

NIR-MIR (1 - 3 μ m) Fiber Coupled PbS Array Spectrometer



The BTC500 offers unique performance in the 1-3 μ m spectral range. It employs a TE cooled linear PbS array with high responsivity especially in the long wave NIR region and also in short wave MIR region. The standard version is equipped with a 256 element linear PbS array, NIR optimized spectrograph, fiber coupled input capability, built-in 14 bit digitizer and USB PC interface. The BTC500 offers high responsivity across the entire NIR region, with low dark noise and long term stability. This makes it ideal for lab and on-line NIR applications. The BTC500 is offered in standard or high resolution configurations. Custom software interfaces and application support are available.

Highlights

- 1100 - 2900 nm response range
- 14 bit digitizer
- USB 2.0 compatible interface
- No moving parts
- TE cooled 256 element array detector
- Portable and light weight

Applications

- Process Analyzer
- NIR Spectroscopy
- Quality Control

BTC500E

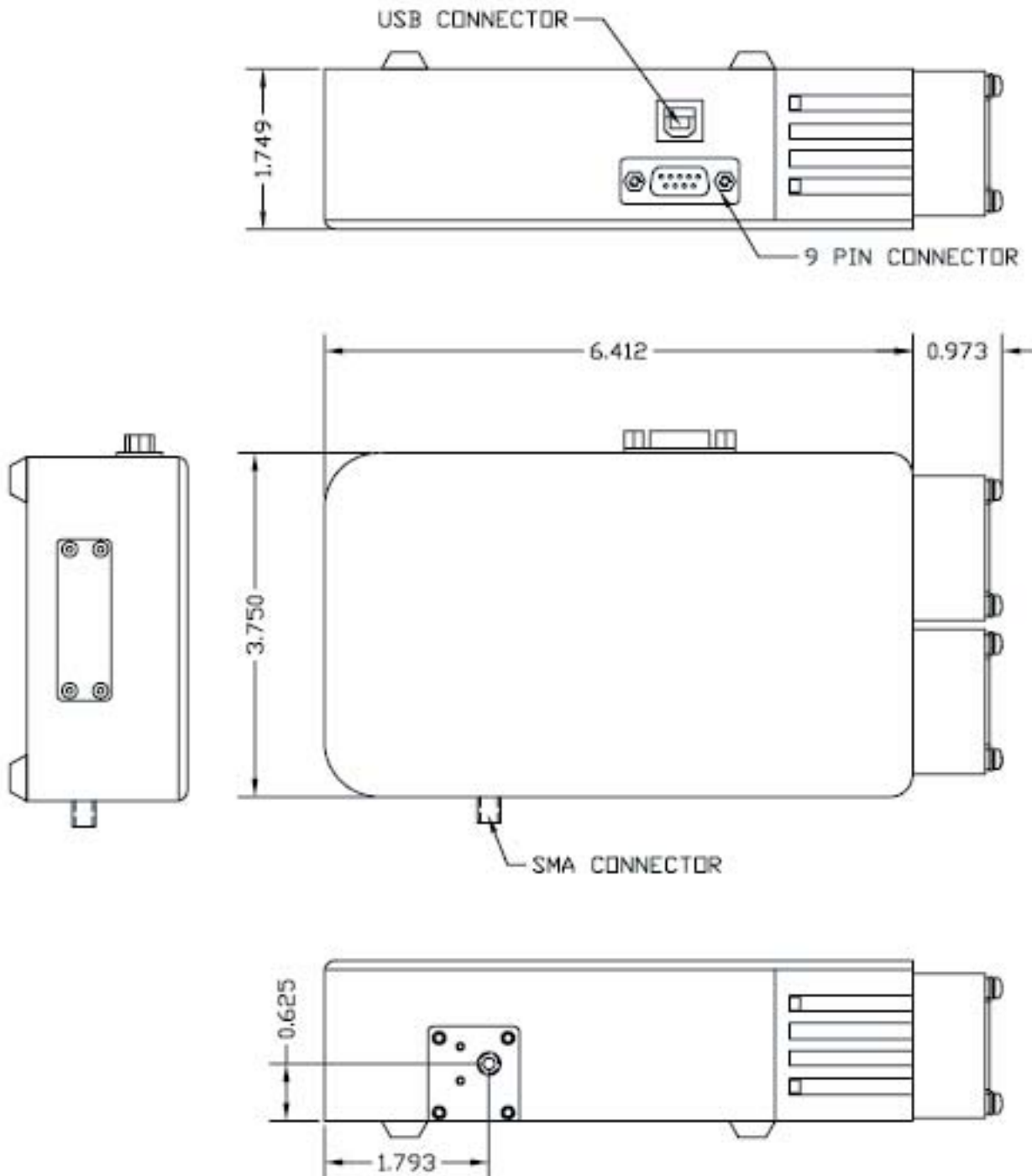
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Typical Specifications

