

AFBR-S20 Spectrometers

Miniature Spectrometer Modules



Key Features NIR

- Ready to use
- Miniature size
- High reliability
- High flexibility
- Thermal stability of < 0.013 nm/k
- Sophisticated onboard signal processing and evaluation
- Full system calibration
- Flexible digital interfaces (USB, SPI, UART)
- OEM design



Applications

- Water analytics
- Chemical and biomedical analytics
- Food and feed control
- Solar monitoring
- Process control (PAT)
- Gas detection
- Medical diagnostics

Overview

Broadcom® offers a wide range of grating based robust Spectrometer modules for spectral analysis from 190 nm to 1700 nm. All of them tailored towards industrial applications targeting solutions for process analytics and more compact systems for point-of-care detection. The spectrometers are ready to use with integrated electronics with fast sensor readout times.

Software + SDK

Every spectrometer comes with a free software package developed for general-purpose applications. The software includes sophisticated algorithms for data acquisition and evaluation which provides many features through a clear and straight forward user interface.

A dedicated SDK supports your software development. It provides a library for the .NET environment and contains example code for C#, Python, Delphi, LabVIEW, Matlab and more.

Communication Protocols

Our open binary communication protocol allows control of the spectrometer starting from microcontrollers up to SPS systems. All device interfaces (USB, SPI and UART) are supported with an easy and straight forward integration into your application.

For the QtubeSpectrometer ASCII-based commands are available for simple spectrometer control.

News and Innovations

Qneo NIR Spectrometer the new neat thing in NIR Sensing

The pocket-size Qneo spectrometer is setting new standards in NIR spectroscopy. The Qneo is the first reliable NIR spectrometer for high volume applications. With a spectral range of 950 – 1700 nm and high sensitivity it covers a wide range of applications and opens up new markets in NIR sensing.

Round Process Module perfect for fluidic analytics

The new QtubeSpectrometer covers an ultra-wide wavelength range from 190 to 1000 nm still offering professional resolution and optimized sensitivity in the lower UV range. With its dimensions the QtubeSpectrometer fits directly into your process pipe and adjusts to your optical setup with or without optical fiber. The integrated electronics takes care about all sensor timings and provides quick results via a UART interface.

AFBR-S20 Spectrometer Variants from 190 – 1700 nm



Round Process Spectrometer
UV

Miniature Spectrometer
VIS

Compact Spectrometer

Industrial NIR Spectrometer
NIR

AFBR-S20 Spectrometers: Key Specification

Product Family	QtubeSpectrometer Round process Spectrometer	Qmini Miniature Spectrometer	Qwave Compact Spectrometer	Qneo Industrial NIR Spectrometer
Part number starting with	AFBR-S20T1WU	AFBR-S20M2xx	AFBR-S20W2xx	AFBR-S20N1N256
Wavelengths range (nm)	190 – 1000 nm	UV: 220 – 400 VIS: 370 – 750 NIR: 730 – 1080 WIDE UV: 225 – 1000 (sensitivity optimized at 300 nm) WIDE VIS: 225 – 1000 (sensitivity optimized at 500 nm) VIS/NIR: 480 – 1100	UV: 220 – 390 VIS: 350 – 880 NIR: 700 – 1030	950 – 1700
Entrance slit (standard)	20 µm	20 µm	20 µm	30 µm
Spectral resolution (nm) [FWHM]	200 – 350 nm: < 3.5 nm 350 – 600 nm: < 2 nm 600 – 730 nm: < 3 nm 730 – 1000: < 5.5 nm	UV: 0.5 VIS: 0.8 NIR: 0.8 WIDE UV: 1.5 WIDE VIS: 1.5 VIS/NIR: 1.5	UV: 0.3 VIS: 0.6 NIR: 0.5	8 nm
Dynamic range	1000:1	1300:1	2000:1	12000:1
Numerical aperture	0.1	0.1	0.1	0.18
Stray light	< 0.2 %	< 0.1 %	< 0.1 %	< 0.1 %
Detector	2500 pixel linear Si CCD	2500 pixel linear Si CCD	3648 pixel linear Si CCD	256 pixel uncooled linear InGaAs sensor
A/D converter	16 bit	16 bit	16 bit	16 bit
Integration time	100 µs to 30 min	3 µs to 30 min	3 µs to 15 min	4 µs to 30 min
Digital interface	UART	USB/SPI/UART	USB/SPI/UART	USB/SPI/UART
Optical interface	SMA 905 connector	SMA 905 connector	SMA 905 connector	SMA 905 connector
Dimensions	35.0 x 70.0 mm	64.0 x 42.0 x 14.5 mm	89.5 x 68.0 x 19.5 mm	60.0 x 50.0 x 19.0 mm
Operating temperature	-15 °C – 60°C (non-condensing)	-15 °C – 60°C (non-condensing)	-15 °C – 60°C (non-condensing)	-15 °C – 55°C (non-condensing)

