T20 - MagneMotion and iTRAK: Introduction to Independent Cart Technology
What is Independent Cart Technology?

- Game-changing technology
- Individual product motion control throughout your process
- Programmable position, speed, and acceleration
- Flexible with excellent reliability

Stop sacrificing flexibility for throughput – You can have both!
What is Independent Cart Technology?

- Game-changing technology
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Stop sacrificing flexibility for throughput – You can have both!
Independent Cart Technology (ICT) Benefits

Benefits

- Higher throughput
- Greater flexibility
- Increased uptime
- Smaller footprint
KUKA Pulse

- Installed at numerous automotive end users
- Key features:
  - Dramatic uptime improvement
  - Reduced maintenance
  - Faster production rates
  - Smaller footprint
- Uses QuickStick® HT
Cama IF318

- Best Future Machine Award, Interpack 2017
- Key features:
  - Lower changeover times
  - Reduced maintenance
  - Faster production rates
  - Smaller footprint
Technology Introduction
Technology Basis

- Magnets move over independently energized coils
  - Magnets and movers have no intelligence
  - Low moving mass maximizes energy efficiency
- Coils are stationary
  - No flexing cable wear or need for slip rings
  - Reduces wear items and maintenance
- Absolute positions are measured with closed-loop servo control
- Technology can be applied to straight motors, curved motors, or mixed to create merge/diverge
Control and Power Architectures

- Integrated control and power electronics
  - Reduces wiring between motors, control, feedback
- Single communication cable back to the controller
  - EtherNet/IP network used between controller and track system
  - Additional communications within the track system
- Power is daisy-chained between motors
- DC power supplies can be added as needed
System Control

Fire and Forget (Asynchronous)
- Destination Based Programming
  - Where to go without “how”
  - Like using a taxi
- Focus on adding value at the stopping points
  - Path planning is handled by system
  - Anti-collision and automatic queuing
  - Scalable to many movers and motors
- Standard on all MagneMotion® products

SYNC IT™ (Synchronous)
- Motion Profile Programming
  - How to get there
  - Like driving a car
- Focus on adding value during the movement
  - Fully programmable motion profiles
  - High dynamic performance
  - Easy synchronization to other axes
- Standard iTRAK®, option for MagneMotion®
Standard Product Portfolio
Independent Cart Product Portfolio

MagneMover® Lite

QuickStick

QuickStick® HT™

iTRAK® SYSTEM

Custom Products for Heavy Industries
MagneMover LITE

- High modularity for small payloads
- Easy design, setup, and maintenance
- Integrated switching and guidance
- Rail and cart options for different payloads and applications
QuickStick Family

- Higher thrust and speeds
  - Hundreds to thousands of kilograms
- Flexible layout with variable motor spacing provides cost efficiencies
- Customer designed bearings and tracks ideal for optimized carriage costs
- Easily supports switching

https://youtu.be/jVCZf9jkUs
iTRAK Intelligent Track System

- Deterministic closed-loop servo performance
- Automatic synchronization with other motion axes
- High dynamic performance and force
- Precision bearing system integration
Which Product to Apply

**Target Payload**

- **MagneMover LITE**
- **iTRAK**
- **QuickStick**
- **QuickStick HT**

<table>
<thead>
<tr>
<th>Payload</th>
<th>MagneMover LITE</th>
<th>iTRAK</th>
<th>QuickStick</th>
<th>QuickStick HT</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 kg</td>
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**Speed**

- **MagneMover LITE**
- **iTRAK**
- **QuickStick**
- **QuickStick HT**

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<th>iTRAK</th>
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<tbody>
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**Minimum Pitch**

- **MagneMover LITE**
- **iTRAK**
- **QuickStick**
- **QuickStick HT**

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<tbody>
<tr>
<td>10 mm</td>
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<td>1000+ mm</td>
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**Tightest Precision***

- **MagneMover LITE**
- **iTRAK**
- **QuickStick**
- **QuickStick HT**

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*Single Mover – Single Point Stop Repeatability to Nominal Tracking Error*
Industries and Applications
Focus Industries

- Food and Beverage
- Life Science
- Consumer Products
- Automotive
- Material Handling
- Entertainment
Automotive

Higher Throughput  Greater Flexibility  Increased Uptime  Smaller Footprint
“QuickStick HT is twice as fast, has 1/10 the parts, zero external locating devices, uses less power, has greater MTBF yet significantly lower MTTR all while being more flexible. These are the main things our customer base measures us on and we hit home runs on every count.”

- Kevin Laurence, Process Manager, KUKA Systems North America
KUKA Pulse Benefits Created by ICT

“QuickStick HT is twice as fast…”  →  Independent Cart Motion and High Acceleration

“…has 1/10th the parts…”  →  Modular Architecture

“…zero external locating devices…”  →  Independent Cart Motion and Absolute Positioning

“…uses less power…”  →  Power Applied as Needed to Minimal Moving Mass

“…greater MTBF…”  →  Simple Moving Carts and Rugged Stationary Components

“…yet significantly lower MTTR…”  →  Modular Architecture

“…all while being more flexible.”  →  Independent Cart Motion
Additional Automotive Examples

- **Electronics assembly**
  - Camera assemblies
  - Sensor assemblies

- **Power train**
  - Piston assemblies
  - Spark plug test

- **Cooling systems**
  - Pump assembly

- **Mold tending**
  - Transporting castings to trimming machines
Consumer Products

Highlighted Application Benefits
- Higher throughput
- High multi-format capability
- Easy changeover
- Energy-efficient

Higher Throughput | Greater Flexibility | Increased Uptime | Smaller Footprint
STAX Ultima Roll Wrapper

- Next generation roll wrapper
- Perfect shape of packs even at 200 rolls per minute
- Supports 60 packaging formats
- Fastest changeover time
- 40% less energy consumption over conventional models
Optima Nonwovens and Integina

- Nearly double throughput up to 1,200 diapers per minute
- Fast changeover time (<30 min)
- Improved reliability and fewer spare parts
- Flexibility to change package formats
Food and Beverage

Highlighted Application Benefits
- Flexibility to handle different products and formats
- Cleanliness
- Easy changeover
- Footprint flexibility

Higher Throughput  Greater Flexibility  Increased Uptime  Smaller Footprint
Weber

- Shuttle system from meat/cheese slicers to packaging line
- High asset and floor space utilization
- Gentle and fast transport
- Fast new product creation with little changeover
Cloud Packaging

- CloudTRAC Pouching machine
- Accepts wide range of pouch sizes
- Rapid changeover (~1 minute)
- 120 pouches / minute
- Small footprint
Highlighted Application Benefits

- Track and Trace
- Cleanliness
- Scalability
- Optimized process stations

Higher Throughput
Greater Flexibility
Increased Uptime
Smaller Footprint
ARUP Laboratories

- Routes and tracks thousands of unique test samples through lab test process
- High speed
- High reliability
- Low maintenance
- Flexible and expandable
R. Weiss Pharmaceuticals

- Top load form, fill, and seal solution
- Balances work in parallel via independent carts to achieve 300 products per minute and minimize footprint
- Modular and flexible
- Clean and excellent reliability
Solutions and Services
Solution Engineering and Services

- Standard products
  - Catalog numbers available off-the-shelf
- Solutions engineering by contract
  - Customized and tailored to the application
  - Mechanical
    - Bearings, mounting, cable routing, ingress protection, switching
- Software
  - Features, application programming
- Services
  - Field support, phone support, system safety analysis, training
Engage and Next Steps

- See these videos and more on YouTube
- Consider the ways your factory can be improved with this technology
- Schedule time with your Rockwell Automation sales representative

VISIT MAGNEMOTION.COM AND FILL OUT AN INQUIRY FORM
It works for iTRAK and MagneMotion ICT products!
Thank You!