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Safety

- Do not open the cover of PCX-7401. There are no user-serviceable parts inside. Opening the cover exposes you to shock and voids the factory warranty.

- Do not install, handle, or remove the output cables or laser diode while the PCX-7401 is operating. Allow at least 10 minutes after power-down before handling the output cable or laser diode.

- Do not use this device in a manner not specified by the manufacturer.

- Allow sufficient space around this device for air circulation. Cooling air enters the front of the chassis and exits the back of the chassis.

- Do not use where liquids are present or in corrosive environments. Clean this instrument by wiping with a dry or damp cloth.

WARNING
Risk of lethal electric shock. Do not open the cabinet of this device. Do not touch the output or laser diode while it is operating. This device produces LETHAL levels of electric current, both inside its cabinet and at its output.

DO NOT OPERATE THIS DEVICE UNLESS ANOTHER PERSON, CAPABLE OF RENDERING FIRST AID OR RESUSCITATION IS PRESENT.

SAFE AND PROPER OPERATION OF THIS DEVICE IS THE RESPONSIBILITY OF THE USER.

Directed Energy, Inc. (DEI) provides information on its products and associated hazards, but it assumes no responsibility for the after-sale operation and safety practices.
Quick Start Guide

❖ Safety

Follow the safety guidelines on previous page. DO NOT PROCEED WITHOUT UNDERSTANDING AND OBSERVING THESE GUIDELINES.

❖ Requirements

Make sure the PCX-7401 is:
• connected with the proper cables and termination impedance
• powered up
• Has all faults cleared
• Has the rear enable and keyswitch enabled. The proper icons will be green when enabled.

❖ Controlling the PCX-7401 from the front panel

1. Disable the PCX-7401
   ➢ The Enable button on the front panel glows green if the PCX-7401 is enabled. Press the button to disable. The green light goes out.

2. Set the output current.
   ➢ Press the Output button on the touch screen.
   ➢ Press the encoder knob to set the resolution.
   ➢ Turn the encoder knob to set the output current from 0.000 A to 3.000 A.
   ➢ Press the Done button.

3. Set the bias current.
   ➢ Press the Bias button on the touch screen.
   ➢ Press the encoder knob to set the resolution.
   ➢ Turn the encoder knob to set the bias current from 0.000 A to 0.550 A.
   ➢ Press the Done button.

4. Set the trigger to internal, external, or single shot, as needed.
   ➢ Press the Trigger button on the touch screen.
   ➢ Press the Internal or External or Single Shot button to select the trigger.

5. Set the internal pulse trigger frequency
   ➢ Press the Frequency icon on the touch screen.
   ➢ Press the encoder knob to set the resolution.
   ➢ Turn the encoder knob to set the frequency.
   ➢ Press the Done icon.
6. Set the duty cycle
   ➢ Press the **Duty Cycle** icon on the touch screen.
   ➢ Press the encoder knob to set the resolution.
   ➢ Turn the encoder knob to set the duty cycle.
   ➢ Press the **Done** icon.

7. Enable the PCX-7401
   ➢ Press the **Enable** button on the front panel. The button lights green.

❖ **Controlling the PCX-7401 from a computer**

1. Disable the PCX-7401
   ➢ Send the command “OUTPUT:DISABLE”.

2. Set the trigger to internal, external, or single shot, as needed.
   ➢ Send the command “TRIG:INTERNAL”, “TRIG:EXTERNAL”, or “TRIG:SINGLESHEET”.

3. Set the internal pulse trigger frequency
   ➢ Send the command “TRIG:INT:FREQ n”, where n = [5 to 100000].
   ➢ Units are hertz.

4. Set the pulse duty cycle
   ➢ Send the command “TRIG:INT:MAIN:DUTYCYCLE n”, where n = [1.00 to 99.00].
   ➢ Units are percent.

5. Set the output current
   ➢ Send the command “MAIN:CURRENT:SETPOINT n”, where n = [0 to 3000].
   ➢ Units are milliamperes.

