



Camera Control Application

User Manual



Ver 2.2

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1 Overview

SPI Corp's Camera Control Application (CCA) provides means for complete control of the M2-D Camera. The CCA enables SPI Corp's customers to test and evaluate the M2-D without implementing camera control support in their systems.

2 System Requirements

The minimal system requirements for using the CCA are:

Operating System	Windows 7/8
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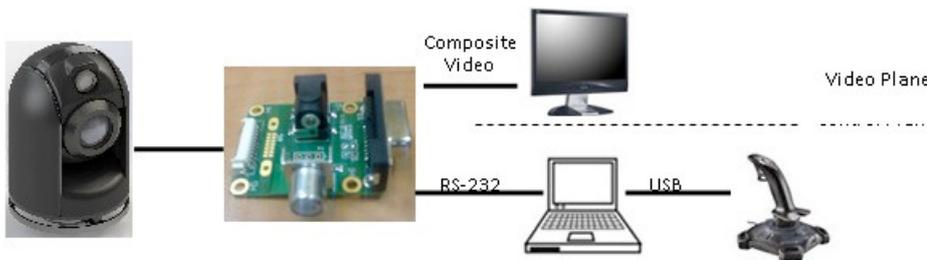
The CCA supports the following controllers:

- [Logitech Attack™ 3 Joystick](#)
- [Logitech DualAction™ GamePad](#)

The use of Joystick or GamePad is **optional**. The camera can be evaluated **without** the use of the Joystick or GamePad.

3 Architecture

A simplified architecture for using CCA is depicted in the following:



4 CCA Installation

The CCA is installed using the supplied installation application.



5 CCA Setup

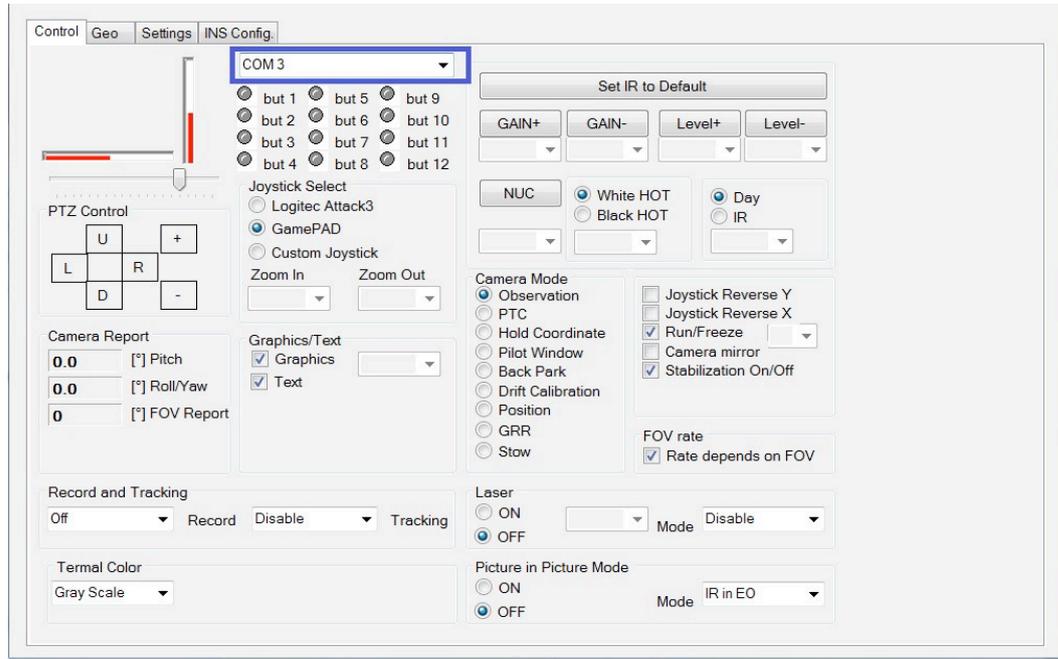
Following the execution of the CCA, the protocol and the COM port shall be selected.

