CUSTOM SENSORS & TECHNOLOGY

PROCESS ANALYZERS AND ACCESSORIES

PX2+ Photometric Transmitter

UV-VIS-NIR

Introduction

The PX2+ Photometric Transmitter is designed for use in continuous process monitoring applications in a variety of industries. The PX2+ is a highly sensitive, easy to use, and compact instrument capable of making absorbance or fluorescence measurements. Process monitoring equipment is a great investment as economic benefits arise from greater process control and less waste. The PX2+ is designed to alert users when properties of their process stream change and no longer fall within acceptable limits. The ability to monitor process conditions in real-time allows users to observe small changes before they become much bigger problems.

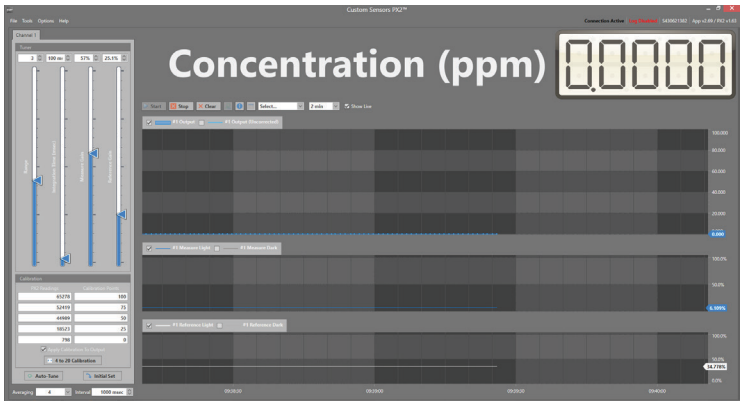
Features

- ◊ Continuously and accurately measures the concentration of a sample while producing results in real-time.
- ◊ Capacitive touch LCD with easy to use software allows users to calibrate and view data.
- ◊ The PX2+ Control Panel App allows the user to adjust the unit's measurement, output, and logging settings. It also allows the user to view historical data, export data to Excel as a .csv, and save or restore past measurement methods.
- ◊ The Auto-Tune feature automatically optimizes the measurement setting for a particular application and determines calibration points using user-provided standards.
- ◊ Standard data outputs include MODBUS, 4-20mA, and USB to CST Software.
- ◊ Low cost of ownership with no routine maintenance.

Industries

- ◊ Bioprocessing
- ◊ Biotechnology
- ◊ Chemical
- ◊ Food & Beverage
- ◊ Oil Fields and Refining
- ◊ Petrochemical
- ◊ Pharmaceuticals
- ◊ Pulp & Paper
- ◊ Utilities
- ◊ Water Quality

PX2+ in Waterpoof NEMA4x Enclosure



PX2+ Control Panel App Administrative Mode

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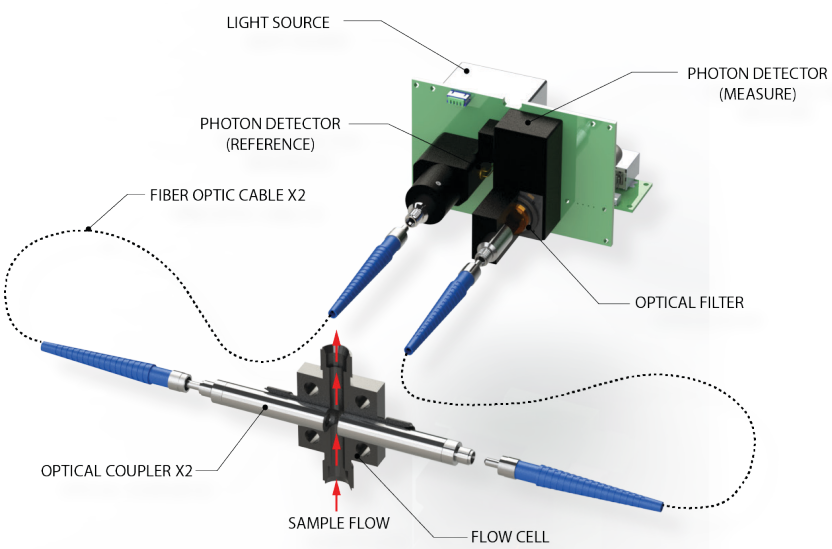
Theory of Operation - Absorbance

Absorption spectroscopy is useful in a wide variety of applications because it allows compounds to be distinguished from one another in a mixture. Absorption peaks along the electromagnetic spectrum are present at specific wavelengths for most subtances. These unique spectral signatures can inform scientists of which substances are present in their sample. The PX2+ is an instrument that measures the concentration of substances by determining the absorbance at specific wavelengths of light.

The PX2+ is a photometric transmitter that utilizes Beer's Law, the attenuation of light as it passes through a substance, to monitor changes in concentration of an analyte in process. The PX2+ sends radiation from a light source within the instrument out to a flow cell and returns the signal to the instrument via optical interface couplers and fiber optic cables. The PX2+ uses optical filters to provide specific measure and reference wavelength ranges chosen to coincide with analyte absorbance. The signal is linearized, and the resulting analog or digital signal can be sent to a PLC or DCS for process control. CST also offers Transmission and ATR Probes that can be used instead of optical interface couplers depending on process requirements.



