



# Power of One

## IS8000 Integrated Software Platform

Precision Making

Bulletin IS8000-01EN



**For over 100 years, Yokogawa has built a reputation on understanding the needs of researchers, scientists, and engineers across the globe. To ensure reliable and trustworthy results, these professionals require accuracy, stability, and reproducibility from their measurement system.**

**The IS8000 software platform is an integrated solution that accelerates engineering workflow. It is a revolutionary software that tightly integrates the timing, control, and data collection from multiple instruments, creating a comprehensive measurement suite that delivers confidence, efficiency, and unity.**

### **Unity**

Unification of Yokogawa instruments ensures measurement coherency during the product development process and allows for effortless data sharing throughout an organization. IS8000 makes it easier to debug and analyze data by viewing all measurements under one unified display.

### **Efficiency**

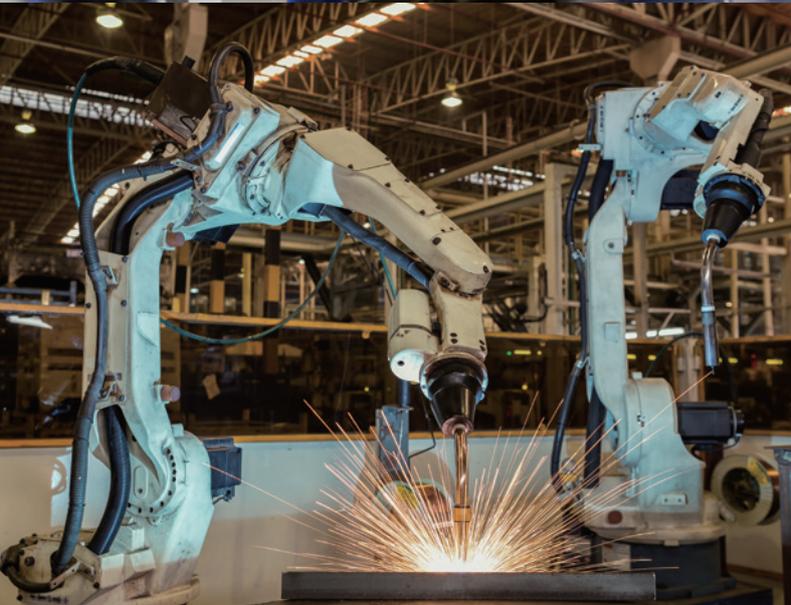
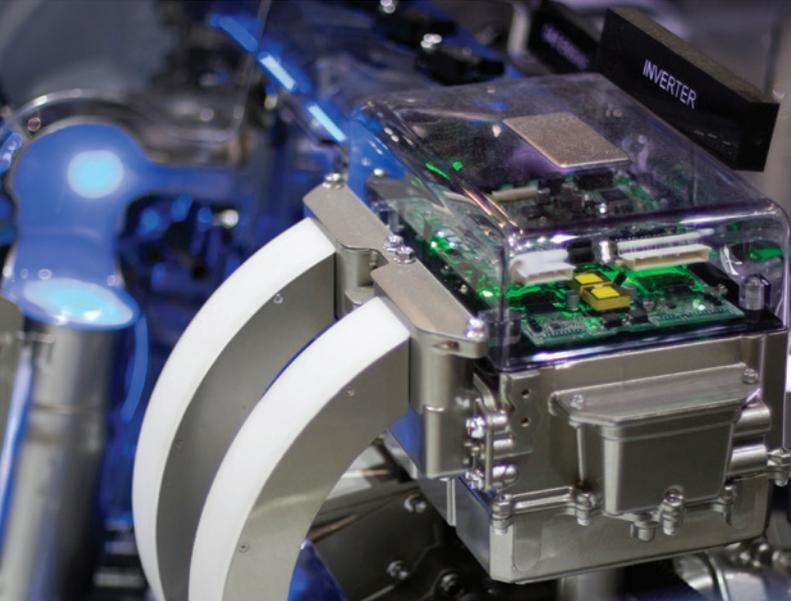
IS8000 allows you to streamline the product development process by spending less time developing testing systems and more time collecting valuable test data. With one software to setup and control all the instruments you need, you can start measuring data faster and more efficiently.

### **Synchronization**

Storing data in one format and location has never been simpler. IS8000 gives you data you can trust by synchronizing measurements across multiple instruments utilizing an IEEE1588 time base.

### **Scalability**

With today's fast evolving technology, a software that has the ability to expand is crucial. As your needs evolve, so can IS8000. Analyze your data deeper with add-on software packages.



