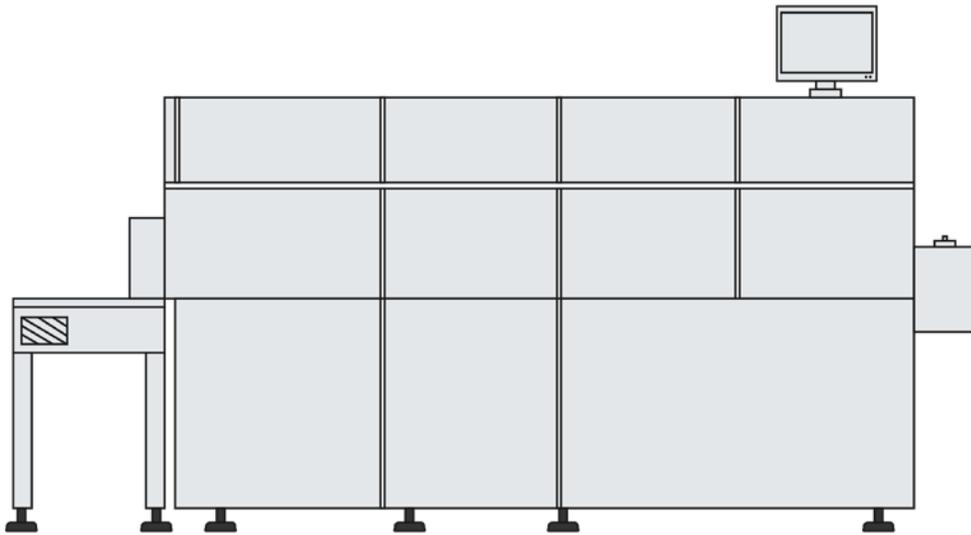


Focused on Quality, Driven by Passion

For successful PCB soldering, temperature and time are variables that must be tightly controlled. It's a balancing act, indeed. PCB assemblies have to be processed at a high enough temperature for a long enough period of time to form good solder joints. Overshooting the temperature or heating the assembly too quickly can damage components. Of course, insufficient heat also has detrimental results which can cause poor soldering and long-term reliability issues.

The only way to optimize time and temperature is to measure and analyze. That's what ECD does best. Our 50+ years of innovative product development has yielded the most comprehensive portfolio of thermal profiling technology tools to ensure that electronic thermal processes are in control.



