STEVEN SEPVEST CORP

# PulsIR Evaluation Kit Driver
Instruction Manual

## Theory of operation:

The pulsIR$^{®}$ driver is a computer/manually controlled constant current source designed to allow experimentation with the pulsIR$^{®}$ family of infrared sources. The basic wave form pattern it produces is a two stage square wave as shown below. The first portion of the wave is a high current spike designed to overcome initial (cold) low resistance in the source. After the initial warm-up, the second portion of the pulse maintains a constant current designed to keep the source at the user selected temperature.
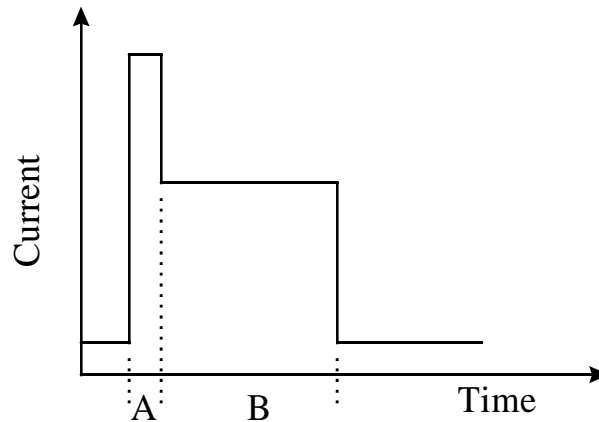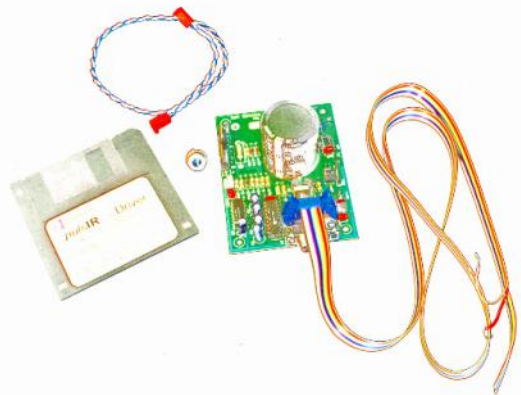




Figure 1. pulsIR$^{®}$ Driver Waveform.    A) Initial Warm Up B) Sustain

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## Unpacking:

Your pulsIR® driver kit should include the following:

      1 Radiator source (customer selected)
      1 Driver Board
      1 Pigtail connector
      1 Windows™ Software Driver Floppy Disk
      1 Ribbon Cable

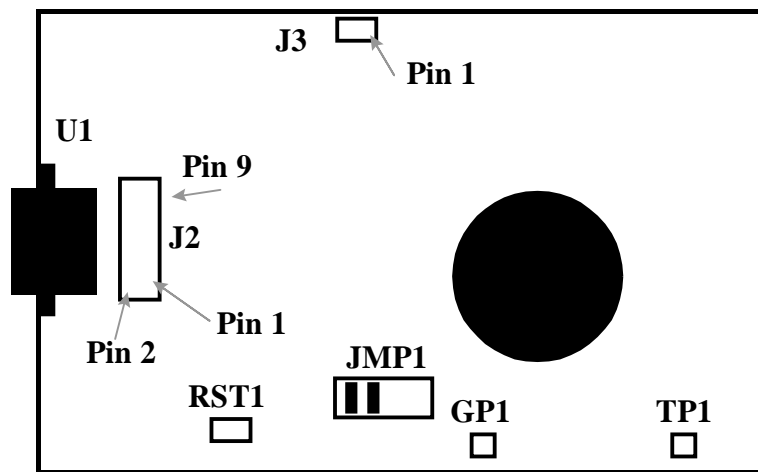If anything appears to be missing/damaged please contact Steven Sepvest for a replacement.



Figure 2: Driver Board Connector Diagram

## Installation:

1) Insert floppy disk into computer and double click on the SETUP.EXE icon (not setup1). The software will prompt you for a directory name in which to install the necessary files and then install itself. It will run on Windows™ 3.0,3.1*,95,or NT.

2) Connect a 9 pin serial computer cable between the driver board and a serial port on your computer. The drive software can control the board via COM1 through COM4.