# Accelerate Your Engineering Workflow



\*This image has been partially processed.

## An Intuitive User Interface

### 1 Ribbon menu

It change depending on which window is active.

### 2 Numeric display

Numerical data from WT5000 power analyzer can be displayed here.

### 3 Trend and waveform window

Acquired data from single or multiple devices is displayed simultaneously.

### 4 Zoom/Pan window

Up to four zoom regions can be defined and displayed simultaneously.

### 5 Remote control interface

It works with WT5000, DL350/850/950 and DLM3000/5000 series.

### 6 Recording file list

Name, creation date and file size of the acquired data files are displayed here.

### 7 FFT Analysis (MH1 option required)

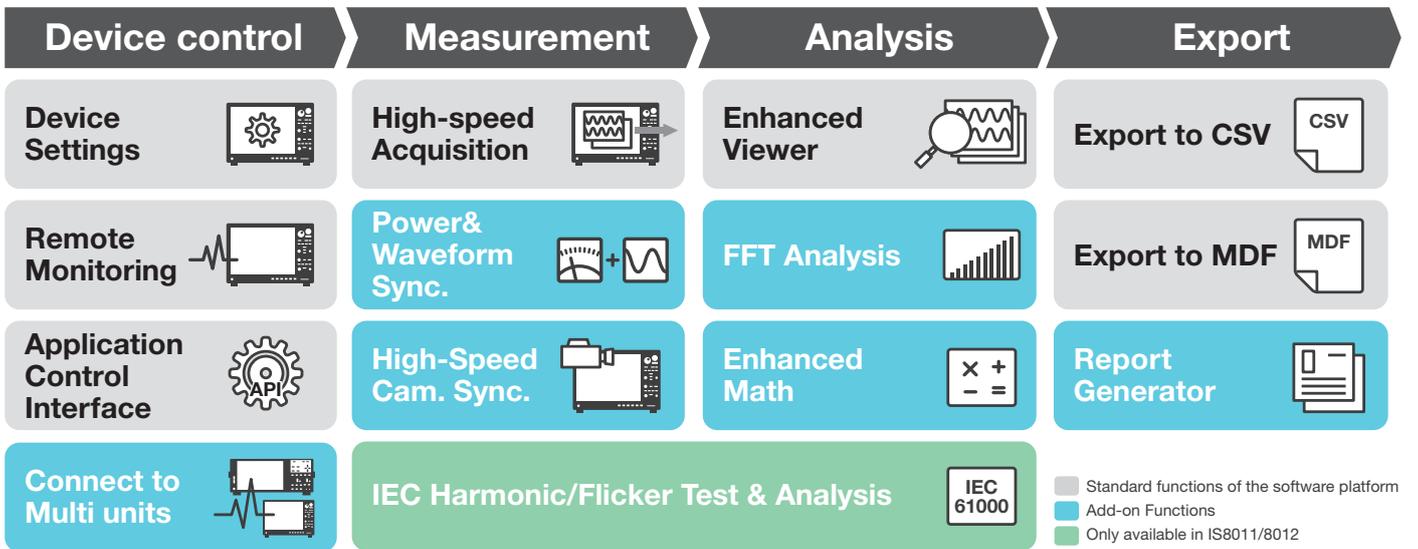
Measure up to 16 FFT processes at same time.

### 8 High-speed camera images (FS1 option required)

IS8000 can synchronize high-speed video with acquired waveforms.

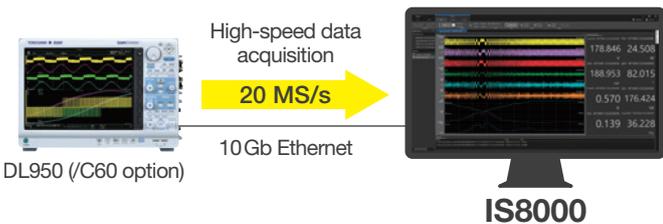
## The Power of One

The IS8000 software platform is an integrated solution that accelerates engineering workflow. It is a revolutionary software solution that tightly integrates the timing, control, and data collection from multiple instruments, creating a comprehensive measurement suite that delivers high confidence, efficiency, and unity.



### High Speed Data acquisition up to 10 Gb

In combination with the 10 GbE option (C60 option) on the DL950 and the IS8000, up to 8 channels of data can be stored in real time on a PC at a sampling rate of up to 20 M samples per seconds.\* Longer recording times are now possible for high-speed, multi-channel inputs such as gate signals and switching waveforms of multi-phase inverters.

