# VIZION

Video Camera On-Screen Display

**Firmware V2 Series**

**Rev B Hardware**

INTRODUCTION:

VIZION is a low cost video overlay device designed for hobby applications. It displays your ham call sign at timed intervals, two voltages, Radio Control (R/C) signal status, and elapsed time. An optional current sensor can be added to display current to 50 Amps. In addition, it offers plug-n-play integration with the popular ZLog altimeter (available from hexpertsystems.com).

Total weight is approximately 0.6 ounces (0.9 ounces with the optional current sensor). Size is a compact 1.6" x 2.1". A four-pin connector is provided for direct connection to the user supplied ZLog altimeter.

Flexible power requirements allow for operation on 6VDC to 15VDC at 30mA (VIZION only). Both NTSC/RS-170 and PAL/CCIR video is supported.

VIZION is compatible with high quality CCD video cameras that use industry standard composite video levels and timing.


Figure 1, Typical Data View

VIZION FEATURE SUMMARY:

- Compatible with Hexpert System's "ZLog" digital altimeter.
- Automatic station identification, at a user-defined interval.
- Display local battery voltage and any external voltage to 40 VDC.
- An optional current sensor displays ±50 amps.
- Display elapsed time in a variety of formats.
- R/C signal indicator with visual lost signal alert.
- Remote on/off operation using a spare R/C channel.
- Micro 5-way Joystick allows an easy user setup of all the features. No PC is required!

## OSD (ON-SCREEN DISPLAY)

An example of the displayed data is shown in Figure 1 above. The top left data field shows the altitude (an optional ZLog altimeter required). The top right field shows the elapse time. At the bottom left are the external voltage and current. This field is also used for the station ID. The bottom right field is the local voltage monitor. The last field is a small graphic Icon that represents the presence of a valid R/C servo signal.

The displayed data format is very flexible. You can disable unused text fields, change the elapse time format, and easily customize the Station ID text. We will discuss this in detail in a moment.

The altitude data is available whenever the ZLog altimeter option is installed. If the altimeter is not used then this field will be blank. At timed intervals, the Station ID (Ham call sign) will appear. The interval time is easily changed and this feature can even be turned off.

The R/C signal icon field will be blank until a valid R/C servo signal has been received. Once it has been detected, the "antenna" icon will appear to show that the R/C signal is valid. If the PPM R/C receiver experiences an extended loss of contact (more than one second), the icon will flash as a warning. Once the R/C signal returns, the flashing will stop. This lost signal feature is not available if PCM or DSP based R/C receivers are used.

## REMOTE CONTROL INPUT

VIZION accepts a standard 1.0mS to 2.0mS R/C servo signal for on/off control of the text display. The servo signal can come from a standard AM, FM, PPM, or PCM R/C receiver. During normal use, the signal pulse values must be limited to a 1.0mS to 2.0mS range. For correct operation, set your R/C transmitter's control channel as follows:

| | | |
|---|---|---|
| EPA/ATV (T-ADJ) | = ±100% | (Note: Multiplex R/C transmitters must use ±90%) |
| Dual Rate Mix | = OFF | |
| Expo Mix | = OFF | |
| Sub-Trim Mix | = 0 | |

If the display has been remotely turned off, it will automatically reappear if the R/C signal is lost. If you are using PCM or DSP based R/C receivers then the "failsafe" servo travel settings must be configured to turn on VIZION's display upon loss of the signal. Otherwise, the automatic text turn-on feature will not be available. Traditional PPM receivers do not require this extra attention.

*Note: As noted above, when using a PCM (or DSP) R/C receiver, you must configure the receiver's failsafe to enable the text. Otherwise, the automatic text turn-on will not be available.*

## LED STATUS INDICATOR

The LED is used to show system status (see Figure 2). The flash pattern and flash rate can vary, as defined below.

1. A slow on/off flash rate indicates that everything is fine.
2. A fast on/off flash rate indicates that attention is required. The problem will be shown in the screen messages.
3. A Flash-Flash-Pause pattern, *at power up only,* indicates that the video camera signal is missing or is bad.
4. Steady On or Off indicates a problem with the input or output video signal. Of course if the LED is Off it could also indicate a power problem.


**Figure 2**, LED & Joystick Location

## FINGER TIP JOYSTICK

VIZION has a tiny Joystick that is used to program its features (see Figure 2). Using the tip of your finger, the joystick can be moved UP, DOWN, LEFT, and RIGHT. Pressing straight down acts as the "ENTER" button.

During normal operation, a momentary press of any joystick direction will briefly display your Station ID. However, pressing and holding ENTER for more two seconds will reset the elapse time. A four-second press time will enable the system setup menu. The setup menu is used to configure the VIZION system to your preferences.

