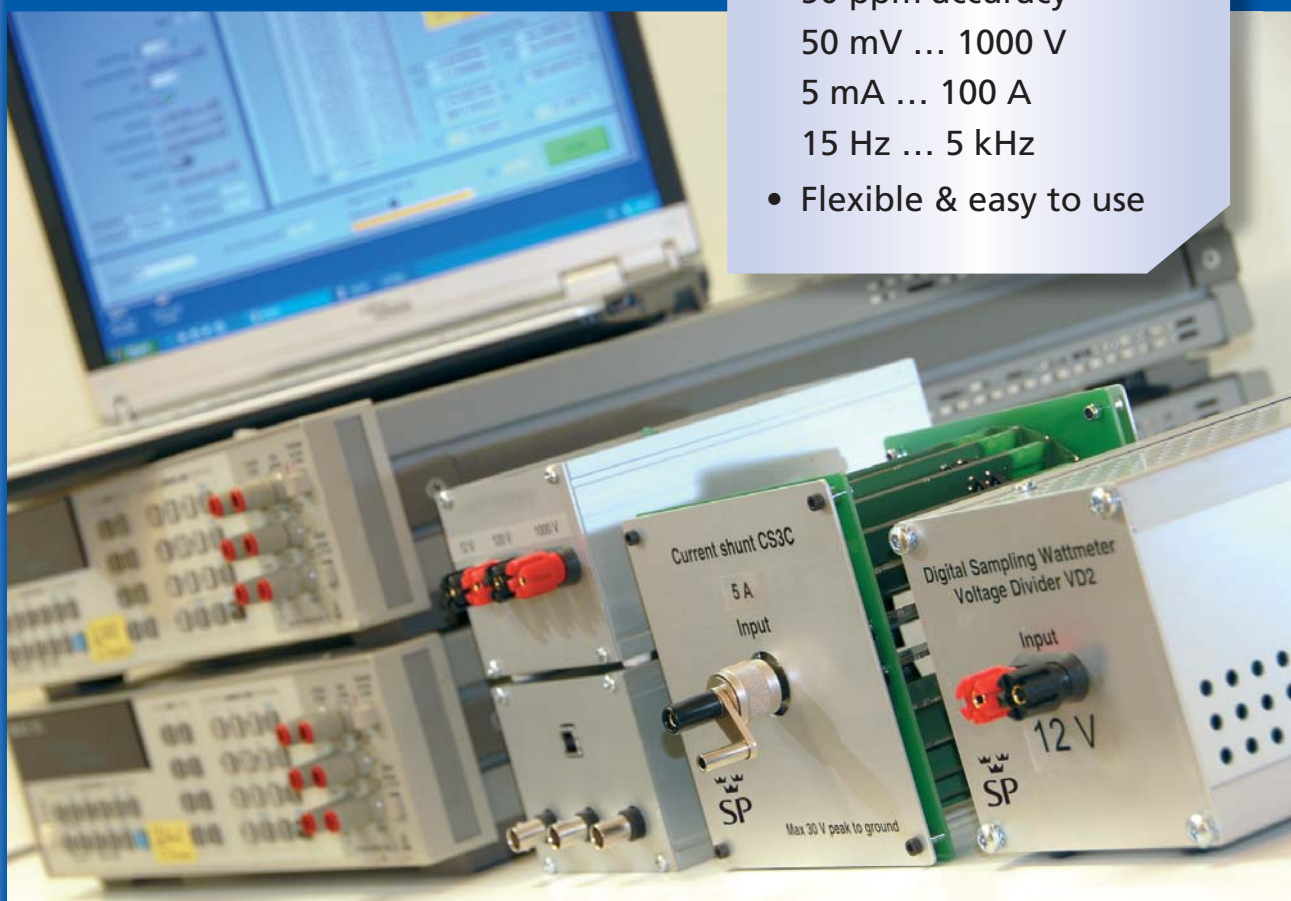


a Digital multifunctional Sampling WattMeter standard

SP Technical Research Institute of Sweden

Primary reference for
electrical power and
related quantities

- Voltage, current, power, impedance, harmonics
- Flicker and other modulation measurements
- 50 ppm accuracy
50 mV ... 1000 V
5 mA ... 100 A
15 Hz ... 5 kHz
- Flexible & easy to use



DSWM

Who needs a DSWM?

Accurate measurements of power and related quantities is required in many situations and is a key factor for development of Smart Grids:

- Verification of power quality calibrators and analyzers.
- Verification of power and energy reference equipment.
- In reference laboratories to ensure that measurement techniques and equipment meet appropriate standards.

We are pleased to be able to provide for purchase our top-of-the-line power measuring system for power quality. Either as a complete system or as parts of a system. We can also provide advice or knowledge transfer. Please feel free to contact SP Measurement Technology for further information. At www.sp.se/DSWM further related technical information can be found, such as international publications as well as results from international comparisons.

Complete DSWM systems which has been manufactured by SP are being used at Fluke as a primary reference for the Fluke 6100A Electrical Power Standard and also at national standards laboratories such as A*STAR in Singapore and the Czech metrology institute, CMI. Our current shunts and voltage dividers are being used in more than fifteen laboratories around the world.

The system

The DSWM is a digital multi functional sampling watt meter with a basic accuracy of $50 \mu\text{W/W}$. It is based on well proven, commercial multimeters together with current shunts, voltage dividers, a trigger unit and PC software of SP design.

The shunts and dividers have very low phase angle errors and cover current ranges from 5 mA to 100 A and voltage ranges from 50 mV to 1000 V, at frequencies from 16 Hz up to 100 kHz.

