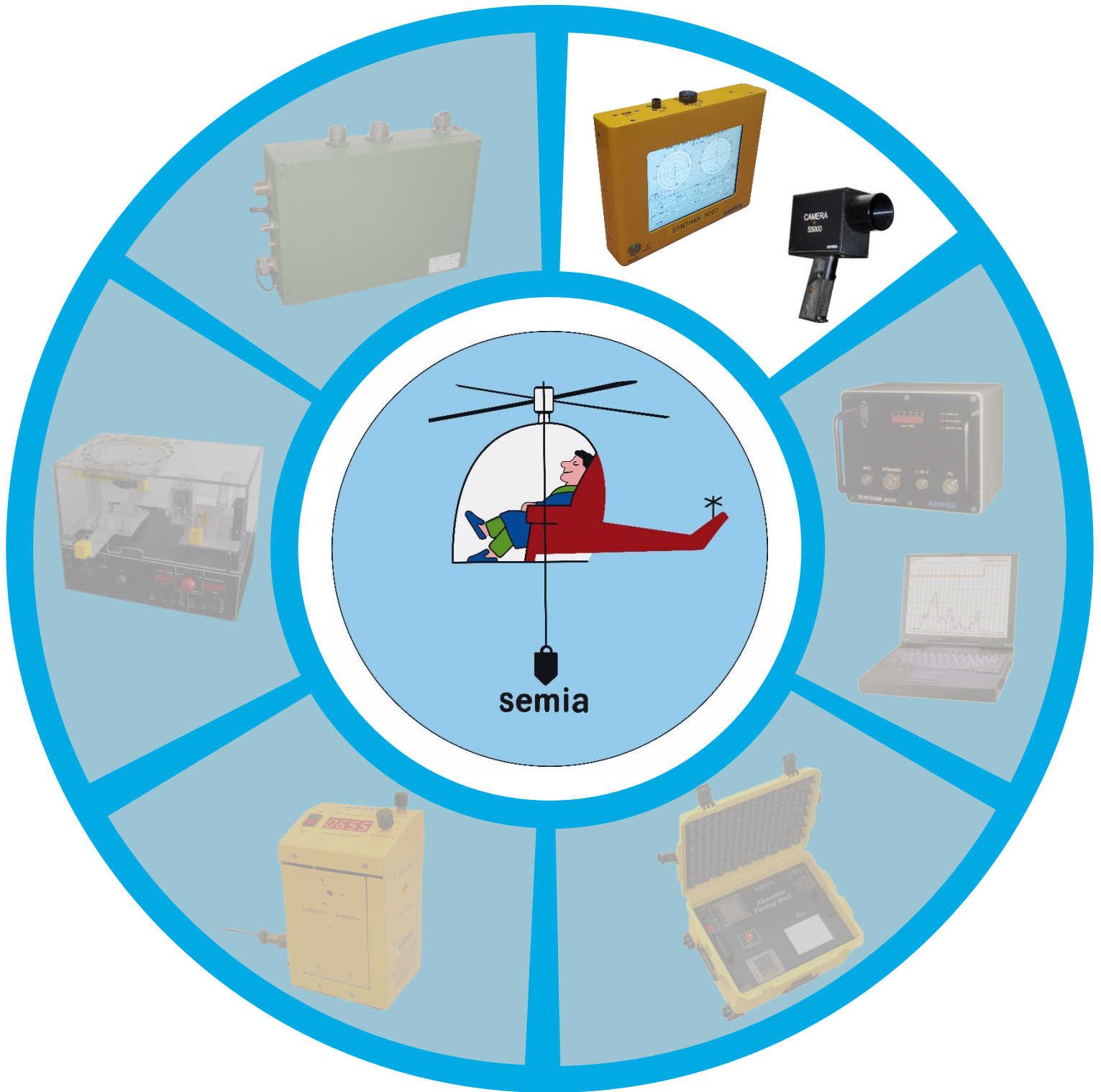


Syntham 5000



Vibration Management



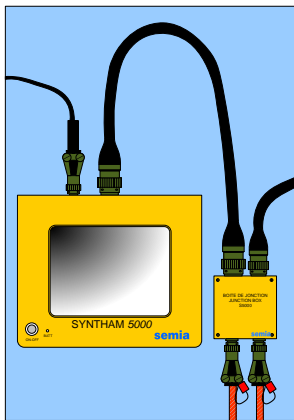
Syntham 5000 : « 2 in 1 »



- **Syntham 5000**, the new born of Ground Support Equipment from **semia**, gives a combined solution for the customer: to Perform **Engine Vibration Control** on Helicopter turbines **AND** set **Rotor Track & Balance** on airframe
- **Syntham 5000** is compatible with all sensor sensitivities
- Its **touchscreen** and **integrated computer** on battery gives a complete autonomy to **record and read** measurements without any laptop or added keyboard. (28VDC connection available)
- **4Gb** internal flash **memory** allows thousands of measurements
- The **DataManager** software is free distributed to backup/read all measurements on computer via USB key from **Syntham 5000**. The **USB connection** on equipment is also use for any upgrade (generic or specific software)
- **Syntham 5000** is always delivered in specific carry-case (internal foams designed for) to avoid any physical damage

