

OPERATING MANUAL

Maxwell[®] 16 Instrument Operating Manual

Instructions for Use of Product AS2000



Maxwell[®] 16 Instrument Operating Manual

All technical literature is available at: www.promega.com/protocols/
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 E-mail Promega Technical Services if you have questions on use of this system: techserv@promega.com

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1. Introduction

As laboratories try to improve productivity, the need has increased for easy-to-use, low- to moderate-throughput automated purification processes. The Maxwell[®] 16 Instrument⁽⁴⁾ is designed for efficient, automated purification from a wide range of sample types. The instrument is supplied with preprogrammed automated purification methods and is designed for use with predispensed reagent cartridges, maximizing simplicity and convenience. The instrument can process up to 16 samples in approximately 15–60 minutes (depending on sample type and method). Purified concentrated products are obtained at high quality and high yield and can be used directly in a variety of downstream applications.

The Maxwell[®] 16 Instrument can be set in either standard elution volume (SEV) configuration to process larger sample sizes and maximize yield, or in low elution volume (LEV) configuration to maximize purified sample concentration. The Maxwell[®] 16 Instrument includes both SEV and LEV hardware to easily personalize your Maxwell[®] 16 Instrument to meet your downstream analysis needs. The instrument can be converted easily from one configuration to another using these conversion kits.

The Maxwell[®] 16 System purifies samples using paramagnetic particles (PMPs), which provide a mobile solid phase that optimizes capture, washing and elution of the target material. The Maxwell[®] 16 Instrument is a magnetic-particle-handling instrument that efficiently preprocesses liquid and solid samples, transports the PMPs through purification reagents in the prefilled cartridges, and mixes efficiently during processing. The efficient magnetic particle-based methodology used by the Maxwell[®] 16 Instrument avoids common problems associated with automated purification systems, such as clogged tips or partial reagent transfers, which can result in suboptimal purification. Several Maxwell[®] 16 reagent kits are available that allow optimal purification from a variety of sample types. See Section 7.F for a list of reagent kits.

1.A. Maxwell[®] 16 Instrument Specifications

Processing Time:	15–60 minutes (depending on sample type and method)
Number of Samples:	up to 16
SEV Configuration:	300µl elution volume
LEV Configuration:	20–100µl elution volume
Weight:	41.7lb (18.9kg)
Dimensions (W × D × H):	12.8 × 17.3 × 12.9 inches (325.5 × 438.2 × 326.5mm)
Power Requirements:	100–240VAC, 50–60Hz, 2.1A

1.B. Product Components

The Maxwell® 16 Instrument includes both SEV and LEV hardware. Your Maxwell® 16 Instrument will be shipped to you in the LEV configuration.

PRODUCT	CAT.#
Maxwell® 16 Instrument	AS2000

Includes:

- 1 Maxwell® 16 Instrument
- 1 Power Cable
- 1 RS-232 Cable for Firmware Upgrades
- 1 CD with Operating Manual and Warranty Information
- 1 SEV Magnetic Rod/Plunger Bar Assembly
- 1 Maxwell® 16 SEV Cartridge Rack
- 1 Maxwell® 16 SEV Magnetic Elution Rack
- 1 SEV and LEV Quick Start Guides
- 1 LEV Magnetic Rod Assembly
- 1 LEV Plunger Bar Adaptor
- 1 Maxwell® 16 LEV Cartridge Rack

Available Separately

PRODUCT	CAT.#
Maxwell® 16 LEV Cartridge Rack (for use with LEV configuration)	AS1251
Maxwell® 16 LEV Magnet (for use with LEV configuration)	AS1261
Maxwell® 16 LEV High Strength Magnetic Rod Assembly and Plunger Bar Adaptor (for use with LEV configuration)	SP1070
Maxwell® 16 SEV Cartridge Rack (for use with SEV configuration)	AS1201
Maxwell® 16 SEV Magnetic Elution Rack (for use with SEV configuration)	AS1202

1.C. Inspection

Upon receiving your Maxwell® 16 Instrument, please inspect the package carefully to make sure all accessories are present. Accessories are shown in Figure 1.

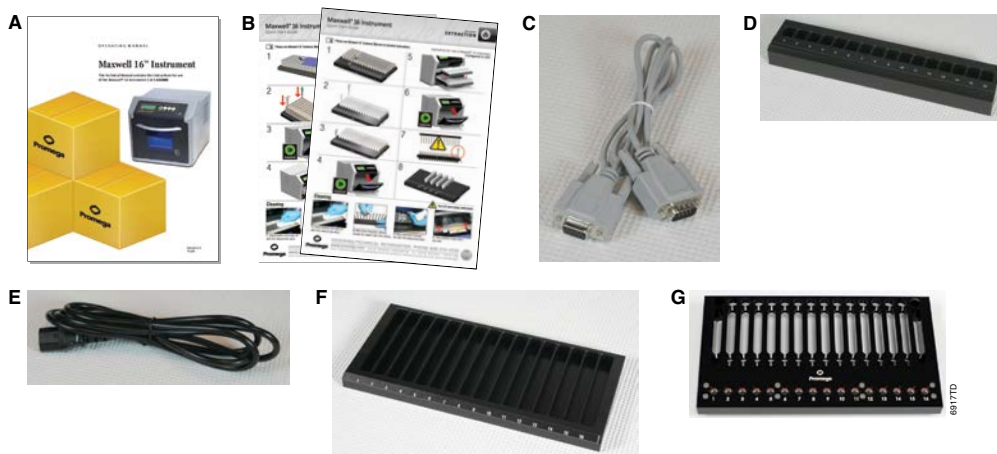









Figure 1. Maxwell® 16 Instrument (AS2000) Accessories. A. CD containing the Operating Manual and Warranty Information. B. SEV and LEV Quick Start Guides; C. RS-232 Cable for firmware upgrades; D. Maxwell® 16 SEV Magnetic Elution Rack; E. Power Cable; F. Maxwell® 16 SEV Cartridge Rack; G. Maxwell® 16 LEV Cartridge Rack.

1.D. Precautions

IMPORTANT SAFETY INSTRUCTIONS. SAVE THESE INSTRUCTIONS.

	Safety Symbols and Markings	Symboles de Sécurité et Marquages
	Danger. Hazardous voltage. Risk of electrical shock.	Danger. Tension dangereuse. Risque de choc électrique.
	Warning. Risk of personal injury to the operator or a safety hazard to the instrument or surrounding area.	Avertissement. Risque de préjudice corporel pour l'opérateur ou d'accident avec l'instrument ou l'entourage.
	Warning. Pinch point hazard.	Avertissement. Risque de pincement.

