



MXDPP-50 (Front)



MXDPP-50 (Back)

The MXDPP-50 digital pulse processor (DPP) is ideal for analytical x-ray and gamma-ray instruments such as; SDD, Si-PIN, CdTe, Si(Li), and Germanium detectors. The MXDPP-50 is designed to digitize detector output signals, achieving high throughput, with excellent pile-up rejection. The MXDPP-50 KIT includes the digital pulse processor, the detector power supply including high voltage bias, and the automatic temperature controller for Moxtek® detectors.

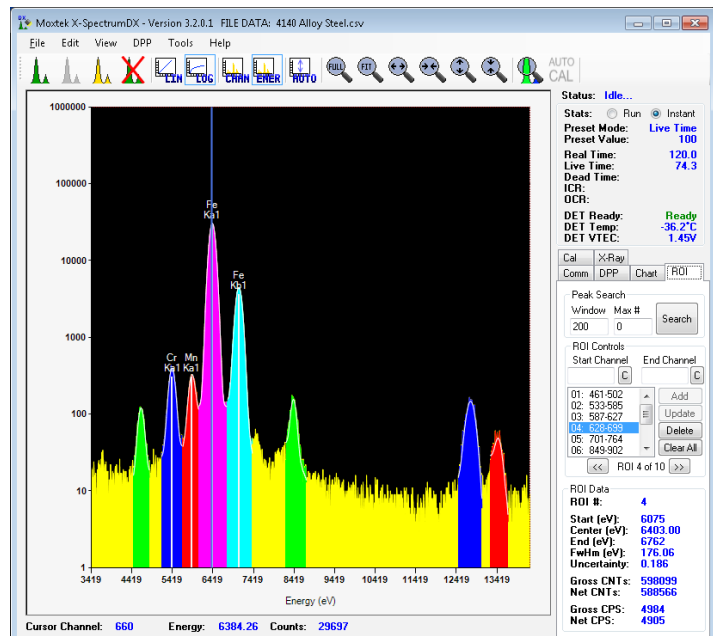
Features	Benefits
Analog-to-Digital Converter (ADC) system (50 MHz, 14 bit)	Fast processing speeds
Two independently configurable fast channels for pileup rejection	Best pile-up rejection for wide range of energies
<ul style="list-style-type: none"> <li>Pulse / Continuous feedback</li> <li>Positive / Negative step</li> </ul>	Compatible with various detector types
<ul style="list-style-type: none"> <li>Configurable: HV bias, ramp polarity, temperature set point</li> </ul>	Change detector settings without changing jumpers
USB2 Interface	High speed communication with Personal Computer (PC)
Certified Microsoft Windows Drivers XP, Vista, Windows 7 & 8 (32 bit and 64 bit)	

## Applications

- Portable XRF applications
- X-ray gamma ray detectors
- Process control
- Scientific research
- Nuclear monitoring

## Standard Package Includes

- MXDPP-50 Digital Pulse Processor
- Detector power supply with HV bias
- 5 VDC power supply brick
- XPIN detector cable (LEMO)
- XPIN signal cable (BNC)
- USB cable
- Spectrum Acquisition Software
  - Product manual (PDF)
  - X-spectrum DX software
  - Software development kit
- FP Software



Example MXDPP-50 Spectrum

## MXDPP-50 Product Specifications

### **Inputs:**

- Detector signal input range -6 V to +6 V
- Software selectable signal polarity
  - 2 Auxiliary software monitorable digital inputs

### **Multi Channel Analyzer (MCA):**

4G counts / channel maximum

Multiple preset functions

- Real Time
- Live Time
- Total Counts
- Peak Counts

4096 channels

Live-time and Real-time acquisition (1 msec to 49 days)

### **Integrated non-volatile EEPROM Memory:**

For persistent parameter settings between power cycles

### **Outputs:**

Selectable analog output signal for monitoring filter outputs with oscilloscope or input into external MCA