5.1 Protocol Selection

Protocol should be selected at the Setting page. See section 7.3 for further details.

5.2 COM Port Selection

The COM port is selected on Control page:



Once the COM port has been set, the CCA is ready to be used.



7 CCA User Interface

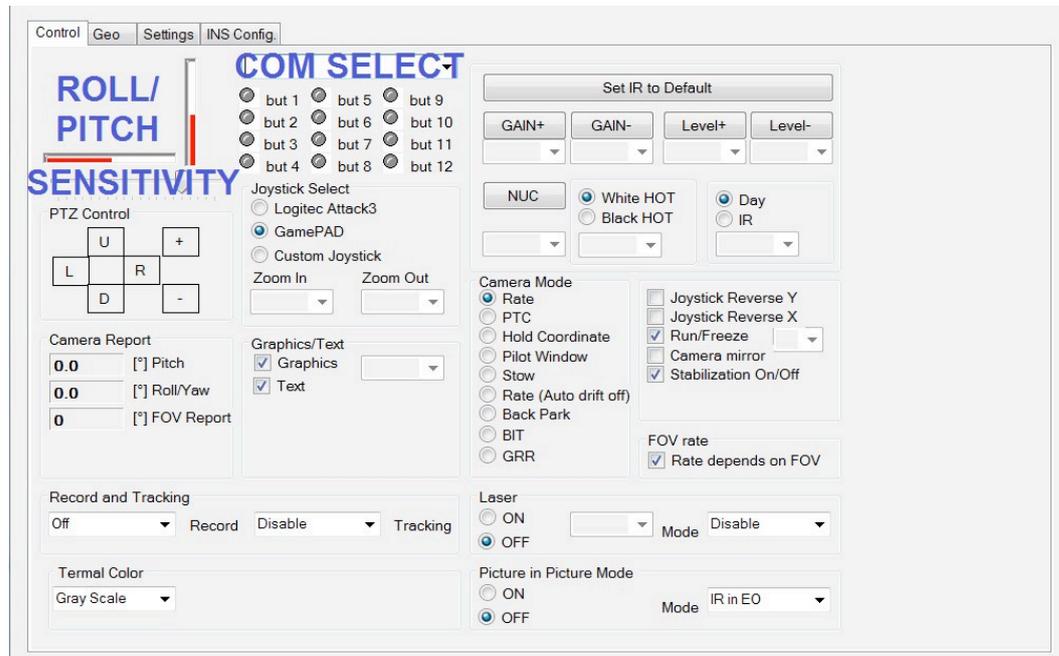
The CCA User Interface includes 4 pages:



	<i>Protocol Type</i>		
<i>Page</i>	<i>Standard</i>	<i>GeoLocation</i>	M2D
Control 7.1	√	√	√
Geo 7.2	--	√	--
Settings 7.3	√	√	√
INS Config. 7.4	--	√	--

7.1 Control Page

The Control page is depicted in the following:



The Control page includes the following controls and indications:

- Roll/Pitch – The red bars on left side and bottom indicate the roll/pitch command.
- Sensitivity – The sensitivity of the joystick is increased when the selector is moved to the right. See section 8.2
- PTZ control – Controlling using 6 buttons:
 - L-R – Roll movement
 - U-D – Pitch movement
 - (+) (-) – Zoom in and out



The PTZ control is functioning in addition to Joystick/GamePad control.

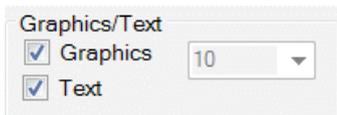
- Camera Report – Latest report from the camera:
 - Pitch in degrees
 - Roll/Yaw in degrees
 - HFOV in degrees
- Record & Tracking
N/A
- Thermal Color
 - Grayscale
 - Color 1
 - Color 2
 - Color 3
- COM Select – Selects COM port number.
- BUT1-BUT12 – Indicates pressing a Joystick/GamePad button
- Joystick Select – Selects type of controller (Joystick, GamePad, Custom Joystick). DIRECT PTZ control operates in parallel to Joystick. If a Joystick or a GamePad are not used, the selection of controller has no effect. Custom Joystick enables to configure the buttons which control the various functions. For example: Button 3 switches between day and night,



- Zoom In  - Button number for zoom-in.

