Validation/Monitoring Solutions to Meet your Needs

SOLUTIONS FOR PHARMACEUTICAL & BIOTECHNOLOGY INDUSTRIES
## Wired Process Validation

**PRODUCT**

Validator® AVS

**APPLICATIONS**

- Wired Thermal Validation utilizing thermocouples
  - Steam Sterilizers
  - Autoclaves
  - Dry Heat Tunnels/Ovens
  - Freeze Dryers
  - SIP Steam in Place
  - CTU Controlled Temp Units
  - Freezers/Refrigerators
  - Incubators
  - Bioreactors

**FEATURES**

- Stand-alone Validation Console dedicated for validation tasks
- Asset Centric Data Management software concept
- 21 CFR/Data Integrity compliant
- Scan time 1/sec for 48 inputs (EN285/ISO17665)
- Accuracy up to 0.1°C (after TC Cal)
- Auto Calibration and Verification
- Enhanced data handling and redundancy (4-levels)
- 6hr battery backup
- Extensive calculation/reporting capability (Pass/Fail)

## Wireless Process Validation

**PRODUCT**

ValProbe®

**APPLICATIONS**

- In Situ Wireless Data Loggers (non-real time)
  - Steam Sterilizers
  - Autoclaves
  - Dry Heat Tunnels/Ovens
  - Freeze Dryers
  - SIP Steam in Place
  - CTU Controlled Temp Units
  - Freezers/Refrigerators
  - Incubators
  - Stability Chambers
  - Bioreactors
  - Warehouses

**FEATURES**

- System includes intrinsically safe Loggers, Reader/Programmer, and ValProbe software
- Intuitive PC software for programming, reading, and reporting of data
- 21 CFR Compliant
- Auto Calibration and Verification
- Accuracy 0.1°C
- Choice of rigid, bendable, and flexible loggers
- Single & Dual sensor options
- Measurands: Temp, Pressure, and Humidity
- 10,000 data sample memory
- Scan Rate – 1 sec to 12 hrs.
- Logger Range: -85 °C to 140°C and up to 10 BAR absolute
- Field replaceable 3.6 V battery
- Extensive calculation/reporting capability
# Real-Time Wireless Process Validation

## ValProbe® RT

### APPLICATIONS

Real-Time In Situ RF Loggers for Validation of Harsh environments:
- Steam Sterilizers
- Autoclaves
- Dry Heat Tunnels/Ovens
- Freeze Dryers
- SIP Steam in Place
- CTU Controlled Temp Units
- Freezers/Refrigerators
- Incubators
- Stability Chambers
- Bioreactors
- Warehouses

### FEATURES

- Real-Time RF data under harsh conditions for validation study
- RF-Range up to 150 meters
- Temperature Range -85 to 400°C
- 100,000 samples per sensor
- Scan rate down to 1 second
- ValProbe RT system capacity 25 loggers/50 sensors
- Accuracy up to 0.1°C
- Unmatched battery life
- Choice of rigid, bendable, and flexible loggers
- Single, Dual, 5 channel loggers
- Measurands: Temp, Pressure, and Humidity
- Stand-alone Validation Console dedicated for validation tasks
- Asset Centric Data Management software concept
- 21 CFR/Data Integrity compliant
- Extensive calculation/reporting capability (Pass/Fail)

## RF ValProbe® II

### APPLICATIONS

Wireless Real Time (RF) Loggers for Continuous Monitoring or Validation of Controlled Temperature Units
- Stability Chambers
- Cryogenic Vessels
- Freezers/Refrigerators
- Controlled Temp Units
- Incubators
- SIP Steam-in-Place
- Warehouses

### FEATURES

- Operating Range of -40°C to 60°C and sensor range of -200°C to 200°C
- RF 2.4GHz – mesh technology
- Range 150 ft / 50 m
- Measurands Temp/Humidity
- 4 – 20 mA sensors Integrated LCD Display
- Logger power – AC or Battery.
- Battery life ~1-year typical use
- Can be used as sensor hardware for continuous monitoring Labwatch IOT or with Validation software
# Temperature Calibration

