



# DSY

Automated System

**DYNEX Technologies, Inc.**  
A Capital Genomix Company

# DSX™ Automated System



## The leading light in microplate automation.

*The DSX is a fully automated 4-plate processing system capable of performing multiple assays per plate. The DSX employs a modular design that provides flexible configuration, and has been developed with ease of use in mind. The DSX incorporates many features to ensure the quality and security of results, and has the performance to handle a wide variety of assays. Simply put, the DSX offers flexible and reliable sample-in/result-out processing for true walk-away automation.*

## Modularity

The DSX modular design facilitates upgrades, repairs and reconfiguration. Each module can be installed and removed quickly and easily. The following modules are available for the DSX:

- *Reader*
- *Washer*
- *Incubators (space for 4)*
- *Sample ID*
- *Ambient Drawer*
- *Electronics Pod (standard)*



*The DSX modular design simplifies upgrades and repairs.*

### Modularity provides:

**Simple upgrades.** As your needs grow, the DSX can be easily upgraded by sliding a new module into an already existing position. The DSX software automatically recognizes the new module.

**Simple repairs.** To keep your critical assays running, Dynex offers service turn around as quick as 24 hours. You save both time and money with rapid repairs that do not require a service technician. All it takes is:

- *Calling DYNEX for a replacement module.*
- *DYNEX will ship the module by express service.*
- *Replacing the module in minutes.*

## Ease of Use

The DSX is simple to install, simple to set up and simple to use. Installation, programming, assay set up and daily maintenance are all designed to keep you focused on your results, not on the instrument.

- **Installation.** The DSX can be installed in less than an hour.
- **Software.** Revelation™ data analysis software offers a graphical user interface with intuitive Windows®-based operation. The following advanced features facilitate running assays:
  - *The Data Reduction Wizard simplifies programming even complex assay configurations and calculations.*
  - *On-line Help is available at all steps of setting up or programming your assays.*
- **Worklist Set Up.** The Worklist Load Wizard walks you through setting up the DSX work list, showing graphically where to place your reagents, samples and plates at the beginning of each run.



*The DSX simplifies workload setup by walking you through where to load consumables and samples*

- **Maintenance.** You can complete daily maintenance in less than five minutes, including removal of consumables and rinsing the washer. The DSX provides maintenance reminders so you know what maintenance and verification the system may need over time.



*The DSX robotic arm moves microplates and pipettes all sample and reagents.*

## Assay Performance

**Pipetting Precision.** The pipette uses disposable tips ensure zero carry over.

Pipette precision and accuracy:

|             | Precision<br><small>(relative to SD)</small> | Accuracy<br><small>(delivered volume within 2% nominal)</small> |
|-------------|--|---|
| Sample tip  | <3% @ 10 ml                                  | +/- 2% @ 10 ml accuracy   |
| Reagent tip | <3% @ 50 ml                                  | +/- 2% @ 50 ml accuracy   |

Rapid pipetting speed minimizes assay drift, ensuring consistent results across the plate and plate to plate.

| Pipetting Task            | Speed       |
|---------------------------|-------------|
| 50 µl reagent to 96 wells | < 2 minutes |
| 50 µl samples to 96 wells | <12 minutes |
| Cycle time per sample     | 8 seconds   |

**Consistent Washing.** The washer module gives consistent results and lowers overall CVs. Several user-definable options provide significant programming flexibility:

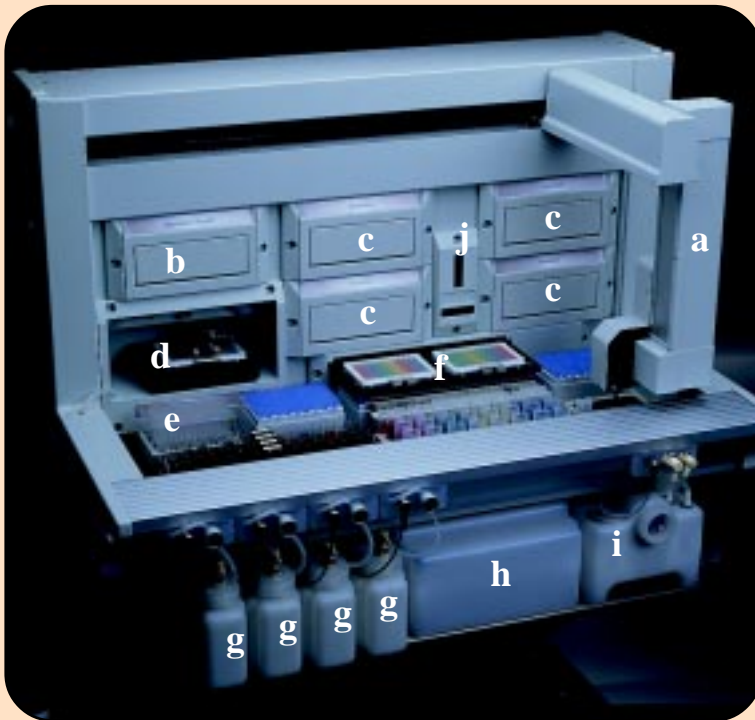
- Plate-specific height settings
- Super Sweep mode aspirates liquid in both the X- and Y-axis of plate wells to leave minimal residual volume.
- Well-bottom washing lowers the dispensers to clean the base of each well more vigorously.
- Critical washer timing can mimic manual wash steps.

**Environmental Control.** The dark cover extends over entire work area of the DSX, locking in place during operation. This cover:

- Protects samples, reagents and reactions from exposure to common environmental contaminants such as light, dust or alkaline phosphatase.
- Eliminates assay interruptions for placing or removing light-sensitive reagents.
- Contains any potential washer aerosols.



