

Produkt-Datenblatt

Technische Daten, Spezifikationen

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Glossary

Integral Action Time

Digital multimeters (DMMs) employ an A/D converter with a dual-integration system, which determines the measurement value by converting the input voltage into time using an integration AD converter. The interval to perform an integral action periodically is referred to as the integral action time.

Measurement Accuracy

With DMMs, the measurement accuracy is generally expressed as: \pm ___ % of reading + ___ digits. ("Reading" refers to the reading value, and is abbreviated as "rdg"; "digits" refers to the number displayed in the smallest decimal place, and is abbreviated as "dgt.") This expresses the range of values that a DMM may measure or represent for a given actual value.

Root Mean Square Value

The value most directly related to the energy of a given waveform. Refers to the square root of a value found by averaging the squares of instantaneous values of a waveform over a single cycle. (See Table 1, Figures 1 and 2.)

Mean Value

Refers to the average of the sum of instantaneous values, determined for a current half-wave. It is equivalent to calculating the surface area of a waveform.

Form Factor

Ratio of RMS value with respect to average value.
Form factor = RMS value/mean value (See Figures 1 and 2.)

Crest Factor

Ratio of maximum value to RMS value.
Crest factor = maximum value/RMS value (See Figures 1 and 2.)

Peak-to-Peak (P-P) value

Refers to the distance between the smallest and largest amplitudes in a waveform (see Figure 1).

Frequency Characteristic

Refers to a characteristic that shows variations in input, measurement, or response with frequency. When measuring alternating current signals, a measured signal does not have a simple frequency, but often includes various frequencies ranging from lower frequencies to higher harmonics. To measure such signals more accurately, it is preferable to use a measurement device that has a broader frequency characteristic range.

Input Impedance

To prevent the measured object from being influenced during voltage measurement, you should use a measurement device with an extremely high input impedance.

Decibel

A unit used for describing the change in electrical signal amplitude or noise level, or transmission systems in wired devices, etc. This parameter is also used to represent the level differences in voltage, current or related values, but is generally restricted to cases characterized by the relationship: $(I_1/I_2)^2 = (V_1/V_2)^2 = P_1/P_2$. In the abbreviation "dB," "d" (deci) denotes 1/10, and "B" (Bell) denotes logarithm.

Table 1. RMS Value, Average Value, Waveform Factor and Crest Factor for a Typical Periodic Waveform

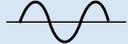
Item	Waveform	RMS	Mean value	Waveform factor	Crest factor
Sine wave		$\frac{1}{\sqrt{2}} = 0.707$	$\frac{2}{\pi} = 0.637$	$\frac{\pi}{2\sqrt{2}} = 1.11$	$\sqrt{2} = 1.414$
Half rectification wave		$\frac{1}{2} = 0.5$	$\frac{1}{\pi} = 0.318$	$\frac{\pi}{2} = 1.571$	2
Full rectification wave		$\frac{1}{\sqrt{2}} = 0.707$	$\frac{2}{\pi} = 0.637$	$\frac{\pi}{2\sqrt{2}} = 1.11$	$\sqrt{2} = 1.414$
Triangular wave		$\frac{1}{\sqrt{3}} = 0.577$	$\frac{1}{2} = 0.5$	$\frac{2}{\sqrt{3}} = 1.155$	$\sqrt{3} = 1.732$
Square wave		1	1	1	1

Figure 1. RMS and Mean Values of Sine Wave

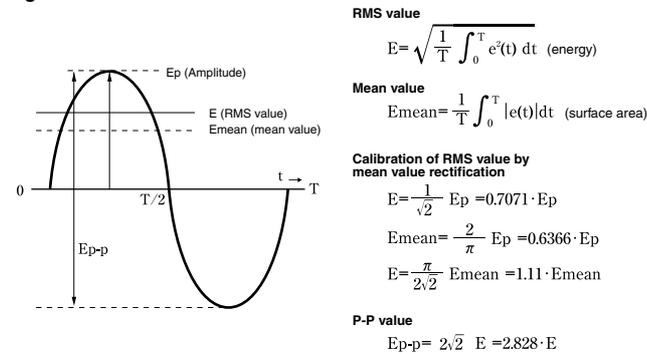
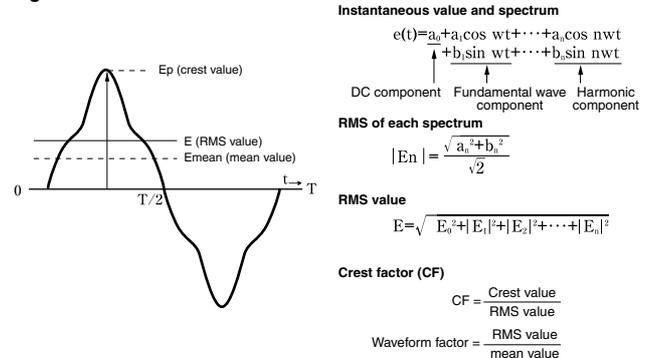


Figure 2. RMS of Distorted Waves



CE Mark

The products of Yokogawa Meters & Instruments Corporation are subjected to design and evaluation testing to ensure compliance with the safety and EMC standards in accordance with the directives issued by the EC.