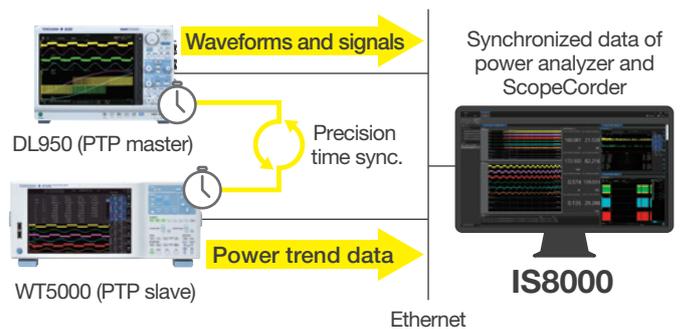


\*With 1 Gb Ethernet/USB connection, the maximum transfer rate is 6.4 MB/s (200 kS/s × 16 ch).

### Multi-unit Monitoring with Time Synchronization

**SY1 option**

IS8000 and SY1 option enable accurate power and waveform data synchronization across multiple channels with minimal error. Data from the WT5000 power analyzer and DL950 ScopeCorder is time correlated with less than 10 μs error using IEEE1588 technology.



# Extensive Measurement data and analysis functions

## Control and realtime remote monitoring

YOKOGAWA's high-precision power analyzer, ScopeCorder and oscilloscope can be remotely operated, monitored and configured from IS8000. Additional options, third-party high-speed cameras can also be controlled, greatly reducing the burden of operating and managing various instruments measuring power, physical phenomenon, video, and control signals. IS8000 can also be connected to non-supported devices via an API\* and DAQ functions can be used. In addition, IS8000's functions can be controlled by user-created applications, enabling customers to proceed with development work efficiently.

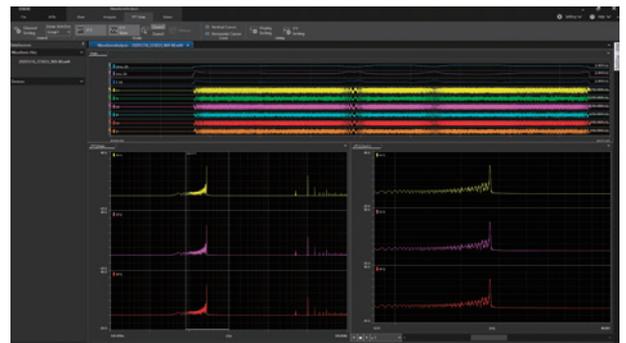
\*API will be available in near future.



## FFT and Math Function

MH1 option

Measure up to 16 FFT processes for a wealth of analysis functions for automatic calculation of frequency and integrated value and filter processing.



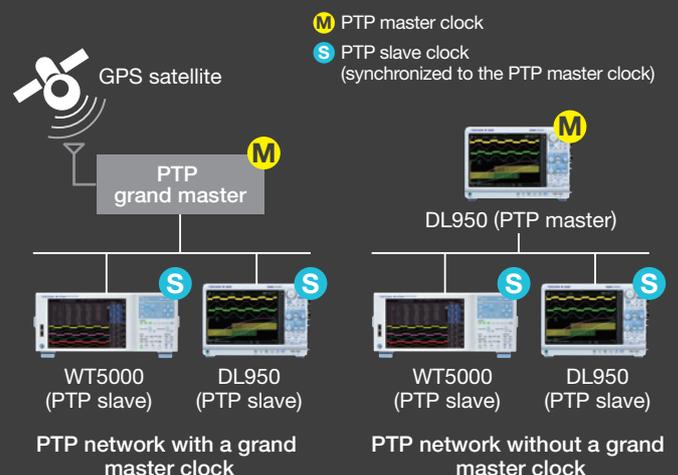
FFT Analysis window

## Technology Story : IEEE1588 Precision Time Protocol

IEEE 1588 is a standard for the Precision Time Protocol (PTP), a protocol for high-precision time synchronization of networked instruments and control systems.

The PTP grandmaster server provides a reference clock for each client instrument to achieve high-precision clock synchronization. Since the ScopeCorder DL950 has the PTP master function, high precision clock synchronization of the corresponding instruments on the same network is possible even without a PTP grandmaster server.

The IS8000 is also capable of combining the simultaneous measurement data of each of these PTP-synchronized instruments in the same window.



# Conveniently export measurement data

## Report Generator

RP1 option

Customized reports are easily created by dragging and dropping measurement data, waveforms, graphs, etc. onto the sheet.



## File Import and Export

The IS8000 supports binary, ASCII, and the MDF<sup>1</sup> format, a very common format for the automotive industry. Power and waveform data on the IS8000 can be shared with your development system or third-party software.

