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# C-Star Calibration

Date January 28, 2020 S/N# **CST-1269DR** Pathlength 25 cm

| | Analog output | |
|---|---|---|
| $V_d$ | **0.058 V** | |
| $V_{air}$ | **4.743 V** | |
| $V_{ref}$ | **4.646 V** | |
| Temperature of calibration water | | **22.5** ℃ |
| Ambient temperature during calibration | | **23.3** ℃ |

Relationship of transmittance (Tr) to beam attenuation coefficient (c), and pathlength (x, in meters): $\mathbf{Tr = e^{-cx}}$

To determine beam transmittance: $\mathbf{Tr = (V_{sig} - V_{dark}) / (V_{ref} - V_{dark})}$

To determine beam attenuation coefficient: $\mathbf{c = -1/x * ln\ (Tr)}$

$\mathbf{V_d}$ Meter output with the beam blocked. This is the offset.
$\mathbf{V_{air}}$ Meter output in air with a clear beam path.
$\mathbf{V_{ref}}$ Meter output with clean water in the path.
Temperature of calibration water: temperature of clean water used to obtain $V_{ref}$.
Ambient temperature: meter temperature in air during the calibration.
$\mathbf{V_{sig}}$ Measured signal output of meter.