SOluciones **T**ecnológicas **I**nnovadoras para **C**ontrol **Ó**ptimo y p**L**anificación (SOTICOL)

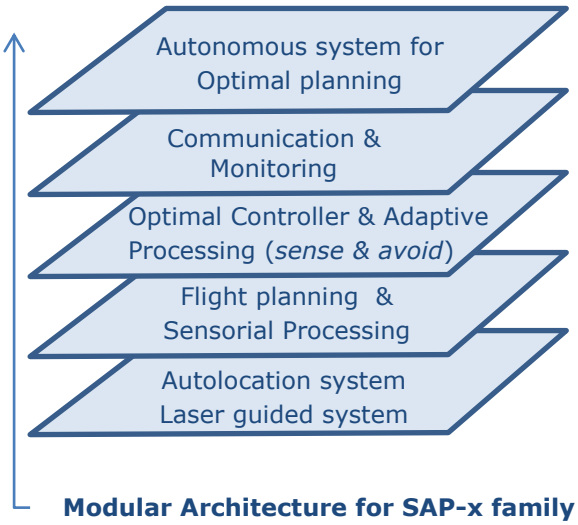
SOTICOL Autopilot SAPx

SOTICOL-Autopilots SAPx family has been conceived as a modular architecture with a wide range of advanced features designed to cover all kind of sceneries and needs.

SAPx family incorporates the last advances in optimal flight planning integrating sense & avoid capabilities and the last indoor-outdoor autolocation technologies.

SOTICOL technology introduces a new concept of optimality in control, making possible to optimally control any kind of platform with variations in fuel, payload or any other change in real-time.

Thanks to the modular architecture, specific adaptive solutions are provided without a high implementation complexity and without additional costs.



Modular Architecture for SAP-x family

SOTICOL Robotics Systems has the patents and full intellectual property of the hardware and software designs and know-how required to adapt its modules into third-party solutions.

SOTICOL Autopilot Specification

Advanced Autolocation system

Laser range finder + guided system	milimetric range accuracy for distances less than 15 m
3D-Sonar autolocation 10 points	1 cm accuracy for distances < 7 m
Visual Optical SLAM Indoor/Outdoor	GPS-Less, 3-D autolocation

Flight planning

Flight Control	3-axis stabilized
Flight Modes	Manual, Safe–Manual, Autonomous & Optimal–Autonomous
Flight-plan	Unlimited on waypoints or real-time trajectory generation in Optimal Autonomous mode
Airfield operations	Automatic takeoff & landing in static and dynamic platforms
Platforms	Fixed Wing, helicopter, multi-rotor, any specific

Telemetry

Frequency	400 MHz / 900MHz / 1.4 GHz / GSM
Power	1 W
Range	100 km / 80 km / 40 km / GSM National coverage
Baud rate	115200 bps / GSM-GPRS / 3G

Mechanical

SAP1 dimensions (WxHxL)	60x20x90 mm
SAP2 dimensions Optimal (WxHxL)	60x40x110 mm
SAP3 dimensions Optimal + autolocation system (WxHxL)	60x40x110 mm
Weight	119 g, 130 g, 220 g
Main connector	DB26 & Soriau 85102E1832P50
Pressure connector diameter	3 mm
Radio & GPS connectors	SMA female
Temperature range	–40 °C to +85 °C

Electrical

Supply	4.8 V – 5.8 V
Power Consumption	1-3 W

GPS Positioning

Channels	12
Satellite Based Augmentation System (SBAS)	
Differential navigation	Available on request

Sensor Suite

3-axis magnetometer	Isolated to avoid interference
3-axis gyroscope	300 °/s
3-axis accelerometer	10 g
Optical sensor	7 Mpixels
Laser guide	2mW
3–D Sonar Sensor	10 points, 1 cm < accuracy < 7 m

Interface with Payloads & Actuators

PWM & GPIO outputs	15
RS-232 ports	4
RS-232 Rates	9600 – 115200 bps
External ADC channels	8 channel 10bit, 0 V – 30 V
Switched output for relay	1 A, 0 V – 30 V

Air Data System

Dynamic pressure sensor range (pitot)	0 – 360 km/h
Static pressure, low altitude option	0 – 2.000 m
Static pressure, high altitude option	0 – 5.000 m

Hardware Architecture

Modular multicore architecture	ARM Processors
CPUs	4 cores
CPU1	Flight control & Sensorial processing
CPU2	Optimal controller & Adaptive Processing
CPU3	Communications and system monitoring
CPU4	Advanced autolocation & real-time Optimal Planning

SOTICOL Autopilot Configuration

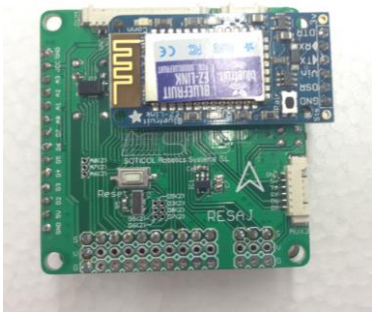
Autopilot SAP1: (CPU 1 + CPU 3)

Unlimited Waypoints

Manual and Safe–Manual flight modes

Simultaneous Multi-band Datalink

(400 MHz / 900MHz / 1.4 GHz / GSM)



Autopilot SAP2: (CPU 1 + CPU 2 + CPU 3)

Optimal Control planning

3–D Advanced Autolocation system

Autopilot SAP3: (CPU 1 + CPU 2 + CPU 3 + CPU 4)

Advanced Autolocation system (optical)

Laser guided system

Real-time Optimal Planning system

Optical Autolocation without GPS