Executive War College, May 2018

John Wellbank
Thermo Fisher Scientific, Digital Pathology
DPA Foundation President & Board 2017
DPA President 2015 & 2016
Manufacturer Overview: First European DP manufacturer, established in Budapest Hungary in 1996, over 1500 systems sold. Berlin DP Scanner contest May 2016, won first place for high throughput and image quality at 20x and 40x for Panoramic Flash and Midi.

Project Scope: This project is a distribution agreement of 3DH products and Thermo Fisher for sole distribution in NA > ROW.

* available in Europe, Canada and other countries for Clinical Use under the CE mark. For US for Research US Only, not currently for sale for Clinical use.
Thermo Fisher Offering

• 6 types of scanners, low/high volume, bright, fluorescence, 3-D
• Extensive workflow, analysis software, flexible storage scenario
• Project Management, implementation, applications, + service

User Value

• Full spectrum of DP Solution for Frozens, Teaching, Tumor Bd., Tele-Pathology, Multiple Sites
• Streamline workflow, Improve TAT and Quality of Service
• Single capable source for DP transformation
• Trusted Pathology Partner, fast action, needs addressed.
A to Z

1 Slide 12 Slides 150 Slides 250 Slides

1000 slides Confocal

5 Blocks 72 Blocks

Confocal
• 5MP CMOS
  Brightfield/LED/40X

• All Single Objective/Single Slide/Manual loading

• Standard Slide
  HR-1*  60x / 0,17 μm
  HR-3*  116x / 0,09 μm

• Double Width Slide
  HS*     40x / 0,27 μm
  HR-2*   70x / 0,14 μm

* MacroStation available to tie into case center
Pannoramic® MIDI II for Low Volume Bright and Fluorescence

- 12 Slide Capacity
- 26X @ 1.5 minutes to 90X Brightfield
- to 9 Channel Fluorescence
- Manual Cam Changer
- Motor Obj. Changer
- Auto Slide loading/previewing/bar code reading/scanning
Pannoramic® SCAN II for Mid Volume Bright and, Fluoresce

- 150 Slide Cap.
- 26X @1.5 minutes to 90X Brightfield
- To 9 channel Fluorescence @20X,32X,64X
- Manual Cam. changer
- Motor Obj. changer
- Auto Slide Loading, preview, bar code reading, scanning
Pannoramic® P250 FLASH III, High Volume Bright + Floures.

- 250 Slide Cap.
- 26X @30 seconds to 52X Brightfield
- To 9 channel Fluorescence @20X,32X,64X
- Manual Cam. changer
- Motor Obj. changer
- Auto Slide Loading, preview, barcode reading, scanning
**Pannoramic® P1000**

**Highest capacity and** automatic loading and scanning

**Shortest scanning time**
- Fastest @ 100 slides per hour, 2000 slides per day
- 40x resolution
- 2x Wide slide
- Priority slide handling/ordered/arbitrary
- Any type of stainer slide cassettes
- Auto scan quality check
- Touch-enabled, easy-to-use
- new software user interface
- Integrated slide server and storage (optional)

**High-resolution imaging**
- 3 separate objectives exchangeable automatically
- Water immersion
- Oil immersion
- Multilayer (Z-stack) scanning
- Extended Focus scanning
- Multiple scanning profiles, auto selection
- 1D and 2D barcode reading and parsing
- Multiple image compression
- Multiple color profile and schemes
- Multiple image compensation
- Automated tissue detection
# Pannoramic® Confocal