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>APPLICATIONS</th>
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</tr>
</thead>
</table>
| HTR-420 | High Temperature Dry Block Calibrator can be used for temperature calibrations/verifications of:  
- Thermocouples  
- RTD’s  
- ValProbe RT bendable or flexible loggers  
- ValProbe bendable or flexible loggers |  
- Temp range of 30 to 420°C with temp stability of 0.01°C and uniformity of up to 0.1°C  
- Easy to use color touch screen  
- Calibration of up to 48 T/C’s  
- Thermocouple fixture for easy handling of up to 48 T/C’s  
- Fast Heating and Cooling times  
- Software support for all existing Kaye products to support Automatic/Manual calibrations  
- Addition inserts available for calibrating specialty probes |

<table>
<thead>
<tr>
<th>PRODUCT</th>
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<tbody>
<tr>
<td>IRTD Temperature Standard</td>
<td>The IRTD is a precise secondary standard used for Calibration/Verification of Kaye products. The IRTD can also be used standalone with windows provided software for calibrations or high accuracy measurements.</td>
<td></td>
</tr>
</tbody>
</table>
- Temp range -196 to 420°C  
- Accuracy over range ±0.025°C  
- Resolution 0.001°C  
- Traceability to NIST or PTB.  
- Ambient temperature range 0 to 60°C (32 to 140°F) |
<table>
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<tr>
<th>PRODUCT</th>
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<tbody>
<tr>
<td>LTR-150 Multi-purpose Temperature Calibrator can be used for temperature calibrations/verifications of:</td>
<td>• Temp range of -30 to 150°C with temp stability of +/- 0.01°C and uniformity of 0.1°C • Ability to be used as Dry Block, Liquid Bath &amp; Surface Calibrator • Easy to use color touch screen • Calibration of up to 48 T/C’s • Thermocouple fixture for easy handling of up to 48 T/C’s • Optional Liquid micro bath, sensor cage and magnetic stirrer can be used for special probes or loggers • Fast Heating and Cooling • Software support for all existing Kaye products to support Automatic/Manual calibrations • Addition inserts available for calibrating specialty probes</td>
<td></td>
</tr>
<tr>
<td>LTR-150</td>
<td>• Thermocouples • RTD’s • ValProbe RT bendable or flexible loggers • ValProbe bendable or flexible loggers • RF ValProbe probes • Specialty process probes</td>
<td>• Temp range of -30 to 150°C with temp stability of +/- 0.01°C and uniformity of 0.1°C • Ability to be used as Dry Block, Liquid Bath &amp; Surface Calibrator • Easy to use color touch screen • Calibration of up to 48 T/C’s • Thermocouple fixture for easy handling of up to 48 T/C’s • Optional Liquid micro bath, sensor cage and magnetic stirrer can be used for special probes or loggers • Fast Heating and Cooling • Software support for all existing Kaye products to support Automatic/Manual calibrations • Addition inserts available for calibrating specialty probes</td>
</tr>
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</table>

