# PULSELab Pulse measurement software

PULSELab is a software application designed for the measurement of electromagnetic field, current and voltage pulses. PULSELab has been especially developed to help test operators during complex EMP or HPEM immunity tests. PULSELab enables, however, a wider range of applications in the pulse measurement domains.

PULSELab controls the measurement oscilloscope, collects measured data, and processes the data for display and automatic report generation.
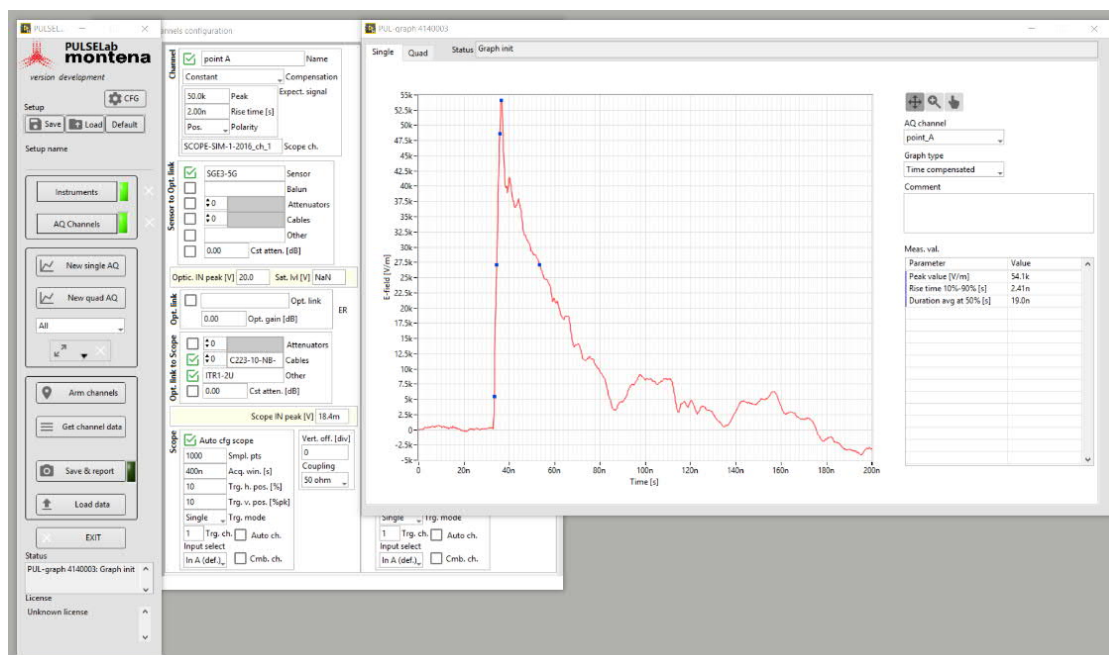
PULSELab improves the measurement accuracy by considering the transfer function of all devices used in the measurement chain (sensor, attenuators, cables, fibre optic link, etc.) and compensates the signals received by the oscilloscope to display the measured value in its own units. The correction factor of each component can be either a constant value or a frequency dependant transfer function.

The measured pulses are displayed with their main characteristics, such as the pulse peak amplitude, the rise time, the fall time, the duration, and the peak derivative.

The operator has the possibility to easily generate reports and include test information such as EUT name, test date, operator name, location, comments, etc.

The control of the measurement equipment is performed through the available interfaces: USB and Ethernet.

PULSELab can control multiple oscilloscopes simultaneously. The software application is compatible with most of the popular recent models of oscilloscopes. Contact us for the latest compatibility list.

Oscilloscope configuration

All needed oscilloscope settings to measure the pulse waveform (vertical and horizontal ranges, trigger levels, number of points, time window, etc.) can be set from the PULSELab application software. Nevertheless, the operator has the possibility to manually set these parameters on the oscilloscope, and PULSELab will read them back from the scope.

