

HEAVY-LIFT PRECISION PLATFORM — TECHNICAL PROPOSAL

SUPRATIKA H13

A 100 kg-payload multirotor built around the payload, not around the airframe.

Supratika H13 is a coaxial quad-X heavy-lift platform built on the RX100 airframe, designed and manufactured in-house. Eight rotors across four axes give an installed thrust of 452 kg against a 222 kg all-up weight with a full 100 kg payload, so the aircraft hovers at roughly half of its capability rather than at the edge of it. Because the airframe is our own, the geometry, mounting interfaces and the load path to the payload are all ours to set — which is what makes it possible to configure the platform around a specific instrument instead of asking the instrument to tolerate a generic drone.



Supratika H13 in flight, instrument payload carried inside the protective cage on the aircraft centreline.

AT A GLANCE

222 kg	100 kg	~18 min	11 km	20 km	452 kg
ALL-UP WEIGHT	MISSION PAYLOAD	ENDURANCE	OPERATIONAL RANGE	CONTROL LINK	INSTALLED THRUST

WHY THIS CONFIGURATION

Thrust in reserve

452 kg installed against a 222 kg loaded weight. Gusts and a failed rotor are absorbed by margin rather than by luck.

Coaxial redundancy

Losing one motor of eight leaves the paired rotor on that axis producing lift. The aircraft degrades rather than departs.

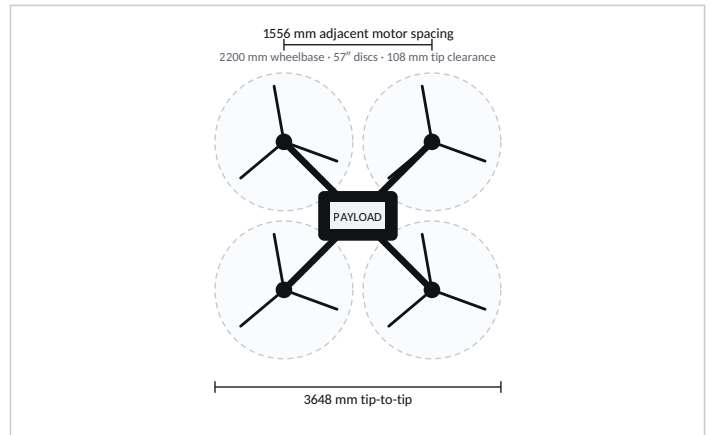
High-voltage bus

24S / 92 V draws 370 A fully loaded where a 14S system would need over 600 A. Lighter harness, cooler connectors.

AIRFRAME — RX100



RX100 airframe — folding carbon arms on a machined aluminium centre section, dual modular battery bays and cross-braced landing gear.



Plan geometry. Rotor discs at full 57" diameter; the wheelbase is set by tip clearance rather than by structure.

RX100 STRUCTURE

Layout	X-quad, coaxial (4 axes / 8 rotors)
Wheelbase	2200 mm motor-to-motor
Span, tip-to-tip	3648 mm
Arms	T700 carbon fibre tube, foldable
Centre structure	6061-T6 CNC-milled plate

RX100 QUALIFICATION

Frame mass	45–55 kg by configuration
Static payload capacity	100 kg, load tested
Safety factor	≥ 2.5 at rated load
Tip deflection under load	< 4 mm (FEA)
Damping	Rubber isolators and cross-frame dampers

SCALE AND ARRANGEMENT



Supratika H13 against a 1.8 m figure. Overall span 3648 mm tip-to-tip; the aircraft transports with the arms folded.

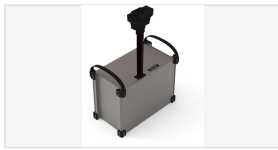


Front elevation. The payload sits on the centreline between the landing gear, below the rotor plane and inboard of the downwash-loaded structure.

