intelliSENS DAQ

8 Channel, 16-bit, Simultaneous Sampling USB DAQ for Power Electronics Applications

DESIGNED FOR RESEARCH & EDUCATION

intelliSENS tools offer a low cost test and measurement solution for power electronics applications, providing real-time monitoring, high accuracy measurements and advance power quality and harmonic analysis, without the use of expensive oscilloscopes, power analyzers and recorders. Moreover, a free application software enables recording of experimental data, while retaining complete analysis capabilities for sharing and performing complex analysis, such as, fault condition behavior, load transient response and control system stability. Thus, empowering students, researchers and professors with a powerful, user friendly and cost efficient alternative.

OVERVIEW

The intelliSENS DAQ is a simultaneous sampling 8 Channel USB DAQ device with high accuracy 16-bit ADC and a sampling rate of 250kS/CH/s with a maximum aggregated transfer rate of up to 1MSps. It supports external triggering that enables accurate acquisition control, which is critical for analyzing power electronics systems at specific events and conditions. The intelliSENS DAQ is supported by intelliSENS software; an application software designed specifically for power electronics applications. The software includes oscilloscope with wide array of measurements, math functions and FFT analysis. Furthermore, the software can perform advanced power quality and harmonic analysis, hence, providing a low cost alternative to power analyzers. The measured data can be recorded and shared while retaining complete analysis capabilities. Moreover, multiple intelliSENS tools can be synchronized using intelliSync to achieve up to 32 simultaneous input channels. Thus, enabling a scalable DAQ solution.

The intelliSENS DAQ can also be used to Analyze Fault Condition Behavior, Load Transient Response & Control System Stability, as well as, Real-Time Monitoring of Power Electronics Hardware in Development Stage. Furthermore, when combined with USM-3IV, it provides a Complete Measurement Solution for Power Electronics Labs in universities and research institutions.

The intelliSENS DAQ can be ordered, either as a standalone product or, as an OEM version without casing and IDC connector for on-board DAQ solutions.

8-Ch Simultaneous Data Acquisition

For accurate instantaneous power measurements, voltages and currents need to be sampled simultaneously. Additionally, higher number of channels are particularly helpful for complete monitoring of power electronics systems. Low budget oscilloscopes provide only 4 channels, which are not enough for 3 phase measurements and monitoring. intelliSENS DAQ can measure 8 Channels at the same time, hence, making it ideal for multi-phase power measurements and hardware monitoring.

High Accuracy Measurements using 16-bit ADC

Most low budget oscilloscopes use 8-bit ADCs. Due to lower resolution of these scopes, measurements have large digitization error making vertical measurement readings such as RMS, AVG and PEAK inaccurate. IntelliSENS DAQ uses a 16-bit ADC, thus, resulting in very accurate RMS and other measurements.

External Triggering for Accurate Measurements

For certain power electronics applications, measurements are required at a specific point of the PWM cycle or a specific event, such as, peak inductor current. Using external trigger, ADC acquisition can be triggered by the controller, hence, providing flexibility for application specific requirements to be fulfilled with ease.

Measure up-to 32 Channels through intelliSync

Many power electronics applications require extended number of channels to capture the complete picture during operation. Up-to 4 intelliSENS DAQs can be synchronized using intelliSync to monitor a maximum of 32 inputs. Therefore, providing a scalable solution at low cost.

APPLICATIONS

- ✓ Power Electronics Hardware Monitoring
- ✓ 3 Phase Power Quality & Harmonics Analysis
- ✓ Fault Condition Behavior Monitoring
- ✓ Load Transient Response Analysis
- ✓ Control System Stability Measurement
- ✓ Complete Measurement Solution for Power Electronics Lab with USM-3IV

KEY FEATURES

- ✓ 8 Channels, Simultaneous Sampling
- ✓ 250kS/CH/s with Aggregated 1MSps
- ✓ ±10V Inputs @ 16-bit Resolution
- ✓ External Acquisition Triggering
- ✓ Multi-Device Synchronization
- ✓ Free intelliSENS Application Software
- ✓ Oscilloscope Software and Measurements
- ✓ Fast Fourier Transform (FFT) Analysis
- ✓ Power Quality & Harmonics Analysis
- ✓ Interactive Recordings

