

Reading Analog Input into MetaMorph

ABSTRACT

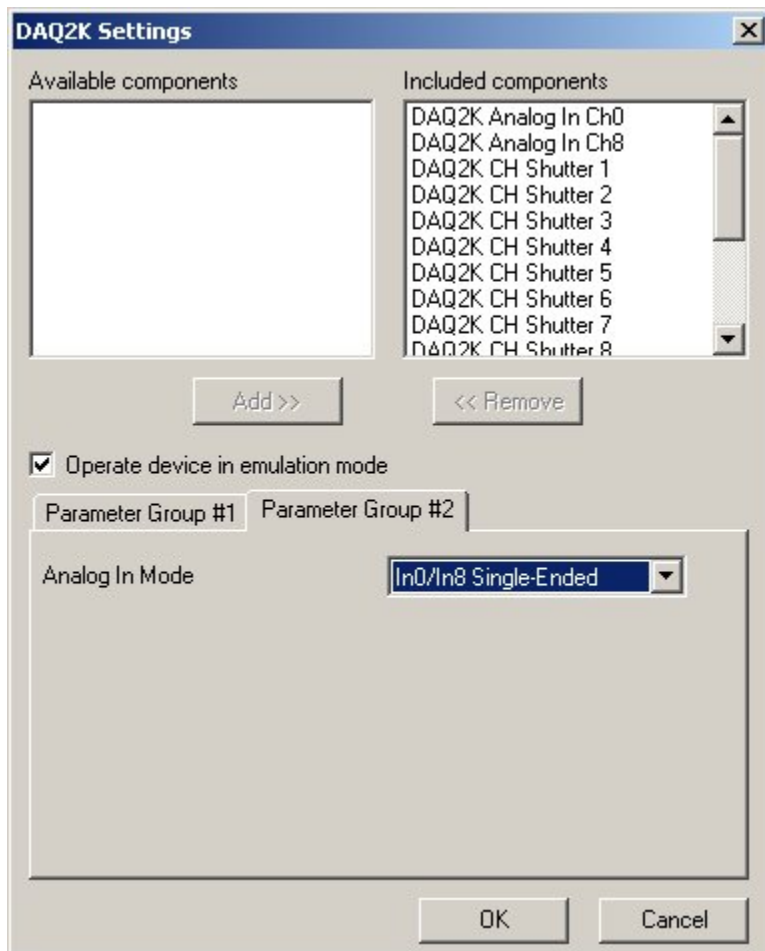
With the appropriate Data Acquisition (DAQ) card, analog voltage signals can be digitized and displayed in MetaMorph, logged to a data log, as well as stored in the annotation of images.

OVERVIEW

A Data Acquisition (DAQ) card, such as the DaqBoard 2000, must be installed to digitize analog voltage signals.

The DAQ card can be configured in the Meta Imaging Series Administrator program. Figure 1 shows the settings dialog for the DaqBoard 2000.

FIGURE 1
DAQ2K SETTINGS DIALOG (FROM META IMAGING SERIES ADMINISTRATOR)



Within the Parameter Group #2 tab you can configure whether the board will digitize through two channels (channels In0 and In8) sharing a common ground, or whether the board will digitize through one

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PRODUCTS
MetaMorph®

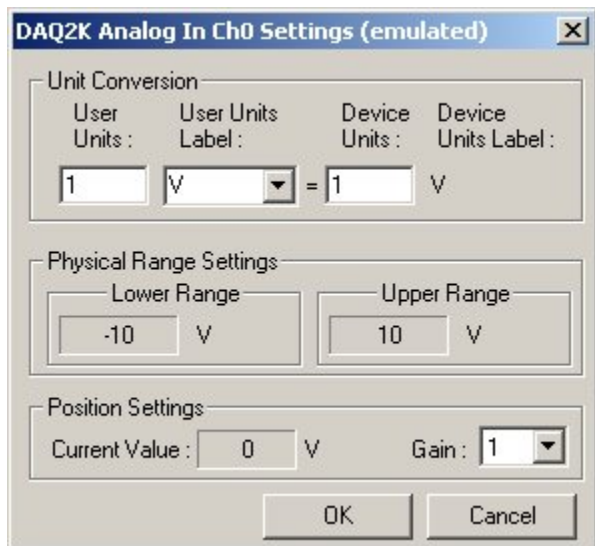
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channel (In0) using the other channel (In8) as the reference voltage – this is called differential-ended mode.