\*1 Only power trend data saved by the WT5000, WT3000, or WT1800 is supported.

File Format	Import	Export
WDF (Binary)	✓	—
CSV (ASCII)	✓*1	✓
MDF (ASAM measurement data format)	✓	✓

## Synchronization High-speed camera FS1 option

IS8000 synchronizes high speed camera images with related current, voltage, and control signals. Simultaneous slow motion playback allows visualization between design and results. In addition, the video files\* captured by non-supported cameras can also be imported and played back in sync with waveforms and power trend data with IS8000.

\*Supported video file format:  
AVI(\*.avi), MP4(\*.mp4), WMV(\*.wmv)  
AVCHD(\*.mts), MOV(\*.mov), MPEG2-PS(\*.mpeg, \*.mpe)

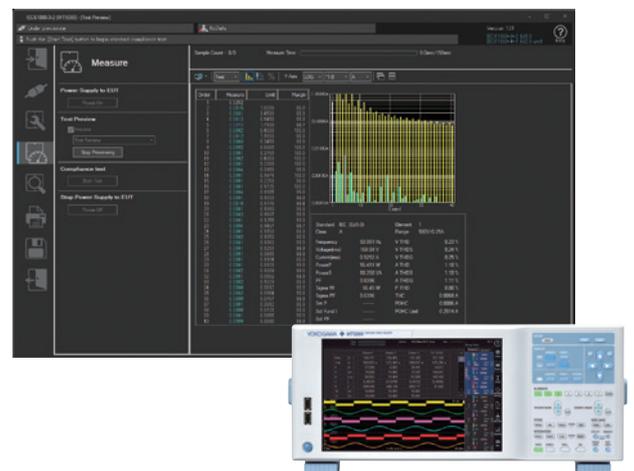


## IS8011/IS8012 Harmonic/Flicker Analysis Software

### Optional software package for IEC Harmonic and Flicker compliance test

IS8011/IS8012 optional software package is designed to perform harmonic and flicker tests in accordance with IEC61000-3-2, 3-3, 3-11 and 3-12 standards using the WT5000 precision power analyzer. Users can easily set the conditions and output the test report without any specialized knowledge.

Users can make a pass/fail judgment by class A, B, C, and D of the harmonic current measurement values.



# Applications

Evaluate all electrical and mechanical test faster with IS8000

## For Automotive and Industrial Industry

### Motor Efficiency

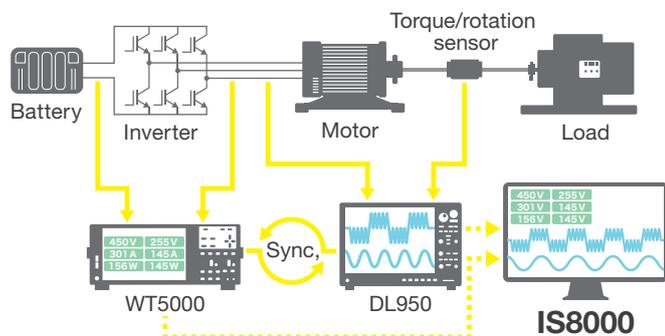
#### Overview

Motor efficiency is a critical measurements for electric vehicles as small improvements can result in increased range. Efficiency measurements require accurate synchronous measurements of power consumption with motor speed and torque.

#### IS8000 Advantage

**High Precision synchronized power and high speed recorder measurements**

Data from the WT5000 power analyzer and DL950 ScopeCorder is time correlated with less than 10  $\mu$ s error using IEEE1588 PTP technology. Precise power parameters and waveforms are displayed on the same time axis.



### Switching Waveform Analysis for IGBT Inverter

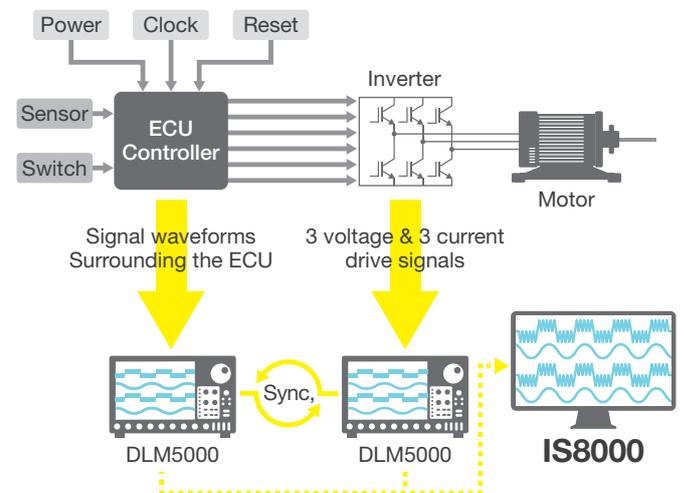
#### Overview

In order to analyze the motor and inverter system, voltage and current signals between 3 phases, motor I/O signals, and multiple IGBT gate signals are required to properly measure and diagnose system performance and efficiency.