COMPLIANCE

- ✓ CE & FCC (Pending)

OPTIONS

- ✓ Standard
- ✓ OEM (Without Casing, Unshrouded Header)

SOFTWARE SUPPORT

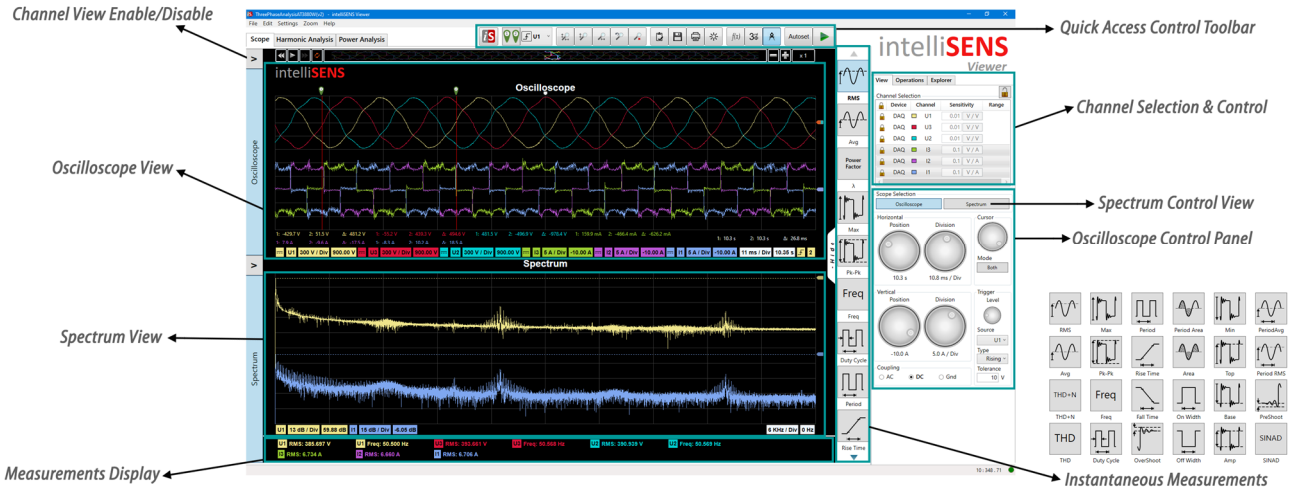


Figure 1: intelliSENS Software GUI Overview

intelliSENS Software Overview

The intelliSENS DAQ is supported by intelliSENS software; an application software designed specifically for power electronics applications. The software includes oscilloscope with wide array of measurements, math functions and FFT analysis. In addition, advanced power quality and harmonic analysis can be performed, thus, replacing traditional power analyzers. Moreover, interactive recordings can be saved while retaining complete analysis capability for result sharing and future use. The software can also interface to multiple intelliSENS tools at the same time using intelliSync, which extends the number of simultaneous measurements. Consequently, providing a scalable solution for monitoring and testing of power electronics systems of different complexities.

Oscilloscope Software and Measurements

IntelliSENS comes with full fledge oscilloscope functionalities, including a wide array of measurements. In addition, advance math equations can be added to the waveform to provide more versatility. Furthermore, adjustable trigger and fluid control makes the use of intelliSENS oscilloscope much more user-friendly than traditional oscilloscopes.

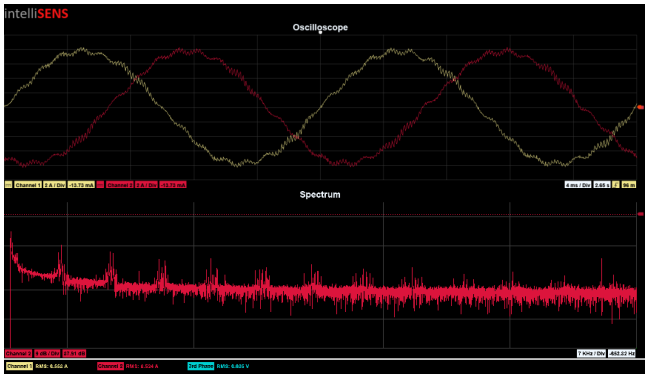


Figure 2: VFD Output Current Harmonics

Fast Fourier Transform (FFT) Spectrum Analysis

IntelliSENS software can perform FFT analysis of the input signals, a feature only available in high end oscilloscopes and spectrum analyzers. Thus, making it accessible to students and researchers working on low budget. Furthermore, a dynamic range of 96 dB, which is much more than the usual 48 dB in traditional Digital Storage oscilloscopes (DSOs) with FFT, provides a robust and accurate depiction of different harmonics in the frequency domain.