	Safety Symbols and Markings	Symboles de Sécurité et Marquages
	Warning. Hot surface. Burn hazard.	Avertissement. Surface chaude. Risque de brûlure.
	Warning. Lifting hazard.	Avertissement. Risque lors du soulèvement.
	Warning. Biohazard.	Avertissement. Danger biologique.
	Warning. It is important to understand and follow all laws regarding the safe and proper disposal of electrical instrumentation. Please contact your local Promega Representative for disposal of the instrument. Please follow your institutional requirements for disposal of the accessories.	Avertissement. C'est important comprendre et suivre tous les règles et de prendre tous précautions concernant la élimination correcte des instruments électriques. Nous vous prions de bien vouloir contacter votre représentant de Promega pour l'élimination de l'instrument et de suivre les règles de votre établissement pour l'enlèvement des accessoires.







Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio reception, the user is encouraged to try to correct the interference by one or more of the following measures: (1) reorient or relocate the receiving antenna, (2) increase the separation between the equipment and receiver, (3) connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

A Class A digital device meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

1.D. Precautions (continued)

IMPORTANT SAFETY INSTRUCTIONS. SAVE THESE INSTRUCTIONS.

	Safety Precautions	Mesures de Sécurité
	Do not use this instrument for anything other than its intended use.	Ne pas utiliser cet instrument à d'autres fins que celle pour laquelle il a été conçu.
	Always disconnect the power before cleaning or performing routine maintenance.	Toujours débrancher le cordon d'alimentation avant d'effectuer le nettoyage ou l'entretien de routine.
	Do not disassemble unit.	Ne pas démonter l'unité.
	Do not override the door sensor. Moving parts may cause personal injury.	Ne pas neutraliser le capteur de la porte. Les pièces mobiles risquent d'entraîner un préjudice corporel.
	Ensure cartridges, elution tubes and plungers have been securely inserted in their correct positions and orientation. Failure to do so may result in damage to the instrument.	S'assurer que les cartouches, les tubes à élution et les pistons ont bien été insérés dans la position et l'orientation correcte. Tout manquement à ces directives risque d'entraîner des dommages de l'instrument.
	After each run, verify that the plungers have been completely removed from the magnet rods before pressing "OK" to extend the platform.	Après chaque cycle, vérifier que les pistons ont été complètement retirés des tiges magnétiques avant d'appuyer sur "OK" pour étendre la plate-forme.
	Use only Promega Maxwell® 16 cartridges and plungers designed for use with the instrument.	Utiliser uniquement des cartouches et pistons Promega Maxwell® 16 conçus pour une utilisation avec l'instrument.
	Do not reuse cartridges or plungers.	Ne pas réutiliser les cartouches ou pistons.
	If the equipment is used in a manner other than that specified by Promega, the protection provided by the equipment may be impaired.	Si l'instrument est utilisé d'une autre manière que celle mentionnée par Promega, la protection apportée par l'équipement pourrait être endommagée.
	Keep hands clear of instrument platform as it moves in and out of the instrument.	Éloigner les mains de la plate-forme de l'instrument pendant qu'elle effectue son mouvement de va-et-vient dans et hors de l'instrument.
	During elution, the heated elution block at the front of the platform becomes very hot. Do not touch.	Lors de l'élution, le bloc d'élution chauffé à l'avant de la plate-forme devient très chaud. Ne pas le toucher.
	To avoid muscle strain or back injury, use lifting aids and proper lifting techniques when removing or replacing the instrument. The Maxwell® 16 Instrument weighs 41.7lb (18.9kg) and should be handled by two people.	Pour éviter des claquages musculaires ou de se faire mal au dos, utiliser du matériel permettant de soulever et des techniques de soulèvement correctes lors du retrait ou du repositionnement de l'instrument. L'appareil Maxwell® 16 pèse environ 18.9kg (41.7lb) et doit être manipulé par deux personnes.
	Equipment can be hazardous due to the use of chemical and biohazardous substances.	L'équipement peut être dangereux du fait de l'utilisation de substances chimiques et biologiques dangereuses.

1.E. Environmental Requirements

Power Requirements: 100–240VAC, 50–60Hz, 2.1A

Temperature: 5–40°C

Humidity: up to 80% relative humidity

The Maxwell® 16 Instrument is intended for indoor use only. Wipe up spills immediately. Install the instrument on a clean, level surface. To avoid shortening the expected lifespan of the instrument, install in a location that meets the following criteria:

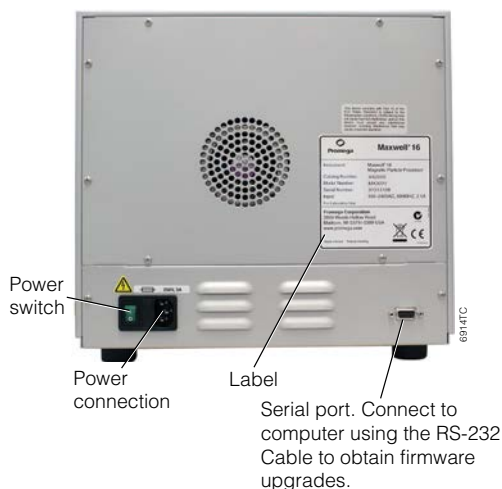
- Locate on a sturdy, level surface.
- Avoid dusty areas.
- Choose a location that has good air circulation and is not exposed to direct sunlight.
- Avoid noisy electrical power sources (e.g., power generators).
- Do not install in a location where there is large temperature variability or high humidity.
- Do not position the instrument so that it is difficult to unplug from the power source.
- Do not place next to heat sources.
- Do not use near flammable gases or liquids.
- Do not place near other electrically sensitive instruments.

2. Hardware Overview

Maxwell® 16 Instrument Front



Maxwell® 16 Instrument Back

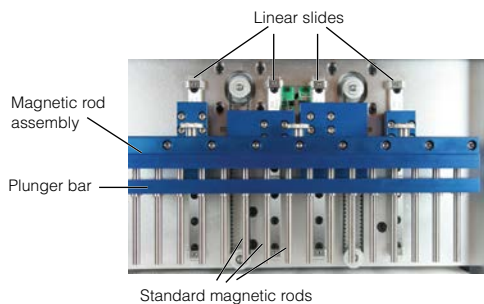


2. Hardware Overview (continued)

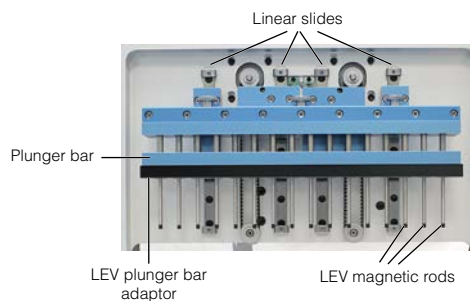


Maxwell® 16 Instrument display panel. The LCD display panel and Keypad, including Run/Stop, Menu, Scroll Up and Scroll Down buttons, are shown.

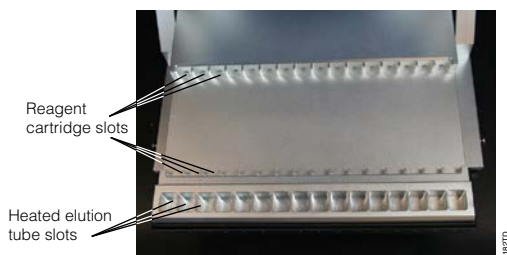
A. Standard Elution Volume (SEV) Configuration



B. Low Elution Volume (LEV) Configuration



C. Maxwell® 16 Platform



Maxwell® 16 components. A. SEV configuration; B. LEV configuration; C. Maxwell® 16 platform.


3. Unpacking and Setting Up the Maxwell® 16 Instrument

3.A. Setup

1. Remove the accessories and literature from the shipping container. Slide the Maxwell® 16 Instrument out of the box.


Note: Do not lift the instrument out of the box by the door handle.

2. Remove the foam packaging from the sides of the instrument and remove the clear plastic cover.
3. Check that all parts have been included. Refer to Figure 1 for a list of parts.
4. Set the Maxwell® 16 Instrument on a flat, level, solid surface in a dust-free location with reasonable air circulation. If possible, move the instrument back from the edge of the surface to prevent inadvertently bumping the open door.


 **Important:** Save the packaging material in case the instrument needs to be returned for service or repair at a later date.

3.B. Removal of Magnetic Rod Assembly/Plunger Bar and Platform Shipping Anchors

1. Ensure that the instrument is turned off and is not plugged in.
2. The magnetic rod assembly, plunger bar and platform are anchored in place during shipment to prevent movement of and damage to these parts.

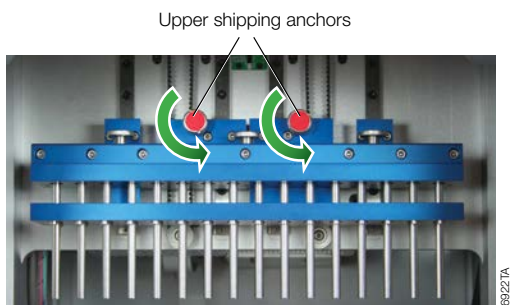
 **Note: Do not plug in or turn on the machine before removing the shipping anchors.** Turning on the Maxwell® 16 Instrument before the shipping anchors are removed will cause a lot of noise but will not result in permanent damage to the instrument. If this occurs, immediately turn off and unplug the instrument. Proceed with removal of the shipping anchors.

3. Open the instrument door.
4. Locate the Magnetic Rod Assembly/Plunger Bar shipping anchor thumbscrews labeled with red stickers (Figure 2). Unscrew and remove these shipping anchor thumbscrews.
5. Locate the Platform shipping anchor thumbscrews with the red stickers (Figure 2). Unscrew and remove the Platform shipping anchor thumbscrews.
6. Your Maxwell® 16 Instrument is now ready for operation. Section 3.C describes the steps required to reconfigure your instrument hardware settings. Proceed directly to Section 3.D, Operational Mode Setup, if you do not need to change the instrument hardware settings.

 **Important:** Save the shipping anchor thumbscrews in case the instrument needs to be returned for service or repair at a later date.

3.B. Removal of Magnetic Rod Assembly/Plunger Bar and Platform Shipping Anchors (continued)

A. SEV Configuration



B. LEV Configuration

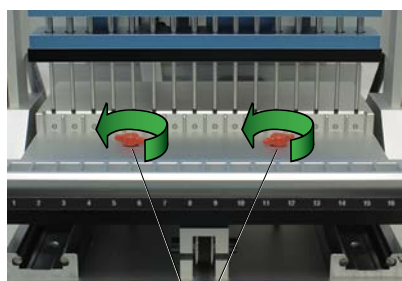
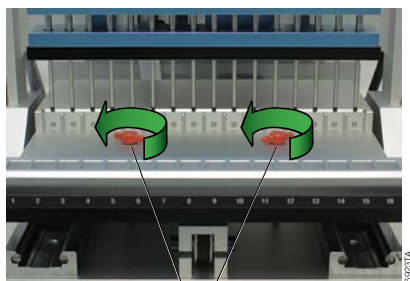
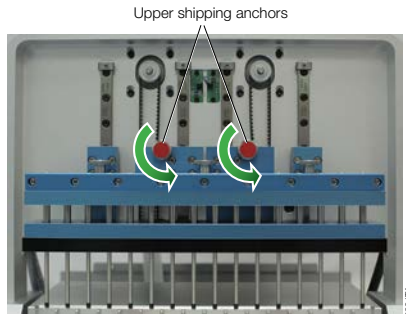


Figure 2. The upper (Magnetic Rod Assembly/Plunger Bar) shipping anchors and the Platform shipping anchors on (A) Standard Elution Volume (SEV) and (B) Low Elution Volume (LEV) instruments.

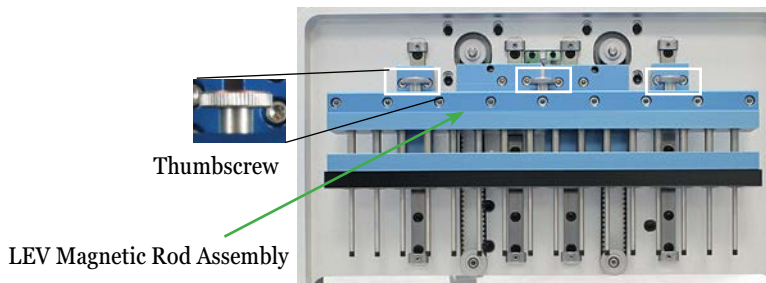
3.C. Reconfiguring the Maxwell® 16 Instrument Hardware

The Maxwell® 16 Instrument may be configured for different sample elution volume for use with different purification kits.

(i) Changing from LEV to SEV Configuration

⚠ Note: Do not reconfigure the instrument while samples or reagent cartridges are in place on the instrument platform. Wear gloves to avoid exposure to any reagent contamination that may remain on the instrument after previous use.

