illumina*Dx*™

BeadXpress® System

Illumina's BeadXpress system is an FDA-cleared in vitro diagnostic* device for the simultaneous detection of multiple analytes in a sample utilizing VeraCode® holographic microbead technology.

Highlights

- **Broadest multiplexing range:** Supports simultaneous detection of multiple analytes, from one to several hundred
- **Assay versatility:** Performs a wide range of applications, including DNA, RNA, and protein-based assays on a single platform
- **Superb data quality:** Enables industry-leading measurement density and sensitivity through the stringency of code detection
- **Dual-color laser system:** Analyzes single as well as true dual-color detection assays

Introduction

Illumina's BeadXpress Reader was specifically developed to analyze bioassay applications using the versatile VeraCode technology. With the broadest multiplexing range in the industry, the BeadXpress Reader is the optimal solution for small and high-throughput laboratories conducting molecular testing applications that benefit from robust, multiplexed-based assays.

VeraCode technology presents a digital revolution for multiplex testing in genotyping, gene expression, and protein-based assays. The unique holographic code embedded in each VeraCode bead type delivers unparalleled data quality by enabling customizable tracking and providing an unprecedented level of data precision and verifiability.

Versatile and Robust

The BeadXpress Reader employs a dual-color laser detection system to identify the unique holographic code embedded in each VeraCode microbead and to detect the signal intensity associated with each bead. Because assays developed with VeraCode microbeads typically include up to 30 replicates of each bead type, the data generated by the BeadXpress Reader is particularly robust. For every sample, each microbead is optically scanned up to a dozen times, providing up to 300 independent data points for each analyte.

In addition to providing outstanding data quality for a broad spectrum of bioassays, the dual-laser BeadXpress Reader enhances the versatility of VeraCode technology by supporting robust single-color detection assays as well as two-color assays.

High Throughput

The BeadXpress Reader draws up eight samples at a time from a standard 96-well plate or 8-well strip and loads them onto the eight-chambered transparent groove plate that forms the bottom of the system's fluidic cell. Illumina's proprietary groove plate design creates a high-density, fixed array of microbeads amenable to rapid and accurate scanning. Through a unique combination of fluid flow, gravity, and capillary force, the VeraCode microbeads efficiently populate the groove plate and align closely within the grooves. Once the beads are aligned, the entire fluidic cell is actuated across the optical system and scanned for fluorescent intensity and code classification.

A two-color, ten-plex VeraCode assay can be scanned at a rate of 120 samples per hour, a 96-plex assay at a rate of 80 samples per hour. During scanning, the BeadXpress Reader acquires fluorescence data and associated code data for each microbead, compiles a virtual representation of the 96-well plate, and exports the data for downstream analysis with Illumina's VeraScan software.

Figure 1: BeadXpress Reader

The Illumina BeadXpress Reader employs a dual-color laser detection system to identify and analyze each VeraCode microbead.

*FDA cleared for in vitro diagnostics with specific VeraCode FDA cleared tests.

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Powerful and User-Friendly Analysis

Through a user-friendly graphical interface, VeraScan software allows control of the BeadXpress Reader, enabling users to load assays, perform real-time scans, and view scan data for up to 96 samples per run. The software is ideal for clinical laboratories as it includes administrator control of setting user specific accounts and rights, configuration of default file locations, and security options, including alerts via email. It also offers user-friendly customization of scanning protocols, enables acquisition and viewing of intensity data, report generation, and allows data extraction for application-specific data analysis modules. The software can also export data via *.csv and *.idat files.