Power Input	by accompanying power supply
Operating Temperature	5° to 35° C
Detector	TE cooled 256-element linear PbS array
Spectral Coverage	500, 1000 nm or custom in 1100 - 2900 nm
Spectrograph f#	3.5
Spectrograph Optical Layout	Crossed Czerny-Turner
Grating	85-1000 lines/mm available with different blaze wavelengths
Slit	40-400 μ m width dependent on resolution requirements (slit height : 1000 μ m)
Optical Resolution	2 to >10 nm FWHM
Digitizer Resolution	14 bit
Integration Time	0.004 ms (minimum) - 218 ms (maximum)
Computer Interface	USB 2.0 compatible
Operating Software	Windows 95, 98, Me, 2000 and NT 4.0 compatible
Dimensions	6.4 x 3.75 x 1.75"
Weight	2.5 lbs

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Dimensional Drawing

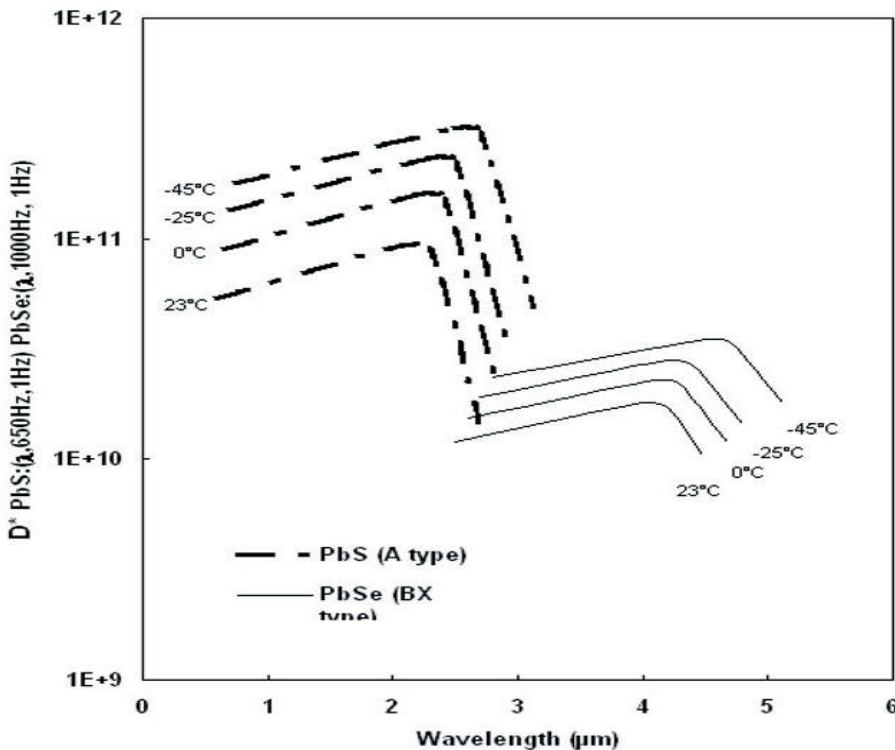


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Frequently Asked Questions

- 1. Is a chopper required?**
No. The system integrates in the DC mode and has dark current subtraction to remove the DC offset.
- 2. What is the maximum temperature the array assembly and board can be exposed to either in operation or during assembly process?**
The system should not be stored or operated above approximately 50°C.
- 3. Is lifetime data available?**
No. Not yet, although our standard detector data would apply to the array.
- 4. What are the power requirements for TEC?**
+5V @ 1.5A max for the cooler and +12V @ 1A max for everything else.
- 5. What is the wavelength sensitivity for both materials?**
Curves are the same as standard materials at 0°C.



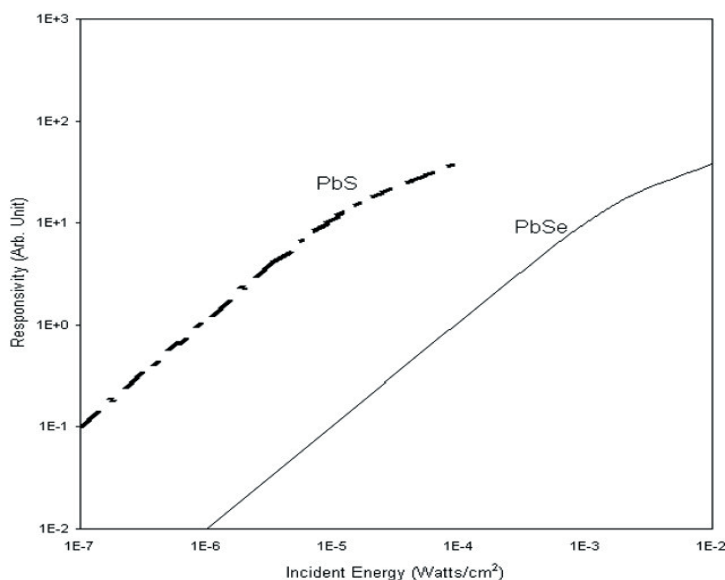
- 6. Does the array work for imaging applications?**
No. The array uses an integrating multiplexer and has high aspect ratio elements intended only for spectroscopic applications.
- 7. What is the window material included in the array package?**
AR coated Si.