- Zoom out  - Button number for Zoom out.

- Graphics – display / hide graphics OSD (e.g. cross hair)
- Text – display / hide text OSD



-  - Button number for OSD enable / disable
- SET IR TO DEFAULT – IR gain and level default values
- Gain + - increase IR gain
- Gain - - decrease IR gain
- Level + - increase IR level
- Level - - decrease IR level



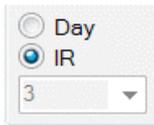
-  Gain & Level Button numbers. When all 4 buttons are pressed the default gain and level values are set
- NUC – Generate NUC



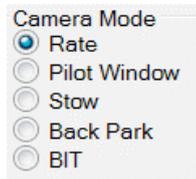
- Nuc button number
- White HOT/ Black HOT – switch between white hot / black hot modes



- White / Black hot switching button
- Day /IR – switch between day and IR cameras



- Day / IR switching button
- Camera Mode



- Standard Protocol

Rate – gimbal movement is controlled with rate commands. Image is stabilized.

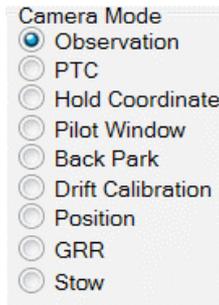
Pilot window – Roll is set to 0° . Pitch is set to 70° . Image is not stabilized.

Stow – Roll is set to 0° . Pitch is set to 0° . Image is not stabilized.

Back Park - Roll is set to 140° . Pitch is set to 0° . Image is not stabilized.



BIT – Built-in test. The gimbal shall reside on stable platform during BIT.



o GeoLocation / M2-D Protocol

Observation – gimbal movement is controlled with rate commands. Image is stabilized.

PTC – Point to Coordinate, camera looks at certain Lat,Lon,Alt location.

Hold Coordinate – Camera looks at location certain location. The location is determined by the last time the joystick was moving.

Pilot window – Roll is set to 0° . Pitch is set to 70° . Image is not stabilized. (Stabilization is off)

Back Park - Roll is set to 140° . Pitch is set to 0° . Image is not stabilized. (Stabilization is off)

Drift Calibration – Gyro drift is calibrated. Camera needs to stand on stable platform.

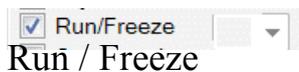
Position – Camera is set to certain Roll / Pitch angles while maintaining stabilization on.

GRR – Compensation for platform linear movement.



Stow – Roll is set to 0° . Pitch is set to 0° . Image is not stabilized. (Stabilization is off)

- Joystick Reverse X – Selects the direction of camera roll movement when controlled by Joystick or Pad. Joystick Reverse X setting does not affect the DIRECT PTZ control.
- Joystick Reverse Y – Selects the direction of camera pitch movement when controlled by Joystick or Pad. Joystick Reverse Y setting does not affect the DIRECT PTZ control.
- Run/Freeze – Selects between video display and freezing image. Freeze mode is useful for reading vehicle plate number, recognizing face, etc.



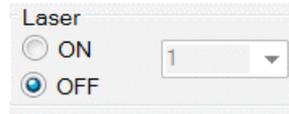
- Button number for switching between

- Camera Mirror – Selects camera output mirroring. The text on screen is not affected and is displayed with no mirroring.
- Stabilization On/Off
- Rate depends on FOV –
 - Selected - The rate of movement is decreasing when zooming in. It is recommended to select “Rate depends on FOV”
 - Not selected - The rate of movement remains unchanged when zoom is changed.



