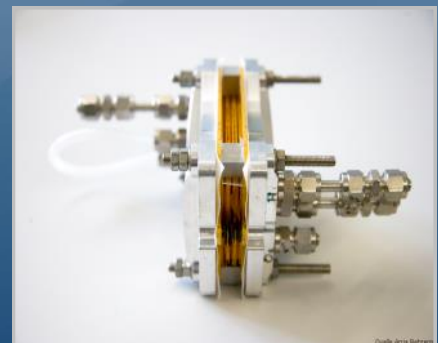


The Electronic Load



Multichannel Loads, PMLI Series

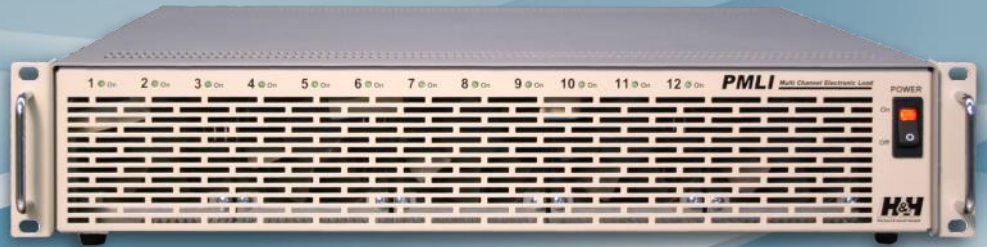
SCPI
37 Commands



Interface overview

RS-232	X
USB	/
GPIB	X
LAN	O
System bus	X
Analog	X
Analog isolated	/

X Standard O Option / not available



- Configurable multi-channel load
- Up to 12 channels in 19" -2HU
- Tailored configurations possible with modules in 3 voltage- and 4 power classes
- 150 W - 300 W - 450 W - 600 W modules
- Voltages 60 V - 120 V - 240 V
- Currents from 4.5 A to 80 A
- Current, voltage, resistance, power mode

- Dynamic loads
- 1,800 W total power
- SCPI programming with measurement function
- Full electronic protection
- Analog measurement outputs for voltage and current
- Analog control input
- RS-232 and GPIB interface with software tools

Configuration

The PMLI electronic multi-channel load has up to 12 slots for load modules.

150 W, 300 W, 450 W or 600 W load modules are available.

Depending on power, a module occupies one (150 W), two (300 W), three (450 W) or four slots (600 W).

Load Modules

The modules are available in three different voltages 60 V, 120 V and 240 V and for currents of 4.5 A to 80 A.

Various loads can be configured, e.g.:

1 x 600 W + 1 x 450 W + 2 x 300 W + 1 x 150 W

The total power is max. 1,800 W.

The loads can therefore be easily configured to test units

with multiple outputs.

The load inputs are galvanically separated.

Very simple systems can therefore be specially configured to requirements with multi-channel Burn-In equipment.

Functions

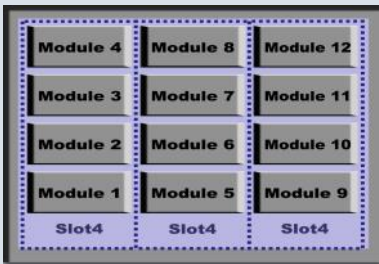
The following operating modes are possible:

- Current mode ¹⁾
- Voltage mode ²⁾
- Resistance mode ²⁾
- Power mode ²⁾
- Dynamic mode with 2 presets

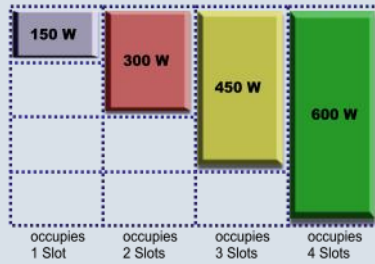
An adjustable trigger voltage enables current to flow when exceeded. Voltage and current measurement functions are available.

Operating Modes and

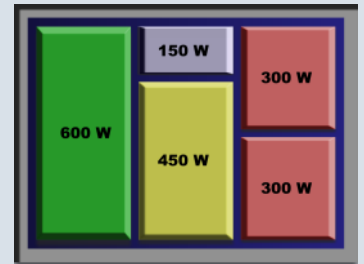
Configuration



Max. 3x4 available modules per device



The modules occupy 1-4 slots depending on power



E.g 5-channel ³⁾

1) Hardware-controlled with fast control time
2) Software-controlled with programmable control parameters

3) Modules with 300 W, 450 W and 600 W can only be inserted in the same column of slots.

H&H
PL
ZS
ZSLC Water-cooled
ZSLV Low Voltage
PMLI Multi-channel
ZSAC AC
NL Source-Sink
Accessories
Application Notes
Software
GTC



Available Load Modules

Modules	150 W	300 W	450 W	600 W
60 V	M15-06 60V/20A	M30-06 60V/40A	M45-06 60V/60A	M60-06 60V/80A
120 V	M15-12 120V/10A	M30-12 120V/20A	M45-12 120V/30A	M60-12 120V/40A
240 V	M15-24 240V/4,5A	M30-24 240V/9A	M45-24 240V/13,5A	M60-24 240V/18A

Load Modules

Load modules are available in three voltage categories and four power classes.

