# axiREADER

**Microarray Imager & Analyzer**

# Image and Analyze your Arrays

## Colorimetric and Fluorescence versions


## Compact & Versatile

The axiREADER is a compact and portable imager designed for imaging arrays of biomolecules. It is available as a fluorescence reader, for tagged molecules, or as a colorimetric reader, to view spots such as after treatment with a chromogenic substrate for example.

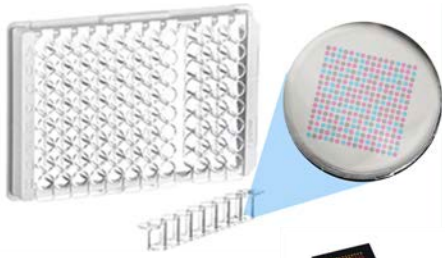
The reader can work with a 96-well plate, a 12 x 8 strip well plate, 25 x 75 mm slides, or any other substrates, such as iRiS chips, via custom adapters. Beyond imaging, the software can auto-find array spots, analyze them, and interpret test results using powerful algorithmic capabilities.

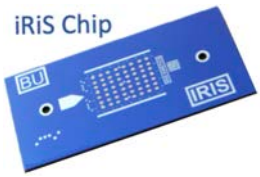
## The power of multiplexing

- Save time, reagents, and precious samples
- Perform multiple assays in one well
- Ideal for multiplex ELISA and genotyping
- Same functionality as confocal scanner at a fraction of the cost
- Designed for routine use in diagnostics and biochemical analysis

The colorimetric reader images from above and therefore can read white or opaque plates / slides, as well as clear ones.

The fluorescence reader images from below and therefore clear bottom plates should be used. Opaque slides or other substrates, can be used by flipping them upside down.



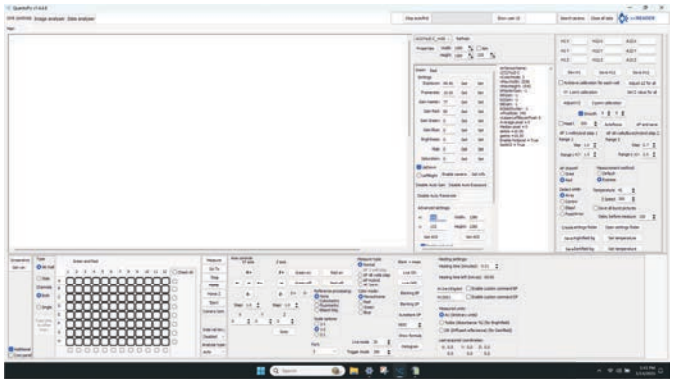



**FUN FACT**: The dual layer silicone surface of the iRiS chip enhances imaging for fluorescence based assays. In addition, the silicon surface allows for a wide range of functionalization chemistries to be utilized, for immobilization of your capture biomolecules.

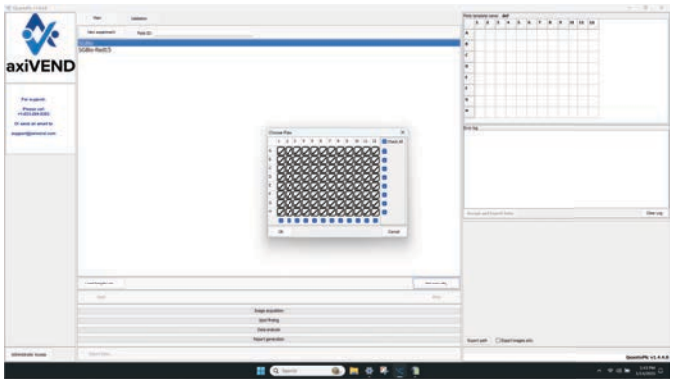
## Microarray Analysis

The readers image the array using a single picture from a high sensitivity low-noise camera. The optics do not move during a read. This approach makes the reader particularly robust and easy to transport. An automated stage moves the plate or slide to preprogrammed / customizable XYZ coordinates to capture images. While at a location, several images can be acquired using for example, different channels or exposure settings.

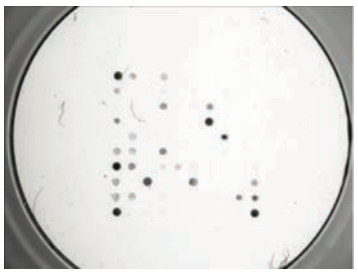
- You have the flexibility to read a full plate or slide, using a number of camera settings, and export TIFF files for external processing.
- You can use the built-in software to find the spots and calculate their intensities using a number of methods, and export as a csv.
- Finally, you can automate the analysis with powerful algorithms to analyze spot intensities, culmulating into a custom report with interpreted results.

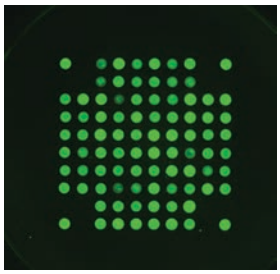


The first step consists of setting up image acquisition parameters. Focus and camera settings are adjusted here. Plate position calibration for XY and auto-focus mode selection is usually done by an administrator. One can also manually select samples to be read, useful during assay development.