**SUPERM.O.L.E.®
GOLD 2**



V-M.O.L.E.®



MEGAM.O.L.E.® 20



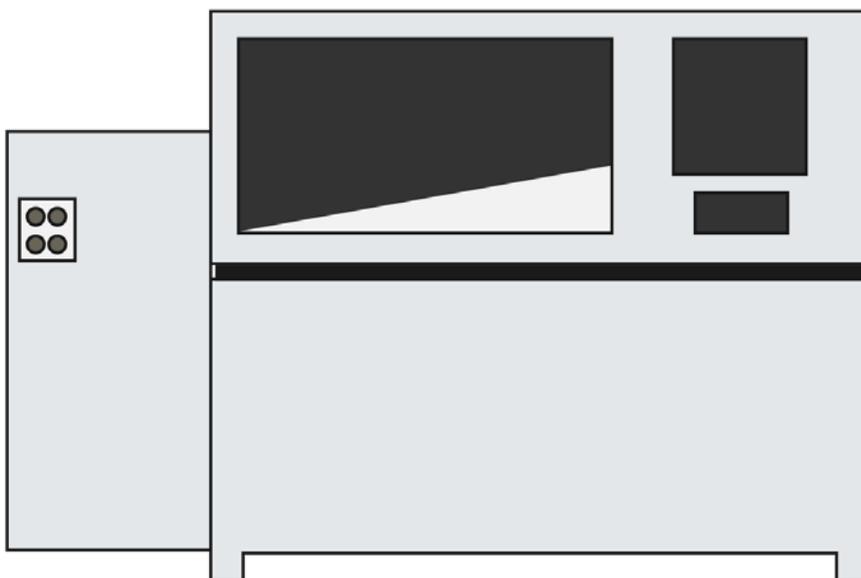
OVENSENTINEL™



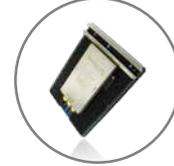
OVENRIDER® NL2+



OVENCHECKER®



**SUPERM.O.L.E.®
GOLD 2**



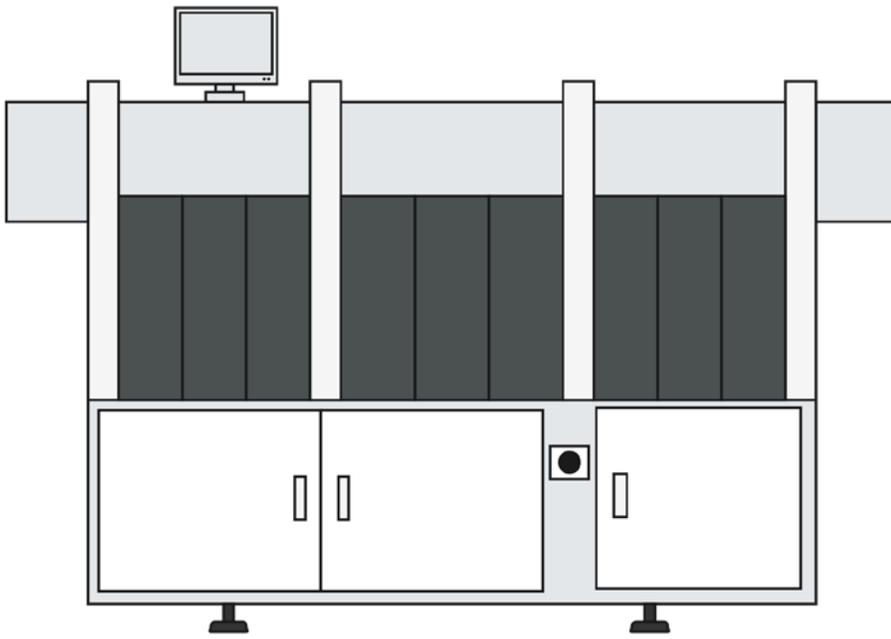
WAVERIDER® NL2+



FLUXOMETER®



THERMAL PROCESSES



SUPERM.O.L.E.®
GOLD 2



V-M.O.L.E.®

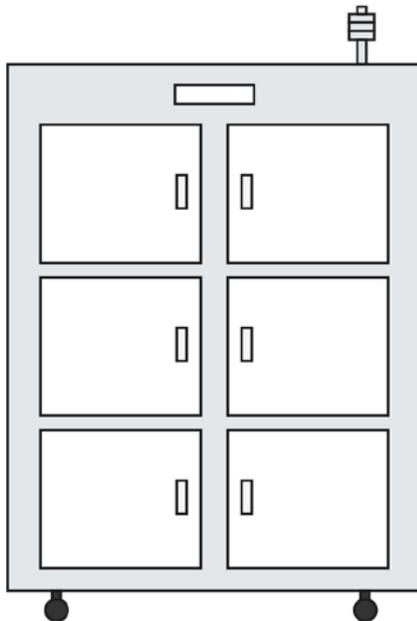


MEGAM.O.L.E.® 20



OVENRIDER® NL2+

IN-LINE CURING



SMARTDRY™

DRY STORAGE



YOUTUBE





- 6-channel value-packed thermal profiling workhorse, most often relied upon for in-transit thermal profiling quality assurance
- 14 LEDs provide on-sight confirmation of M.O.L.E.® and sensor mode and health
- Multi-run, 1.5 million data point memory means you're not tethered to the PC for ongoing profile runs
- Takes full advantage of M.O.L.E.® MAP Software, pallets, and sensors
- Easy to use: separate On, Off and Record buttons, direct USB for setup, download and charging
- Use one tool for recipe generation, golden boards and oven verification, all with the same tool

REFLOW SOLDERING
IN-LINE CURING
FLUX & WAVE SOLDERING

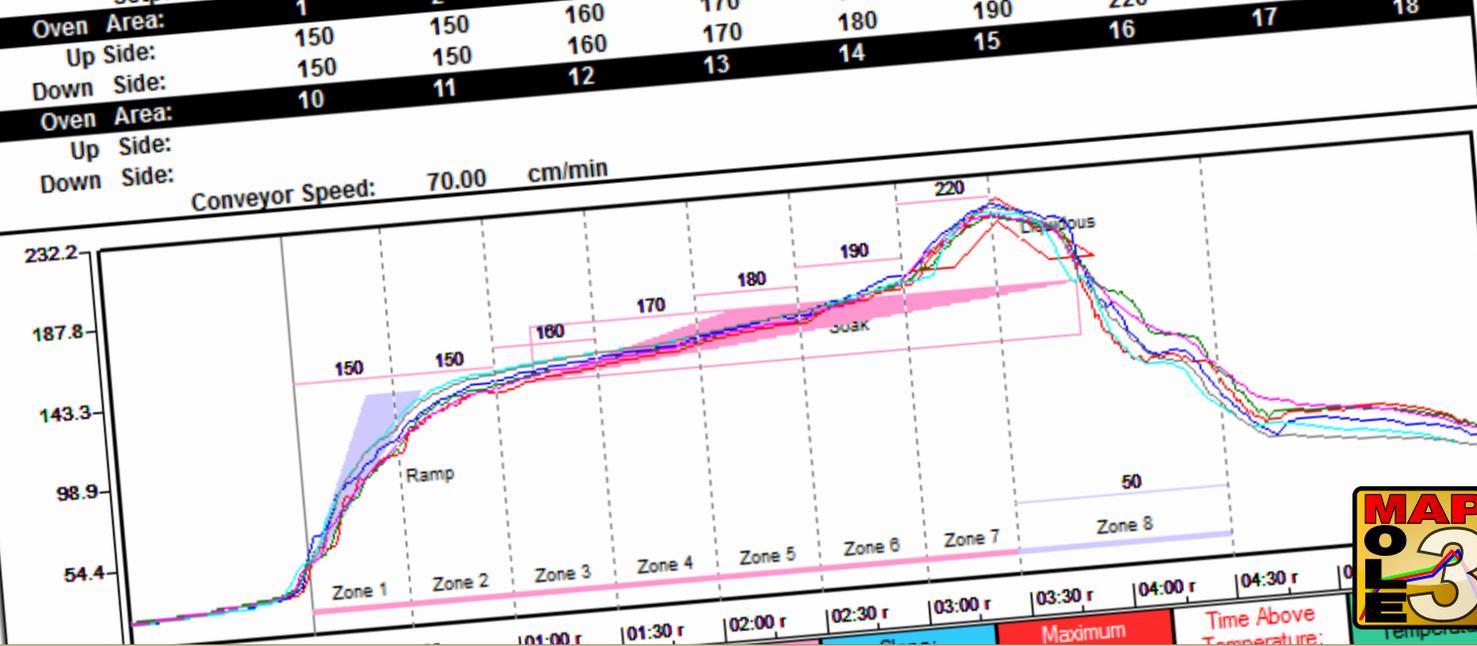
WWW.ECD.COM/SMG2



- Patented "OK" process provides instant profile validation: Engineer sets Slope, Soak, TAL and Peak specs in M.O.L.E.® MAP. Operator presses "OK" button for instant Go/No-Go assurance by Green/Red LED
- Elevates profiling precision of large, complex boards to 20-channels of assembly locations to satisfy OEM and R&D demands
- Multi-run, 1.5 million data point memory enables faster sample rates and longer runs
- Three-module design with M.O.L.E.®, I/O Module and Power Pack for interchangeable flexibility.
- Easy-of-use: Thermocouples organized into 4 gangs of 5 channels, nano-mini adapters available
- Real-Time Wireless RF Compatible

REFLOW SOLDERING
IN-LINE CURING

WWW.ECD.COM/MM20



THERMAL PROFILERS



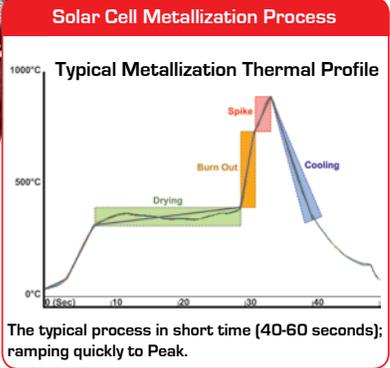
- Perfect 3-channel, entry-level profiler
- M.O.L.E.® readiness indicators show battery and internal temperature are run-ready
- Operator Go/No-Go function is achieved with patented "OK" button for instant profile validation
- Profiles hot, cold and sensitive components on the PCB
- Powers the OvenCHECKER™!
- Identical controls to the ECD 6-channel (SuperM.O.L.E.® Gold 2) & 20-channel (MEGAM.O.L.E.® 20)

REFLOW SOLDERING
IN-LINE CURING

WWW.ECD.COM/VM



- 3-channel profiling solution that enables quality assurance measurement during Metallization and Lamination Press Photo Voltaic processes
- 17mm [0.7"] reflective stainless steel thermal barrier
- Stainless steel-sheathed, Type K mini thermocouples
- M.O.L.E.® MAP 3's Solar Metallization Environment enables V-M.O.L.E.® Solar's "OK" button with Soak, Peak and TAL specifications
- 96-run memory and 70 hours of logging at 0.1 sec rate
- M.O.L.E.® Readiness Indicators show battery and internal temperature are run-ready
- Optional compression shell for reflective barrier available



SOLAR CELL METALLIZATION

WWW.ECD.COM/VMSOLAR

V-M.O.L.E.® SOLAR



- Industry standard 6-channel convection reflow oven verification platform
- Provides SPC-driven Go/No-Go oven readiness to process engineers, operators and maintenance technicians
- Verifies heat flow, temperatures and conveyor speed across the oven
- Superior alternative to 'Golden Board' as a first-off [thousands of runs].
- Available in 168mm [6.6"], 305mm [12"], & 458mm [18"] as well as custom widths
- Powered by the 6-channel SuperM.O.L.E.® Gold 2 & M.O.L.E.® MAP 3

REFLOW SOLDERING
IN-LINE CURING

WWW.ECD.COM/OR

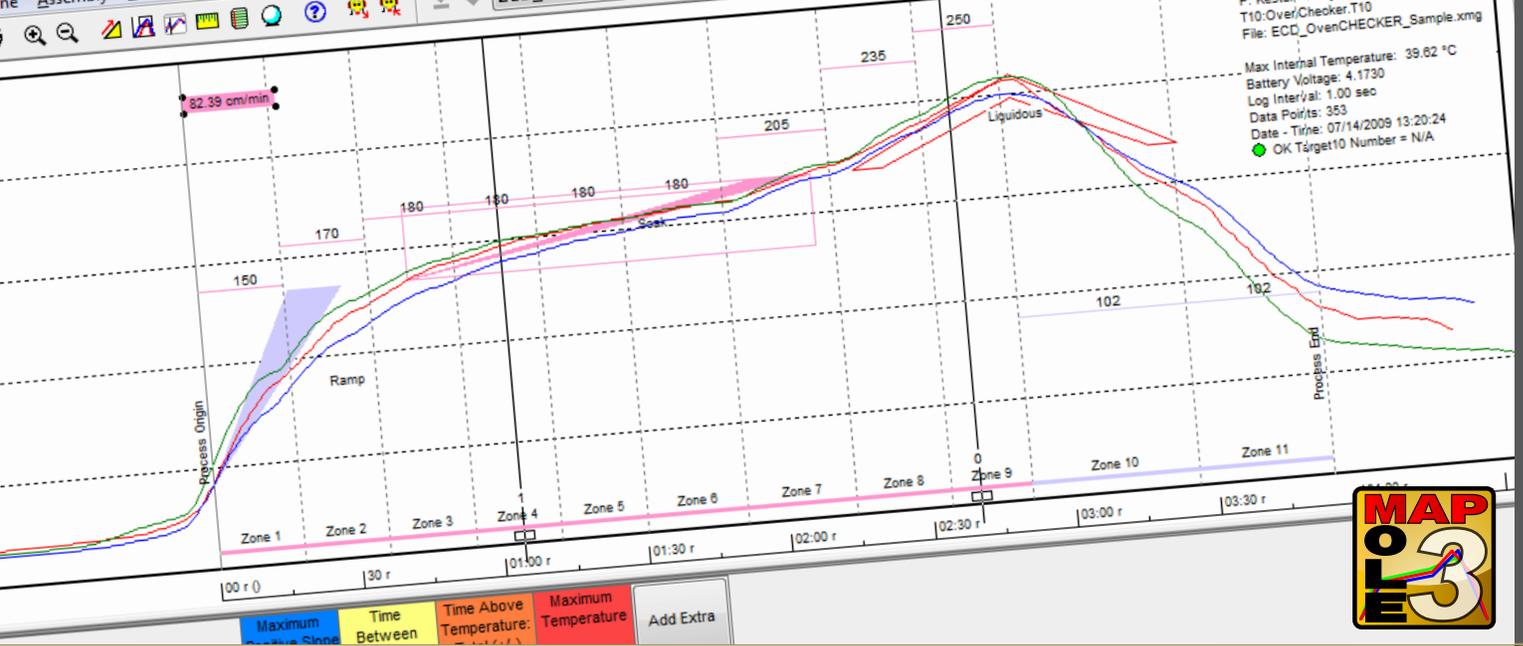
OvenRIDER® Data Table:

Table is specialized for reflow oven applications. Group parameters are color-coded, so views on other page tabs can be easily associated with label parameters.

Features:

1. Oven Summary Data
2. M.O.L.E.® Status
3. Individual Temperature and Process Delta Zone Data





- 3-channel reflow oven recipe verification platform
- ECD-exclusive 'OK Button' makes quickly determines if oven is in or out of specification
- The 3-channel V-M.O.L.E.® interprets 3 FR4-simulating sensors on the pallet's leading edge
- Set Ramp, Soak, TAL and Peak, initiate a run, then press the OK button to verify specifications
- Ideal if Go/No-Go decisions must be delegated to multiple operators

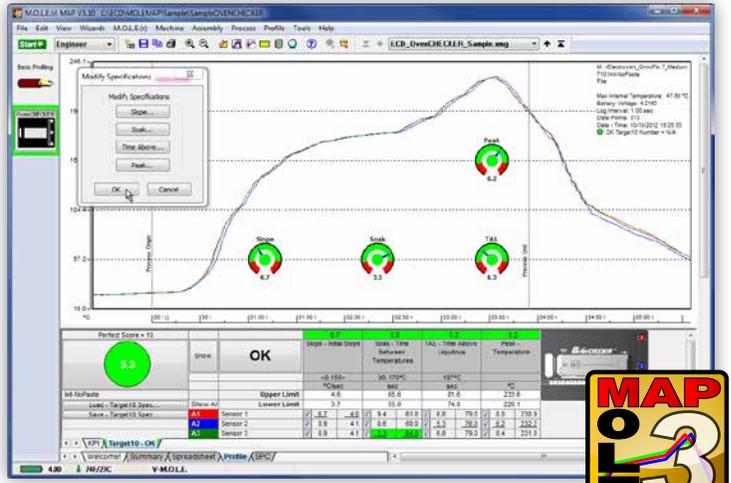
REFLOW SOLDERING

WWW.ECD.COM/OC

Create a Target-10™ specification file using OvenCHECKER™:

- A simple color "Go/No-Go" test criteria
- Analog gauges for intuitive data interpretation
- Drill down data for engineering analysis
- Configurability for easy delegation of decision-making

Verify the process using the OvenCHECKER™ by pressing the OK button.





WAVE RIDER® NL2



- Daily confirmation of product recipe performance on the wave soldering system
- Use as a physically stable alternative to a “Golden Board” as a as verification at the beginning of every shift (Go/No-Go readiness)
- Process sensors quantify parallelism, dwell time in wave(s) immersion depth and conveyor speed
- Replaceable Test Coupon measures solder, top and bottom-side temperatures
- Powered by the 6-channel SuperM.O.L.E.® Gold 2 & M.O.L.E.® MAP 3

FLUX & WAVE SOLDERING

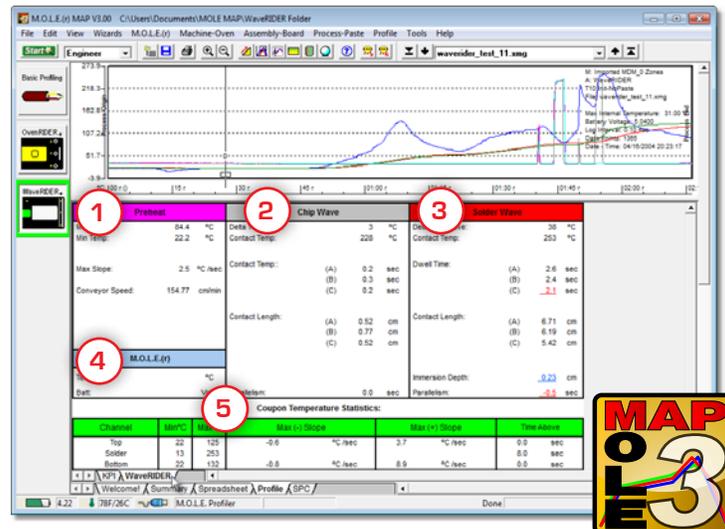
WWW.ECD.COM/WR

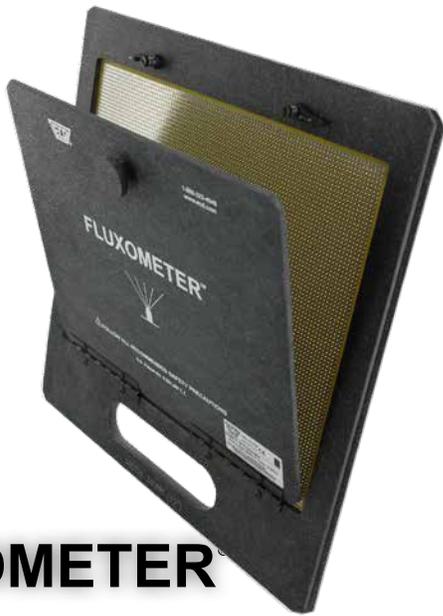
WaveRIDER® Data Table:

Specialized for wave soldering machine applications. Group parameters on the data sheet are color-coded for easy label parameter association within other page tabs.

Features:

1. Pre-heat Parameters and Conveyor Speed
2. Chip Wave Parameters (Blank column if there is no chip wave)
3. Solder Wave Parameters
4. M.O.L.E.® Internal Status
5. Overall Coupon Parameters





FLUXOMETER



- Quickly displays spray flux top side penetration and pattern uniformity to ensure proper setup and maintenance
- Sprayed flux through a sandwiched through-hole mesh reveals an easy to read and comparable signature on the test paper to enable machine adjustments
- Ensure proper deoxidation and wetting throughout the width and length of wave soldered products
- Place on to conveyor similar to a product run and retrieve prior to preheater if a product recipe is active

FLUX & WAVE SOLDERING

WWW.ECD.COM/FOM

Reflow Validator



6-Channel
[used with SuperM.O.L.E.® Gold 2]



3-Channel
[used with V-M.O.L.E.®]

- Verifies true oven performance through ambient and process temperature monitoring
- Profiles ovens without thermocouple attachments – potential Golden Board substitute
- Easy profile verification through Target 10 – Ramp/Soak/TAL and Peak temperatures
- Uncovers problematic areas in ovens, abnormal ambient and process temperatures, differentials across processing width, heat transfer/convection abnormalities
- Customizable data collection and profile analysis (M.O.L.E.® MAP software) including average ambient zone temperatures, convection changes through in zone delta temperature monitoring
- Automatically provides SPC data charts with Cp/CpK
- Profile overlay function, magnification, slope/distance, conveyor speed estimation & oven setup [initial oven recipe generation]

