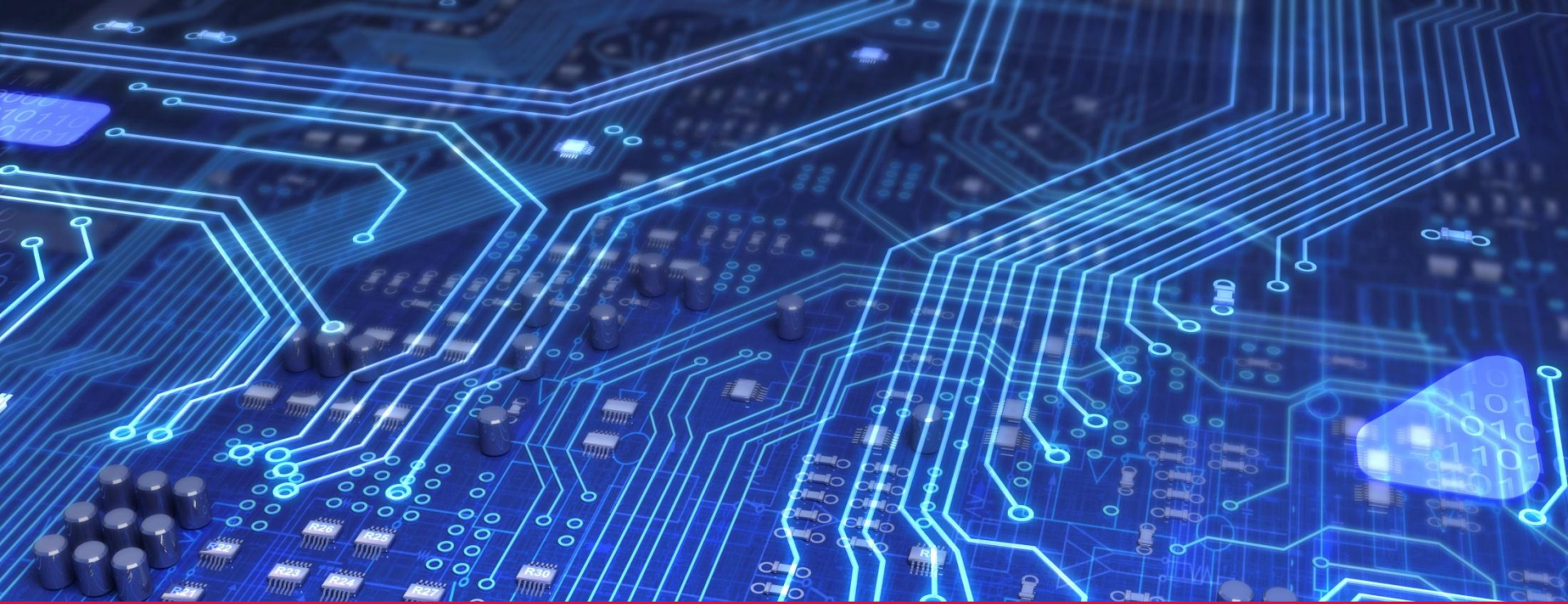

Challenges of the Consumer Electronics Industry

Instron® – A World Leader in Materials Testing

INSTRON®

The difference is measurable®

Why Now?

1. Adoption rate of consumer electronics is climbing.

> *In 2013, mobile subscriptions outpaced fixed lines by a 6 to 1 ratio – more so in developing nations. For instance, in Africa over 63% of people now have a mobile cellular subscription.*
>
> *Source: MobiThinking report*

2. Device functionality is expanding and new product categories are being added.

> Neilson estimates in its latest survey of American consumers that smartphones now account for around 64% of all mobile phones used in the United States and that 80% of Americans who recently bought a new phone bought a smartphone.
>
> *Source: Neilson Report*

3. Competition is increasing.

> *There are 150 suppliers fighting for a share of the smart phone market. The high-growth market presents ample opportunities for challengers and vendors with unique market advantages to rapidly gain market share.*
>
> *Source: IDC Report*

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So What?

