

# TRAC Labs

Reaching New Heights in Technology



## Biclops™

Looking Forward to the Future

Introducing Biclops™, our pan tilt, verge head for stereo vision applications.

### Features

- Rugged and finely adjustable camera mounts.
- Novel verge mechanism provides zero backlash and high precision.
- Pan and tilt mechanisms have separate drive and feedback trains for precise observability.
- Wide pan axis bearing ring allows for orderly camera cable routing through base.
- All control electronics are housed in the base.
- Simple, high bandwidth, serial interface provides several position and velocity PWM servo control modes.

➔ **Lightweight**

➔ **Compact**

➔ **Inexpensive**

➔ **Embedded Control Electronics**

➔ **Low Power Consumption**

### Performance Parameters

- Range of Motion:  
Pan (+/- 165°), Tilt (+/- 60°), Verge (0° to 11°)
- Maximum Speed:  
Pan/Tilt (120°/sec.), Verge (10°/sec. avg.)
- Maximum Acceleration:  
Pan/Tilt (300°/sec.), Verge (50°/sec.)
- Resolution:  
Pan/Tilt (1.8 arc-min & 33.33 counts/deg), Verge (14 arc-min & 6,144 counts/inch along drive screw)

### Physical Specifications

- Maximum camera/lens mass 500g each (load limits higher for non-verge models)
- Stereo camera mounting distance 60mm
- Camera mount fine adjust range:  
pitch 1.5 degrees  
roll 2.0 degrees
- PTVM Mass (w/o cameras) 1.1Kg
- Overall dimensions (w/o cameras):  
101mm deep  
53mm x 53mm square pattern  
Custom mounting interfaces available
- Power Consumption:  
24v motor power 750 mA maximum  
5v logic power 300 mA maximum

## Overview

The Metrica Pan/Tilt/Vergence Camera Mount (PTVM) is a three-axis motion control platform for aiming stereo cameras. It is compact, lightweight, low power, and accurate. The pan and tilt axes move the pair of stereo cameras much like a standard camera tripod. The vergence axis accurately controls the angle between the cameras from parallel to each camera pointing inward by an angle of  $11^\circ$ . All axes are under closed-loop computer control, with motion commanded through a standard RS232 port.

The PTVM is designed for use with small CCD cameras from a variety of manufacturers. The pair of cameras are mounted on the vergence stage a distance of 152mm apart. Peak speeds exceed 120°/sec. while drawing less than 20 watts of power for both the motors and the controller. The controller, mounted in the base of the Biclops, consists of a four (or two, depending on the model) axis PMD chipset and corresponding motor drive electronics.

The command interface to the controller is a straightforward packet protocol operated over a standard RS232 port. When a command packet, consisting of a command byte and command data, is sent, it is immediately acknowledged by a status packet containing operating status as well as the position and velocity of each axis.



### Biclops PT-M

Biclops Pan/Tilt Monocular  
Includes: C++ API Software



### Biclops PT-W

Biclops Pan/Tilt/Wide  
Shown with Sony DXC990  
Camera and Canon YH18x6.7  
KRS lens (Sold Separately)



### Biclops PT-S

Biclops Pan/Tilt Stereo  
Mount  
Includes: C++ API Software  
Shown with two Sentech  
SC410 Cameras (Sold  
Separately)



### Biclops PTV

Biclops Pan/Tilt/Verge  
Includes: Stereo/Video  
Cables, Switching Power  
Supply (when needed), and  
C++ API Software  
Shown with two Sony XC-75  
Cameras (Sold Separately)

# TRAC Labs

A division of Metrica, Inc

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**Texas Robotics and Automation  
Center Labs is a Houston based  
firm that researches and develops  
advanced concepts in mobile and  
autonomous robotics.**

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Metrica TRAC Labs is a leader in intelligent systems and robotics research with the mission of developing new technologies and products for emerging markets. TRAC Labs has a strong team of engineers and scientists with diverse backgrounds and national recognition for their research. This team has previously developed new technology and completed research for NASA in the area of automation and robotics, including: leading-edge research in robot perception and vision, autonomous control, robot manipulator design, space qualified robot hardware design and human-computer interface technology.