

Application Note 5308

Introduction

There are many motion sensing solutions in the market for the Pan/Tilt/Zoom camera system. It ranges from the expensive Absolute Encoder to low costs Incremental Encoder. With Absolute Encoder, the system able to obtain the current position once power-up and the position information will retain even though the power is shut down. As for the Incremental Encoder, the system requires to position the camera to its homing position as system initialization power-up. In this application notes, we will discuss a low cost encoder solution for the PTZ camera using the Incremental Encoder solution.

PTZ Camera Mechanical Mounting

Figure 1 illustrates an example of PTZ camera mechanical mounting. The PTZ camera mounting might varies from one camera manufacturer to another.

Based on figure 1, pan-axis motor will move the PTZ camera in pan direction (360°) via gear. The tilt direction (90°) will be controlled by tilt-axis motor. Each of the motors contained a motion sensing device connect to it.

Avago Motion Sensing Solution

Each of the motors requires an encoder feedback to tell the current pan and tilt location. Two types of Avago motion sensing devices can be used, either transmissive or reflective. Besides the motion sensing devices, one requires to have the Codewheel that are coupled with the motor shaft. For transmissive encoder, the optical detector and emitter are direct opposite to each other whereas reflective encoder, the optical detector and emitter are on the same plane. Both solutions are viable and provide low costs solution for PTZ camera system.

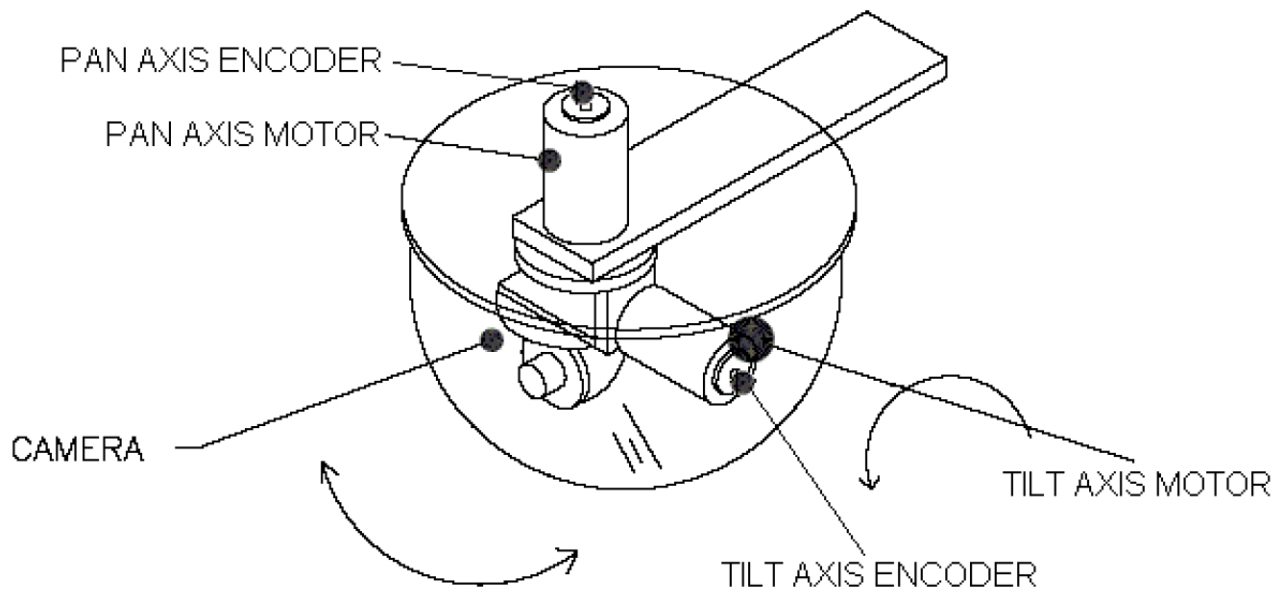


Figure 1. PTZ Camera Mechanical Mounting Example

Transmissive Solution

The incremental transmissive encoders provide 2 output channel, Channel A and Channel B. The outputs are quadrature where Channel A and Channel B are 90° out-of-phase. From this signals, one can determined the direction and speed of the motion. Since PTZ camera system requires homing location, an additional signal channel encoder such as photo-interruptor can be used.

