

## NX-FCU

### Flight Control Unit

### Features

#### Overview

- Integrated navigation, flight control and mission management unit
- Integrated Multi-constellation GNSS and inertial sensors
- Wide range of configurable I/O (Serial, Ethernet, GPIO, PWM, CAN, ADC)
- Optional integrated LOS and BLOS communication links
- Video streaming, archiving and retrieval
- Available in Dual Redundant (with or without integrated communication links) and Compact Configurations
- Certification-ready

#### Applications

- Fixed and rotary wing UAS
- Civil and military Tactical / Mini UAS
- SWaP sensitive unmanned systems

#### Key Advantages

- Rugged and environmentally qualified design
- Small, light-weight and low power (SWaP sensitive)
- Safety critical software architecture (DO-178C)
- Highly reliable with redundancy and dissimilar hardware
- Customisable electrical and mechanical interfaces
- Very wide input voltage range
- Optional integrated redundant telemetry/C2 and video data links
- Optional integrated Iridium SatCom, GSM BLOS communication and external Inmarsat L-band SatCom

#### Environmental Qualification Standards

- Operating Temperature -40 to +71°C, MIL-STD-810G
- Storage Temperature -40 to +105°C, MIL-STD-810G
- Vibration 0.040 g2/Hz (20 to 1000 Hz), -6dB/octave (1000 to 2000 Hz)
- Shock 20 g / 11 ms (Sawtooth)
- Humidity 95% RH, MIL-STD-810G, Aggravated Cycle



### Overview

The NX-FCU is the Nano variant of S-PLANE's renowned X-FCU, a state-of-the-art navigation, flight control and mission management unit for fixed and rotary wing UAS. The NX-FCU was specifically optimised for Size, Weight and Power (SWaP), without compromising ruggedness, reliability or certifiability of the solution. The result is a highly functional yet physically compact design able to meet strict unmanned aviation regulations.

The NX-FCU is ideally suited to Tactical and Mini UAVs for both civil and military applications. Integrated navigation sensors, a wide range of highly configurable I/O and embedded LOS and BLOS communication links, provide it with the flexibility and capability of meeting almost any automation requirement. Reliability is ensured through optional redundancy, a rugged hardware design and a safety critical software architecture, making the NX-FCU the responsible choice for UAS system integrators aiming at system certification.

The NX-FCU is available in dual redundant and compact configurations. Contact S-PLANE for further information and support in selecting and configuring an NX-FCU for your system.

# NX-FCU CSMC

Redundant FCU with Integrated Comms



The NX-FCU CSMC offers a tightly integrated dual redundant navigation, flight control and mission management solution for UAS. Ideal for high-end Tactical and Mini UAS, this rugged, fault-tolerant and certification-ready unit, with dissimilar integrated comms, provides the ultimate in automation reliability in a SWaP sensitive design. C2 communication reliability is ensured through redundant LOS data links. Video streaming, archiving and retrieval is provided to round off this complete avionics solution.

### Features

- Fault tolerant, SWaP sensitive FCU for Tactical/Mini UAS
- Rugged, highly reliable and safety certifiable (RTCA DO-178/254/160)
- Dissimilar hardware with GNSS constellation redundancy
- Integrated redundant LOSCom and GSM communication
- Video streaming, archiving and retrieval
- Optional Iridium and Inmarsat data/video streaming

# NX-FCU CSC

Redundant Flight Control Unit



The NX-FCU CSC offers the ideal navigation, flight control and mission management solution for Tactical and high-end Mini UAS. Rugged, reliable and certification-ready, this highly functional unit provides unparalleled performance in a SWaP sensitive design. With integrated sensors, a wide range of highly configurable I/O, and dual redundancy the nxFCU has both the flexibility and capability of meeting almost any automation requirement.

### Features

- Full-envelope fixed and rotary wing navigation and flight control
- Rugged, reliable, SWaP sensitive and certification-ready (RTCA DO-178/254/160)
- Redundant flight control, integrated GNSS (multi-constellation), and inertial sensors
- Configurable I/O (Serial, Ethernet, GPIO, PWM, CAN, ADC)
- External LOSCom, GSM, Iridium and Inmarsat data/video streaming
- Ideal for civil/military Tactical and high-end Mini UAS

# NX-FCU Compact

Compact Flight Control Unit



The NX-FCU Compact was developed in response to increased safety requirements for airspace integration of Mini UAS. Rugged, reliable and safety certifiable, this unit draws from the hardware and software building blocks of the nxFCU to provide a responsible and highly functional automation solution for small SWaP sensitive systems. Integrated LOS and GSM data links complete the design, providing for redundant telemetry/C2 communication and real-time video streaming.

