

- Flexible and scalable structure: **Keithley 2700/2750** 6½-digit DAQ/DMM, Keithley 7700 multiplexer module, **OFRIM Engineering MCCS/MVCS-06/08** multi-channel constant current source, **OFRIM Engineering PDC-06/08** micro-cuts detector/counter;
- Common (model **MCCS-06/08**) or different (model **MVCS-06/08**) test current for each contact;
- Manual or semiautomatic testing of the automotive connectors' electrical contacts' quality;
- **TestRez** software package for PC assisted semiautomatic operation;
- PC connection through IEEE-488 for DAQ/DMM and USB 2.0 for **PDC-06/08**;
- Easy to acquire, process and interpret test results;
- Possibility to connect and control optional equipments for additional test conditions (vibration, temperature & humidity) defined in standards such as e.g. MIL, IEC and DIN.



The **Test System for Automotive Connectors (TESACON)** with up to 6 or 8 contacts performs manual and semiautomatic testing of the automotive connectors' electrical contacts' quality.

The system was developed for testing the connectors of the auto headlights lamps but it can be used for any type of lamp or connector with up to 6 or 8 contacts. A customized version can be developed for testing any larger number of contacts.

The system offers several information about the quality of the contacts, like the variation of the contact resistance during different test steps as well as the presence and number of micro-cuts (contact resistance changes which exceed certain value and duration limits). Additionally, **TESACON** has the possibility to connect and control optional equipments as temperature and climatic test chambers in combination with vibration capabilities for additional test conditions defined in standards such as e.g. MIL, IEC and DIN.

The system has the following components:

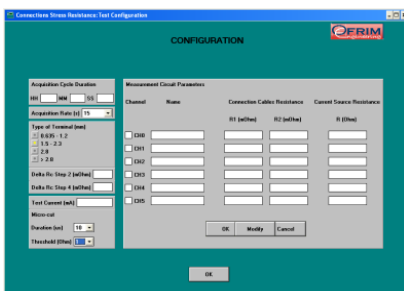
DAQ/DMM Switch System – digital multimeter model Keithley Integra 2700 Series Systems with 6½-digit resolution and up to 5 switch plug-in modules.

Switch module – multiplexer card model Keithley 7700 with 20 voltage channels and 2 current channels. This module is plugged in the DAQ/DMM instrument.

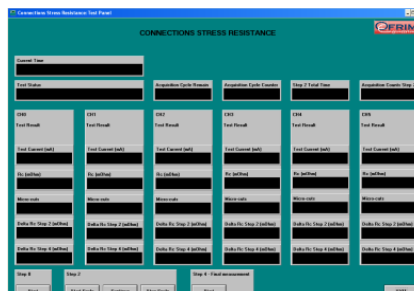
Micro-cuts detector/counter – 6/8-channel module for micro-cuts detection and counting (up to 256 values), model OFRIM Engineering **PDC-06/08** (**P**ulse **D**etector and **C**ounter). Each channel has two selectors for defining the micro-cuts' duration (10µS and 20µS) and value (1Ω and 2Ω) thresholds. The PDC-06/08 module communicates with the PC via the USB 2.0 interface.

Multi-channel constant current source – model OFRIM Engineering **MCCS-06/08** (**M**ulti-channel **C**onstant **C**urrent **S**ource), consisting of a DC voltage power supply and a 6/8-channel voltage-to-current converter. The **MCS-06/08** provides a constant test current which has the same value (e.g. 100mA) for all channels. The **MVCS-06/08** (**M**ulti-channel **V**ariable **C**urrent **S**ource) model enables the user to set different threshold constant current values for each test channel.

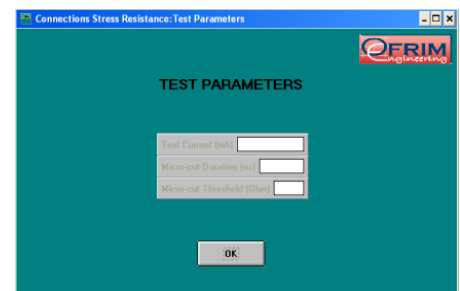
Test Configuration



Test Results



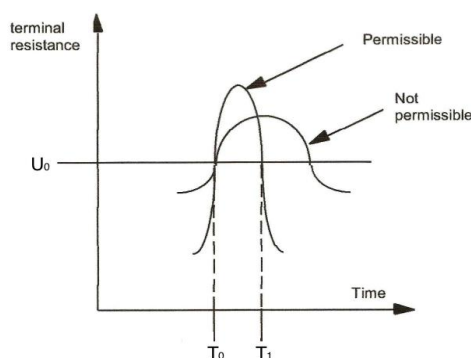
Standard Test Parameters



Operating principle

The maximum value of each contact resistance is estimated at 200mΩ, which implies using low resistance measurement techniques. **TESACON** performs 4-wire resistance measurements by applying a constant test current (model MCCS/MVCS-06/08) and by measuring the voltage drop across each contact (Keithley 27xx/7700 system).

