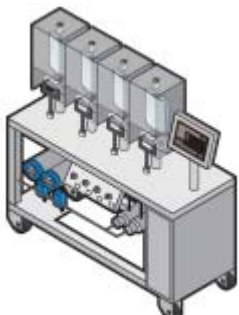
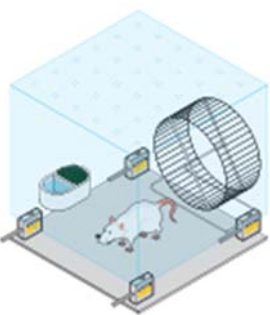



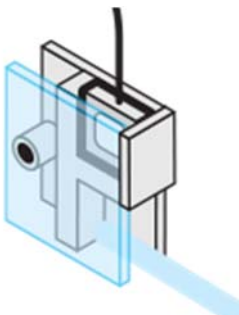

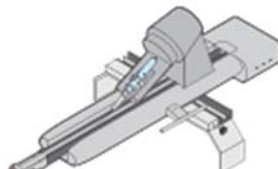




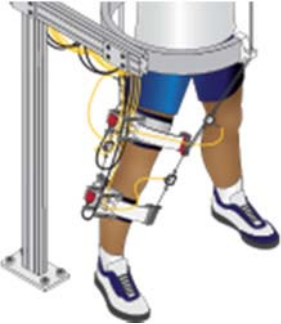


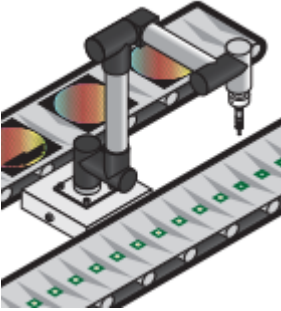

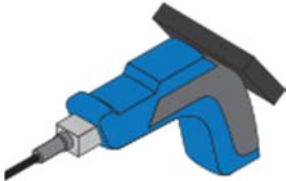
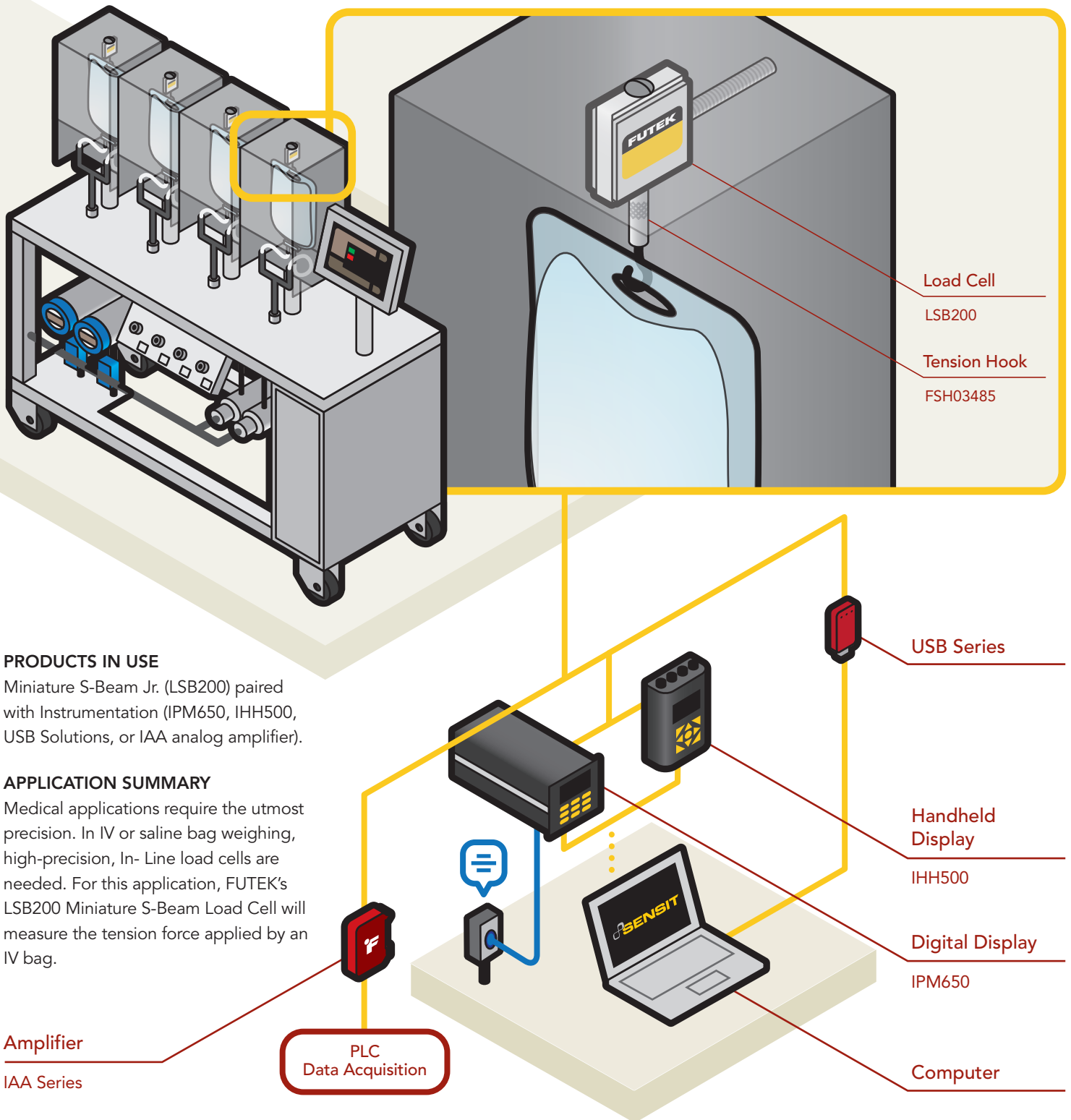


Giunti di forza estensimetrici miniatura

I giunti di forza miniatura offrono flessibilità di misura in molti ambienti applicativi. Ad esempio la cella di carico subminiatura ad "S" LSB200, grazie al blocco meccanico di fondo scala, consente misure con elevata accuratezza ed affidabilità anche in presenza di sovraccarichi nel ciclo di lavoro. LSB200 è una delle celle più innovative nel settore del Test & Measurement.

<p>Medical Bag Weighing (Application 101)</p> 	<p>Medical Behavioral Research (Application 129)</p> 	<p>OEM Syringe Test Stand (Application 130)</p> 
<p>Syringe Test Stand (Application 131)</p> 	<p>Humanoid Robot Load Cell (Application 132)</p> 	<p>Catheter Track Force Test (Application 134)</p> 
<p>Prone Stereostatic Biopsy (Application 139)</p> 	<p>Catheter Force Measurement (Application 144)</p> 	<p>Laparoscopic Calibration (Application 145)</p> 

Trackpad/Touchpad Test Stand (Application 147)	Medical Guidewire Test (Application 151)	Robotic Glove Rehabilitation (Application 156)
		
Robotic Leg Rehabilitation (Application 157)	Touchscreen Haptic Feedback (Application 165)	Precision Wire Tensioner (Application 166)
		
Die Attach Force Measurement (Application 170)	Robotic Spot Welding Force (Application 173)	Endoscope Force Control (Application 177)
		



PRODUCTS IN USE

Miniature S-Beam Jr. (LSB200) paired with Instrumentation (IPM650, IHH500, USB Solutions, or IAA analog amplifier).

APPLICATION SUMMARY

Medical applications require the utmost precision. In IV or saline bag weighing, high-precision, In- Line load cells are needed. For this application, FUTEK's LSB200 Miniature S-Beam Load Cell will measure the tension force applied by an IV bag.

