

## RTC-9000 REAL TIME TEST CONTROLLER

### *single-axis and up-to 4 axis*

STANDARD UP TO 4 AXIS



SLIM SINGLE-AXIS



The RTC-9000 controller range has been developed and assembled in Italy, using the best available technologies. The system is realized in the SLIM single-axis and STANDARD up to 4 axis versions for making accurate and reliable structural mechanical tests, with full control of different actuators and motors. RTC 9000 can make the test in force or displacement control mode, auxiliary  $\pm 10V$  channel and incremental Encoder. The system is configured in pneumatic mode (P) for managing pneumatic actuators or electric mode (E) for managing electric actuators or hydraulic mode (H) for managing hydraulic actuators.

Controller model	Control mode	Test mode	Type of actuators	Number of axis	Multi-axis extension	ET-4C-R01 Extension board
RTC-S 9001	Force Displacement Aux Encoder	Axial Torsion	Pneumatic Electrodynamic Electromechanical Servo-motor	Single axis	No	Yes
RTC-9001				Single axis	Yes (2 axis) Yes (4 axis)	Yes
RTC-9002		Brushless motors Hydraulic	2 axis	Yes (4 axis)	Yes	
RTC-9004			4 axis	Yes (max 4 axis)	Yes	

Both the RTC 9000 SLIM and STANDARD versions can be extended by using an ET-4C-R01 extension board to connect 4 measurement sensors only for reading and logging.

SLIM SINGLE-AXIS



STANDARD UP TO 4 AXIS



### SOFTWARE INTERFACE

The controller connects with a network connector to a PC, where the RTC 9000 Command Software is installed.

A user-friendly interface enables settings and test parameters managing, including:

- Set-point (or arrival point)
- Load/displacement speed
- Cycle amplitude
- Cycle frequency
- Waveform (ramps, sine, square, triangle, user-defined)
- Safety limits
- PID control loop coefficients
- Set the recording mode and display the acquired values



\*Windows user interface serves only to set up the test parameters and log test values; all control and safety operations are run directly by the control logic's FPGA board.

The controller is equipped with a very high speed FPGA board, to acquire signals from the sensors and close the PID control loop with a frequency of 1KHz and an integrated Real Time processor, by which the operator can generate the waveforms applied by the actuator or connected motor.

RTC 9000 controllers have been proved to be ideal for static, dynamic and fatigue testing.

### TYPES OF TESTS

- Load or displacement ramp with settable speed
- Constant amplitude cyclic testing with sine/triangle/square waves
- Variable amplitude testing defined by the user or importable from an external text or excel file

### APPLICATIONS

- 1 STATIC YIELD/FAILURE TESTING, for composite and biological components, dental implants, ecc.;
- 2 RIGIDITY TESTING, for single components and assemblies, metallic, plastic, composite products, 3D print and biological products;
- 3 DYNAMIC TESTING, with sine, pulsed square wave with settable duty cycle or constant speed triangle wave (e.g. for characterization of suspensions/shock absorbers);
- 4 CONSTANT AMPLITUDE FATIGUE TESTING to characterize the life under cyclic/repeated loads for any type of components (Wöhler curves);
- 5 CONSTANT AMPLITUDE BLOCK FATIGUE TESTING for determining the Palmgren-Miner relation and the effective damage value;
- 6 VARIABLE AMPLITUDE FATIGUE TESTING using the reproduction/simulation in the laboratory of real world load curves acquired on-site;
- 7 REPRODUCTION OF LOAD CURVES defined by the user during the design phase



### TECHNICAL SPECIFICATIONS

	RTC-S (Slim)	RTC-9001	RTC-9002	RTC-9004
RTC Real Time Controller	Yes	Yes	Yes	Yes
Processor	Dual core 667 MHz			
Force channel +/-10V, 16 bit	Yes	Yes (1)	Yes (2)	Yes (4)
Displacement channel +/-10V, 16 bit	Yes	Yes (1)	Yes (2)	Yes (4)
Auxiliary channel +/-10V, 16 bit	Yes	Yes (1)	Yes (2)	Yes (4)
Encoder (8000 v pulse/rev or more)	Yes	Yes (1)	Yes (2)	Yes (4)
PID output voltage	+/-10V			
PID Loop Control Frequency Standard	1000 Hz			
Safety limits	Yes	Yes	Yes	Yes
Panel emergency stop	Yes	Yes	Yes	Yes
Remote emergency stop	Yes	Yes	Yes	Yes
PC connection	RJ45 Ethernet cable			
ET-4C-R01 4 channels extension board for reading	Extension with 4 channels board for reading (it needs software extension)			
Power supply	220V 50 Hz			

Training is available for users at their premises (on delivery of the product) or in tutorial videos, for self-training at their own convenience.

#### GENERAL INFORMATION

info@litem.info

#### SALES

sales@litem.info

#### TECHNICAL

support@litem.info

#### DRC Srl

sales and production

Via Montesicuro snc - 60131 Ancona (Italy)

Ph. (+39) 071 80 36 077

#### EnginLAB Srl

research and development

Via Verità 3/a - 35131 Padova (Italy)

Ph. (+39) 049 20 21 489

www.litem.info