Pre-Installation Guide

# GenomeLab GeXP Genetic Analysis System

## Pre-Installation

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**Pre-Installation**
**GenomeLab GeXP Genetic Analysis System**

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# Revision History

**Fourth Revision, A32350AD, August 2014**

AB SCIEX branding boiler copy added to Front Cover and Back page.

AB SCIEX consolidation with Beckman Coulter insert added for SCIEX Separations.

Beckman Coulter changed to AB SCIEX on all pages except for Cover, Copyright, SCIEX Separations Insert, and Revision History pages.

Numerous changes made throughout the manual due to the GeXP software being updated to work with Windows 7.

# Table of Contents

# Overview

## 1.1 General Description

This manual details the necessary site preparation required before installing the GenomeLab GeXP Genetic Analysis system. Pay careful attention to the specifications and requirements described in this manual. Accurate and timely preparation allows the AB SCIEX Field Service Engineer to install the instrument efficiently upon arrival. The supplies you must have on hand prior to the installation of the instrument are specified. Also provided is a list of accessories available.

For your convenience, a "Preparation Check List" on page 3 is to help you prepare for the installation.

This “GenomeLab GeXP Genetic Analysis System Pre-installation Guide” covers:

- Pre-Installation Requirements
- Site Requirements
- Specifications
- Required Consumable Materials
- Additional Materials
- GenomeLab GeXP System Training

# Pre-Installation Requirements

## 2.1 Preparation Check List

The following is a summarized list of the requirements that must be addressed, and the components that must be obtained, prior to installation. To ensure a successful installation, please verify that the requirements have been fulfilled and that you have the system components listed below. When completed, contact your local AB SCIEX representative to schedule the installation.

- ❑ Appropriate table or bench ("Tabletop Space" on page 5)
- ❑ Suitable laboratory environment ("GenomeLab GeXP System Specifications" on page 7)
- ❑ Suitable power source (Table 1 on page 7)
- ❑ Consumable items (Table 3 on page 9 or Table 4 on page 10)
- ❑ Customer supplied equipment and materials (Table 5 on page 13)
- ❑ Training prerequisites met ("Training Plan" on page 15)

### Technical Support

If you encounter a problem that is not discussed in this guide and you need technical support, contact your local dealer, the provider of this product, or contact AB SCIEX directly by using the information below:

**NOTE** Whenever you call your local dealer or AB SCIEX, be sure to have your registration material, instrument serial number, and software version number available.

For future reference, record this information here.

| | |
|---|---|
| Instrument Serial Number: | |
| Software Version: | |
| Firmware Version: | |
| Dealer Name: | |
| Dealer Phone Number: | |
| Mailing Address: | |

# Site Requirements

## 3.1 Tabletop Space

The GenomeLab GeXP System is comprised of the following:

- GenomeLab GeXP Instrument
- IBM Controller (small form factor PC)
- 22-inch Monitor
- Keyboard
- Mouse

Figure 1 shows the overall system. Figure 2 shows the footprint and dimensions of the GenomeLab GeXP instrument. Use this information along with the "weight" entry in Table 1 on page 7 to select an appropriate table or bench for the system.

**CAUTION** Ensure that the system is placed on a surface that is level and strong enough to support in excess of 200 lbs.

### Ventilation

To provide adequate ventilation and convenient access to cabling, allow for ten inches on the left side (facing instrument) of the instrument as well as at the rear of the IBM PC. All other sides of the equipment should have a six inch clear space to ensure proper ventilation (see Figure 2 for the system dimensions).