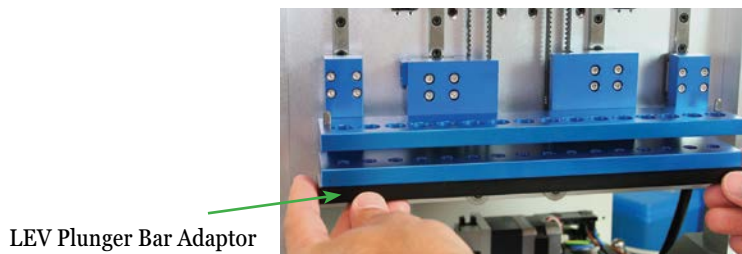
1. Ensure that the power is turned off and the instrument is unplugged. This will release the motors so that the heads can be gently moved to allow easier access to the hardware assemblies.
2. Gently and slowly, with constant pressure on both the right and left sides, push the blue LEV Magnetic Rod Assembly down to the lowest position on the slides. Do not push the LEV Magnetic Rod Assembly too fast as this could result in damage to the instrument's electronics.
3. Unscrew the three thumbscrews on top of the magnetic rod assembly.
4. Gently lift up the LEV Magnetic Rod Assembly to remove it.



5. Pull down on the LEV Plunger Bar Adaptor to release the magnets that hold it in place.

Hint: Pull down at an angle so that the back of the magnet is released first.

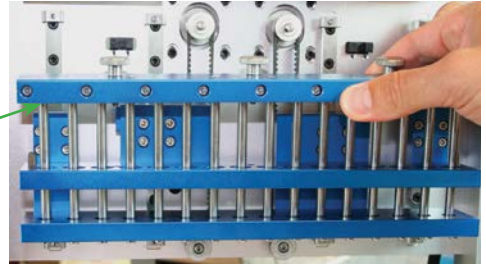
Remove the black LEV Plunger Bar Adaptor.



(i) Changing from LEV to SEV Configuration (continued)

6. Insert the blue SEV Magnetic Rod Assembly.

SEV Magnetic Rod Assembly

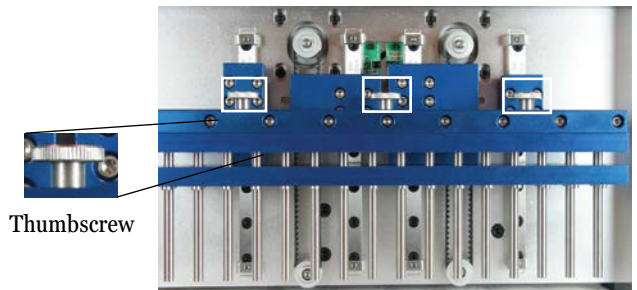


7. Secure the Magnetic Rod Assembly with the three thumbscrews, and hand-tighten.
8. Proceed to Section 3.D, and complete the configuration by updating the Firmware to the Standard Elution Volume settings.

! Failure to change the instrument firmware operational mode from the low elution volume to the standard elution volume settings will cause damage to the instrument.

(ii) Changing from SEV to LEV Configuration

1. Ensure that the power is turned off and the instrument is unplugged. This will release the motors so that the heads can be gently moved to allow easier access to the hardware assemblies.
2. Gently and slowly, with constant pressure on both the right and left side, push the blue Plunger Bar and the blue Magnetic Rod Assembly down to their lowest positions on the slides. **Do not push the Plunger Bar and Magnetic Rod Assembly too fast** as this could cause damage to the instrument's electronics.
3. Unscrew the three thumbscrews on top of the magnetic rod assembly.



Thumbscrew

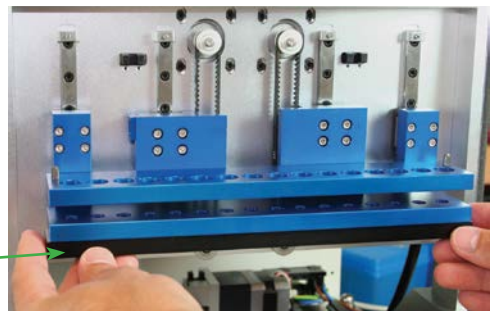
4. Gently lift up the SEV Magnetic Rod Assembly and remove it.

SEV Magnetic Rod Assembly

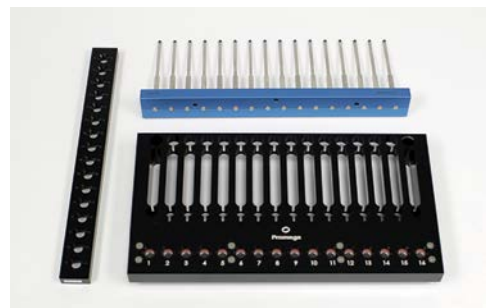


5. Insert the black LEV Plunger Bar Adaptor onto the bottom of the remaining arm. Make sure that the side containing the set screws faces upward. Several magnets will “click” and hold the LEV Plunger Bar Adaptor in place once it is attached. The LEV Plunger bar should then be fairly difficult to remove.

LEV Plunger Bar Adaptor




6. Insert the blue LEV Magnetic Rod Assembly. The set screws should be facing toward you. Press firmly to place the LEV Magnetic Rod Assembly in position. It will fit tightly into place.



(ii) Changing from SEV to LEV Configuration (continued)

7. Secure the LEV Magnetic Rod Assembly with the three thumbscrews from the standard magnetic rod assembly, and hand-tighten. Proceed to Section 3.D, and complete the configuration by updating the Firmware to the LEV (Low Elution Volume) settings.

 Failure to change the instrument firmware operational mode from the standard elution volume to the low elution volume settings will cause damage to the instrument.



3.D. Operational Mode Setup

(i) Plugging the Instrument into the Power Outlet

1. Once the Magnetic Rod Assembly/Plunger bar shipping anchors and Platform shipping anchors have been removed, all packaging materials have been removed, and configuration (if required) is complete, you can connect the instrument to a power outlet.
2. Ensure that the power switch is in the off position. The power switch is located next to the power cord connection on the back of the instrument.
3. Connect the power cord to the back of the Maxwell[®] 16 Instrument.
4. Plug the power cord into a wall outlet. See Section 1.A for power requirements.
5. Close the door.
6. Turn the instrument on.
7. Once turned on, the instrument will display the firmware version number and operational mode setting, proceed through a self-check and home all axes.
8. Connecting to the serial port on the back of the instrument is not required. Store the RS-232 Cable in a location near the instrument.

(ii) Hardware Configuration and Operational Mode Setup Requirements

The Maxwell® 16 Instrument has multiple operational modes, depending on the purification procedure and the Maxwell® 16 Purification Kit being used. Table 1 lists the hardware configuration and operational mode requirements for the various Maxwell® 16 Purification Kits. Please refer to the Technical Bulletin or Technical Manual supplied with your Maxwell® 16 Purification Kit for further information on the operational mode setting required for your selected system.