Each component in the driver has a Settings dialog of its own. Figure 2 shows the Settings dialog for the In0 Analog Input channel

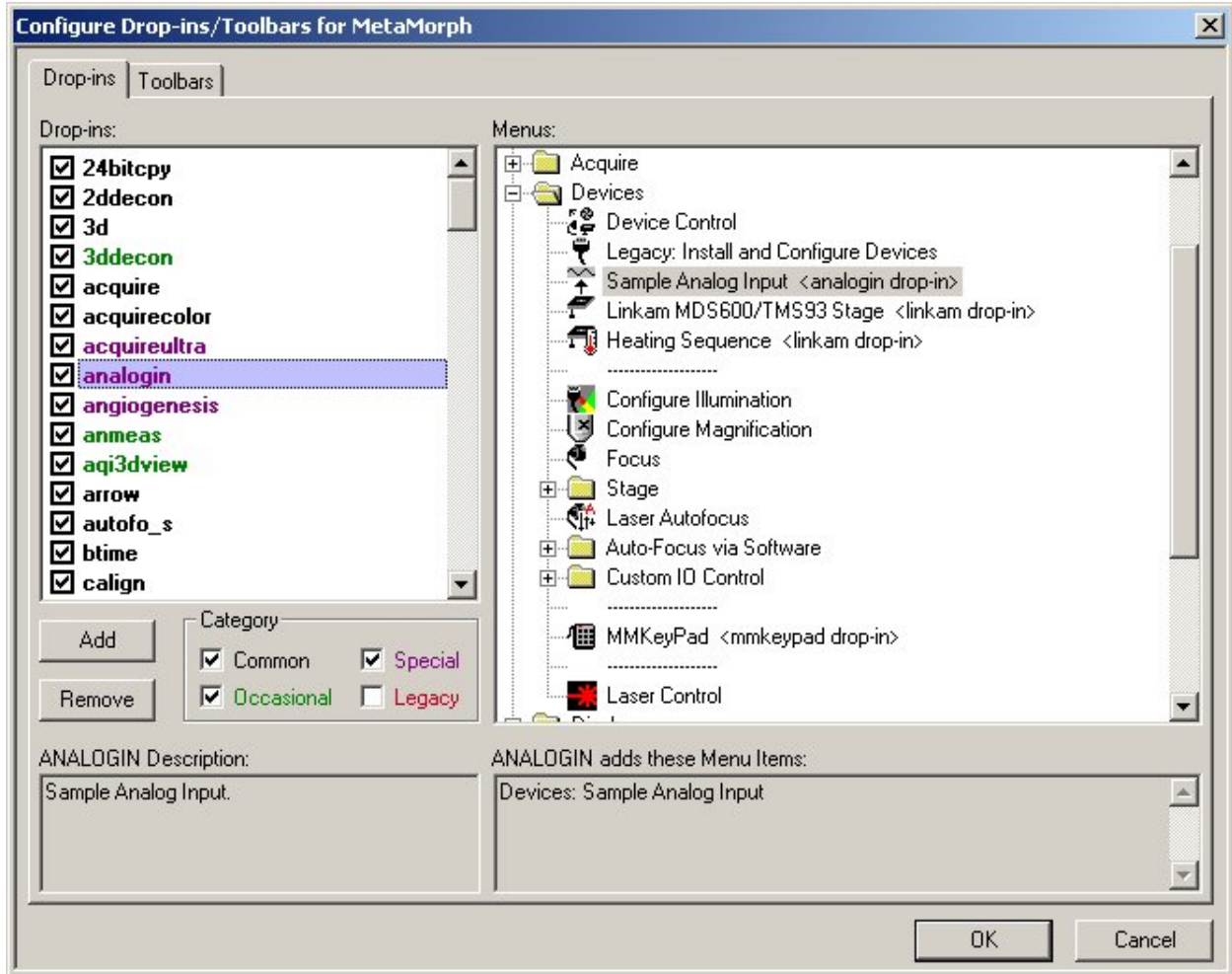
FIGURE 2
IN0 ANALOG INPUT SETTINGS DIALOG (FROM META IMAGING SERIES ADMINISTRATOR)



From this dialog, the voltage range of the digitizer as well as the Gain can be set.

