DV2 Spec Sheet

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# Microscope

* **API Deltavision Personal DV2**
* **Body:** Olympus IX-71

# Objectives

## Objective list

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Magnification** | **100x** | **60x** | **40x** | **20x** | **10x** | **4x** |
| **Medium** | Oil | Oil | Oil | Oil | Air | Air |
| **Brand** | Olympus | Olympus | Olympus | Olympus | Olympus | Olympus |
| **Type** | UPlanSApo | PlanApoN | UPlanFL N | UPlanSApo | UPlanSApo | Plan N |
| **NA** | 1.40 | 1.42 | 1.30 | 0.85 | 0.4 | 0.1 |
| **WD** | 0.13 | 0.15 | 0.20 | 0.17 | 3.1 | 18.5 |
| **Coverslip** | 0.17 | 0.17 | 0.17 | - | 0.17 | - |
| **Correction collar** | n | n | n | N | n | n |
| **Spring** | yes | yes | yes | No | no | no |
| **Tube** | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ |
| **Bright field** | DIC | DIC | DIC | DIC | DIC | BF |

## Lateral resolution

* **λem** = 515 nm
* **n** = 1.518
* **chip pixel size** = 6.45 µm

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Objective mag.** | **NA** | **Pixel size (nm)** | **Rayleigh limit (nm)** | **Nyquist pixel size (nm)** | **Sampled?** | **Sampled w/ 1.6?** |
| **4** | 0.1 | 1610 | 3140 | 1370 | No | Yes |
| **10** | 0.4 | 645 | 785 | 341 | No | No |
| **20** | 0.85 | 323 | 370 | 161 | No | No |
| **40** | 1.3 | 161 | 242 | 105 | No | Yes |
| **60** | 1.41 | 108 | 223 | 96.9 | No | Yes |
| **100** | 1.4 | 64.5 | 224 | 97.6 | Yes | Yes |

## Axial resolution

* **λem** = 515 nm
* **n** = 1.518

|  |  |  |  |
| --- | --- | --- | --- |
| **Objective mag.** | **NA** | **FWHM (nm)[[1]](#footnote-1)** | **Nyquist sampling (nm)** |
| **4** | 0.1 | 91400 | 39800 |
| **10** | 0.4 | 5490 | 2390 |
| **20** | 0.85 | 1760 | 766 |
| **40** | 1.3 | 624 | 271 |
| **60** | 1.42 | 467 | 203 |
| **100** | 1.4 | 492 | 214 |

# LED Illumination

## Spectrum



Taken from imsol website 09/08/2018.

## Output power

Power (in mW) measured at the back aperture of the microscope on 06/04/2018 for four common illumination wavelengths.

# Filters

## Filter sets

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Excitation band (nm)** | **Emission band (nm)** | **Eyepiece (nm)** |
| DAPI | 382-393 | 450-500 | 450-500 |
| CFP | 418-442 | 450-500 | N/A |
| GFP | 450-490 | 500-550 | 520-550 |
| YFP | 490-510 | 520-550 | 520-550 |
| mCherry | 558-586 | 602-662 | 635/60 |
| CY5 | 633-647 | 665-705 | N/A |

## Dichroics

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Channel** | **Reflection band (nm)** | **Transmission band (nm)** |
| **Quad** | DAPI | 381-401 | 409-456 |
| FITC | 464-492 | 500-523 |
| TRITC | 531-556 | 564-611 |
| CY5 | 619-644 | 652-700 |
| **GFP/mCh** | GFP | 464-492 | 500-553 |
| mCherry | 561-590 | 598-617 |
| **CFP/YFP** | CFP | 400-454 | 463-487 |
| YFP | 496-528 | 537-550 |

# Camera

* **Photometrics CoolSNAP HQ2 interline CCD**
* **Speed** = 11 fps (full-chip), 104 fps (256x256 sub-array, 8x8 binning)
* **QE** = 64 %
* **Read noise (r.m.s)** = 4.5 (10 MHz), 5.5 (20 MHz) electrons
* **Dark current** = 0.001 electrons/px/s (at -30 °C)

## Field of view

* **chip size** = 1040 x 1392 px
* **field number** = 26.5 mm (22 mm for 4x)

|  |  |  |  |
| --- | --- | --- | --- |
| **Objective mag.** | **Magnified chip size (µm)** | **Chip illumination area (µm)** | **FOV (µm)** |
| **x** | **y** | **x** | **y** | **x** | **y** |
| **4** | 1680 | 2240 | 5500 | 5500 | 1680 | 2240 |
| **10** | 671 | 898 | 2650 | 2650 | 671 | 898 |
| **20** | 335 | 449 | 1330 | 1330 | 335 | 449 |
| **40** | 168 | 224 | 663 | 663 | 168 | 224 |
| **60** | 112 | 150 | 442 | 442 | 112 | 150 |
| **100** | 67.1 | 89.8 | 265 | 265 | 67.1 | 89.8 |

# Computer

* **Software:** softWoRx v 5.5.1
* **OS:** Centos v 4.8
* **Processor:** AMD Opteron 170 @ 2GHz (2 CPUs)
* **Memory:** 2GB RAM, 1x 500GB hard disk space
1. Calculated using eq. 16 in Wilson, T. Resolution and optical sectioning in the confocal microscope. *Journal of Microscopy.* 244:2 pp. 113-121 (2011) [↑](#footnote-ref-1)