AEROSPACE & DEFENCE HERITAGE

CEDRAT TECHNOLOGIES (CTEC) actuators, sensors and electronics for Air, Space & Defence (ASD) can be found in optic instruments, embedded cameras, telescopes,... inside airplanes, helicopters, missiles, unmanned micro aerial vehicles (MAV), satellites, nanosat, spacecraft, ... to address following mechatronic functions & applications:

- Compact and dynamic actuation
- Precise positioning
- Sensing and detection

CTEC has been involved for 30 years in a multiple space missions and aircraft/defence applications and has reached the required standards and recurrent production for several customized products. These customized solutions are especially designed to withstand severe environment (vibrations, shocks, vacuum, humidity, wide thermal range including cryogenic) in partnership with customers. They have to be extremely reliable. Following this approach, more than 20 000 piezoelectric or magnetic actuators from CTEC have been delivered and are successfully used in operations in ASD fields.

Because of their double space & optronic heritage, offering both high performance & cost effective, CTEC products are relevant solutions for New Space business: In particular, they can cover FSM and PAM functions as requested in constellations performing optical communication (FSO).

For example the table below (page 2) shows the Aerospace & Defence Heritage of CTEC piezoelectric and electro-magnetic actuators, at different stage of qualification, with a variety of customers and functions.

To learn more about functions & applications of CTEC mechatronic components and systems for Aerospace & Defence see our related publications.



Rosetta



CTEC DTT60S-SG with a SiC mirror Point Ahead Mechanism (PAM30)



CTEC Scan Mechanism Motor Engineering Model (MTG)

























## • AEROSPACE & DEFENCE HERITAGE

MISSION	CUSTOMER	CL	JRRENT STATUS	PRODUCTS	FUNCTION
Rosetta / Midas	ESA/ESTEC SCI SO (NL)	×	Flying (Feb. 2004)	Piezo Stage XYZ	AFM scanning mechanism
ISS / ACES / Pharao / MEF	AIRBUS DS / SODERN (F)	X	Flying (August 2025)	Piezo Tilt DTT35XS	Pointing mechanism for laser
ISS / ACES / Pharao / LCE	AIRBUS DS / SODERN (F)	×	Flying (August 2025)	Piezo Actuator PPA10M-SG	Laser Extended cavity control
GOCE	AMPAC-ISP		Engineering model delivered	Piezo Actuator APA200M	Cold gas Micro propulsion
ADM-Aeolus /Aladin / TXA	Selex Galileo (IT)	×	Flight model delivered (2007)	Piezo Actuator HPPA	Laser Extended cavity control
FOTON M3 / DIMAC	Redshift (BE)	×	Flying (Sept.2007)	Piezo Actuator APA	Free floating mass repositioning
LISA-PF / LMU / OPDA	Oerlikon Space (CH)	X	Flying (Dec. 2016)	Piezo X Stage	Optical delay line
PICARD / SODISM / SMP	CNRS Aeronomie (F)	X	Flying (June 2010)	Piezo actuator PPA40M-SG	Telescop Fine Steering Mirror
MARS-MSL / CHEMIN	NASA-JPL (USA)		Engineering model delivered	Piezo actuator APA120S	Powder shaker for X-ray analysis
MARS-MSL / SAM	NASA-GSFC (USA)	X	Flying on board Curiosity (Nov. 2011)	Piezo actuator APA100M-NM-TW	Piezoelectric sieving
SWARM / Magnetometer	CEA-LETI (F)	X	Flying (Nov. 2013)	Piezo motor RSPA	Laser Fiber Extension control
LISA / PAAM	TNO (NL)		COTS Model delivered	Piezo actuator PPA40M	Fine Steering Mirror
ISS / MISSE7	Univ of Florida (USA)	×	Flying (Nov. 2009)	Piezo actuator APA50XS-TW	Reciprocating tribometer
EARTHCARE / ATLID / TXA	Selex Galileo (IT)	×	Flying (May 2024)	Piezo Actuator HPPA	Laser Extended cavity control
EARTHCARE / ATLID / BSA	AIRBUS SODERN (F)	×	Flying (May 2024)	Piezo Tilt DTT60S-SG	Laser Beam steering of the lidar
TARANIS	CNES		Flight model delivered	Electromagnet pin puller BRUCE	Hold Down & Release Mechanism
MTG / FCI / EWM	SENER (SP)		Breadboard model delivered	Limited Angle Torque Actuator	Large Angle Scan mecanism
MTG / SCA / FCI-IRS N / S and E / W motors	SENER (SP)		Flight models delivered	Magnetic Rotating Voice Coil Motor	Large Angle Scan mecanism
EChO	ESA/ESTEC (NL)		Breadboard model delivered	Piezo Cryo Fine Steering Mirror	Telescop Fine Steering Mirror
MTG / IRS / CCM	CSEM (CH)		Flight model delivered	Magnetic Linear Voice Coil Actuator	Corner cube actuation
IASI / MV3 / CCM	CSEM (CH)		Flight model delivered	Magnetic Linear Voice Coil Actuator	Corner cube actuation
METOP-SG / IASI NG (BSMA)	AIRBUS DS (F)	×	Flying (Aug. 2025)	Piezo motor deriving from FSPA	In orbit fine adjustment of the Beam Splitter Tip/Tilt
TRP LAFP	CSEM (CH)		Engineering model delivered	Cryo Large Angle Rotating Voice Coil Actuator	Large Angle Scan mecanism



