MICRO X-RAY INC.

# HIGH-VOLTAGE POWER SUPPLY

**50kV, 100W**


*The **High Voltage Power Supply, 50kV, 100W** is an ultra-compact X-Ray generator that offers tight regulation, high stability, and low ripple. Take control with local and analog GUI to set beam voltage, emission current, and filament current limits.*

*Features include:*

- **50kV Output Voltage, 100W Output Power**
- **Adjustable ground isolated filament supply**
- **Overvoltage and short circuit protection**
- **Voltage and current programming**
- **Local and remote emission control**
- **Safety interlock**
- **RS-232, Ethernet, & USB standard**
- **Redundant HV Monitor Signal Available**

## TYPICAL APPLICATIONS

This high voltage power supply features a 0 to 50kV high voltage output at 5mA and is limited to 100W. It is designed to run grounded cathode X-Ray tubes. Contact MXR Sales to determine if the X-Ray tube of interest can be powered by this power supply.

## SPECIFICATIONS

| | |
|---|---|
| **Input** | +24Vdc ±1V, 7.75A Max. |
| **Output** | 0-50kV, 0-5mA at 100W |
| **Efficiency** | 75%, typical |
| **Voltage Control** | **Local:** Internal multi-turn potentiometer to set voltage from 0 to full output voltage<br>**Remote:** 0-10Vdc=0 to 100% rated output voltage. *Accuracy: ±1%, $Z_{IN}$: 10Mohm* |
| **Emission Control** | **Local:** Internal potentiometer to set beam current from 0 to full output current.<br>**Remote:** 0-10Vdc=0 to 100% rated output current. *Accuracy:* ±1%, *$Z_{IN}$: 10Mohm. Filament limit and filament preheat control capability is also provided.* |
| **Voltage & Current Monitors** | 0-10Vdc=0 to 100% rated output<br>*Accuracy: ±1%, $Z_{OUT}$=1KΩ* |
| **Redundant Voltage Monitor** | A redundant high voltage feedback divider where 0-10Vdc=0 to 100% rated output is available. |
| **Temperature Coefficient** | 0.01% per °C, voltage and current |
| **Stability** | 0.05% per 8 hours after ½ hour warm-up |
| **Digital Interface** | RS-232, Ethernet, USB |
| **DC Filament Supply** | Ground isolated filament power supply allows actual tube current feedback signal for monitoring accurate low X-Ray tube current performance.<br>**Current:** 0-3.5A, adjustable limit<br>**Voltage:** 5.0V, max. compliance |
| **Environment** | **Operational:** 0°C to +50°C<br>**Storage:** -40°C to +85°C<br>**Humidity:** 0% to 90%, non-condensing |
| **Cooling** | User provided forced air cooling is required |
| **Dimensions** | 7.0"H x 3.07"W x 9.0"D<br>(177.80mm x 78.00mm x 228.60mm) |
| **Weight** | 8.5lbs (3.85kg) |
| **Regulatory Approvals** | Compliant to EEC EMC Directive. Compliant to EEC Low Voltage Directive. RoHS Compliant. UL/CUL recognized, File E227588. |

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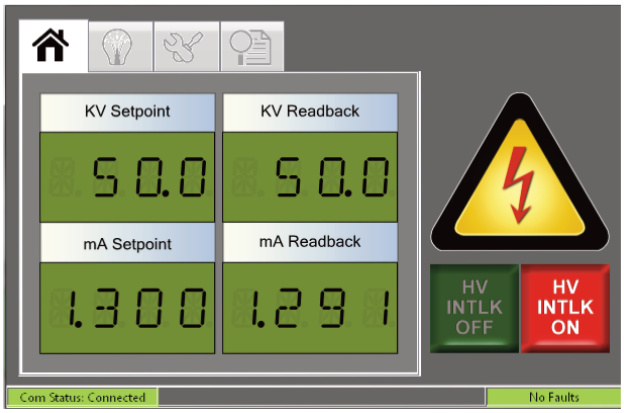
## DIGITAL INTERFACE