In summary:

| | |
|---|---|
| Momentary press of any Joystick Button: | Recall Station ID |
| Two second press of the Enter Button: | Reset Elapsed Time |
| Four second press of the Enter Button: | Enable Setup Menu |

## SYSTEM SETUP MENU

VIZION's configuration features are accessed using special menus that are guided by the joystick. Entering the SETUP menu begins by pressing the joystick's ENTER button (press straight down) for more than four seconds. The first text field will show "SETUP MODE, PRESS UP-DOWN" as seen in Figure 3.


**Figure 3**, Setup Menu

While in the SETUP mode the Up and Down joystick positions are used to travel through the various menu choices. Each press toward the up direction moves the menu to the next entry, and a down press moves back one entry. If a menu item needs to be changed then the LEFT and RIGHT joystick positions are used.

**TEXT POS: 1-14.** This entry changes the location of the text fields. There are fourteen locations to choose from. The higher the number the higher on the screen the text will be located. Just use the location that suits your needs. TEXT POS:13 and TEXT POS:14 swaps the fields for more flexibility. The top of the screen should be used with caution since light color sky can wash out the text. Default is near the bottom of the screen (TEXT POS:2).

**FIELD ROW: 1-2.** This entry chooses between a single and two row display. When FIELD ROW:1 is selected, only the altitude and local battery voltage fields are available. The station ID will appear in the Altitude field at timed intervals. To see the other fields you MUST select the 2-Row entry. Default is FIELD ROW:2.

**TIME: HH:MM:SS / HH:MM / MM:SS / MM / OFF.** This entry is used to select the elapse time format. When set to OFF, the elapse time is only shown during the periodic Station ID interval. Default is TIME: HH:MM:SS.

| | |
|---|---|
| HH:MM:SS | = Hours, Minutes, Seconds. |
| HH:MM | = Hours, Minutes. |
| MM:SS | = Minutes, Seconds. |
| MM | = Minutes. |
| Off | = Disabled, see description above. |

**UPDATE NORMAL/SLOW.** This entry is used to reduce the voltage and current update rate for applications that do not want to be bothered by constantly changing values. The NORM setting provides five updates per second (5Hz). The SLOW setting provides a four second update rate (0.25Hz). Default is UPDATE:NORM.

**BAT VDC: ON/OFF.** This entry is used to turn off the local battery voltage field. If the voltage is under 5.75V, or higher than 16.5VDC, then the field will flash as a warning. Extremely low battery voltages will show an “ALERT” message. Default is BAT VDC:ON.

> Note: Do not operate VIZION on less than 6.0VDC or higher than 15.0VDC. Lower voltages will adversely affect the accuracy of the data. Higher voltages may stress the components.

**EXT VDC: ON/OFF.** This entry is used to turn off the external voltage monitor field. Voltages up to 40.0 VDC may be displayed. Default is EXT VDC:ON. Note: Voltages higher than 40V should be avoided (they will be displayed as “40++V” to act as a visual warning).

**EXT AMP: ON/OFF.** This entry is used to turn off the external current monitor field. If the optional current sensor module is not installed then this field should be turned off. If the module is installed, then select EXT AMP:ON. Currents up to ±50 Amps can be displayed. Default is EXT AMP:ON.

Current Sensor Specifications

| | |
|---|---|
| Maximum Current | : ± 50 Amps |
| Minimum Current | : ± 200mA |
| Hardware Resolution | : 125mA |
| Display Resolution | : 100mA |
| Maximum Display Error | : < 3% of actual + 0.250A |

**AMP CAL: GO/PASS.** The current sensor must be calibrated when it is first installed or whenever the display does not show “0.0" when current is zero.

> Note: When actual current is zero, it is usual to see the readings bounce slightly above and below the 0.0V value. However, constant values above or below 0.0V indicate that a calibration is required.

To calibrate, the current sensor must be plugged into VIZION, and the module’s “P8" connections must be removed from the monitored source. When the AMP CAL:GO entry is selected the result will show “OK” if the calibration is successful. Otherwise, “BAD” will be displayed and the calibration will be aborted.

**U/M (UNIT OF MEASURE) FEET/METERS/YARDS:** This entry is used to select the ZLog’s measurement type. Set it to match your ZLog altimeter’s configuration. Default is Feet.

**MSG TM Off/Minutes:** This entry is used to set the Station ID (ham call sign) interval time. It can vary from Off to sixty minutes, in one minute increments. Default is MSG TM:5.

**EDIT MSG?**: This entry is used to edit the station ID (call sign) message. It can be up to eleven characters long. During the ID text editing the LEFT and RIGHT joystick presses will move the character position. UP and DOWN presses change the selected character. Holding the joystick’s UP/DOWN position will provide a convenient repeat feature. To end the editing session, press and hold the Enter button for at least three seconds (wait until “Edit Msg?” reappears).

