



Promega Corporation  
**An Improved Capillary Electrophoresis System for Human Identification**

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The Power to Solve... *from sample to analysis*



**New Technologies for Forensic DNA Typing**

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**New Technologies**

**NGS** Power to squeeze more data from an individual sample



Ease, Portability and Speed to take forensics to new places  
**Rapid DNA**

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**Rapid DNA Technology for Forensic Laboratories**

+	<p><u>Advantages</u></p> <ul style="list-style-type: none"> <li>- Fast turnaround time</li> <li>- Integrated workflow eliminates need for extraction</li> <li>- Portable</li> </ul>	<p><u>Disadvantages</u></p> <ul style="list-style-type: none"> <li>- Very low throughput</li> <li>- Expensive</li> <li>- Limited information from sample</li> <li>- Not suited for casework samples</li> </ul>	<p><u>Uses</u></p> <ul style="list-style-type: none"> <li>• Temporary or remote installations; booking facilities</li> <li>• Rush processing of reference samples</li> </ul>

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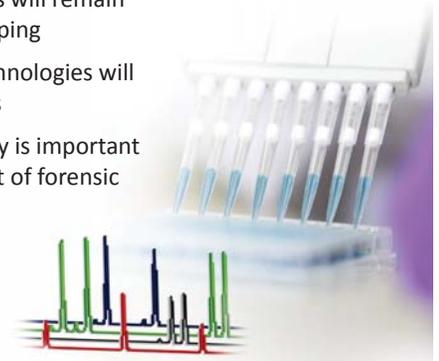
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## NGS Technology for Forensic Laboratories

Advantages	Disadvantages	Uses
<ul style="list-style-type: none"> <li>- More markers per system</li> <li>- Genotyping based on length and sequence</li> <li>- Detect SNP variations in markers and flanking areas</li> </ul>	<ul style="list-style-type: none"> <li>- Long turnaround time</li> <li>- High bioinformatics effort; steep learning curve</li> <li>- Expensive</li> <li>- Sample pooling needed to reduce cost per sample</li> <li>- More complex workflow</li> </ul>	<ul style="list-style-type: none"> <li>• Cases with limited investigative leads</li> <li>• Highly challenging samples</li> <li>• Labs with capacity for supplementary techniques</li> </ul>

## Improving Forensic DNA Typing Technology

- Capillary electrophoresis will remain the workhorse of STR typing
- Rapid DNA and NGS technologies will be complementary tools
- Advancing CE technology is important for further improvement of forensic DNA typing





### Spectrum CE System Product Overview

Instrument, Consumables, and 8-Color PowerPlex® System

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## Primary Development Goals

- Improve workflow efficiency
  - 4-plate capacity
  - Continuously accessible plates
- Provide more information from samples with 8-color STR systems
- Offer a **choice** in CE instrumentation



### Instrument Operation:

#### Unobstructed Access

Upper door operation allows easy access to instrument and computer



### Instrument Operation:

#### Continuous Access

- Plate access is separate from electrophoresis
  - Robotic arm transfers plate when needed
- Continuous access to plates not currently being injected
  - Fewer schedule conflicts
- Four-plate capacity
  - Running partial plates is more justifiable



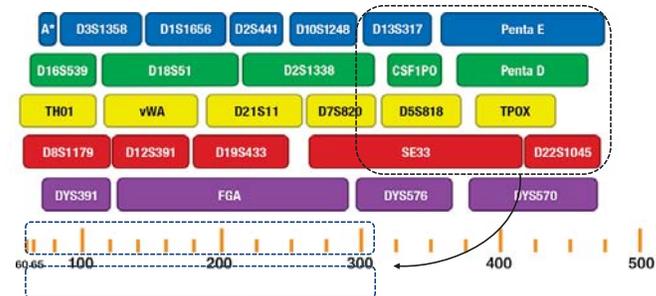
### Instrument Operation:

#### Barcode Detection and Plate Map Import

- Spectrum Plate Base and Retainer does not obscure plate barcode
- Integral plate barcode readers
  - Automatically record plate barcode
  - Import sample "plate map"
- Reduces potential error
- Simplifies run initiation process