Advanced Power Quality and Harmonic Analysis

Power electronics designers must comply with standards for parameters, like Power Factor (PF) and Total Harmonic Distortion (THD), while designing power electronics converters and inverters. These measurements can only be performed by power analyzers, which are very expensive. intelliSENS software can perform all these measurements and displays them in a format similar to power analyzers, making power quality and harmonic analysis available for students and researchers alike.

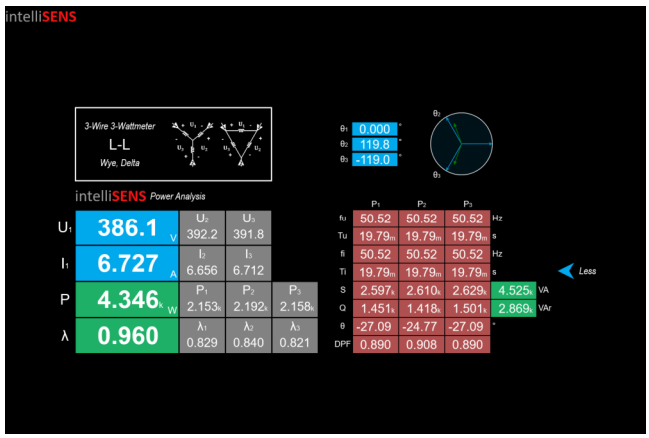


Figure 3: Power Quality Analysis of 3 Phase Power Supply

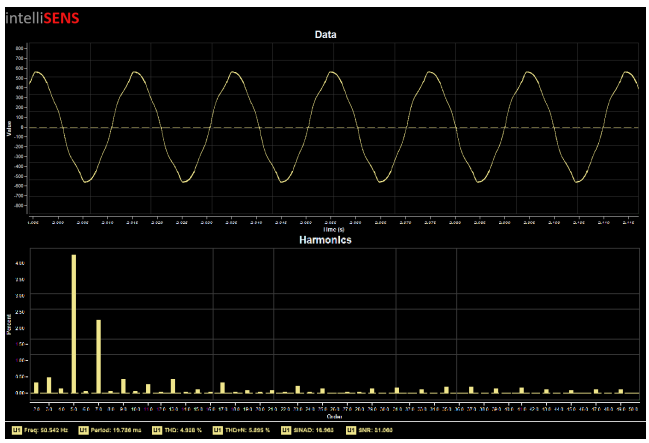


Figure 4: Grid Voltage THD Measurement

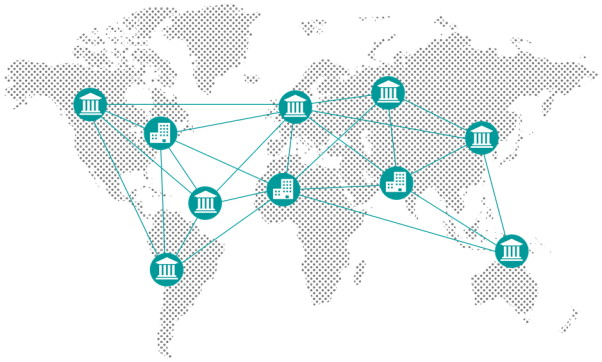
SOFTWARE SUPPORT CONT.

Interactive Recording of Experimental Data

The main advantage of intelliSENS software is the ability to record experimental data, and share those interactive recordings with peers and colleagues far away, thus, improving teamwork phenomenally. On top of that, there is no limit to how long the real-time data can be recorded and the application software is completely free of cost. Consequently, introducing a new way for measuring and sharing data between students and researchers in the field of power electronics.