Amplifier
IAA Series

PLC
Data Acquisition

USB Series

Handheld Display
IHH500

Digital Display
IPM650

Computer

Sensor Solution Source

Load · Torque · Pressure · Multi Axis · Calibration · Instruments · Software

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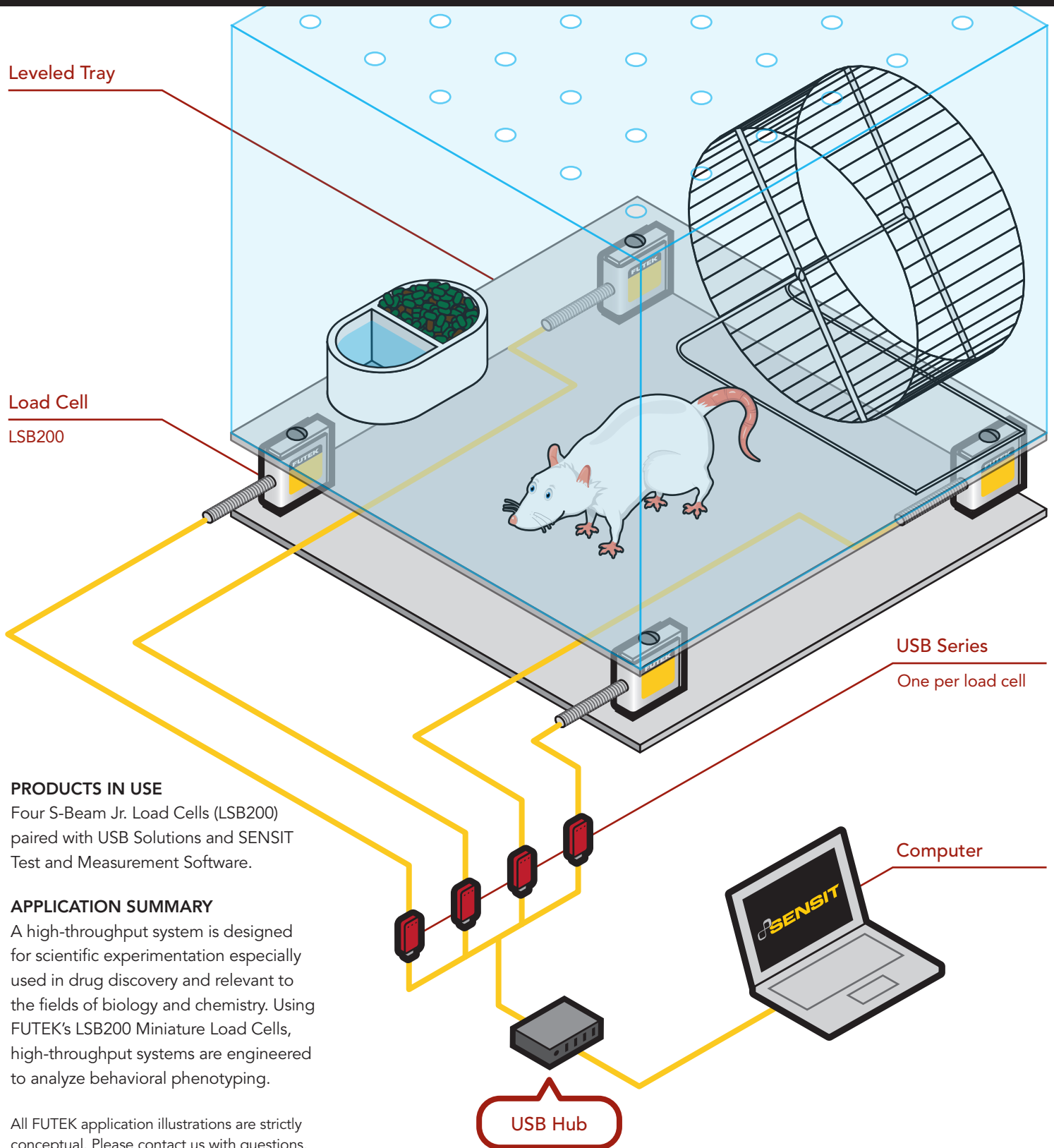
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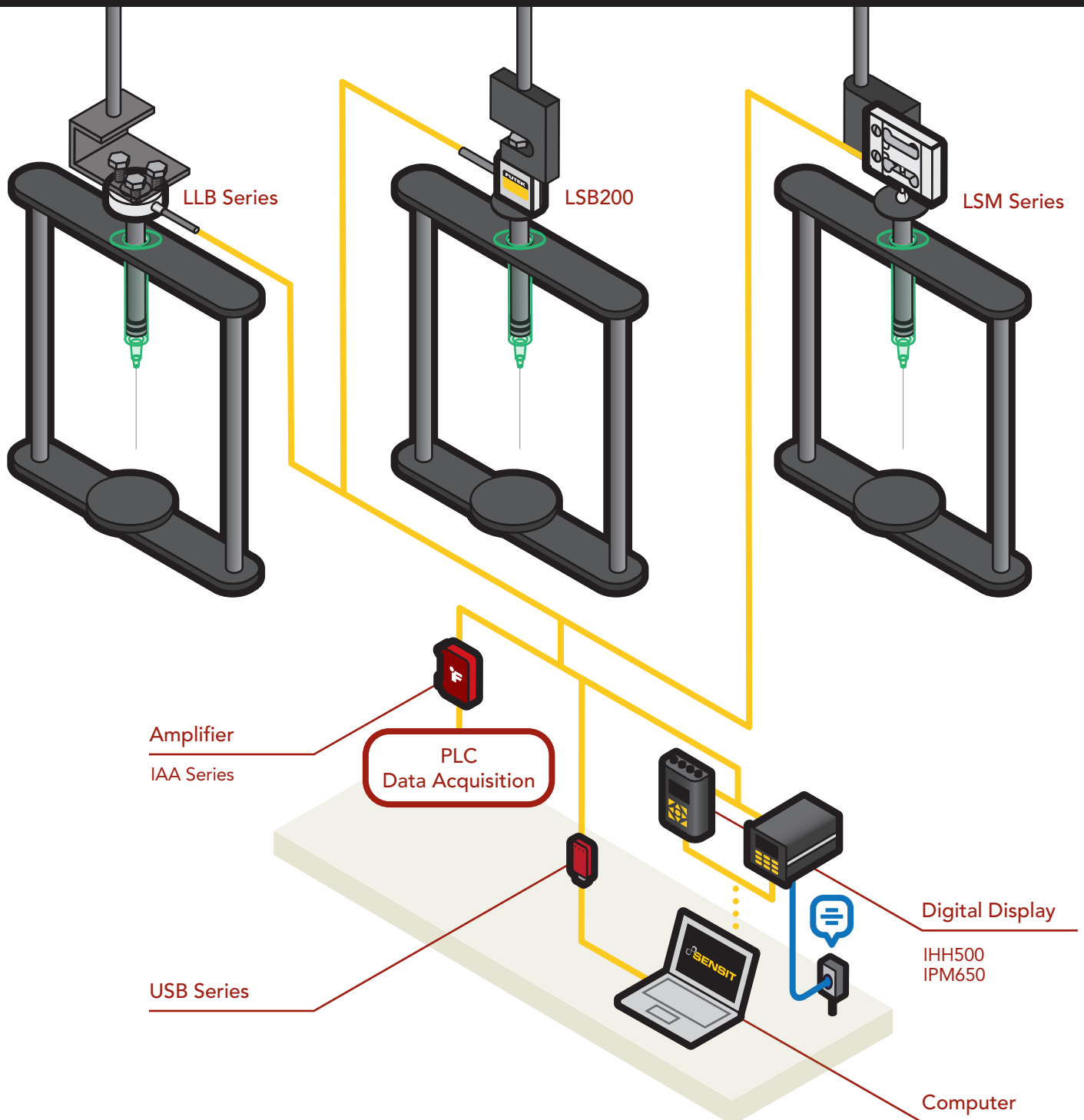
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U.S. Manufacturer



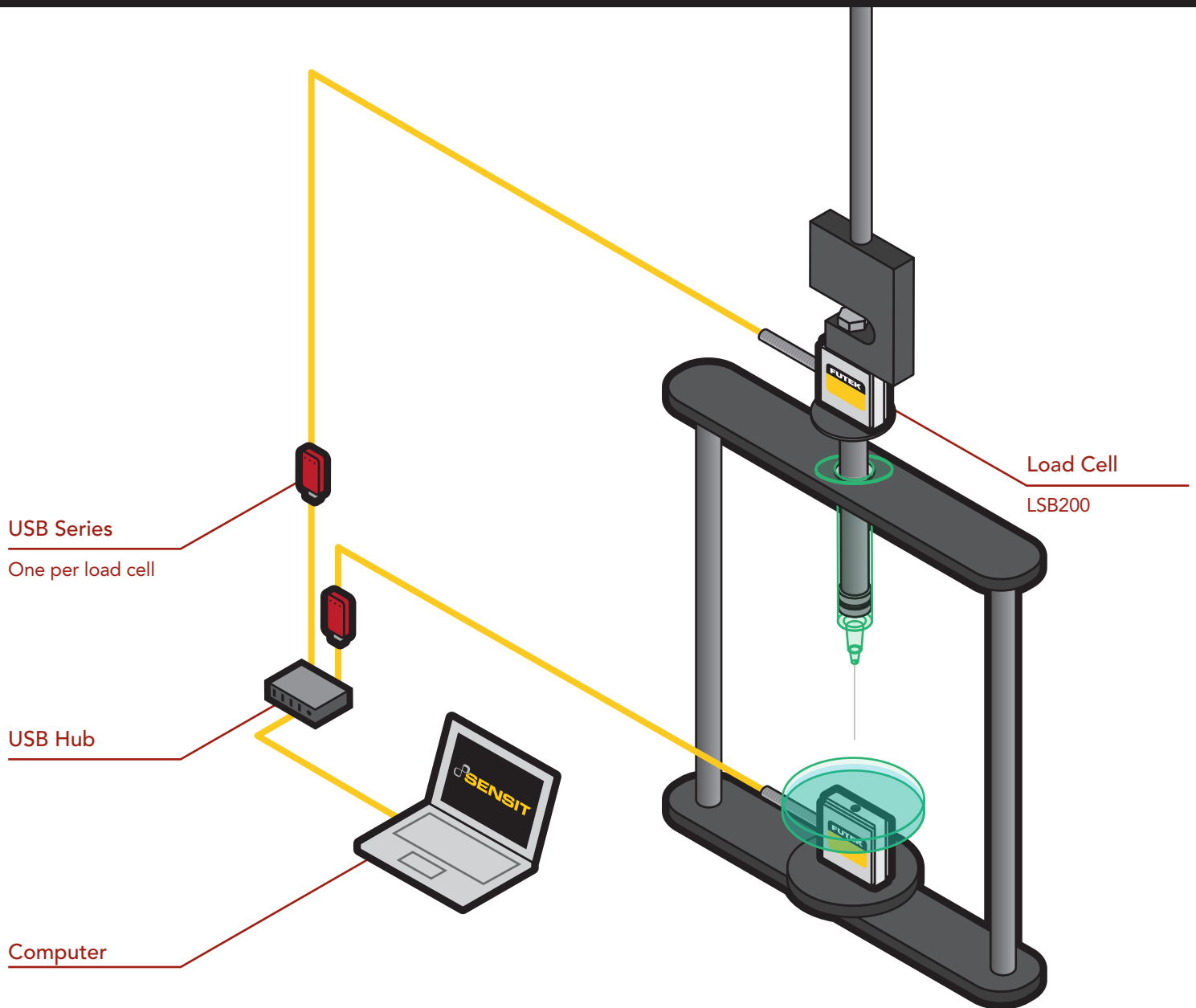


APPLICATION SUMMARY

Utilizing OEM load cells to audit syringes (infusion pumps) provides medical quality inspectors with assurance that these apparatuses will perform up to code.

PRODUCTS IN USE

One S-Beam Jr. Load Cell (LSB200), Side-Mount Series Load Cell (LSM Series), or Load Button Load Cell (LLB Series) paired with Instrumentation (IAA analog amplifier, IPM650, IHH500, or USB Solutions) and SENSIT™ Test and Measurement Software.



All FUTEK application illustrations are strictly conceptual.
Please contact us with questions.

APPLICATION SUMMARY

Medical equipment requires precise testing. Utilizing FUTEK's LSB200 Miniature S-Beam Jr. provides quality inspectors with measurements down to the micro-gram on delicate applications, such as this syringe test stand (infusion pump).

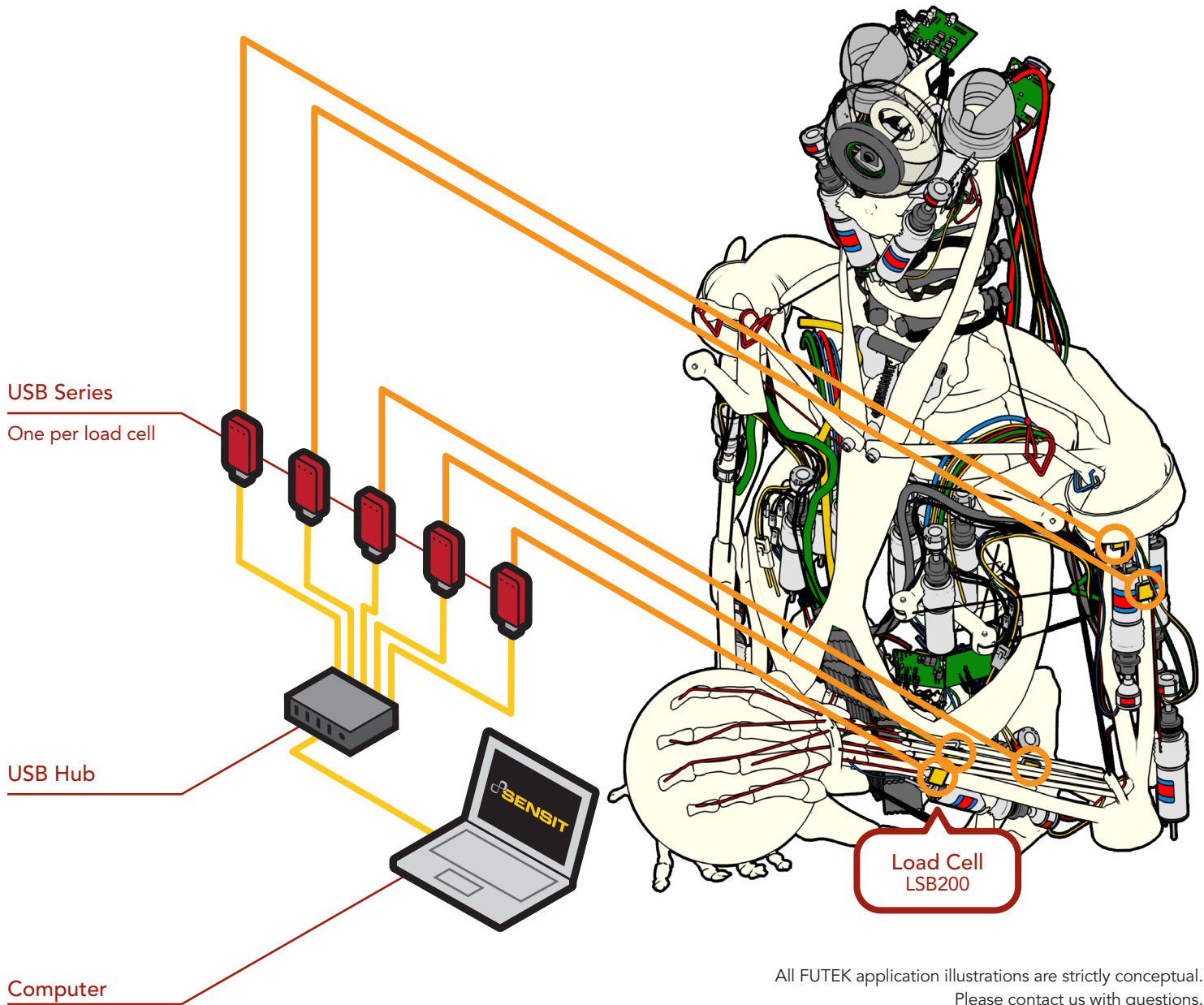
PRODUCTS IN USE

Two S-Beam Jr. Load Cells (LSB200) paired with USB Solutions and SENSIT Test and Measurement Software.

Sensor Solution Source

Load · Torque · Pressure · Multi Axis · Calibration · Instruments · Software

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PRODUCTS IN USE

60+ Miniature S-Beam Jr. Load Cells (LSB200) with USB Solutions and SENSIT™ Test and Measurement Software.

APPLICATION SUMMARY

FUTEK partnered with The Robot Studio, a specialist in biometric robotic hardware, to construct a fully functional humanoid robot. Over 60 of FUTEK's LSB200 Miniature S-Beam Jr. Load Cells are in operation to monitor the robot's movements.

Sensor Solution Source

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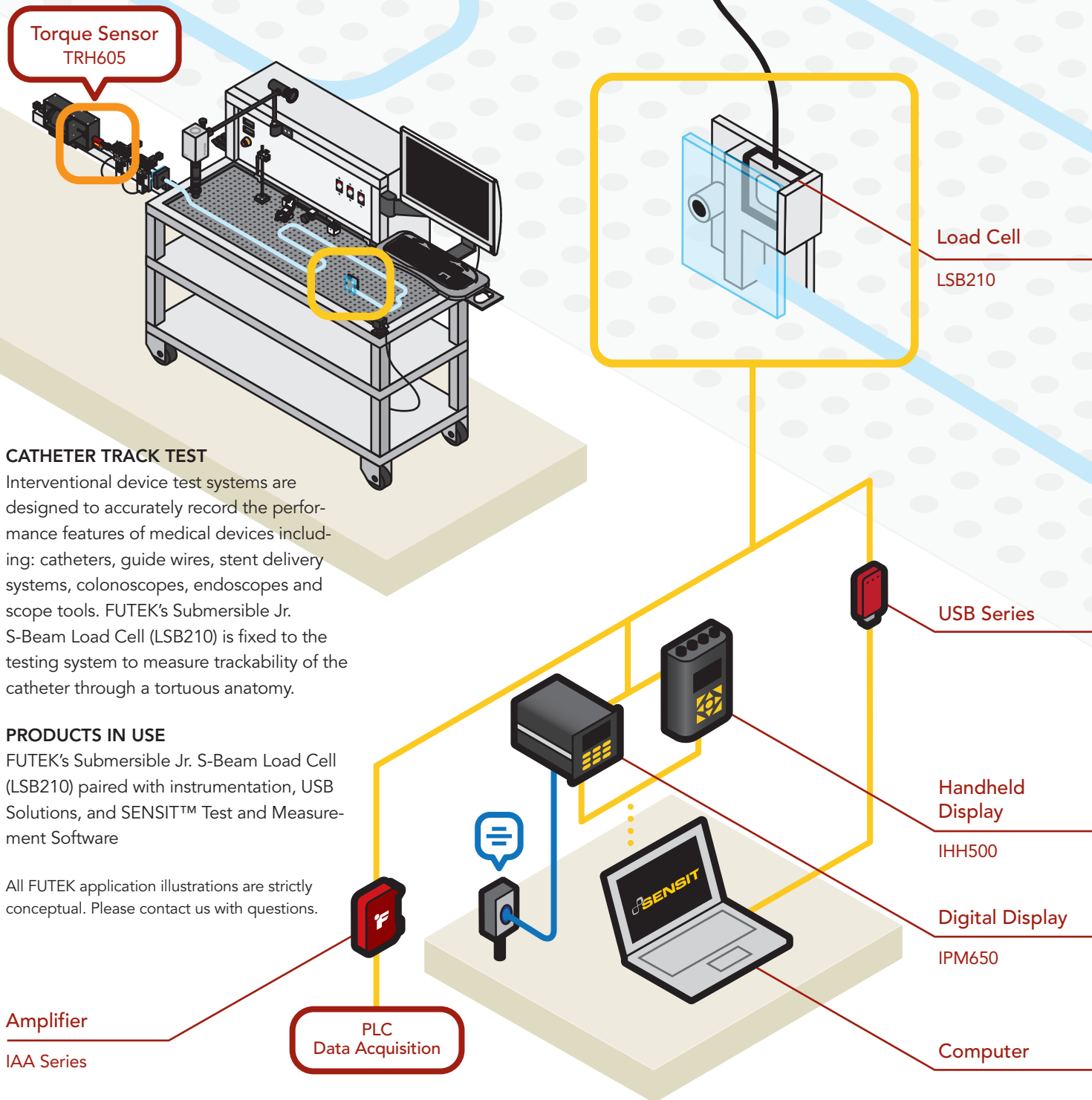
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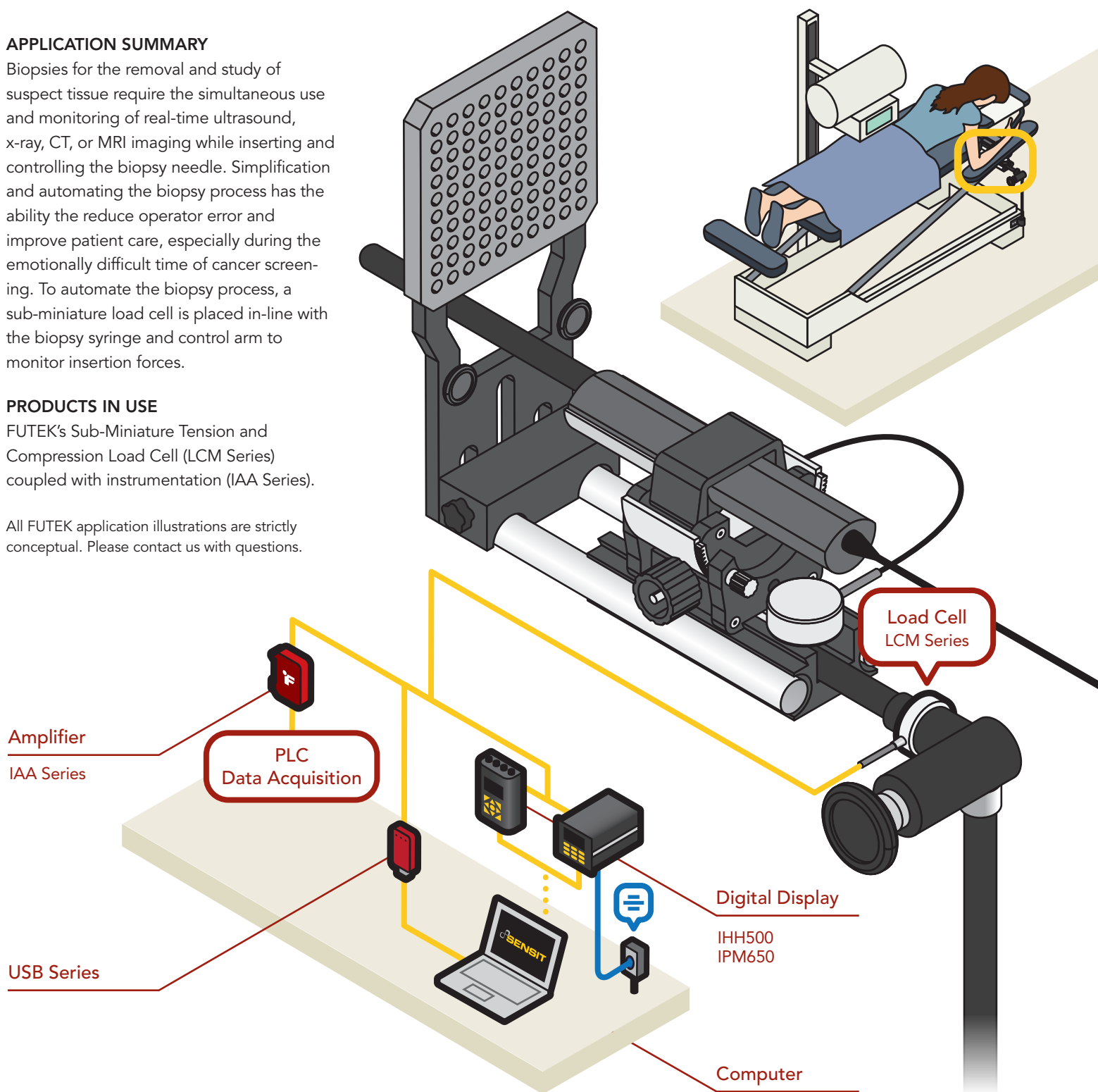
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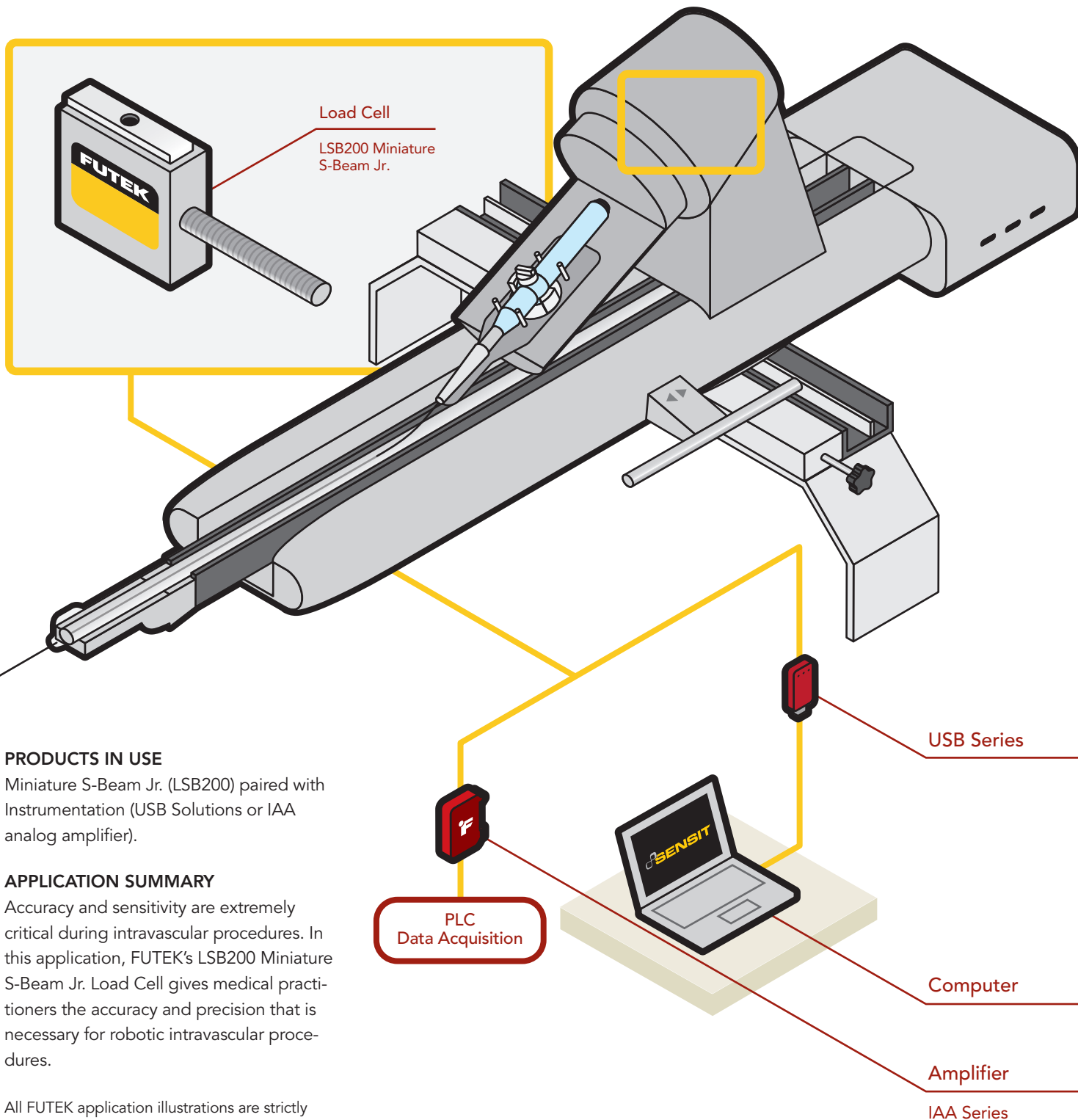
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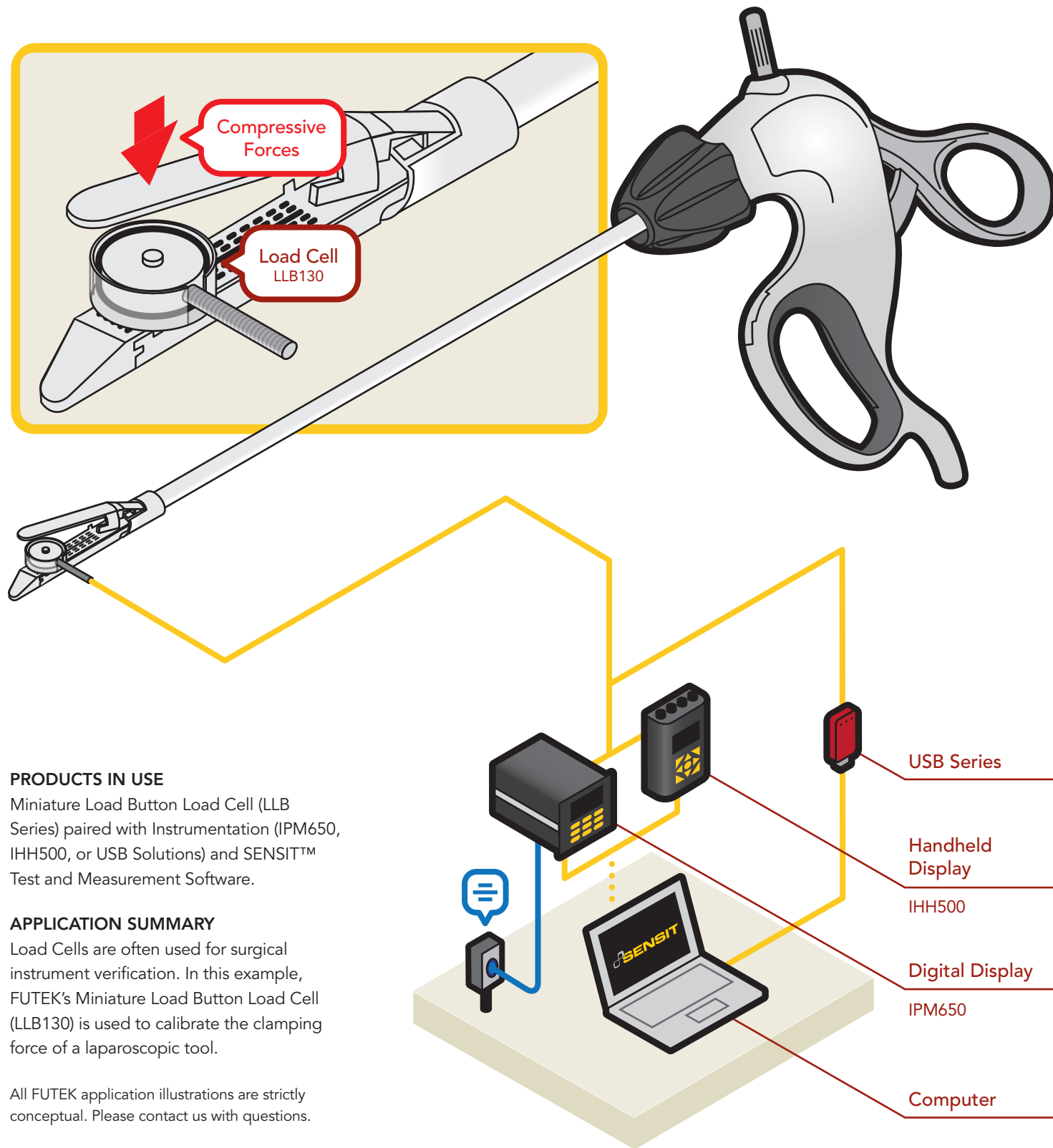




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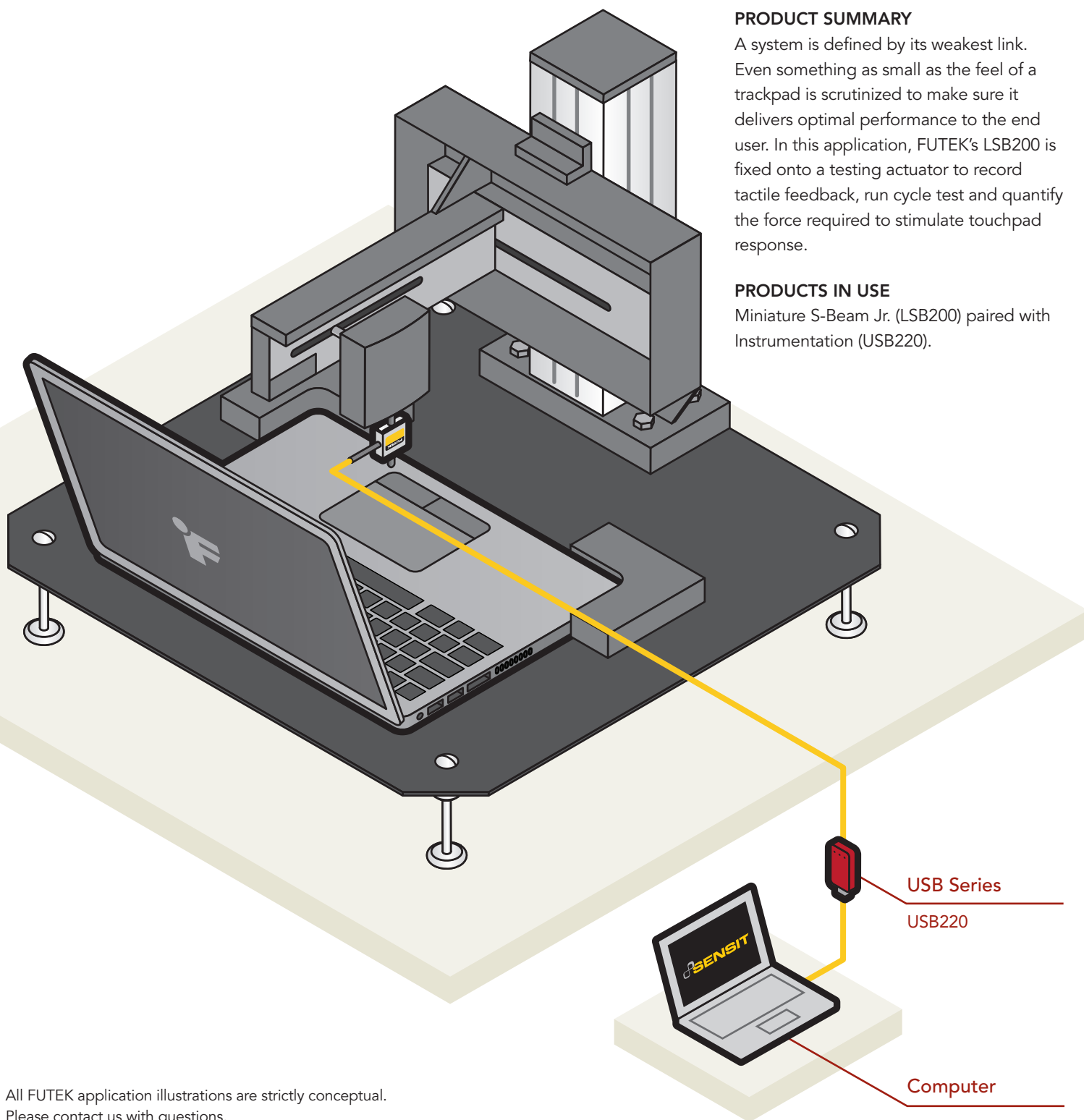
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PRODUCT SUMMARY

A system is defined by its weakest link. Even something as small as the feel of a trackpad is scrutinized to make sure it delivers optimal performance to the end user. In this application, FUTEK's LSB200 is fixed onto a testing actuator to record tactile feedback, run cycle test and quantify the force required to stimulate touchpad response.

PRODUCTS IN USE

Miniature S-Beam Jr. (LSB200) paired with Instrumentation (USB220).

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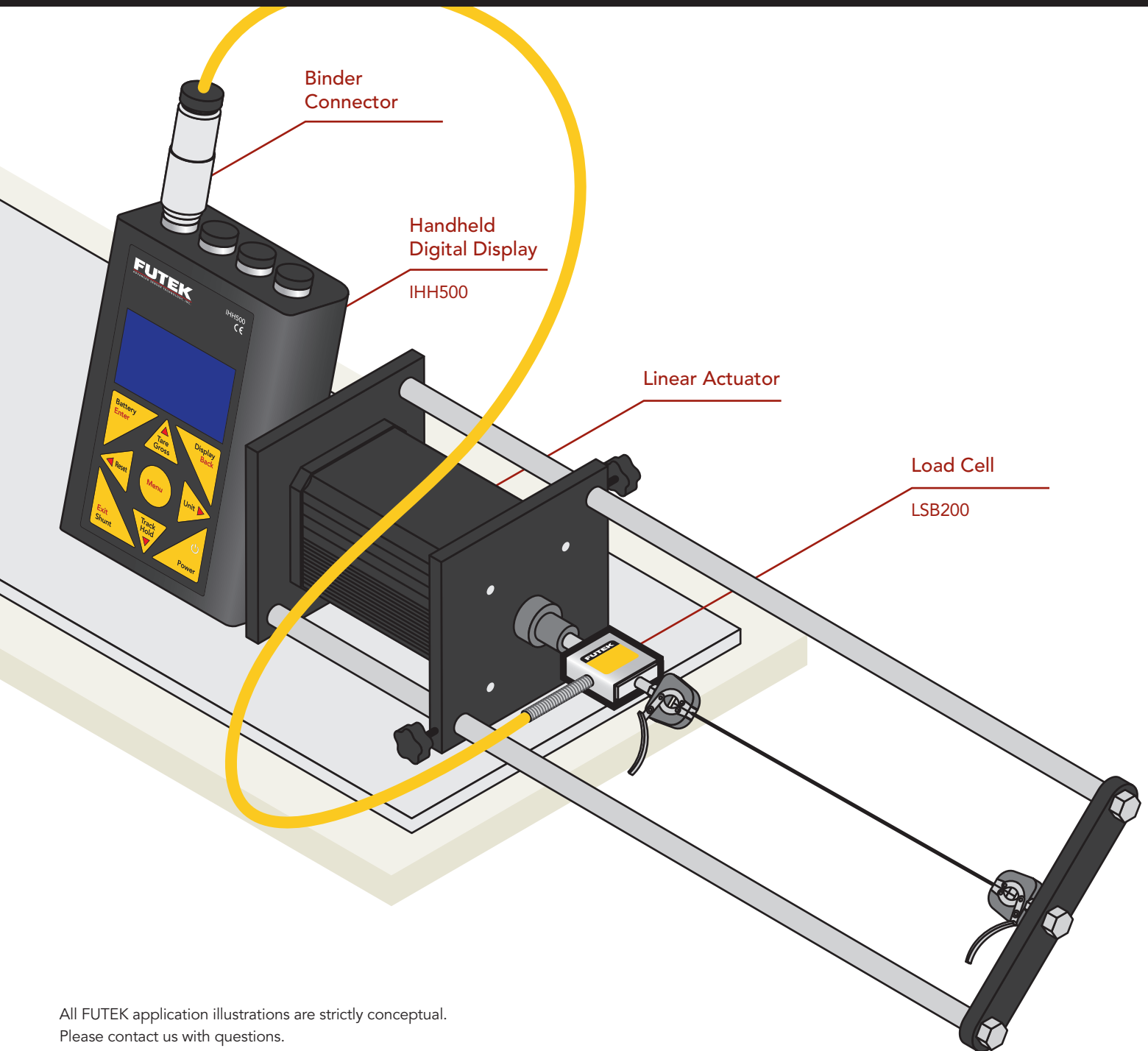
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APPLICATION SUMMARY

In the medical industry, guidewire testing can provide a means of evaluating material quality, and core wire consistency and reliability. In this automated guidewire testing system FUTEK's LSB200 Miniature S-Beam Load Cell is integrated to the wire clamp, guided by an actuator, to record the peak force or breaking force of the guidewire under test.

PRODUCTS IN USE

Miniature S-Beam Jr. (LSB200) paired with Instrumentation (IHH500 or USB Solutions).

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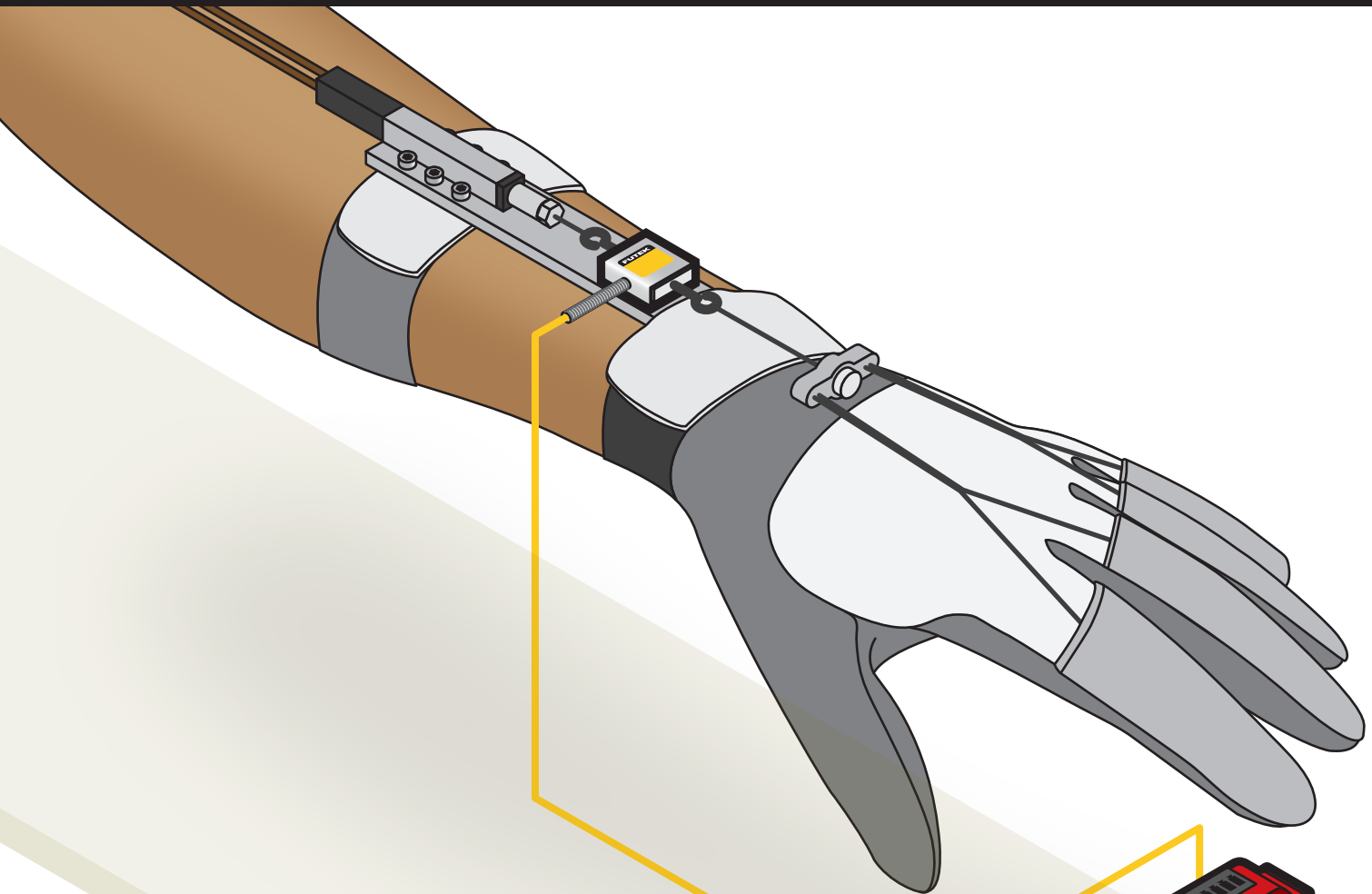
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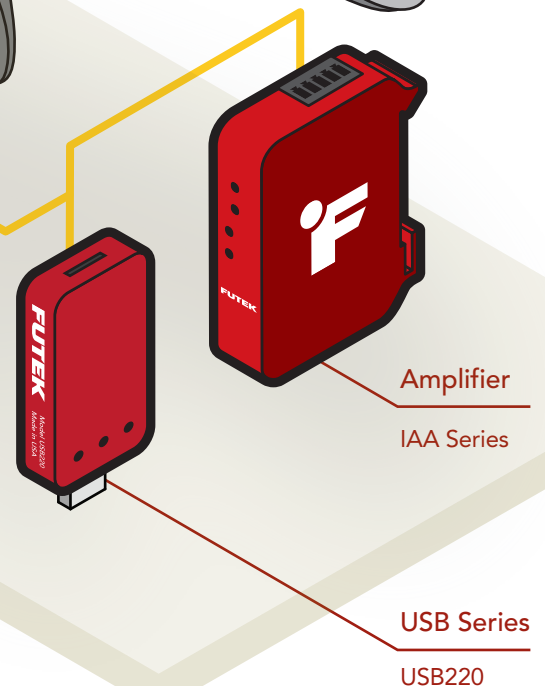
APPLICATION SUMMARY

Researchers, doctors, and engineers are creating ways to help patients speed up rehabilitation by allowing them to perform more tasks on their own, with the assistance of specially made bionics. The LSB200 load cell is small enough to mount to the cabling of the glove, in order to measure the forces on the simulated tendons on the hand.

PRODUCTS IN USE

JR S-Beam Load Cell (LSB200) paired with instrumentation (USB220 and IAA Series analog amplifiers.

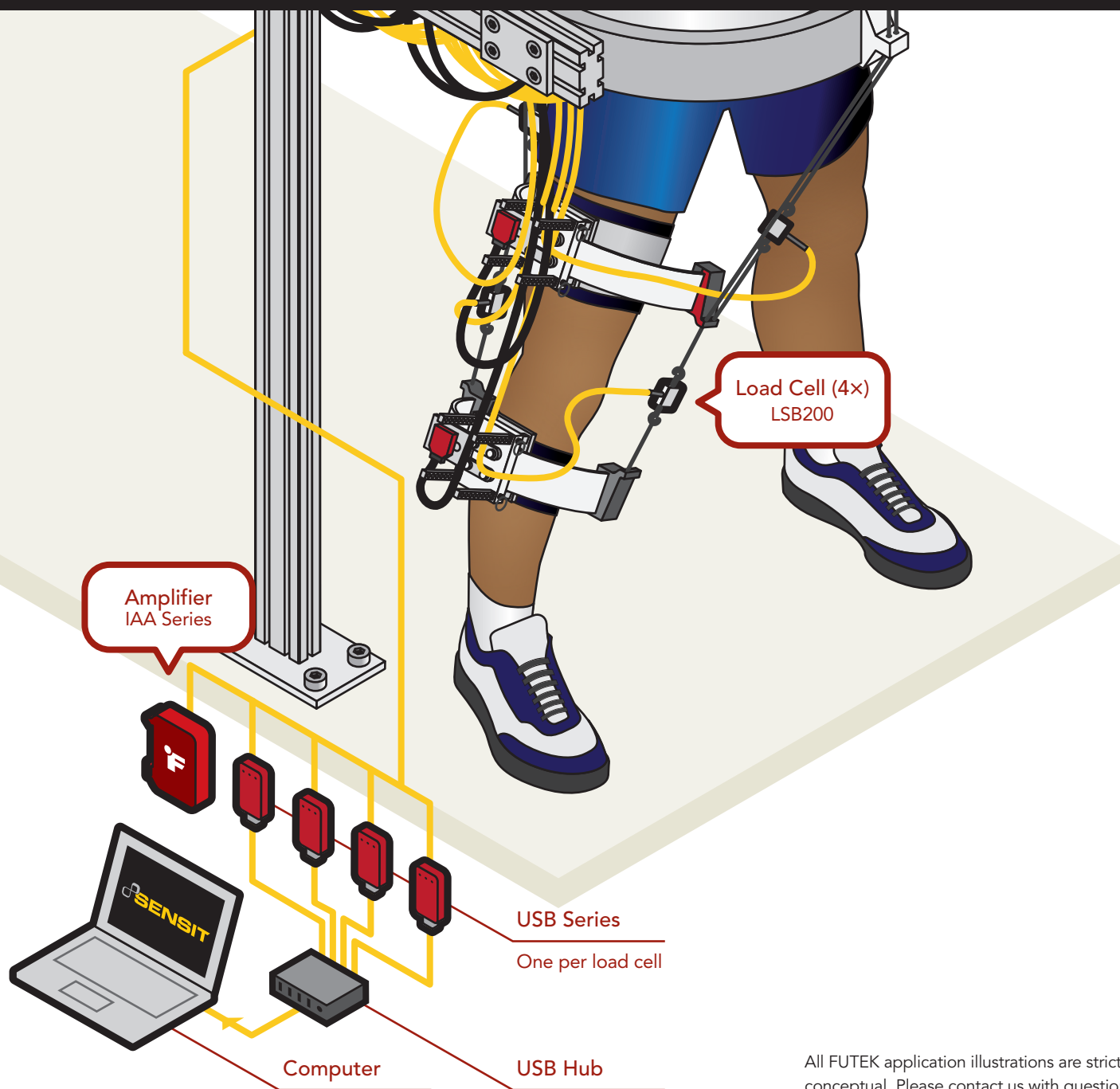
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APPLICATION SUMMARY

Gait training and rehabilitation are not modern concepts, but through modern technologies, engineers and researchers are working on developing exoskeletons to help rehabilitate a patient at a more accelerated pace. Critical measurements are gathered during development of motor-assisted exoskeletons to ensure that proper assistance is given at different stages of treatment.

PRODUCTS IN USE

JR S-Beam Load Cell (LSB200) paired with instrumentation (USB220 and IAA Series analog amplifiers).

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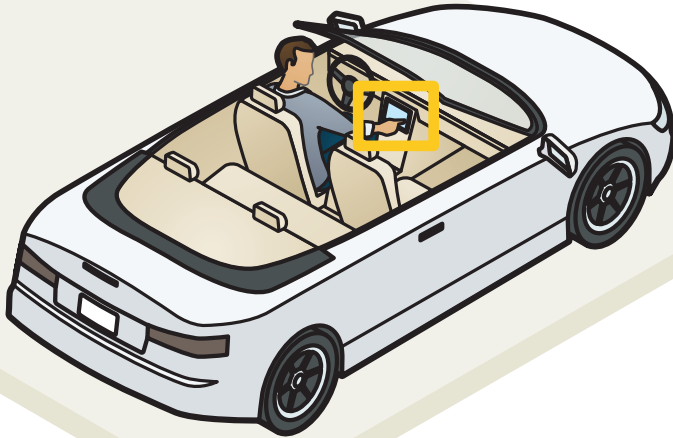
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Touch Surface

Load Cell

4x LSB Series

Digital Amplifier

4x IDA100

Computer

Haptic
Vibration Motor

APPLICATION SUMMARY

As automotive entertainment UIs become more sophisticated, it's become harder to control them hands free without looking directly at the screen. The lack of tactile feedback results in the user's brain wanting to look at the screen to confirm input selection. By incorporating load cells to measure contact force, the on-board computer can confirm correct and incorrect inputs using varying vibrations, ensuring the driver that their input was correctly registered.

PRODUCTS IN USE

4 LSB200 In-line Tension and Compression S-Beam Load Cells each paired with an IDA100 Digital and Analog Amplifier

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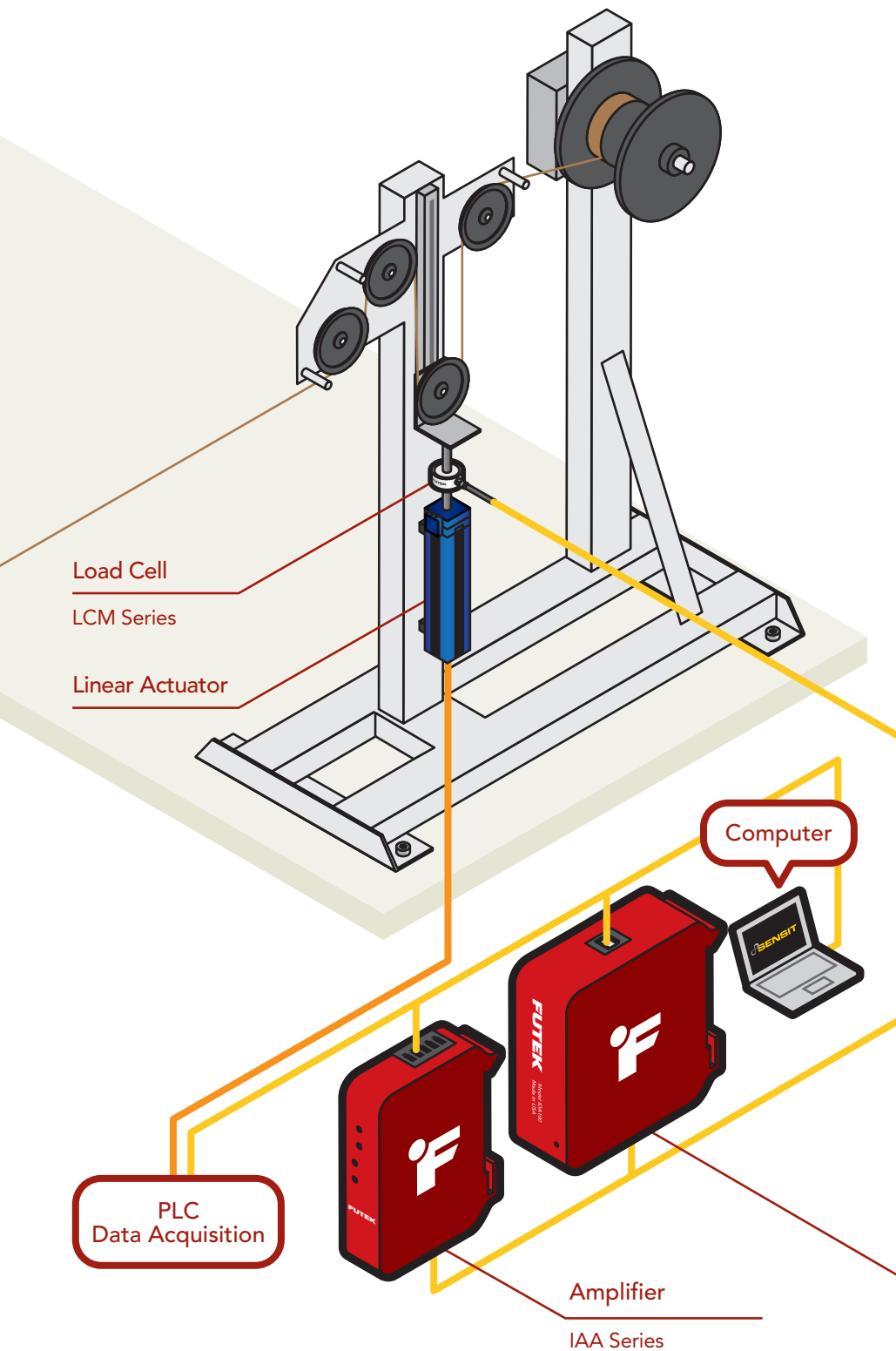
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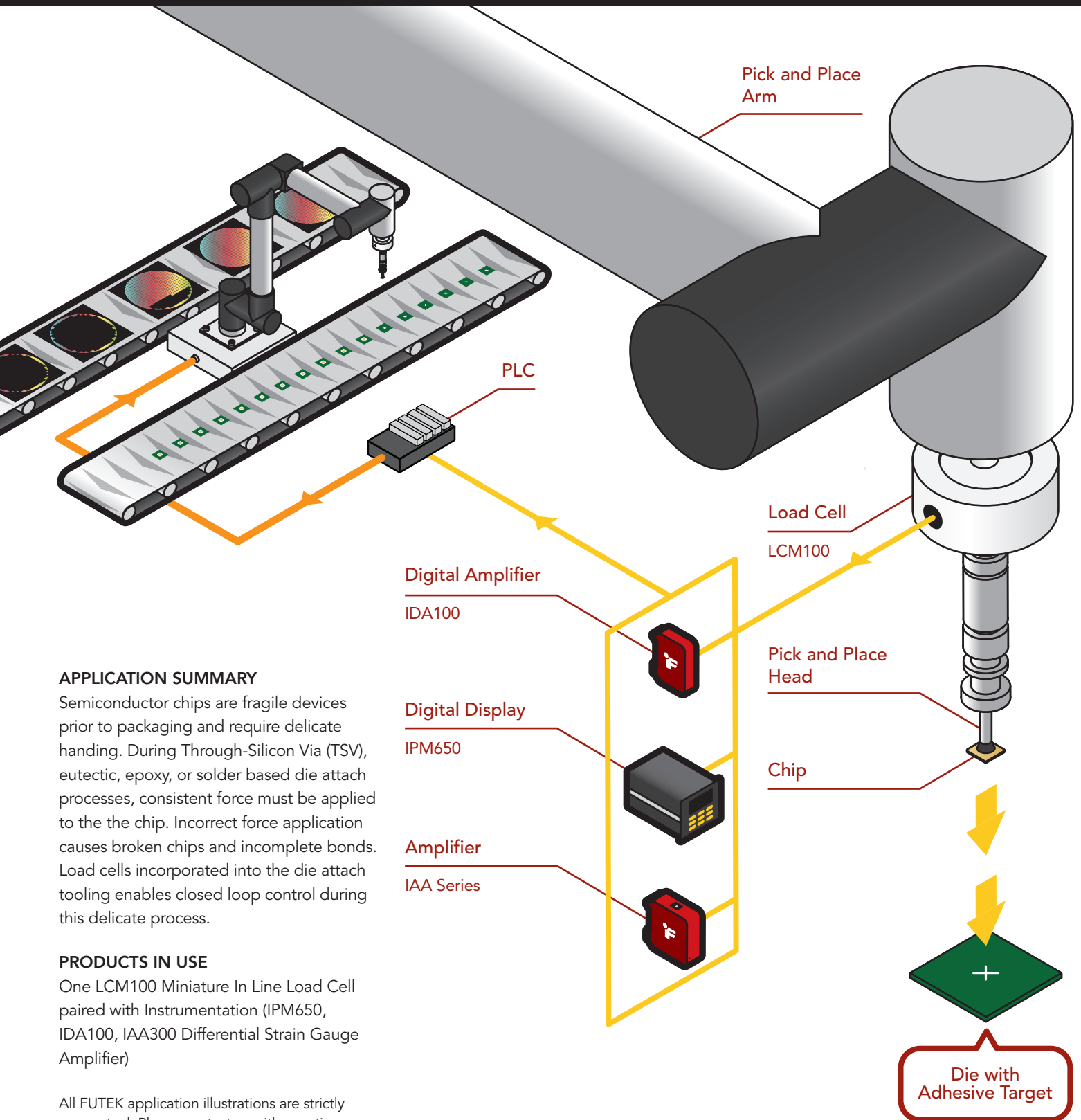
APPLICATION SUMMARY

Whether you are feeding a wire EDM machine, a wire stripper, or winding electric motor coils, precision wire tension is key to meet today's high performance standards. The key to precision wire tension control requires live monitoring of the wire tension. By utilizing a load cell in-line with the wire tensioner, a versatile wire tensioning system can be developed that can adapt to changing wire quality and conditions. Furthermore this adaptive system can maintain high coil winding quality and repeatability while maximizing process efficiency by preventing wire breakage.

PRODUCTS IN USE

1 In-Line Tension and Compression Load Cell (LCM Series) paired with Instrumentation (IAA Series or IDA100).

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APPLICATION SUMMARY

Semiconductor chips are fragile devices prior to packaging and require delicate handling. During Through-Silicon Via (TSV), eutectic, epoxy, or solder based die attach processes, consistent force must be applied to the the chip. Incorrect force application causes broken chips and incomplete bonds. Load cells incorporated into the die attach tooling enables closed loop control during this delicate process.

PRODUCTS IN USE

One LCM100 Miniature In Line Load Cell paired with Instrumentation (IPM650, IDA100, IAA300 Differential Strain Gauge Amplifier)

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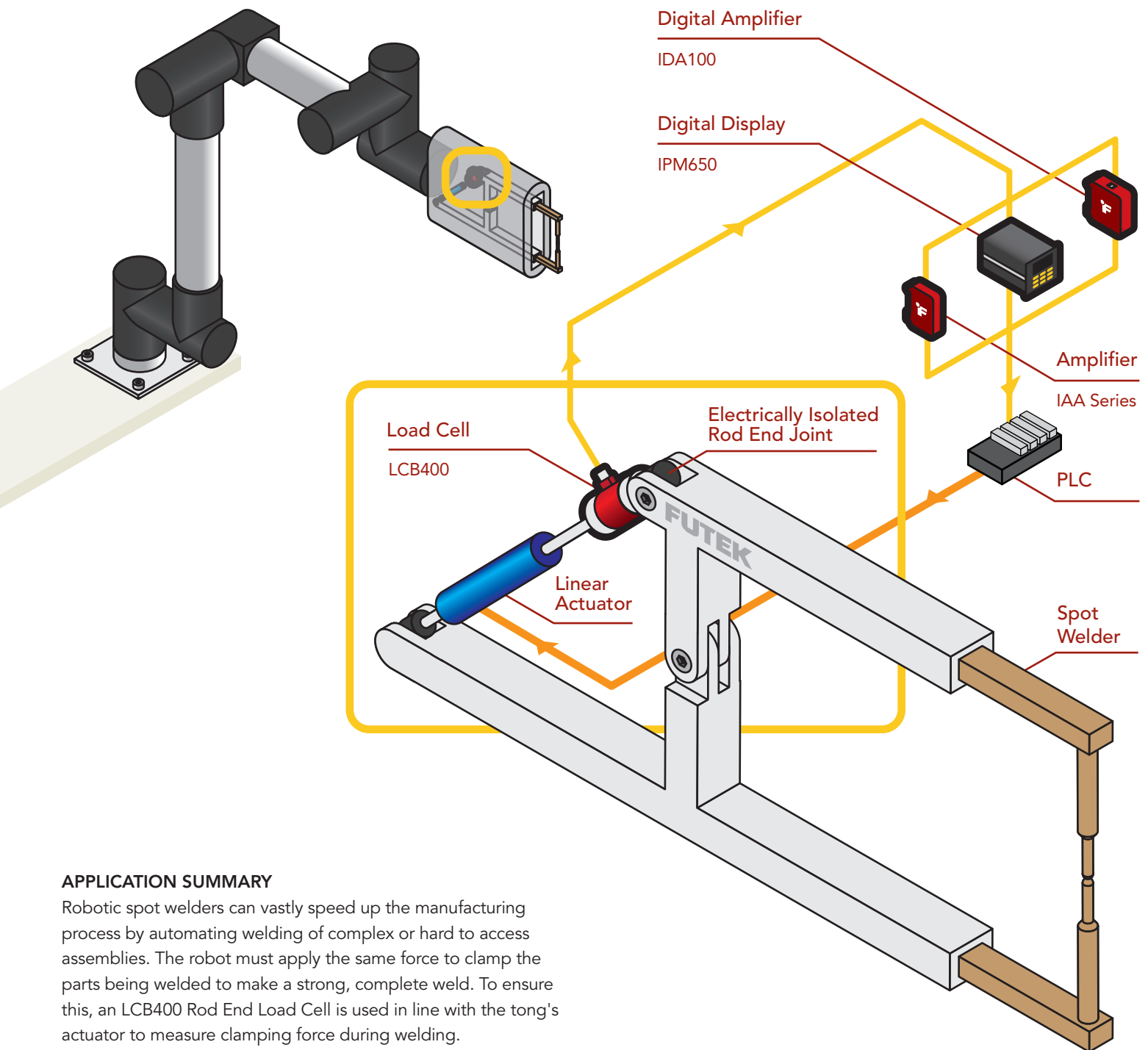
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APPLICATION SUMMARY

Robotic spot welders can vastly speed up the manufacturing process by automating welding of complex or hard to access assemblies. The robot must apply the same force to clamp the parts being welded to make a strong, complete weld. To ensure this, an LCB400 Rod End Load Cell is used in line with the tong's actuator to measure clamping force during welding.

PRODUCTS IN USE

One LCB400 Rod End Load Cell paired with Instrumentation (IAA Series or IDA100)

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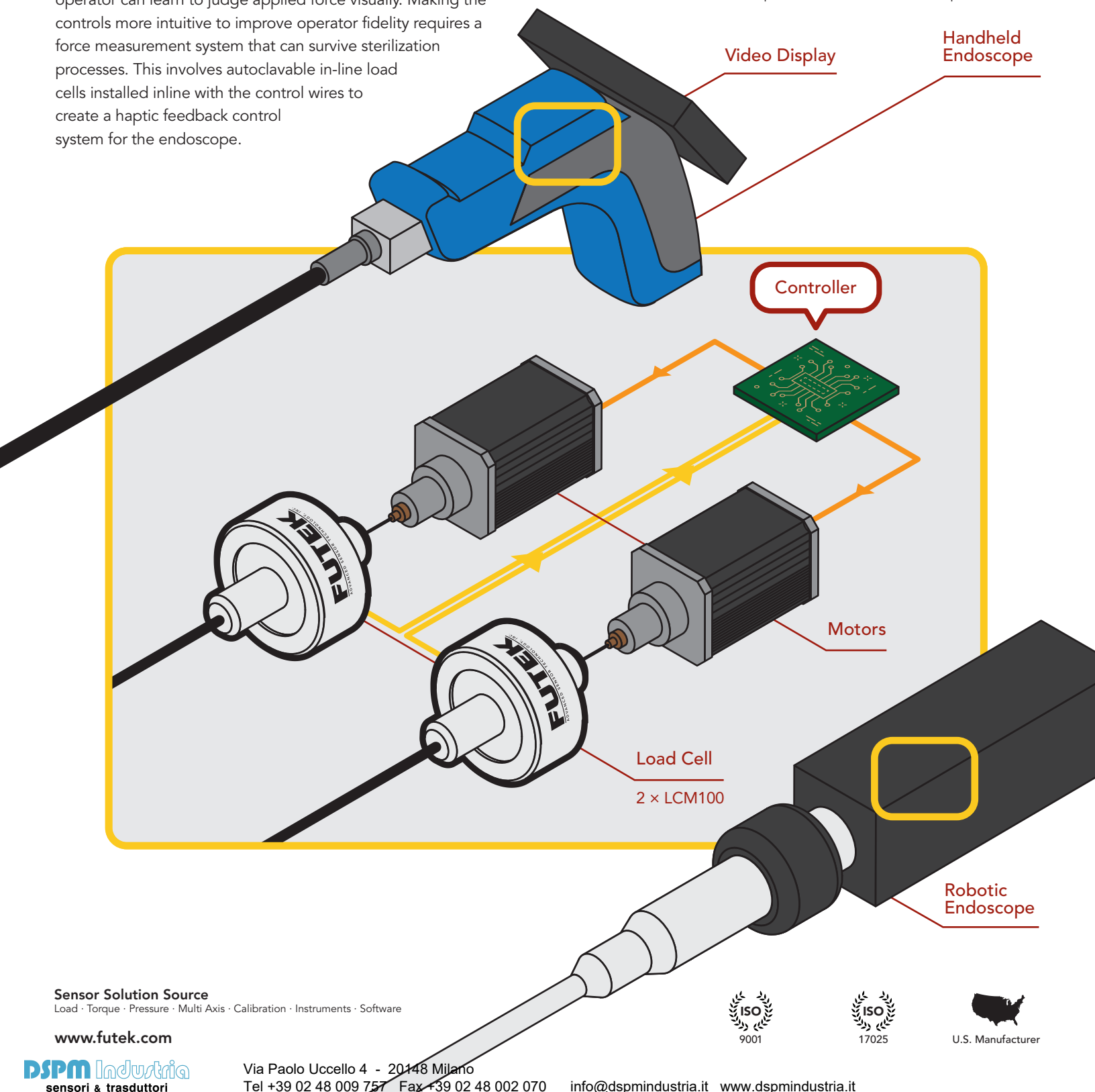
APPLICATION SUMMARY

Endoscopes allow doctors to see inside the patient to find anomalies during diagnostic, laparoscopic, or exploratory procedures. The movement of these devices are wire driven and provide little to no haptic feedback. This requires extensive training so that the operator can learn to judge applied force visually. Making the controls more intuitive to improve operator fidelity requires a force measurement system that can survive sterilization processes. This involves autoclavable in-line load cells installed inline with the control wires to create a haptic feedback control system for the endoscope.

PRODUCTS IN USE

Two Autoclavable In-line load cells

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