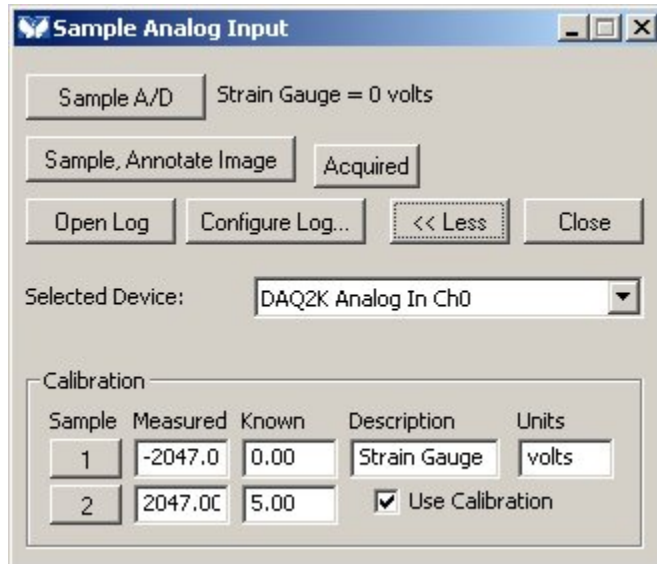
After configuring the hardware, it is necessary to confirm that the Dropin Module called “analogin” is loaded. This can be confirmed from the Drop-ins/Toolbars button within the Meta Imaging Series Administrator, as shown in Figure 3.

FIGURE 3
ANALOGIN DROPIN (FROM META IMAGING SERIES ADMINISTRATOR)



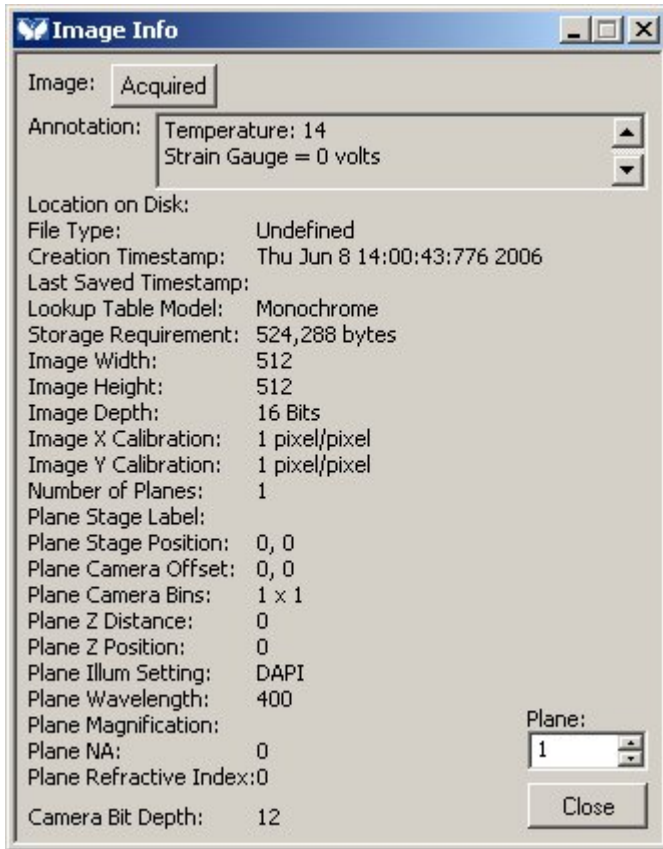
Exit the Meta Imaging Series Administrator and start MetaMorph. Under the Devices Menu, there is a command called Sample Analog Input. The dialog box appears as in Figure 4.

