PIM-Mini

Pulsed Current Source

Operation Manual

Directed Energy, Inc.
1609 Oakridge Dr., Suite 100, Fort Collins, CO 80525
(970) 493-1901
sales@ixyscolorado.com
www.ixyscolorado.com

Manual Document 7650-0007 Rev. A4

Contents

Safety

- Do not open the cover of the PIM-MINI. 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 PIM-MINI 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.

- 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 chassis of this device. Do not touch the output or laser diode while it is operating. Ensure that all instrument connections, load wiring and load connections are either insulated or covered so that no accidental contact with lethal output voltages occur. 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.

CAUTION

The rear surface of this module is HOT, do NOT touch rear surface. The rear surface is defined by the Output J6 of the module.

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.

Introduction

❖ Description

Precision Pulse Control

The PIM-Mini is a compact and lightweight pulsed current source designed to drive laser diodes, bars, arrays, or any low-impedance load.

System Operation

The PIM-Mini output current may be set with an internal potentiometer or an analog voltage. The pulse width is controlled with the input trigger signal.

The system requires two DC voltages for operation, 12 V (control) and compliance voltage equal to 12 V above the laser diode's forward voltage.

Output Cable

The laser or load is connected to the PIM-Mini with 22 AWG twisted pair cable (included) with a length of 15 cm (6 inches) or less.

What is included?

PIM-Mini

- PIM-Mini Pulser Module
- DC Input Cable
- Output Cable
- Control Signal Cable

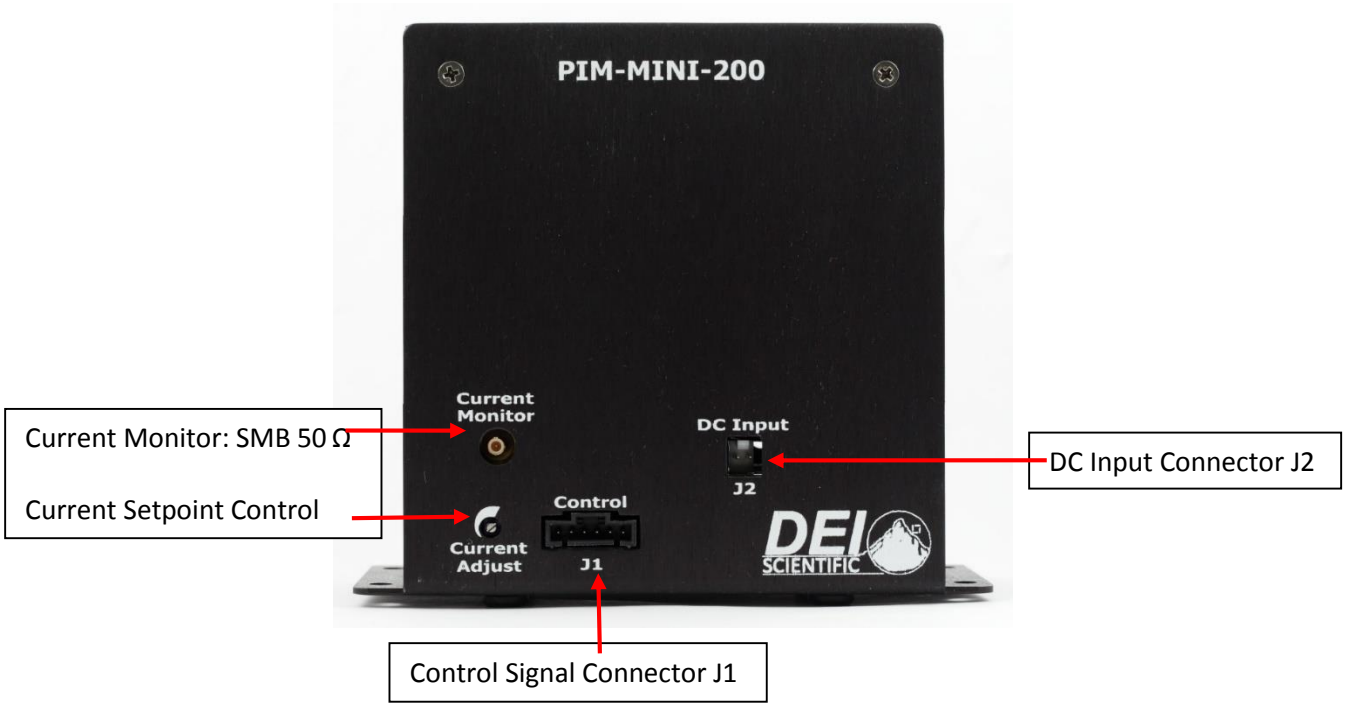
PIM-Mini Development Kit

This development kit (Accessory package, not included with the basic PIM-Mini) includes everything in the PIM-Mini (listed above) plus everything required to send single shot pulses from 25 µs to 250 µs to a laser with a forward voltage up to 12 V. It allows current amplitude and pulse width control via USB computer control or a color touch screen.

