Datasheet

Bruker FTIR – MATRIX-F Driver/Interface

This document describes the driver/interface for the Bruker FTNIR – MATRIX-F series process analyzers.
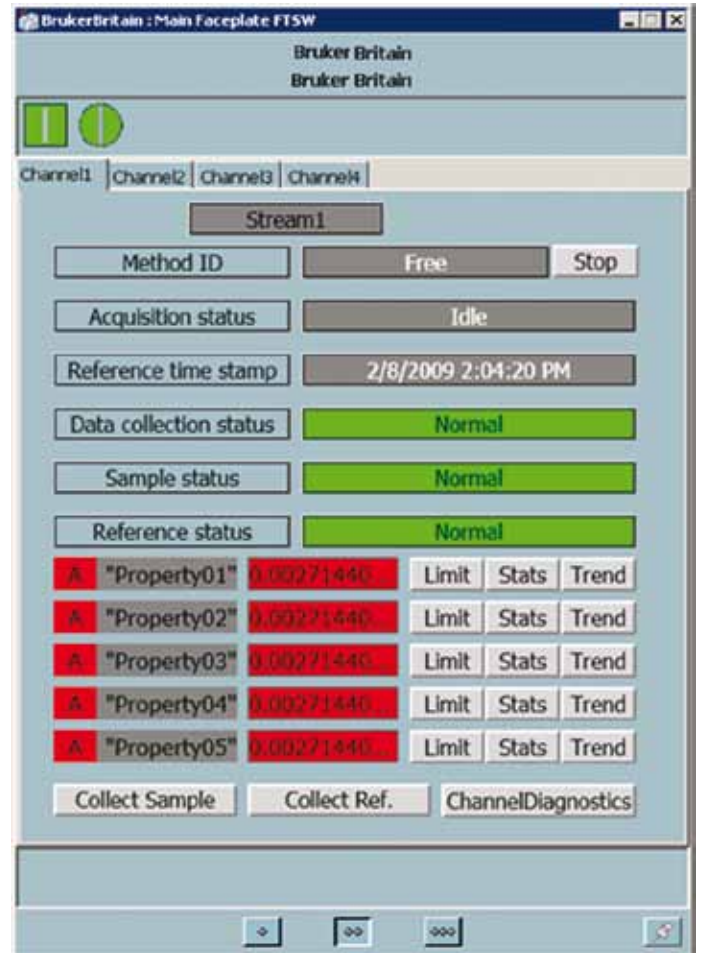
Product Description

The interface provides data collection and control of all instrument parameters. This allows acquisition of reference (also called background) and sample spectra.

The interface is compatible with all Bruker MATRIX-F spectrometers running firmware version 1.470 and using Bruker OPUS v5.5 or v6.0.
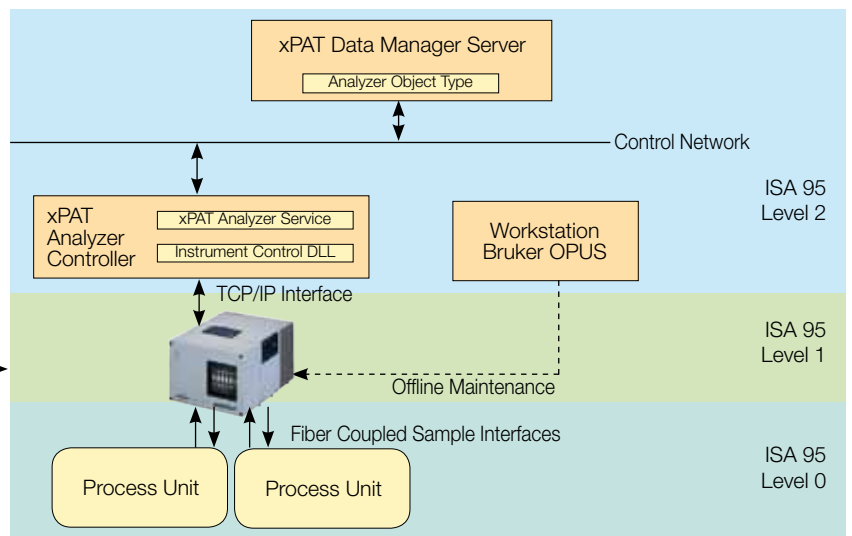
The software interface is made up of an instrument control DLL that interfaces to the analyzer hardware, the xPAT analyzer service, the xPAT configuration template for MATRIX-F and the xPAT object type for MATRIX-F.