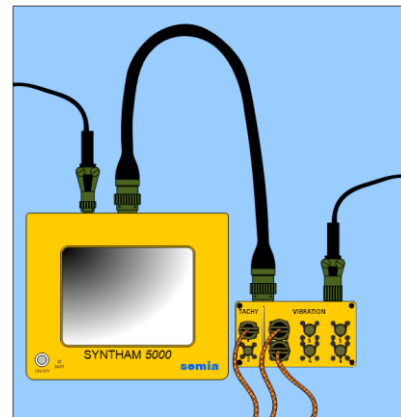
Syntham 5000 is modular with one or two measurement kits

Engine Vibration Control (EVC)



AND
OR

Rotor Track and Balance (RTB)



- **EVC kit:**
 - 2 vibration channels Junction Box
 - Hot Point accelerometer + cable
- The EVC function is Safran Helicopter Engines® certified on:
 - ARRIEL 1B / 1C / 1C1 / 1D / 1D1 / 1E2 / 1M / 1M1 / 1MN / 1MN1
 - ARRIEL 2B / 2B1 / 2C / 2D
 - ARRIUS 1 all versions
 - ARRIUS 2B1 / 2B2 / 2F / 2R
 - TURMO IIIC4 / IVC
 - MAKILA 1A / 1A1 / 1A2
 - MAKILA 2A / 2A1

ASTAZOU XIV, ARRIEL 2C2, validations in progress

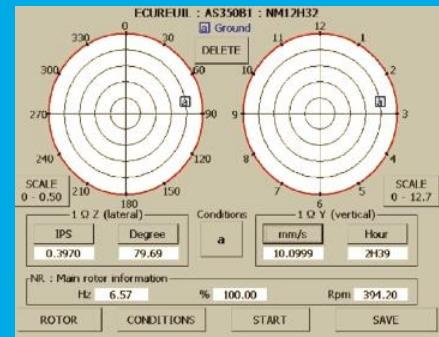
Any other engine can be certified on request

- **RTB kit:**
 - Junction Box with 6 vibration and 2 speed channels (or 8 vibration and 4 speed channels),
 - Track Camera with Monopod (no need of any target on blades)
 - Sensors / cables
 - Universal brackets
- For each type of aircraft, an airframe kit is available with specific brackets and specification software regarding:
 - Speed of rotors
 - Number of blades on each rotor
 - Track and balance specifications and tolerances
 - List of vibratory sources

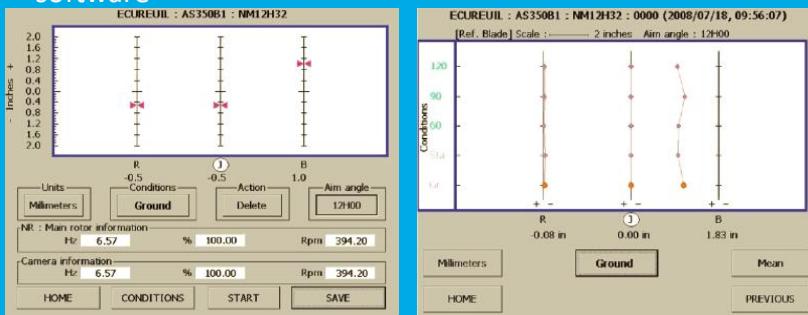
Syntham 5000 : « 2 in 1 »

ROTOR TRACK AND BALANCE

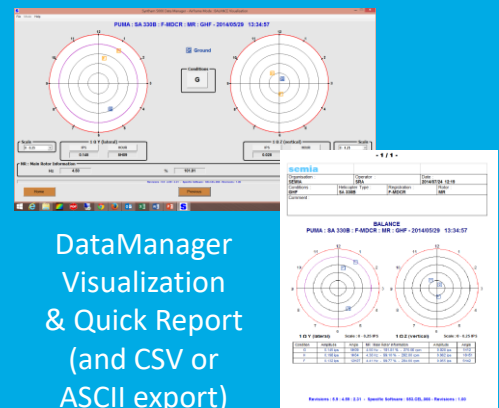
- **Syntham 5000** can be ordered and used only for RTB measurements
- Thanks to its RTB **multi-sensors** junction box, **Syntham 5000** can work with any accelerometer or velocimeter (and cables) already used with old or competitor's equipment
- The collected data can be reviewed directly on Syntham 5000 and then transferred to a station, on ground, thanks to USB key and DataManager software