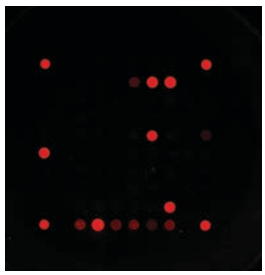


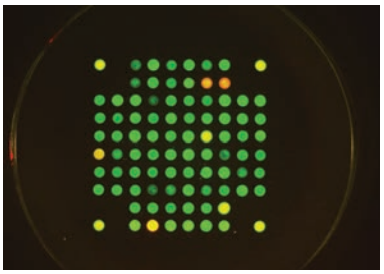

Once an 'assay' is defined, the end-user can use this simple interface as the only screen. Select 'assay', select wells to read, and click 'start'. All steps defined by the assay are then executed, including image acquisition spot finding, area calculation, analysis, reporting, including images / data exports.



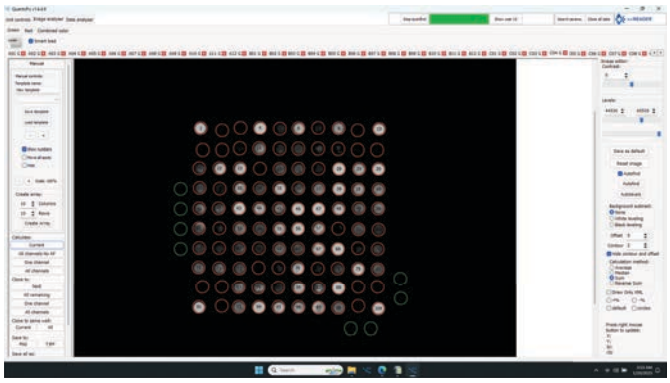


With adjusted camera settings, well / array images are then acquired. For multichannel fluorescence readers, one can specify the capture of several images per well location, using different settings, without moving the stage.

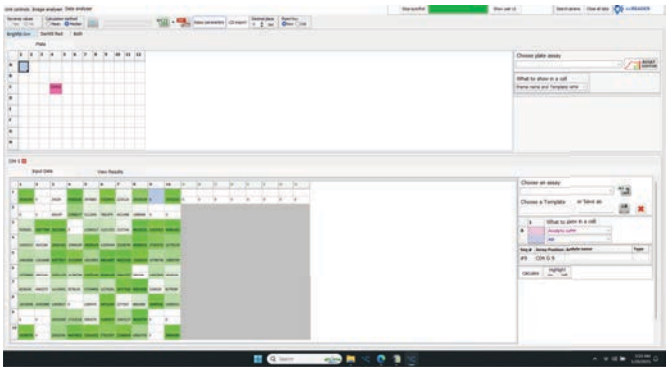




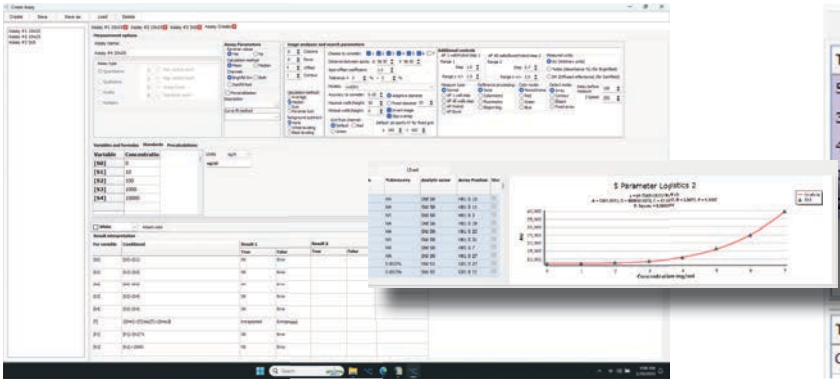
Up to 4 excitation wavelenghts can be used, and a total of 4 emission filters can be included during the assembly of the reader. The standard 2 channel configuration uses red/green channels.



Spot finding uses a template of your array and a powerful AI model. The model is trained based on sample images from your assay. This results in robust spot finding performance.



Once the spots are found, a calculation is performed to quatify spot intensities, such as average, median, and sum of all pixels within, with associated statistics. Spot matching to array components is performed with the import of a GAL file, or manually.



Results | Simplified | Diagnosis

| Test name | Result1 | Result2 |
|---|---|---|
| 5Nucleocapside | Positive | 54922.5 |
| 3SpikeNTD | Negative | 19578.7 |
| 4Spike1 | Negative | 20750.6 |
| 1SpikeRBD | Negative | 21082.0 |
| 2Spike2 | Positive | 40274.3 |

| Test Diagnosis | Result1 | Result2 |
|---|---|---|
| Covidiad 1.2 beta2.1 avg | Positive | |

With the calculated spot intensities, as AUC, one can then perform a thorough and accurate analysis. Spots can be defined as positive or negative controls, as well as calibrators. Algorithms can use intra-array spot values, as well as inter-array values (from different wells) to perfom results calculations. Calibration curves using data from different wells can be generated. This suite of powerful features enables the generation of interpreted results in a consise diagnostics report.