### Features

- SWaP sensitive FCU ideal for safety-critical civil/military Mini UAS
- Rugged, highly reliable and safety certifiable (RTCA DO-178/254/160)
- Integrated sensors, configurable I/O and integrated servo power
- LOS data links for telemetry/C2 and video streaming

# NX-FCU

Technical Specifications

	NX-FCU CSMC	NX-FCU CSC	NX-FCU Compact
<b>GENERAL</b>			
Navigation	GNSS/AD-Aided INS (EKF)	GNSS/AD-Aided INS (EKF)	GNSS/AD-Aided INS (EKF)
Control	Fixed & Rotary Wing	Fixed & Rotary Wing	Fixed & Rotary Wing
Mission	Waypoints, Loiter, Follow	Waypoints, Loiter, Follow	Waypoints, Loiter, Follow
Health Monitoring	PBIT, CBIT, IBIT	PBIT, CBIT, IBIT	PBIT, CBIT, IBIT
Redundancy	Dual Redundant	Dual Redundant	Optional Pairing
Certification	DO-178C SW Certifiable	DO-178C SW Certifiable	DO-178C SW Certifiable
<b>SENSORS</b>			
GNSS Receiver	Redundant	Redundant	Yes
GNSS Accuracy (Differential)	< 2 cm	< 2 cm	< 20 cm
GPS & GLONASS Tracking	Yes	Yes	Yes
GALILEO & BEIDOU Tracking	Yes	Yes	No
IMU & Magnetometer	Redundant MEMS	Redundant MEMS	MEMS
Air-Data	150 KIAS, 18 kft	150 KIAS, 18 kft	150 KIAS, 18 kft
<b>INPUT / OUTPUT*</b>			
Serial (RS-422/485/232)	16x	16x	5x
GPO / PWM	16x	16x	12x
GPI / Input Capture	16x	16x	12x
Ethernet	2x Gigabit	2x Gigabit	1x Gigabit
CAN	1x 1Mbps	1x 1Mbps	1x 1Mbps
ADC	4x 16 Bit	4x 16 Bit	4x 16 Bit
<b>TELEMETRY / C2</b>			
Frequencies	~400, 900 or 2400 MHz	N/A	~400, 900 or 2400 MHz
Data Rate	< 230 kbps	N/A	< 230 kbps
LOS Range	50km to 100km	N/A	50km to 100km
Redundancy	Dual LOS Links	N/A	Single LOS Link
GSM (HSPA+)	Optional	N/A	Yes
Iridium Satellite	Optional	N/A	No
WLAN (802.11 b/g)	Optional	N/A	No
<b>VIDEO STREAMING</b>			
Video Input	2x Ethernet	N/A	2x Ethernet
Streaming Frequency	S/C-Band	N/A	S/C-Band
Streaming Data Rate	< 12 Mbps	N/A	< 12 Mbps
Streaming Range	50km to 100km	N/A	50km to 100km
Data Storage	64 GB	N/A	16 GB
<b>MECHANICAL &amp; ELECTRICAL</b>			
Dimensions	100H x 128W x 122D mm	79H x 128W x 122D mm	58H x 128W x 122D mm
Mass	1 360 g	1 090 g	530 g
Input Voltage	6 to 36 VDC	6 to 36 VDC	6 to 36 VDC
Power (Typical)	35 W	20 W	15 W
Regulated Servo Power	External	External	25 W Continuous
<b>ENVIRONMENTAL</b>			
Operating Temperature	-40 to +71°C	-40 to +71°C	-40 to +55°C
Storage Temperature	-40 to +105°C	-40 to +105°C	-40 to +105°C
Vibration & Shock	MIL-STD-810G	MIL-STD-810G	MIL-STD-810G

\*Number of ports indicated is maximum and depends on overall configuration. Specifications subject to change without notice.

# NX-SERIES

## UAS Subsystems



S-PLANE's X-SERIES represents the state-of-the-art in avionics and automation solutions for UAS. The NX-SERIES is the Nano extension of this product family catering for small-form-factor, SWaP sensitive systems. Reliability, functionality, flexibility and certifiability are all key design elements carried across to the NX-SERIES architecture. The result is a set of subsystems able to accommodate the strict physical and electrical requirements of SWaP sensitive systems, while continuing to provide the latest in technology and functionality, responsibly and reliably. NX-FCUs are supplied as complete FCUs or as FCU hardware with Board Support Packages (for PikeOS and Real-time Linux).



### Contact Details

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