Trend	Challenges	Implications on Testing
Adoption rate of consumer electronics is climbing	• Mass production is driving global operations • Product quality issues are impacting millions of consumers	• Increasing need to standardize testing across functions (e.g. R&D to manufacturing) and across locations • Increasing need to automate testing and remove operator influences
Device functionality is expanding & new product categories are being added	• Additional features introduce new sources for problems • Proliferation of devices drives increasing product lines	• Test plans continue to expand • Increased demands for flexible test equipment • Demands to test various inputs on different surfaces of the device
Competition is increasing	• Development cycle times are shrinking • Demand for innovative and differentiating functionality is increasing • Increased pressure to maintain corporate quality image	• Companies must find and eliminate issues before products hit the market. • Increased pressure to test new materials

Common Consumer Electronics Applications

- Quality check on buttons
- Quality check on switches and sliders
- Tactility characterization of buttons/sliders/switches
- Peel testing on adhesives
- Impact testing on displays/glass
- Durability testing on keyboards
- Bend testing on components
- Tensile tests on cords
- Torsion testing of fasteners
- Hardness testing for reliability

Top Testing Challenges for Consumer Electronics

- Quantifying button tactility
- Testing various types of inputs (buttons, switch, slider) on different surfaces of an electronic device
- Protecting the device during testing
- Throughput and uptime in production environment
- Flexible configurations for continually changing prototypes

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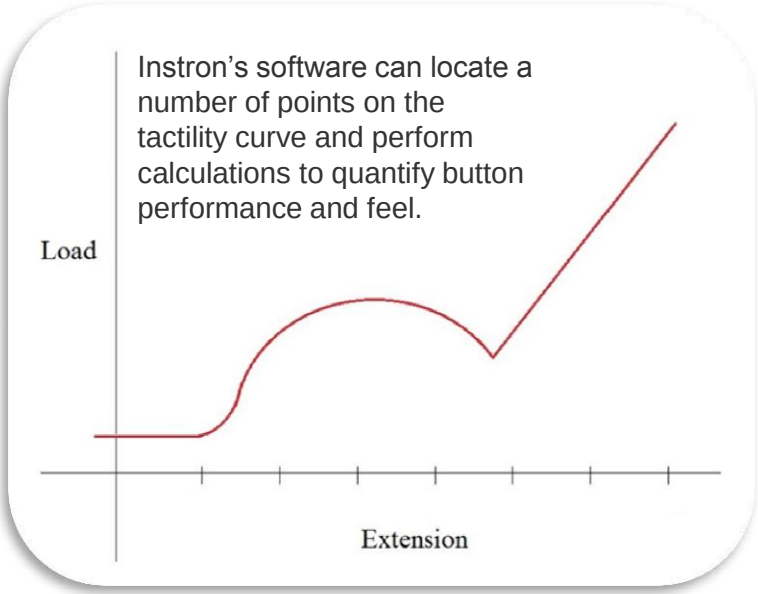
Challenge: Quantifying Button Tactility



Measuring Button Tactility (rather than just button actuation) Allows Device Manufacturers to:

Accurately characterize button "feel"
An important consumer metric when assessing product quality

Eliminate variability in testing
There is no way to calibrate a finger

Reduce rejects and warranty expenses
Button's that are "sticky" or "loose" tend to fail earlier