The micro-cuts or micro-disturbances are detected using the PDC-06/08 module. This device signals and counts (up to 255) every time the contact resistance exceeds a threshold value for a time period longer than a threshold duration. These value and duration limits are defined by the user at the beginning of the test. The micro-cuts / micro-disturbances detection and counting is performed independently for every channel.



The above figure illustrates possible shapes of the signal measured by the PDC-06/08 module. The values U_0 and T_1-T_0 are respectively the voltage and the time interval thresholds of the micro-cuts.

A micro-disturbance could be defined as an increase in resistance greater than 1 ohm for 10 μs. Any voltage drop across the contacts which exceeds the value U_0 for a period longer than T_1-T_0 is considered a micro-cuts signal or a malfunction.

The software component of the **TESACON** system, **TestRez**, determines the variation of each channel's contact resistance during a test cycle. It also reads from the PDC-06/08 module the number of micro-cuts detected for each channel. The quality of the electrical contacts can be tested under different thermal, humidity and vibration conditions. At the end of the test, the obtained results are evaluated and a PASS/FAIL decision is made for every contact. A test report is generated automatically.

Main technical specifications

2700 Integra Series

Main Measurement ranges:

DC Voltage: 100nV .. 1000V
 AC Voltage: 100nV .. 750V
 DC Current: 10nA .. 3A
 AC Current: 1uA .. 3A
 Resistance, 2W: 10μΩ .. 120MΩ
 Resistance, 4W: 1μΩ .. 120 MΩ
 Expansion Slots :
 2 (2700, 2701), 5 (2750).

Remote Interface :

GPIO (IEEE-488.2) (2700, 2750),
 RS-232C (2700, 2701, and 2750).
 Ethernet TCP/IP (10bT and 100bT) (2701)
 SCPI, LabVIEW Drivers

7700 Card

Main capabilities:

DC Volts
 AC Volts
 DC Current
 AC Current
 Resistance, 2W
 Resistance, 4W

PDC – 06, Pulse detector/counter

- Channel count: 6, extendible to 8, opt 08
- Input signal: 20 mV, programmable
- Counter: 0 .. 255 / channel
- Interface: USB 2.0

MCCS – 06, DC voltage power supply and voltage to-current converter

- Channel count: 6, extendible to 8, opt 08
- Output signal: 100 mA, standard
- Output signal: variable current, opt MVCS

Opt – 08,

- **Pulse detector/counter**
Channel count: 8
- **DC voltage power supply and voltage-to-current converter**
Channel count: 8

Ordering Information

- **TESACON-6C / 2700**, TESACON, 6 channels, 2700 DMM, Data Acquisition, Datalogging System w/2 Slots
- **TESACON-6C / 2701**, TESACON, 6 channels, 2701 DMM, Data Acquisition, Datalogging System and Ethernet Support w/2 Slots
- **TESACON-6C / 2750**, TESACON, 6 channels, 2750 DMM, Data Acquisition, Datalogging System w/5 Slots
- **Opt – 08**, 8 input channels and 8 constant test current sources
- **Opt – MVCS**, programmable current for each test channel



5A Lahovari Square, ap. 8,10, sector 1, RO 010464, Bucharest, ROMANIA, Tel/Fax:+4021.312.1662/63, www.ofrimgroup.com

InterNET SRL

București / RO
 Tel: +4021.312.1662
 Fax: +4021.312.1663
 E-mail:
office@inter-net.ro
www.inter-net.ro

MultiM Systems EOOD

Sofia / BG
 Tel./Fax: +359.2.870.3004
 Mobile: +359.877.00.44.64
 E-mail:
office@ofrim.bg
www.ofrim.bg

SciTEST Solutions Kft.

Budapest / H
 Tel.: +36 1 295 1046
 Fax: +36 1 700 2215
 E-mail:
office@scitest.hu
www.scitest.hu