3/8" Optical Interface Couplers

Transmission Probe

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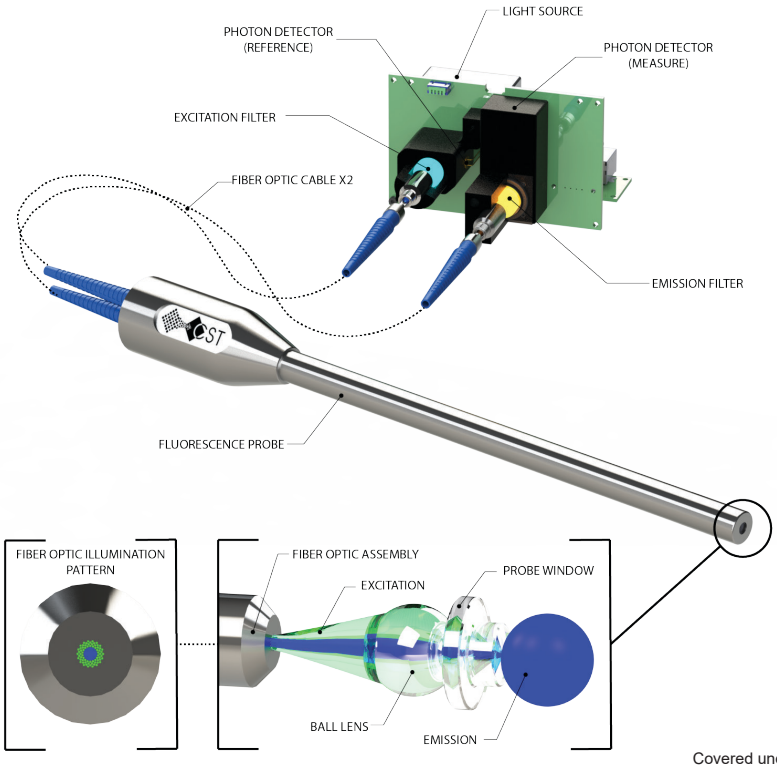
Theory of Operation - Fluorescence

Fluorescence occurs when a molecule absorbs light energy at one wavelength and re-emits light at another, typically longer, wavelength. The wavelength where the maximum absorption occurs is called the excitation wavelength, and the wavelength where the maximum emission occurs is called the emission wavelength. The PX2+ uses optical filters to provide specific excitation/emission wavelength ranges chosen to coincide with analyte fluorescence.

Fluorescence spectroscopy can be used to measure the concentration of a compound because the fluorescence intensity is linearly proportional to the concentration of the fluorescent molecule. Only molecules that fluoresce can be detected by this method, however, the sensitivity and specificity of fluorescence measurements leads to more precise and accurate readings than comparable absorbance measuring methods.

The Front Surface Fluorescence Probe is the key component of making a measurement with the PX2+. The light source within the PX2+ provides excitation energy to the probe tip via a fiber optic cable. The ball lens, located at the sensing surface of the probe, focuses this energy through the sapphire probe window. The energy is then absorbed by the analyte which creates emission energy. This emission energy is transmitted back to the PX2+ by another fiber optic cable and is directed to the measure detector where the concentration signal is detected. The Front Surface Fluorescence Probe is less susceptible to the inner-filter effect and to bubbles or suspended solids because of it's front surface probe design.



Covered under US Patent # 7,382,458

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PX2+ Part Numbering Guideline

Part Number: 64AB-CD-EFG-HIJ-KL	
A = Measurement Method	(0) Absorbance (1) Fluorescence
B = Measurement Quantity	(0) Single (1) Dual
C = Light Source 1	(0) LED (245nm and greater) (1) Flash Lamp (185-2000 nm) (2) Tungsten Halogen Lamp (400-2600 nm)
D = Light Source 2	(0) None (1) LED (245nm and greater)
E = Detector 1	(0) Si Photodiode (190-1100 nm) (1) PMT (185-700 nm) (2) Two-stage TE-cooled InGaAs Photodiode (1200-2550 nm)
F = Detector 2	(0) Si Photodiode (190-1100 nm) (1) Two-stage TE-cooled InGaAs Photodiode (1200-2550 nm)
G = Reference Technique	(0) Source (1) Through Media
H = Analog Output	(0) None (1) 4-20 mA
I = Digital Output	(0) None (1) RS-485 (Modbus)
J = Packaging	(0) Anodized Black Aluminum (1) NEMA4X (2) Explosion Proof (3) Custom
KL = Compensation	(0) None (1) pH (2) Temperature (3) Pressure (4) Conductivity (5) Custom

PX2+ Specifications

Alarms	Contact closure (60VDC, 0.75 A maximum)
Analog Ouput	4-20mA, isolated (max 500 Ω)
Digital Output	RS-485 (Modbus), USB
Power Consumption	8.5 watts maximum
Power Requirements	24 VDC nominal (12-48 VDC)
Operating Temperature UV-VIS	5-55°C
Operating Temperature NIR	-20-32°C
Repeatability	±1% of full scale or better
Response Time	Varies, 500msec-10sec
Size	2.8” H x 4.5” W x 9.5” L
Weight	3.5 lbs. (1.6kg)

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