天空飛車
Sky VTOL

INNOVATE / COOPERATION / WIN-WIN

PRODUCT BROCHURE

Shenzhen SkyeVTOL Intelligent Technologies Co., Ltd.

www.skyevtol.com

Company Introduction

Shenzhen SkyeVTOL Intelligent Technology Co., Ltd. is an innovative technology enterprise dedicated to the **design, R&D, and manufacturing of aircraft**, as well as the development of low-altitude integrated application platforms. Headquartered in **Shenzhen, China**, the company integrates expertise in aircraft design, intelligent control, electric propulsion systems, and low-altitude operations to drive independent innovation and system integration.

SkyeVTOL is committed to **democratising flight** by providing safe, efficient, and intelligent low-altitude travel solutions. The company's core technological foundation lies in its advanced avionics and proprietary **Simplified Vehicle Operations (SVO) systems**.

Core Product Portfolio

The company’s offerings span from high-performance components to manned electric Vertical Take-Off and Landing (eVTOL) aircraft:

- **Manned eVTOL Aircraft:**
- **"David":** A single-seat, all-electric manned aircraft featuring an all-aluminum airframe and multi-redundancy electric propulsion. It is designed for high safety, low noise, and zero emissions, catering to urban operations, emergency logistics, an d personal short-haul travel.
- **"Little Helmsman" (Tour Cab):** A compact, ultra-light manned eVTOL engineered for scenic roaming. It features an **amphibious pontoon system** for water-surface stability and a smart touchscreen interface with proprietary avionics.
- **Industrial Flight Controllers:**
- SkyeVTOL is a leader in developing **industrial-grade UAV flight control systems**.

- The **FC1128** series offers high-end intelligent control with aerospace-grade sensor integration and triple IMU redundancy for mission-critical reliability.
- The **FC1129** series incorporates an advanced redundancy architecture featuring dual processors, quadruple IMUs, and multiple backup systems for satellite reception and data links.
- The **FC1129 3x** establishes a new industry benchmark by providing a **triple-redundant architecture** designed to protect high-value payloads and ensure continuous operation even in the event of component failure.

Integrated Solutions and Vision

Beyond hardware, the **SkyeVTOL Low-Altitude Integrated Application Platform** leverages cutting-edge technologies like **digital twins**, flight management, and dispatching control. This platform provides complete solutions for "low-altitude +" scenarios, including tourism, urban transportation, and emergency response, empowering the high-quality development of the low-altitude economy. SkyeVTOL continues to contribute to a safe and intelligent global low-altitude airspace operation system.

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David eVTOL Aircraft

The **David** is a single-seat electric vertical take-off and landing aircraft built on an all-aluminum airframe with advanced multi-redundancy electric propulsion. Designed for personal short-haul air travel, urban aerial operations, and emergency logistics, David combines zero-emission flight with autonomous route capability and a compact footprint compatible with urban environments.

Technical Specifications:

Max Takeoff Weight 200 kg	**Payload** 85 kg	**Max Speed** 80 km/h
Range (Unloaded) 30 km	**Hover Time** ≥15 min (full load)	

Airframe

- 6063-T5 aluminum alloy frame
- Tensile strength ≥ 288 MPa
- Yield strength ≥ 260 MPa
- Design life ≥ 2,000 flight hours
- Anodized anti-corrosion finish
- Modular fuselage / wing / power units

Key Dimensions

Parameter	Value
Fuselage Length	3,500 mm
Axle Spread	2,600 mm
Height	1,400 mm
Cabin Interior Width	650 mm
Cabin Interior Height	900 mm

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David eVTOL Aircraft

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Propulsion System

Motor: 8× brushless inductive, 5.544 kW each, ~85% efficiency, 0–3,404 RPM, air + conductor cooling

Battery: Lithium-ion, 91.2 V nominal, 4,012.8 Wh total, 22.5 kg, max discharge 300 A, ≥800 cycles @ 80% capacity retention

Redundancy: 80% power margin; automatic torque redistribution on single motor failure

Flight Performance

Parameter	Value
Economy cruise speed	≥ 30 km/h
Max level flight speed	80 km/h
Max climb rate	5 m/s
Max descent rate	3 m/s
Max flight altitude	1,000 m ASL
Max pitch / roll angle	15°
Max yaw rate	15°/s

Flight Control Computer — FC1129

- ARM Cortex-M7 @ 600 MHz | 1 MB RAM | 2 MB Flash + SD up to 32 GB
- 16-ch PWM output (50–400 Hz), 4× UART, 2× CAN bus, Bluetooth 5.0
- 10 Hz position / attitude / speed output; data link range 30 km (LOS)
- Remote firmware upgrade via SD or network; onboard FDIR diagnostics