**Figure 1 GenomeLab GeXP System Components**

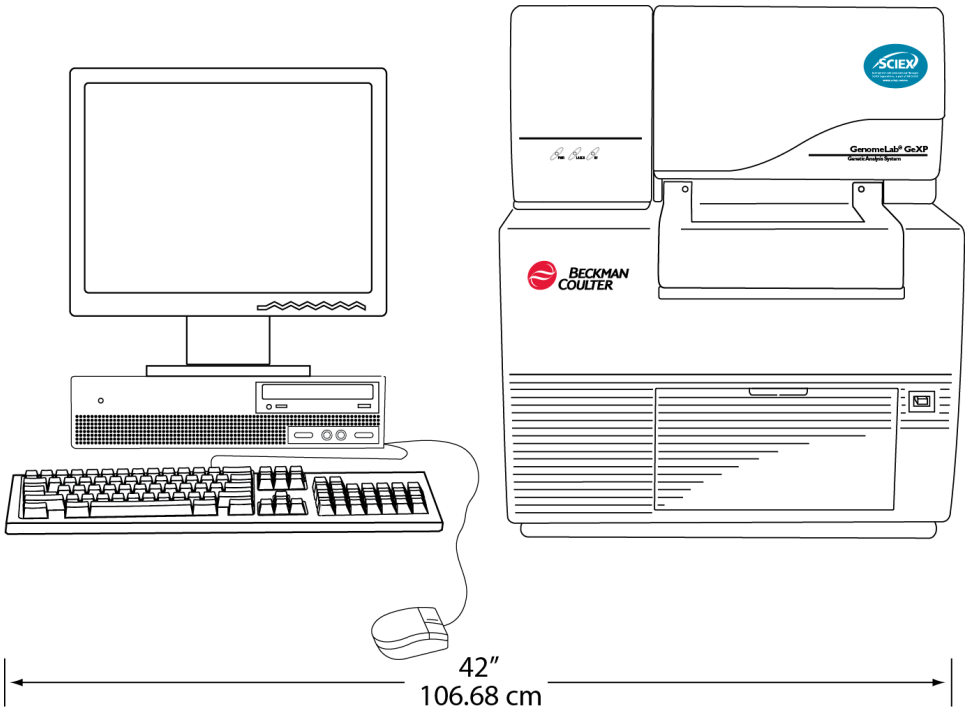
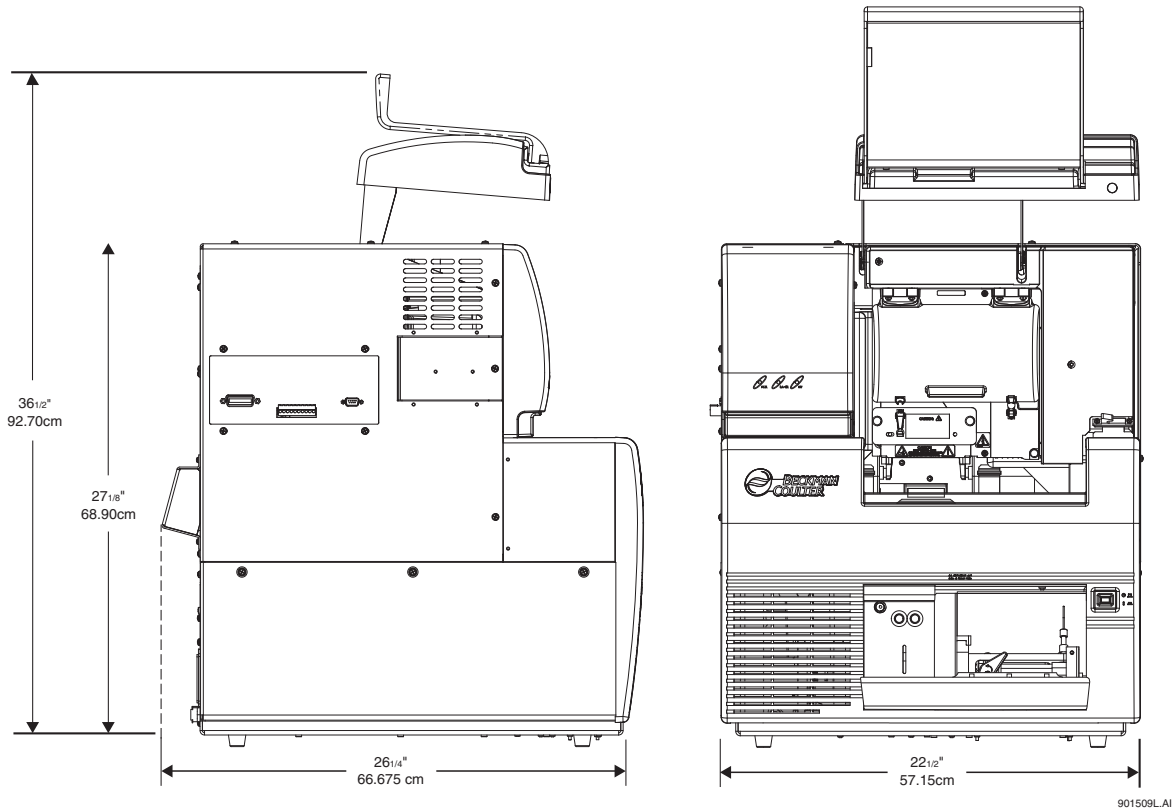


**Figure 2 GenomeLab GeXP Instrument Footprint and Dimensions**



# Specifications

## 4.1 GenomeLab GeXP System Specifications

Table 1 lists the specifications of the GenomeLab GeXP System. Use this information to prepare the environment where the system will be located.

