

# Qred AFBR-S20R1XX

## Ultra-Compact NIR Spectrometer with Cooled High-Performance Image Sensor



### Key Features

- Spectral resolution from 4 nm
- Cooled InGaAs detector
- Ultra-compact design
- Powerful onboard processing and evaluation

### Applications

- Food safety
- Chemical analysis
- Quality control
- System integration
- Counterfeit detection
- Environmental analysis
- Biomedical applications
- Pharmaceutical analysis
- Process control and monitoring

### Overview

The Qred is the world's first truly portable near-infrared spectrometer. On a footprint smaller than a credit card, it includes high-throughput Czerny-Turner optics with a TEC-cooled InGaAs image sensor. The advanced thermal design provides high thermal stability and excellent heat transfer without a fan. The rugged design with no moving parts ensures reliable operation in rough environments. The Qred offers the following:

- Full processing of spectra in the device (offset, nonlinearity, dark spectrum, and spectral sensitivity)
- Stable measurement conditions due to active cooled sensor
- AUX connector for analog and digital I/O, communication interfaces and power supply

| Part Number  | Product Configuration | Wavelength Range  | Spectral Resolution |
|--------------|-----------------------|-------------------|---------------------|
| AFBR-S20R12R | Qred 256C-1.7         | 900 nm to 1700 nm | 8 nm                |
| AFBR-S20R12E | Qred 256C-2.5         | 900 nm to 1700 nm | 4 nm                |
| AFBR-S20R15R | Qred 512C-1.7         | 900 nm to 2500 nm | 16 nm               |
| AFBR-S20R15E | Qred 512C-2.5         | 900 nm to 2500 nm | 8 nm                |

| Specifications        |   |
|-----------------------|---|
| Focal length          | 50 mm   |
| Entrance slit         | 50 $\mu$ m: 256-pixel sensor version<br>30 $\mu$ m: 512-pixel sensor version      |
| Dynamic range         | 15000:1   |
| Numerical aperture    | 0.14  |
| Stray light           | <0.1 %  |
| Detector              | Cooled 256/512-pixel InGaAs sensor  |
| A/D converter         | 16-bit  |
| Calibration           | Wavelength, sensitivity, nonlinearity, and multiple dark spectra stored in device |
| Internal memory       | 32 MB (>3000 spectra)   |
| Transfer speed to PC  | USB 2.0 high-speed  |
| Optical Interface     | SMA connector   |
| Digital interfaces    | USB 2.0 with Type-C connector, SPI, UART  |
| Dimensions            | 67.0 mm $\times$ 58.0 mm $\times$ 22.5 mm   |
| Weight                | 160g  |
| Operating temperature | -15°C to 60°C (non-condensing)  |
| Storage temperature   | -25°C to 70°C   |
| Power consumption     | 5V DC<br>without cooling: 200 mA<br>without cooling: up to 3A                     |
| PC operating system   | Windows 10, 8, 7, Vista   |

## Application Software

Every Qred spectrometer includes Waves user software developed for general-purpose spectroscopy applications. Waves includes sophisticated algorithms for data acquisition and evaluation, which provides the following features through a clear and straightforward user interface.

- Take and display series of spectra
- Automatic exposure control with dark spectrum interpolation
- Import most ASCII-based file formats
- Export as ASCII table to almost any numerical analysis software
- Comprehensive tools for displaying and analyzing spectra
- Strip charts for comparing characteristic values between multiple spectra including peak follower in real time
- Graph printing and export to PDF
- Dynamic peak finder (no need to set a threshold level)
- Dark spectrum interpolation
- Transmission, absorption, and reflection measurements
- Colorimetry

Waves is very easy to use and very intuitive. Various spectrum evaluation options are available with minimal effort and only a few mouse clicks. For example, to zoom in, adjust the zoom slider. To move around, adjust the scrollbar. To change the x-axis unit, select the corresponding button. Values such as peaks or colorimetry are instantly calculated as soon as a spectrum is taken. Waves is available as a free download from our website.

## Software Library

A software development kit (SDK) is also included to control the spectrometer and take spectra from your own software. It consists of a Windows DLL library for the .NET framework, documentation, and sample code. The SDK can be used with any programming language that can use .NET DLLs, including C#, Visual Basic .NET, C++, Delphi, LabVIEW, Matlab, and Mathematica.

## Communication Protocol

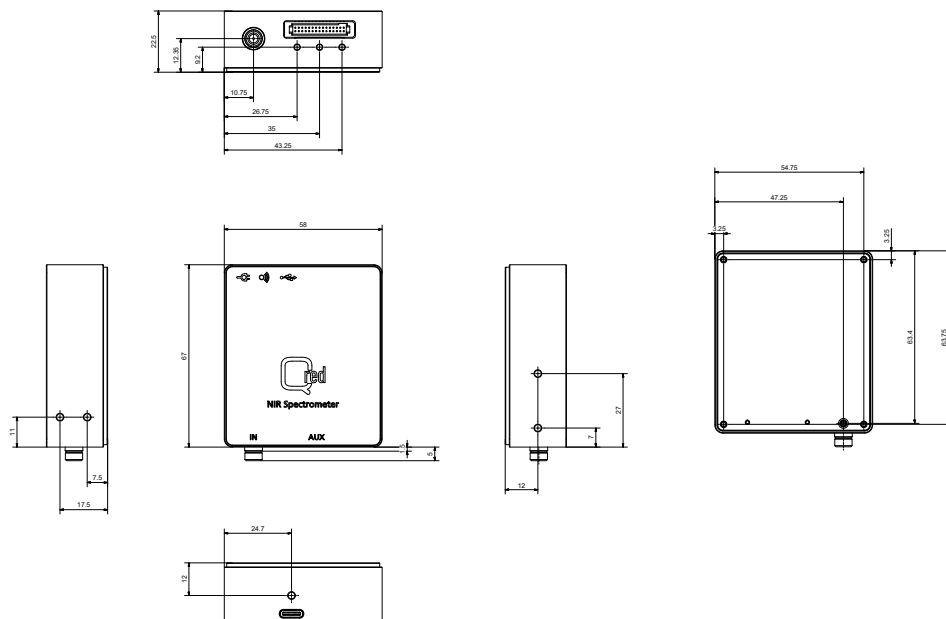
The spectrometer can also be directly controlled from an embedded microcontroller or other operating systems using the device communication protocol. Just like our application software, the protocol is designed to be both powerful and easy to use for software developers.

## I/O Port

The Qred includes a new auxiliary connector for analog and digital I/O, communication interfaces and power supply (if USB is not used). The eight digital channels can be configured as trigger input, shutter or flash lamp control, process control, or general purpose I/O pins.

The Qred supports three trigger modes: software trigger, interval trigger, and external trigger. It can be set to trigger on the start or the end of the exposure period.

### Qred Schematic Drawing





Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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