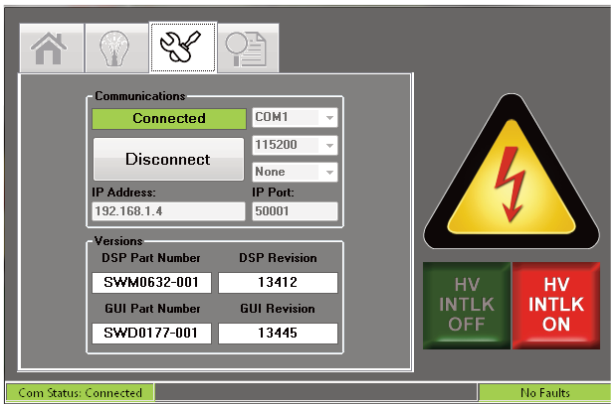
This high voltage power supply features a standard USB, RS-232 and Ethernet digital interface. Utilizing these standard digital interfaces can dramatically simplify power supply interfacing requirements saving the user both time and money, while enhancing functionality and overall capability. Micro X-Ray provides a GUI with the power supply that allows the customer to both customize operational features of the power supply while also providing basic power supply operational features. Details of the power supply's digital interface capability are described in detail in the manual.

### *DIGITAL INTERFACE CONNECTORS*

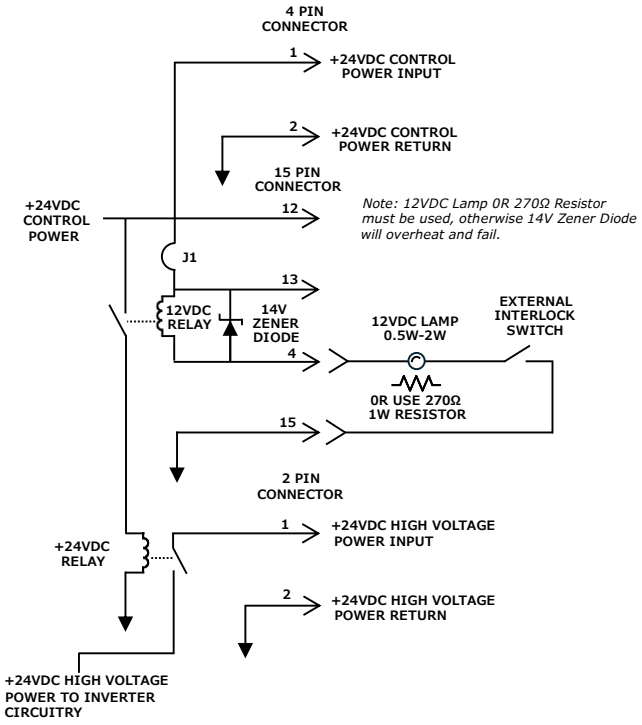

### *MAIN CONTROL SCREEN*



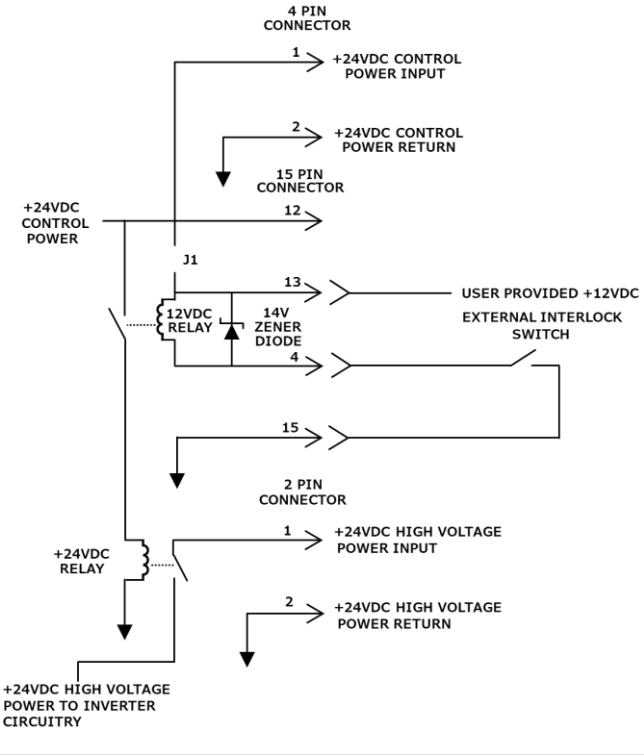

### *COMMUNICATION SCREEN*




### *RECOMMENDED INTERLOCK CONFIG*




### *ALTERNATE INTERLOCK CONFIG*



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## HIGH VOLTAGE POWER INPUT CONNECTOR

### 2 PIN PHOENIX CONTACT

| PIN | SIGNAL | PARAMETER |
|---|---|---|
| 1 | **+24 High Voltage Power Input** | +24 at 7.75A Max |
| 2 | **+24 High Voltage Power Return** | Power Ground |