**Table 1 System Specifications**

| Item | Description |
|---|---|
| Environment | Indoor use only |
| Weight<br>(GenomeLab GeXP) | 81.8 Kg (180 lbs) |
| Power Requirements | **CAUTION** The supply voltage must not exceed 10% of nominal. |
| GenomeLab GeXP | 100-240VAC, 5.0A, 50/60Hz |
| PC (typical) | 6.0A, 50/60Hz |
| Monitor (17" typical) | 1.8A, 50/60Hz |
| Hub (typical) | 120VAC/60Hz and 220VAC/60Hz |
| Fuses (GenomeLab GeXP) | 6.3A Time Delay; 20mm (2 ea.); 200-240VAC |
| Maximum Heat Dissipation<br>(to room) | |
| GenomeLab GeXP | 400W (1365 BTUs/Hour) |
| PC and Monitor | 936W (3194 BTUs/Hour) |
| Internet | All network connections via RJ-45 connector ports and CAT 5 cables for Local Area Network (LAN) Ethernet with access to the Internet. |
| Ambient Operating Temperature Range | 15-30°C (59-86°F) |
| Humidity Restrictions | <85% (non-condensing) @ 30°C (86°F) |
| Altitude Restrictions | up to 2000m (6,562ft) |
| PC<br>(small form-factor PC) | AB SCIEX certified controller.<br>For specific features, contact your local AB SCIEX representative. |
| Installation Category | Category II |
| Pollution Degree | 2 |
| Sound Pressure Level | Maximum Sound Pressure: 73 dB<br>Maximum Sound Pressure at 1 Meter away: 67 dB |
| Laser Category<br>  | Class 1<br><br>This instrument uses a "Class 3B" laser. The laser is housed in a sealed container. During normal operation of the system, laser light is not accessible to the user. Therefore, overall laser classification of the sequencer is "Class 1." |

## EMI Effect on GenomeLab GeXP Performance and Recommended Mitigations

Under the test conditions specified by the European normative electromagnetic compatibility standard EN 61326-1, the GenomeLab instrument may exhibit temporary degradations in performance in accordance with Table 2 below.

Because the environmental circumstances contributing to the problem can vary, several different mitigation techniques have been provided that should help eliminate or reduce the interference

**Table 2 EMI Effect on GenomeLab GeXP Performance and Recommended Mitigations.**

| Test Condition | Effect on Performance | Mitigation |
|---|---|---|
| Radio Frequency Field Interference (RFI) System exposed to electromagnetic field strengths of greater than or equal to 3 V / m at multiple frequency bands. | May cause temporary degradation of base calling accuracy. In some cases, significant noise will appear in the measured results. Will return to normal performance once exposure is removed. | • Re-run sample.<br>• Move location of the product by several meters.<br>• Change the orientation of the equipment by 90 degrees.<br>• Avoid using transmitters or cellular phones within 1 meter of the equipment.<br>• Review the temperatures in the run log for any anomalies and re-run as necessary. |
| | May cause temporary loss of capillary temperature control resulting in lower than expected capillary temperature. Affect will be documented in the run log. Will return to normal performance once exposure is removed. | |
| | May cause temporary loss of capillary temperature control resulting in run not being initiated because temperature cannot reach desired level. | • Apply mitigation techniques above.<br>• Disabling the temperature limit feature in the Method Edit screen (Capillary Temperature box) will allow the run to be performed without desired temperature being reached. |

**CAUTION** The GenomeLab GeXP system requires five grounded electrical receptacles. The power line to the laboratory should be connected directly from a main power line transformer of a power source that is known to be clear of erratic power loads, spikes and electromagnetic interference.

**CAUTION** Power lines used with this system must have an adequate reserve capacity to allow for start-up loads and the additional equipment of this system. AB SCIEX recommends that the normal loading not exceed 50% of the nominal capacity of the power lines.

**NOTE** Installation of the GenomeLab GeXP PC controller onto a local network is not required for the system to operate. Installation, support and administration of local networks or internet connections are the responsibility of the user. Network and internet connections can expose the system to security risks, potential loss of data and possible system damage caused by hackers, software viruses or other external factors. It is the user's responsibility to ensure that appropriate security measures, anti-virus software, firewalls and procedures have been implemented.

# Required Consumable Materials

## 5.1 Sequence Analysis

Table 3 provides a list of the required consumable items for performing sequence analysis using the GenomeLab GeXP System. Contact your local AB SCIEX representative for specific consumable material requirements based on your application and frequency of use.