6. Set the bias current.
   ➢ Send the command “BIAS:CURRENT:SETPOINT n”, where n = [0 to 550].
   ➢ Units are milliamperes.

7. Enable the PCX-7401
   ➢ Send the command “OUTPUT:ENABLE”.
Introduction

Description

The PCX-7401 is a precision pulsed current source for driving laser diodes, bars, and arrays. It delivers current pulses variable from 0.000 A to 3.000 A, with a bias current from 0.000 A to 0.550 A. An internal trigger provides pulse repetition frequencies from 5 Hz to 1.000 MHz and duty cycles of 1.00 % to 99.00 %.

The internal Single-shot pulse is adjustable in pulse widths ranging from 200 ns to 1.000000000 second. The single shot is easily enabled using the Enable button on the front panel.

The system can be fully adjusted by using the color touch screen or by using a computer interface. System adjustments include the main output current amplitude, bias current amplitude, main pulse width, trigger source, trigger frequency, duty cycle, and single shot pulse width.

The bias feature allows the PCX-7401 to deliver the current pulse in two steps. The first step—the bias DC—is turned on before the intended trigger time, and is adjusted to supply enough current to set the laser diode just below the trigger point of the laser diode. This minimizes the laser diode’s response time to the main pulse.

The second step—the main pulse—adds to the current from the bias pulse and triggers the diode at the intended time. The main pulse amplitude is variable from 0.000 A to 3.000 A. Its duty cycle is variable from 1.00 % to 99.00 %.

The total current output pulse is always the sum of the bias current and the main pulse current. Consider both the bias output current and the main output current when setting the total output current.

The PCX-7401 can be triggered internally or externally, and readily synchronized with other devices via a Sync output signal on the rear panel. The input termination impedance for the external trigger is selectable for either 50 Ω or 10000 Ω. The Sync signal amplitude varies between 0 and +5.0V. The rising edge corresponds to the rising edge of the main output current pulse. The delay between the sync output signal and the main output current pulse is ~100 ns, measured from rising edge to rising edge.

The PCX-7401 has the ability to store four unique user settings, which include all system configurations for operation of the PCX-7401.
Panel Layout

All features of the front touch screen and the rear panel are labeled. Their functions are covered in the next sections.

Front Panel Features

Local Button Mode
Pressing the LOCAL button returns the PCX-7401 to front panel control from computer control. The Local button is lit when the computer is in control.

Enable Button Mode
The ENABLE button selects whether the PCX-7401 output current is enabled or disabled. The Enable button is lit when the unit is enabled.

Touch Screen
The touch screen provides a graphical user interface and touch control to adjust all functions of the PCX-7401.

Encoder Knob
Turn the encoder knob to change a value for functions of the PCX-7401. Push it to cycle through the resolutions (increments of value change).

Keyswitch
The Keyswitch ON allows the PCX-7401 output current to be enabled. OFF disables the PCX-7401.
Rear Panel Features

Current Output
A socket that accepts the factory-supplied output cable, and is the connection for the system generated current pulses. DO NOT TOUCH any part of this cable while the PCX-7401 is powered up. Please review the Safety section.

Note: Absence of a properly installed output cable disables the output and creates an output enable fault.

Sync Output
Synchronization pulses for external devices are available at this BNC connector. The sync pulse corresponds to the leading edge of the output current pulse.

Rear Enable
This connector accepts either an external dry-contact closure or the factory-supplied shorting BNC plug. Closed contacts or use of the shorting plug enables the output. Open contacts or removal of the shorting plug disables the output and creates a rear enable fault.

USB Connector
Use this connector to communicate with an external computer with a USB cable.
**Ethernet Connector**
Use this connector to communicate with an external computer through an Ethernet network.

**RS232 Connector**
Use this connector to communicate with an external computer via a RS232 cable.

**Power Cord Connector**
The power cord connector accepts a standard grounding equipment power cord, connector type NEMA C-14.