Ordering Information

PIM-Mini Development Kit
PIM-Mini

❖ Front Panel Features



Current Monitor
Monitor output current using a SMB connector with 50 Ω termination.

Internal Current Setpoint Control
Adjust output current to proper current required. Clockwise increases current output, Counter Clockwise decreases current output.

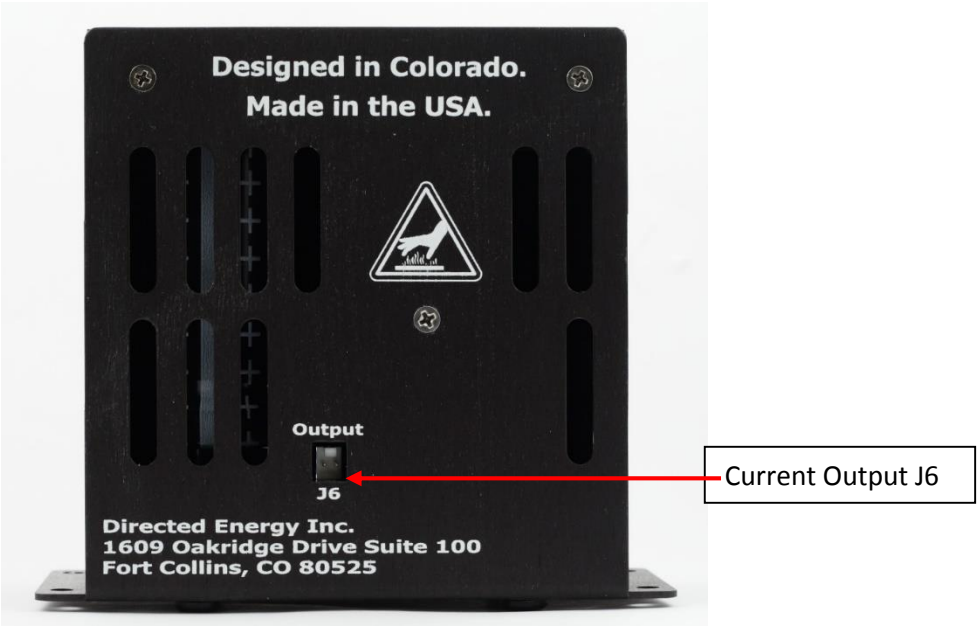
Control Signal Connector J1
Connection for module control.

- Pin 1: 12 V DC, support voltage
- Pin 2: 12 V return
- Pin 3: 12 V return
- Pin 4: Current setpoint control
- Pin 5: Analog current setpoint
- Pin 6: Trigger

DC Input Connector J2
Forward voltage from 0 V to 48 V.

- Pin 1: DC +
- Pin 2: DC -

❖ Rear Panel Features



Current Output J6
This socket accepts the factory-supplied output cable, and is the connection for the system generated current pulses.

SHOCK HAZARD -- DO NOT TOUCH any part of this cable while the PIM-MINI is powered up. Please review the Safety section.

HOT SURFACE -- DO NOT TOUCH any part of the rear surface while the PIM-MINI is powered up. The surface takes approximately 10 minutes to cool. Please review the Safety section.

❖ Accessories Included

DC Input Cable
This is a standard 2 wire input cable for the compliance voltage connection at J2.

Output Cable
This cable provides output current pulses to an external device at J6.

Control Signal Cable
This cable assembly provides a connection from the control the system to the PIM-Mini at the control connector. The control system would include: 12 V support voltage, trigger, and analog current control.

Operation

❖ Setup

1. ALL connections must be made prior to powering up of the PIM-Mini system.

2. Make sure the PIM-MINI has been OFF for at least ten minutes.
   a. The 12 V support power at **Control J1** should be OFF or disconnected.
   b. The compliance voltage at **DC Input J2** should be OFF or disconnected.

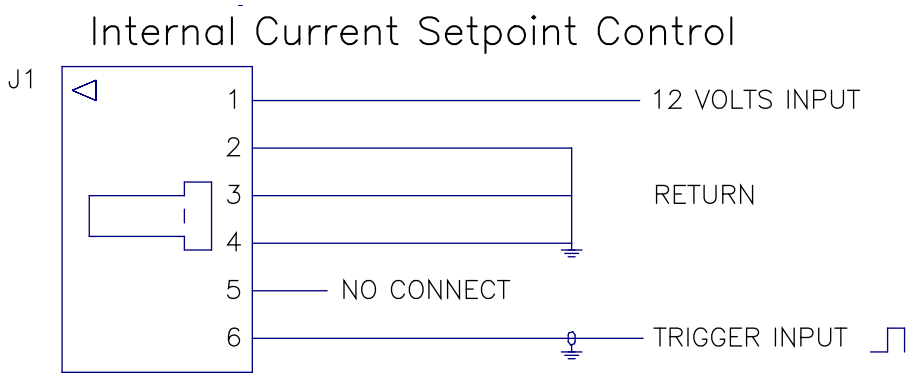
3. Connect the PIM-MINI Current **Output J6** to the diode, or output device, with the correct polarity. If necessary review the output cable for polarity specifications.