#### IS8000 Advantage

**Combining multiple waveforms**

More than 8 waveforms are required to measure inverter performance in a loaded system. IS8000 can connect with multiple 8 channel DLM5000 oscilloscopes for analog and digital signals to scale up to any channel requirement, all in one control and viewing interface.



## For Power/Energy Industry

### Solar/Wind Power System Development

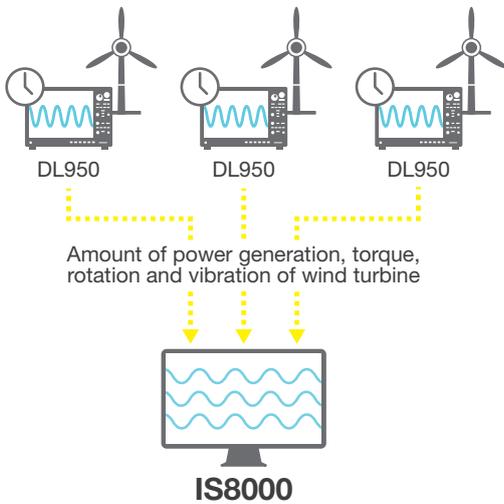
#### Overview

Renewable energy systems, like wind, solar and hydro must maintain efficiencies through their power conversion stages to decrease their impact on the environment. Multiple measurement points require precision and synchronization.

#### IS8000 Advantage

##### View and compare waveforms from multiple instruments

IS8000 can easily synchronize waveforms from multiple instruments, creating an easy view for comparison. Manipulating waveforms is easily done with zoom and pan controls to analyze long records of energy waveforms.



## For R&D

### Analysis of Robotic Welding Control

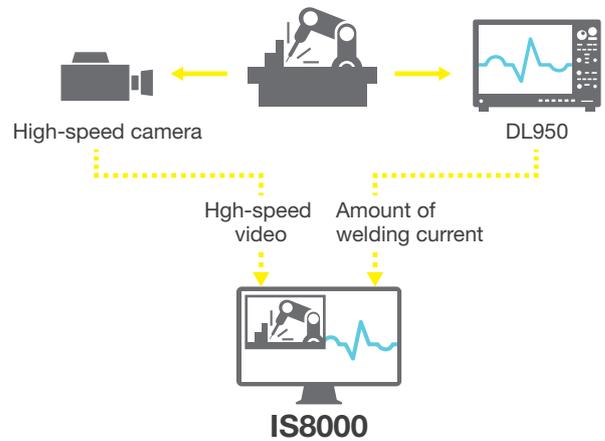
#### Overview

It is necessary to optimize robotic welding conditions for a cost effective manufacturing system. Multiple signals and inputs are required to be monitored in order to determine the best combination between the robot's position and performance, including high speed camera inputs, source voltage and current, and multiple position and control I/O signals.

#### IS8000 Advantage

##### Simultaneous recording of multiple signal types

IS8000 displays multiple inputs. The camera image is aligned in time with the other waveform, including the control signals and the voltage and current waveforms. Simultaneous slow motion playback allows visualization between design and results.



# IS8000 compatible Products



## DL950 ScopeCorder

The DL950 combines a mixed signal oscilloscope and portable data acquisition recorder into a single platform which can capture both high speed transient events and long term trends and capable of high-speed, multi-channel measurements up to 200 MS/s and up to 16-bit A/D. With a combination of more than 20 different modules for your application, a single unit can measure isolated analog signals from low voltage to 1000 V, as well as logic signals, vibration and strain, temperature and more. It can also display automotive communication data such as CAN/CAN FD/LIN/SENT as trend waveforms. The 12.1-inch large touch screen enables an intuitive operation. The newly designed application menu makes it easy to set up frequently-used applications. By combining the DL950 with the IS8000, data can be transmitted directly to a PC while measuring, allowing analysis on a PC. Up to five DL950 units can be synchronized with optical fiber cords to measure up to 160 channels simultaneously. Long time recording to the internal flash memory at sampling rate up to 20 MS/s is also available.