SYSTEM COMPOSITION



H13MD Coaxial
13825-37KV + H150A-FOC, ×4 axes



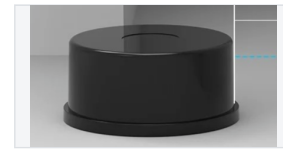
24S 70 Ah Pack
6048 Wh × 2



V6X Autopilot
STM32H753, triple IMU, dual baro



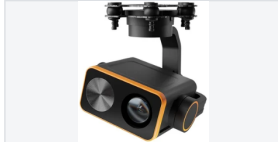
mosaic-H GNSS
Dual-antenna heading, RTK



360° LiDAR
Obstacle detection, 0.05–30 m



G20 Ground Station
Dual-band, 20 km operational link



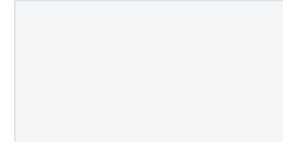
C20 Gimbal
22× zoom, three-axis, 1080p



UP2000-24S
2000 W intelligent charger



RX100 Airframe
In-house carbon / 6061-T6 structure



Payload Interface
Isolated mount, configured to sensor

SPECIFICATION

PROPULSION		AVIONICS & NAVIGATION	
System	H13MD coaxial integrated, 4 axes	Autopilot	V6X, STM32H753 @ 480 MHz
Motor	13825-37KV, 36N42P, Ø147.9 mm	Coprocessor	Cortex-M3, independent bus and supply
ESC	H150A-FOC, 60 A cont. / 150 A peak	Redundancy	Triple IMU, dual barometer, RM3100 magnetometer
Throttle	PWM + CAN dual redundant (UAVCAN)	Interfaces	8× UART, 16× PWM, 2× CAN, 100M Ethernet
Propellers	MSC 57×20 carbon fibre, non-folding	GNSS	mosaic-H dual-antenna, RTK capable
Rated thrust	45 kg per axis / 180 kg total	Heading	GNSS baseline — immune to magnetic disturbance
Maximum thrust	113 kg per axis / 452 kg total	Interference rejection	Anti-jamming, anti-spoofing
Efficiency	7.2 g/W at rated take-off weight	Obstacle detection	360° scanning LiDAR, 0.05–30 m, IP65
Operating temperature	−40 °C to +65 °C	Altimetry	Laser rangefinder, terrain-referenced landing
Ingress protection	IP35	Recovery	Failsafe, return-to-home, ballistic parachute
ENERGY		COMMAND, CONTROL & PAYLOAD	
Battery	24S 70,000 mAh lithium pack × 2	Ground station	G20, 7" 1920×1200, Android 13
Nominal voltage	86.4 V	Datalink	2.4 / 5.8 GHz dual-band, auto-switching
Installed energy	12,096 Wh	Control link range	20 km operational LOS (30 km rated)
Bus architecture	Dual input, current-balanced	Video link range	30 km rated, line of sight
Charger	UP2000-24S intelligent, 16–24S	Air unit	16 channel, SBUS + PWM + Ethernet
Charge power	2000 W	Observation gimbal	C20 three-axis, 22× optical zoom, 1080p
Recharge, both packs	~6.7 h single charger / ~3.4 h dual	Payload interface	Isolated mount, regulated 24 V / 12 V rails

MASS AND PERFORMANCE

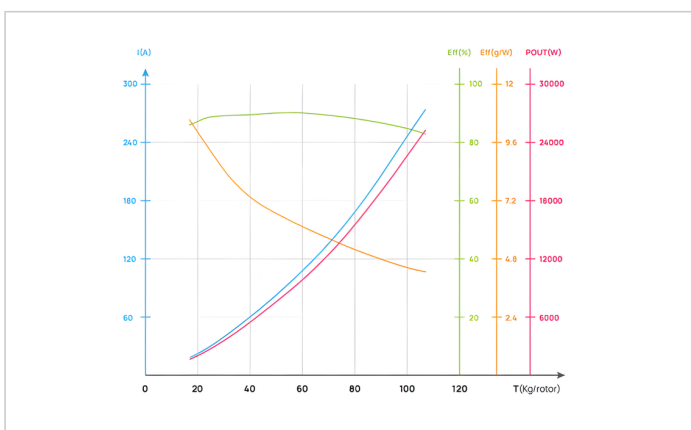
MASS BUDGET		FLIGHT PERFORMANCE	
Propulsion, 4 coaxial axes	32.0 kg	Hover power at 100 kg payload	34.0 kW at 222.5 kg
RX100 airframe	40.0 kg	Bus current	370 A total / 46 A per ESC
Battery, 2 × 24S 70 Ah	45.0 kg	ESC utilisation	77% of 60 A continuous rating
Avionics, harness, distribution	5.5 kg	Propulsion continuous limit	266 kg AUW / 143 kg payload
Empty, ready to fly	122.5 kg	Endurance at 100 kg payload	~18 min, 15% energy reserve
Mission payload	100.0 kg	Endurance at 25 kg payload	~33 min
All-up weight	222.5 kg	Cruise speed	10 m/s

PAYLOAD AND ENDURANCE

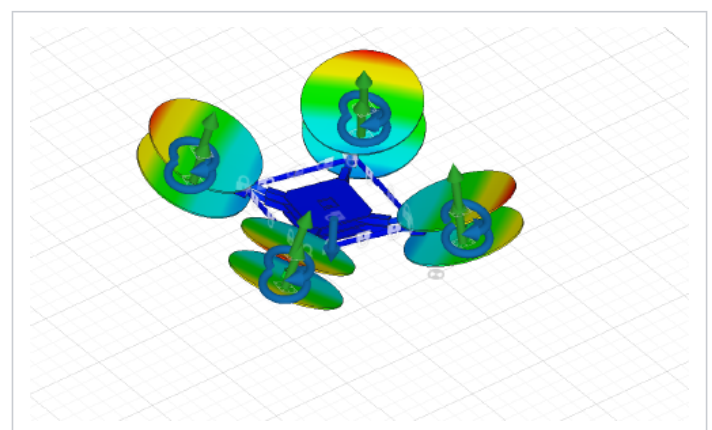
Mission payload	All-up weight	Hover power	Per ESC	Endurance	Range	Note
0 kg	122 kg	13.8 kW	19 A	~44 min	27 km	
25 kg	147 kg	18.5 kW	25 A	~33 min	20 km	
50 kg	172 kg	23.5 kW	32 A	~26 min	16 km	
75 kg	197 kg	28.7 kW	39 A	~21 min	13 km	
100 kg	222 kg	34.0 kW	46 A	~18 min	11 km	Reference configuration
125 kg	247 kg	39.7 kW	54 A	~16 min	9 km	
143 kg	266 kg	44.1 kW	60 A	~14 min	8 km	Propulsion continuous limit