4. Connect DC Input voltage of 12 V above the laser diode's forward voltage to the **DC Input J2** power connector.

5. Connect the Control Signals to the PIM-Mini at J1. These controls are: 12 V DC support power, and Trigger.

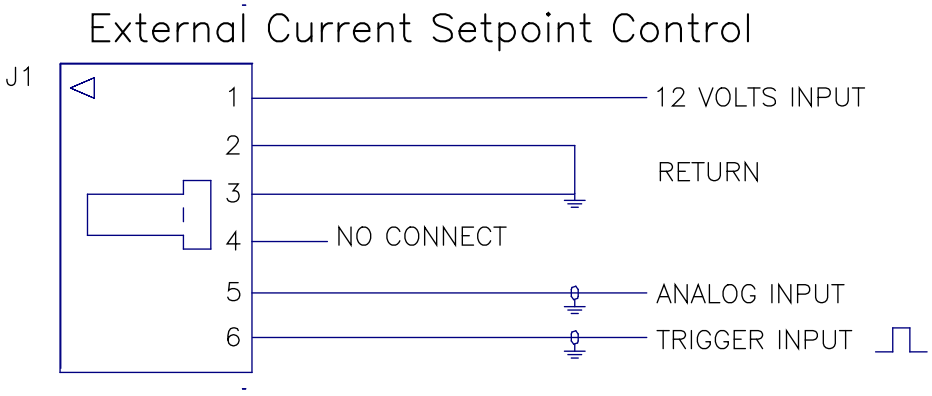
6. Set the system up to use either internal current setpoint control or external current setpoint control.
   a. Internal current setpoint control involves adjusting the internal potentiometer (located on the front panel of the PIM-Mini) for the current output control.
      i. Connect Current Setpoint Control—(J1 Pin 4) to ground at J1 Pin 3.
      ii. Disconnect Analog Current Setpoint—(J1 Pin 5), No Connect.
         - Rotate potentiometer clockwise to increase the output current.
         - Rotate the potentiometer counter clockwise to decrease the output current.

   Below is an example of the control cable at J1 using internal control.



b. External current setpoint control uses an external analog voltage to set the output current control.
    i. Disconnect Current Setpoint Control—(J1 Pin 4), No Connect.
    ii. Connect Analog Current Setpoint—(J1 Pin 5) to an external analog device capable of 0 V to 2.048 V.

Below is an example of the control cable at J1 using external control.



7. Connect the **Current Monitor** device as necessary to the SMB with a 50 Ω termination.

❖ Power Up

1. ALL connections must be made prior to power up of the PIM-Mini system.

2. Power ON the 12 VDC support voltage at **Control J1** Pin 1. The module must have a constant 12 VDC power (for at least 100 milliseconds) prior to applying power to the **DC Input J2**.

3. After 100 milliseconds but NOT more than 30 seconds, power ON the **DC Input J2** compliance voltage.

4. Apply trigger to the module at **Control J1** Pin 6. Adjust trigger as necessary, staying within the constraints defined in the PIM-Mini Datasheet.

5. After 45 seconds from power up the output signal is available.

6. Adjust the Current **Output J6** to the output current required for the output device (diode).
    a. If using the internal current setpoint control, change the Current Adjust potentiometer on the front panel to the output current required.
    b. If using the external current setpoint control, change the Analog Current device to the output current required.

❖ Power Down

1.  **SHOCK HAZARD -- Do NOT disconnect the output device or cable until the module is powered OFF and the capacitor bank has discharged.**

2. Turn OFF the **DC Input J2** compliance voltage.

3. Stop the trigger source to the module at **Control J1** Pin 6.

4. If using the Analog control, Turn OFF the Analog control device **Control J1** Pin 5, or set to 0 V.

5. Turn OFF the 12 V DC support voltage at **Control J1** Pin 1.

 **SHOCK HAZARD -- The PIM-Mini has a capacitor bank that needs to discharge prior to disconnecting the output device from J6.**

 **HOT SURFACE -- DO NOT TOUCH any part of the rear surface.**

6. **Wait ten minutes for the capacitor bank to discharge and for the surface to cool before touching the surface or removing the output device from J6.**

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, ext. 24

- sales@ixyscolorado.com
- techsupport@ixyscolorado.com
- http://ixyscolorado.com/