## METERS

# $CO_2$ Detector Unit DU03

Fluorescent chemical optical sensor foils combined with the imaging Detector Unit DU03 allow easy 2D visualization of carbon dioxide distributions in heterogeneous samples. For measurement the sample surface is covered with the sensor film, which translates the analyte content into a light signal. The sensor response is recorded pixel by pixel with a handheld digital camera. With VisiSens™ spatial and temporal changes of carbon dioxide can be monitored. The software allows controlling the image recording process, and assists image processing and evaluation. An easy to use camera controlling user interface manages image acquisition and storage. Measurements which belong together can be organized in user defined sessions as separate folders and annotated with a free text comment. Acquired images can be single images or automatically recorded time series.

- Read-out of $CO_2$ sensor foils
- More than 100,000 measurement points within one recorded image
- USB powered & portable
- Small to medium size field of view (4.6 mm² to 13.5 cm²)
- Image processing and evaluation software included
- Visualize spatial and temporal gradients
- Time-lapse analyte movies

## TECHNICAL

| Specifications | |
|---|---|
| Camera chip | Enhanced Color CMOS |
| Image resolution | 1.3 megapixel (1,280 x 1,024 pixels) |
| Magnification | 10-fold up to 220-fold, depending on adapter tube used |
| Field of view | □ 1.6 x 1.3 $mm^2$ to □ 3.6 x 3.0 $cm^2$; typically □ 1.2 x 1.0 $cm^2$ |
| Output | 15 fps live video preview (no storage) and 0.5 fps full-resolution picture storage (.png) |
| Interface | USB 2.0, high speed USB transmission |
| Number of LEDs | 8 |
| Material | All-aluminum housing |
| Dimensions | Length 10 cm, diameter 3.8 cm |
| Weight | 170 g (without adapter tubus) |

## SENSORS


### $CO_2$ Sensor Foil SF-CD1R

This chemical optical $CO_2$ sensor foil can be attached to any sample surface or to the inner surface of any transparent glass or plastic vessel. $CO_2$ distributions over whole surface areas are then visualized contactless and non-destructively with the VisiSens™ detector unit DU03 or VisiSens TD. The SF-CD1R is used for measurements in liquids or samples with a constant relative humidity of 100 %, and has a measuring range of 1 – 25 % $CO_2$.

- 2D read-out
- Contactless, direct sensing or through transparent walls
- Visualize spatial and temporal gradients
- Numerous measurement points in one image

# TECHNICAL

| Specifications# | |
|---|---|
| Measurement range | 0 - 25 % $pCO_2$ at atmospheric pressure (1013.15 hPa) |
| Response time ($t_{90}$)* | < 3 min. |
| **Specifications using VisiSens TD read-out** | |
| Precision (temporal)** | ± 0.02 % $CO_2$ at 2.0 % $CO_2$<br>± 0.01 % $CO_2$ at 25.0 % $CO_2$ |
| Precision (spatial)*** | ± 0.2 % CO2 at 2.0 % CO2<br>± 1.2 % CO2 at 25.0 % CO2 |
| **Properties** | |
| Compatibility | Aqueous solutions, pH 4 - 9 |
| General sensor temperature working range | from +5 to + 45 °C |
| Size of sensor foil | Standard 40 x 40 $mm^2$<br>min. 5 x 5 $mm^2$ |

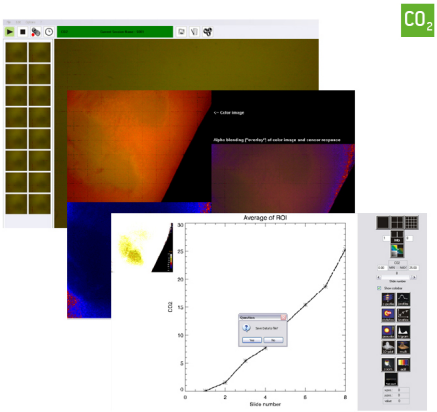
# VisiSens™ is no approved medical device

* typical data which may stronlgy differ with adapting the imaging set-up to specific needs

** typical data of precision of a defined ROI (> 6,000 pixels) over time at 20 °C, excluded ambient light, FoV 8 cm x 6 cm, DU03 strongly differs

*** typical data of spatial standard deviation in defined ROI > 6,000 pixels at 20 °C, excluded ambient light, FoV 8 cm x 6 cm, DU03 strongly differs

## SOFTWARE



### $CO_2$ VisiSens™ AnalytiCal 3 Software

This software allows controlling the image recording process with the VisiSens A3 $CO_2$ imaging system, and assists the image processing process and data analysis. An easy-to-use acquisition module manages image recording and storage. Measurements which belong together can be organized as user defined sessions. Single images or time series measurements can be performed to analyze both spatial and temporal changes in analyte concentration. The software's evaluation module allows image processing and multiple options for image display. For analysis a number of functions are supplied.

- Display the sensor response in false color image
- Display the actual pixel information
- Display ROI statistic
- Interactive x- and y-axis profiles
- Z-axis profiles for plotting ROI average at defined coordinates
- Follow kinetics through a time series and display as 2D-plot
- Side-by-side image comparison of selected images
- Alpha blending of false color sensor response with color image

## TECHNICAL

| | Minimum System Requirements | Suggested Configuration |
|---|---|---|
| Operating system | Microsoft® Windows® XP, Vista™ or Microsoft® Windows® 7 (32 or 64 Bit) | Microsoft® Windows® 7 (64 Bit) |
| Processor | 2.4 GHz Pentium IV or adequate AMD Athlon Processor | Intel 'i ' series or adequate AMD Processor (or higher) |
| RAM | 2 GB | 4 GB or more |
| Memory capacity for graphic board | 256 MB | 1 GB or more |
| Hard disk | 1 GB free memory | 250 GB or more free memory |
| USB | USB 2.0 | USB 2.0 |
| Screen resolution | 1366 x 768 (16:9)<br>1280 x 800 (16:10)<br>1280 x 1024 (5:4) | 1680 x 1050 or higher (16:9 or 16:10) |

## GET IN CONTACT

- **Request more info**
- **Request a quote**
- **Rent-a-meter**

**PreSens** Precision Sensing GmbH
Am Biopark 11, D-93053 Regensburg
Phone +49 941 942 72 100
Fax +49 941 942 72 111
**info@PreSens.de**