2 Auxiliary digital outputs

8 Single Channel Analyzer (SCA) outputs with software selectable windows

- Selectable dead time corrected frequency output or pulse per event output

### **Pulse Processing:**

Trapezoidal shaping

Slow channel

Two fast channels for pile-up rejection

Programmable peaking time (flat top) for all channels

- Slow 0.08 to 81 $\mu$ s
- Fast 0.08 to 19.8 $\mu$ s

Offset function for adjustment of 0 channel to 0eV

Adjustable holding time for all channels

- Slow 0.08 to 19.8  $\mu$ s
- Fast 0 to 19.8 $\mu$ s (typically 0)

Digital fine gain setting for adjustment of eV/channel with high resolution

### **Preprocessor:**

50MHz 14Bit ADC

Adjustable coarse gain for keeping same signal-to-noise ratio level at ADC

Adjustable differentiator time constant for optimal performance

### **Communication:**

Virtual Com Port (VCP) and Direct (D2XX) drivers available

USB 2.0 high speed communication

## Power Supply Specifications

### **Power Supply:**

+5V  $\pm$ 10% 1A Max (Includes power for detector)

Integrated detector power supply

- $\pm$ 9V for BT style detectors
- Software adjustable detector bias supply
  - -250Vdc to +250Vdc

### **Environmental:**

0°C to 60°C Operating Temperature

-40°C to 80°C, 10% to 90% humidity

non-condensing Storage Temperature

RoHS Compliant

### **Integrated Detector Temperature Controller (TC):**

Software selectable TC mode

- Detector mode for use with detectors with integrated temperature controllers
- Box mode for use with detectors without integrated temperature controllers

Software selectable temperature setting

- 0°C to -100°C

Software monitor for Detector temperature, TEC voltage, Ready Signal, and DPP temperature

### **Export Classification:**

EAR99 Export Classification



## Power Supply Specifications Continued

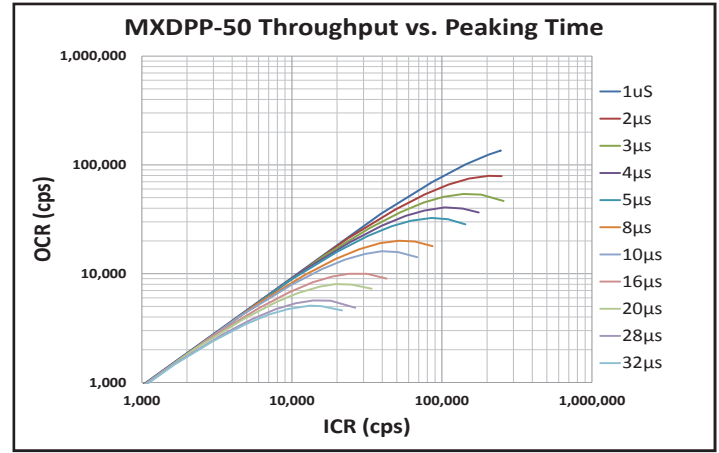
### Connections:

BT Option

- Detector Power connector: Lemo, EPL.1S.306.HLN
- Detector Signal (BNC) connector: Amphenol, 31-5538-10RX