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Frequently Asked Questions (cont.)

8. What is the maximum input power (irradiance) to the detector? What will happen if it is 'over exposed'?

Partial Answer: non-linearity is caused when so many photons flood the detector active area that it actually heats up, and can not recover completely during the dark portion of the chop. You may find that using a lower bias voltage, is helpful, but you may also require some sort of neutral density filter which is required in the optical path between the source of IR radiation, and the detector.

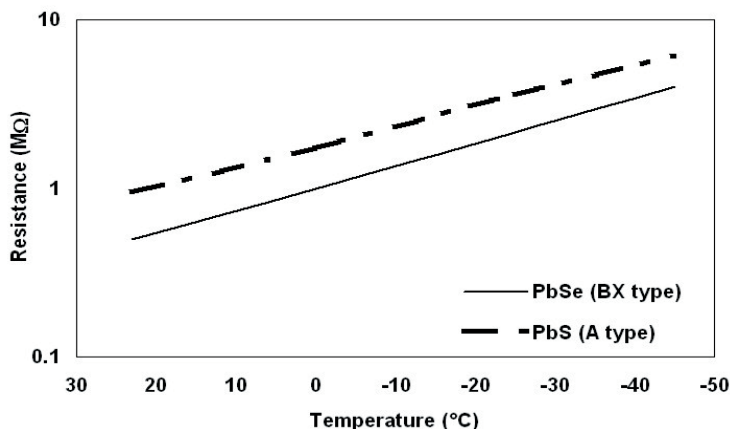


9. How many bit resolution in A/D conversion system?

The multiplexer has an analog output. The interface electronics board uses a true 14bit (all bits are significant) A/D converter that operates at 100K samples/sec.

10. Can I operate the array at a colder temperature than 0C?

Yes. We can provide custom set points to around -10°C. Colder temperatures will require more heat removal. A reference dark resistance vs. temperature curve is provided below.



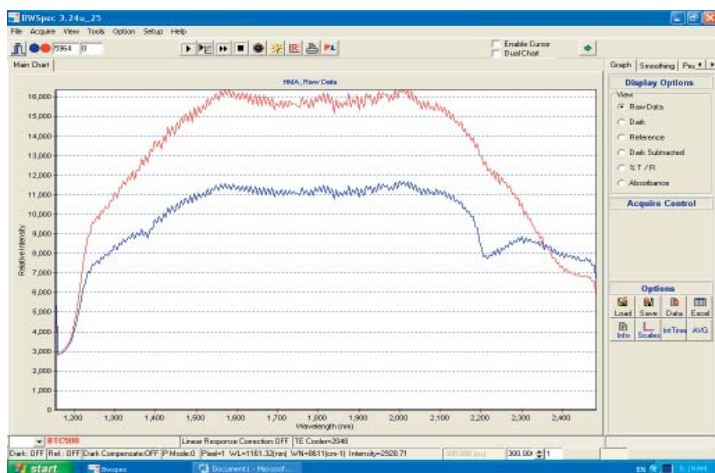
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Frequently Asked Questions (cont.)

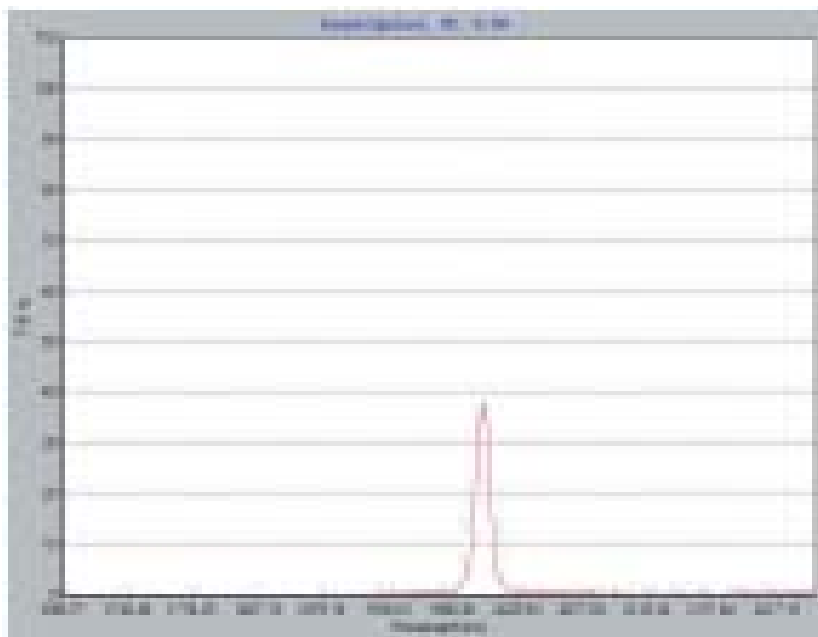
11. Any limitations to the chopping Frequency?

Since this is a DC system (see #1) there is no chopper required.



Red Tungsten Halogen Light Source with 400-NIR Low OH All Silica Fiber

Blue Tungsten Halogen Light Source with Quartz Lens No Fiber



Sample NIR bandpass filter spectrum