**Table 3 Required Consumbables for Performing Sequence Analysis**

| Item | P/N | QTY | Description |
|---|---|---|---|
| Methods Development Kit<br><br>***or*** | 608000 | 1 | Dye Terminator Cycle Sequencing Kit for 96 reactions. Includes:<br>• DNA polymerase<br>• Dye Terminators (ddUTP, ddGTP, ddCTP, ddATP)<br>• dNTP Mix Solution<br>• Sequencing Reaction Buffer<br>• pUC18 Control Template<br>• -47 Sequencing Primer<br>• Glycogen<br>• Mineral Oil<br>• Sample Loading Solution (SLS) |
| DTCS Quick Start Kit | 608120 | 1 | Dye Terminator Cycle Sequencing Kit for 96 reactions. Includes:<br>• DTCS Quick Start Master Mix<br>• pUC18 Control Template<br>• -47 Sequencing Primer<br>• Glycogen<br>• Mineral Oil<br>• Sample Loading Solution (SLS) |
| Separation Gel LPA 1 | 391438 | 1 | 20 mL of gel in CE system compatible container. Sufficient to run two 96 well plates. |
| DNA SEQ Gel Kit | 608010 | 1 | 10 mL gel that is used for GeXP single rail systems. Sufficient to run one 96 well plate. |
| Separation Buffer | 608012 | 1 | Each container has a screw top and pour tip. The container has enough buffer (30 mL) to fill a CE system 96-well, flat bottom Buffer Plate. (Each well being ¾ full.) 4/Pack |
| DNA Separation Capillary Array 33-75B | 608087 | 1 | Eight capillaries, 75 µm i.d., 33 cm long, 200 o.d. complete with electrode block and detector array fitting. Ready for installation into CE system. |
| Buffer Plates | 609844 | Box | Package of 100 flat-bottom polystyrene plates, non sterile, without lids. Required for use as the separation buffer plate. |
| Sample Plates | 609801 | Box | Package of 25 V-bottom thermal cycler-compatible polypropylene plates with 200 µL volume capacity. Required for use as the CE system sample plate. 25 Plates/Box |

## 5.2 Fragment Analysis

Table 4 provides a list of the required consumable items for the performing fragment analysis using the GenomeLab GeXP System. Contact your local AB SCIEX representative for specific consumable material requirements based on your application and frequency of use.

**Table 4 Required Consumables for Performing Fragment Analysis**

| Item | P/N | QTY | Description |
|---|---|---|---|
| DNA Separation Capillary Array 33-75B | 608087 | 1 | Eight capillaries, 75 µm i.d., 33 cm long, 200 o.d. complete with electrode block and detector array fitting. Ready for installation into the GenomeLab GeXP. |
| Separation Gel LPA 1 | 391438 | 1 | 20 mL of gel in CE system compatible container. Sufficient to run two 96 well plates. |
| DNA SEQ Gel Kit | 608010 | 1 | 10 mL gel that is used for GeXP single rail systems. Sufficient to run one 96 well plate. |
| Separation Buffer | 608012 | 1 | Each container has a screw top and pour tip. The container has enough buffer (30 mL) to fill a CE System 96-well, flat bottom Buffer Plate. (Each well being ¾ full.) 4/Pack |
| DNA Size Standard Kit - 80 | 608395 | 1 | Contains fragments of 13 and 88 nucleotides designed to accommodate a wide range of sizes for multiplexed and poolplexed SNP fragments. |
| DNA Size Standard Kit - 400 | 608098 | 1 | DNA size standard for analysis of fragments up to 400 nucleotides. Includes:<br>• Mineral Oil<br>• DNA fragments of the following sizes labeled with CE system WellRED fluorescent dye: 60, 70, 80, 90, 100, 120, 140, 160, 180, 190, 200, 220, 240, 260, 280, 300, 320, 340, 360, 380, 400, and 420 nucleotides<br>• Sufficient for 96 fragment analysis separations. |
| DNA Size Standard Kit - 600 | 608095 | 1 | DNA size standard for analysis of fragments up to 600 nucleotides. Includes:<br>• Mineral Oil<br>• DNA fragments of the following sizes labeled with CE system fluorescent dye: 60, 70, 80, 90, 100, 120, 140, 160, 180, 190, 200, 220, 240, 260, 280, 300, 320, 340, 360, 380, 400, 420, 440, 460, 480, 500, 520, 540, 560, 580, 600, 620, and 640 nucleotides<br>• Sufficient for 96 fragment analysis separations |
| SNPStart Kit | A23201 | 1 | Includes reagents for 100 SNP genotyping reactions:<br>• SNPStart Master Mix<br>• Control<br>• Mineral oil<br>• Sample Loading Solution |