FIGURE 4
SAMPLE ANALOG INPUT DIALOG BOX (FROM METAMORPH)



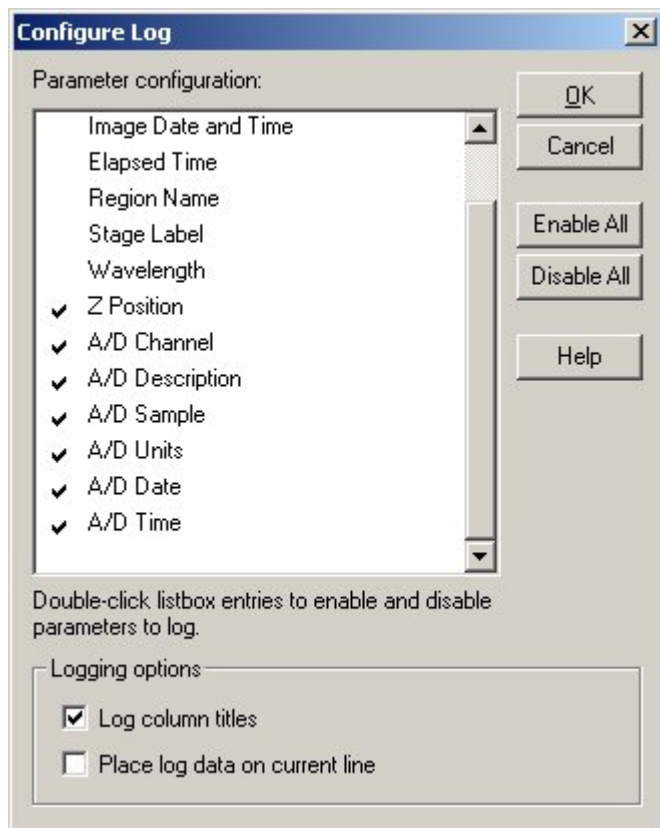
1. Make sure the “More >>” button is pressed, to expand the dialog to full view.
2. Select the appropriate digitizer device and channel (in this example, “DAQ2K Analog In Ch0” has been selected).
3. Define the calibration. The calibration maps the 12-bit digitizing range of 0 to 4095, to whatever units the device is measuring. For example, if a Strain Gauge outputs from 0 to +5 volts to reflect the amount of muscle tension in a sample, enter 0 to 5 as the calibration range. The Description and units can also be entered.
4. Press the “Sample A/D” to measure the voltage present at the channel input. This is an instantaneous measurement, and the single measured sample is displayed in calibrated units in the dialog (in this example, “Strain Gauge = 0 volts”).
5. The button “Sample, Annotate Image” will make a measurement and in addition will store that measurement in the annotation area of the image which is selected in the adjacent control. In this example, the image called “Acquired” will be annotated. The annotation will appear as shown in Figure 5, which has a picture of the Image Info dialog box.

FIGURE 5
IMAGE INFO DIALOG BOX (FROM METAMORPH)



- The sampled value can also be logged to the Data Log. The Data Log can be configured, as shown in Figure 6, to determine what values are stored in the log.

FIGURE 6
IMAGE INFO DIALOG BOX (FROM METAMORPH)



7. When in Journal Record mode, a button called "Record" will appear in the Sample Analog Input dialog box. Pressing this button will record the action that samples the channel and logs it.
8. There are three journal actions that can be used:
 - a. Sample Analog Input: Annotate Image
 - b. Sample Analog Input: Configure Log
 - c. Sample Analog Input: Log Analog Input
9. There are six variables that relate to analog measurements:
 - a. LogAToDSample.AToDChannel
 - b. LogAToDSample.AToDDate
 - c. LogAToDSample.AToDDescription
 - d. LogAToDSample.AToDSample
 - e. LogAToDSample.AToDTime
 - f. LogAToDSample.AToDUnits

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