## C-Star Calibration

<table>
<thead>
<tr>
<th>Date</th>
<th>S/N#</th>
<th>Pathlength</th>
<th>Analog output</th>
<th>Digital output</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 24, 2019</td>
<td>CST-1825PR</td>
<td>25 cm</td>
<td>0.010 V</td>
<td>0 counts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.793 V</td>
<td>15699 counts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.702 V</td>
<td>15401 counts</td>
</tr>
</tbody>
</table>

Temperature of calibration water: 24.3 °C

Ambient temperature during calibration: 22.4 °C

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

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

To determine beam attenuation coefficient: $c = -1/x \times \ln (Tr)$

- $V_d$: Meter output with the beam blocked. This is the offset.
- $V_{air}$: Meter output in air with a clear beam path.
- $V_{ref}$: 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.
- $V_{sig}$: Measured signal output of meter.