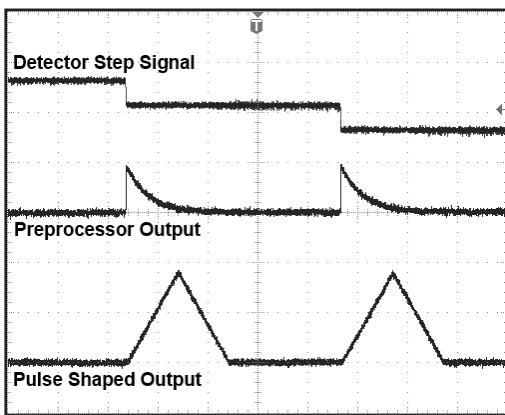
Auxiliary: Samtec, T2M-110-01-L-D-RA

Communications: USB type B connector

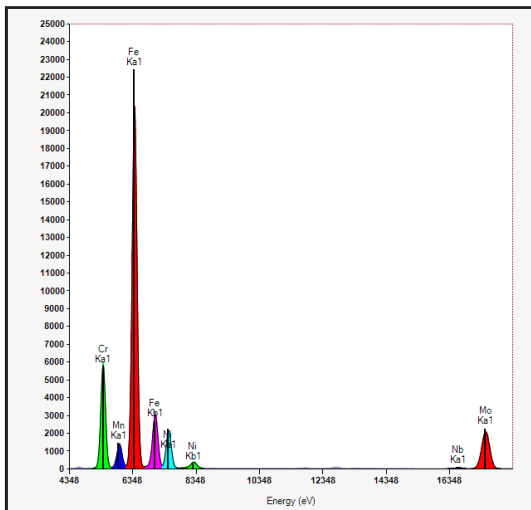


DPP Throughput vs. Peaking Time

## DPP Signal Diagram and Spectrum



DPP Signal Example



DPP Spectrum Example

## Free Evaluation Software (X-SpectrumDX) Specifications

### Read/Write DPP Parameters:

Factory Default DPP configuration files for easy operation

Fine Control of all DPP parameters for advanced users

### Read/Write Detector Settings:

Predefined detector settings for Moxtek detectors

Monitor and display detector temperature, and TEC voltage

### Save Data:

Save raw data to .csv file

Save full date including ROIs, calibration, X-Ray lines to .csv file

Save spectrum as image (.bmp, .gif, .jpg, .png, .tiff)

