Syrinx3 Series
Digital FM Demodulators and Modulator/Calibrators

3U cPCI/PXI or PCIe Form Factor

Direct Replacement for Legacy FM Demodulator and Modulator/Calibrator Applications

ULYSSIX TECHNOLOGIES, INC.

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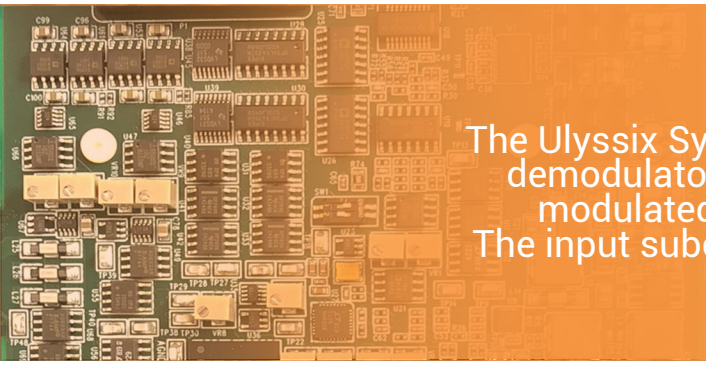
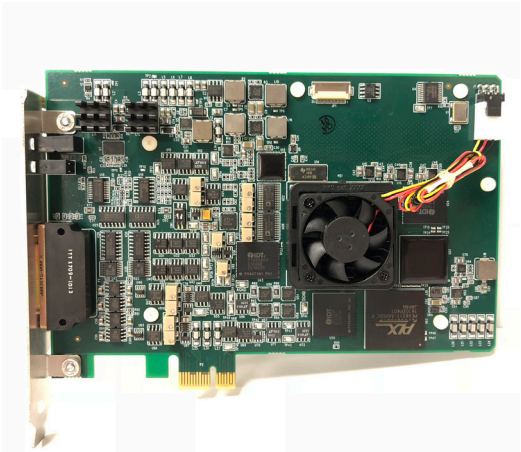


Syrinx3 Series

The Ulyssix Syrinx3 Series of products are DSP based baseband demodulators and modulator/calibrators for use in FM legacy modulated streams for the traditional telemetry community. The input subcarrier is received in analog form, conditioned and then digitized for processing.

Available Form Factors



3u 1x channel PCIe

3u cPCI/PXI

Baseband Demodulator

Program selectable for FM or FSK. Contact Ulyssix if other band demodulation techinques are needed.

Fully programmable for all IRIG 106 CBW and PBW subcarriers and other non-standard channels

Frequency range from 250 Hz to 15 MHz

FM subcarrier deviations from 0.5% to 50% of the center frequency

User friendly Windows based software for setup and operation

By using DSP based algorithms the Syrinx Series eliminates the need for calibration and tuning

Output Capabilities

Program selectable output filter characteristics for analog or digital data

Digital output filter, programmable from 1 Hz to 1 MHz, can be bypassed for higher PCM data rates, up to 5 Mbps NRZL

User selectable bypass low pass filter

Digitally time synchronized sampled output data available for FFT analysis

Additional Features

FIR Lowpass Filter

- Provides configuration capability to either be a Baseband Demodulator or as a standalone digital FIR Lowpass Filter

Capture Mode

- Outputs the digital demodulated data to the hard disk for storage, which can be analyzed by the Syrinx3 FFT playback screen or imported into 3rd party analysis software

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Syrinx3 FM Mod/Cal-cPCI and -PCIe Specifications*

Overall Card Specifications

VCOs / Calibrators per Card	Twelve (12)
Independent Digitizers per Card	Twelve (12)
Summing External Analog Input	5.0 Vpp for max input resolution for single channel. Auxiliary Summing Input sums external analog input for higher channel capacities
Multiplex Output Level	Programmable from 1.0 to 10.0 Vpp into a 1K Ohm load
Frequency Range	250 Hz to 5 MHz
Analog Output Noise	Less than 10 mVRMs

Individual Subcarrier VCO/Calibrator Specifications

Subcarrier Frequency Range	250 Hz to 5.0 MHz
Center Frequency Resolution	0.0002 ppm (1 part in 2^{32})
FM Deviation Range	0.5% to 50.0% of center frequency
PM Deviation Range	0.3 to 2.3 radians, programmable
Subcarrier Input Dev Resolution	0.0244% (12 bit digitizer)
Subcarrier Harmonic Distortion	All harmonic terms are below -53 dB
Input Data Harmonic Distortion	All harmonic terms are below -60 dB
Input Modulation Linearity	Less than 0.02%
Pre-emphasis Scheduling	Programmable from 0 to -20 dB per subcarrier
Deviation Accuracy	0.0244% of the programmed center frequency
Linear Deviation Range	±125% of the programmed deviation
Frequency Stability	25 ppm over the full operation range