- Laser

- On/off – trigger



- - BUT number for trigger

- Mode : Disabled / always on / Fast / Medium / Slow

- Picture In Picture Mode

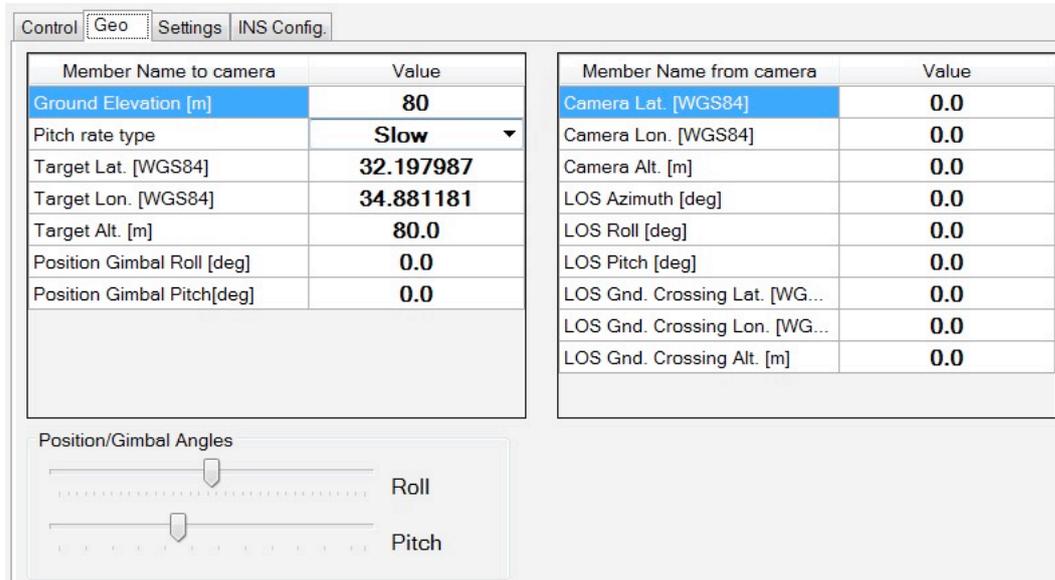
- On / Off

- Mode : IR in EO / EO in IR / IR with EO

7.2 Geo Page

Note: Geo page can be edited only when GeoLocation protocol is selected.

The Geo page is depicted in the following:



The screenshot shows the 'Geo' tab in the software interface. It contains two tables of camera parameters and two sliders for gimbal angles.

Member Name to camera	Value
Ground Elevation [m]	80
Pitch rate type	Slow
Target Lat. [WGS84]	32.197987
Target Lon. [WGS84]	34.881181
Target Alt. [m]	80.0
Position Gimbal Roll [deg]	0.0
Position Gimbal Pitch [deg]	0.0

Member Name from camera	Value
Camera Lat. [WGS84]	0.0
Camera Lon. [WGS84]	0.0
Camera Alt. [m]	0.0
LOS Azimuth [deg]	0.0
LOS Roll [deg]	0.0
LOS Pitch [deg]	0.0
LOS Gnd. Crossing Lat. [WG...]	0.0
LOS Gnd. Crossing Lon. [WG...]	0.0
LOS Gnd. Crossing Alt. [m]	0.0

Position/Gimbal Angles

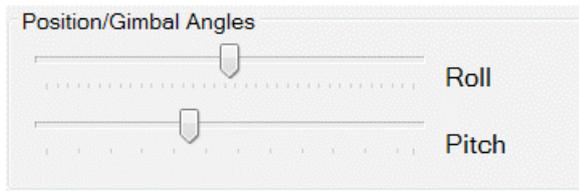
Roll

Pitch

The Geo page includes the following controls and indications:

- Ground Elevation [m] - Ground height at line of sight ground crossing point. The height is stated in meters above EGM96 geoid which approximates mean sea level.
- Pitch rate type
 - Slow – about half the rate of the roll movement
 - Fast – Similar rate to roll movement
- Target Lat. - WGS84 Coordinate of the target used in PTC mode.
- Target Lon. - WGS84 Coordinate of the target used in PTC mode.
- Target alt. - Altitude of target used in PTC mode. Height above EGM96 geoid which approximates mean sea level.