**On-Off Power Switch**
This switches powers the PCX-7401 on and off.

❖ **Accessories Included**

![Accessories Included Image]

**AC Power Cord**
Factory-supplied standard computer-style power cord, with a NEMA C14 and a NEMA 5-15R connectors.

**Current/Voltage Monitor Cable**
This factory-supplied cable (PCA-9550) connects the laser output PCBA to a monitoring instrument, such as an oscilloscope.
Shorting BNC Plug
The factory supplied shorting BNC plug (PCA-9410) attaches to the Rear Enable BNC connector on the rear panel. It takes the place of closed contacts and enables the output.

Keyswitch Keys
The keys access the front panel on-off keyswitch. The output is enabled when the keyswitch is in the ON position.

Laser Output PCBA
This factory-supplied PCB assembly provides a connection to the laser. Use this assembly to monitor the system’s output current and voltage. On the laser output PCBA below, the current monitor (J1) has a ratio of 125 mV/A, with a 50 Ω termination.

```
Top side               Bottom Side
```

Output Strip Line Cable
This factory-supplied cable that provides output current pulses to external devices. A DB37 male connector fits the socket on the rear panel of the PCX-7401; a DB37 female connector is on the user end.

Output Cable Connector Pinouts
The male DB-37 connector interfaces with the instrument and has the following pinout:

- Pins 1 through 16: positive (+) output
- Pins 20 through 35: negative (‒) output
- Pins 17, 36, 37: no connection
- Pins 18 and 19: connected together to satisfy interlock requirement

The female DB-37 connector interfaces with the customer’s laser diode PC board and has the following pinout:

- Pins 1 through 16: positive (+) connection (to laser diode anode)
- Pins 20 through 35: negative (‒) connection (to laser diode cathode)
- Pins 17, 18, 19, 36, 37: no connection
**Interlock**
The DEI instrument requires that **pins 18 and 19** of the **male DB-37** be connected together to satisfy an interlock that determines whether the output cable is present. If this connection is not detected the instrument will not be enabled.

**Output Cable Diagram**
The diagram below depicts the male and female connectors and their pinouts.
### Operation

#### Setup

**NOTE:** Any change to a command adjustment requires <200ms (typically) to complete.

1. Make sure the PCX-7401 has been OFF for at least ten minutes.

2. Make sure the diode connection is in the correct polarity. If necessary review the output cable for polarity specifications.

3. Make the other connections as necessary: External Trigger, External Bias, Sync, Rear Enable, or the connection to the computer.

4. Connect the power cable.

#### Power Up

1. Turn on the power switch. The instrument powers up in about 3 seconds.

2. The instrument plays a tune and displays DEI information.

3. After a few seconds, the PCX-7401 displays the **Home** screen.

![PCX-7401 Home screen diagram]

- **Tools icon** displays the Settings menu
- **Internal Trigger or External Trigger icon**
- **Frequency icon** sets the output frequency
- **Duty Cycle icon** sets the output duty cycle
- **Keyswitch, Rear Enable, Output Connector, Internal Temperature**
- **Output Current**
- **Bias Current**
Home Help Screen

1. On the Home screen, press the “?”, question mark icon.

2. The Help screen appears. This screen describes the icons used in the PCX-7401.

Set the Output Current

MAIN:CURRENT:SETPOINT?
MAIN:CURRENT:SETPOINT n (in mA)


2. Press the encoder knob to select a resolution: x0.001, x0.010, x0.100, or x1.000.

3. Turn the encoder knob to change the output current: 0.000 A to 3.000 A.

4. Press the Done button.

Set the Bias Current

BIAS:CURRENT:SETPOINT?
BIAS:CURRENT:SETPOINT n (in mA)

1. On the Home screen, press the Bias button. The Set Bias Current screen appears.

2. Press the encoder knob to select a resolution: x0.001, x0.010, x0.100, or x1.000.

3. Turn the encoder knob to change the output current: 0.000 A to 0.550 A.

4. Press the Done button.
❖ Set the Trigger Source

TRIG:INTERNAL
TRIG:EXTERNAL

Note: The PCX-7401 will default to Internal Trigger mode during initial power up.

