

## HY-FLY DRONE BASED GAS SENSOR FOR HYDROGEN SULFIDE



- Keep release sources (wellhead, process vessel, piping, pipeline) under watch
- The Sour content (H<sub>2</sub>S) of Hydrocarbon is increasing worldwide
- H<sub>2</sub>S > 100 PPM can not be smelt, fatal hazard to humans and equipments
- Traditional sensors are fixed in location and samples only a small area
- Not all areas are accessible for Leak / Safety checks by humans
- Ideal for new construction asset stability studies
- Spend \$ only as required basis, no fixed cost !
- Cutting-Edge Technology now available to measure H<sub>2</sub>S in Low PPB levels !
- H<sub>2</sub>S Sensor mounted to 'any' Drone / UAV
- Real Time data for quick corrective action
- Gas and GPS Data posted via Cellular connection or wireless link to Base Station
- High Res Camera to capture images for key asset spots
- Other sensors for CH<sub>4</sub>, O<sub>3</sub>, tVOC, CO<sub>2</sub> currently available



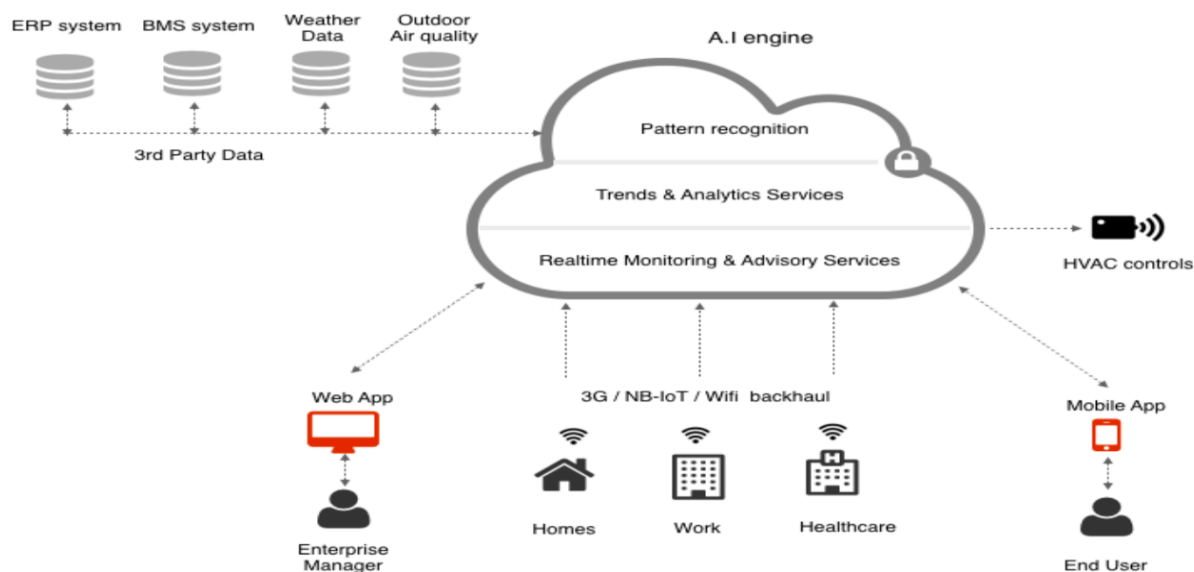
Web Apps for analytics & deployment

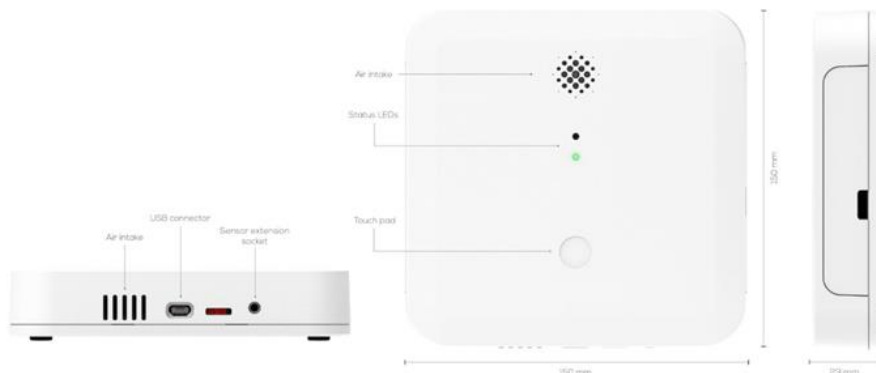


White label iOS & Android App available

Hy-Fly connects to a fully managed cloud solution to harvest data, run analytics and interconnect to various algorithms. The solution is truly plug'n'play - you just need to setup the hardware on location, connect a custom algorithm and then login via your credentials to instantly start build your services.

Hy-Fly is designed as a scalable OEM solution for variety of use cases in mind including, indoor climate, security, work safety, insurance, presence detection and tele health - with full inbound and outbound integration to various data sources, use cases automation, advanced rule engine and data integration via a REST-API.





HyFly : Offers fully calibrated, high sensitivity sensing as a service for creating scalable automated services with an integrated cloud based artificial intelligence platform.

**Standard Sensors:**

H<sub>2</sub>S : 0 - 10 ppb (+/- 3% of reading )  