Table 1. Hardware Configuration and Operational Mode Setup Requirements.

Maxwell® 16 Kit	Purification Procedure	Firmware Operational Mode	Hardware Configuration
Maxwell® 16 Blood DNA Purification Kit (Cat.# AS1010)	gDNA	Research (Rsch)	Standard Elution Volume (SEV)
Maxwell® 16 Cell DNA Purification Kit (Cat.# AS1020)	gDNA	Research (Rsch)	Standard Elution Volume (SEV)
Maxwell® 16 Tissue DNA Purification Kit (Cat.# AS1030)	gDNA	Research (Rsch)	Standard Elution Volume (SEV)
Maxwell® 16 Mouse Tail DNA Purification Kit (Cat.# AS1120)	gDNA	Research (Rsch)	Standard Elution Volume (SEV)
Maxwell® 16 FFPE Tissue LEV DNA Purification Kit (Cat.# AS1130)	gDNA	Research (Rsch)	Low Elution Volume (LEV)
Maxwell® 16 FFPE Plus LEV DNA Purification Kit (Cat.# AS1135)	gDNA	Research (Rsch)	Low Elution Volume (LEV)
Maxwell® 16 Cell LEV DNA Purification Kit (Cat.# AS1140)	gDNA	Research (Rsch)	Low Elution Volume (LEV)
Maxwell® 16 LEV Blood DNA Purification Kit (Cat.# AS1290)	gDNA	Research (Rsch)	Low Elution Volume (LEV)
Maxwell® 16 Buccal Swab LEV DNA Purification Kit (Cat.# AS1295)	gDNA	Research (Rsch)	Low Elution Volume (LEV)



(ii) Hardware Configuration and Operational Mode Setup Requirements (continued)

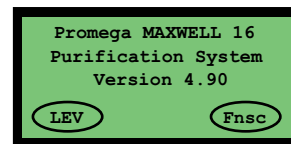
Table 1. Hardware Configuration and Operational Mode Setup Requirements (continued).

Maxwell® 16 Kit	Purification Procedure	Firmware Operational Mode	Hardware Configuration
Maxwell® 16 LEV simplyRNA Cells Kit (Cat.# AS1270)	RNA	Research (Rsch)	Low Elution Volume (LEV)
Maxwell® 16 LEV simplyRNA Tissue Kit (Cat.# AS1280)	RNA	Research (Rsch)	Low Elution Volume (LEV)
Maxwell® 16 LEV simplyRNA Blood Kit (Cat.# AS1310)	RNA	Research (Rsch)	Low Elution Volume (LEV)
Maxwell® 16 Total RNA Purification Kit (Cat.# AS1050)	RNA	Research (Rsch)	Standard Elution Volume (SEV)
Maxwell® 16 Tissue LEV Total RNA Purification Kit (Cat.# AS1220)	RNA	Research (Rsch)	Low Elution Volume (LEV)
Maxwell® 16 Cell LEV Total RNA Purification Kit (Cat.# AS1225)	RNA	Research (Rsch)	Low Elution Volume (LEV)
Maxwell® 16 Viral Total Nucleic Acid Purification Kit (Cat.# AS1150)	Viral	Research (Rsch)	Low Elution Volume (LEV)
Maxwell® 16 Polyhistidine Protein Purification Kit (Cat.# AS1060)	Protein	Research (Rsch)	Standard Elution Volume (SEV)
DNA IQ™ Reference Sample Kit for Maxwell® 16 (Cat.# AS1040)	Forensic gDNA Reference Samples	Research (Rsch)	Standard Elution Volume (SEV)
DNA IQ™ Casework Pro Kit for Maxwell® 16 (Cat.# AS1240)	Forensic gDNA Casework Samples	Research (Rsch)	Low Elution Volume (LEV)

! Please ensure that you select the operational mode that is required for your hardware configuration. Failure to use the correct operational mode and hardware configuration will cause damage to the instrument.

(iii) Setting the Maxwell® 16 Instrument Operational Mode

1. Make sure the instrument door is closed and turn on the Maxwell® 16 Instrument. While the instrument is homing itself during power up, the screen will display both the firmware version number and the current operational mode setting.
2. Verify that the current operational mode displayed matches the operational mode required by both the installed hardware and the purification kit to be used.
3. If the operational mode displayed does not match the operational mode required by the purification kit, you will need to change the instrument setting (see (iv) below, “Changing the Maxwell® 16 Instrument Operational Mode”).

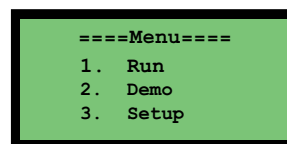


Operational Mode Setting
 SEV = Standard Elution Volume
 LEV = Low Elution Volume
 Rsch = Research
 Fncs = Forensic

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(iv) Changing the Maxwell® 16 Instrument Operational Mode

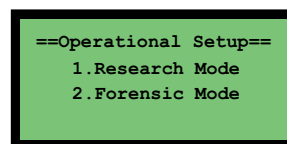
1. Press the “Menu” button to get to the Menu screen.
2. Scroll down to move the cursor to “Setup”. Press “Run/Stop” to select “Setup”.



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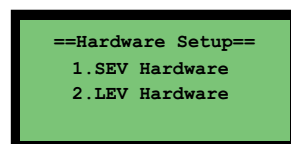
3. Scroll up/down to move the cursor to the desired operational mode. Press “Run/Stop” to select.

ⓘ Refer to Table 1 for information on the operational mode required for each Maxwell® 16 Purification Kit.



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4. Scroll down to move the cursor to the desired hardware mode. If the instrument is configured with the Standard Elution Volume hardware, select “SEV”. If the instrument is configured with the Low Elution Volume hardware, select “LEV”. Press “Run/Stop” to select.

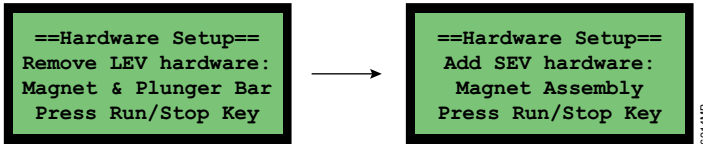


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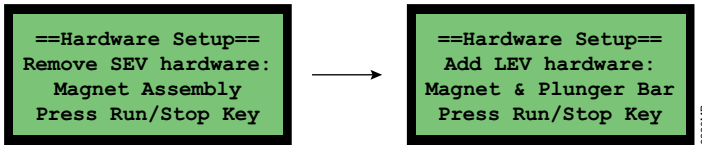
(iv) Changing the Maxwell® 16 Instrument Operational Mode (continued)

- If the hardware mode in the firmware has changed, the following LCD screens will appear, prompting the user to change the hardware. Failure to change the hardware will result in damage to the instrument.

