

INTRODUCTION

The Personal Measurement Assistant (PMA2100) in conjunction with a suitable sensor can monitor and control the delivered exposure in time or dose from a light source. Any sensor whose signal can be integrated with respect to time can operate either in the “Meter” mode or in the “Dose Control System” (DCS) mode. A simple menu allows switching between modes. When used with properly configured equipment the dose integration is started automatically when the shutter of the light source is opened. The shutter is automatically closed when the predetermined dose has been delivered.

In certain cases a beam-splitter is used to direct a small percentage of the output beam of a light source to a sensor in a fixed position. To ensure accurate readings the sensor calibration has to be adjusted so that it displays an intensity value that corresponds with the light intensity irradiating the sample. In the DCS mode, the PMA2100 automatically applies the correction if the Sensing parameter is set to the ratio of the irradiance of the reference beam to the output of the light source in percent as outlined below.

SELECTING THE SENSOR’S OPERATING MODE

Any light sensor attached to the PMA2100 can operate in either the DCS mode or the Meter mode. Refer to Figure 1. In the Meter mode the sensor can be used for general purpose measurements displaying the intensity, minimum/maximum/average values, dose integration and dose delivery time. For detailed descriptions of the operation in the Meter mode refer to the PMA2100 User’s Guide.

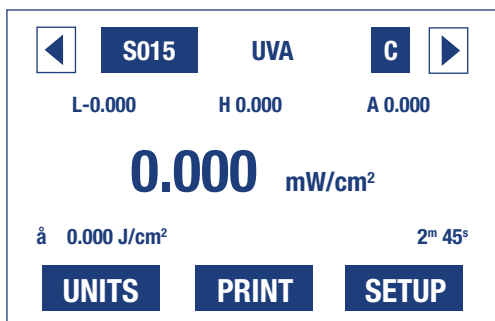


Figure 1 UVA Sensor in Meter Mode

Refer to Figure 2. In the DCS mode the sensor modifies the functionality of the PMA2100 converting it to a Dose Control System.

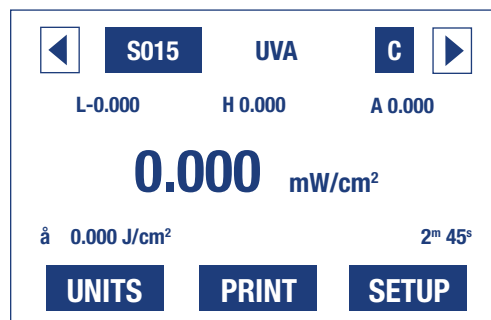


Figure 2 UVA Sensor in DCS Mode With Min/Max and Dose Integration Enabled

SENSING CALCULATIONS AND ADJUSTMENT

When a beam-splitter is used, the sensor Sensing has to be adjusted to accurately display the intensity of the light irradiating the sample. This is done by measuring the intensity of the light delivered to the sensor through the beam splitter and then measuring the intensity of the light delivered to the sample. The ratio of these two values is used to determine the Sensing parameter used to configure the sensor in the DCS mode.

To measure the reference and output intensity for setting the Sensing perform the following:

- 1 Turn the PMA2100 on and connect a selected sensor to either input.
- 2 Make sure the sensor is in Meter mode (see figure 3).
- 3 Position the sensor in the reference light path and record the light intensity. This is the **Reference Beam Intensity**.
- 4 Position the sensor in the output beam and record the light intensity. The diffuser of the sensor should be over-filled in the same position that the exposed sample will be. This is the **Output Intensity**.
- 5 Perform the calculation below for the Sensing setting:

$$\text{Sensing} = \frac{\text{Reference Beam Intensity}}{\text{Output Intensity}} \cdot 100\%$$

The sensor is now ready to be set to the DCS mode, perform the following steps:

- 1 Turn the PMA2100 on and attach the selected sensor to either sensor input. The mode and settings at which the sensor were last used will automatically be restored.
- 2 Press the **SETUP** key **F3**. The sensor setup mode will appear as in Figure 3.
- 3 The Mode heading in the right hand column selects the mode of operation. Use the arrow keys to select the Mode item and press **ENTER** to toggle between Meter and DCS.
- 4 Press the **Esc** key to return the main display shown in Figure 2. Notice the function of the F2 key has changed from Print to DCS.
- 5 Press the **DCS** key **F2**. The sensor setup menu will appear as in Figure 4.
- 6 Use the arrow keys to select the Sensing item and press **ENTER**. The display will appear as in Figure 5.
- 7 A blinking underline “_” cursor can be moved left and right with the ◀▶ keys and the value of the underlined digit can be increased or decreased by pressing the ▲▼ keys. The cursor skips the decimal point. Pressing **ENTER** ↵ or **Esc** ends the editing and the control returns to the previous menu. Pressing **Esc** again brings back the main screen.

Now with the PMA2100 in the DCS mode the current Sensing of the sensor is displayed in the upper left hand corner of the display in inverse text. Place the sensor in the reference beam. The displayed intensity should read the same as when the sensor was in the output beam. The PMA2100 will now display the intensity seen by the test sample and perform all of the integration calculations accurately.

Note that in some instances where the beam is being monitored directly (sunlight for example) the Sensing parameter should be set to 100% since the sensor is exposed to the same light intensity as the sample being exposed.

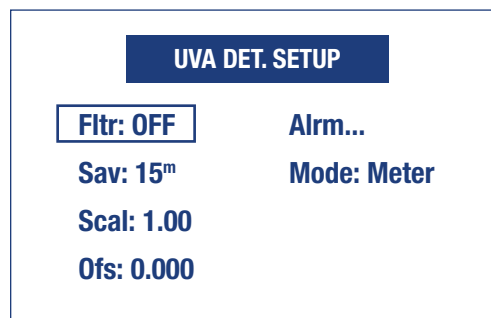


Figure 3 Meter Setup Menu



Figure 4 DCS Setup Menu

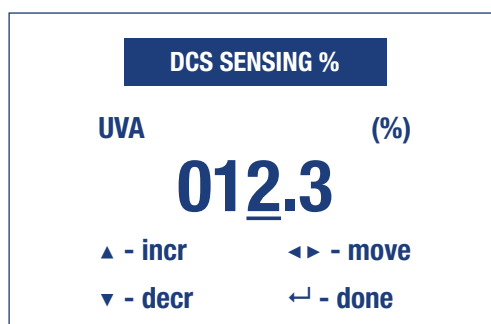


Figure 5 Sensing Setup