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Slide capacity</strong></td>
<td>12 slides</td>
</tr>
<tr>
<td><strong>Acceptable slide formats</strong></td>
<td>25.5 (+0.5) mm x 75.5 (+0.5) mm, 1 (+0.05) mm thickness</td>
</tr>
<tr>
<td><strong>Default objectives</strong></td>
<td>Zeiss Plan-Apochomat 20x/0.8 NA, Zeiss C-Apochomat (W) 40x/1.2 NA</td>
</tr>
<tr>
<td><strong>Camera type</strong></td>
<td>5.5Mpx, 16 bit, low noise (1.3 e-) PCO edge cooled scientific CMOS camera</td>
</tr>
<tr>
<td><strong>Image resolution (in focus plane)</strong></td>
<td>0.4 µm FWHM (with 40x 1.2NA objective)</td>
</tr>
<tr>
<td><strong>Confocal sectioning</strong></td>
<td>1.43 µm FWHM (with 40x 1.2NA objective)</td>
</tr>
<tr>
<td><strong>Fluorescent illumination</strong></td>
<td>6 channels Solid state light engine, 15000 hrs lifetime</td>
</tr>
<tr>
<td><strong>Default fluorescent filter sets</strong></td>
<td>Quad band: DAPI/FITC/TRITC/Cy5,</td>
</tr>
<tr>
<td><strong># filter cube positions</strong></td>
<td>3 (BF+FL mode) or 4 (FL mode)</td>
</tr>
<tr>
<td><strong>filter type</strong></td>
<td>single-/dual-/quad-band</td>
</tr>
<tr>
<td><strong>Brightfield illumination</strong></td>
<td>3CCD equivalent separated R-G-B LED</td>
</tr>
<tr>
<td><strong>Digital slide format</strong></td>
<td>Proprietary digital slide format (MRXS) with lossless or JPG/JPGXR/JPG2000 encoding</td>
</tr>
<tr>
<td><strong>Export opinions area</strong></td>
<td>single/multi channel annotation or whole slide</td>
</tr>
<tr>
<td><strong>file format</strong></td>
<td>TIFF/JPEG</td>
</tr>
<tr>
<td><strong>Instrument dimensions</strong></td>
<td>97 cm x 58 cm x 103 cm or 39”x23”x41”</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>100 kg</td>
</tr>
</tbody>
</table>
Case Viewer Software
Nuclear Quant Software

NuclearQuant Measurement Report

Patient Data
Name: Jennifer White
Social insurance number: 445-723-456

Sample Data
Biopsy ID: 12345678
Patient clinical status: New
Sender doctor's name: John Maxwell
Clinical History: Right Breast CA

Measurement Data
Institute: Pathology Department
Slide Name: 17361-12_E2_v3
Test region / Annotation name:

Results

<table>
<thead>
<tr>
<th>Name</th>
<th>Percent</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.04%</td>
<td>3</td>
</tr>
<tr>
<td>1+</td>
<td>0.15%</td>
<td>11</td>
</tr>
<tr>
<td>2+</td>
<td>11.64%</td>
<td>1112</td>
</tr>
<tr>
<td>3+</td>
<td>84.17%</td>
<td>9866</td>
</tr>
<tr>
<td>Total count</td>
<td>100 %</td>
<td>7112</td>
</tr>
</tbody>
</table>

Microscopic diagnosis: Invasive ductal carcinoma

1 - Strong positive
2 - Medium positive
3 - Negative

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Pattern Quant Software

Estrogen stained breast tissue

ThermoFisher Scientific

Proprietary & Confidential
Membrane Quant Software

MembraneQuant Measurement Report

**Patient Data**
- Name: Jennifer Smith
- Social insurance number: 445-673-2319
- Sex: Female
- Date of birth: 10/06/1954

**Sample Data**
- Biopsy ID: 1203567/2
- Patient clinical status: -
- Sender doctor's name: Patrick Maxwell
- Clinical History: Right breast CA
- Sample ID: 1203567/2-1
- Onset date: 05/08/2014
- Sender Institute: Central Hospital
- Examiner: Robert King
- Test date: 10/7/2014 3:45:22 PM

**Measurement Data**
- Institute: Pathology Department
- Slide Name: 10301-07_bre2
- Test region / Annotation name: <unnamed roi(s)>

**Results**

<table>
<thead>
<tr>
<th>Value</th>
<th>Percent</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.95%</td>
<td>660</td>
</tr>
<tr>
<td>1+</td>
<td>14.79%</td>
<td>10785</td>
</tr>
<tr>
<td>2+</td>
<td>43.99%</td>
<td>31289</td>
</tr>
<tr>
<td>3+</td>
<td>41.42%</td>
<td>30199</td>
</tr>
<tr>
<td>Total carcinoma</td>
<td>100%</td>
<td>72913</td>
</tr>
</tbody>
</table>

**Microscopic diagnosis:** Invasive Ductal Carcinoma

1 - sample image | 2 - sample image | 3 - sample image

10/7/2014 3:45:22 PM  1 of 2  Signature: