



## Unmanned Mission Avionics Test Helicopter UMAT

### Mission

The **Unmanned Mission Avionics Test Helicopter UMAT** is a VTOL-UAS (Vertical Take Off & Landing – Unmanned Aerial System) which can be flown automatically and/or guided from ground by the UAV Control Station.

With **UMAT** ESG can offer an unmanned flying testbed for special applications for military and civil customers. These applications cover a wide spectrum from R&D investigations for the military customer (e.g. verification of UAS platform performance within a par-

ticular operational environment) to special services for the civil customer (e.g. border patrol, environmental monitoring, etc.).

To operate this system not only in restricted but also in non-restricted airspace without the need for special permission, ESG and its industrial partner Swiss-UAV together with civil and military certification authorities have started the definition and set-up of a certification process to generate a type certificate for this aircraft.

### UMAT capabilities

- ▶ Independent evaluation of VTOL-UAS performance requirements
- ▶ Impartial investigations of VTOL-UAS technologies (mission avionics, data link, UAV Control Station/Human Machine Interface)
- ▶ Examination & verification of operational procedures for military & civil VTOL-UAS applications
- ▶ R&D tool with operational performance features to examine topics such as Manned-Unmanned Teaming (MUM-T), on-board & on-ground Sense & Avoid (S&A) functions, autonomous system functions etc.
- ▶ Analysis of VTOL-UAS certification requirements regarding particular system functions and operational procedures including verification in flight tests
- ▶ Support of UAS certification process especially for VTOL-UAS

### UMAT technical characteristics

- ▶ Fuselage: 320 x 105 x 98 cm
- ▶ Total length inc. rotor: 440 cm
- ▶ MTOW/dry weight: 125 kg/65 kg
- ▶ Payload: up to 25 kg depending on fuel
- ▶ Power plant: 2 x 14.7 KW turbine
- ▶ Max speed: up to 100 km/h
- ▶ Max endurance: up to 3.5 hours
- ▶ C2 Data Link: 30 or 60 km LOS (2.4 or 0.9/1.3GHz)
- ▶ Image Data Link: 12 – 30 km

### Variable payload

- ▶ Experimental, prototype & COTS payload
- ▶ EO/IR, e.g.
  - FLIR COBALT 190
  - FLIR TALON
  - IAI Minipop
- ▶ MiniSAR
- ▶ SIGINT
- ▶ Navigation sensors
- ▶ Meteorological sensors
- ▶ Geological sensors

### UAV Control Station (UCS)

- ▶ STANAG 4586 compatible
- ▶ User Interfaces for
  - Air Vehicle Management (AVM)
  - Payload Management (PM)
  - Flight Guidance Control (FGC)
- ▶ External interfaces for data link, radio, IP, telephone networks
- ▶ Experimental interfaces for special test purposes



Unmanned Mission Avionics Test Helicopter (UMAT)



UMAT UAV Control Station (UCS)



Mission Avionics Test Helicopter (MAT)

### UMAT MAIN FEATURES

- ▶ Highly flexible experimental platform for easy integration of various mission payloads
- ▶ Simplified certification requirements for experimental hardware & software
- ▶ Experimental avionics strictly separated from UMAT avionic system providing a unique safety concept
- ▶ Additional ESG onboard Mission Management Computer (MMC) providing unique autonomous system functions (e.g. on-board replanning, Sense & Avoid, emergency procedures)
- ▶ UMAT UAV Control Station (UCS) with integrated MMC clone allows continuous on-ground guidance & overruling off all UMAT guidance modes
- ▶ Comprehensive data acquisition & recording of system & flight states simultaneously on-board and on-ground for post flight analysis
- ▶ UMAT can be integrated in ESG's unique manned – unmanned test environment comprising the Mission Avionics Test Helicopter (MAT) and the on-ground UAS Mission Training Simulation (UMITS)
- ▶ In-flight operation of UMAT and ESG's well established manned Mission Avionics Test Helicopter (MAT) allows special investigations such as "Manned-Unmanned Teaming" in realistic operational scenarios