## CONTROL POWER INPUT CONNECTOR

| PIN | SIGNAL | PARAMETER |
|---|---|---|
| 1 | **+24V Control Power** | +24V at 1A, Max. |
| 2 | **+24V Control Power Return** | Power Ground |

## FILAMENT CONNECTOR

| PIN | SIGNAL | PARAMETER |
|---|---|---|
| 1 | **Filament Output** | 0.3A to 3.5A at 5V max. |
| 2 | **Filament Return** | Filament Return |

*Note: The filament return wire cannot be grounded as this would short circuit the tube return current monitoring to the power supply. If grounding of the filament is required, please contact MXR.*

## ANALOG INTERFACE CONNECTOR

### MALE 15 PIN MINI "D"

| PIN | SIGNAL | PARAMETER |
|---|---|---|
| 1 | **Monitor Return** | Signal Ground |
| 2 | **Voltage Monitor** | 0-10V=0 to full scale, $Z_{OUT}$=1KΩ |
| 3 | **Current Monitor** | 0-10V=0 to full scale, $Z_{OUT}$=1KΩ |
| 4 | **Interlock Output** | Connect 12V HV ON bulb to pin 15 to enable |
| 5 | **+10V Reference** | +10V at 1mA, max |
| 6 | **Filament Monitor** | 1V=1A, $Z_{OUT}$=1KΩ |
| 7 | **Voltage Program Input** | 0-10 volts=0 to full scale, $Z_{IN}$=10MΩ |
| 8 | **Local Voltage Program*** | 0-10V, screwdriver adjust |
| 9 | **Filament Limit Setpoint*** | 1V=1A, screwdriver adjust |
| 10 | **Current Program Input** | 0-10V=0 to full scale, $Z_{IN}$=10MΩ |
| 11 | **Local Current Program*** | 10 turn pot, screwdriver adjust |
| 12 | **Not used (+24 out for interlock)** | (Optional interlock configuration) |
| 13 | **Not used (Interlock Coil)** | (Optional interlock configuration) |
| 14 | **Filament Preheat Setpoint*** | 1V=1A, screwdriver adjust |
| 15 | **Interlock Return** | Interlock Ground |

## HIGH VOLTAGE OUTPUT CONNECTOR

Drywell type detachable connector: 50kV, 8.25in.

## USB DIGITAL INTERFACE

### 4 PIN USB "B" CONNECTOR

| PIN | SIGNAL | PARAMETER |
|---|---|---|
| 1 | **VBUS** | +5 Vdc |
| 2 | **D-** | Data - |
| 3 | **D+** | Data + |
| 4 | **GND** | Ground |

## ETHERNET DIGITAL INTERFACE

### 8 PIN RJ45 CONNECTOR

| PIN | SIGNAL | PARAMETER |
|---|---|---|
| 1 | **TX+** | Transmit Data + |
| 2 | **TX-** | Transmit Data - |
| 3 | **RX+** | Receive Data + |
| 4 | **NC** | No Connection |
| 5 | **NC** | No Connection |
| 6 | **RX-** | Receive Data - |
| 7 | **NC** | No Connection |
| 8 | **NC** | No Connection |

## RS-232 DIGITAL INTERFACE

### 9 PIN FEMALE D CONNECTOR

| PIN | SIGNAL | PARAMETER |
|---|---|---|
| 1 | **NC** | No Connection |
| 2 | **TX out** | Transmit Data |
| 3 | **RX in** | Receive Data |
| 4 | **NC** | No Connection |
| 5 | **SGND** | Ground |
| 6 | **NC** | No Connection |
| 7 | **NC** | No Connection |
| 8 | **Voltage Monitor 2** | 0-10V=0 to full scale, $Z_{OUT}$=1KΩ |
| 9 | **Power supply OK** | +15V=OK<br>0V=Fault, Sink/Source 3mA max. |

RoHS CE c UL US

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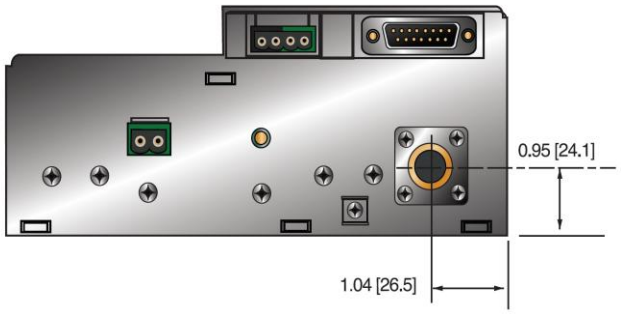
## 50kV UNIT