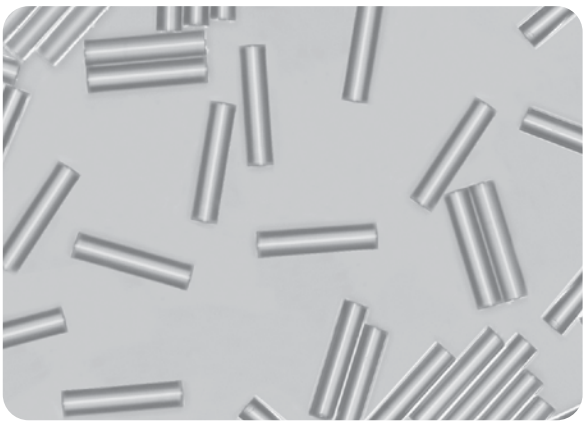
Complete System

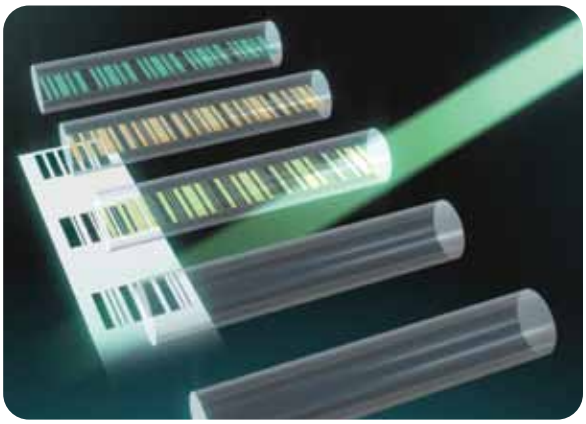
Included in the purchase of a BeadXpress Reader are:

- **1-year limited warranty**
- **PC**
- **VeraScan software**
- **BeadXpress starter kit, which includes a VorTemp incubating plate mixer and the VeraCode bead kitting system**
- **Onsite training by a field applications scientist**

The BeadXpress System

Figure 2: VeraCode MicroBead





VeraCode technology uses cylindrical glass microbeads measuring 240 microns in length by 28 microns in diameter, each inscribed with up to 24 bits of information. Millions of unique bead types can be made by embedding a limited number of unique combinations of overlapping holograms.

Illumina Systems and Software

BeadXpress Reader Specifications

Specifications	Requirements
Environmental Conditions	For indoor use only Altitude up to 2400 m Temperature range 15˚C to 30˚C Humidity: 20 to 80% RH
Electrical Ratings	90–260 V (AC), 2.0 A, 50/60 Hz, Class I
Physical Conditions	Overall dimensions: 47 cm (W) x 77 cm (D) x 62 cm (H) Weight: 57 kg
Laser Classification	Class I laser instrument housing two internal Class 3B lasers (IEC 60825-1, 1.2, 1993)
Laboratory Space	BeadXpress Reader: 47 cm (W) x 77 cm (D) x 72 cm (H) PC, keyboard, and monitor: 46 cm (W) x 40 cm (D) Sturdy bench that is level within ± 2 degrees
Access to Receiving Dock	BeadXpress Reader shipping crate: 76 cm (W) x 96.5 cm (D) x 86.5 cm (H) BeadXpress Reader shipping weight: 160 lbs PC box size: standard PC, keyboard, and monitor shipping weight: 60 lbs Waste container Note: Shipping weights include pallets
Power	Dedicated circuit BeadXpress Reader (110V): 15 A BeadXpress Reader (220V): 12 A Note: This includes the power needs for the PC; the BeadXpress Reader itself draws < 2 A
Sinks	Convenient access to a sink for waste disposal

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Ordering Information

Catalog No.	Product	Description
VC-101-1000/1001	BeadXpress System	Includes the BeadXpress Reader, reagent carrier, PC, VeraScan software, the BeadXpress starter kit, 1-year limited warranty, installation by a field service engineer, and 1-day onsite VeraCode technology basics training by a field applications scientist.
Extended Warranty Packages		
SV-201-1004	BeadXpress Premium Extended Warranty Plan	The premium warranty plan for the BeadXpress Reader provides the most complete service program from Illumina. This plan includes: • 48-hour guaranteed onsite response from a field service engineer • Two preventive maintenance visits per year • Unlimited field service calls
SV-201-2003	BeadXpress Plus Extended Warranty Plan	The plus warranty plan for the BeadXpress Reader includes: • 3-day guaranteed onsite response from a field service engineer • One preventive maintenance visit per year • Unlimited field service calls
SV-201-2002	BeadXpress Basic Extended Warranty Plan	The basic warranty plan for the BeadXpress Reader includes: • 5-day guaranteed onsite response from a field service engineer • Either one preventive maintenance visit per year or one emergency call per year • No additional field service calls

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FOR IN VITRO DIAGNOSTICS USE (U.S.A. ONLY)
Illumina's BeadXpress system has been cleared for in vitro diagnostic use in the U.S.A.
It has not been cleared for in vitro diagnostic use in any other country.
***FDA cleared for in vitro diagnostics with specific VeraCode FDA cleared tests.**

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