Arrayit introduces high throughput hybridization instrumentation for microplate formatted microarrays configured in 4x16 and 4x24 multi-well hybridization cassettes. Hybridize and react up to 96 DNA, protein, peptide and carbohydrate microarrays at a time. This digitally controlled peltier heating and cooling (ambient to 100ºC) orbital mixer (300-1,500 rpm) can also be used for the full gamut of microarray applications as well as cell studies, RNA transcription, immunoprecipitation, enzyme kinetics, and more.:

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Introduction
Introduction
Congratulations on taking an important step towards improving the economies of scale, quality and speed of your life sciences, medical, diagnostics and agricultural research. This booklet contains a complete set of protocols outlining the steps and principles needed to use Arrayit’s Multi-Well Hybridization Station.

Quality Control
Arrayit ensures the performance of this product line. Rigorous quality control monitoring on a instrument-by-instrument basis guarantees that the manufacturing, performance and safety benchmarks exceed the highest industry standards.

Product Description
Arrayit Array Plate Multi-Well Hybridization Stations have been designed and developed to rapidly and efficiently hybridize and/or incubate DNA, protein, carbohydrate and peptide microarrays. Multi-Well Hybridization Station customers will appreciate the following product features:

- Easy-to-use digital interface
- Microcomputer control of timer, heating and cooling, and mixing operations
- Operations progress easily visible on high-luminosity 3-color digital display
- Alloy block allows rapid heating and cooling
- Versatile block accommodates microplates and single tubes
- Compatible with microarray microplate hardware AHC4X16 and AHC4X24
- Temperature range: ambient to 100°C
- Timer range: 1 min to 100 hours
- Mixing speed: 300-1,500 RPM
- Mixing amplitude of microwell samples: 3 mm
- Temperature control accuracy ±0.5°C
- Display accuracy ±0.5°C
- Temperature uniformity ±0.5°C
- Heating time from 20°C to 100°C: 10 min
- Cooling time from 100° to 20°C: 10 min
- Dimensions (L x W x H): 32.5 x 26.5 x 17.0 cm (12.8 x 10.4 x 6.7 in)
- Net weight: 8.5 kg (18.7 lbs)
- Power requirements: 110-240V AC at 50/60Hz and 150W

Instrument Components

- Array Plate Multi-Well Hybridization Station, 220V
- Alloy block instrument cover
- Voltage-appropriate power cord
- Replacement fuses (2 each)
- Replacement instrument feet (4 each)
- Allen wrench for block removal

**Figure 1.** Pictured is the Arrayit Multi-Well Hybridization Cassette with wells configured in a 4 x 24 configuration (Cat. AHC4x24). The cassette is sealed with microplate foil seals to eliminate sample evaporation during hybridization of the 96 microarrays. The silicone gaskets can be modified to hybridize different numbers and different sizes of microarrays. Please contact us for modified gasket pricing.

**Figure 2.** The Multi-Well Hybridization Station can be equipped with several different types of interchangeable blocks to hold tubes, plates, chambers and cassettes.
**Figure 3.** Photograph of the heating and cooling block that transfers temperature directly to the glass microarray substrate slide. The block shown here accommodates the 4x24 well (Cat. AHC4x24) hybridization cassette. Interchangeable blocks are available for 4x16 hybridization cassettes, single tubes and other types of hardware.

**Figure 4.** Schematic diagram of the Array Plate Multi-Well Hybridization Station instrument display including temperature, time and vibrational mixing speed. The display reports the instrument indicators (left), the real-time readouts (center) and the programmed settings (right). The button area at the bottom of the display allows the user to toggle in temperature, time and mixing speed, as well as to start and stop the instrument.

**Short Protocol (Steps 1-6)**

1. Configure the Array Plate Multi-Well Hybridization Station on an approved laboratory bench.
2. Prepare a plate of microarray samples.

3. Place the array plate on the instrument heating block.

4. Program run time, temperature and mixing rate.

5. Run the program.

6. Remove the reacted samples and turn off the instrument.

**Complete Protocol (Steps 1-6)**

1. Configure the Array Plate Multi-Well Hybridization Station on an approved laboratory bench. Upon receipt of the instrument, carefully unpack all of the components and make sure the components received include an Array Plate Multi-Well Hybridization Station (110V or 220V), an alloy block instrument cover, a voltage-appropriate power cord, replacement fuses (2 each), replacement instrument feet (4 each), and an Allen wrench for block removal. Place the instrument and components on a certified laboratory bench, protected from splashing liquids, strong air currents and other environmental factors that would diminish instrument safety and performance. Connect the domestic version 110 volt version Array Plate to an appropriate 110 volt electrical outlet, or the 220 volt international version Array Plate to an appropriate 220 volt electrical outlet. Power up the instrument by pressing the toggle switch on the rear instrument panel.

2. Prepare a plate of microarray samples. The Array Plate accommodates a variety of microarray microplate devices such as the 4x16 and 4x24 well Arrayit Hybridization Cassettes, as well as single tubes and other types of microarray hardware. For the 4x16 and 4x24 tools, microarrays should be printed on 25 x 76 mm glass substrate slides 2x8 and 3x8 patterns, respectively, for a total of 64 (2x8x4) and 96 (4x16x4) microarrays. The microarrays should be processed, blocked and assembled into the AHC4x16 or AHC4x24 Hybridization Cassettes. Hybridization solution (75 µl per well) should be added to each well immediately prior to transferring the hybridization cassette onto the Array Plate instrument. The wells should be covered with the appropriate sealing implement to prevent well-to-well contamination.