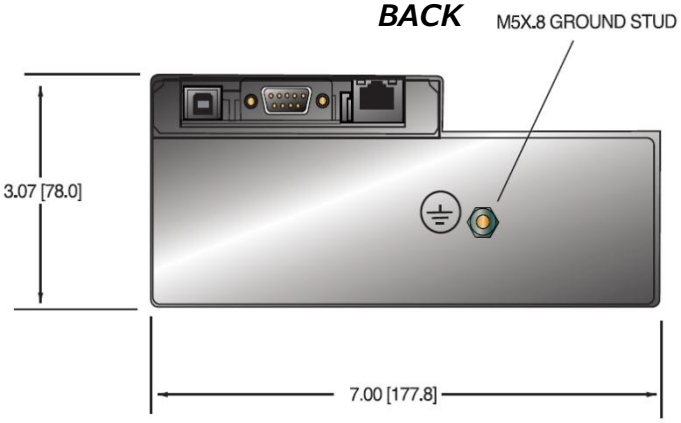
**DIMENSIONS: in.[mm]**

*XCC Option not shown on drawing below. XCC option includes 1in extension. Contact MXR for more information.*

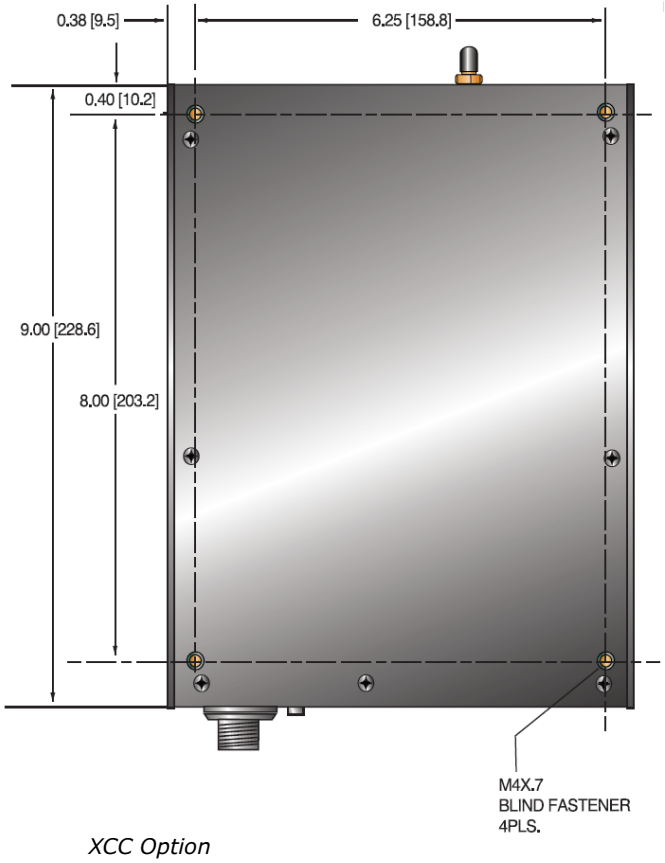
### *FRONT*



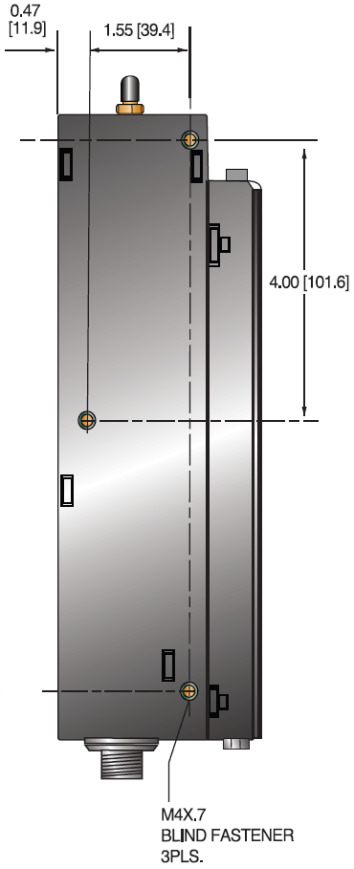

### *BACK*



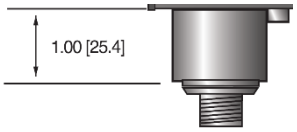

### *BOTTOM*




### *SIDE*




*XCC Option*

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