**Table 4 Required Consumables for Performing Fragment Analysis**

| Item | P/N | QTY | Description |
|---|---|---|---|
| GenomeLab GeXP Start Kit | A85017 | 1 | Includes reagents for 100 RT and PCR reactions:<br>• RT Buffer 5X<br>• Reverse Transcriptase<br>• PCR Buffer 5X<br>• $KAN^r$ RNA with RI<br>• DNase/RNase Free $H_2O$<br>• DNA Size Standard-400<br>• Mineral Oil<br>• GenomeLab Sample Loading Solution |
| GenomeLab GeXP Human Reference*Plex* Kit | A54657 | 1 | Includes primers and control RNA for 100 RT and PCR reactions:<br>• RT Rev Primer Plex Human Reference*Plex*<br>• PCR Fwd Primer Plex Human Reference*Plex*<br>• Control RNA Templates Human Reference*Plex* |
| Thermo-Start Taq DNA Polymerase | A85022 | 1 | Includes Thermo-Start Taq DNA polymerase and $MgCl_2$ for 100 PCR reactions:<br>• Thermo-Start Taq DNA Polymerase<br>• 25 mM $MgCl_2$ |
| GenomeLab Human STR Primer Set | A20100 | 1 | Includes Human STR primer mixtures for 48 reactions. |
| Sample Loading Solution (SLS) | 608082 | 1 | Sample Loading Solution (SLS), 6.0 mL |
| Buffer Plates | 609844 | Box | Package of 100 flat-bottom polystyrene plates, non sterile, without lids. Required for use as the CE system separation buffer plate. |
| Sample Plates | 609801 | Box | Package of 25 V-bottom thermal cycler-compatible polypropylene plates with 200 µL volume capacity. Required for use as the CE system sample plate. 25 Plates/Box |

# Additional Materials

## 6.1 Materials Required but not Supplied

**Table 5 Additional Materials Required**

| Item | Sequence Analysis | Fragment Analysis |
|---|---|---|
| Refrigerated microfuge | √ | √ |
| Molecular Biology Grade: sterile $dH_2O$, 95% (v/v) ethanol/$dH_2O$, 70% (v/v) ethanol/ $dH_2O$ | √ | — |
| Sterile tubes - 0.5 mL microfuge tubes, 0.2 mL thin wall thermal cycling tubes or plates | √ | √ |
| Thermal cycler with heated lid | √ | √ |
| Sample Loading Solution (SLS) | — | √ |
| Microduster III AccTech, P/N: 58019-538 (VWR) | √ | √ |
| Mini Alpha Swab from Texwipe, PN: TX754B (VWR) | √ | √ |
| 3M Sodium Acetate pH5.2 - Sigma, Cat. # S7899 | √ | — |
| 100mM $Na_2$-EDTA pH8.0 (500 mM Sigma Cat. # E7889) | √ | — |
| PCR enzyme and buffer | — | √ |
| Labeled primers (available from Sigma and IDT or Integrated DNA Technologies) | — | √ |
| Nuclease-Free H2O, non-DEPC Treated (Affymetrix 71786 or Thermo Fisher 10977-015) | — | √ |
| 1 M Tris-HCl pH 8.0 (Affymetrix 22638) for gene expression analysis | — | √ |
| The RNA Storage Solution (Thermo Fisher AM7000) for gene expression analysis | — | √ |
| AmpliTaq Gold (Thermo Fisher 4311806) for Human STR analysis | — | √ |
| Interrogation primers, Purified PCR products, Shrimp Alkaline Phosphatase and Exonuclease I for SNP genotyping | — | √ |

## 6.2 Optional Materials not Supplied by AB SCIEX

- Aluminum Foil Seal and Sample, PN 538619
- Thermowell™ Cap Strips - Corning Cat. # 6556

## Additional Materials

*Optional Materials not Supplied by AB SCIEX*

# GenomeLab GeXP System Training

## 7.1 Training Plan

Basic training should take place immediately following the installation of the system. The AB SCIEX Field Engineer will train two users in basic instrument operation, use of the software program and routine maintenance.

Advanced training sessions may be scheduled for an additional fee. Contact your local AB SCIEX representative for more information.

To optimize the training session, the following prerequisites have been established for users:

- Experience in the handling of biological samples
- Working knowledge of the Windows 7 Operating System
- Familiarity with DNA sequencing and/or fragment analysis

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