IQ Quantification 4, 6, 8, 12 or 16 bits

> DIGITIZER COMPATIBILITY

SAFRAN NuRoN IO
 ETTUS N200, N210

> NuRoN REACTOR - HIGH RATE DEMODULATOR (information upon request)

Telemetry channel 1
 Modulation BPSK/(O)QPSK/8PSK
 Demodulation Rate Up to 200Mbps
 Acquisition Threshold $E_s/N_0 < 2\text{dB}$
 CCSDS Decoding Viterbi, Reed Solomon, Derandomization, LDPC
 BER Degradation $< 1\text{ dB}$ (Digitizer dependent)



Find out more how Safran digitizers enable your virtual signal processing architecture to achieve greater challenges!
 Ranging over WAN and Loss-less WAN/VPN/OS-through protocol.

GLOBAL SALES

5, Avenue des Andes - CS 90101 - 91978 Courtaboeuf Cedex - FRANCE - Tel.: +33 1 69 82 78 00 - Email: sales.sdsy@safrangroup.com

USA

3005 Business Park Dr - Norcross, GA 30071 - USA - Tel.: +1 770 753 4017 - Email: sales@SafranDataSystemsUS.com