The Bruker OPUS software is required to set up the analyzer and to configure certain parameters while engineering an application. The xPAT Analyzer Controller reads the parameter file generated by OPUS (Experiment file *.xpm) and uses it at run time to set the required parameters. The Bruker OPUS software is also required to validate the correct operation of the analyzer by performing the Operational Qualification (OQ). The OPUS 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.

Bruker FTNIR – MATRIX-F series process analyzers

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Specifications

Analyzer Class / Subclass	NIR spectrometer / Fourier Transform spectrometer (FTNIR)
Interface	HTTP over Ethernet TCP/IP
Compatibility	MATRIX-F analyzers (firmware v1.470), Bruker OPUS software v5.5 or v6.0

Throughput

Resolution	Max Spectrum Size	Max Samples*
1 cm^{-1}	32768	Every 64 secs
2 cm^{-1}	16384	Every 32 secs
4 cm^{-1}	8192	Every 16 secs
8 cm^{-1}	4096	Every 8 secs
16 cm^{-1}	2048	Every 5 secs
32 cm^{-1}	1024	Every 5 secs
64 cm^{-1}	512	Every 5 secs
128 cm^{-1}	256	Every 5 secs

*Note: At higher resolutions faster sampling possible by reducing spectral range; max 1 every 5 secs

Control Parameters	Read/write access to all parameters
Channels	1 to 4 channels supported, select any 4 from the maximum 6 supported by the hardware
Gains	2 stage gain – preamp gain: 0=A, 1=B, 2=C, 3=ref – signal gain: 1, 2, 4, 8, 16, -1=auto
Spectral Resolution	Selectable from 1 to 256 cm^{-1}
Number of Scans	Number of scans to average per sample measurement / per reference measurement; Default 1
Source	NIR source can be turned on=100 and off=0
Aperture	Selectable from 1 to 10, 10=open, others can be filters or apertures, depends on device configuration
Scan Speed	Set in the xpm file: can be 5, 10, 20 or 40 kHz
Internal Settings	Additional internal settings in xpm, normally left at their default values. See Bruker documentation.
Signal Processing Parameters	Settings for signal processing of raw data
Laser Frequency	Set in the xpm file, determines the x axis of the spectrum; Default 15798.80 cm^{-1}
Phase Correction Resolution	Set in xpm file, default 128 cm^{-1}, can be set from 1 to 256 cm^{-1}
Phase Correction Type	Mertz or Mertz with no peak search, default is Mertz
Peak Position for ZPD	Identify the center of the Interferogram for phase correction if using no peak search
Spectral Range	Minimum and maximum of desired spectral range in cm^{-1}
Faceplate Status Indicators – analyzer	
Connection Status	Status of Ethernet link to analyzer: good or bad
Analyzer Status	Status of analyzer: good or bad
Faceplate Status Indicators per channel	
Acquisition Status	Idle, Sample starting, Sample, Reference starting or Reference
Reference Time Stamp	Data time for last reference
Data Collection Status (for sample or reference)	Normal, Maintenance, Fault
Faceplate Commands per channel	Collect Sample, Collect Reference
Control Type	xPAT provides start/stop signal
Data Acquisition	Collect reference spectrum for calibration and absorbance spectrum for samples
Data Analysis	Up to 5 properties / channel with statistics from Peak height or PLS model (PLSplusIQ or SimcaP+)
Calibration	Collect Reference
Validation	Operational Qualification (OQ) of analyzer partly supported in spectral diagnostics; full OQ requires OPUS 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), Non-linearity (detect saturation with out of band signal), Spectral Band Intensity (Check a band for minimum intensity)
Health Monitoring	Not implemented, only check if analyzer is present or not
Asset Management	Not implemented

For more information about this analyzer please visit www.brukeroptics.com/matrix. For more information on ABB Life Sciences solutions visit www.abb.com/lifesciences.

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