**SERVO NORMAL/REVERSE**: This entry is used to “reverse” the servo signal direction that controls the video overlay. When set to NORM the OSD is turned on whenever the R/C servo signal is greater than 1.6mS and is off when it is less than 1.4mS. When set to REV, the On/Off operation is reversed. Default is SERVO:NORM.

**DEFAULTS**: This entry is used to return the configuration settings to their factory defaults. However, it does not affect the Station ID text. If chosen, the display will report “RESET!” to show that the defaults have been restored.

**EXIT**: This entry is used to exit the Setup menu. The new settings are saved in memory and are NOT lost when VIZION’s battery is removed.

## INSTALLATION

The VIZION OSD board requires connection to a battery supply and to the video equipment. All of the cables are identified with labels to simplify the installation. All cable connections are summarized below in Table 1 and Figure 4.

**TABLE 1**

| REF | Color | Description |
|---|---|---|
| **A** | RED<br>BLK | +6VDC to +15VDC.<br>0V Battery Ground.<br>[See NOTE-1 below] |
| **B** | Gold PIN (+)<br><br>Gold PIN (-) | External VDC Monitor, +40VDC max. (Left Pin, marked **+**).<br><br>Ground, 0V. (Right Pin). |
| **C** | N/A | Optional Current Sensor Plug. |
| **D** | ORG<br>RED<br>BRN | Video Output Signal.<br>Video Input Signal.<br>Video Signal Ground. |
| **E** | N/A | R/C servo signal cable. |

***NOTE-1: Do not power the VIZION board (or any other video system component) from the R/C system's battery. Use a dedicated power source.***

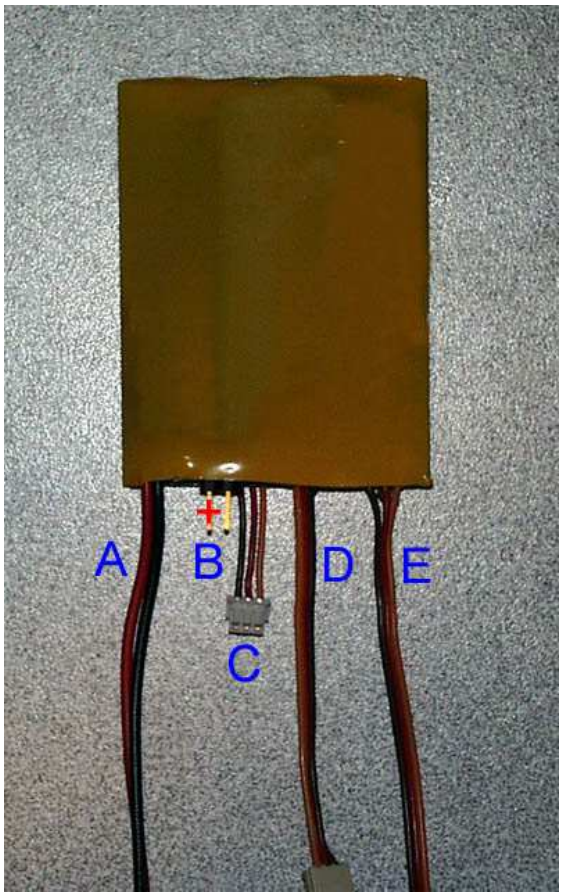


**Figure 4**, Wiring Diagram

## EXTERNAL VOLTAGE MONITOR INSTALLATION

The external voltage input is available using a 2-pin header, as seen in Figure 4. Connection methods to this input will depend on your installation requirements. NEVER reverse the external voltage monitor connections. Otherwise, serious damage will result.

## EXTERNAL CURRENT SENSOR INSTALLATION

The optional 50 Amp current sensor (see Figure 5) simply plugs into the VIZION board. It is wired IN SERIES with the positive lead of the Electronic Speed Control's (ESC's) positive battery lead. This will require simple soldering.

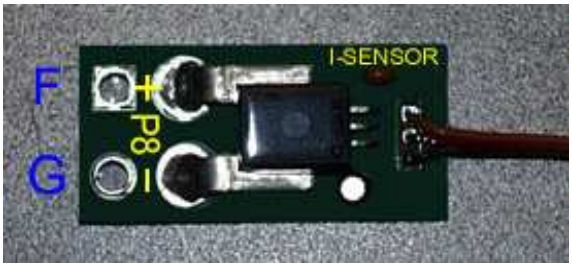


**Figure 5**, Current Sensor

Begin by cutting the red lead (BAT+) on your ESC and insert the current sensor into the cut path. Pad P8+ (reference "F") goes to the battery+ side and P8- (reference "G") goes to the ESC+ side of the cut lead. See Figure 6.