Minimum Detectable Limit: 0.2 ppb  
Temperature: -20 to +60 Deg C, (±0.5 °C)  
Relative Humidity : 1- 99% (±3%),  
Barometric pressure : 300 - 1100 hPa (±1%)  
Presence : Add on module by algorithmic correlation model.

**Power rating**

Supply & Charging : 5V DC (micro USB)  
Power consumption : 200 mA during sensing  
Standby consumption : 0.05 mA (sleep mode)  
Battery : Li-Ion 6600 or 9600 mAH, 3.7 V battery (optional)

**Environmental rating**

Outer casing : IP65 for in-flight ambient conditions

**Data Connectivity**

Option 1: Wifi - 802.11 a/b/g (standard)  
Option 1: 3G - Cellular Dual-Band UMTS/HSDPA (optional)  
Option 3: NB-IoT (Release in Q4 2018)

**Sensor extensions :** Via ISM band / Zigbee / IEEE 802.15.4

HyFly : Ambient Intelligence Node  
Extra Modules

Particle Sensor : PM 1, PM 2.5, PM 10.

Lux (Lumens /SqM)

Decibel Meter : 40-105 dBA (20 Hz – 20 kHz )

tVOC (Total volatile organic compounds)

**Possible Extension** (custom implementation):

E-paper Display on device

PIR Sensor (moment & presence)

4-20mA analog interface | MoD BUS / CAN BUS / RS485

SD card backup on device (up to 4GB)

**Sensing frequency :**

Adjustable between ‘real time’ / 3-30 seconds  
minute to several hours / days.

**Physical Attributes**

Dimensions : 150 mm x 150 mm x 23 mm

Weight : 150 gms (without battery)

Calibration : HyFly comes fully calibrated with certified gases for H<sub>2</sub>S. We also run real time compensations for drift and high sensing resolution via our cloud services in real time.

**AIRCRAFT**

Weight (Battery & Propellers Included)	1216 g
Diagonal Size (Propellers Excluded)	350 mm
Max Ascent Speed	5 m/s
Max Descent Speed	3 m/s
Max Speed	16 m/s (ATTI mode)
Max Tilt Angle	35°
Max Angular Speed	150°/s
Max Service Ceiling Above Sea Level	19685 feet (6000 m)
Max Flight Time	Approx. 25 minutes
Operating Temperature Range	32° to 104°F (0° to 40°C)
Satellite Positioning Systems	GPS
Hover Accuracy Range	Vertical: ±0.5 m Horizontal: ±1.5 m



**REMOTE CONTROLLER**

Operating Frequency	5.725 - 5.825 GHz, 922.7 - 927.7 MHz (Japan)
Max Transmission Distance	FCC: 1000 m CE: 500 m (outdoors and unobstructed, aircraft's altitude at 400 feet (120 m))
Operating Temperature Range	32° to 104°F (0° to 40°C)
Battery	2600 mAh LiPo 18650
Transmitter Power (EIRP)	<ul style="list-style-type: none"> <li>• FCC: 19 dBm</li> <li>• CE: 14 dBm</li> <li>• MIC: 10 dBm</li> </ul>
Operating Current/Voltage	600 mA@3.7V
Mobile Device Holder	Tablets and smart phones
Charging Port	Micro USB

**GIMBAL**

Stabilization	3-axis (pitch, roll, yaw)
Controllable Range	Pitch: -90° to +30°
Max Controllable Angular Speed	Pitch: 90°/s
Angular Vibration Range	±0.02°

**CHARGER**

Voltage	17.4 V
Rated Power	57 W

**APP / LIVE VIEW**

Mobile App	DJI GO
Live View Working Frequency	2.4 GHz ISM
Live View Quality	720P @ 30fps
Latency	Low Latency Video (depending on conditions and mobile device)
Required Operating Systems	<ul style="list-style-type: none"> <li>• iOS 8.0 or later</li> <li>• Android 4.1.2 or later</li> </ul>
Recommended Devices	<ul style="list-style-type: none"> <li>• ios: iPhone 5s, iPhone 6, iPhone 6 Plus, iPhone 6s, iPhone 6s Plus, iPod touch 6, iPad Pro, iPad Air, iPad Air Wi-Fi + Cellular, iPad mini 2, iPad mini 2 Wi-Fi + Cellular, iPad Air 2, iPad Air 2 Wi-Fi + Cellular, iPad mini 3, iPad mini 3 Wi-Fi + Cellular, iPad mini 4, and iPad mini 4 Wi-Fi + Cellular. This app is optimized for iPhone 5s, iPhone 6, iPhone 6 Plus, iPhone 6s and iPhone 6s Plus.</li> <li>• Android: Samsung tabs 705c, Samsung S6, Samsung S5, Samsung NOTE4, Samsung NOTE3, Google Nexus 9, Google Nexus 7 II, Ascend Mate7, Huawei Mate 8, Nubia Z7 mini, SONY Xperia Z3, MI 3, MI PAD</li> </ul> <p>*Support for additional Android devices available as testing and development continues.</p>

**INTELLIGENT FLIGHT BATTERY**

Capacity	4480 mAh
Voltage	15.2 V
Battery Type	LiPo 4S
Energy	68 Wh
Net Weight	365 g
Charging Temperature Range	41° to 104°F (5° to 40°C)
Max Charging Power	100 W

**CAMERA**

Sensor	1/2.3" CMOS Effective pixels:12 M
Lens	FOV 94° 20 mm (35 mm format equivalent) f/2.8
ISO Range	<ul style="list-style-type: none"> <li>• 100-3200 (video)</li> <li>• 100-1600 (photo)</li> </ul>
Electronic Shutter Speed	8 - 1/8000 s
Image Size	4000x3000
Still Photography Modes	<ul style="list-style-type: none"> <li>• Single Shot</li> <li>• Burst Shooting: 3/5/7 frames</li> <li>• Auto Exposure Bracketing (AEB): 3/5 bracketed frames at 0.7 EV Bias</li> <li>• Timelapse</li> </ul>
Video Recording Modes	<ul style="list-style-type: none"> <li>• 2.7K: 2704 x1520p 24/25/30 (29.97)</li> <li>• FHD: 1920x1080p 24/25/30</li> <li>• HD: 1280x720p 24/25/30/48/50/60</li> </ul>
Max Video Bitrate	40 Mbps
Supported File Systems	FAT32 (≤32 GB); exFAT (>32 GB)
Photo	JPEG, DNG (RAW)
Video	MP4, MOV (MPEG-4 AVC/H.264)
Supported SD Cards	Micro SD Card 8 GB included
Operating Temperature Range	32° to 104°F (0° to 40°C)