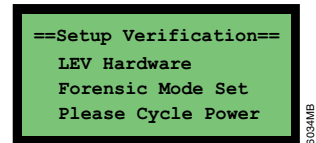
If changing from LEV to SEV, the following screens will appear:



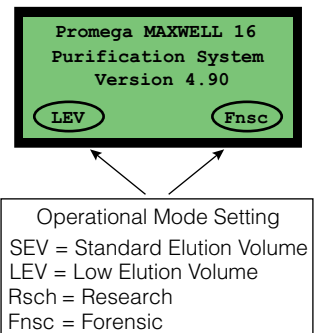
If changing from SEV to LEV, the following screens will appear:



- The display will show the operational mode selected. Turn the instrument off and then on to cycle the instrument power.



- When you turn the instrument back on, verify the instrument's operational mode setting on the display screen.



4. Operating the Maxwell® 16 Instrument

4.A. Navigation

The installed firmware will prompt you through initiation of a purification run. Follow the prompts displayed on the LCD screen. Use the “Scroll Up” and “Scroll Down” buttons to move the cursor to the desired prompt. Once the cursor is moved to the desired position in the list, press the “Run/Stop” button to make the selection. At any time during the selection process, you may press the “Menu” button to return to the beginning.

4.B. Operational Qualification

With instrument power on:

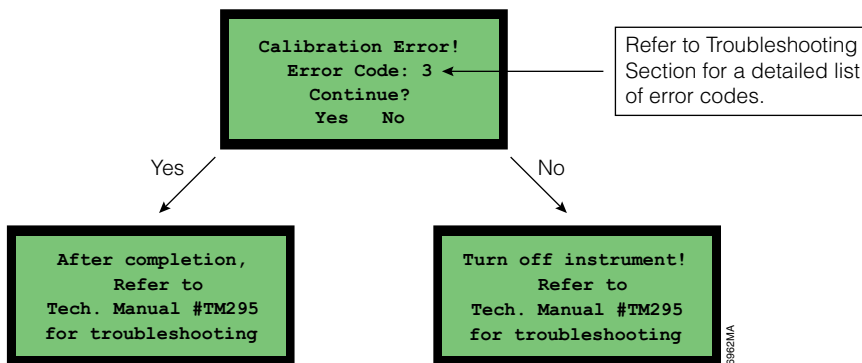
Each time you turn the instrument on, it will automatically go through a self-diagnostic test during which the platform, plunger bar and magnetic rod assembly are moved to check that the instrument is properly calibrated. Upon completion of this self-diagnostic test, the screen will display either “Diagnostic Check Successful” or “Calibration Error”.

During instrument runs:

During instrument runs, the instrument will automatically do periodic self-diagnostic tests to verify that the platform, plunger bar and magnetic rod assembly are within calibration during the purification procedure. If the instrument detects that any of these parts are not within calibration during a run, the method will pause and display “Calibration Error”.

If calibration error occurs:

If a calibration error occurs, you will see the “Calibration Error” screen. Note the Error Code Number displayed on the LCD screen and refer to the Troubleshooting section of this manual (Section 6) for more information on each Error Code. If you are in the middle of a run, you can choose to continue the purification procedure or abandon the run by turning off the instrument.



4.C. Sample Purification

Placement of sample cartridges in the cartridge preparation racks for the SEV and LEV configurations is illustrated in Figure 3. Please refer to your specific Maxwell® 16 Purification Kit Technical Bulletin or Technical Manual for detailed instructions regarding cartridge and sample preparation and purification.

Note: Carefully peel back the plastic coating so that all plastic comes off the top of the cartridge. Ensure that all sealing tape and any residual adhesive are removed from the Maxwell® 16 system cartridges before placing the cartridges into the instrument.



The Maxwell® 16 reagent cartridges are designed to be used with potentially infectious substances. Users should wear the appropriate protection (i.e., gloves, goggles, etc.) when handling infectious substances. Users should adhere to their institutional guidelines for the handling and disposal of all infectious substances when used with this system.

The Maxwell® 16 reagent cartridges contain potentially hazardous chemicals. Users should wear protective gloves or other protective means when handling the reagent cartridges. Users should follow their institutional guidelines for disposal.



Note: Following an automated DNA purification procedure, the LEV Cartridge Rack will be warm. It will not be too hot to touch. To remove the rack from the instrument platform, hold onto the sides of the rack as shown in Figure 3, Panel B.

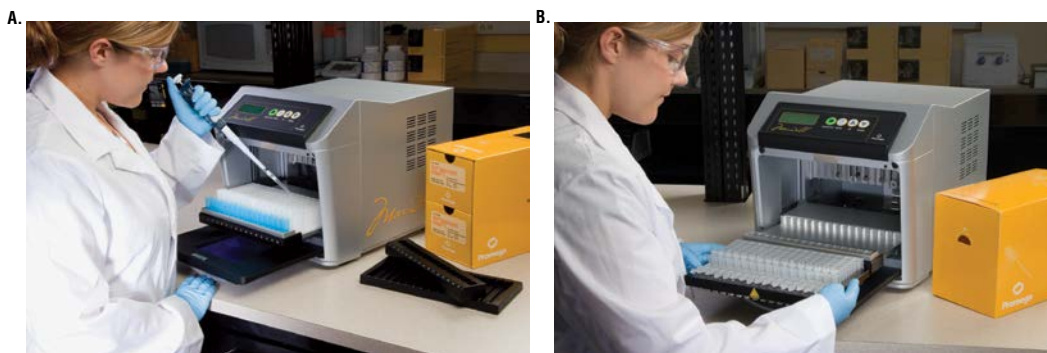


Figure 3. Placement of sample cartridges into the Maxwell® 16 and Maxwell® 16 LEV Instruments.
Panel A. Standard configuration. Sample cartridges are placed in the Maxwell® 16 Cartridge Rack. The sample cartridges are then removed from the Maxwell® 16 Cartridge Rack and placed onto the instrument platform.
Panel B. LEV configuration. The sample cartridges are placed on the instrument platform in the LEV Cartridge Rack.

5. Periodic Cleaning and Maintenance

The Maxwell® 16 Instrument requires minimal maintenance. However, it is important to clean the instrument at regular intervals. If samples or reagents have been spilled, it is important to clean the instrument to avoid damage. Most parts of the Maxwell® 16 Instrument have an anodization coating, which forms a durable, easily cleaned barrier with the metal.



Always turn off and unplug the instrument before cleaning.