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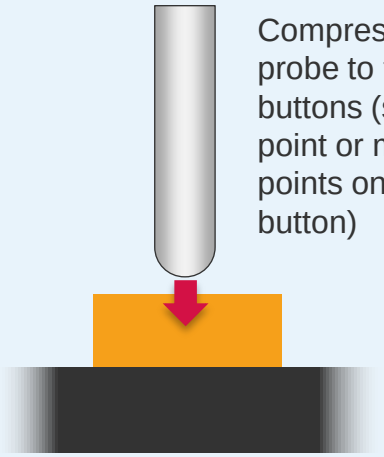
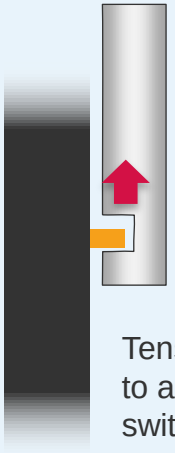
Challenge: Testing Various Types of Inputs on Different Surfaces

Buttons



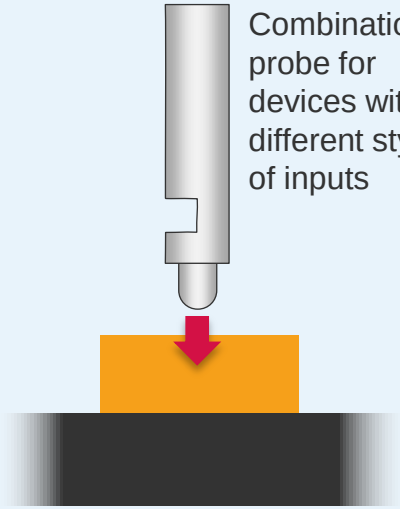
Compression probe to test buttons (single point or multiple points on same button)

Switch / Slider

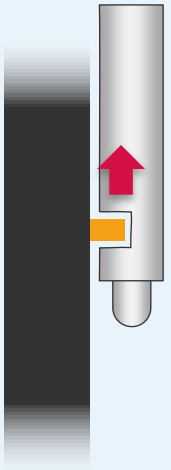


Tension probe to actuate a switch or slider

Switch / Slider/ Button

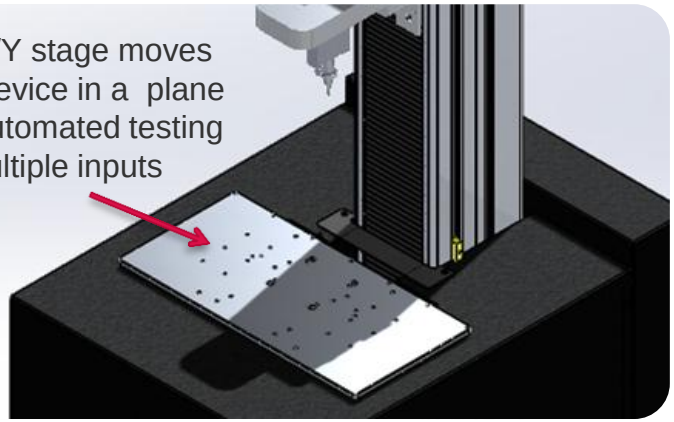


Combination probe for devices with different styles of inputs



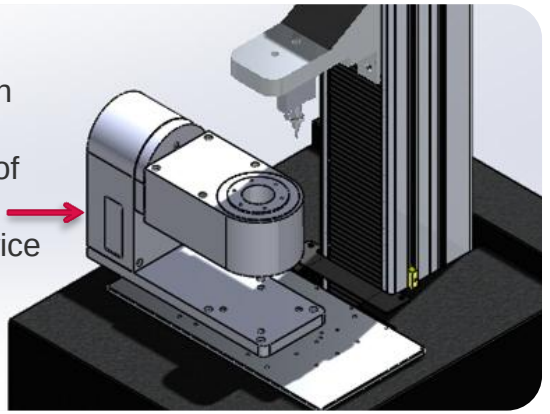
Multiple Inputs on Same Surface

An X/Y stage moves the device in a plane for automated testing of multiple inputs



Multiple Inputs on Different Surfaces

A rotary stage in combination with an X/Y stage provides automated testing of inputs on different surfaces of the device