<p>| LTR-90 | Kaye LTR-90 Ultra-Cool Dry Well Calibrator can be used for temperature calibrations/verifications of: | • Temp range -90 to 140 °C • Stirling cooler technology reaches -90°C in 80 min • Temp stability of ±0.015 °C • Axial Uniformity 0.05°C • Accommodates up to 16 T/C’s and 2 IRTD • Software supports all existing Kaye products for Automatic/Manual calibrations • Rubber insulator cap to prevent frost buildup • Weight: 16 kg (35 lbs.) |
| LTR-90 | • Thermocouples • RTD’s • ValProbe RT bendable or flexible loggers • ValProbe bendable or flexible loggers • RF ValProbe probes • Specialty process probes | • Temp range -90 to 140 °C • Stirling cooler technology reaches -90°C in 80 min • Temp stability of ±0.015 °C • Axial Uniformity 0.05°C • Accommodates up to 16 T/C’s and 2 IRTD • Software supports all existing Kaye products for Automatic/Manual calibrations • Rubber insulator cap to prevent frost buildup • Weight: 16 kg (35 lbs.) |</p>
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| **CTR-25** | Portable Liquid Calibration Bath can be used for temperature calibrations/verifications of:  
- Thermocouples  
- RTD’s  
- ValProbe RT rigid, bendable or flexible loggers (fully submersed)  
- ValProbe rigid, bendable, or flexible loggers (fully submersed) |  
- Temp range -25°C to 140°C with temp stability of 0.01°C and uniformity of up to 0.02°C  
- Compact, portable design for carrying (20kg/44lbs)  
- Compressor free unit – using Peltier Technology  
- Large 2.5L tank with up to 6” (15.24 cm) depth for use with wide range of sensor types  
- Special fixture holds 10 Kaye stainless loggers and one IRTD |
| **CTR-40** | Liquid Calibration Bath can be used for temperature calibrations/verifications of:  
- Thermocouples  
- RTD’s  
- ValProbe RT rigid, bendable or flexible loggers (fully submersed)  
- ValProbe rigid, bendable, or flexible loggers (fully submersed)  
- Specialty process sensors |  
- Temp range -40 to 150 °C  
- 110 minute cool down time from 25 to -40°C  
- Large capacity for multiple and different size sensors  
- Temp Stability ±0.005°C  
- Temperature resolution 0.01°C  
- Supports Automated calibration for all Kaye Products  
- Quiet operation |
| **CTR-80** | Liquid Calibration Bath can be used for temperature calibrations/verifications of:  
- Thermocouples  
- RTD’s  
- ValProbe RT rigid, bendable or flexible loggers (fully submersed)  
- ValProbe rigid, bendable, or flexible loggers (fully submersed)  
- Specialty process sensors |  
- 120 minute cool down time from 30 to -80°C  
- Large capacity for multiple and different size sensors  
- Stability and uniformity of ±0.03°C  
- Indicates temperature to 0.01°C resolution  
- Supports Automated calibration for all Kaye Products  
- Quiet operation |
## Validation Accessories

<table>
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<tr>
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</thead>
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<tr>
<td><strong>Kaye Feedthru</strong></td>
<td>Kaye Feedthru used for insertion of thermocouples into pressure vessels such as:</td>
<td>• Accommodates from 1 to 18 T/C’s of any diameter</td>
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<tr>
<td></td>
<td>• Autoclaves</td>
<td>• No hole plugs required for unused T/C ports</td>
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<td>• Freeze dryers</td>
<td>• Accepts labeled T/C’s</td>
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<td></td>
<td>• Pressure chambers</td>
<td>• High Quality silicone rubber sealing gaskets</td>
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<td></td>
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<td>• 1.5” tri-clamp connection</td>
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<td>• Easily installed with no tools required</td>
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<tr>
<td><strong>Kaye Autoclave Pressure Transducer</strong></td>
<td>High performance pressure transducer designed for the harsh environment applications such as:</td>
<td>• Connects to 1.5 triclover flange</td>
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<td></td>
<td>• Steam sterilizers</td>
<td>• ISO-17025 traceable calibration</td>
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<td></td>
<td>• Steam-in-Place systems</td>
<td>• 0 bar to 4 bar (59 psia) absolute</td>
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<td></td>
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<td>• Media temp -20°C to 140°C</td>
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<td></td>
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<td>• Wires directly to Validator/AVS</td>
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<td></td>
<td></td>
<td>• No ext. power supply required</td>
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<td></td>
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<td>• Autoclave Temp compensated</td>
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<tr>
<td><strong>Highest Quality Thermocouple Wire</strong></td>
<td>Kaye Type T thermocouple wire is manufactured with the highest purity and uniformity wire available. Useful for any temperature measurement using -200°C to 400°C.</td>
<td>• Type T thermocouples available:</td>
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<tr>
<td></td>
<td></td>
<td>• Ultra-Premium Autobond</td>
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<td></td>
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<td>• Ultra-Premium Type T Teflon</td>
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<td></td>
<td>• Ultra-Premium Type T Kapton</td>
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<tr>
<td></td>
<td></td>
<td>• Stainless Steel Tips</td>
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<td></td>
<td></td>
<td>• Available in 3 or 7 strands</td>
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<td></td>
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<td>• Available uncut in spools or cut to length with Teflon tips</td>
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<td>• Labels available</td>
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Calibration/Service Contracts/Rental/IQ-OQ Execution

