

WE BRING QUALITY TO LIGHT.

# MAS 40

## Mini-Array Spectrometer



- Cost-effective and robust CCD spectrometer technology
- Standard USB interface
- Compatible with all INSTRUMENT SYSTEMS measuring adapters
- Different models for UV / VIS / NIR spectral range
- Optimized for spectroradiometry and spectrophotometry
- Easy operation using SpecWin-Light software
- DLL and LabView driver available for writing custom software

# MAS 40 MINI-ARRAY SPECTROMETER

## MAS 40: A high-quality spectrometer in the low-cost range

Have you been looking for a value-for-money spectrometer that delivers quality and precision? Then the new MAS 40 Mini-Array Spectrometer is just what you need.

INSTRUMENT SYSTEMS has drawn on the experience gained in industrial quality control to develop an instrument that meets your demanding requirements, yet won't break your budget.

Like all spectrometers from INSTRUMENT SYSTEMS, optical fiber connectivity provides access to all the measurement-adaptor accessories. This capability supports for a wide range of applications. Flexibility of this nature means that the MAS 40 is also ideal as a cost-effective instrument for research and development work.

## USB Interface: plug and go

Install the software, connect up the USB cable and start taking measurements. That's how quick it is to get up and running – whether on a desktop or a notebook. The benefit: you can start working productively straight away.



## MAS 40: compact, precise, complete

A number of manufacturers produce miniature spectrometers that boast compact design and low price. The snag is that they just aren't up to the complete application support required for the challenges of photometry, colorimetry and high-quality spectral analysis.

The MAS 40 is manufactured to the exacting quality standards of INSTRUMENT SYSTEMS. It is also calibrated with the measurement adapter of choice prior to shipment. The calibration procedure uses standards directly traceable to PTB or NIST.

All INSTRUMENT SYSTEMS measurement adapters can be linked up to the spectrometer by optical fiber. This permits applications in LED and display metrology, general spectroradiometry, spectrophotometry and colorimetry.

## MAS 40 Software: seamless integration in your application

INSTRUMENT SYSTEMS is a partner who understands what you need for optical metrology. In addition, DLLs and Labview drivers permit efficient integration within existing customer applications. These drivers are also compatible with the entire INSTRUMENT SYSTEMS spectrometer family.

If you have already purchased instruments from the CAS 140B or SPECTRO 320 model types, you can also use your investments in software development and training for cost-sensitive applications, without having to change your measurement equipment supplier.

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## The Setup:

The MAS 40 includes the complete spectrometer with data acquisition electronics and a USB port in a convenient package. The optical input is compatible with all PLG fiber adapters from INSTRUMENT SYSTEMS.

When you place your order you have the option of specifying a 10-fold sensitivity enhancement or alternatively a density filter to decrease the sensitivity. This tunes the sensitivity range to the desired application.

## Specifications:

Model	VIS	UV	VIS-NIR
Spectral range	320 to 800 nm	200 to 600 nm	380 to 950 nm
Spectral resolution *1	2.5 nm	2.5 nm	2.5 nm
Wavelength accuracy *2	± 0.5 nm	± 0.5 nm	± 0.5 nm
Stray light (broadband with standard illuminant A) *3	1 · 10E-3 at 400 nm	1 · 10E-3 at 285 nm	1 · 10E-3 at 400 nm
Stray light (for LEDs) *4	6 · 10E-4	6 · 10E-4	6 · 10E-4
<b>General</b>			
Detector	CCD line sensor		
Number of pixels	2048		
Integration time	4 msec to 20 sec		
Linearity	± 2.5 %		
<b>Spectroradiometry</b>			
Sensitivity range for irradiance *5	1 · 10E-5 to 0.1 W/m <sup>2</sup> nm		
Signal sensitivity at 1 s integration time *5	5 · 10E-4 W/m <sup>2</sup> nm		
Spectroradiometric accuracy *6	± 7 %		
<b>Spectrophotometry</b>			
Baseline noise *7	± 0.7 %		
Photometric transmission accuracy *8	± 1 %		
Baseline drift *8	0.5 %/h		
<b>Miscellaneous</b>			
Interface	USB		
AD converter	12 Bit		
Dimensions (H,W,D)	145 mm x 90 mm x 185 mm		
Power consumption	approx. 650 mW (via USB interface)		
Ambient conditions	10 to 35° C; relative humidity 70%		
Weight	approx. 2.1 kg		

\*1 Approximate values for standard 50 µm slit; other values are obtained with optional 25 µm and 100 µm slits

\*2 Applies to penray lamp or laser

\*3 Measured with 320 nm cut filter for 285nm data point and 455 nm cut filter for 400 nm data point

\*4 Measured at 100nm distance to the left of the peak wavelength, relative to the peak intensity of the unweighted spectral data

\*5 Measured with EOP120 and OFG414 fiber bundle at 500 nm wavelength, a signal-to-noise ratio of 10:1, and without averaging; remark: option MAS40-210 delivers a ten-fold improvement in sensitivity

\*6 Directly after calibration relative to the calibration standard

\*7 For the shortest integration time, a sufficient signal level and averaging of 10; noise is reduced further at higher averaging

\*8 Applies to LS100-130 light source after 1 hour of warming up and averaging of 10

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## Ordering Information

Order No	Description		
<b>Spectrometer</b>			
Model	Spectral range	Spectral resolution	Data point interval
MAS40-100	320 to 800 nm	2.5 nm	0.33 nm
MAS40-110	200 to 600 nm	2.5 nm	0.33 nm
MAS40-120	380 to 950 nm	2.5 nm	0.33 nm
<b>Options</b>			
MAS40-210	10-fold sensitivity improvement		
MAS40-221	Density 1 filter (reduces signal level nominally by a factor of 10)		
MAS40-222	Density 2 filter (reduces signal level nominally by a factor of 100)		
MAS40-231	UV Density 1 filter (reduces signal level nominally by a factor of 10)		
<b>Software</b>			
SW-105	SpecWin high-end spectral software for Windows 2000/XP		
SW-120	SpecWin Light spectral software for Windows 2000/XP		
SW-251	Windows DLL for custom software development		
SW-253	LabView driver (requires SW-251 DLL)		



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