## WT5000 Precision Power Analyzer

WT5000 precision power analyzer is a high-precision power meter with a basic power accuracy of  $\pm 0.03\%$ , one of the best in the world. With a DC power accuracy of  $\pm 0.07\%$ , a 10 MHz voltage measurement bandwidth, a 5 MHz current measurement bandwidth, and a low power factor characteristic of  $\pm 0.02\%$  (of apparent power), the WT5000 provides highly accurate measurements of power consumption, loss, and conversion efficiency of devices. In addition, the data streaming function enables waveform data streaming at sampling rate up to 2 MS/s. Up to seven power inputs and four motor torque inputs enables simultaneous evaluation of multiple motor drive systems. The WT5000 helps to improve the efficiency of development of EVs, HEVs, renewable energy related devices, and energy saving home appliances.



## DLM5000 Oscilloscope

The DLM5000 is a mixed-signal oscilloscope with 8 analog channels and 32 bits of logic input on each unit. It is available in two frequency bands, 500 MHz and 350 MHz.

The DLM5000 combines fast sampling rates of up to 2.5 GS/s and a long memory of up to 500 Mpts, making it ideal for a wide range of waveform measurements. The DLMsync function supports multi-unit synchronization for up to 16 measurement channels. A wide variety of triggers, serial bus analysis functions, arithmetic functions and our original "History" functions provide powerful support for waveform measurement operations.

# License Types

## Subscription License

This licenses type is based on annual subscription renewal for the platform and optional features. Users can purchase the software for as long as they need it, keeping their initial investment to a minimum.

Users will always have the latest version of the software available for the duration of the subscription, so they will always be able to use the latest features, standards and security.

## Perpetual License

This is a one-time purchase and can be used indefinitely. Additional optional features can be purchased at a later date. The platform can be upgraded free of charge for up to five years major software version revisions after purchase. After that, users can continue to use the software in the same environment.

This license is suitable for users who do not plan to change their equipment environment at the time of installation.

## IS8000 Edition, License and Features

Features	Simple* <sup>1</sup>	IS8000	IEC Harmonic/ Flicker	Trial
		IS8001 (Annual) IS8002 (Perpetual)	IS8011 (Annual) IS8012 (Perpetual)	Trial users can experience all the features for 30days free
<b>Data file import/export</b>				
Load wdf files (Measurement data of YOKOGAWA oscilloscope/Scopecoder)	✓	✓	✓	✓
Load csv files (Only saved on WT1800 series, WT3000 series, WT5000)	✓	✓	✓	✓
Load mf4 (IS8000 measurement data) and IS8000 project files	✓	✓	✓	✓
Conversion of the loaded WDF files and measurement data to CSV files	✓	✓	✓	✓
Conversion of the loaded WDF files and measurement data to mf4 files		✓		✓
CSV batch conversion		✓		✓
<b>Online data acquisition</b>				
Real-time data acquisition and save mf4 format with DL950 (Include connection of 10 GbE)		✓		✓
Monitoring, real-time data acquisition and save mf4 file of WT5000 data (Over 9 items)		✓		✓
Monitoring, real-time data acquisition and save mf4 file of WT5000 data (up to 8 items)	✓* <sup>2</sup>	✓	✓	✓
WT5000 data streaming function (/DS) support		✓		✓
API connection and DAQ		✓		✓
<b>Remote control</b>				
Remote control and monitoring with DL350, DL850 series, DL950, DLM3000, DLM5000, WT5000	WT5000 ×1 unit	✓	WT5000 ×1 unit	✓
Remote control, monitoring and real-time data acquisition for up to 5 devices		SY1 option		✓
<b>File manager</b>				
Transfer saved file from DL350, DL850 series, DL950, DLM3000, DLM5000		✓		✓
<b>Analysis</b>				
Combining, overlaying and separation of multiple measurement waveforms		✓		✓
Max number of display channels	8 CH ×1 Group	32 CH × 4 Group	8 CH ×1 Group	32 CH × 4 Group
Max number of zoom screens/Max number of X-Y screens	1/1	4/2	1/1	4/2
Cursor measurement/Display history data and dual capture data	✓	✓	✓	✓
Automatically measure waveform parameters/Inserting annotations/Automated measurement of history/cycle statistics		✓		✓
Inter-channel calculation (MAX 16 CH) /FFT analysis (MAX 16 CH)		MH1 option		✓
Power numeric display	4 or 8 value ×1	4 to 32 value × 2	4 or 8 value ×1	4 to 32 value × 2
Harmonic bar graph display	Bar Pannel ×1	Bar Pannel × 6	Bar Pannel ×1	Bar Pannel × 6
Report generator function		RP1 option		✓
Synchronized measurement between DL950 and video file/camera		FS1 option		✓
<b>IEC Harmonic/Flicker testing</b>				
IEC Harmonic/Flicker testing and report creation with WT5000			✓	✓
Loading,analyzing and report creation of IEC Harmonic/Flicker test data	✓	✓	✓	✓

\*1 After 30 days have passed since you started to use the trial version without activation or the annual license has expired, the software will switches to the simple edition.