Balance Acquisition on 2 channels

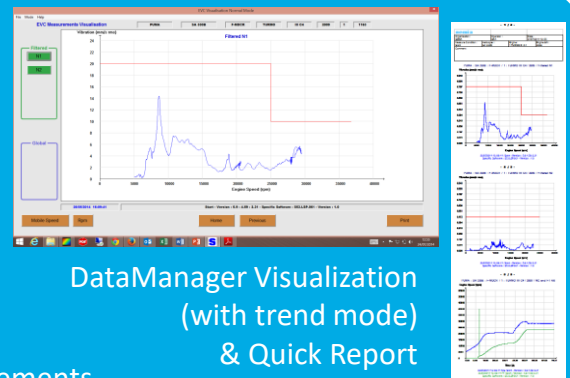
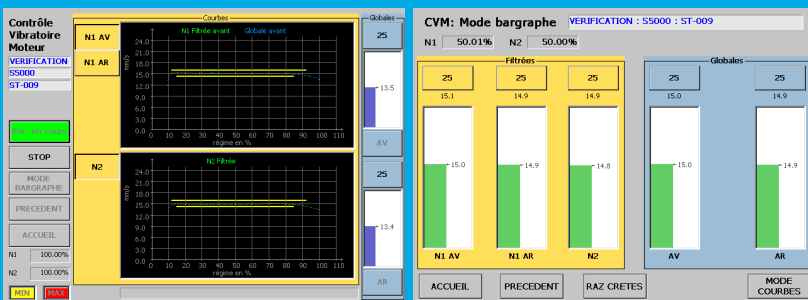


Track Acquisition (1 condition) and Review (all conditions)



DataManager Visualization & Quick Report (and CSV or ASCII export)

Engine start vibration acquisition (curves or barographs)



DataManager Visualization (with trend mode) & Quick Report

- **Syntham 5000** can be ordered and used only for EVC measurements
- Thanks to its EVC junction box with 2 speed channels (Generator and free turbine) and 2 vibration channels, **Syntham 5000** can perform up to **three measurements** during **only one engine start**:
 - Front and rear point measurement on Generator (or one unique point on several engines)
 - Unique point on free turbine
- The vibration **acquisition is automatic** when the Syntham 5000 detects the **start of the engine**
- Each measurement is filtered regarding the speed of the reference mobile thanks to a filter designed by semia on Syntham 2000 and now more optimized on Syntham 5000
- The global level of the vibration is also represented when authorized by the engine manufacturer
- The collected data can be reviewed directly on Syntham 5000 and then transferred to a station, on ground, thanks to USB key and DataManager software

ENGINE VIBRATION CONTROL

Syntham 5000 : More...

FREQUENCYMETER & GOVERNOR STATIC DROOP (Engine)

- **Frequencymeter** function is used to assist engine power settings
- **Governor Static Droop** function is available on Makila, Arriel 1 and Turmo engines



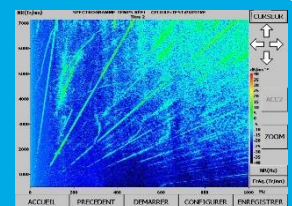
SPECTRAL ANALYSIS (Airframe & Engine)

- **Syntham 5000** helps maintenance team to find any vibration source thanks to a large spectral analysis on frequency range from 0 to 5000 Hz and a real-time measurement visualization on 2 channels (RMS amplitude)



WATERFALL Time & RPM (Airframe & Engine)

- This function allows a 3D representation of the vibration by a spectral picture, colours are for amplitude, X axis is for vibration frequency, Y axis for time or mobile speed (RPM)



HARMONICS SIGNATURES (Airframe)

- This function is very simple to find all the harmonics sources since 2R to 25R on main or tail rotor
- The result is shown on a graph or a tab (PEAK amplitude)



VIBRATORY SIGNATURES (Airframe)

- This function is more precise than spectral analysis for rotors which are in low frequency range. The result is displayed as punctual curve (PEAK amplitude)



ABSORBER TUNING (Cabin Vibration)

- This new function turns the Syntham 5000 as a MMI console for the **Absorber Tuning Unit** (dedicated datasheet) for cabin vibration setting



TECHNICAL CHARACTERISTICS

General

- Display : Touchscreen.....8,4"
- Languages.....French/English
- Communication.....USB
- Power Supply.....
Rechargeable Battery (2 hours)
- Dimensions..255/215/50 (mm)
- Weight.....2,2 Kg
- Service Temp.....-20/+55°C
- Storage Temp.....-40/+60°C
- Humidity.....5 to 90%

Airframe (RTB + extra functions)

- Syntham 5000 balance Function
- Average amplitude.....+/- 5%
- Resolution phase.....+/- 2°
- Multi-sensors Junction Box
- Vibratory.....6 input channels
- Tachometers..2 input channels
- Frequency..180 to 60000 RPM
- Camera Resolution
- Tracking.....0,43mm at 6m
- Lead-Lag0,1° at 6m

Engine (EVC + extra functions)

- Speed range..60 to 60000 RPM
- Maximum vibration..100 mm/s
- Vibratory.....2 input channels
- Tachometers...2 input channels
- FFT.....1024 to 8192 points
- Measurement precision.....2%