µLC Test System

- User-friendly interface
- Functions can be extended with Expansion Boards
- Prepared for test automation
- Favorable test setup, consuming low space
- Simulation of typical automotive interfaces combined in one unit

The new and modern hardware-in-the-loop test system µLC Test System is suitable for mobile application, measuring a compact 17 x 11 x 6 cm. Initial test setup typically takes under ten minutes, since the system allows for a simple test setup.
It is a compact open-loop test system for quality assurance of control unit development and combines the simulation of all typical automotive sensors and communication protocols in one unit. Its interface is user-friendly and enables an easy operation and evaluation.
The µLC Test System is especially used for automotive control units with typical interfaces for sensors and bus systems such as analog/digital inputs and outputs, PWM signals, SENT, CAN, LIN and speed sensors.

Application

Engine Speed Simulation

- Up to 20,000 rpm
- Supported sensors: Hall, inductive, DG23i, TL4953
- Up to 2 crankshafts, up to 4 camshafts
  - each is independently configurable
  - auxiliary shaft
  - -180 to 180° camshaft adjustment
- Oscilloscope trigger signal for easier monitoring
- Error simulation for engine position management EPM

Vehicle Busses

- 2 * CAN, up to 1 MBit/s,
  switchable 120 Ohm CAN bus terminator
- LIN Master/Slave
- SENT, full J2716 Jan. 2012 standard
  4 Outputs, alternative to PWM output

Analog Interfaces

- 8 * 10 bit DAC 0 to 5 V, max. 5 mA
  Internal or external supply
- 4 * 12 bit DAC 0 to 5 V, max. 5 mA
- 6 * 12 bit ADC 0 to 40 V, GND reference

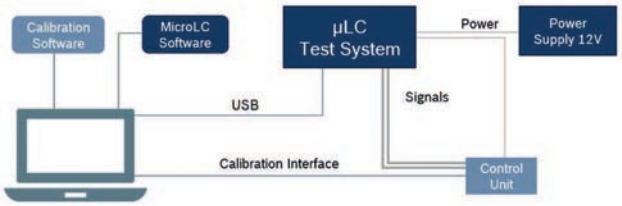
Digital Interfaces

- 6 * Digital Out, max. 200 mA in total
  Output modes: Ground, 12 V, High impedance
- 2 * Relays, max. 10 A, separate ECU power supply possible and incl. main relay sensing
- 2 * PWM input, 1 Hz to 20 kHz
- 4 * PWM output, max. 90 mA in total,
  0.1 Hz to 20 kHz
  Output voltages: 12 V, 5 V, GND
- Complex PWM with sub signals, each separately adjustable in frequency, duty cycle and pulse count

Additional Features

- Throttle body simulation
- Cylinder pressure simulation
  - Up to 8 cylinders with one device
  - Expandable with multiple devices
- USB connection completely galvanic decoupled
- All in- and outputs short-circuit protected and ESD protected
- EMC tested
- Expansion boards for additional HW features
- Multi device support with sync option for engine speed signals

Test Setup



Note: Calculation intensive modules like cylinder pressure simulation can cause a limitation of e.g. the max. engine speed.

Technical Specifications

Operating voltage	12 V DC
Current consumption	typ. < 1 A
ECU voltage	12 V / 24 V DC
ECU current	10 A
Permissible operation temperature	0 to 40°C
Housing material	Aluminum
Dimensions	175 x 107 x 61 mm
Weight	690 g

The screenshot shows the MicroLC Software with analog outputs, crank-/ camshaft, RPM and complex PWM.

Update and Support Subscription

- Free in the first year of use, chargeable from the second year

Legal Restrictions

The sale of this product in Mexico is prohibited.

Ordering Information

µLC Test System
Order number **F02U.V02.303-02**

Software Options

Update and Support Subscription
Order number **F02U.V02.838-01**

Accessories

Expansion Board Current Loop Interface
Order number **F02U.V02.889-01**

Expansion Board Digital Outputs
Order number **F02U.V02.904-01**

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235898379 | en, V, 12. Jan 2022