\*2 mf4 file saving is unavailable

# Main Specifications

<b>Languages</b>	English / Chinese / Japanese										
<b>PC requirements</b>	For data acquisition with 10 Gb Ethernet connection; Desktop PC required/Intel Core i7-1165G7 or later, 4 cores (8 threads) or more, 4.7 GHz or faster/16 GB or more memory/512 GB or more SSD (M.2 slot is recommended, Sequential read/write 3 GB/s or faster)										
	For data acquisition with 1 Gb Ethernet/USB connection and offline analysis; Intel Core i5-10210U or later, 4 cores (8 threads) or more, 4.2 GHz or faster/8 GB or more memory/256 GB or more SSD (Sequential read/write 400 MB/s or faster)										
<b>OS</b>	Windows 10 64 bit										
<b>Display resolution</b>	1366 × 768 dots or higher, 100% zoom										
<b>Communication interface</b>	USB (USBTMC / VISA), Ethernet (VXI-11 / HiSLIP)										
<b>Number of connectable units (SY1 option)</b>	Up to 5 units (Only a single unit can be connected without SY1 option) (When using FS1 option, two or more camera cannot be connected)										
<b>Supported file format</b>	<table border="1"> <tr> <td>WDF</td> <td>DL350, DL850 series, DL950, SL1000, DLM2000 series, DLM3000 series, DLM4000 series, DLM5000 series</td> </tr> <tr> <td>CSV (Power measurement data)*1</td> <td>WT5000 (without multi-unit sync. based on IEEE1588 PTP), WT5000 (with multi-unit sync. based on IEEE1588 PTP), WT3000 series*2, WT1800 series</td> </tr> <tr> <td>WVF</td> <td>DL750, SL1400</td> </tr> <tr> <td>MD4</td> <td>IS8000 data files, ASAM MDF 4.1 files</td> </tr> <tr> <td>mepjt, anpjt</td> <td>IS8000 Project files</td> </tr> </table>	WDF	DL350, DL850 series, DL950, SL1000, DLM2000 series, DLM3000 series, DLM4000 series, DLM5000 series	CSV (Power measurement data)*1	WT5000 (without multi-unit sync. based on IEEE1588 PTP), WT5000 (with multi-unit sync. based on IEEE1588 PTP), WT3000 series*2, WT1800 series	WVF	DL750, SL1400	MD4	IS8000 data files, ASAM MDF 4.1 files	mepjt, anpjt	IS8000 Project files
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WVF	DL750, SL1400										
MD4	IS8000 data files, ASAM MDF 4.1 files										
mepjt, anpjt	IS8000 Project files										
<b>Export file formats</b>	ASAM MDF 4.1 files (mf4), ASCII files (csv)										
<b>CSV batch converter</b>	<table border="1"> <tr> <td>Load</td> <td>MF4 (MDF4.1), WDF, WVF</td> </tr> <tr> <td>Save</td> <td>CSV</td> </tr> </table>	Load	MF4 (MDF4.1), WDF, WVF	Save	CSV						
Load	MF4 (MDF4.1), WDF, WVF										
Save	CSV										
<b>Online data acquisition (DL950)</b>	<table border="1"> <tr> <td>Maximum data transfer rate (DL950)</td> <td>320 MB/s (20 MS/s × 8 ch, 10 MS/s × 16 ch) with 10 GB Ethernet 6.4 MB/s (200 kS/s × 16 ch) with 1 Gb Ethernet / USB</td> </tr> <tr> <td>Maximum recording length</td> <td>7 days</td> </tr> <tr> <td>Maximum recording file size</td> <td>500 GB</td> </tr> <tr> <td>Maximum recording channels</td> <td>128 channels</td> </tr> </table>	Maximum data transfer rate (DL950)	320 MB/s (20 MS/s × 8 ch, 10 MS/s × 16 ch) with 10 GB Ethernet 6.4 MB/s (200 kS/s × 16 ch) with 1 Gb Ethernet / USB	Maximum recording length	7 days	Maximum recording file size	500 GB	Maximum recording channels	128 channels		
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Maximum recording length	7 days										
Maximum recording file size	500 GB										
Maximum recording channels	128 channels										
<b>Display format (Common)</b>	TY (up to 32 ch for each group, up to 4 group), XY (up to 2 windows for each group), Zoom/Pan (up to 4 areas for each group)										
<b>Display format (For WT5000)</b>	Numeric, Trend, Peak-to-peak compressed waveform (Data update interval: 1s or slower), Streamed waveform data, Bar graph of the amplitude and phase of each harmonic, Harmonic list display, Matrix display										
<b>Automated waveform parameter measurements</b>	Cycle Statistics, History Statistics and Up to 28 parameters (including P-P, Amp, RMS and Freq).										
<b>Cursor</b>	Vertical (up to 2 cursor for each window), Horizontal (up to 2 cursor for each window)										
<b>Annotation function</b>	Comments, acquired data and calculated values can be added on the main/zoom waveform window and X-Y window.										
<b>Supported devices</b>	<table border="1"> <tr> <td>Online data acquisition</td> <td>DL950, WT5000</td> </tr> <tr> <td>Remote control and setting, acq. data download</td> <td>DL350/850 series/950, DLM3000/5000 series, WT5000 (Remote control and setting only)</td> </tr> <tr> <td>Data File Import</td> <td>DL350/750/850 series/950, SL1400, SL1000, WT1800E/3000E/5000, DLM series</td> </tr> </table>	Online data acquisition	DL950, WT5000	Remote control and setting, acq. data download	DL350/850 series/950, DLM3000/5000 series, WT5000 (Remote control and setting only)	Data File Import	DL350/750/850 series/950, SL1400, SL1000, WT1800E/3000E/5000, DLM series				
Online data acquisition	DL950, WT5000										
Remote control and setting, acq. data download	DL350/850 series/950, DLM3000/5000 series, WT5000 (Remote control and setting only)										
Data File Import	DL350/750/850 series/950, SL1400, SL1000, WT1800E/3000E/5000, DLM series										