In order to choose the best transmissive solution, one requires knowing the resolution needed for one PTZ camera

system. The resolution can be expressed as Line-per-Inch (LPI) or Count-per-Revolution (CPR). The LPI and CPR relationship is as below:

$$LPI = \frac{CPR}{2\pi R_{OP}} \quad (1)$$

Where, R_{OP} = Codewheel Radius (inch)

Figure 2 illustrates the placement of transmissive encoder with respect to the Codewheel in the PTZ camera system.

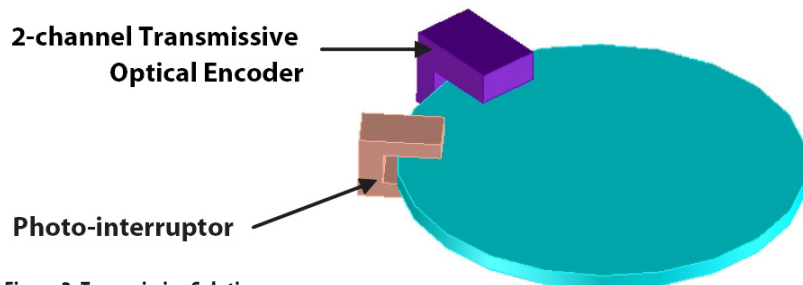


Figure 2. Transmissive Solution

Transmissive Encoder Recommended Part Number

Part Number	Descriptions	Resolution
HEDS-9701-Cxxx	2-Channel Small Optical Encoder (recommended)	100 CPR (11mm ROP)
HEDS-9701-Hxxx	2-Channel Small Optical Encoder	400 CPR (11mm ROP)
AEDS-9300	Single Channel Photointerruptor (for indexing)	-

Reflective Solution

The incremental reflective encoders are available in 2-channel output and 1-channel output. Figure 3 illustrates the placement of reflective encoder with respect to the Codewheel in the PTZ camera system.

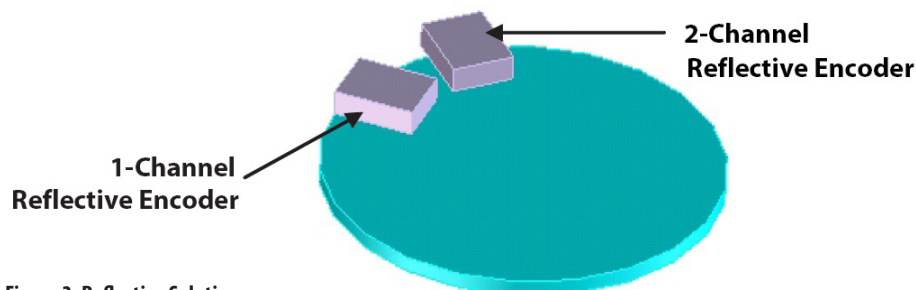


Figure 3. Reflective Solution

Reflective Encoder Recommended Part Number

Part Number	Descriptions	Resolution
AEDR-8300-1Kx	2-Channel Reflective Small Optical Encoder (recommended)	75 LPI (100CPR @ 5.4mm ROP)
AEDR-8300-1Px	2-Channel Reflective Small Optical Encoder	150 LPI (400CPR @ 11mm ROP)
AEDR-8311-1Kx	1-Channel Reflective Small Optical Encoder (for indexing)	75 LPI

For product information and a complete list of distributors, please go to our web site: www.avagotech.com

Avago, Avago Technologies, and the A logo are trademarks of Avago Technologies in the United States and other countries. Data subject to change. Copyright © 2005-2008 Avago Technologies. All rights reserved. Obsoletes AV01-0656EN AV02-1674EN - November 19, 2008

AVAGO
TECHNOLOGIES