## • • AEROSPACE & DEFENCE HERITAGE

Aircraft SHM  AIRBUS (F)  FP6 / FP7 AISHA I & II completed projects (2009, 2012)  Acoustic SHM & Pulse-eci SHM  Product delivered (2013)  LWSD45-2  Pulse echo SHM  Aircraft SHM  ENSAM (F)  H2020 ReMAP Eu projects (2019, 2022)  Acoustic SHM & Pitch-Cat Pulse-echo SHM  Aeronautic  ONERA  Breadboard model wind tunnel APASOOLCFRP Carbon Fiber Reinforced Polym.  Aeronautic  Aeronautic Aeronautic institute  Breadboard model delivered  APA1000L  Active Flap for BVI noise cancellation  Aeronautic  Aeronautic Breadboard model rotor tested  APA1000XL  Active Flap for BVI noise cancellation  Active Flap for BVI noise cancellation  Aeronautic  Defence Optronic  Confidential  Recurring production  Piezo XY Stage  Image enhancement  Defence Optronic  Confidential  Qualified model delivered  Piezo Tilt Stage  Field tracking compensati  Defence Optronic  Confidential  Qualified model delivered  Piezo SY Stage + controller  Image Stabilisation  Defence Optronic  Confidential  Qualified model delivered  Piezo XY Stage + controller  Image Stabilisation  Defence Optronic  Confidential  Qualified model delivered  Piezo XY Stage + controller  Image Stabilisation  Defence Optronic  Confidential  Qualified model delivered  Piezo XY Stage + controller  Image Stabilisation  Flying (PicSat not responding since Mars 2018)  Flying (P	MISSION	CUSTOMER	CURRENT STATUS	PRODUCTS	FUNCTION
completed projects (2009, 2012)  Helicopter SHM ONERA (F) Product delivered (2013) LWSD45-2 Pulse-echo SHM  Aircraft SHM ENSAM (F) H2020 ReMAP Eu projects (2019, 2022) LWSD v2 Acoustic SHM & Pitch-Cat Pulse-echo SHM  Aeronautic ONERA Breadboard model wind tunnel Reinforced Polym. Active Flap for BVI noise cancellation  Aeronautic Aeronautic Breadboard model delivered APA1000L Active Flap for BVI noise cancellation  Aeronautic Helicopter manufacturer Breadboard model rotor tested APA1000XL Active Flap for BVI noise cancellation  Defence Optronic Confidential Recurring production Plezo XY Stage Image enhancement  Defence Optronic Confidential Recurring production Plezo X Stage Image enhancement  Defence Optronic Confidential Recurring production Plezo X Stage Fleld tracking compensati  Defence Optronic Confidential Recurring production Plezo Tilt Stage Fleld tracking compensati  Defence Optronic Confidential Recurring production Plezo Tilt Stage Fleld tracking compensati  Defence Optronic Confidential Recurring production Plezo SY Stage + controller Image Stabilisation  Defence Optronic Confidential Recurring production Plezo Tilt Stage Fleld tracking compensati  Defence Optronic Confidential Recurring production Plezo SY Stage + controller Image Stabilisation  Defence Optronic Confidential Recurring production Plezo SY Stage + controller Image Stabilisation  Defence Optronic Confidential Recurring Production Plezo Tilt Tilt DTT60S-SG with a SiC mirror  Flying (PicSat not responding Sic mirror File DTT60S-SG with a SiC mirror LIDAR  Flying (PicSat not responding Sic mirror LIDAR  Flight Models Plezo Tip Tilt DTT60S-SG with a SiC mirror LIDAR  Flezo Tip Tilt DTT60S-SM with a SiC mirror LIDAR  Flydrogen ESA/ESTEC BreadBoard Model Joules Thomson Compressor Hydrogen Liquefyer for Ze  TRP Hydrogen ESA/ESTEC BreadBoard Model Joules Thomson Compressor Hydrogen Liquefyer for Ze	SIFTI	CNES (F)	Engineering model delivered	Piezo tilt incl. ECS	Highly Dynamic & High Precision Scan Mechanism
Aircraft SHM ENSAM (F)	Aircraft SHM	AIRBUS (F)	completed projects (2009,	LWSD45-2	Acoustic SHM & Pulse-echo SHM