Retained Complete Analysis Capability of Recordings

The recorded data files retain complete analysis capabilities. In other words, when a saved file is viewed, any information from the real-time analysis can be extracted again and further analysis can be made on the very same data that may have not been performed before. Therefore, enabling collaborative work between team members across different countries and institutions.



For more information about intelliSENS software, please visit our website www.taraztechnologies.com.

APPLICATION EXAMPLES

Analyze Fault Condition Behavior, Load Transient Response & Control System Stability

Power electronics researchers have to monitor and analyze events, such as, fault condition behavior, load transient response and control system stability. These events are hard to monitor with oscilloscopes, whereas, Recorders are inaccessible due to their high cost. The intelliSENS DAQ provides a low cost solution for researchers and R&D engineers to monitor, analyze and record these events for future reference.

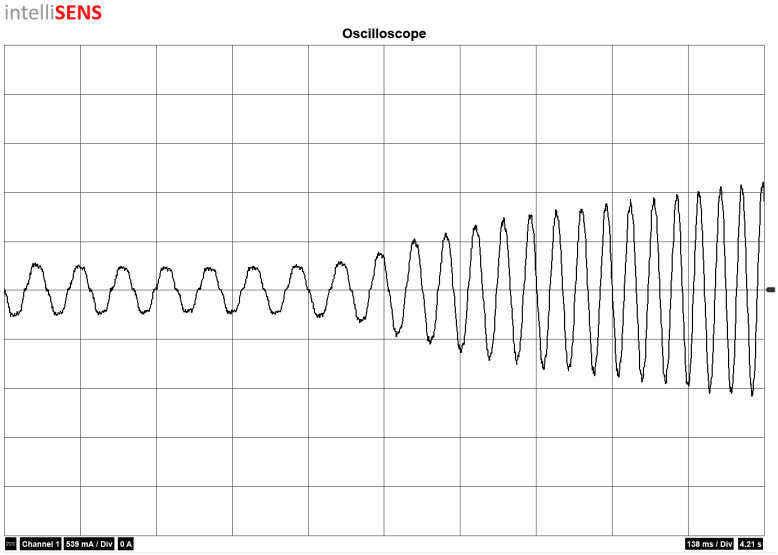


Figure 5: Motor Transient Response during Acceleration

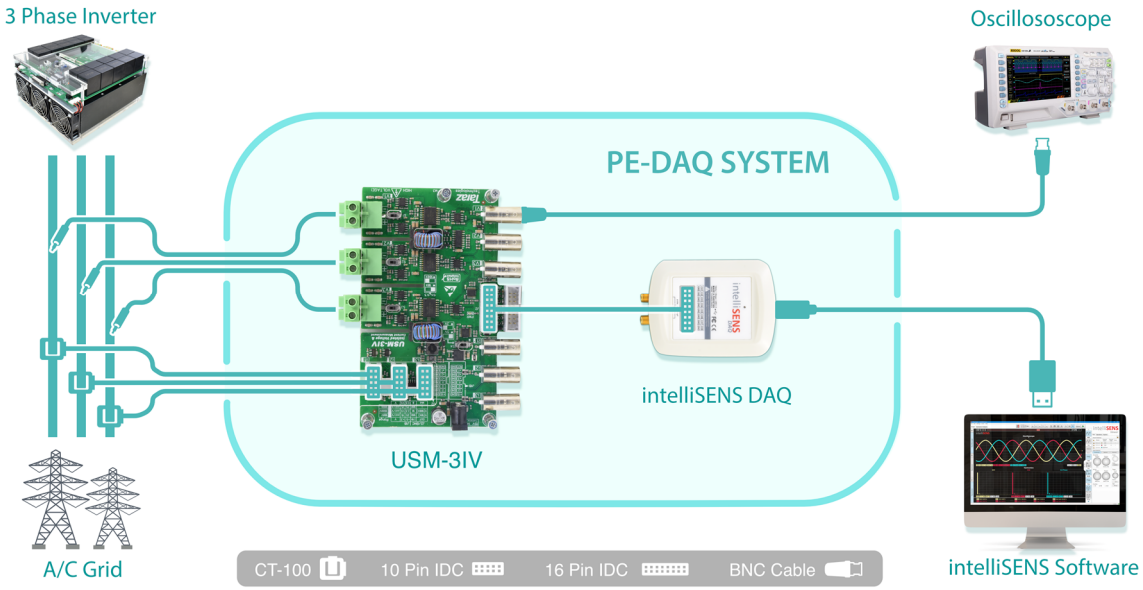
Sync with Third-Party Differential Voltage & Current Probes through intelliSENS Bridge

intelliSENS Bridge interface's 3rd party Differential Voltage & Current probes to intelliSENS software, which can be viewed alongside measurements obtained from intelliSENS DAQ, giving the user flexibility to use available probes and access powerful features of the intelliSENS software.