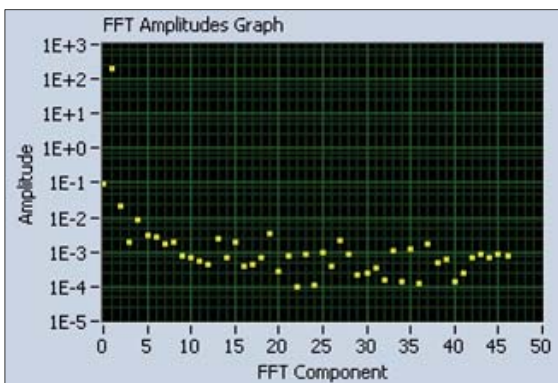
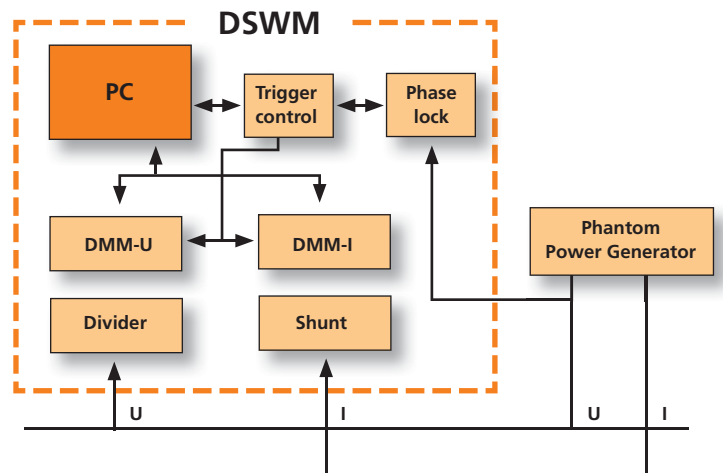
Aside from voltage, current and power, the DSWM can also easily be used for harmonics, inter-harmonics and flicker measurements, as a replacement for various bridge devices, and for impedance measurements.

Since the DSWM is a modular system, you have the flexibility of verifying it either to a standard of higher accuracy, or by primary verifications of its parts in case appropriate standards are available.

Software

The DSWM is user-friendly and easy to setup thanks to convenient handling of settings, which can be stored and easily retrieved. Frequency domain data and other results are displayed graphically and can also be stored to disk.

The software can be adapted for automation of test sequences, report generation etc. Please contact us with your specific needs.



Display	FFT Components	
U	U Amplitude	U Phase
I	DC	0.0938
P	1	193.6545
units	2	0.0209
%	3	0.0018
	4	0.0089
	5	0.0033



Specifications

Functions

Active power, apparent power, reactive power, impedance, voltage, current and power harmonics with selectable phase angle reference, modulation measurements

Ranges and accuracy

Active Power:

45 – 65 Hz sinusoidal, 5mA –100 A, 50mV – 1000 V	50 – 80 μ W/W of range ^[1]
15 – 500 Hz sinusoidal, 5mA – 100 A, 50 mV – 1000 V	80 – 120 μ W/W of range ^[1]

Voltage and current:

45 – 65 Hz sinusoidal, 5mA –100 A, 50mV – 1000 V	30 – 50 μ V/V or μ A/A of range
15 – 500 Hz sinusoidal, 5mA –100 A, 50mV – 1000 V	40 – 70 μ V/V or μ A/A of range

Relative harmonic amplitudes and phase angles of voltage and current:

45 – 65 Hz fundamental frequency, 5 mA – 100 A, 50mV – 1000 V	70 –100 + h • 20 μ V/V or μ A/A ^{[2],[3]} 70 – 100 + h • 20 μ rad
15 – 500 Hz fundamental frequency, 5mA – 100 A, 50mV – 1000 V	200 – 300 + h • 70 μ V/V or μ A/A ^[2] 200 – 300 + h • 70 μ rad

^[1] The uncertainty (in watt) is the same for all power factors. Range is in watt and calculated as [current shunt range • voltage divider range].

^[2] In terms of the fundamental frequency component

^[3] h is the ordinal number of the harmonic

Specifications subject to change without notice.

Contacts

SP Measurement Technology
Stefan Svensson
tel +46 105 16 54 15
e-mail stefan.svensson@sp.se

Further technical information and references can be found at www.sp.se/DSWM.

Energy and Environment



Building and Construction



Wood Technology and Wood Construction



Fire, Risk and Safety



Materials Technology and Chemistry



Foods



Mechanical Engineering and Automotive Industry



Electronics and ICT



Measurement Technology and Calibration



Certification



SP Technical Research Institute of Sweden

Our work is concentrated on innovation and the development of value-adding technology. Using Sweden's most extensive and advanced resources for technical evaluation, measurement technology, research and development, we make an important contribution to the competitiveness and sustainable development of industry. Research is carried out in close conjunction with universities and institutes of technology, to the benefit of a customer base of about 9000 organisations, ranging from start-up companies developing new technologies or new ideas to international groups.

The Group's comprehensive skills

Our various profile areas bring together technical departments and subsidiary companies. This enables us to meet requirements for a multi-disciplinary approach and expertise in a wide range of fields and deliver high-quality results for all aspects of the innovation process, from research and technical development to market introduction assistance services.



SP Technical Research Institute of Sweden

Box 857, SE-501 15 Borås, SWEDEN

Telephone: +46 10 516 50 00

Telefax: +46 33 13 55 02

E-mail: info@sp.se

www.sp.se