*The dark cover protects your reagents and reactions from environmental contaminants, securely locking during the entire assay run.*



## The DSX System

- a. Robotic arm
- b. Reader
- c. Incubators
- d. Washer
- e. Samples
- f. Ambient drawer
- g. Washer bottles
- h. Tip disposal
- i. Liquid waste disposal
- j. Sample identification



## QC Features / Process Security

**Revelation™ Software.** Revelation offers powerful QC equations that monitor daily assays. Revelation incorporates Levey-Jennings statistical analysis; as part of the onboard comprehensive QC monitoring of assay performance.

**LIMS Interface.** The LIS-Link application is an optional software package that can be installed on the DSX PC. The LIS-Link application allows the DSX to communicate with the laboratory host computer to download pending test orders and to upload completed assay results.

**Learned error recovery.** To support walk-away automation, you can train the DSX to perform appropriate error recovery actions if an error condition is detected.

**Cover Lock.** The dark cover locks automatically when the DSX begins to run, protecting reagents from room light and protecting both samples and reagents from interference.

**Sample Identification.** An onboard barcode reader tracks samples and plates in process.

**Alarms.** “Wash buffer low” and “waste full” alarms.

**Pipette Security.** Fluid level sensing, tip detection, tip-ejection and clot detection functions protect your assay as well as the DSX robotic pipette.



*Revelation software incorporates Levey-Jennings statistical analysis.*

## DSX Specifications

### Dimensions

|            | Metric         | Non-Metric |
|------------|----------------|------------|
| Width :    | <1060 mm       | 42"        |
| Depth:     | <910 mm        | 36"        |
| Height:    | <800 mm        | 32"        |
| Footprint: | <1060 x 610 mm | 42" x 24"  |
| Weight:    | 110 kg         | 243 lbs    |

### Power Supply Requirements

|                    |                                      |
|--------------------|--------------------------------------|
| Voltage:           | 100 – 240V automatic conversion      |
| Frequency:         | 50/60Hz                              |
| Power consumption: | <800 VA<br>"on-line" UPS recommended |

### Reader Specifications

|                 |   |
|-----------------|---|
| Optic Range:    | 0.000 to 3.500 OD   |
| Dynamic Range:  | 0.000 to 3.000 OD   |
| Spectral Range: | 405nm to 690nm  |
| Precision:      | ±0.010 OD at 0.000 to 0.500 OD<br><1% CV at 0.501 to 2.000 OD<br><1.5% at 2.001 to 2.500 OD |
| Linearity:      | ±1% at 0.000 to 2.500 OD<br>≤1.5% at >2.500 OD  |
| Accuracy:       | ≤0.01 OD or 2.5%<br>(0.000 to 3.000 OD) whichever is greater                                |
| Read Time:      | <10 seconds, single wavelength<br><20 seconds, dual wavelength                              |

### Washer Specifications

|                         |  |
|-------------------------|--|
| Manifold configuration: | 8-way wash head  |
| Programmable volumes:   | 50 – 999 µl  |
| Wash containers:        | 4 wash bottles at 2.0 L, with level-sensing                |
| Waste Container:        | 8 L with waste full sensor                                 |
| Residual wash volume:   | <3 µl per well with dual-axis sweep in a flat-bottom plate |
| Dispense precision:     | <5% CV (with 300 µl in a 96 well plate)                    |

### Incubator Specifications

|                       |                               |
|-----------------------|-------------------------------|
| Number of incubators: | Up to 4                       |
| Temperature range:    | RT + 7°C to 50° C             |
| Temperature Accuracy: | ± 1° C                        |
| Shaking:              | >15 Hz periodic or continuous |

## Pipetting Specifications

|                                     |  |
|-------------------------------------|--|
| Number of plates:                   | 4  |
| Number of assays:                   | 1 assay per strip or up to 12 assays per plate |
| Number of sample tubes:             | 96   |
| Number of reagents:                 | 24   |
| Number of standard/control bottles: | 33   |
| Number of pipettes:                 | 1  |

### Sample Pipetting

|  |   |
|--|---|
| Sample tip size:   | 300 µl  |
| Sample pipetting volume:                                     | 5– 250 µl<br>5 – 250 µl single shot mode<br>25 – 100 µl multi-shot                          |
| Estimated cycle time for sample pickup to delivery on plate: | <8 seconds  |
| Time to dispense:  | 15 minutes (typical)^<br>50 µl of 96 samples to plate from sample tubes or deep well plates |
| Sampling time w/dilutions:                                   | <26 minutes<br>Example: 2 stage dilution, 20 µl sample to 400 µl buffer in <26 minutes      |
| Single-shot sample pipetting precision:                      | <3% CV at any volume in operating range for 10 successive dispenses                         |
| Single-shot sample pipetting accuracy:                       | ±2% of target volume at any operating volume above 10 µl *                                  |
| Dilution range:  | part in 190 one-stage dilution, 1 part in 36,100 two stage dilution                         |
| Number of sample tips loaded:                                | 4 racks of 108  |
| Sample tube dimensions:                                      | 12 – 16 mm diameter external dimension, 55 – 100 mm depth                                   |

### Reagent Pipetting

|                              |  |
|------------------------------|--|
| Reagent tip size :           | 1300 µl  |
| Number of reagent tips:      | 41   |
| Reagent pipetting volume:    | 25 – 1000 µl for single shot, 25 – 500 µl multi-shot           |
| Reagent pipetting precision: | 3% CV at 10 shots at any volume in operating range above 25 µl |
| Reagent pipetting accuracy:  | ±2% of target volume in operating range                        |

# DYNEX

TECHNOLOGIES

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