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<thead>
<tr>
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| Equipment Rental | Kaye offers a comprehensive range of products for short- and long-term rentals with the latest updates all guaranteed and supported by of specialists in tech support. | • Large inventory of systems  
• Systems maintained with up-to-date upgrades  
• ‘As Found’ certificates provide on rental return.  
• Backed by expertise only the manufacturer can provide  
• Systems reset & data cleared to ensure user confidentiality |

Calibration/Repair Services

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</table>
|Kaye offers ISO 17025-2018 factory calibration and repair service worldwide. | • 5 Direct Service Centers – Europe, China, India and 2 in the USA  
• Accredited to DIN ISO 17025:2018 – NVLAP/DAkkS  
• Manufacturer provided guarantee/support/warranty |
## Service Contracts

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| Kaye offers customizable service contracts covering calibration and/or extended warranties. (Gold/Silver) | • Annual/semi-annual factory or onsite calibrations  
• Extended warranty on products  
• Quantity pricing  
• Lock in pricing up to 3 years  
• Simplified RMA process |

## IQ/OQ Documentation/Execution

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| Kaye offers IQ/OQ Protocols as well as factory or onsite executions. | • Detailed IQ/OQ protocols for all Validation systems.  
• Execution services offered on-site or at Kaye factory  
• Execution performed by Kaye certified field service team |
## Facility/Stability Monitoring

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<tr>
<td>Labwatch IoT is a web based Centralized monitoring, alarming and reporting system</td>
<td>• Web based hosted operation eliminates costs and local support of site-based servers</td>
<td>• Secure and redundant data storage using AWS GxP Cloud</td>
</tr>
<tr>
<td>Where we Monitor:  • Warehouses  • Repositories  • Clean Rooms  • Blood Banks  • Tissue Banks  • Pharmacies  • Cold Storage  • Animal Rooms  • Laboratories</td>
<td>• Scalable from 5 – 25,000 sensors</td>
<td>• Wired/wireless hardware</td>
</tr>
<tr>
<td>What we Monitor:  • Stability Chambers  • Freezers  • Refrigerators  • Incubators  • Cryogenic Freezers  • LN2 Tanks</td>
<td>• 21 CFR Part 11 and Data Integrity compliant</td>
<td>• Accessible via standard browser on any platform - desktop or mobile</td>
</tr>
<tr>
<td>Kaye LabWatch® IoT</td>
<td>• Provides historical collection and analysis of data</td>
<td>• Extensive alarm monitoring and notifications via mobile APP, email, SMS</td>
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<td>• Complete Audit trail of alarms, event, and user actions</td>
<td>• Intuitive, easy to use software provides extensive capability for viewing, analyzing, and reporting,</td>
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<td>• Unlimited number of users can access the facility monitoring system</td>
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# Cold Chain Monitoring During Transport

## Kaye Log – All in one solution for traceable transportation of temperature sensitive products.

- Cold chain
- Transportation
- Logistics

### Kaye Log NFC Data Logger

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<tr>
<td>Kaye Log NFC Data Logger</td>
<td>Kaye Log – All in one solution for traceable transportation of temperature sensitive products.</td>
<td>- Fast and secure data transfer with any NFC mobile device&lt;br&gt;- Temp range -40°C to 60°C&lt;br&gt;- Accuracy 0.2 °C to 0.5°C&lt;br&gt;- Logger models ranging from 36 days to 1 year&lt;br&gt;- Only 2.5 mm thick, easily integrates into any packaging.&lt;br&gt;- Label can be programmed with any shipment and product information&lt;br&gt;- Internal Battery 1 year&lt;br&gt;- Quick and easy installation&lt;br&gt;- Encrypted data transfer to secure cloud&lt;br&gt;- Resistant to mechanical damage IP67</td>
</tr>
</tbody>
</table>
Warranty and disclaimer: The information mentioned on documents are based on our current tests, knowledge and experience. Because of the effect of possible influences in an application of the product, they do not exempt the user from their own tests, checks and trials. A guarantee of certain properties or a guarantee for the proper suitability of the product for a specific, especially permanent application can not be derived from our data. Liability is therefore excluded to that extent permitted by law. Any proprietary rights of third parties as well as existing laws and regulations must be observed by the recipient of the product on his own responsibility.

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