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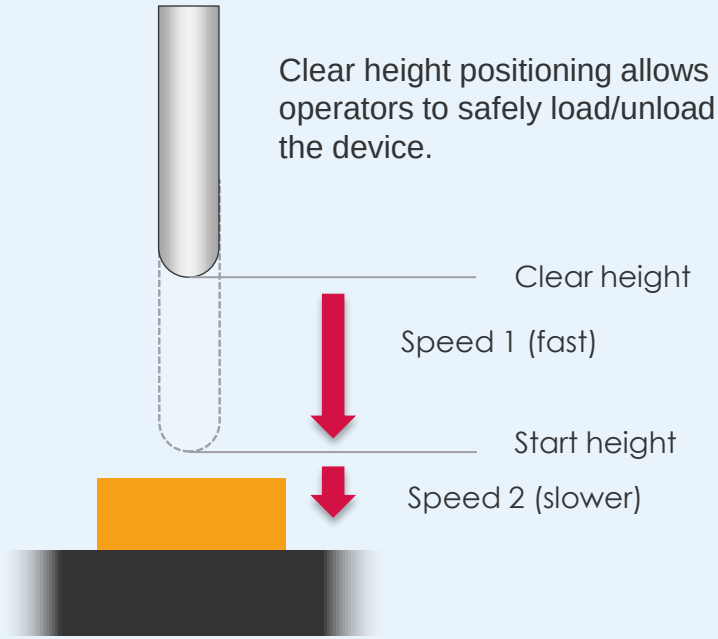
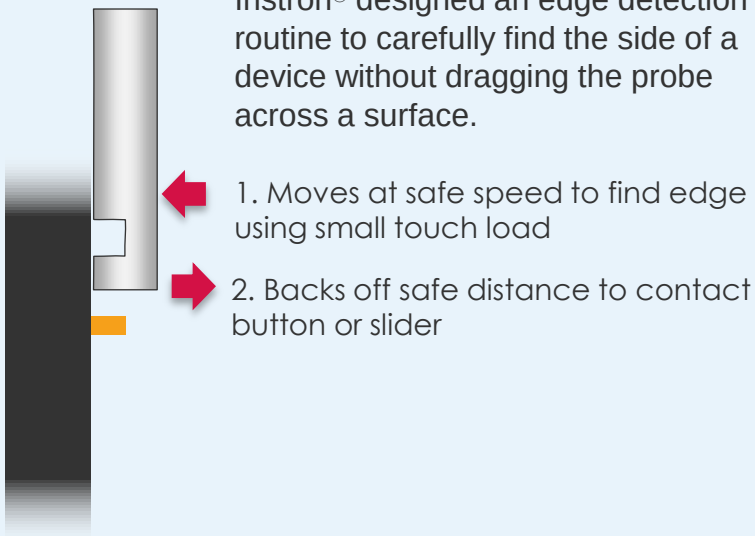
Challenge: Protecting the Device

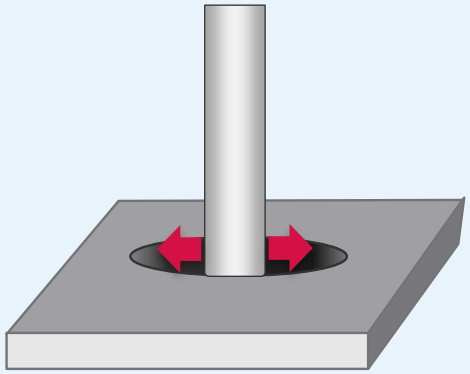
Clear Height Protection



Edge Detection



Teaching Templates



Teaching templates eliminate the need for operators to “eyeball” positioning, which can damage the device and adversely effect test data. These templates allow the test probe to accurately locate button positions and map coordinates.