REFLOW SOLDERING

WWW.ECD.COM/RV



YOUTUBE

OVENSENTINEL™
Intelligent Monitoring Solutions™ by ECD



- Full-Featured Traceability: Local and remote database support
- Continuous Quality Monitoring: Precise PASS/FAIL for every board
- Dynamic Measurement Capabilities: Open architecture that is integration-ready for future measurement needs
- OvenSENTINEL™ Software: Trusted traceability with patent-pending TrueProfile™ technology
- Industry 4.0+: Easy integration and full-featured reporting delivers actionable data and deep analytics

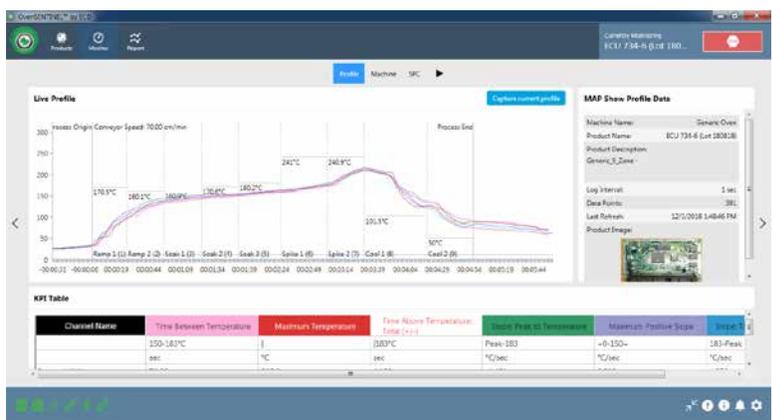


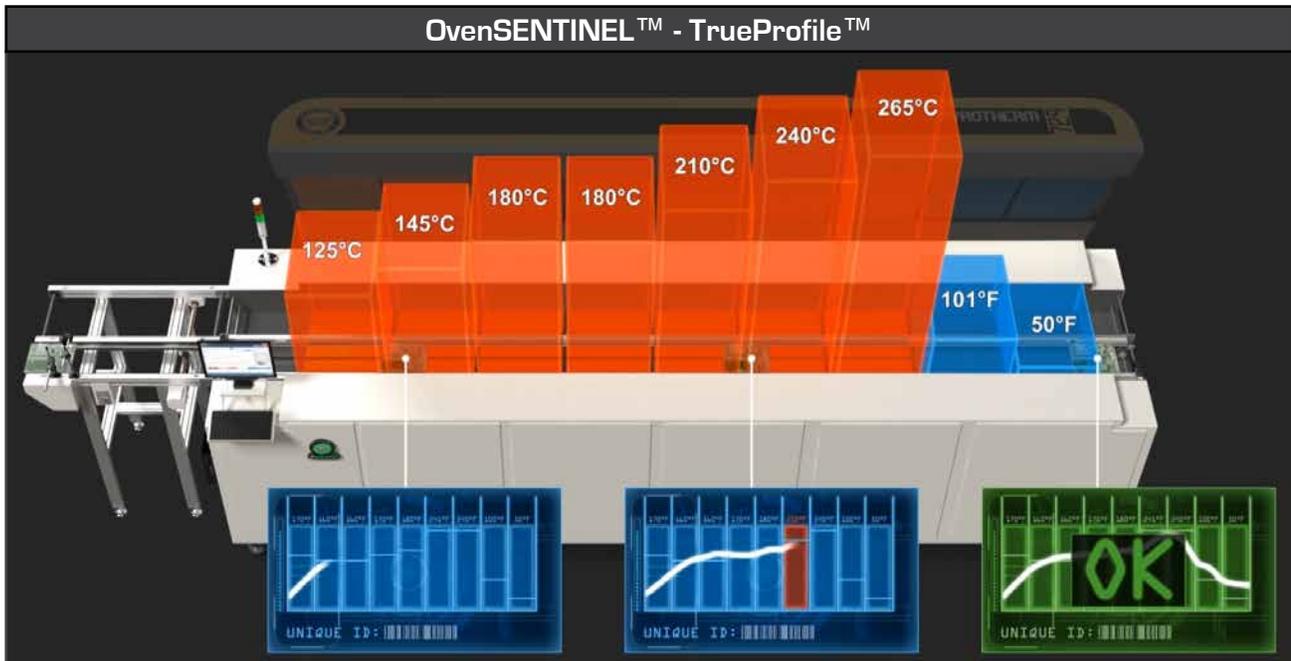
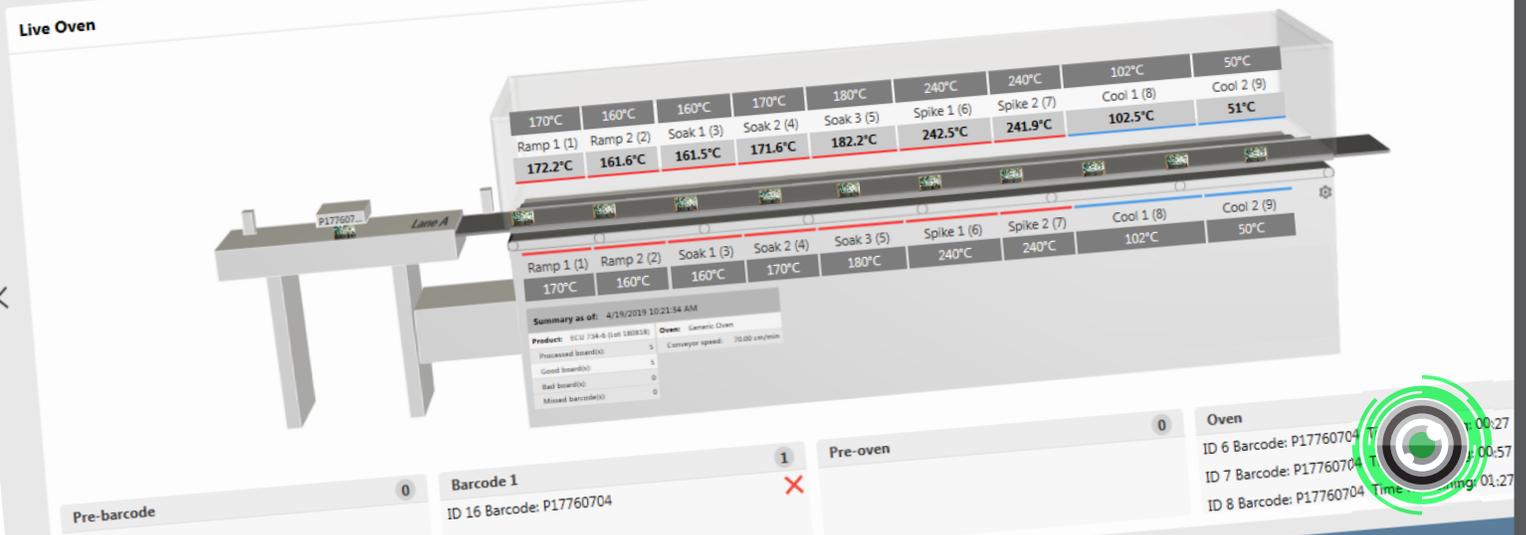
REFLOW SOLDERING

