Mx-PLT™ Physical Layer Tester

DATASHEET

BENEFITS

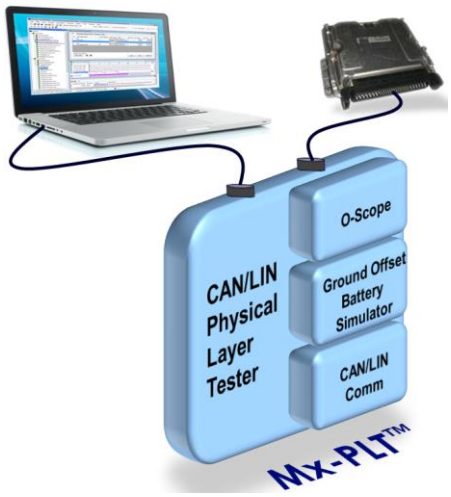
- Automatic testing saves time (weeks reduced to a few hours)
- Preconfigured and calibrated
- Generates reports in OEM-standard formats
- Quick turn-around time to detect and fix issues prior to manufacturing
- Avoid crunch-time conformance testing

FEATURES

- Comprehensive physical layer test system for CAN (high speed, med. speed, single-wire) and LIN (master, slave, master/slave)
- Built-in Self Test (BIST) for power supply, network bus loads, and oscilloscope,
- Includes measurement equipment, electronic impedance switching, power supply w/crank simulation and ground offset, and harnesses (with pigtails for your ECU connection)
- Mx-PLT™ transform connectors for Mx-Suite™ software included
- Invalid frame insertion
- Variable bus traffic loading

CAN/LIN Physical Layer Tester for Mx-Suite™

MX-PLT™ is hardware to extend **Mx-Suite™**, the industry's leading embedded software test environment. Mx-PLT™ is a cost-effective desktop solution that automatically performs CAN/LIN physical layer tests to OEM conformance specifications. It considerably reduces test time and operational costs when compared with traditional manual testing. By using a trusted tool that conforms to standard test methods and reporting formats, suppliers can quickly prepare their components for production release.



Mx-PLT™ Physical Layer Tester

Mx-PLT™ Specifications

Installation Platform Requirements
• Microsoft™ Windows XP, SP3 • Windows Vista, SP2 • Windows 7
Mx-Suite™ Embedded Software Test Environment Dependency
• Mx-Serve™ 1.0.6 License Server or newer • Mx-Suite™ 3.36 Release or newer
CAN Physical Layer Compliance Testing
• ISO: 11898 • General Motors: GMW14241 • Fiat Chrysler Automobiles: 7-Z0140, 7-Z0146, 7-Z0166 • Toyota: TSC7222G • Nissan: 25953NDS36
LIN Physical Layer Compliance Testing
• SAE J2602/2 (Layer 1) • Ford: 000601.101.AA, 000601.111.AA

COMPONENTS

The Mx-PLT™ is a modular system for measuring CAN/LIN devices during normal usage, abnormal power perturbations, and network stress conditions. Three main components are provided: The Danlaw Mx-PLT™ module provides control, communications and bus loading required by standards. The Picoscope 5243A is used for measurements and capture of waveforms. The Danlaw Ground Offset Battery Simulator module is used to provide the ECU's power and creates the stressing voltages, offset voltages and cranking waveforms required by tests. Danlaw's Mx-Suite software coordinates the operations of the Mx-PLT™. The Mx-PLT™ provides a library of standardized conformance test cases.

Danlaw Mx-PLT™ Hardware Component Key Features

Bus types:	CAN (DWHS, DWMS, DWLSFT, SWLS); LIN
PC interface	USB 2.0 (USB 1.1 compatible)
Operating temp. range	0 °C to 45 °C
Humidity	5 to 80% RH, non–condensing
Power requirements	100-230 V @ 1A

Danlaw Ground Offset Battery Simulator Key Features

Voltage range	0 - 29V
Current	6A continuous; 20A peak (<1sec)
Offset voltage range	0 - +/-4.5V
Resolution	9mv
Accuracy	1%
Slew rate	<1ms for the range.
PC interface	USB 2.0 (USB 1.1 compatible)

PicoScope 5243A Key Features

Bandwidth	100 MHz
Vertical resolution	12 bits
DC accuracy	±1%
Maximum sampling rate	13 MS/s streaming; 125MS/s one shot
PC interface	USB 2.0 (USB 1.1 compatible)

Contact us for more information at:

Danlaw, Inc.
41131 Vincenti Court
Novi, MI 48735 USA
Tel: +1 (248) 476-5571
Fax: +1 (248) 471-4485
sales@danlawinc.com

Eontronix Co., Ltd.
12 Shangdi Information Rd, Ste. C-420
Zhongguancun Development Building
Haidian, Beijing 100085 China
Tel: +86-10-8278-0969
Fax: +86-10-8278-0433
steve.shi@eontronix.com

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	CAN Wires Shorted to 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 implementing Wake-up by CAN
Device Capacitance	Device Input Capacitance	Dominant Input Threshold	Dominant Output
Dominant Output Voltage Levels	Ground Loss on Another ECU	Ground Loss on the ECU Under Test	High Voltage Sensitivity
Input Threshold	Internal Differential Resistor	Internal Resistance	Internal Resistance of CANH and CANL
Interruption of CAN Wires	Local Wake-up	Loss of Ground	Loss of Supply
Low Voltage Sensitivity	Operation at Min Power Supply Voltage	Open Circuit on CANH	Open Circuit on CANL
Operation at Max Power Supply Voltage	Minimum and Maximum Supply Voltage Level for Bus Communication	Output Voltage Levels after Failure Modes Tests - Dominant	Output Voltage Levels after Failure Modes Tests - Recessive
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)	Signal Characteristics (Symmetric 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 – SWLS (Single Wire Low Speed)			
Behavior during Crank	Bus Dominant Output Voltage Level	Bus Recessive or Passive State Low Voltage	Bus Shorted to Battery
Bus Shorted to Ground	Device Capacitance	Device Resistance	Input Threshold HVWU Mode
Input Threshold Normal Mode	Loss of Ground Connection	Loss of Power Supply	Minimum and Maximum Supply Voltage Level for Bus Communication
Signal Characteristics	Signal Rise/Fall Time	Temporary Loss of Power Supply	Test Immunity to Battery Offsets
Test Immunity to Ground Potential Offsets	Tolerance of Bit Timing	Tolerance to Baud Rate Variation	

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	Minimum and Maximum 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 Enable Line In Input Threshold	Comm Enable Line In Input Threshold Hysteresis	Comm Enable Line In Successful Wakeup Detection	Comm Enable 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	Comm En In Comm En Shorted to Battery	Comm En In Loss of Gnd Connection	Comm En In Loss of Power Supply
Comm En Out Comm En Shorted to Battery	Comm En Out Comm En Shorted to Gnd	Comm En Out Loss of Gnd Connection	Comm En Out Loss of Power Supply
Comm Enable Pulsed Wake In Input Threshold	Comm Enable Pulsed Wake In Successful Wakeup Detection	Comm Enable Pulsed Wake In Wakeup Filter Function	Comm Enable Pulsed Wake Out High Level Output Voltage
Comm Enable Pulsed Wake Out Low Level Output Voltage	Comm Enable Pulsed Wake Out Short Circuit Output Current	Comm Enable Pulsed Wake Out Wake Up Pulse Length	

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 Capacitance Measurement	Master Node Bit Time Measurement
Bus Writing Short to Battery Device with TxD/RxD Not Accessible	Master Node Tr-d max and Td-r max Measurement	Master Node Vil Level Measurement and Input Threshold Hysteresis (Vih - Vil)	Master Node Vin Level Measurement
Master Node Voh and Vol Levels Measurement	Operating Range Normal Battery Voltage - Master Device with TxD / RxD Not Accessible	Operating Range Normal Battery Voltage - Slave Device with TxD / RxD Not Accessible	Operating Range Over Voltage - Master Device with TxD / RxD Not Accessible
Operating Range Over Voltage - Slave Device with TxD / RxD Not Accessible	Operating Range Under Voltage - Master Device with TxD / RxD Not Accessible	Operating Range Under Voltage - Slave Device with TxD / RxD Not Accessible	Sample Point Autobaud Max Bit Sample Timing Slave Node
Sample Point Autobaud Min Bit Sample Timing Slave Node	Sample Point Fixed Clock Max Bit Sample Timing Slave Node	Sample Point Fixed Clock Min Bit Sample Timing Slave Node	Slave Node Bit Time Measurement - Autobauding Slave Node
Slave Node Bit Time Measurement - Fixed Clock Slave Node	Slave Node Termination Resistance	Slave Node Tr-d max and Td-r max Measurement	Slave Node Vil Level Measurement and Input Threshold Hysteresis (Vih - Vil)
Slave Node Vin Level Measurement	Slave Node Voh and Vol Levels Measurement		