The BioSense range of qualitative biofouling monitors provide a relative measure of “activity” of biofilm being present in your process, allowing you to dose your biocide accordingly or take other appropriate remedial action.

- Legionella control
- Automatic Biocide control
- Can be combined with other sensors
- No maintenance
- Cooling towers and any water circuit
- Seawater option
- Reduced chemical costs
- Up to 10 Bar

"Using the BioSense allows us to monitor for biofilm development and then to dose the appropriate biocide" Dr Craig Stracey, UK

The BioSense sensors are available with different controllers to give you the same great performance with different communication, display, and control options. With the BioSense range of biofilm analyzers, you can simply monitor and alarm for biofilm in your water system, or you can implement a sophisticated monitoring and control regimen with biofilm and residual disinfectant monitoring all available online via the integrated remote access over LAN or GPRS modem.

**CRONOS® BioSense**
- High Quality - Low Cost
- Multilingual
- High resolution grayscale display
- 9 buttons for easy navigation
- Graphing and data logging
- Enclosure; wall, panel, pipe or pole mounting. IP65/Nema 4x.
- Options:
  - Modbus RS485/LAN
  - Profibus DPV 1
  - Up to 2 sensors
  - PID/flow proportional controls
  - Remote sensors
  - Color display
  - Downloadable data logs

**CRIUS® BioSense**
- highest Quality - Low Cost
- Multilingual
- High resolution color display
- Downloadable data logs
- Intuitive user interface
- Customizable home pages
- All CRONOS® options plus:
  - Up to 4 sensors
  - Remote access via LAN
  - Remote access via 3G/4G
  - Expandable to 16 sensors

**Biofilm**

HSE HSG274 Legionnaires' disease: Technical guidance Part 1, 2013, Pg. 31 – "Biofilm can impair heat transfer efficiency, cause severe localized corrosion and the growth of legionella and should be considered a high risk contamination."

Options include:
- NPT or BSP fittings
- Flow cell
- Stainless steel electrodes
- Titanium electrodes for sea water

For more information please see the individual brochures - CRONOS® and CRIUS®

www.processinstruments.net
**Principle of Operation**

The controller applies a potential between the probe electrodes that encourages microorganisms to grow on the surface of the probe before they would grow on the surfaces of a pipe or a vessel. The biological activity of the biofilm creates a signal.

A BioSense controller collects and monitors that signal continually. An increasing trend in the signal indicates the onset of biofilm activity on the probe. The controller can then take remedial action automatically by, for example, increasing or decreasing the biocide levels.

The CRONOS® BioSense is a low cost controller capable of automatically changing dosing regimes etc. with the more sophisticated CRIUS® controller providing; data logging, email and text alarms, remote access and control via GPRS/LAN.

![Image of BioSense controller](image)

To view a flash animation of the BioSense go to:
[http://www.processinstruments.net/products/biofilm-monitor](http://www.processinstruments.net/products/biofilm-monitor)

**Automatic Biocide Control**

Measuring the residual biocide in a body of water only tells half the story. It tells you that there is little or no biological activity in the bulk water. This doesn't necessarily mean that biofilm isn't building up on the walls of pipes and vessels with the possibility of the development of harmful bacterial colonies. The CRIUS® BioSense can come equipped with its own integrated GSM/GPRS modem, which allows anyone, with the appropriate security level, to receive text alarms or emails relating to the chemistry of the treated water. It also allows you to monitor the build up of any biofilm and in turn take the appropriate action AUTOMATICALLY to return the system to a clean condition. This could be as simple as triggering an alarm for a manual intervention or as complex as increasing biocide levels or shock dosing, all controlled by the BioSense controller.

The BioSense gives you:

- Control of system surface biological activity
- Treatment effectiveness monitoring
- Biocide program optimization
- Indication of a "clean" state

Both of the biofilm controllers: CRONOS® and CRIUS® can also come equipped with sensors such as pH, temperature, conductivity, chlorine dioxide, chlorine, bromine etc. for a fully integrated water treatment control system including biofilm monitoring.

**Specification**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>All uses of water (optional titanium rings for seawater)</td>
</tr>
<tr>
<td>Type</td>
<td>Solid epoxy and stainless steel (optional titanium rings for seawater)</td>
</tr>
<tr>
<td>Measurand</td>
<td>Biofilm Activity</td>
</tr>
<tr>
<td>Range</td>
<td>0-10 Biofilm Activity</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>&gt;0 up to 65°C (fast temperature transients will affect the active current readings***)</td>
</tr>
<tr>
<td>Max. Pressure</td>
<td>10 bar</td>
</tr>
<tr>
<td>Flow Rate</td>
<td>Low (high flows can prevent biofilm growth)</td>
</tr>
<tr>
<td>pH Range</td>
<td>pH3 to pH11</td>
</tr>
<tr>
<td>Disinfectants</td>
<td>Suitable for use with disinfectants. Extreme disinfection regimes can cause oxidation of the rings. This should be avoided as it can lead to false positives</td>
</tr>
<tr>
<td>Warm Up Time</td>
<td>At least 18 hours***</td>
</tr>
<tr>
<td>Calibration</td>
<td>None</td>
</tr>
<tr>
<td>Effects of Salinity</td>
<td>None, though in high salinity environments the titanium option is recommended</td>
</tr>
<tr>
<td>Effects of Scale</td>
<td>None</td>
</tr>
<tr>
<td>Effects of Fouling</td>
<td>None</td>
</tr>
<tr>
<td>Dimensions</td>
<td>Diameter approx. 25.4mm, length 116.5mm</td>
</tr>
<tr>
<td>Fitting</td>
<td>Either 1” BSP or 1” NPT</td>
</tr>
</tbody>
</table>

*All subject to change without notice

**Fast temperature transients can affect active current. If these are occurring it will be necessary to turn off the active current. This will reduce the efficiency of the BioSense however most biofilms will be adequately detected by the passive current alone.

***The sensor needs to equilibrate and reach a steady state which can take up to 36 hours. Whenever power is lost to the BioSense for more than 24 hours since the last polarisation period it will re-enter the warm up time. It is possible to reset the sensor at any time from the user interface.