WWW.ECD.COM/OS

OvenSENTINEL™ Software

- 24-hour oven monitoring
- Process Data Archiving and Playback
- Automatic Statistical Process Control Charting
- Out-of-Specification Alarm





What is TrueProfile™?

The TrueProfile™ process tracks the PCB through the oven and records the temperatures that the board actually experiences. These temperatures are used to generate a single dynamic profile from which KPI measurements are taken. This method is superior because it records the actual zone temperatures at the time the board was in each zone, versus a single view or group of snapshots at of single moments in time. TrueProfile also enables identification of specific board(s) that failed specification, rather than scrapping all boards in the oven during a certain time.





YOUTUBE



SmartDRY™
INTELLIGENT DRY STORAGE™



- Market-leading recovery time of <3 minutes provides constant access to stored parts
- Immediate visual confirmation of dry storage status
 - » OK = Green
 - » Working = Yellow
 - » Alert = Red
- J-STD Performance: Achieves more than just compliance with innovative regeneration
- Selection of volume sizes to suit your needs
- Industry 4.0 Ready: Integrated network tracks events from all SmartDRY™ cabinets for access to data on connected devices.



SD-10

SD-30

SD-48F

DRY STORAGE

WWW.SMARTDRY.COM

INTUITIVE NETWORK DASHBOARD



ADAPTABLE SHELVING





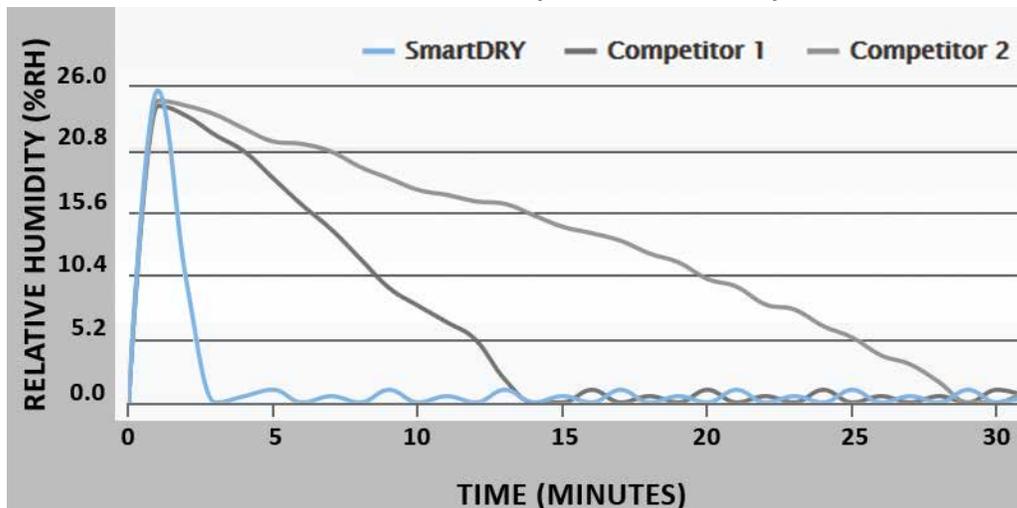
READINESS LIGHT STATUS



FAST RECOVERY TIME

With a market-leading recovery time of less than three minutes, SmartDRY enables continuous access to stored parts. Exceptional, self-regulating drying technology allows assembly specialists to retrieve critical moisture-sensitive components from the desiccant dry cabinet as many as 10 to 12 times per hour. That's more than twice the access of competitive dry cabinets.

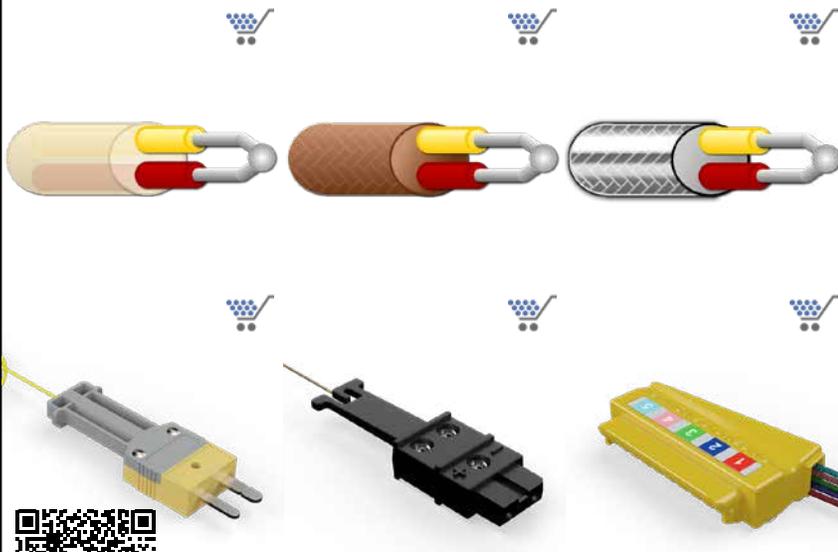
ECD SmartDRY Vs. Other competitors RH Recovery Rate





