GomSpace Presentation

3rd UNISEC Global Meeting
GomSpace at a Glance

- A space company situated in Denmark established in 2007
- Experienced management team with background in defense, cyber and space
- Has exported space hardware to customers in more than 45 countries spanning the globe
- Focus on product design, mission design and mission implementation
- Manufacturing with network of aerospace manufacturers (AS9100C QA)
- 35+ highly qualified international staff
Who do we Serve?

• Nanosat customers in various segments:
  – Technical universities in 35 countries
  – Ambitious science groups
  – National space agencies
  – Commercial businesses (start-ups)
  – Military and national authorities

• Flight Experience
  – >25 satellites launched with GomSpace hardware on-board
  – Representing >14 countries
  – No mission failure attributed to GomSpace provided hardware
  – GOMX-1 operating successfully in space since November 2013
Example: Our GOMX-1 Mission

- 2 kg satellite launched in November 2013
- Based on GomSpace standard components
- Special designed ADS-B receiver payload
- Very successfully demonstrated global aircraft tracking
- Potential to reduce flight time, carbon emissions and to improve flight safety
What is keeping us busy in 2015?

- The GOMX-3 mission – a collaboration between GomSpace and the European Space Agency
- 3kg satellite platform:
  - New generation of GomSpace products
  - 2 degree pointing capability
- Payloads:
  - ADS-B receiver
  - L-band receiver for SATCOM signals intercept
  - X-band transmitter with 3 Mbit downlink
- Schedule:
  - Flight model delivery in June 2015
  - Launch to ISS in August 2015
  - Deployment in space in September 2015
GomSpace Products

• Power systems
  – NanoPower P31U/S
  – NanoPower BPX
  – NanoPower P110 /U solar panels incl. custom design

• Mission Control Systems
  – NanoMind AD712D

• Communication systems
  – NanoCom 482C
  – NanoCom Ant430
  – NanoCom TNC modem

• ADCS
  – Coarse ADCS SW

• Integration
  – Interstage modules
  – NanoHub

• Payloads
  – NanoCam C1U

• Software
  – CDH package
Next Generation

Faster and more resilient mission development and improved processing capabilities in smaller package

- Reduced size – room for redundant systems
- Shorter communication path between system critical modules
- More reliant tailoring to specific mission - NanoDoc board
- Series production of standard mission critical modules
- Software modularity and integrated parameter system
- Compatible with existing GomSpace key products
- Comprehensive portfolio of additional modules and payloads
NanoMind A3200

- High-performance AVR32 MCU with advanced power saving features
- Multiple CSP data interfaces: I²C, UART, (CAN-Bus)
- 32 kB FRAM for persistent configuration storage
- 32 MB SDRAM
- 8 external ADC channels that also can be used as GPIO
- Attitude stabilization system
  - 3-Axis magneto resistive sensor
  - 3-Axis gyroscope
  - 3 bidirectional PWM outputs with current measurements
  - I²C interface for GomSpace Sensor Bus (GSSB)
- New compact daughter-board form-factor
- Operational temperature: -40 C to +60 C
NanoCom AX100

- High Performance narrow-band transceiver for UHF and VHF bands
- Multiple CSP data interfaces: I²C, UART, (CAN-Bus)
- FSK/MSK/GFSK/GMSK
- Data rates from 0.5 kbps to 115.2 kbps
- Sensitivity down to –137 dBm
- RF carrier frequency programmable in 1 Hz steps
- Automatic frequency control (AFC)
- Transmitter with 30 dBm output power at > 45 % PAE
- compact daughter-board form-factor
- Operational temperature: -40 C to +60 C
NanoDock DMC-3

- Motherboard for up to 4 daughter boards
- Provision for mounting a NovAtel OEM615 GPS receiver (in place of 2 daughter boards)
- Operational temperature: -40 C to +85 C
- Dimensions: 91.9 mm x 88.7 mm x 8.6 mm
- 20-position FSI one-piece connector for daughter boards
- USB to UART console interface for easy use in lab setup
- ADCS version
  - Additional I/O for ADCS sensors and control
  - Support for reaction wheel control board
Upcoming: Software Defined Radio

• Applications
  – Advanced multi node communications systems
  – Spectrum monitoring and interference analysis
  – Signal source location

• Platform
  – Very Powerful FPGA
    • Dual ARM Cortex A9 MPCore (up to 1 GHz)
    • DSP blocks, 1 GB DDR3, up to 32GB storage
    • Linux operating system
  – Mission specific RF modules
    • Dual Band 70 MHz - 6.0 GHz
    • Tuneable channel bandwidth: <200 kHz to 56 MHz
  – Reprogrammable in orbit
NanoCom GS100

- 19” rack Ground Station with dual-radios for polarization diversity
- UHF and VHF versions available
- Internal Power Amp output 25W
- Data rates from 0.1 kbps to 115.2 kbps
- FSK/MSK/GFSK/GMSL modulation options
- Cubesat Space Protokol (CPS) and AX.25 support
- GS100L version for simplified lab testing
Contact for more information

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