Electromagnetic Compatibility (EMC)

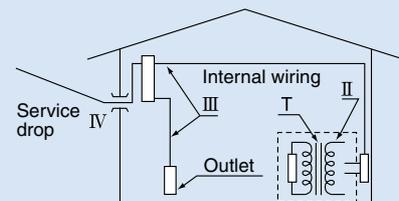
The parameters EMI and EMS are referred to as electromagnetic compatibility as they relate to compatibility within an electromagnetic environment.

Safety Standards

These standards lay out safety requirements that are to be met by a product with the objective of the preservation of human life and property. The applicable international standard is IEC 61010, and while a product must conform to this standard, there are also domestic standards laid out by individual countries. With these safety regulations, the range of use of a measurement device is specified by categorization in measurement categories I through IV to ensure the safety of the user. The designations "CAT II, 1000 V" or "CAT III, 600 V" at the input terminals of a measurement device, for example, indicates the applicable category and the maximum voltage for the device in terms of safety.

Measurement categories (CAT)

In order to ensure the safety of the user, IEC 60664 defines the ranges of use of measuring instruments by classifying power levels into measurement categories II through IV and O (None, other). This is because the excessive impulse or surge levels induced in a power line vary depending on the location of measurement (category). Categories with higher numerals designate locations that include larger surge voltages. Instruments that are designed for category III can thus withstand higher surge voltages than instruments designed for category II.



Measurement category	Description	Remarks
O (None, other)	Other circuits that are not directly connect to MEANS.	
CAT.II	For measurement performed on circuits directly connected to the low-voltage installation.	Appliances, portable equipments, etc.
CAT.III	For measurement performed in the building installation.	Switchboard, circuit breaker, etc.
CAT.IV	For measurement performed at the source of the low-voltage installation.	Overhead wire, cable systems, etc.

Communication Functions and Application Software Allow Analyses and Management of Measurement Data

Data management by dedicated application software

Data saved in the DMM can be managed by the dedicated application software (Model 92015).

- Saved data can be transmitted from the internal memory to a PC. Data collected in SAVE-memory mode or logging-memory mode
 - Measurements by the DMM can be monitored on a PC in real time.
 - Large amounts of data that cannot be saved in the DMM internal memory can be transmitted to a PC in real time. Data can be written to an Excel* spreadsheet. Maximum number of real-time data transmission: 32767
 - Measurement data can be laid out in an Excel spreadsheet. Graphs can be automatically created on a spreadsheet.
- * Excel is a registered trademark of Microsoft Corporation in the United States.

92015 Communications Package Specifications

Specifications

Communication cable

Communication cable: IR communication adapter, USB communication cable: 1
 Cable length: 2 m
 Interface: USB 1.1
 Supported models: TY710, TY720, TY530

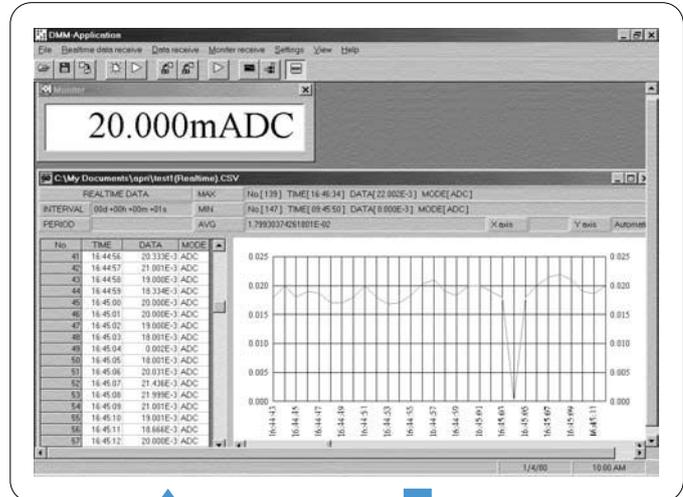
Application software

System requirements of PC

Operating system: WindowsXP/Vista(*)/7
 CPU: Pentium 133 MHz or higher
 Memory: 64 MB or larger
 Storage device: Hard disk with 10 MB or more free space
 CD-ROM drive: 1
 Excel: Excel2003 or later(*)
 Contents: CD-ROM software: 1
 Communication cable (communication adapter included): 1
 User's manual

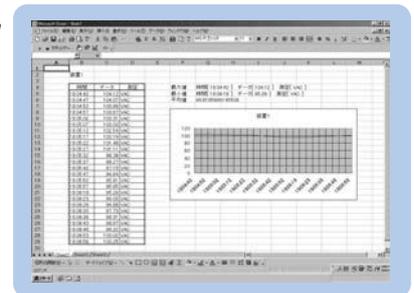
* Windows and Excel is a registered trademark of Microsoft Corporation in the United States.

Example of document windows in DMM application software



Enlarged view

Data layout on Excel spreadsheet



Data layout example on Excel spreadsheet

Optional Accessories*

* For TY710, TY720, and TY530 only

Item	Model	Specification
DMM communication package	92015	USB communication cable (adaptor included), application software