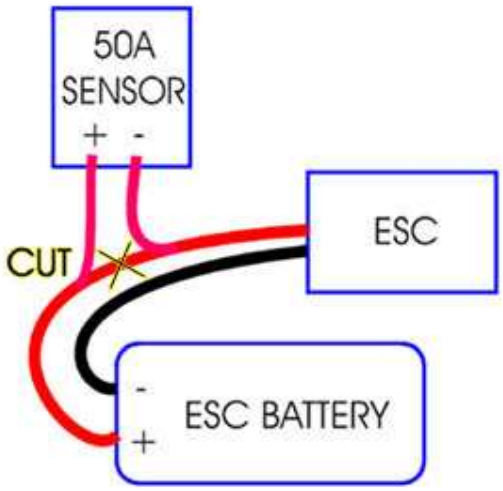


**Figure 6**, Sensor Wiring Layout

**Do not use the "F" and "G" holes with high currents:** In applications that will draw more than 25 amps the ESC's wires should be soldered *directly to the heavy metal studs of the sensor* on the bottom side of the circuit board. Ensure that the soldered connections are acceptable for the current.

Th sensor installation is a SERIES Connection. Do not wire it in parallel (across) the battery or ESC leads!

## ZLOG INSTALLATION

Installing the optional ZLog altimeter (available from Hexpert Systems) begins by configuring it for 19.2K baud operation. This setting is in the ZLog menu and **requires software version 3.4 or higher.** Older versions of software can be upgraded using the ZLog's PC-BASED utility. After you have entered your new configuration be sure to select "Save" too.

VIZION will mate with the ZLog MOD2 and MOD3 altimeters. With the batteries disconnected, plug the two boards together as shown in the photo below. When installed, ZLog's display should be on the "outside." So, if you cannot see the display, the ZLog is installed backwards!

When using the Zlog MOD3, the space between the two boards should be filled with a piece of soft foam (1" x 1.5" x .25") or several layers of double sided foam servo tape. Use enough to ensure that the two boards are parallel. To hold the boards together you may use rubber bands or clear battery heat shrink tubing (do not omit this step).

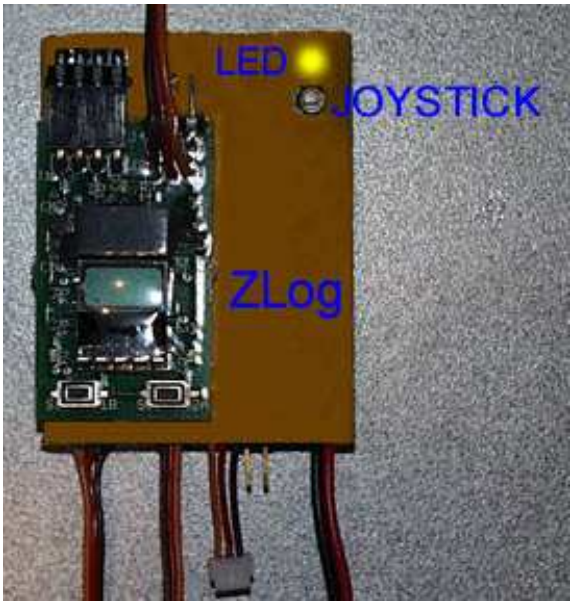


**Figure 7**, ZLog Installation

VIZION's servo cable can be directly plugged into ZLog's 3-pin servo header connector. This reduces the cable clutter. Just plug ZLog into the R/C channel that will control the OSD.

VIZION does not affect ZLog's operation or change its basic installation. Please keep in mind that your ZLog will continue to be powered by the R/C receiver (VIZION does not supply its voltage). Just follow the manufacturer's instructions when setting up the altimeter.

If the optional ZLog altimeter is not used then be sure to fully cover the 4-pin connector with plastic tape to insulate and protect its electrical pins. Do not apply power until this is done.

## R/C RANGE TESTING

If the VIZION system is used with R/C equipment then a thorough range test must be made to ensure that reliable radio operation is experienced. If the range test does not pass the R/C manufacturer's recommendations then do not use the video system until the problem is corrected. For best results, keep ALL video components and related wiring away from the R/C equipment. DO NOT SKIP THE R/C RANGE TEST.

## WARRANTY

Your Vizion OSD System is warranted to the original purchaser against manufacturer defects in material and workmanship for 90 days from the date of purchase. During this period, Digital Products Company (DPC) will repair or replace, at their discretion, any component that is found to be factory defective. This warranty does not apply to any unit that has been improperly installed, mishandled, abused or damaged, or to any unit that has been repaired or altered by any unauthorized agencies. Under no circumstances will the buyer be entitled to consequential or incidental damages. There are no further warranties, either expressed or implied.

## SERVICE

For service, please visit www.dpcav.com for contact information.