### Software Development Kit (SDK):

Example Code

- Visual Basic 2010
- C#.NET 2010
- LabView

### Intuitive GUI Interface:

Linear/Logarithmic display

Spectrum controls using mouse

Integrated help for DPP parameters

Copy & Paste spectrum data to/from excel using windows clipboard

Customizable colors

### Basic XRF Analysis:

Start/Stop acquisition controls

Download spectra

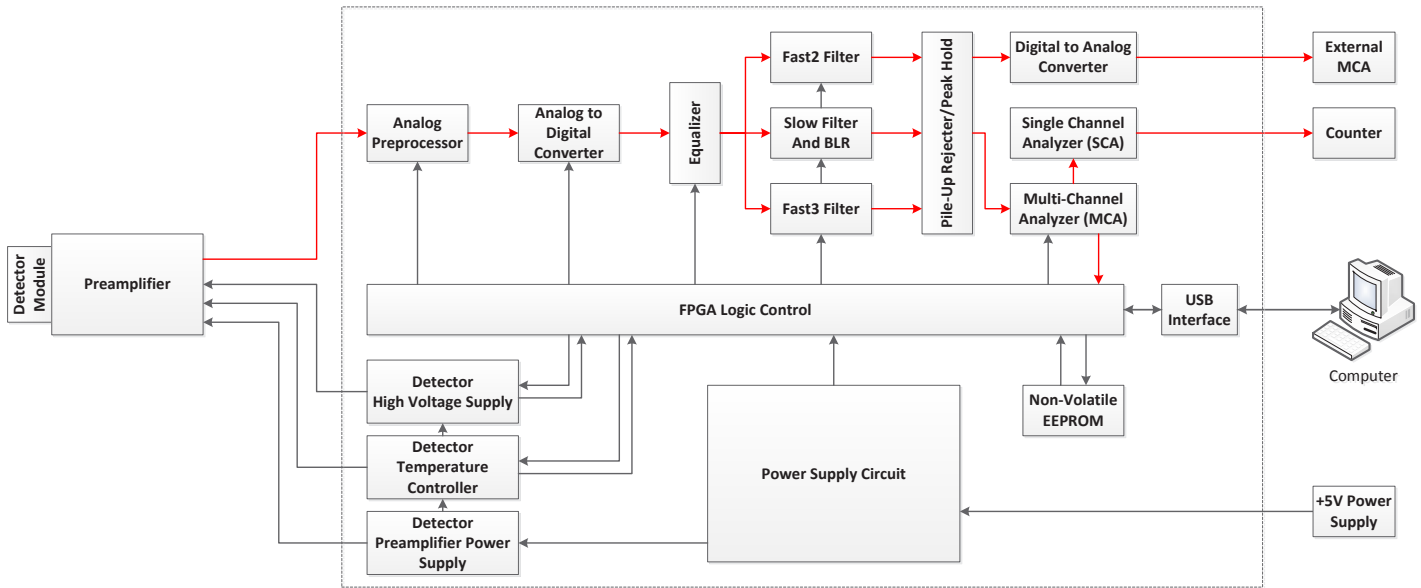
Automatic peak search

2 peak linear calibration

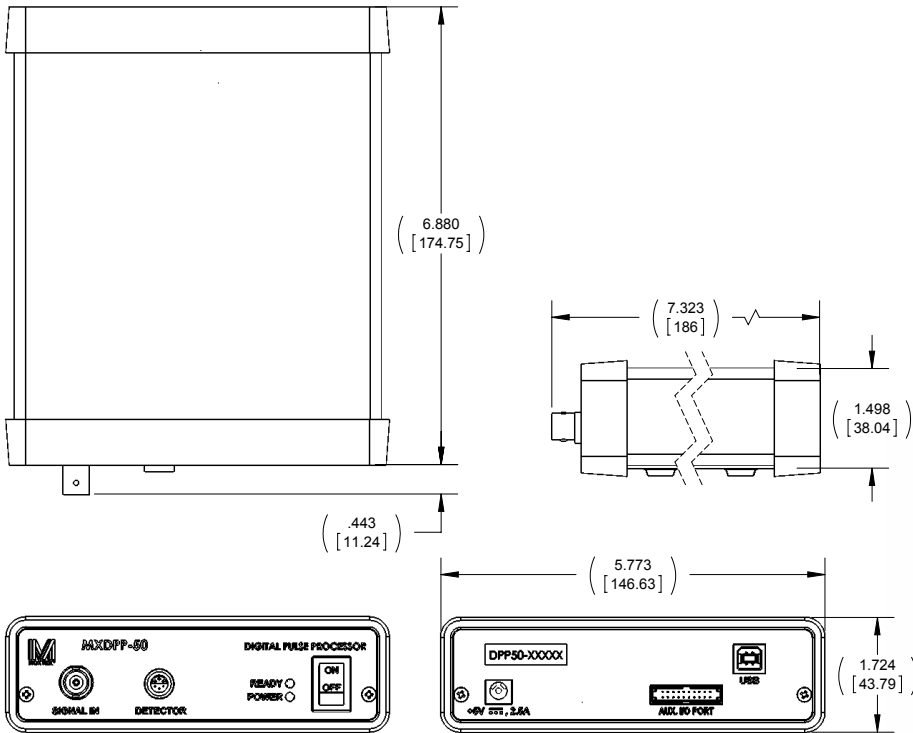
Integrated X-Ray Line display

Example spectrums

# Block Diagram of MXDPP-50 and XRF System



## MXDPP-50 Box Dimensions and Pinouts



Note: Dimensions are in (inches) and [millimeters]

Detector Power Connector (Lemo*)		
Pin ID	Description	Set
1	Temp / Ready	Input
2	High Voltage Bias	-250 to +250Vdc
3	Preamp Power -	-9V Output
4	Preamp Power +	+9V Output
5	Temp GND / TEC -	TC GND / Return
6	TC Power / TEC +	Output
Shield	Detector Ground	GND

Table 1 Lemo Power Connector Pinout

Signal Connector (BNC)	
Contact	Description
Pin	Detector Signal
Shield	Signal GND

Table 2 Signal Connector Pinout



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