APPLICATION EXAMPLES CONT.

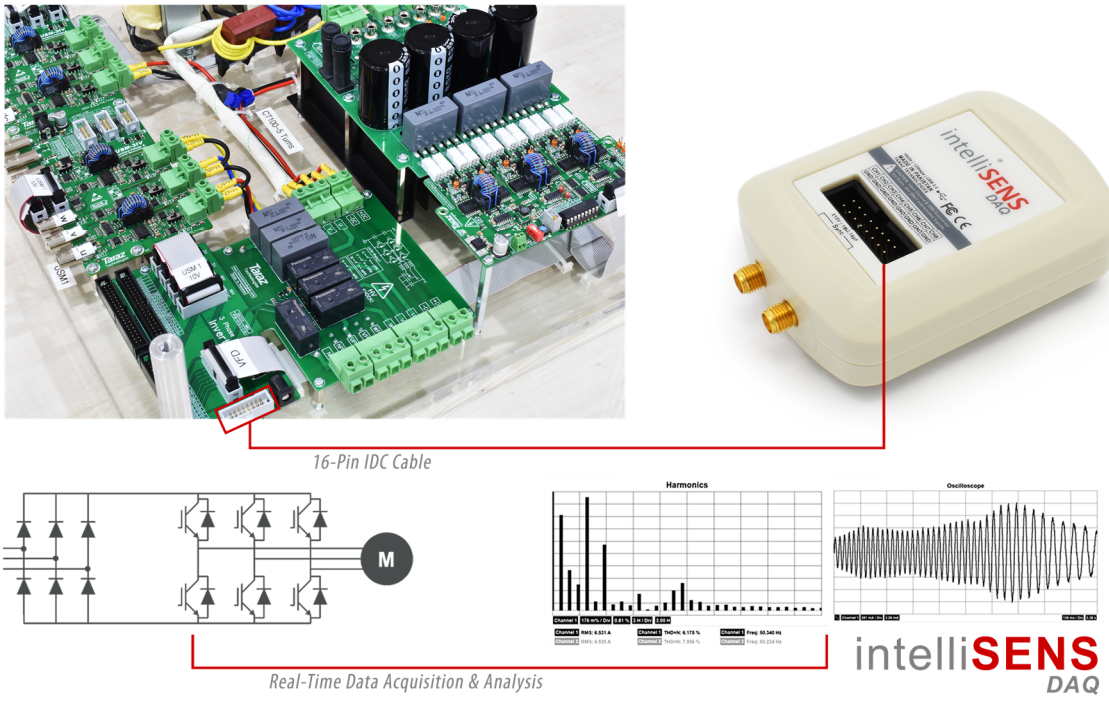
Complete Measurement Solution for Power Electronics Lab with USM-3IV

Power electronics measurement and test equipment, ranging from differential voltage probes and current probes to oscilloscopes and power analyzers, cost thousands of dollars to set up. For typical applications, this setup can be easily replaced by intelliSENS DAQ and USM-3IV, which has 3 differential voltage sensors (±1000V, 100kHz) and 3 current sensors (±100A, 200kHz) with complete galvanic isolation. Therefore, providing a low cost and compact solution for power electronics labs in universities and research institutions.