3) Plug the radiator pigtail into socket J3 on the driver board and connect your radiator to the outer two jacks of the three way end.

4) Connect the ribbon cable to the socket on the driver board. Connect a 12 volt DC power supply between the brown lead and the red (ground) lead.

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## Oscilloscope Connection:

There are two ways to monitor the source. The first is to connect an oscilloscope between TP1 and GP1.  This will allow you to monitor the as-generated waveform driving the radiator.  To monitor the waveform live (as-loaded) connect your oscilloscope between pin 1 of J3 and GP1.  Pin one has a square solder pad on the back of the board and is the pin closest to the transistors at the card's edge.

IMPORTANT!! - Do not connect oscilloscope directly across the radiator (J3).  The oscilloscope's chassis ground will short out the system and burn out the radiator.

## Manual Control:

The pulsIR® driver can be run in certain pre-defined modes manually. These modes are selected by moving the jumpers on connector block JMP1.
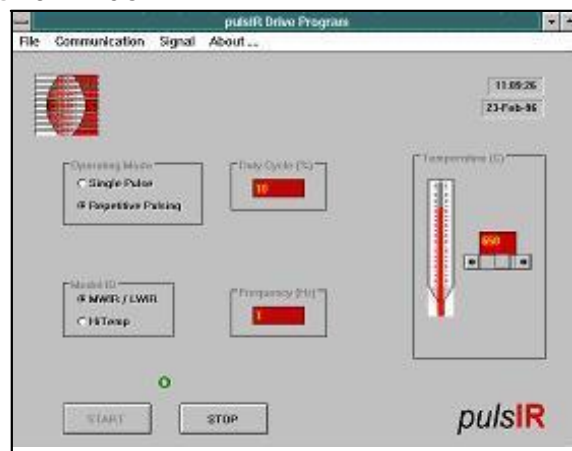
| JumperSetting | OperatingConditions |
|---|---|
| Pins 1 & 2 | 1 Hz, 10% Duty Cycle, 500ºC |
| Pins 3 & 4 | 3 Hz, 10% Duty Cycle, 500ºC |
| Pins 1 & 2, 3 & 4 | 5 Hz, 10% Duty Cycle, 500ºC |
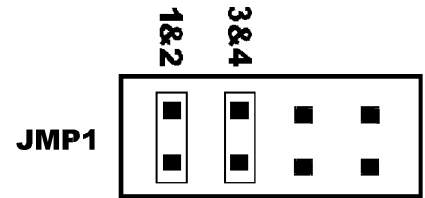
The system ships configured for 1 Hz operation.

## Computer Control:

To start the software, double click on the pulsIR icon.  The system should boot up to this window:

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## Computer Control:

The computer will always override the manual settings but it must first be initialized.  Before attempting to control the board with the software, pull down the Communication menu and select PORT and choose the appropriate COM port; then click on RESET BOARD.  The system is now ready for use.

## Model ID and Temperature Control:

If you selected a radiator in the MSL-T family select MWIR/LWIR from the Model Id box.  If you have a radiator from the MSL-N family select Hi Temp. Model Id selects the appropriate allowable temperature range for your source (200-500ºC or 200-900ºC).  To select a temperature use the scroll bar to the right of the thermometer graphic (while source is off).

## Duty Cycle, Frequency, Pulse Width:

Pulse width, duty cycle, and frequency are user selectable in the following ranges(while source is off):

- Pulse length           10 to 300 msec
- Frequency              0.1 to 20 Hz
- Duty Cycle             0 to 50%

In order to prevent damage to the driver board, the operational envelope forbids certain extreme combinations of pulse length, frequency, and duty cycle.

## Sync Output:

If a timing pulse is need to synchronize the board with some other electronics, connect it to pin 9 of connector block J2. Then use the SIGNAL menu to activate the SYNCHRONIZATION  option.

## Additional Notes:

The driver board has no battery back-up for its memory registers.  Even a minor power interruption will cause the board to revert to manual mode.  To restore computer control, use the Reset Board command under the communication menu (it may also be necessary to briefly short the pins of jumper block RST1).