Navigation & Communications

Technology	Specification
GPS / BeiDou dual-mode	≤ 1 m accuracy (open sky)
RTK differential	≤ 0.5 m (base station / network)
Position update rate	10 Hz (configurable)
Attitude accuracy	± 0.5° pitch / roll
IMU gyroscope drift	≤ 0.1°/h
IMU accelerometer	≤ 0.01 m/s²
2.4 GHz data link	20–30 km LOS range
4G cellular module	Backup telemetry

Battery Management System (BMS)

- SOC estimation error ≤ 10%; auto-balance charging at 70 mA
- Temperature sensors (NTC): −20 °C to +70 °C, ±3 °C accuracy, 10 Hz sampling
- Warning range: −12 °C to −10 °C or 55 °C to 60 °C (power limited)
- Shutdown range: below −20 °C or above 70 °C (automatic alarm + cutoff)
- CAN bus real-time telemetry to flight control computer

Application Scenarios: Personal short commutes (15–30 km) · Emergency medical logistics · Urban aerial patrol · Recreational and enthusiast flight · Aviation R&D and education platforms

Fault-Tolerant & Redundancy Architecture

Power Failure
Coaxial dual-rotor hardware redundancy + dynamic flight control compensation → controlled safe landing

Sensor Failure
Redundant sensor fusion; multi-source data cross-validation eliminates single-point errors

GPS Loss
Inertial navigation maintains short-term positioning; serious failure → hover and await operator instruction

FCC Failure
Primary → backup processor handover; dual failure → emergency slow-descent landing system activates

Battery Module Failure
Automatic isolation of faulty cell; remaining modules maintain flight; serious failure → emergency land

Fail-Safe Response Matrix

Fault Level	Automatic Response
Minor	Warning issued; flight envelope limited; return recommended
Moderate	Auto return-to-home; fly to nearest safe landing site
Serious	Emergency landing + emergency protection system
Catastrophic	Full emergency descent + parachute activation

Cockpit & Ground Station

- 12-inch touchscreen + manual joystick dual-mode operation
- Real-time altitude, speed, battery, attitude, and temperature display
- Color-coded priority warning and alert system
- Emergency power-off switch, manual parachute release, aviation-grade multi-point seat belts
- Windows-based ground station: map route planning, autonomous mission upload, manual/auto flight control

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Little Helmsman eVTOL Aircraft

Low-Altitude Roaming · Your Sky Awaits

The Little Helmsman is a single-seat ultra-light manned eVTOL independently developed by Shenzhen SkyeVTOL Intelligent Technology Co., Ltd. Engineered for low-altitude urban and scenic applications, it integrates advanced avionics, multi-mode control, and amphibious capability into a compact, lightweight airframe. Designed for accessibility and safety, it democratizes personal aviation for tourism, education, and recreational markets.

Key Specifications

Max Takeoff Weight	277 kg
Empty Weight	105 kg
Max Payload	80 kg
Max Speed	30 km/h
Wind Resistance	Level 5
Endurance	20 min
Max Altitude	200 m
Dimensions (m)	3.0 × 3.4 × 2.3

Control Modes

- Ground remote control
- Onboard joystick
- Automated flight route

Applications

- Aerial sightseeing & tourism
- Entertainment & experience rides
- Education & research

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Little Helmsman eVTOL Aircraft

FEATURE 01

Proprietary Avionics + Smart Touchscreen

Integrated smart touchscreen with unified UI — intuitive, information-rich, easy to operate

In-house avionics with GPS/BeiDou + RTK dual-system positioning — zero-latency control, high-precision situational awareness

Real-time status monitoring with one-touch anomaly alerting for all-round flight safety

FEATURE 02

Lightweight Pontoon System — Amphibious & Redundant

Four-pontoon design provides robust buoyancy, enabling stable hover and takeoff/landing on water surfaces

Emergency ditching stability — maintains level attitude to prevent capsizing or sinking

Minimal weight impact — streamlined, visually distinctive design balances practicality with aesthetics

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FC1128: Intelligent Flight Controller

Industrial-Grade Performance and Precision

The FC1128 is a high-end intelligent controller specifically developed for industry and industrial-grade unmanned systems. Engineered to provide exceptional stability and anti-interference capabilities even in complex, mission-critical environments, it integrates aerospace-grade sensors with a powerful processing core to deliver uncompromising reliability.

Core Technical Specifications

Specification	Value	Operational Benefit
Processor	S T M 3 2 H 7 4 3 (480MHz)	High-speed multi-threaded flight stacks and real-time double-precision floating-point operations.
Sensor Redundancy	Triple IMU Sets	Intelligent fault monitoring and immediate, transparent switching in case of sensor anomaly.
Barometers	Dual MS5611	Redundant altitude estimation and enhanced reliability in turbulent aerodynamic environments.
Operating Temperature	−20°C to 85°C	Stable performance across extreme thermal gradients and harsh industrial climates.
Primary IMU	ADIS16470	Automotive-grade reliability with aerospace-level drift performance for high-accuracy navigation.
Weight	101g	Optimized for industrial airframes with integrated internal vibration isolation.