YOUTUBE





- Available in a wide variety of insulation types and temperature ratings to suit application requirements
- Wide availability of stock and offer a full range of K-type thermocouples with PFA (Teflon®), glass, glass with overbraid and stainless/inconel sheath in various lengths and wire diameters
- Micro, Nano and Mini connector styles available
- ECD sells only special-limits-of-error grade thermocouple wire
- Maintain measurement integrity of measurements by replacing thermocouples at the first sign of nicks, kinks or severed junction
- Easy ordering through ECD's SuperStore

REFLOW SOLDERING
IN-LINE CURING

WWW.ECD.COM/TC



- High-Temperature Solder Sample (Sn05Pb93)
- Aluminum T/C Tape
 - » Roll & 12.7mm [0.5"] x 25.4mm [1"] pieces
- Polyamide (Kapton) T/C Tape
 - » Roll & 12.7mm [0.5"] x 25.4mm [1"] pieces
- Instant Adhesive
- Takpak Spray Accelerator
- T/C Fiberglass Sleeving Organizer

REFLOW SOLDERING
IN-LINE CURING

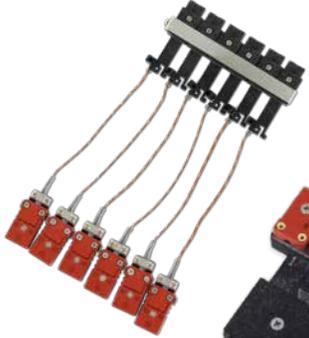
WWW.ECD.COM/TCATTACH



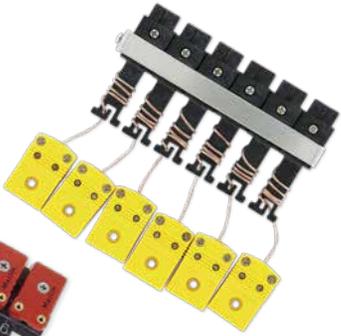
YOUTUBE



SuperM.O.L.E.® Gold - Standard Mini Adaptor (Glass)



SuperM.O.L.E.® Gold - Standard Mini Adaptor (Teflon®)



- Adapts mini-terminated K-Type thermocouples to ECD Micro Gold & Nano styles
- One-piece and individual channel adaptors
- Available in Teflon® and glass wire insulations for high-temperature lead-free work. The glass wire and high-temperature mini connectors are rated to 482°C [900°F]



SuperM.O.L.E.® Gold - Standard Mini Adaptor (Rigid)

REFLOW SOLDERING
IN-LINE CURING



WWW.ECD.COM/TCADAPTORS

TEMPROBE™



- Precisely set and lock angle and span to position tip onto any component or lead, including fine pitch
- Non-destructive attachment: Use when a profile board cannot be spared
- Precision, reusable instrument with excellent thermal isolation
- Clamp to trailing edge of PCB or ECD BOARD CARRIER™

REFLOW SOLDERING
IN-LINE CURING



WWW.ECD.COM/TP



SIDE RIDER™



- Built with stainless steel for durability and long life
- Profiler carrier for low clearance ovens
- Includes one tray and one expansion arm; designed to allow a second arm
 - » Max width with 1 arm: 38.6 cm (15.2 in)
 - » Max width with 2 arms: 60.2 cm (23.7 in)
- No tools required for adjustment