Load Connections

The load inputs are connected to jack-in terminal strips. All load inputs are galvanically separated.

Analog Measurement Outputs, Analog Control Input

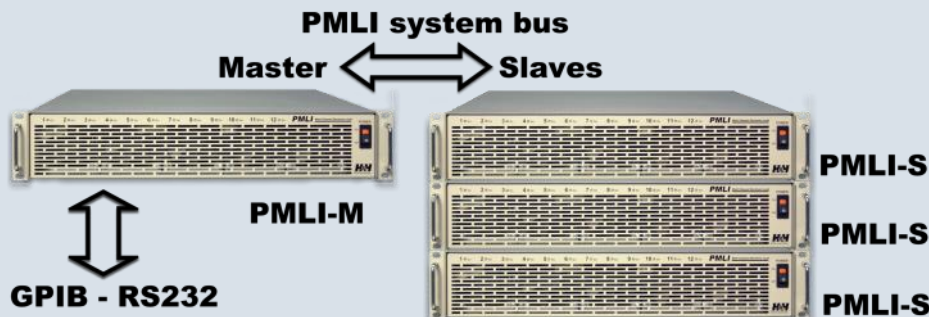
For each load module, analog measurement outputs 0 ... 10 V for voltage and load current are

available.

Via an analog control input the load current can be additionally set by 0 ... 10 V.

Cooling

The air supply from the front panel to the back panel enables the assembly of compact rack systems with no gaps. The temperature-controlled fan control provides a pleasant operating noise.



Programming

Programming takes place in SCPI syntax. All channels can be addressed individually, jointly or in groups.

Current LabVIEW® drivers and tools can be downloaded from our website.



Devices and Interfaces

are available in the following versions:

PMLI-M Master device with GPIB + RS-232 interface and PMLI system bus for connection of up to 8 slave devices.

PMLI-S Slave device with PMLI system bus for operation on a master device and with an output for a further slave device.

SLOT4 Empty cooler module (without load modules) with 4 free slots. (1x, 2x or 3x required per device depending on channels).

PMLI05 Option external LAN-RS-232 adapter

H&H
PL
ZS
ZSLC Water-cooled
ZSLV Low Voltage
PMLI Multi-channel
ZSAC AC
NL Source-Sink
Accessories
Application Notes
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GTC

Type Overview

Model order number	M15-06	M15-12	M15-24	M30-06	M30-12	M30-24	M45-06	M45-12	M45-24	M60-06	M60-12	M60-24
Power	150 W	150 W	150 W	300 W	300 W	300 W	450 W	450 W	450 W	600 W	600 W	600 W
Voltage	60 V	120 V	240 V	60 V	120 V	240 V	60 V	120 V	240 V	60 V	120 V	240 V
Current	20 A	10 A	4.5 A	40 A	20 A	9 A	60 A	30 A	13.5 A	80 A	40 A	18 A
Size	1 Slot	1 Slot	1 Slot	2 Slots	2 Slots	2 Slots	3 Slots	3 Slots	3 Slots	4 Slots	4 Slots	4 Slots

PMLI Software Tools

TAT Test Automation Tool

The PMLI Test Automation Tool simulates the timed process control of several individual devices.

Typical use is to simulate all consumers in a vehicle.

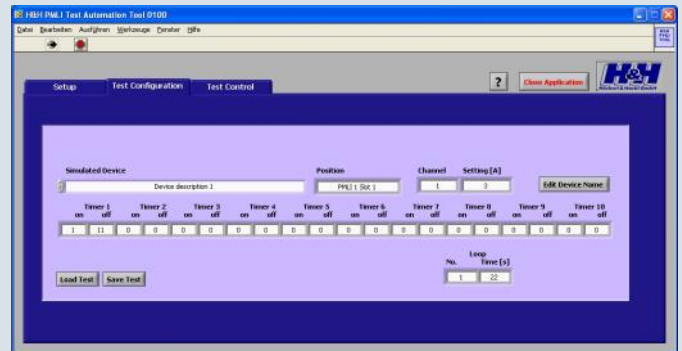
Each channel of the PMLI is assigned a device with its typical current consumption (wind-screen wiper, window winder etc.).

There are 10 programmable timers for each channel. Test routines can be carried out individually or in loops.

