

# Scanner Initialization - Image Input Terminal

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## Scanner Initialization

Scanner Initialization includes several measurements and calculations to calibrate the image scanning and processing circuits to images of known color and color purity. These Include:

1. Automatic Gain Control (AGC)
2. Automatic Output Control(AOC)
3. Shading Control
4. White Variation Correction
5. Automatic Density Control (ADC)

### Automatic Gain Control

Automatic Gain Control (AGC) compensates for variations in the sensitivity of pixels in the CCD Array, while the array looking at an brightly-illuminated pure-white image. During this calibration, the Full Rate Carriage is placed under the White Reference Strip, the Exposure Lamp is lit and readings are taken from all pixels in the CCD Array. The most extreme (highest) value from any pixel is taken to be the "correct" value. A multiplier is then calculated for each remaining pixel to make its measured white value equal to this reference. During document scanning, all readings from each pixel which are above a threshold value are adjusted by this multiplier to create a corrected value.

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### Scanner Initialization (continued)

#### Automatic Output Control

Automatic Output Control (AOC) compensates for variations in the readings between pixels in the CCD array, when looking at a black image. Immediately after the AGC readings, with the Full Rate Carriage still under the White Reference Strip, the Exposure Lamp is shut off and readings are taken from all pixels in the CCD array. The most extreme (lowest) value from any pixel is taken to be the correct value. A multiplier is calculated for each remaining pixel to make its measured black value equal to this reference. During document scanning, all readings from each pixel which are below a threshold value are adjusted by this multiplier to create a corrected value

#### Shading Control

Shading Correction compensates for the fact that the Exposure Lamp does not provide consistent illumination across its length. The ends of the Lamp are dimmer than the center. Because of this, a multiplier is calculated which is then applied to the pixels on the end. One distinct difference between Shading Correction and AGC is that readings for Shading Correction are taken in two places on the White Reference Strip.

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### Scanner Initialization (continued)

#### White Variation Correction

White Variation Correction compensates for the fact that the White Reference Strip isn't white everywhere. In this test, a lighted reading is taken from two separate locations on the White Reference Strip. The more extreme (higher) value is taken to be correct and is used in future calculations.

#### Automatic Density Control

Automatic Density Control (ADC) is a joint function of the Imaging circuitry and the Xerographics Module. It ensures that the density of the image on the copy doesn't change over time with a constant image input density