Expo ePAT601
Driver/Interface

This document describes the driver/interface for the Expo – ePAT601 blend monitor.

Product Description

The interface provides data collection and control of all instrument parameters. This allows acquisition of sample spectra and calibration spectra (white and dark background). The interface is compatible with Expo ePAT 601 blend monitors running NovaPAC v4.21.0.190 with Axsun firmware v1.5.94.
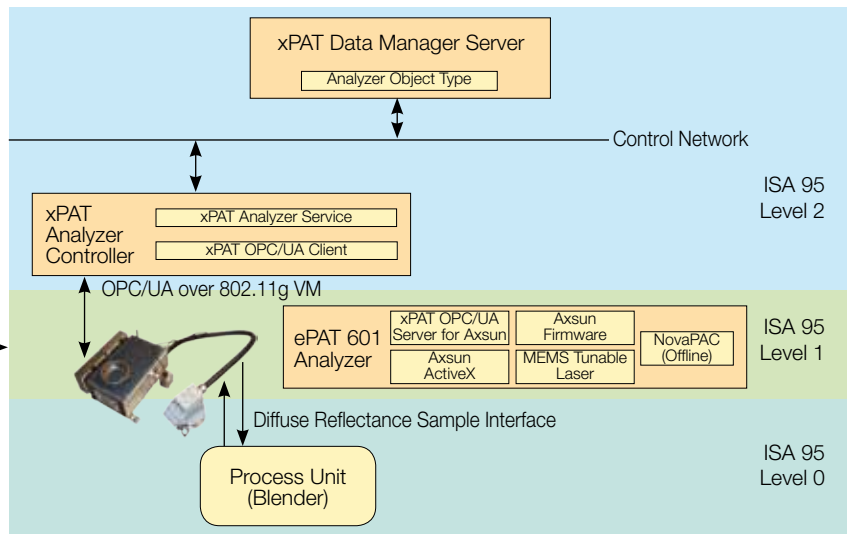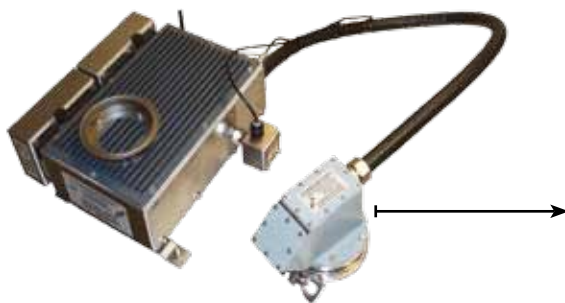
The software interface is made up of the Axsun firmware that controls the tunable laser MEMS spectrometer, the Axsun ActiveX interface that runs on the analyzer on-board computer and interfaces to the firmware, an OPC/UA server that interfaces to the ActiveX and provides buffered connectivity over Wifi to the xPAT Analyzer Controller, the xPAT analyzer service including the OPC/UA client, the xPAT configuration template for Expo ePAT601 and the xPAT object type for Expo ePAT601.

The Expo NovaPAC software is required to validate the correct operation of the analyzer by performing the Operational Qualification (OQ). The NovaPAC software is not required for routine operation of the analyzer.

Manual control and status display of the analyzer is provided by a standard faceplate associated with each instance of the analyzer on the xPAT workplace.

Expo ePAT601 blend monitor

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Specifications

Analyzer Class	NIR spectrometer
Subclass	Tunable laser (MEMS Technology)
Interface	OPC/UA with data buffering over 802.11 WIFI
Compatibility	EXPO ePAT 601 with Axsun firmware v1.5.94, Axsun ActiveX v1.7.0 and NovaPAC v4.21.0.190
Throughput	Max 1 sample every 5 seconds
Spectrum Size	Nominal 225 points for 1350 to 1800 nm spectral range
Control Parameters	Read/Write access to all parameters
Channels	1 channel
Gains	Selectable 1 to 8
	Default 5
Number of Scans	Number of scans to average per sample measurement
	Default 4
Number of Scans for Reference	Number of scans to average per reference measurement
	Default 4
Hardware Trigger Delay	Sets the delay in seconds for sample analysis start after the hardware trigger
	Range: 0.001 to 3600 seconds
	Default: 0.001 seconds
Trigger Mode	Selectable trigger function: rising edge, trailing edge, level, no trigger (software triggered)
	Default: rising edge
Signal Processing Parameters	
Spectral Range	Minimum and Maximum of desired spectral range in nm
	Default 1350 to 1800nm
Point Spacing	Point spacing in nm
	Default 2.0nm
Deresolve Mode	Selectable: None, Weighted moving average, Savitsky-Golay
	Default: Weighted moving average
Deresolve Width	Width of deresolve function in nm
	Default: 2 nm
Faceplate Status Indicators – analyzer	
Connection Status	Status of Ethernet link to analyzer: good or bad
Analyzer Status	Status of analyzer: good or bad
Acquisition Status	Idle, Sample starting, Sample, Reference starting or Reference
Reference Time Stamps	Date time for last dark background and white background spectra
Data Collection Status (for sample or reference)	Normal, Maintenance, Fault
Faceplate Commands per channel	Collect Sample, Collect Reference
Control Type	xPAT provides start of batch signal, analyzer samples are triggered by blender, no real-time handshake required to allow for network dropouts without data loss (OPC/UA data buffering)
Data Acquisition	Collect dark background and white background spectra for calibration and absorbance spectra for samples
Data Analysis	Up to 5 properties with statistics from Peak height or PLS model (PLSplusIQ or SimcaP+)
Calibration	Collect dark background and white background
Validation	Operational Qualification (OQ) of analyzer partly supported in spectral diagnostics; full OQ requires NovaPAC software. Performance Qualification (PQ) implement by method specific configuration
Spectral Diagnostics	Available on reference and sample spectra: Spectral Noise (RMS noise over a spectral region), Frequency Validation (check correct location of a known band), Spectral Band Intensity (Check a band for minimum intensity)
Health Monitoring	Monitors analyzer hardware status; e.g. TCP/IP connection to analyzer, Analyzer status
Asset Management	Not implemented

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