1. From the Home screen, press the **Trigger** icon. The **Select Trigger** screen appears.

2. Press the icon for the desired trigger mode.
   a. For **Internal Trigger** the **Home** screen appears. Set the frequency.
   b. For **External Trigger** the **Set Termination** screen appears. Set the Termination if necessary.

❖ Set the Frequency

TRIG:INT:FREQ?
TRIG:INT:FREQ n

1. From the Home screen, press the **Set Frequency** icon. The **Set Frequency** screen appears.

2. Press the encoder knob to change the resolution:

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Hz to 995 Hz</td>
<td>5 Hz</td>
</tr>
<tr>
<td>1.0 kHz to 49.9 kHz</td>
<td>100 Hz</td>
</tr>
<tr>
<td>50 kHz to 1.000 MHz</td>
<td>1000 Hz</td>
</tr>
</tbody>
</table>

3. Turn the encoder knob to change the frequency to a value from 5 Hz to 1000000 Hz.

4. Press the **Done** icon. The **Home** screen reappears.
Set the Duty Cycle

DUTYCYLE?
DUTCYCLE n


2. Press the encoder knob to select a resolution: x0.01, x0.10, x1.00, or x10.00.

3. Turn the encoder knob to change the duty cycle: 1.00 % to 99.00 %.

4. Press the Done icon.
Set the Single Shot

SINGLE:SHOT?
SINGLE:SHOT n


2. Press the Single Shot box.

3. The Home screen appears in single shot control.

4. To change the single shot pulse width, press the Pulsewidth icon.

5. The Set Pulsewidth screen appears.

6. Press the encoder knob to select a resolution (incremental mode):
   - 200ns to 5,000ns  is  100ns
   - 6µs to 1,000ms  is  1µs

7. Turn the encoder knob to change the single shot from 200 ns to 1.0000000s.

8. Press the Done icon.

9. To perform a single shot pulse, press the Enable button. This will produce a pulse for the programmed pulse width.

   NOTE: In single-shot mode, the bias is a fixed pulselength before and after the main pulse.
10. To change back to internal or external trigger control, press the **Single Shot Trigger** box.

11. The **Select Trigger** screen appears. Press the **Internal or External Trigger** box.

12. The home screen appears in internal or external trigger control.

❖ **Settings Menu**

1. On the Home screen, press the **Tools** icon.

2. The **Settings** screen appears.

   This screen allows the user to view the system settings and change settings as necessary.

❖ **View Information About the PCX-7401**

*IDN*

1. On the **Home** screen, press the **Tools** icon. The **Settings** screen appears.

2. Press the **About** icon. The **About** screen appears.

3. View the model number, serial number, calibration date, and firmware revision level.

4. Press the **Home** icon to return to the **Settings** screen.

5. Press the **Home** icon to return to the **Home** screen.
**View the Communication Settings**

1. On the **Home** screen, press the **Tools** icon. The **Settings** screen appears.

2. Press the **COM Settings** icon. The **PCX-7401 COM** screen appears.

3. To view the communication help screen, press the ? (question mark) icon.

4. Press the **X** to return to the **PCX-7401 COM** screen.

5. Press the icon for the desired communication port.

   a. If **RS232** is selected, change the baud rate to appropriate setting.
   The screen reports the number of data bits, stop bits, and the parity.

   b. If USB is selected, change the baud rate to appropriate setting.
   The screen reports the number of data bits, stop bit, and the parity.

   c. If Ethernet is selected, choose DHCP or STATIC for IP address.

   - For DHCP, press **DHCP** then press the **Update Hardware** icon.
   To reset the DHCP address press the **Settings** icon and press the **Default DHCP Settings**, then press **Save and Exit** icon, and then press **Update Hardware** icon.
- For Static, press **STATIC**, then press the **Settings** icon to make the desired entries for IP, Gateway, and Netmask fields.