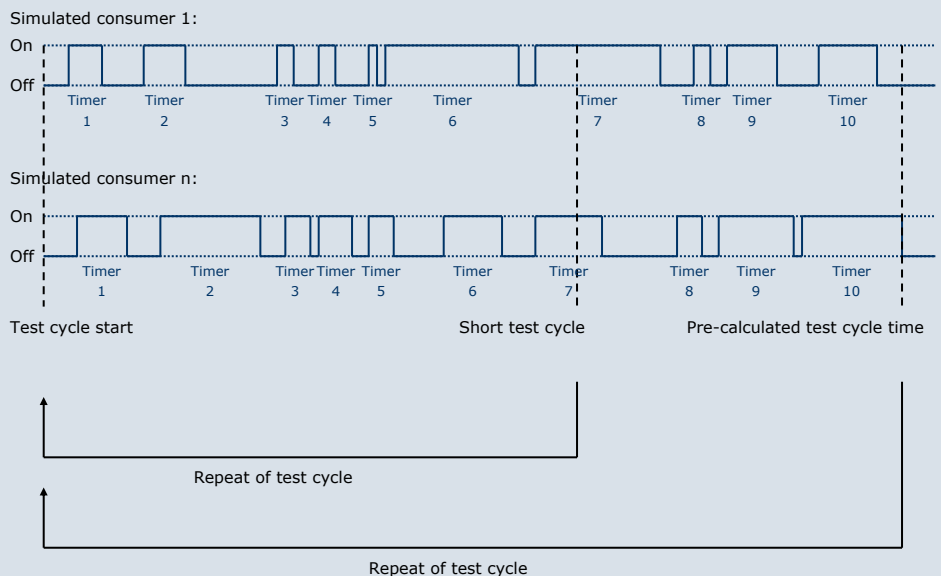
PMLI Control Tool

The PMLI Control Tool lets you control up to 120 channels in 40 PMLI devices.

The tool enables individual channel setting, voltage and current display and measured data recording.



Customer application:
Vehicle simulation 132 channel



Technical Data PMLI Series

Input	
Input voltage	See type overview
Input resistance	>50 kΩ when load input is off
Input capacity	Approx. 1 μF / 150 W
Parallel operation	Up to 3 channels can be connected in parallel
Current range	See type overview
Current rise and fall time ¹⁾	300 μs (10 % ...90 % Inom)
Minimum voltage	Vmin 1.4 V at rated current, including linear derating of the current
Permissible operating voltages	Negative load input to case: max. 100 V Load input to load input: max. 100 V
Load connections	Jack-in connections for 4 mm ² , touch-protected (several pins have to be connected for currents greater than 20 A)
Sense connections	available on the Analog I/O Interface
Protective devices	Over-current and power protection Over-voltage protection up to 120 % of rated voltage Reverse polarity protection with diode up to rated current Over-temperature cut-off Transient protection
Rated power	Up to T _A = 21 °C
Derating	-1.2 % / °C for T _A > 21 °C
Accuracy of setting	
	of the setting value of the corresponding range
Current	±0.25 % ±0.15 %
Voltage Resistance Power	SW control with adjustable control parameters Accuracy depends on accuracy of the measurement function for voltage and current and the accuracy of the current setting
Trigger voltage	±1 % ±0.15 %
Resolution of settings	12 Bit
Accuracy of measurement	
	of the measured value (real value) of the corresponding range
Voltage	±0.2 % ±0.1 %
Current	±0.25 % ±0.1 %
Resolution of measurements	12 Bit
Sampling rate	300 ms
Dynamics	
2 programmable currents and times	
Setting range	10 ms ... 60 s
Accuracy of time setting	±2 ms

1) Rise and fall times are defined as 10 % ... 90 % and 90 % ... 10 % of the

maximum current. (current mode FAST, tolerance ±20 %)

Accuracy of analog control 0 ... 10V for current		
	of the setting value	of the corresponding range
Current	±0.25 %	±0.15 %
Input resistance > 20 kΩ GND max. ±2 V with respect to negative load input		
Accuracy of analog measurement outputs 0 ... 10 V for current, voltage		
	of analog signal of real value	offset voltage
Voltage	±0.5 %	±30 mV
Current	±0.5 %	±30 mV
GND max. ±2 V with respect to negative load input Minimum load capacity 2kΩ		

Operating conditions	
Operating temperature	5 °C ... 40 °C
Cooling	2-phase air-cooling, temperature-controlled Air inlet via the front panel Air outlet via the back panel for gap-free 19" rack installation
Noise	69 dBA (measured from a distance of 1m)
Supply voltage	115/230 V ~ ±10 %, 50 ... 60 Hz switchable Power consumption approx. 90 VA
Dimensions	19" - 2 HU, 500 x 88 x 390 mm (without handles and mounting bracket)
Weight	max. 18.3 kg, depending on equipment
Color: Front panel Side panels, top	RAL7032 (pebble grey) RAL7037 (stone grey)
Electrical safety	DIN EN 61010-1
EMC, CE marking	DIN EN 55011 DIN EN 61326-1 DIN EN 61000-3-2 DIN EN 61000-3-3
Scope of supply	incl. 19" mounting bracket, RS-232 cable
Warranty	2 years

Order details	
PMLI-M	PMLI Master device with GPIB + RS-232 + PMLI system bus interface
PMLI-S	PMLI Slave device with system bus interface for connection to Master device and for connection to other Slave devices
SLOT4	Cooler module, empty with 4 slots (depending on use, 1x, 2x or 3x required per PMLI device)
Mxx-xx	Load module (see type overview, top). Unless otherwise indicated the modules are mounted in the device in the order specified in the order.
PMLI05	Optional external LAN-RS-232 adapter

Subject to technical modifications

H&H
PL
ZS
ZSLC Water-cooled
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ZSAC AC
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