- Position Gimbal Roll – Roll position used in Position mode
- Position Gimbal Pitch – Pitch position used in Position mode



- - Slide bar for setting gimbal roll and pitch angles used in Position mode.
- Camera Lat - WGS84 Coordinate of the Camera
- Camera Lon - WGS84 Coordinate of the Camera
- Camera Alt - Altitude of the camera. Height above EGM96 geoid which approximates mean sea level.
- LOS Azimuth [deg] – Line-of-Sight azimuth.
- LOS Roll [deg] – Line-of-Sight roll.
- LOS Pitch [deg] – Line-of-Sight pitch.
- LOS GND. Crossing Lat. – WGS84 Coordinate of Line-of-Sight ground crossing.



- LOS GND. Crossing Lon. – WGS84 Coordinate of Line-of-Sight ground crossing.
- LOS GND. Crossing Alt. – Altitude of the Line-of-Sight ground crossing. Height above EGM96 geoid which approximates mean sea level.



7.3 Settings Page

The Settings page is depicted in the following:

The Settings page includes the following controls and indications:

- Protocol Type
 - Standard – Legacy protocol
 - GeoLocation – GeoLocation protocol
 - M2-D Protocol

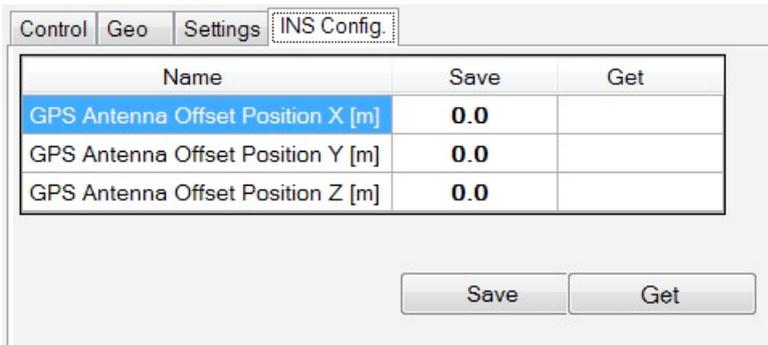


- Camera pitch/roll offset (can be used in standard protocol only) – setting offset of camera pitch and roll
- **M2D Protocol Type**
 - Mode 1 - Independent Pan/Tilt Operation
 - Mode 2 - Auto Roll, Yaw stabilize to center
 - Mode 3 - Auto Roll, with yaw control

7.4 INS Config. Page

Note: INS Config. page can be edited only when GeoLocation protocol is selected.

The INS Config. page is depicted in the following:



Name	Save	Get
GPS Antenna Offset Position X [m]	0.0	
GPS Antenna Offset Position Y [m]	0.0	
GPS Antenna Offset Position Z [m]	0.0	

Save Get

The INS Config. page includes the following controls and indications:

- GPS Antenna Offset Location X [m] – distance between GPS antenna and GPS antenna connection at the bottom of the camera along X-axis in meters.
- GPS Antenna Offset Location Y [m] – distance between GPS antenna and GPS antenna connection at the bottom of the camera along Y-axis in meters.
- GPS Antenna Offset Location Z [m] – distance between GPS antenna and GPS antenna connection at the bottom of the camera along Z-axis in meters.

GPS Antenna Offset Axis is defined in the following:



8 Controller

8.1 Mouse

By clicking on DIRECT PTZ control buttons.

8.2 Logitech Attack™3 Joystick

The functionality of the joystick buttons is depicted in the following figure:



8.3 Logitech DualAction™ GamePad

The functionality of the joystick buttons is depicted in the following figure:

