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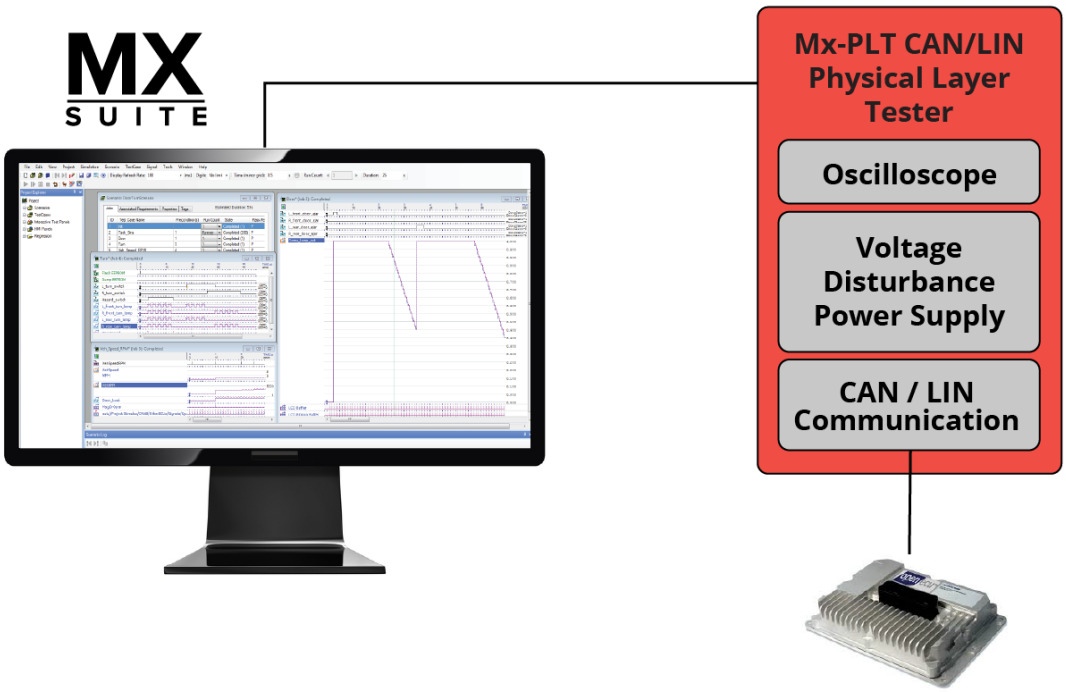
MxSuite

Mx-PLT™ CAN/LIN Physical Layer Tester

MX-PLT is a CAN/LIN physical layer test solution that integrates seamlessly with Danlaw's Mx-Suite embedded software test environment. The cost-effective desktop solution automatically performs tests based on OEM conformance specifications, which reduces test time and operational costs as compared with traditional manual testing. By using a trusted tool that conforms to standard test methods and reporting formats, components are quickly qualified for production release.

Mx-PLT is a modular system for measuring CAN/LIN devices with three main hardware components: the Danlaw Mx-PLT module, the PicoScope 5243A, and the Danlaw Ground Offset Battery Simulator module. The Mx-Suite software coordinates the operations of the Mx-PLT, providing a library of standardized conformance test cases.



Benefits

Automatic testing saves time (weeks reduced to a few hours)

Pre-configured and calibrated system

Generates reports in OEM-standard formats

Quick turn-around time to detect and fix issues prior to manufacturing

Features

Comprehensive physical layer test system for CAN (high speed, medium speed, fault tolerant, single-wire) and LIN (master, slave, master/slave)

Tests include normal usage, abnormal power perturbations, and network stress conditions, including invalid bit insertion

Built-in Self-test (BIST) for power supply, network bus loads, and oscilloscope

Includes measurement equipment, electronic impedance switching, power supply with crank simulation and ground offset, and harnesses (with pigtails for your ECU connection)

Mx-PLT transform connectors for Mx-Suite software included

Communication Bus Specifications

CAN Physical Layer Complaince Testing

- General Motors: GMW14241 sections 1-3
- Fiat Chrysler Automobiles: 7-Z0140, 7-Z0146, 7-Z0166
- Toyota: TSC7222G
- Nissan: 25953NDS36

LIN Physical Layer Complaince Testing

- SAE J2602/2 (Layer 1)
- Ford: 000601.101.AA

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Mx-PLT™ CAN/LIN Physical Layer Tester

Mx-PLT Conformance Library of Test Cases

CAN - DWHS / DWMS
(Dual Wire High/Medium Speed)

(-) Ground Offset/Line Capacitance Sensitivity
(+) Ground Offset/Line Capacitance Sensitivity
Behavior during Crank
CAN Circuit Shorts
CAN Wires Shorted to - Ground, Supply
CAN-HI BATTERY SHORT with Power-On RESET
CAN-HI GROUND SHORT with Power-On RESET
CAN-HI TO CAN-LO SHORT with Power-On RESET
CAN-LO BATTERY SHORT with Power-On RESET
CAN-LO GROUND SHORT with Power-On RESET
Power-Up or Reset for ECU not implement CAN
Wake-up Device Capacitance, Input Capacitance
Dominant Input Threshold
Dominant Output, Output Voltage Levels
Ground Loss - on Another ECU, on the ECU Under Test High Voltage Sensitivity
Input Threshold
Internal Differential Resistor, Resistance
Internal Resistance of CANH and CANL
Interruption of CAN Wires
Local Wake-up
Loss of - Ground, Supply
Low Voltage Sensitivity
Operation at Min Power Supply Voltage
Open Circuit on CANL Open Circuit on CANH
Operation at Max Power Supply Voltage
Min and Max Supply Voltage Level for Bus Communication Output Voltage Levels after Failure Modes Tests - Dom, Rec Current Consumption Test
Recessive Input Threshold
Recessive Output Voltage Levels
Recessive Output Short Between CANH and CANL
Short Circuit Between CANH and +Vbat
Short Circuit Between CANH and CANL
Short Circuit Between CANH and Ground
Short Circuit Between CANL and Ground
Short Circuit Between CANL and -Vbat
Signal Characteristics (Asymmetric Load), (Symmetic Load) Signal Rise/Fall Times
Supply +Vbat Loss on the ECU Under Test
Test Immunity to Potential Ground Offsets
Tolerance of Bit Timing
Tolerance to Baud Rate Variation
Transceiver Slope Control
Transmitted Waveform Measurement
Wake Up by CAN

CAN - DWLSFT
(Dual Wire Low Speed Fault Tolerant)

Bit Rising Edge and Falling Edge Times
Engine Cranking Power Voltage Curve
CANH and CANL Internal Resistance
Dominant Signal Voltage Levels
Bit Time Precision During Message Transmission
Ground Potential Deviation Immunity Test - Anomalies Ground Potential Deviation Immunity Test - No Anomalies Min and Max Power Level for Communication via bus Node Anomaly Tolerance Test - CAN Wire Open Circuit Node Anomaly Tolerance Test - CAN Wire Short Circuit Node Anomaly Tolerance Test - Short Circuit to Power
Recessive Signal Voltage Levels
Signals Features (Symmetry)

CAN - Communication Enable

Comm En Line In Input Threshold / Threshold Hysteresis
Comm En Line In Successful Wakeup Detection
Comm En Line In Wakeup Filter Function
Continuous Wake Out Continuous High Level Output
Continuous Wake Out High Level Output Voltage
Continuous Wake Out Low Level Output Voltage
Continuous Wake Out Short Circuit Output Current
Comm En In Comm En Shorted - to Gnd, to Battery
Comm En In Loss of - Gnd Connection, Power Supply
Comm En Out Comm En Shorted - to Battery, to GND
Comm En Out Loss of - Gnd Connection, Power Supply
Comm En Pulsed Wake In Input Threshold
Comm En Pulsed Wake In Successful Wakeup Detection
Comm En Pulsed Wake In Wakeup Filter Function
Comm En Pulsed Wake Out High Level Output Voltage
Comm En Pulsed Wake Out Low Level Output Voltage
Comm En Pulsed Wake Out Short Circuit Output Current
Comm En Pulsed Wake Out Wake Up Pulse Length

CAN - SWLS
(Single Wire Low Speed)

Behavior during Crank
Bus Dominant Output Voltage Level
Bus Recessive or Passive State Low Voltage
Bus Shorted to Battery/Ground
Device Capacitance/Resistance
Input Threshold HVWU/Normal Mode
Loss of Ground Connection
Loss of Power Supply
Min and Max Supply Voltage Level for Bus Comm
Signal Characteristics
Signal Rise/Fall Time
Temporary Loss of Power Supply
Test Immunity to Battery Offsets
Test Immunity to Ground Potential Offsets

LIN

Battery Offset Voltage
Bus Wiring Short to Ground Master / Slave
Master Node Termination Resistance
ECU Power Loss - Master / Slave
Ground Offset Voltage
Loss of ECU Ground at Master or Slave Node
Master and Slave Node ECU Time Constant and Cap Meas Master Node Bit Time Meas
Bus Writing Short to Battery Device with TxD/RxD Not Acc
Master Node Tr-d max and Td-r max Measurement
Mstr/Sl Node Vil Level Meas and Input Thresh Hysteresis (Vih-Vil) Master Node Vin Level Meas
Master Node Voh and Vol Levels Meas
Op Range Norm Batt Volt-Mstr/Sl Device with TxD/RxD Not Acc Op Range Over Volt-Mstr/Sl Device with TxD/RxD Not Acc
Op Range Under Volt-Mstr/Sl Device with TxD/RxD Not Acc Sample Pt Autobaud Max/Min Bit Sample Timing Slave Node Sample Pt Fixed Clock Max/Min Bit Sample Timing Slave Node Slave Node Bit Time Meas - Autobauding
Slave Node Bit Time Meas - Fixed Clock Slave Node
Slave Node Termination Resistance
Slave Node Tr-d max and Td-r max Meas
Slave Node Vil Level Meas and Input Thresh Hysteresis (Vih-Vil) Slave Node Vin Level Meas, Slave Node Voh/ Vol Levels Meas

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Mx-PLT™ CAN/LIN Physical Layer Tester

Product Features

Mx-PLT Module

For control, communications, and bus loading.

Features	
Bus Types	CAN (ISO 11898 - dual wire and fault tolerant, J2411 - single wire); LIN
PC Interface	USB 2.0 (USB 1.1 compatible)
Operating Temp. Range	0º C to 45º C
Humidity	5 to 80% RH, non-condensing
Power Requirements	100-230V @1A

Ground Offset Battery Simulator Module

For ECU power, to create stressing voltages, offset voltages, and cranking waveforms required by tests.

Features	
Volt	0 - 29V
Current	6A continuous; 20A peak (<1 sec)
Offset Voltage Range	0 - +/- 4.5V
Resolution	9mV
Accuracy	1%
Slew Rate	<1 ms for the range
PC Interface	USB 2.0 (USB 1.1 compatible)

PicoScope 5243A

For measurements and capture of waveforms.

Features	
Bandwidth	100 MHz
Vertical Resolution	12 bits
DC Accuracy	+/- 1%
Maximum Sampling Rate	13 MS/s streaming; 125 MS/s one shot
PC Interface	USB 2.0 (USB 1.1 compatible)

About Danlaw

We are a global leader in connected car and automotive electronics. Our people live, breathe, and create innovative tech for some of the world's largest car makers. Thirty years ago, we designed software for the first 8-bit Electronic Engine Control module, and today, we continue to develop forward-looking technologies. We focus our efforts on R&D to stay ahead of rapidly changing industry needs in an increasingly connected world. Danlaw is known for ground-breaking tech, efficient development, and adaptive solutions for dynamic environments. Our world-class connected vehicle solutions make Danlaw one of the largest suppliers of connected products, tools, and services in the world.

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