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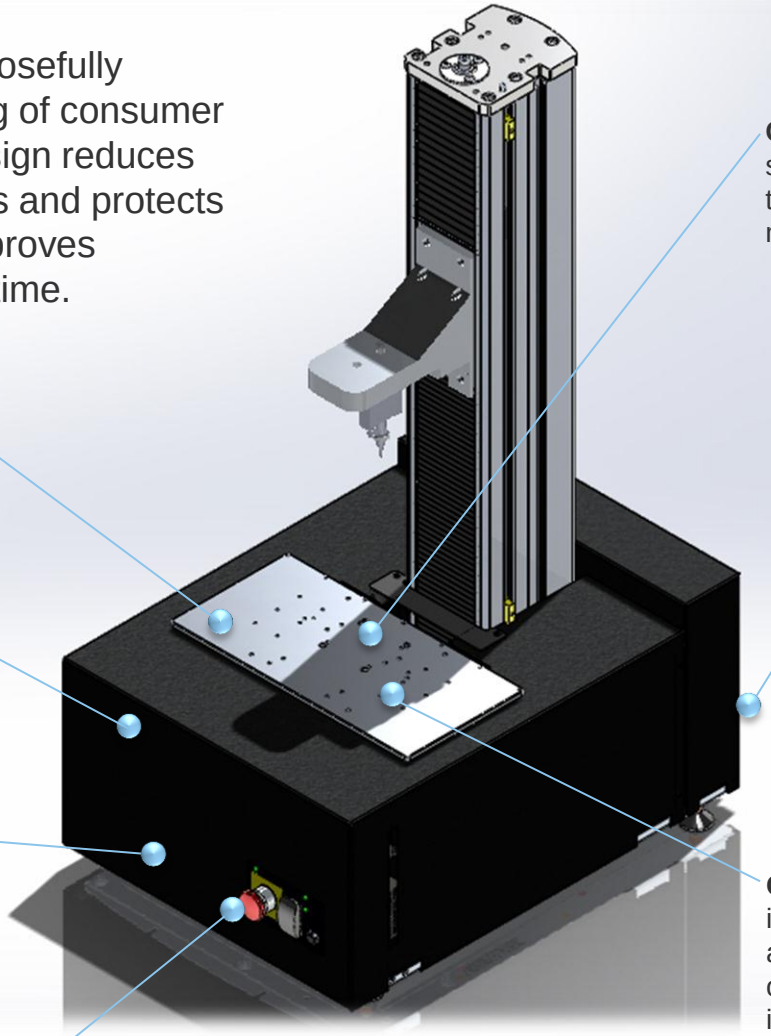
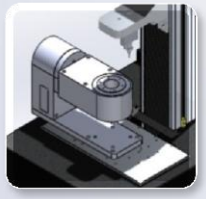
Challenge: Throughput and Uptime in a Production Environment

The Instron® 5942-200 is purposefully designed for production testing of consumer electronics. The industrial design reduces operator intervention, conceals and protects valuable components, and improves serviceability for maximum uptime.



Optional Rotary Stage supports automated testing of inputs on multiple surfaces



Integrated **X/Y Stage** supports automated button testing

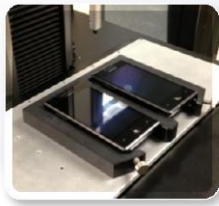
Full cover base minimizes ingress of debris and improves serviceability

Concealed PC minimizes theft and prevents unwanted operator intervention

Minimal controls (no handset) prevent undesirable operator intervention

The ability to control testing and communicate results through a **COM port** means that quality professionals can lockdown test procedures and secure results

Optional shuttle system increases throughput by allowing operators to load one device while another is under test