Data correction/compensation

PULSELab combines the transfer function of each element of the measurement chain with the FFT of the oscilloscope raw data.
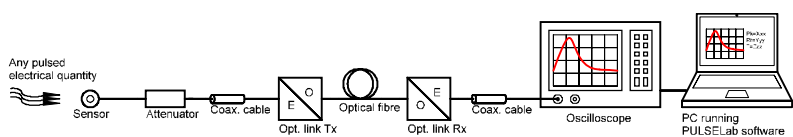
The result is then converted back to the time domain by inverse fast Fourier transform (IFFT). Raw and compensated data can be displayed in both, time and frequency domains, and exported to a text file.
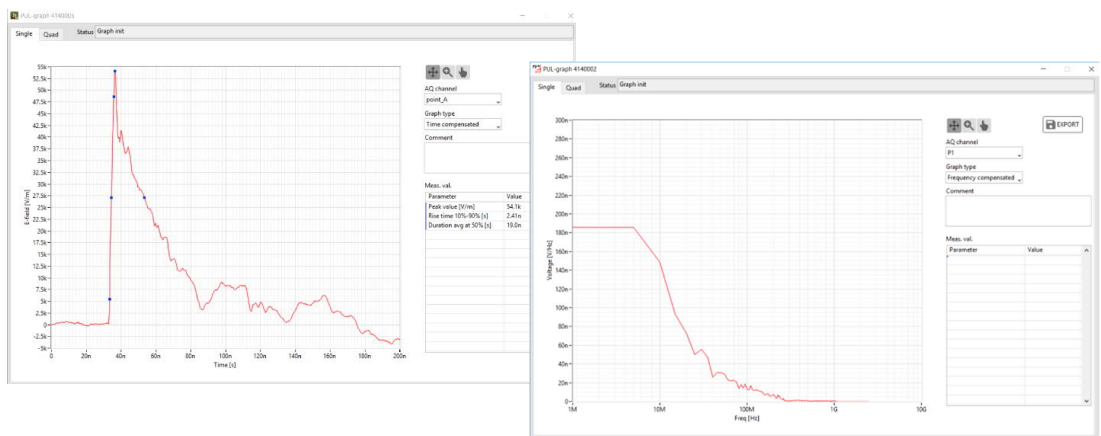
The transfer functions of all montena sensors and some other pulse measurement devices are preconfigured. The user has the possibility to add and edit additional components.

Time delay compensation

When measuring fast pulses at different locations, with different cable or fibre optic lengths, the measurement will be time-shifted because of the pulse propagation time and of the delays induced by cables, fibre optics and electronics. The operator has the possibility to synchronise the display of each channel, based on the pulse peak or other pulse parameters.

Interface to MOL2000T

Montena MOL2000T is a broadband fibre optic link system with variable remote-controlled transmission gain. PULSELab interfaces with the MOL2000T links, read and set the transmission gain to avoid saturations, and ensure the best usage of the dynamic range of the measurement devices.

Save and recall measurement setups

The configuration and setup of the measurement channels, including the MOL2000T fibre optic links and the oscilloscopes configurations can be saved as setup files and reloaded.

SPECIFICATIONS

Type	PULSELab software application
Computer hardware requirements	1 x USB port and /or 1x LAN port Screen resolution of at least 1920 x 1080
Computer software requirements	PC with Microsoft Windows 8/10
Number of channels	There is no limitation of the number of measurement channels and of the number of connected oscilloscopes. Only the communication speed and data processing time may somehow limit the scalability.
Supported sensors	Current pulses with current probes / current transformers Current pulses with Rogowski coils Voltage pulses with voltage probes Voltage fast pulses with V-Dot sensors Electromagnetic field pulses with B-Dot and D-Dot sensors Etc.
Preconfigured devices responses	Montena B-dot free-space and ground plane field sensors Montena D-dot free-space and ground plane field sensors Prodyn B-24, B-90 field sensors Montena baluns (used with free space field sensors) Montena V-dot high voltage dividers Magnelab current transformers Pearson current monitor 3025 Montena MOL fibre optic transmission links Montena ITR passive integrators Montena semi-rigid coaxial cable assemblies Other devices and transfer functions can be added by the user.
Measured pulse parameters	[Time domain] [Frequency domain] Peak value Max Rise time 10% - 90% Max on graph Duration at 50% Number of samples Max pulse derivative Delta freq Peak on graph Freq @ max Peak rate of rise BW @ level Root action BW @ level on graph Rectified total impulse Etc. Time @ peak Sampling rate Number of samples Delta t
Compatible oscilloscopes (NI driver ref.)	Teledyne Lecroy Wave Series Tektronix MDO MSO DPO 2000 3000 4000 Series, MSO5X Series, 7000 Series Rohde & Schwarz RTO1000 RTO2000 RTE1000 RTM3000 Series Keysight 2000 3000 4000 X-Series, 90000 If an oscilloscope series is not listed, please contact montena.

Licences and ordering information

PULSELab licences are lifetime fixed licences. One licence per computer is required. The licence activation is semi-automatic during the software installation.

TYPE	DESCRIPTION
PULSELab	Pulse measurement and processing software application, Lifetime license for installation on one PC.