## GENERAL SPECS (Common to both types)

| | |
|---|---|
| Detection: | CMOS 3MP camera (FOV 7x7 mm) |
| Resolution: | 6 um / pixel, 1280x1280 pixels |
| Exposure: | Controllable, up to 30 sec per well |
| Focus: | Manual, Auto |
| Image formats: | TIFF, PNG (16-bit) |
| Sample Import: | GAL, Excel |
| Speed: | ~ 2 min per 96-well plate |
| Software: | Included, runs on 64-bit Windows 11 |

## COLORIMETRIC

| | |
|---|---|
| Light Source: | top and bottom white LED |
| Camera mounting: | top, imaging downward |
| Substrate: | opaque *or* transparent |

## FLUOROMETRIC

| | |
|---|---|
| Light Source: | bottom laser illumination |
| Camera mounting: | bottom, imaging upward |
| Substrate: | clear, *or* insert facing downward |
| Standard laser (2): | 520 & 638 nm |
| Std filters (bandwith): | 575 (25) & 688 (48) nm |

### Common Configurations:

**Blue Green Red**

| Fluorophore | Excitation, nm | Emmision, nm |
|---|---|---|
| ALEXA 430 | 445 | 520 |
| CY3 | 520 | 615 |
| CY5 | 635 | 697 |

**Violet Green Red**

| Fluorophore | Excitation, nm | Emmision, nm |
|---|---|---|
| ALEXA 405 | 405 | 438 |
| CY3 | 520 | 615 |
| CY5 | 635 | 697 |

**Violet Blue Green**

| Fluorophore | Excitation, nm | Emmision, nm |
|---|---|---|
| ALEXA 405 | 405 | 438 |
| FITC/ALEXA488 | 470 | 520 |
| ALEXA568 | 520 | 640 |

Blue Channel Options: 445, 460, or 470 nm
Red Channel Options: 635 or 650 nm

Need different wavelengths?
Ask us !

### Available emission filters

| nm | FWHM | Application | nm | FWHM | Application |
|---|---|---|---|---|---|
| 435 | 48 | — | 561 | 21 | — |
| 438 | 28 | — | 562 | 46 | — |
| 440 | 46 | Sirius Emission | 572 | 33 | SpectrumGold™ Emission |
| 447 | 65 | DAPI Emission / BFP & GFP Emission | 575 | 35 | — |
| 448 | 25 | — | 578 | 22 | Cy3.5 Emission |
| 452 | 51 | — | 585 | 40 | — |
| 466 | 45 | — | 586 | 26 | SpectrumOrange™ Emission |
| 472 | 35 | — | 591.5 | 49 | Cy3 Emission / TRITC Emission |
| 475 | 56 | — | 605 | 22 | Qdot® 605 Emission |
| 482.5 | 36 | CFP Emission | 607 | 42 | GFP Emission / RFP Emission |
| 494 | 25 | — | 615 | 26 | Alexa Fluor® 594 Emission / Cy3 Emission |
| 500 | 29 | — | 620 | 60 | — |
| 510 | 25 | Cy2 Emission | 623 | 30 | Texas Red® Emission |
| 510 | 89 | FURA2 Emission | 624 | 46 | Texas Red Emission |
| 512 | 30 | Fluorescein Emission | 625 | 25 | Qdot® 625 Emission |
| 520 | 41 | GFP Emission | 628 | 38 | SpectrumRed™ Emission |
| 520 | 77 | Alexa Fluor® 488 Emission / GFP Emission | 631 | 28 | — |
| 525 | 18 | Qdot® 525 Emission | 640 | 20 | — |
| 525 | 51 | GPF/FITC Emission | 640.5 | 81 | mCherry Emission |
| 527 | 22 | SpectrumGreen™ Emission | 648 | 20 | FITC Emission |
| 530 | 62 | Thiazole Orange Emission | 655 | 24 | Qdot® 655 Emission |
| 534 | 25 | — | 655 | 47 | — |
| 534.5 | 48 | FITC Emission | 661 | 26 | TO-PRO®-3 Iodide Emission |
| 540 | 56 | FITC Emission | 676 | 36 | Cy5 Emission |
| 543 | 27 | YFP Emission | 692 | 47 | Cy5 Emission |
| 549 | 21 | Alexa Fluor® 532 Emission | 697 | 91 | Alexa Fluor® 680 Emission / Cy5.5™ Emission |
| 550 | 100 | Broadband Green Fluorescence | 716 | 47 | Cy5 Emission |
| 560 | 32 | — | 785 | 71 | Superbright780 |

**Notes:**

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