- Press the **IP** box to set the IP address, the **IP Address Config** screen appears. Press each field setting and use the encoder knob to change settings. Press the **Save and Exit** icon,

- Press the **Gateway** box to set the Gateway, the **Gateway Configuration** screen appears. Press each field setting and use the encoder knob to change settings. Press the **Save and Exit** icon,

- Press the **Netmask** box to set the Netmask, the **Netmask Configuration** screen appears. Press each field setting and use the encoder knob to change settings. Press the **Save and Exit** icon,

- Once all static settings are completed then press the **Save and Exit** icon. Then press the **Update Hardware** icon.

6. Press the home icon to return to the **Home** screen.
Save Settings

*SAVE n


2. Press the Save Settings icon. The Save screen appears.

3. Press the icon for one of the four locations to which you want to save the settings.

NOTE: Saving to a location overwrites any data at that location.

4. The save takes ~10 seconds. Press the Home icon to return to the Home screen.

Recall Settings

*RECALL n


2. Press the Recall Settings icon. The Recall screen appears.

3. Press the icon for one of the four locations from which you want to recall the settings.

4. The recall takes ~10 seconds. Press the Home icon to return to the Home screen.

Power Down

OUTPUT:DISABLE

1. Disable the unit by pressing the Enable button.

2. Turn the Keyswitch OFF.

3. Turn the power OFF by using the power switch on the rear of the instrument.
Command Set

The Command Set consists of all the commands and queries that the PCX-7401 supports via remote computer control. Commands and queries must be in all capital letters. Commands and queries that require data, denoted as \( n \), must have a space between the command and the data.

The PCX-7401 expects "\n" to be the end line character of commands and queries. The responses to the user’s computer are also terminated with "\n". For every command sent to the PCX-7401, a response will be sent back to the user from the PCX-7401. The user’s software must wait for a response before sending another command to avoid an overflow of the PCX-7401 receive buffer.

**NOTE:** Any change to a command adjustment typically needs <200 ms to complete.

In the examples, the command or query is in black; the response is in blue italics.

*LIST?

Lists all commands and queries supported by the PCX-7401. Example:

*LIST?
*IDN?
*SAVE \( n \) :: \( n = [1 \ldots 5] \)
*RECALL \( n \) :: \( n = [1 \ldots 5] \)
*LIST?
OUTPUT?
OUTPUT:ENABLE
OUTPUT:DISABLE
TRIG?
TRIG:INTERNAL
TRIG:EXTERNAL
TRIG:EXT:TERM?
TRIG:EXT:TERM
TRIG:INT:FREQ?
TRIG:INT:FREQ \( n \) :: \( n = [5 \ldots 1,000,000] \) Hz
TRIG:INT:MAIN:DUTYCYCLE?
TRIG:INT:MAIN:DUTYCYCLE \( nn.nn \) :: \( n = [1.00 \ldots 99.00] \)%
TRIG:SINGLESHT
TRIG:SS:PULSEWIDTH \( n \)
MAIN:CURRENT:SETPOINT?
MAIN:CURRENT:SETPOINT \( nnnn \)
BIAS:CURRENT:SETPOINT?
BIAS:CURRENT:SETPOINT \( nnnn \) :: \( n = [0 \ldots 0.550] \) mAmpps
STATUS:KEYSWITCH?
STATUS:REAR:ENABLE?
STATUS:OUTPUT:CABLE?
TEMP:HEATSINK?
FAULT?
FAULT:CLEAR:ALL

*IDN?
Abbreviation for identity; returns the manufacturer's name, unit model number, serial number, firmware revision, and manufacture date. Example:

*IDN?
DEI Scientific, PCX-7401, 2012-121131, FW.002, 11.27.2012

*SAVE n
Saves the current configuration to non-volatile memory. The value of n must be between 1 and 5. Example:

*SAVE 3
Saved Memory Location 3

*RECALL n
Recalls saved configurations. The value of n must be between 1 and 5. Example:

*RECALL 2
Recall Memory Location 2

OUTPUT?
Returns the state of the output (Enabled or Disabled). Example:

OUTPUT?
Disabled

OUTPUT:ENABLE
Enables the output. Performs the same function as pressing the front-panel ENABLE icon. Example:

OUTPUT:ENABLE
OUTPUT:ENABLE

OUTPUT:DISABLE
Disables the output. Performs the same function as pressing the front-panel ENABLE icon. Example:

OUTPUT:DISABLE
OUTPUT:DISABLE
TRIG?
Returns the trigger type (Internal, External, or Single Shot). Example:

TRIG?
  INTERNAL

TRIG:INTERNAL, TRIG:EXTERNAL, or TRIG:SINGLESHT
Sets the trigger type. The trigger types are Internal, External, or Single Shot. Example:

TRIG:INTERNAL       response is TRIG:INTERNAL
TRIG:EXTERNAL       response is TRIG:EXTERNAL
TRIG:SINGLESHT       response is TRIG:SINGLESHT

TRIG:EXT:TERM?
Returns the external trigger termination value. Example:

TRIG:EXT:TERM?
  50 Ohms

TRIG:EXT:TERM n
Sets the external trigger termination of 50 ohms or 10k ohms, use n value of 50 or 10. Example:

TRIG:EXT:TERM 10
  TRIG:EXT:TERM 10k

TRIG:INT:FREQ?
Returns the trigger frequency in hertz. Example:

TRIG:INT:FREQ?
  1000000 Hz

TRIG:INT:FREQ n
Sets the trigger frequency in hertz. The value of n must be between 5 and 1000000.

Example:

TRIG:INT:FREQ 24000
  TRIG:INT:FREQ 24000

<table>
<thead>
<tr>
<th>Frequency</th>
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</tr>
</thead>
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<tr>
<td>5 Hz to 995 Hz</td>
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<td>100 Hz</td>
</tr>
<tr>
<td>50 kHz to 1.000 MHz</td>
<td>1000 Hz</td>
</tr>
</tbody>
</table>

TRIG:INT:MAIN:DUTYCYCLE?
Returns the duty cycle of the pulse in percent. Example:

TRIG:INT:MAIN:DUTYCYCLE?
  28.10 %
TRIG:INT:MAIN:DUTYCYCLE \textit{nn.nn}
Sets the duty cycle of the pulse in percent. The value of \textit{nn.nn} must have two decimal places and be from 1.00 to 99.00. Example:

\begin{verbatim}
TRIG:INT:MAIN:DUTYCYCLE 28.10
\end{verbatim}

TRIG:SS:PULSEWIDTH?
Returns the Single Shot pulse width in nanoseconds. Example:

If the pulse width is 1100 ns then the response will be:
\begin{verbatim}
TRIG:SS:PULSEWIDTH?
1.100 \mu s
\end{verbatim}

If the pulse width is 500001100 ns then the response will be:
\begin{verbatim}
TRIG:SS:PULSEWIDTH?
500.001100 ms
\end{verbatim}

TRIG:SS:PULSEWIDTH \textit{n}
Sets the Single Shot pulse width always in nanoseconds. The value of \textit{n} must be from 200 ns to 1,000,000,000 ns in 100 ns increments. Example:

\begin{verbatim}
TRIG:SS:PULSEWIDTH 180000000
\end{verbatim}

\textbf{Note:} To enable a single shot, send an OUTPUT:ENABLE command. The computer must have a delay of 2000 ms before sending any other command to the system.