480MHz
Processor Speed
Cortex-M7 core

3x
IMU Redundancy
Fault-tolerant sensing

101g
Total Weight
Industrial airframe ready

-20°C
Min. Operating Temp
Up to +85°C range

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FC1128: Intelligent Flight Controller

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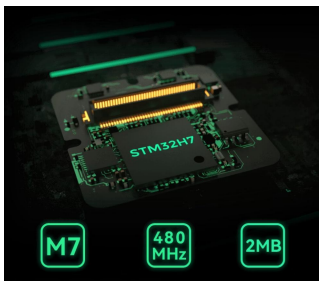

At the heart of the FC1128 is the STM32H743 processor and aerospace-grade sensor integration — engineered for mission-critical performance across demanding industrial and commercial unmanned systems.

Unrivaled Processing Power

- **Speed:** Cortex-M7 core at up to 480MHz for real-time computation.
- **Efficiency:** Double-precision FPU support; 2× better dynamic power efficiency vs. prior gen.
- **Memory:** 2MB Flash + 1MB RAM for demanding flight computing workloads.

Flexible & Modular Connectivity

- **I/O:** 14 PWM outputs (12 supporting DShot), 6 I2C buses, 2 CAN bus ports.
- **Power:** Triple redundant supply — Power A, Power C, and USB.
- **Protocol:** DroneCAN support with proprietary ITT algorithm for real-time voltage/current sensing.
- **Software:** ArduPilot, PX4, QGroundControl, Mission Planner compatible.

Triple Redundancy & Aerospace Sensors

ADIS16470

Automotive-grade IMU. Aerospace-level drift for precise dead-reckoning navigation.

ICM-42688-P

40% noise reduction; 2× temperature stability vs. consumer-grade IMUs.

RM3100

Industrial magnetometer with superior anti-magnetic interference capability.

Harsh Environment Engineering

Patented Shock Absorption

New-generation internal vibration damping adapts to harsh operating conditions.

Temperature Compensation

High-precision built-in system keeps sensors at constant operating temperature across extreme climates.

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FC1129: Powerful Flight Controller

The FC1129 is an advanced flight control and avionics system designed to provide a powerful and reliable foundation for a wide range of unmanned platforms. It supports diverse configurations, including Multi-Rotor, Quad Plane, Tilt Wing, Fixed Wing, Unmanned Vehicles, and Unmanned Surface Vehicles (USV).

PNP Version

PRO Version

Technical Specifications:

Feature	FC1129 PNP Version	FC1129 PRO Version
Positioning	Centimeter-level	Centimeter-level (RTK/PPK)
Data Link	20KM Range	20KM Range
Interconnect	Easy-plug / Quick install	J30J Interface
I/O Density	Standard	19x PWM, 6x Serial, 3x CAN
Special Features	Standard GNC	Pods & Obstacle Avoidance
Weight	286g	286g
Chassis	107 x 57 x 40mm	107 x 57 x 40mm

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FC1129: Powerful Flight Controller

Advanced Redundancy System: Safety is a core component of the FC1129 architecture, featuring a reliable redundancy system to ensure continuous operation in the event of component failure.

Processors

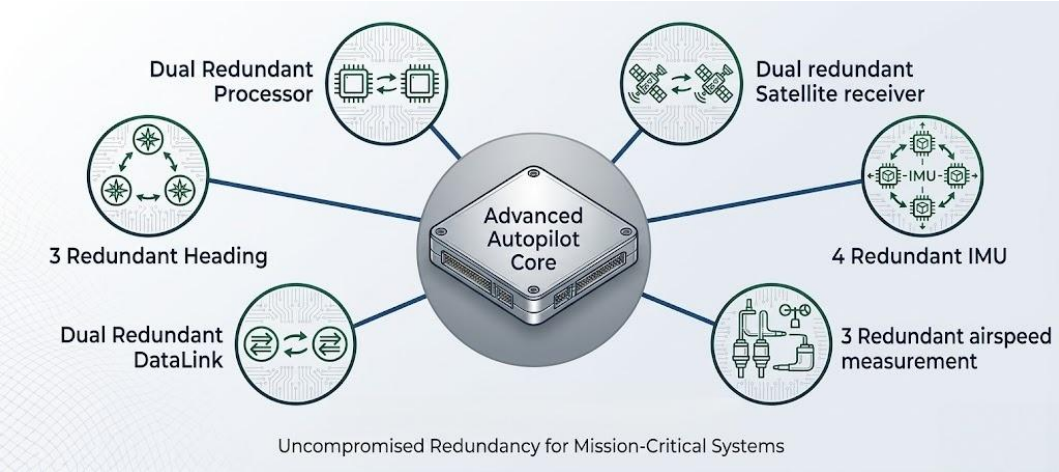
Powered by dual processors with a capacity of **1440 DMIPS**.