Signal Generator Specifications

Waveform Synthesixer Modes	Square, Triangle, Sawtooth

Calibrator Specifications

Calibration Modes	Manual or Automatic (Autostep)
Calibration Steps	3 to 21 steps from -100% to +100% deviation Selectable
Autostep Dwell Time	0.5 to 10 seconds per step Programmable in 0.1 second increments

Physical Specifications

Syrinx3 FM Mod/Cal-cPCI and -PCIe	
Form Factor	-cPCI 3u, 32 bit PCI form factor, PCIe - 3u 1x Channel
Interface Connectors	MDM-31 conncector with breakout cable to individual BNC connectors for Output, Channel Input, and Summing Input panel mount BNC (optional customer request)
Manufacturing	The design utilizes Surface Mount Technology (SMT), manufactured with robotic assembly techniques to IPC-610B Class 2 manufacturing standards.
Temperature Range	Operating: 0°C to 50°C Storage: -20°C to 60°C
Power Consumption	Max 30 Amps total

Input Modulation Specifications

Modulation Modes	FM, FSK
Input Frequency Response	DC to 500KHz
Input Configuration	Single ended or differential using BNC conncetors, Software selectable
Input Voltage Range	0.5 Vpp to 5.0 Vpp, selectable
Maximum Safe Input	± 40 VDC
Input Offset	Programmable from center to either band edge
Range to Range Gain Error	0.03 % at 25°C

Ordering Information

Syrinx3 FM Mod/Cal-cPCI	Standard Twelve Channel Calibrator/Multiplexer Unit in 3U cPCI/PXI form factor
Syrinx3 FM Mod/Cal-PCIe	Standard Twelve Channel Calibrator/Multiplexer Unit in 3U PCIe form factor
Syrinx3 FM Mod/Cal 3U 5 slot Breakout Panel	Optional breakout panel for cPCI or PCIe bracket mount

Syrinx3 FM Demod
Specifications*

Input Specifications

Subcarrier Frequency	250 Hz to 15 MHz, programmable
Amplitude Range	15 mVpp to 4 Vpp
Maximum Safe Input	±35 VDC
FM Deviation Range	0.5% to 50.0% of entered center frequency, up to 3 MHz, programmable
Demodulation Modes	FM with optional other baseband modes
Impedance Matching	Hi-Z/75Ω/50Ω, single ended input, software selectable

Demodulator Specifications

Output Filtering	3 digital output filter modes, program selectable
Analog Mode (Linear Data): The FIR Filter is programmed to be flat within 0.1 dB in the programmed passband and -60 dB attenuation at 2 times the programmed cutoff frequency. Digital Mode (PCM Data): The FIR filter is programmed to be monotonic in the passband with -3 dB attenuation at the programmed cutoff frequency and down -50 dB at 2.5 to 3.0 times the programmed cutoff frequency. Bypass Mode (>1 MHz Data): The digital and analog reconstruction filters are bypassed for maximum digital data throughput, up to 2.7 Mbps NRZ-L. The data frequency throughput is equal to the programmed deviation filter frequency.	
Demod PCM Output	All Syrinx3 demodulators in a single chassis running under the ALTAIR software are encoded into a PCM frame for digital output along with the Analog Output per demodulator
Output Filter Range	Programmable from 1 Hz to 1 MHz with FM deviation ratios from 1 to 64 of the programmed deviation or from 1.5% to 50% of the subcarrier frequency
Output Linearity	Less than 0.05% of programmed full deviation bandwidth measured from the best 3 point straight line
Output Harmonic Distortion	All harmonic terms are below -56 dB for FM deviation
Analog Output Level	Programmable from 1.0 Vpp to 10.0 Vpp with programmable offset from -5 VDC to +5 VDC
Analog Output Noise	Less than 10 mVRMS
Subcarrier Deviation Accuracy	0.0001% of the programmed center frequency (32 bit MNCO phase accumulator)
Linear Deviation Range	±125% of the programmed deviation

Physical Specifications

Syrinx3 Physical Specifications	
Form Factor	-cPCI 3u, 32 bit PCI form factor, PCIe - 3u 1x Channel
Interface Connectors	Subcarrier input and analog outputs are available on MDM51 pigtail BNC connectors or panel mount BNC (optional customer request)
Manufacturing	The design utilizes Surface Mount Technology (SMT), manufactured with robotic assembly techniques to IPC-610B Class 2 manufacturing standards.
Temperature Range	Operating: 0°C to 50°C Storage: -20°C to 60°C
Power Consumption	max 30 Amps total

Ordering Options

Syrinx3-PCIe	Digital Baseband FM Demodulator, 3u PCIe 1x form factor with pigtail interface cable
Syrinx3-Dual-PCIe	Dual Channel Digital Baseband FM Demodulator, 3u PCIe 1x form factor, with pigtail interface cable
Syrinx3-cPCI	Digital Baseband FM Demodulator, 3u cPCI/PXI form factor with pigtail interface cable
Syrinx3-Dual-cPCI	Dual Channel Digital Baseband FM Demodulator, 3u cPCI/PXI form factor, with pigtail interface cable

Specifications are subject to change without notice.
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