EoL function test for traction batteries

Test systems for electromobility

Testing tasks

- potential equalization measurements
- simulate crash shutdown
- HV interlock test
- discharge / charge pulse
- test ISO guard
- charge battery
- link voltage measurement
- check state of charge

Function test

- voltage range up to 1500 V DC
- current range up to 1200 A DC
- battery charging and discharging

Security tests

- tests up to 4000 V DC
- isolation test to over 10 MOhm

GOPEL electronic

System

Measurement cabinet 2

- relay matrix for LV measurements
- relay matrix for HV measurements
- control for HV contactors
- safety control with emergency stop
- pre-charge capacities with
- discharge circuits
- R-Simulation for ISO Guard
- temperature measurement

Measurement cabinet 1

- system computer with monitor
- USV for system computer
- DMM's for voltage measurement
- power supply for KI30 and KI30C
- current measurement for KI30 and KI30C
- all components air-conditioned

Restbus simulation

- simulation through high-end solutions from GÖPEL electronic
- multibus controller for CAN/CAN FD/ FlexRay/Automotive Ethernet/LIN

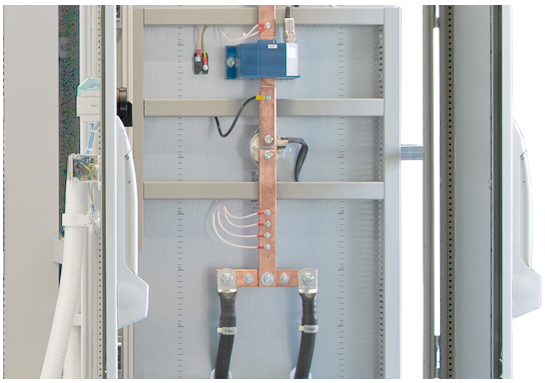
CAN CAN FD AUTOMOTIVE ETHERNET 100/1000 BASE-T1 lin FlexRay™ LVDS

Power Supply Quelle/Sink

- power up to 500 kW
- voltage DC up to 1000 V
- current up to 800 A DC
- energy recovery into the 400 V mains

Measurement cabinet 3

- high current switch 800 A DC
- high current measurement +/- 600 A DC
- with LEM converters
- fuses for high current
- transfer point for contacting



Possible test stand variants

- Single Test
- Dual Test
- Quad Test

DUT types

- Plug-In Hybrid
- all-electric vehicles BEV

Other test systems

- Battery Junction Box (BJB)
- converter
- electric motor

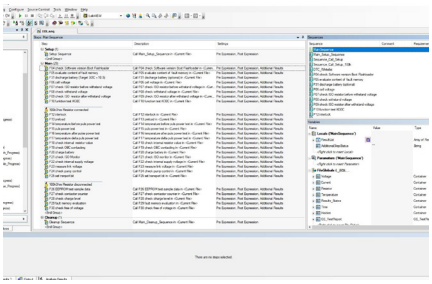
https://www.goepel.com/fileadmin/videos/ats/en/Battery-test-system.mp4

K-Line

Technichal specifications

System software - sequence editor

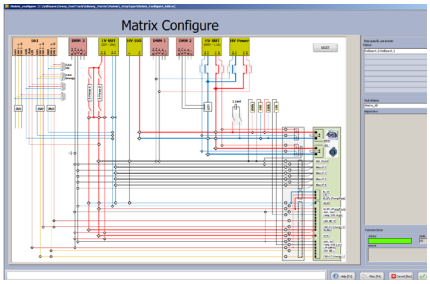
- the basis is NI TestStand™
- create test programs
- change test programs
- change test parameters
- debug test programs



System software - steptype more examples available

Example: Matrix

- structural overview of the system
- visualized interconnection paths
- create circuits by mouse click - immediately executable with „Play“ button

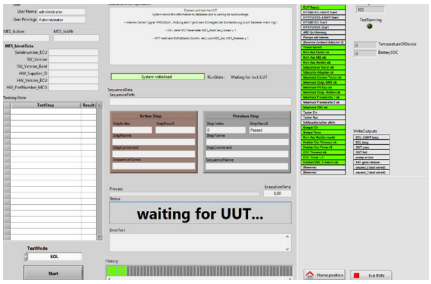


Example: Read

- read measured value with DMM
- compare with tolerance limits
- immediately executable with „Play“ key

System software - production

- selection test program
- start test
- test running
- protocol



Software example

Plant I	Power for charging		UUT BMS communication	Board network supply	
	· HV charging voltage	300 V DC up to 1200 V DC	· CAN, CAN FD and other bus systems	· 12 up to 18 V DC, 40 A DC	
	· HV charging current	up to 1200 A DC	· residual bus simulation via CANoe	· current measurement	· Sleep current in µA, nominal current up to 50 A
	· HV current measurement	1 A DC up to 1200 A DC	· alternatively Net2Run (GÖPEL electronic)		
	· HV voltage measurement	up to 1500 V DC			
Plant II	Test ISO guard		Communication with production system	Security test	
	· connection of up to 3 error resistors		· network (TCP/IP Profinet), OPC UA	· test voltage	100 - 4000 V DC
	· resistance range 10 kOhm to 500 kOhm		· serial interface	· tripping current	1 µA - 10 mA
			· I/O interface	· isolation measurement	up to 20 GOhm

GÖPEL electronic GmbH
Goeschwitzer Str. 58/60
07745 Jena · Germany
ats.sales@goepel.com Mail
www.goepel.com Web
+49 3641 · 6896 0 Phone
+49 3641 · 6896 944 Fax

ISO 9001, ISO 14001 certified