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Defence Optronic  Confidential  Recurring production  Piezo Tilt Stage  Field tracking compensation  Piezo FSM Stage + controller  Image Stabilisation  Defence Optronic  Confidential  Qualified model delivered  Piezo XY Stage + controller  Image Stabilisation  Beta-Pictoris with a 3U nano-sat (PicSat)  Flying (PicSat not responding since Mars 2018)  Flying (PicSat not responding since Mars 2018)  Flight Models  Piezo XY Stage XY400M  Fine pointing mechanism for optical fiber  Flight Models  Piezo Tip Tilt DTT60S-SG with a SiC mirror  Space Meteo Satellite  Confidential  Flight Models  Piezo Tip Tilt DTT60S-NM-SG with a SiC mirror  Piezo Tip Tilt DTT60S-NM-SG with a SiC mirror  Engineering Model  Piezo XY Stage  Microscanning  Piezo Tip Tilt DTT60S-NM-SG with a SiC mirror  Flight Models  Piezo Tip Tilt DTT60S-NM-SG with a SiC mirror  Piezo XY Stage  Microscanning  Piezo XY Stage  Microscanning  Space Meteo Satellite  Fight Models  Piezo XY Stage  Microscanning  Piezo XY Stage  Microscanning  Piezo XY Stage  Microscanning  Piezo XY Stage  Microscanning	Defence Optronic	Confidential	Recurring production	Piezo X Stage	Image enhancement
Defence Optronic Confidential Recurring production Piezo FSM Stage + controller Image Stabilisation  Defence Optronic Confidential Qualified model delivered Piezo XY Stage + controller Image Stabilisation  Beta-Pictoris with a 3U nano-sat (PicSat)  PSYCHE / DSOC / PAM30 Flight Models Piezo XY Stage XY400M Fine pointing mechanism for optical fiber  Flight Models Piezo Tip Tilt DTT60S-SG with a SiC mirror Flight DTG0S-SG with a SiC mirror Flight DTG0S-NM-SG with a SiC mirror Flight DTG0S-NM-SG with a SiC mirror For Satellite Piezo Model Piezo XY Stage Microscanning  Space Meteo Satellite Piezo Tip Tilt DTT60S-NM-SG with a SiC mirror For LIDAR  Flight Models Piezo XY Stage Microscanning Flight DTG0S-NM-SG with a SiC mirror For LIDAR  Space Meteo Satellite Piezo XY Stage Microscanning Flight DTG0S-NM-SG with a SiC mirror For LIDAR  Fine pointing mechanism for optical fiber (Piezo Tip Tilt DTT60S-NM-SG with a SiC mirror For LIDAR)  Flight Models Piezo Tip Tilt DTT60S-NM-SG with a SiC mirror For LIDAR  Space Meteo Satellite Piezo XY Stage Microscanning Fine pointing Mirror For Zecon Model Joules Thomson Compressor Hydrogen Liquefyer for Zecon Model Fine pointing Mirror For Zecon Model Fine pointing Mirror For Zecon Model Fine pointing Mirror For Zecon Model Fine pointing Fine pointing Mirror Fine pointing Mirror Fine pointing Fine pointing Mirror Fine pointing Mirror Fine pointing Fine pointing Fine pointing Mirror Fine pointing Fine pointi	Defence Optronic	Confidential	Qualified model delivered	Piezo linear motor Stage	Auto Focus
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Beta-Pictoris with a 3U nano-sat (PicSat)  PSYCHE / DSOC / PAM30  Flight Models	Defence Optronic	Confidential	Recurring production	Piezo FSM Stage + controller	Image Stabilisation
a 3U nano-sat (PicSat)  PSYCHE / DSOC / PAM30  Flight Models  Flig	Defence Optronic	Confidential	Qualified model delivered	Piezo XY Stage + controller	Image Stabilisation
PAM30 Technologies SiC mirror for Deep Space Optical Communication  Space Meteo Satellite Confidential Flight Models Piezo Tip Tilt DTT60S-NM-SG with a SiC mirror EIDAR  Space Meteo Satellite Engineering Model Piezo XY stage Microscanning  TRP Hydrogen ESA/ESTEC BreadBoard Model Joules Thomson Compressor Hydrogen Liquefyer for Ze	a 3U nano-sat	LESIA - OBSPM (FR)	cinco Mara 2019)	Piezo XY Stage XY400M	Fine pointing mechanism for optical fiber
Satellite with a SiC mirror LIDAR  Space Meteo Satellite Engineering Model Piezo XY stage Microscanning  TRP Hydrogen ESA/ESTEC BreadBoard Model Joules Thomson Compressor Hydrogen Liquefyer for Ze			Flight Models		for Deep Space Optical
Satellite  TRP Hydrogen ESA/ESTEC BreadBoard Model Joules Thomson Compressor Hydrogen Liquefyer for Ze		Confidential	Flight Models		
		Confidential	Engineering Model	Piezo XY stage	Microscanning
Storage	TRP Hydrogen Compressor	ESA/ESTEC	BreadBoard Model	Joules Thomson Compressor	Hydrogen Liquefyer for Zero Boil Off 20K Cryogenic Storage