MAIN:CURRENT:SETPOINT?
Returns the Main Output Current in amperes. Example:

\begin{verbatim}
MAIN:CURRENT:SETPOINT?
1.100 Amps
\end{verbatim}

MAIN:CURRENT:SETPOINT \textit{n}
Sets the Main Output Current in mA. The value of \textit{n} must be from 0 mA to 3100 mA. Example:

\begin{verbatim}
MAIN:CURRENT:SETPOINT 1100
\end{verbatim}

BIAS:CURRENT:SETPOINT?
Returns the Bias Output Current in amperes. Example:

\begin{verbatim}
BIAS:CURRENT:SETPOINT?
0.110 Amps
\end{verbatim}
BIAS:CURRENT:SETPOINT n
Sets the Bias Output Current in mA. The value of n must be from 0 mA to 550 mA. Example:

```
BIAS:CURRENT:SETPOINT 110
```

STATUS:KEYSWITCH?
Returns the state of the keyswitch, (Enabled, Disabled). Example:

```
STATUS:KEYSWITCH?
Enabled
```

STATUS:REAR:ENABLE?
Returns the state of the rear enable connector, (Enabled, Disabled). Example:

```
STATUS:REAR:ENABLE?
Enabled
```

STATUS:OUTPUT:CABLE?
Returns the state of the current output cable connector, (Connected, Not Connected). Example:

```
STATUS:OUTPUT:CABLE?
Connected
```

TEMP:HEATSINK?
Returns the temperature of the internal heat-sink, value in degrees centigrade. The typical temperature is 45°C. Example:

```
TEMP:HEATSINK?
50°C
```
Warranty and Service

**Warranty**

Directed Energy, Inc. (DEI) warrants equipment it manufactures to be free from defects in materials and factory workmanship under conditions of normal use, and agrees to repair or replace any standard product that fails to perform as specified within one year after date of shipment to the original owner. OEM, modified, and custom products are warranted, as stated above, for ninety (90) days from date of shipment to original owner. This Warranty shall not apply to any product that has been:

I. Repaired, worked on, or altered by persons unauthorized by DEI in such a manner as to injure, in DEI’s sole judgment, the performance, stability, or reliability of the product;

II. Subjected the product to misuse, neglect, or accident; or

III. Connected, installed, adjusted, or used otherwise than in accordance with instructions furnished by DEI.

DEI reserves the right to make any changes in the design or construction of its products at any time, without incurring any obligation to make any change whatever in units previously delivered.

DEI’s sole obligation, and buyer’s sole remedies, under this agreement shall be limited to a refund of the purchase price, or at DEI’s sole discretion, to the repair or replacement of products in kind that prove, to DEI’s satisfaction, to be defective, when returned to the DEI factory, transportation prepaid by the buyer, within the warranty period. DEI shall in no way be liable for damages consequential or incidental to defects in its products, for failure of delivery in whole or in part, for injuries resulting from its use, or for any other cause.

Returns must be preauthorized and accompanied by a DEI return authorization number.

The foregoing states the entire warranty extended by DEI, and is given and accepted in lieu of 1) any and all other warranties, expressed or implied, including but not limited to the implied warranties of merchantability and fitness for any particular purpose and 2) any obligation, liability, right, claim or remedy in contract or tort.
Factory Service and Support

For more information about your instrument or for an operation problem, please contact the factory:

Directed Energy, Inc.
1609 Oakridge Dr., Suite 100
Fort Collins, Colorado 80525
(970) 493-1901

sales@directedenergy.com
support@directedenergy.com
https://directedenergy.com
CE DECLARATION OF CONFORMITY

Manufacturer's Name: Directed Energy Inc.
Manufacturer's Address: 1609 Oakridge Drive, Suite 100; Fort Collins, CO 80525; USA
Equipment Description: 3 Amp Current Source
Equipment Model Designation: PCX-7401


Referenced Safety Standards:
EN 60335-2-82

Referenced EMC Standards:
EN61326-1
EN 55011 Class A
EN 61000-3-2
EN 61000-3-3
EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
EN 61000-4-8
EN 61000-4-11

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).

Signature: [Signature]
Printed Name: Stephen Krausse
Title: DEI General Manager