3. Place the array plate on the instrument heating block. Make sure the Array Plate instrument is configured with the correct alloy heating block. Heating blocks are available and can be interchanged by loosening the four Allen bolts and swapping in a different block. Make sure to power the instrument off before interchanging the heating and cooling blocks. Place the 4x16 or 4x24 Hybridization Cassette on the heating block so that the array plate falls into place around the perimeter of the four alloy heating elements. The correct positioning of the array plate on the instrument
ensures direct contact between the four alloy heating elements and the glass substrate slide, resulting in rapid, precise and highly uniform temperature control of each microarray experiment. Place the alloy block instrument cover over the array plate to prevent topical contamination and minimize thermal loss during the hybridization process.

4. Program run time, temperature and mixing rate. Array Plate Hybridization Stations are fully programmable for time, temperature and mixing speed. A schematic of the instrument display is provided in Figure 4. Use the arrowed buttons on the bottom of the display to program incubation temperature, incubation time and mixing speed. The Short button initiates mixing immediately and for a brief period to allow the user to access a given mixing speed. Releasing the Short button terminates the brief mixing process. Microarray hybridization reactions typically use 42ºC for 1-4 hours at a mixing speed of 300 rpms. Different experiments and applications may use different instrument settings. The programmed values will appear on the right side of the instrument display (see Fig. 4). Pressing the Start button will initiate the program, at which time the temperature, time and mixing speed will appear in the center of the instrument display in real time (see Fig. 4). The left portion of the display presents the user with a series of instrument indicators including direction of temperature change, timer and speed.

5. Run the program. Allow the programmed hybridization process to proceed for the complete duration of the programmed setting. Once the run is complete, press the Stop button to complete the hybridization process.

6. Remove the reacted samples and turn off the instrument. After the hybridization process is complete, remove the instrument cover and then remove the array plate from the alloy heating block on the Array Plate instrument. Disassemble the array plate rapidly and transfer the hybridized microarrays into wash buffer immediately to begin the wash process. These steps must be performed quickly to prevent drying of the hybridization solution on the microarray surface. Power the Array Plate instrument off using the toggle switch located on the rear instrument panel and place the instrument cover back on.

Troubleshooting Tips
Readout is not visible in the instrument panel.

- Power cord not connected, instrument power off, or blown fuse. Please make sure to connect the power cord to an appropriate electrical outlet. Make sure that the toggle switch is set to the “on” position on the rear instrument panel. Blown fuses are replaced using the replacement fuses provided with the instrument. The fuse port is located next to the power switch on the rear instrument panel.
Instrument produces noise during mixing.

- Improper block being used, excessive mixing speed, uneven laboratory bench or worn instrument feet. Make sure the alloy heating and cooling block fits properly with the 4x16, 4x24 or other hybridization hardware. Make sure that the mixing speed is appropriate for the application and hybridization hardware. The laboratory bench should be planar and level. Worn instrument feet can be replaced using the replacement feet provided with the instrument.

Recommended Products
VIP™ Diagnostics Packages
NanoPrint™ LM60 and LM210 Enterprise Level Microarrays
SpotBot® 3 Personal Microarrays
SpotLight™ Personal Fluorescence Microarray Scanners
Arrayit Super Microarray Substrate Slides
Arrayit PCR Purification Kits
Arrayit 384-well microplates and lids
Arrayit microplate adhesive foil seals

Ordering Information

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<thead>
<tr>
<th>Product</th>
<th>Descriptions</th>
<th>Catalog ID</th>
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<tr>
<td>Array Plate Multi-Well Microarray Hybridization Station, 220 Volt</td>
<td>High throughput digital hybridization instrument for microplate-formatted hybridization cassettes containing 4x16 and 4x24 well configurations, ambient to 100°C heating, 300-1,500 rpm mixing, hybridize and/or incubate up to 96 DNA, protein, peptide or carbohydrate microarrays at a time. This instrument can also be used for cell studies, transcription, immunoprecipitation, enzyme kinetics, and more. Interchangeable sample blocks are sold separately for multi-well hybridization cassettes, standard microplate plates and single tubes, 220 v.</td>
<td>MMHS220V</td>
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Safety Information
Arrayit Multi-Well Hybridization Station can reach high temperature. This instrument must be used with extreme care to prevent personal injury. Please wear safety glasses and nitrile gloves at all times while operating these instruments and refrain from putting your hands near the moving
and hot areas. Do not move or tip the instrument during operation and refrain from using solvents or flammable liquids in or near the instrument. Never submerge this instrument into liquid as instrument damage and electric shock may result. Microplates must be loaded and spun with the well bottoms facing outward and the sealed microplate wells facing inward. Upon purchasing the Arrayit Microarray Microplate Centrifuges, the customer agrees to read and conform to this safety information at all times.

Warranty
ArrayIt® brand products have been scientifically developed and are sold for research purposes. Extreme care and exact attention should be practiced in the use of the materials described herein. All ArrayIt® brand products are subject to extensive quality control and are guaranteed to perform as described when used properly. Any problems with any ArrayIt® brand product should be reported to Arrayit immediately. Arrayit’s liability is limited to the replacement of the product, or a full refund. Any misuse of this product is the full responsibility of the user, and Arrayit makes no warranty or guarantee under such circumstances.