### 8 Colors = Better Results from More Information

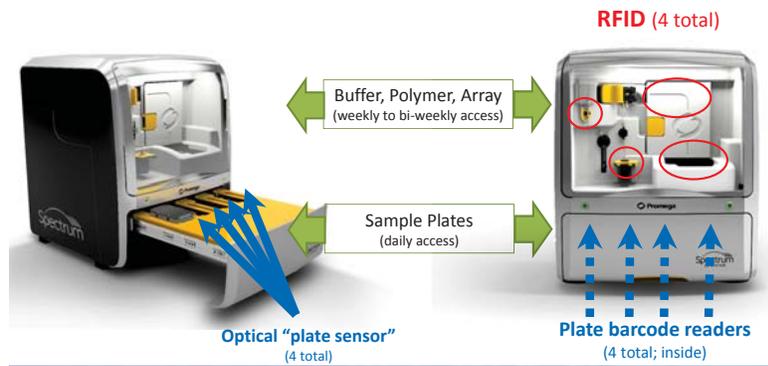


## Consumables

Spectrum-Specific	General Purpose
<ul style="list-style-type: none"> <li>Capillary arrays*                             <ul style="list-style-type: none"> <li>8- and 24-capillary</li> </ul> </li> <li>Polymer &amp; wash pouches*</li> <li>Buffer*                             <ul style="list-style-type: none"> <li>Anode &amp; cathode troughs</li> <li>Cathode septamat</li> </ul> </li> <li>Plate base &amp; retainer</li> </ul> <p>* RFID-tracked</p>	<ul style="list-style-type: none"> <li>Plates</li> <li>Plate septamats</li> <li>Formamide</li> <li>Plate caps for PCR</li> <li>Optical plate seals for qPCR</li> </ul>

## Consumables & Operations Overview

Spectrum consumables vs sample plates – Placement



## Instrument Interface and Data Analysis:

Spectrum Control Software and GeneMarker®HID Software

- Spectrum Control Software (SCS):
  - Calibrates, supports maintenance, runs plates, collects data, creates export sample files, etc.
  - Accepts existing plate map import formats
- GeneMarker®HID Software (SoftGenetics):
  - Allows full project creation, sizes alleles, "calls" alleles, and displays/prints data

GeneMarker® HID  
Human Identity Software

Spectrum  
CE SYSTEM

## Workflow – Data Analysis

- Samples are automatically exported as ".promega" files
  - 1 well = 1 ".promega" file
- GeneMarker®HID start options:
  - Open GeneMarker®HID and import ".promega" files as a new project
  - Double click on an individual ".promega" file to launch GeneMarkerHID
- Review your Spectrum data in GeneMarker®HID

## GeneMarker®HID Software for the Spectrum CE System

- Supports analysis of:
  - Spectrum *and* existing CE data (.fsa and .hid)
  - Promega *and* non-Promega STR kits
- Several important modules included
  - NDIS-approved expert system
  - Mixture assessment, contamination check, kinship analysis, etc.
- **Spectrum users will receive full GeneMarker®HID support from Promega**



## Service, Training, and Validation Support

- Instrument installation by Promega-certified engineer
- On-site training for instrument, software, and application
- Validation support
  - On-site and remote consultation and analysis service
- On-site repair and preventative maintenance



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## Product Overview

*What is included?*

- Instrument
  - UPS will be specified and recommended
- Computer (keyboard, mouse, large monitor, computer case)
- Software (1 license of each)
  - Spectrum Control Software (instrument) and
  - GeneMarker®HID analysis software (SoftGenetics)\*



\*Instrument workstation-specific version

## Product Overview

*What is included in a purchase?*

Consumables/accessories:

- array
- polymer
- buffer (2)
- wash solution
- cathode septamats (2)
- septamats (10)
- plates (10)
- plate base/retainer (4)
- formamide



Support:

- Install service and user training
- 12 months of on-site repair service including one preventative maintenance visit, where applicable



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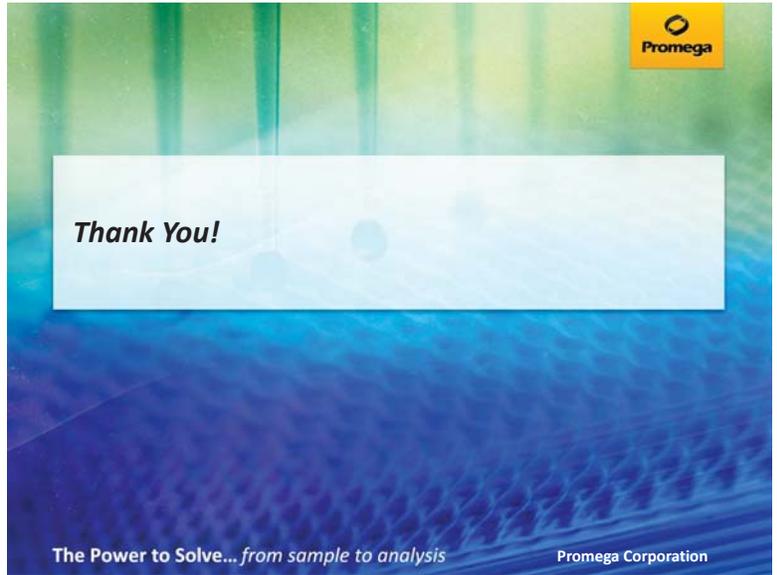
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SpectrumInfo](http://www.Promega.com/SpectrumInfo)



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