Interpolated from the manufacturer's measured MSC 57×20 coaxial load table at 92 V, against a 122.5 kg empty mass and 12,096 Wh installed energy held to a 15% reserve. Endurance at the 100 kg reference payload rises to approximately 21 minutes if the packs are flown to full depth of discharge, which is how the manufacturer's own 20-minute figure is reached; we quote the reserved figure. Range is one-way at 10 m/s cruise — a return sortie halves it. Two limits apply: the RX100 airframe is presently qualified to a 180 kg take-off weight and requires re-qualification above it, and the propulsion system reaches its 60 A per-ESC continuous rating at 266 kg.

ANALYSIS



Coaxial load performance at 92 V — current, output power and efficiency against thrust per rotor. Laboratory measured at sea level and 25 °C. The 45 kg rated operating point sits in the high-efficiency region, well below the 113 kg peak.



Structural and rotor-load analysis of the airframe under hover loading, used to size the arm sections and set the centre-section joint pattern. Tip deflection under rated load is held below 4 mm.

MISSION FIT

Airborne survey and instrument carriage	Defence payload transport	Industrial and infrastructure monitoring	Emergency logistics
Instrumented flight test			



SYSTEM PRICING — ONE COMPLETE AIRCRAFT

Group	Scope	Amount (INR)
RX100 airframe	In-house structure — T700 carbon arms, machined centre section, folding hardware, landing gear, payload bay	3,50,000
Propulsion	H13MD coaxial system × 4 axes with MSC 57×20 carbon fibre propeller sets	7,06,220
Energy	24S 70,000 mAh lithium packs × 2 and UP2000-24S intelligent charger	6,92,133
Power system	Distribution board, DC-DC conversion, pre-charge and isolation, protection, harness	1,75,000
Avionics	V6X autopilot, mosaic-H dual-antenna GNSS, 360° LiDAR, laser altimetry	2,20,548
Command & payload	G20 ground station and air unit, C20 observation gimbal, isolated payload interface	2,29,170
Safety	Ballistic recovery system, anti-collision lighting, independent flight termination	3,56,000
Integration	Assembly, wiring, configuration, ground runs and acceptance flight testing	2,50,000
SYSTEM TOTAL, ONE AIRCRAFT		29,79,071

Ex-works Vadodara. Excludes GST, freight, insurance, type certification and payload-specific development. Imported content is priced at prevailing landed cost and is subject to exchange rate and customs duty at the time of order.

OPTIONS

Option	Scope	Amount (INR)
Second battery set	24S 70,000 mAh × 2 for continuous-operations turnaround	7,12,397
Ground support package	Second charger, transport cases, transit trailer, spare propeller sets	2,55,984
RTK base station	Local correction source for centimetre absolute positioning	80,000
Onboard compute	Edge processing for detection, tracking or payload data reduction	45,000
Extended support	Operator training, on-site commissioning, annual maintenance	on application

INDIGENISATION

UP TO 60% INDIGENOUS CONTENT ON REQUEST

Indigenous content of up to **60%** can be delivered on request, covering the RX100 airframe, structural hardware, power distribution, harness, ground support equipment and system integration. Where a programme requires it, we will substitute imported subsystems with qualified Indian-manufactured equivalents and provide the supporting content declaration.

Indigenisation changes the bill of materials, so **pricing and performance figures may vary** from those quoted above and will be re-issued against the agreed content level and qualification standard.

BASIS OF THIS PROPOSAL

What is measured

Propulsion performance is from laboratory load testing at sea level and 25 °C. RX100 structural capacity is from static load testing and FEA.

What is calculated

Mass budget, hover power, current, endurance and range are engineering calculations from those inputs, not yet confirmed by flight test on this configuration.

What comes next

On order we freeze the payload interface, build and instrument the first article, and issue measured performance against these figures before delivery.

At 180 kg maximum take-off weight Supratika H13 is a Large-category unmanned aircraft under the Drone Rules 2021. Operation requires type certification, a unique identification number, appropriately rated remote pilots and third-party insurance. Quetzalcoatl will support certification; the timeline is set by the certifying authority and is quoted separately. Control link range is stated as an operational figure under unobstructed line of sight against a 30 km rated capability; video link range is the manufacturer's rated figure. Operational range is derived from cruise speed and planning endurance and is stated one-way; a return sortie halves it. Endurance, range and payload vary with temperature, altitude, wind and mission profile. Validity 30 days from date of issue.