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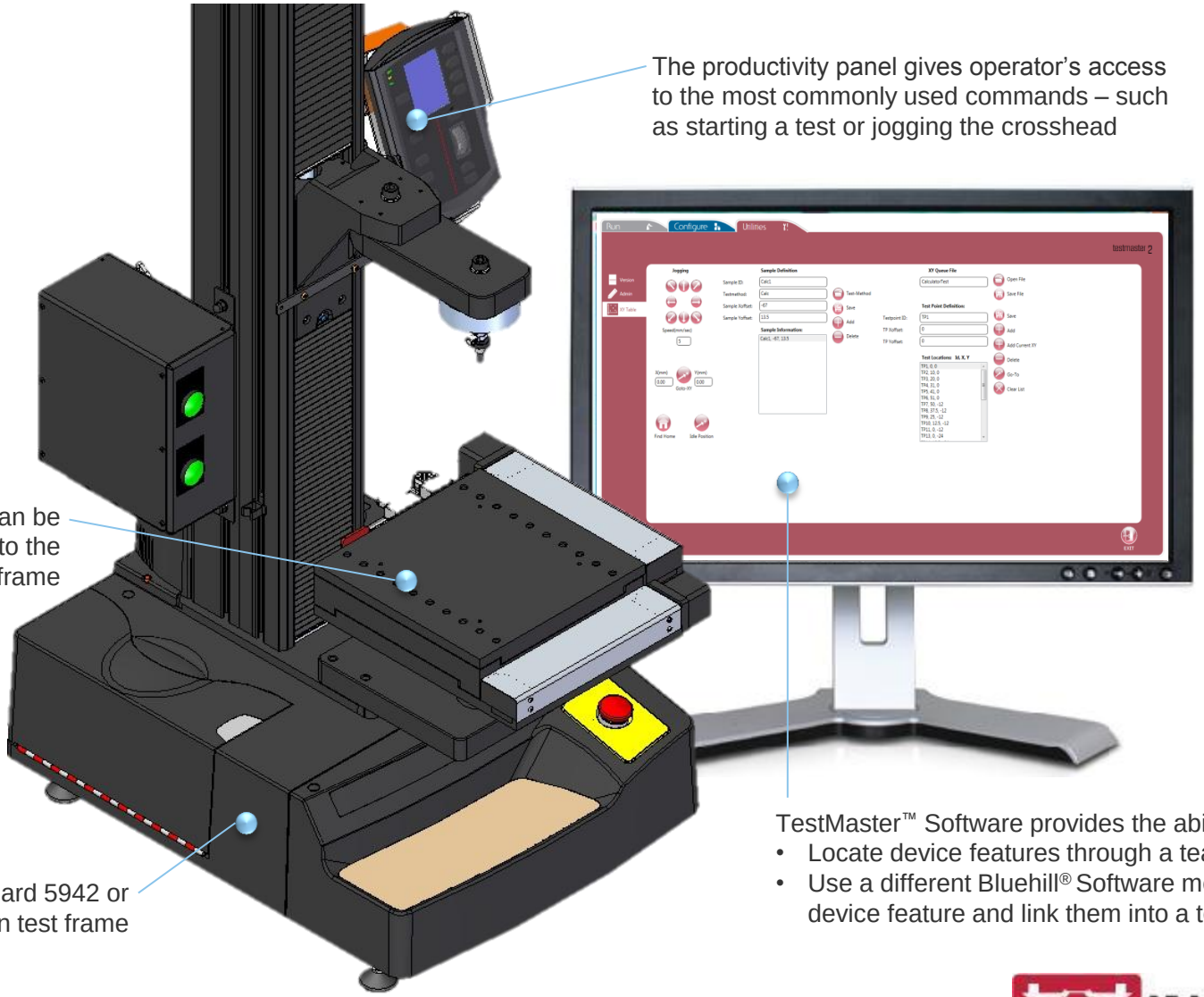
Challenge: Flexible Configurations for Continually Changing Prototypes



The productivity panel gives operator's access to the most commonly used commands – such as starting a test or jogging the crosshead

Various X/Y Stages can be selected and fitted to the load frame

An Instron® standard 5942 or 5944 single column test frame

TestMaster™ Software provides the ability to:

- Locate device features through a teaching interface
- Use a different Bluehill® Software method for each device feature and link them into a test routine

Does this sound familiar?

Do you see the same challenges in your business?

www.instron.com

for more information

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The difference is measurable