<b>Mathematical data analysis (MH1 option)</b>	
Number of Math channels	Up to 16 channels
Operator	+, -, ×, /, Phase shift, ABS, SQRT, LOG, EXP, NEG, SIN, COS, TAN, ATAN, PH, DIF, DDF, INTEG, IINTEG, BIN, P2, P3, F1, F2, FV, PWHH, PWHL, PWLH, PWLL, PWXX, DUTYH, DUTYL, FLT1, FLT2, HLBT, MEAN
Number of computed points	Up to 12.5 Mpoints
Digital filters	Gauss, Sharp, IIR (Butterworth)
<b>FFT analysis (MH1 option)</b>	
Operator	Type: LS, RS, PS, PSD, CS, TF, CH Sub-type: REAL, IMAG, MAG, LOGMAG, PHASE
Window function	Rectangle, Hanning, Flat top, Hamming
Number of FFT channels	Up to 16 channels independently
Number of computed points	Up to 2 M points
<b>Report generator (RP1 option)</b>	
Export file formats	Microsoft Word, Excel, PDF, Print output
<b>High-speed camera Sync. (FS1 option)</b>	
Supported cameras	Photron's FASTCAM SA-Z, NOVA, Mini AX / UX / WX
Supported video format	high-speed camera video files (avi)
Supported devices	DL950
<b>Offline video sync. with measurement data (FS1 option)*3</b>	
Supported file format	AVI (*.avi), MP4 (*.mp4), WMV (*.wmv) AVCHD (*.mts), MOV (*.mov), MPEG2-PS (*.mpg, *.mpeg)

\*1 The measurement data of first 128 channels can be imported.

\*2 Harmonic measurement data excluded.

\*3 Two or more video files cannot be imported.

## Model and Suffix Codes

### IS8000 Integrated Software Platform

Model	Code	Description
IS8001		IS8000 Integrated Software Platform Subscription (Annual license)
IS8002		IS8000 Integrated Software Platform Perpetual (Permanent license)
	/SY1	Multi-Unit Synchronization Option
	/MH1	Waveform Math Option
	/RP1	Report Generator Option
	/FS1	High-speed Camera Synchronization Option

### Add-on Packages

Model	Code	Description
IS8001EX		IS8000 Add-on Package Subscription (Annual license)
IS8002EX		IS8000 Add-on Package Perpetual (Permanent license)
	-SY1	Multi-Unit Synchronization
	-MH1	Waveform Math
	-RP1	Report Generator
	-FS1	High-speed Camera Synchronization

### IS8010 IEC Harmonic/Flicker Measurement Software

Model	Code	Description
IS8011		IEC Harmonic/Flicker Software Subscription (Annual license)
IS8012		IEC Harmonic/Flicker Software Perpetual (Permanent license)

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