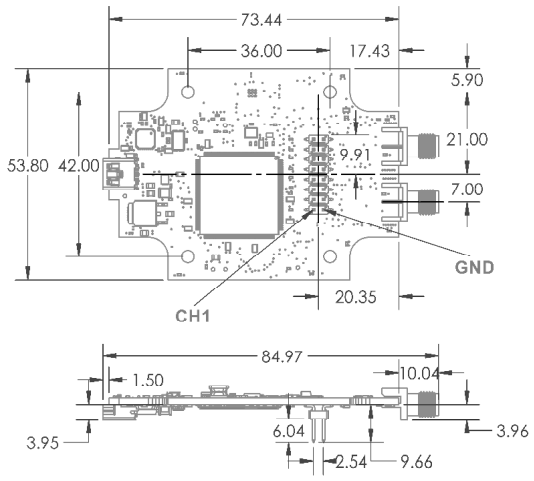


Real-Time Monitoring of Power Electronics Hardware in Development Stage

By simply adding an IDC connector in the hardware design stage, real-time data of the power electronics hardware can be monitored using the existing feedback sensors of the controller. Thus, greatly reducing wiring effort and cost of probes & oscilloscopes used for testing and validation.



MECHANICAL (OEM VERSION)



SPECIFICATIONS

Parameter	Specifications
Channels	8 Channels, Simultaneous Sampling
Configuration	Single Ended
Sampling Rate	125kS/s @ 8 Channels 250KS/s @ 4 Channels
ADC Resolution	16-bits
External Trigger	Yes
External Trigger Voltage	3.3~5 V
Max Device Sync	4
Input Range	±10 V
Input Impedance	1 MΩ | 16pF
Input Connector	16-pin IDC
Absolute Accuracy	±0.15% of Full Scale Range (FSR)
Baseline Noise	0.2 LSB (RMS)
ENOB	14.4
Crosstalk Rejection	-50 dB
Temperature Range	0°C to 60°C
Power Supply	5V, 0.45A (From USB)
PC Connectivity	USB 2.0 HS (Compatible with USB 1.1)
Operating System	Windows 7, 8, 8.1, 10
Device Drivers	Included in intelliSENS Software
Dimensions	85 mm x 60 mm x 25 mm (Standard) 85 mm x 53.8 mm x 10 mm (OEM)
Weight	66 g

WARRANTY

This product will be free from defects in material and workmanship for one year from the date of purchase. This warranty does not cover damage from accident, neglect, misuse, alteration, contamination, or abnormal conditions of operation or handling. Resellers are not authorized to extend any other warranty on Taraz Technologies behalf.

SAFETY NOTICE!

ATTENTION PLEASE! THIS DEVICE IS ESD SENSITIVE AND NEEDS TO BE HANDLED WITH CARE. HIGH VOLTAGE CONDITION MAY OCCUR DURING OPERATION OF THE DEVICE, AND HENCE USER IS SOLELY RESPONSIBLE OF EQUIPMENT AND PERSONNEL SAFETY. TARAZ TECHNOLOGIES SHALL NOT BE HOLD LIABLE FOR ANY DAMAGE TO PERSONNEL AND/OR PROPERTIES AS A RESULT OF USING THIS DEVICE. USER MUST TAKE ADEQUATE STEPS TO ENSURE ELECTRICAL AND MECHANICAL SAFETLY OF THE DEVICE IN USE.

WARNING AND DISCLAIMER!

ATTENTION PLEASE! THE INFORMATION HEREIN IS GIVEN TO DESCRIBE CERTAIN COMPONENTS AND SHALL NOT BE CONSIDERED AS A GUARANTEE OF CHARACTERISTICS. TERMS OF DELIVERY AND RIGHTS TO TECHNICAL CHANGE RESERVED. WE HEREBY DISCLAIM ANY AND ALL WARRANTIES, INCLUDING BUT NOT LIMITED TO WARRANTIES OF NON-INFRINGEMENT, REGARDING CIRCUITS, DESCRIPTIONS AND CHARTS STATED HEREIN. CUSTOMER IS SOLELY RESPONSIBLE OF PROPER AND LEGAL USE OF ALL PRODUCTS OFFERED BY TARAZ TECHNOLOGIES.

For Further information or purchasing, please go to our web site:
www.taraztechnologies.com
Address: 21-X, 2nd Floor, DHA Business Avenue, DHA Phase 1, Bahria Expressway, Rawalpindi 46000, Pakistan
Phone: +92 (51) 5400335
Fax: +92 (51) 5400155
E-Mail: info@taraztechnologies.com

Think Beautifully®
Taraz
TECHNOLOGIES