REFLOW SOLDERING
IN-LINE CURING

WWW.ECD.COM/SR

REFLOW RIDER™

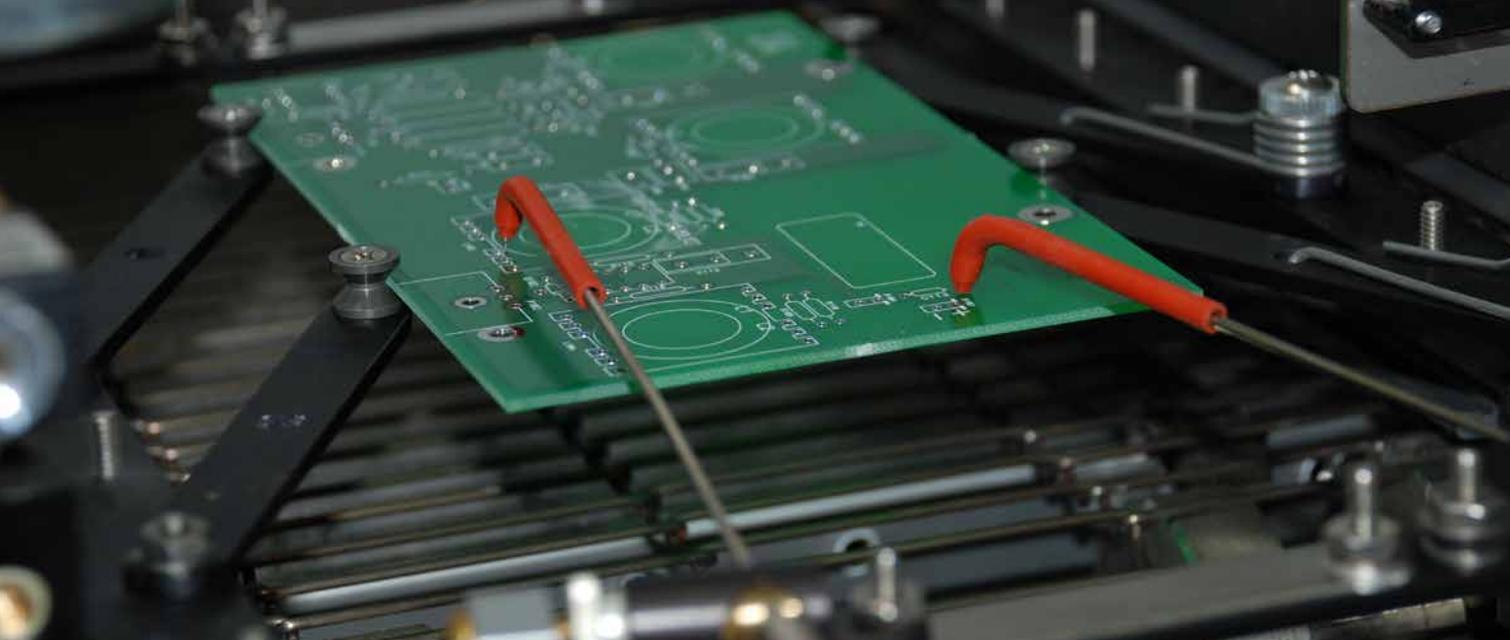


- Built of high quality materials for reliable operation and long life. The side rails, arms and support deck are constructed of hard-anodized aluminum; side rails are clear anodized aluminum. All fasteners are stainless steel.
- Adjusts to the exact width of the circuit board in seconds
- Height adjusts to the oven entry clearance



REFLOW SOLDERING
IN-LINE CURING

WWW.ECD.COM/RR



E-Z RIDER™



- The E-Z RIDER™ adjusts to the exact width of the circuit board in seconds. Scissor out the side rails to match the width of the board and lock them in place with the turn of a screw
- Built with hard-anodized aluminum and titanium

FLUX & WAVE SOLDERING

WWW.ECD.COM/EZR

BOARD CARRIER™



- All BOARD CARRIER™s feature four adjustable arms. Two of the arms can be pivoted and locked to position the board in the middle of the frame. The two opposing arms are spring loaded to grip the board firmly and to permit quick board replacement.
- Standard and Large size BOARD CARRIER™ are available for reflow and wave solder applications.
- Large BOARD CARRIER™s have two additional long arms to support the leading and trailing board edges.
- All BOARD CARRIER™ arms can be repositioned along the side rails to adapt to the length of the circuit board.
- For save solder machines, BOARD CARRIER™s are manufactured of clear, hard anodized aluminum for resistance to flux.

REFLOW SOLDERING
IN-LINE CURING

WWW.ECD.COM/BC



- 1.0" Uni-brier with Yellow Jacket barrier cover compatible with all SuperM.O.L.E.® Gold thermal profilers. Provides 300° C [572° F], 10-minute protection and cool-to-the-touch retrieval for lead-free work
- Dimensions - with Yellow Jacket [L x W x H]: 32.5 mm [1.28"] x 114.8 mm [4.52"] x 286.2 mm [11.27"]
- Weight: 0.95 kg [2.10 lbs.]



REFLOW SOLDERING
IN-LINE CURING

WWW.ECD.COM/UNI



- Next step up from standard 1" M.O.L.E.® kit barriers. Stainless steel with carry/hanging handle. 300° C [572° C] maximum temperature rating
- Dimensions [L x W x H]: 46 mm [1.8"] x 122 mm [4.8"] x 241 mm [9.5"]
- Weight: 1.47 kg [3.25 lbs.]



REFLOW SOLDERING
IN-LINE CURING

WWW.ECD.COM/BB45



- At only 18 mm [0.7"] thick, constructed of highly-polished stainless steel and insulated with spun polyamide insulation, this thermal barrier is designed to protect the thermal profiler in normal solar infrared process conditions. It is also equipped with two-sided detent tabs for a secure closure.
- Compatible with V-M.O.L.E.®, MEGAM.O.L.E.® 20 ECD thermal profilers
- Dimensions (L x W x H): 236 mm [9.3"] x 78 mm [3.1"] x 18 mm [0.7"]
- Weight: 340 Grams [12 oz]



REFLOW SOLDERING
IN-LINE CURING

WWW.ECD.COM/REFLECTIVE

UNI-BARRIER & YELLOW JACKET - 25mm [1"]					
Temperature:	125°C [257°F]	150°C [302°F]	200°C [392°F]	250°C [482°F]	300°C [572°F]
Duration time:	37.6 min.	26.9 min.	17.2 min.	12.7 min.	10.1 min.
BB-45 - 46mm [1.8"]					
Temperature:	100°C [212°F]	150°C [302°F]	200°C [392°F]	250°C [482°F]	300°C [572°F]
Duration time:	79 min.	35 min.	23 min.	17 min.	13 min.
REFLECTIVE - 18mm [0.7"]					
Temperature:	38°C [100°F]	93°C [200°F]	149°C [300°F]	204°C [400°F]	260°C [500°F]
Duration time:	28.0 min.	10.7 min.	6.3 min.	5.3 min.	5.0 min.

What are your three biggest thermal profiling challenges?

ECD has designed a free thermal profiling course to help you better address manufacturing needs and understand which tools can help you achieve more.

So that the course covers everything you want to know, your feedback is important to our cause.

To ensure we provide the material that addresses your pain points, please visit www.ecd.com/elpp and give us your input and register for the course.

When ECD deploys the various courses and modules, all registrants will be notified.



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The trapezoidal ECD logo®, M.O.L.E.® (Multi-Channel Occurrent Logger Evaluator), Fluxometer®, MEGAM.O.L.E.® 20, OvenRIDER® NL 2+, OvenWATCH®, SuperM.O.L.E.® Gold 2, V-M.O.L.E.® and WaveRIDER® NL 2 are registered trademarks of Electronic Controls Design, Inc.. Board Carrier™, E-Z Rider™, OvenCHECKER™, OvenSENTINEL™ Reflow Rider™, SmartDRY™, Side Rider™ and Temprobe™ are trademarks of Electronic Controls Design, Inc.

Patents & Patents Pending: SuperM.O.L.E.® Gold 2, MEGAM.O.L.E.®, V-M.O.L.E.® & M.O.L.E.® MAP 3 #7,653,502, WaveRIDER® #5,767,424; Fluxometer® #6,321,591; OvenSENTINEL™ #6,402,372;

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• Top rated customer support • No-cost ECD Online Training • Award winning software •