Sensors

Includes **four redundant IMUs**, triple redundant heading systems, and triple redundant airspeed measurements.

Connectivity

Features **dual redundant satellite receivers** and dual redundant data links.



Electrical and Environmental Protection: The FC1129 is engineered to thrive in extreme conditions and complex electrical environments.

Thermal Management

Operates between **-40°C and 75°C**. It features an automatic preheating system for cold starts and graphite mixed heat dissipation for high-temperature stability.

Electrical Isolation

Implements full power and signal isolation for actuators, meeting **EN62368 world product safety standards** to prevent signal interference from ground loops.

Wide Voltage Input

Supports a power supply range of **12V to 53V** with multiple protection mechanisms against short circuits and overcurrent.

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FC1129 3x: Three Redundant Flight Control System

System Overview

The triple redundancy system provides essential reliability for flight control in autonomous vehicles performing sensitive tasks and transporting high-value payloads. The redundant architecture consists of three flight control units with equivalent functionality. If one system fails, the remaining two assume control in dual-redundancy mode. If a second system fails, the surviving unit takes over the full mission. An additional monitoring mechanism continuously supervises all three systems, ensuring highly fault-tolerant operation throughout the entire architecture.

Platform Support

- Fixed-wing aircraft and helicopters capable of flight
- Multiple communication links for airborne equipment (cameras, transponders)
- Redundant data link between ground stations
- Synchronized configuration, status, and waypoints across all three controllers

Hardware I/O

Serial Ports

11 ports including RS232 & RS485

Servo Signals

16 independently generated signals

High-Current Drivers

8 independently controlled drivers

Key Specifications

Servo Channels	16 ch, 11-bit
Refresh Rates	30/ 60/180 Hz
Max Altitude	12,000 m
Accelerometer	3-axis, 5g max
Angular Velocity	250°/s max
Kalman Filter	15th-order

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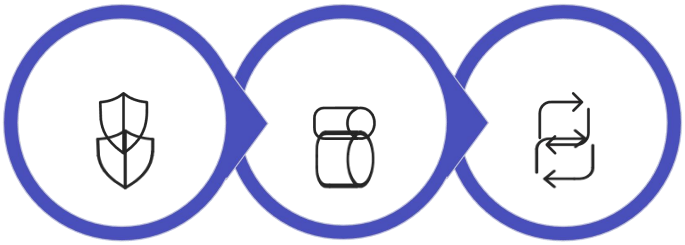
FC1129 3x: Three Redundant Flight Control System

High Reliability Measures

The FC1129 3x integrates three flight controllers on a shared interface board alongside additional redundant components: multi-communication links, independent high-current drives, 16 independently generated servo signals, and two separate GPS systems. This layered approach to redundancy goes beyond the three flight control units themselves, providing comprehensive fault tolerance at the hardware, communication, and navigation levels.

While triple redundancy is established in manned aviation, it represents a novel benchmark in the commercial drone sector. SkyeVTOL is a leading manufacturer of industrial-grade UAV flight control systems and has developed a reference standard for triple redundant UAV flight control design.

Failover Sequence



Primary Control | **Secondary FC1129** | **Tertiary FC1129**

Navigation (NAVAR)

Distributed Gain: Selectable based on inner loop update rate for optimal performance
Autonomous Takeoff & Landing: Altimeter-assisted with user-defined PID loops
User-Defined Mapping Tables: High-current solid-state relay output supported

Multiple Communication Links

The FC1129 3x serves as a communication hub, supporting dual radio installation to establish two independent flight control–ground station data links. PTZ cameras and aircraft transponders can be directly connected to the flight control system.

The redundant data link ensures operators can monitor and control aircraft and critical onboard equipment even when a communication link fails. During flight control switching events, the FC1129 3x automatically reconfigures communication links, guaranteeing continuous ground control visibility throughout operations.

Servo & I/O Architecture

Servo Signals
16 independently generated servo signals managed through the redundant board — continuous reliable control during FC switching events

I/O Ports
Multiple I/O ports plus two RS232 serial ports for ground control communication via radio transmitters

Protective Casing
Ruggedized enclosure safeguards the complete redundant assembly against vibration and environmental exposure

Supported Servo Configurations

- Elevating ailerons & flaps; 4 servo-controlled flaps/ailerons; separated flaps
- Forked flaps/ailerons; Y-shaped, X-shaped tail fin; split rudder; differential thrust
- 3-servo mechanical; 3/4-servo 90° pitch hybrid; 3-servo 120° pitch hybrid; 4-servo 4-axis pitch hybrid

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