

Application Note

Supporting the 16 Bit ST-237A

In Application Software

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Purpose

This Application Note describes the ST-237A, the 16-bit version of the ST-237. It describes the software programming requirements for third party packages to fully support the camera.

Drivers from SBIG

To support the ST-237A SBIG had to modify the low-level parallel driver. The following versions (and later) support the ST-237A:

Headers: PARDRV.H version 3.20 (no changes except version)

DOS: PARDRV.LIB version 3.20D

Windows 95/98/Me: SBIG32.VXD version 3.20W32

Windows NT/2000: SBIG.SYS version 3.20WNT

These drivers are available from the SBIG web site on the Applications Note Page under the Parallel Driver download. Note that the mid-level Windows DLLs (SBIG32.DLL and SBIGNT.DLL) did not have to change to support the ST-237A.

Should someone establish a link to a new ST-237A using older versions of the driver he will notice that camera seems more sensitive (pixel counts are larger) and that the images become zebra striped in pixel intensity when pixel intensities exceed 4095 counts. The older drivers will mask pixel values to 12 bits making 4096, 8192, etc show as 0 counts. Simply installing the new low-level drivers should make the camera operate normally. Finally note that the new drivers are fully backwards compatible with the older ST-237.

ST-237A Differences

For reasons of compatibility with third party software packages the ST-237A is identified by the driver on calls to the **EstablishLink** command as an ST-237. Had we added a new camera type for the ST-237A all third party packages would have had to be modified to support the camera. As it is with the chosen implementation (calling the camera an ST237_CAMERA) most if not all third party applications will function normally with the new 16 bit version without source code modification once the user installs the new drivers.

The changes between the new ST-237A and the original ST-237 are as follows:

- The A/D is 16 bits vs. 12 bits. The driver produces the following pixel values based upon the readout mode:
 - High Res: 0 thru 16383
 - Med Res: 0 thru 32767
 - Low Res: 0 thru 49151

- The image array is now 657 pixels wide and 495 pixels high (vs. 640 x 480). This is reported by the **GetCCDInfo** command when linked to an ST-237A.
- The Electronic Gain (gain from the **GetCCDInfo** command) is reduced hence pixel counts are higher for a given brightness object.
- The name string returned by the **GetCCDInfo** command indicates an “ST-237A” or “ST-237” depending on which camera was detected.

To fully support the ST-237A SBIG’s CCDOPS software had to make the following modifications. Depending on the particular implementation by your software you may have to make similar changes:

- Install the version 3.20 drivers in the appropriate place.
- The *Sat_level* item (A/D full-scale or saturation level) in the Image Header was changed from 4095 per image to 16383, 32767 or 49151 based upon the readout mode as discussed above. In the old ST-237 the *Sat_level* was set to 4095 for an ordinary image and $((N*4096) - 1)$ for an N-image Track and Accumulate image. With the ST-237A Track and Accumulate images are set to N times the above values up to the limit if 65535, again based upon the readout mode. The SBIG image processing commands (Dark Subtract, Co-Add, etc.) used the *Sat_level* to limit pixel values to 0 to *Sat_level* and hence it needed to be adjusted.
- When establishing a link to the camera, the camera is identified as an “ST-237A” in the Link text field of the Status Bar if the gain item in the **GetCCDInfo** command for readout mode 0 indicates the gain is less than 1.0 e-/ADU.
- In the Information command in the Camera menu the camera is identified as an “ST-237A” if the conditions stated above were met.