5.A. General Care

- Wipe up any spills immediately.
- After each use, clean the instrument by wiping off the magnetic rod assembly, plunger bar and platform using a cloth dampened with deionized water or 70% ethanol. Do not use other solvents or abrasive cleaners.



Note: Wear gloves. If the instrument is used with biohazardous materials, dispose of any cleaning materials used in accordance with your institutional guidelines.

- Periodically wipe the outside of the instrument using a cloth dampened with deionized water or 70% ethanol.
- Keep the cooling vents in the back of the machine clear of dust.
- Do not remove the Maxwell® 16 Instrument case for cleaning. **This will void the warranty.**
- Do not use a spray bottle to soak instrument surfaces with large volumes of liquid.
- Never allow liquids to sit on instrument surfaces for extended periods of time.
- Keep all moisture away from the heated elution tube slots to prevent damage to the heating elements.
- If the linear slides (see Section 2) for the platform need to be cleaned, use only a dry paper towel. If they have been contaminated with any liquid, wipe off excess liquid and follow the lubrication guidelines in Section 5.C., or contact Promega Technical Services for assistance.
- If any of the hardware accessories need to be cleaned (i.e., cartridge or elution racks), wipe them with a cloth dampened with deionized water or 70% ethanol.

5.B. Removal of Magnetic Rod Assembly

If the plungers are inadvertently left out during a run or placed in the wrong starting position, the machine may go through a run with the magnetic rods unprotected. If this happens, the magnetic rod assembly may be removed for cleaning.

1. Turn off the power and unplug the instrument. This will release the motors so that the heads can be gently moved to allow easier access to the magnetic rod assembly.
2. Gently and slowly, with constant pressure on both the right and left side, push the plunger bar and the magnetic rod assembly down the slides to their lowest positions. Do not push the plunger bar and magnetic rod assembly too fast. Doing so could result in damage to the instrument's electronics.
3. Unscrew and remove the three thumbscrews on top of the magnetic rod assembly (Figure 4).

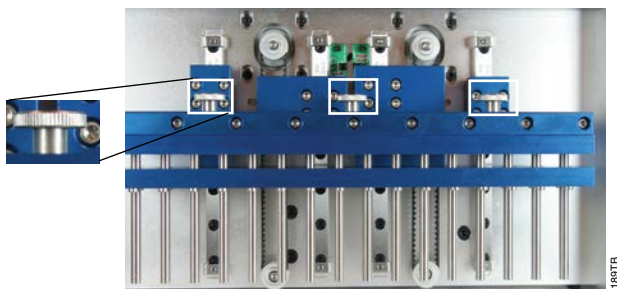


Figure 4. The thumbscrews on the top of the magnetic rod assembly.

4. Once the three thumbscrews are removed, gently lift up the magnetic rod assembly to remove it.
5. To clean the magnetic rod assembly, wipe with a soft paper towel dampened with deionized water or 70% ethanol. Removal of paramagnetic particles from the magnetic rod assembly will require multiple wipes with a damp cloth. Use a damp towel wrapped around a magnet to help remove paramagnetic particles.
6. If the magnetic rod assembly cannot be cleaned, please contact Promega for assistance.
7. Replace the magnetic rod assembly, and firmly tighten the three thumbscrews.

5.C. Periodic Maintenance

Linear Slides: If the linear slides become sticky, they may be lubricated with **light** machine oil. Use a cotton swab, and apply only as much as is needed to make the heads and plate slide easily. Do not get oil on the black drive belts.

Belts: Inspect the belts periodically. If excessive wear or excessive slack is noted, contact Promega or your local Promega representative, and arrangements will be made to service the instrument.

6. Troubleshooting

Symptoms

The instrument is making an unusual, rapid clicking noise when it is turned on.

Causes and Comments

- Verify that the Magnetic Rod Assembly/Plunger Bar shipping anchors and Platform shipping anchors have been removed.
- One of the machine sensors might have a dust particle interfering with it. Contact Promega or your local Promega representative for assistance with sensor cleaning.

The LCD screen does not light up when the instrument is turned on.

If you **cannot** hear the motors running:

- Check that the unit is plugged into a working electrical outlet.
- Verify that the plug is securely connected to the back of the instrument.
- A 3-amp fuse protects the instrument electronics and is located next to the power switch. If the fuse is blown, identify and correct the cause. Never replace this fuse with a fuse rated for an amperage higher than 3A.
- Contact Promega or your local Promega representative for service.

If you **can** hear the motors running:

- Either a cable has become disconnected from the LCD screen, or the LCD screen is broken or damaged. Contact Promega or your local Promega representative for service.

The machine makes unusual noises during the run.

The machine will make some noise during a typical run. Unusual (or louder than usual) noises may indicate that the heads are sticking. Continued operation under these conditions can cause damage to the instrument. Heads that are sticking may be lubricated with **light** machine oil. Do not get any oil on the drive belts. Use a small amount of oil on a cotton swab. If this does not correct the problem, contact Promega or your local Promega representative for service.

Heater error at the elution step.

Something is wrong with the electrical heating system. Contact Promega or your local Promega representative for service.

Plungers are not completely stripped off the rods at the end of the run.

Always be careful to check that plungers are clear of the magnetic rod assembly before extending the platform out from inside the instrument. If the problem occurs consistently, check that the magnetic rods are clean. Wipe them down carefully with a damp cloth. Do not reuse plungers; plungers that are reused may not be completely removed at the end of the run. If plungers are consistently left on, contact Promega or your local Promega representative for service.



6. Troubleshooting (continued)

Symptoms

Causes and Comments

Can I change the steps in a protocol?	No. Contact Promega or your local Promega representative for firmware upgrades. As new purification kits become available, new automated methods will be offered. Reagents are predispensed and optimized to work with the preprogrammed automated methods.
The buttons don't work.	Some of the buttons are ignored during processing. If a button is not working consistently, please contact Promega or your local Promega representative. Do not use spray cleaner on the keypad, as it can seep in and short out the keyboard.
When I close (or open) the door, the program does not advance.	There may be a problem with the door sensor. Please contact Promega or your local Promega representative for service.
The machine runs but does not advance to the "Run" screen.	A sensor for one of the heads may be failing, or a belt may be slipping. Please contact Promega or your local Promega representative for service.
Poor sample quality, low yield or low purity	See the appropriate Technical Bulletin or Technical Manual supplied with your Maxwell® 16 Purification Kit for more information.
Expected methods are not shown on the LCD screen	Verify the firmware setup. Refer to Section 3.D.
Calibration error: Error Code 1:	Error Code 1 indicates a Platform calibration error. (A picture of the instrument platform is shown in Section 2, Panel C, page 8.) <ul style="list-style-type: none">• Verify that there are no obstructions in the slide channels, in the rear, or in front of the platform that prevent it from moving back and forward freely.• If in LEV mode, ensure the cartridges are seated completely in the LEV Cartridge Rack, and that the rack is seated onto the platform properly.• Turn the instrument off, wait a few seconds, then turn the instrument back on. If the calibration error persists, please contact Promega or your local Promega representative for service.

Symptoms

Calibration error: **Error Code 2:**

Causes and Comments

Error code 2 indicates a Plunger Bar calibration error (A picture of the plunger bar is shown in Section 2, Panels A and B, page 9.)

- Verify that there are no solid particulates (e.g., bone, swab tips, large particulates, etc.) inside Well #1 of the cartridge. Solid particulates that are not easily homogenized may obstruct the plunger from moving freely to the bottom of Well #1 during processing.
- Verify that the plastic reagent cartridge is seated properly. **If in LEV mode**, ensure the cartridges are seated completely in the LEV Cartridge Rack and that the rack is properly seated on the platform. **If in SEV mode**, ensure the cartridges are seated properly onto the platform.
- If the error occurs during plunger loading, ensure the hardware configuration matches the firmware settings. Select “No” after the “Continue?” prompt on the LCD screen (see Section 4.B).
- Verify that the shipping anchors have been removed. Refer to Section 3.B.
- Turn the instrument off, wait a few seconds, then turn the instrument back on. If the calibration error persists, please contact Promega or your local Promega representative for service.

Calibration error: **Error Code 3:**

Error code 3 indicates a Magnetic Rod Assembly calibration error.

- If in LEV mode, ensure the cartridges are seated completely in the LEV Cartridge Rack and that the rack is seated onto the platform properly.
- If in LEV mode, verify that the fingers on top of the LEV Plungers are not bent inward, preventing the LEV Magnetic Rods from entering the LEV Cartridge.
- Verify that the shipping anchors have been removed. Refer to Section 3.B.
- If in LEV mode, verify the LEV Plunger Bar Adaptor is attached properly. Refer to Section 3.C.
- Verify that the Magnetic Rod Assembly is attached properly. Refer to Section 3.C.
- Turn the instrument off, wait a few seconds, then turn the instrument back on. If the calibration error persists please contact Promega or your local Promega representative for service.



6. Troubleshooting (continued)

Symptoms

Power failure occurs during instrument run

Causes and Comments

To recover your samples after a power failure, first ensure that the particles are in one of the wells of the cartridge and are not attached to the plunger. If the power failure occurred at a point where the magnetic particles were captured on the outside of the plungers, manually move the plungers up and down in the wells to wash the particles off. Then manually remove the plungers from the instrument and restart the purification, from the beginning, with new plungers.

7. Appendix

7.A. Updating Firmware

As we release new purification kits, new versions of firmware may be required. The firmware version installed on your instrument can be verified by turning the machine off and then on again. The initial screen will display the version number of the firmware loaded on the instrument. Please note the firmware version currently installed on your instrument before contacting Promega or your local Promega representative for service or for new firmware.

Firmware is updated using the RS-232 port on the back of the instrument. Firmware can be updated from any computer (Microsoft Windows® 95 or higher) with an available serial port.

1. Plug the provided RS-232 Cable into the back of the instrument and into a serial port on your computer. Note whether the cable is plugged into COM1 or COM2.
2. Obtain the firmware upgrade program from Promega or your local Promega representative. Save the unzipped file to your hard drive, and follow the directions provided with the new firmware.
3. Double-click on the file icon to open the download program. Select the Com port into which the RS-232 Cable is connected. Click the “Download” button, and wait until the program is complete. The instrument should reset itself. It is a good idea to clear the buffer before doing a run by turning the unit off and then back on again. This only needs to be done once after upgrading firmware. The screen should now display the new firmware version. Disconnect the RS-232 Cable from the computer. The RS-232 Cable may be left plugged into the instrument if desired.

Please contact Promega or your local Promega representative for assistance if you encounter any problems during the firmware upgrade process.

7.B. Instrument Return

The Maxwell® 16 Instrument is designed to provide years of consistent performance with little maintenance. If a problem arises with your instrument, please contact Promega or your local Promega representative for support. If further action is required, repair options will be presented and a return authorization assigned if necessary. **Promega is not responsible for instrumentation returned without an authorization number.** When you ship the instrument for service, please remember to:

1. Obtain return authorization from Promega.
2. Decontaminate the instrument (see Section 7.D for Decontamination Instructions).
3. Affix a signed and dated Certificate of Decontamination to the outside of the package in which the instrument is returned (see Section 7.D). **Failure to complete and attach the Certificate of Decontamination will result in a decontamination charge.**
4. Use the original packaging to ensure that no damage will occur to the instrument during shipping. Any damage will incur additional charges. **Note:** If the original packaging is lost or damaged, contact Promega or your local Promega representative for replacement packaging.
5. Repack the instrument according to the following instructions:



7.B. Instrument Return (continued)

Preparation of the Maxwell® 16 Instrument Prior to Repacking

1. Ensure that the cartridges and elution tubes are removed from the instrument platform.
2. Ensure that the instrument is turned off and is not plugged in.
3. Clean and decontaminate the instrument as described in Section 7.D.

Anchoring the Platform, Magnetic Rod Assembly and Plunger Bar

1. By hand, align the platform to replace the Platform shipping anchor thumbscrews (Figure 2) and tighten by hand to anchor the platform in place for shipment.
2. By hand, gently lower the Plunger Bar and Magnetic Rod Assembly. Replace the Magnetic Rod/Plunger Bar shipping anchor thumbscrews and tighten by hand (Figure 2).

Repacking the Maxwell® 16 Instrument

1. Place the instrument back into the plastic bag.
2. Place the two foam packaging protectors on the sides of the instrument.
3. Slide the instrument into the small inside shipping box. Ensure that the top of the instrument is facing the top of the open box.
4. Slide the small inside shipping box containing the instrument into the large outside shipping box.
5. Repack the Maxwell® 16 Instrument accessories.
 - a. Rewrap the Maxwell® 16 SEV and LEV Cartridge Preparation Racks and Magnetic Elution Tube Rack in bubble wrap and place on top of the instrument.
 - c. Place the RS-232 Cable (in a reclosable bag) into the box.
 - e. Place the Power Cable into the box.
6. Affix the Certificate of Decontamination on the outside of the shipping box. Write the return authorization number provided to you by Promega or your local Promega representative on the outside of the shipping box. Seal the Box securely.

7.C. Instrument Disposal

Contact your local Promega Representative for disposal of the instrument. Please follow your institutional requirements to handle the disposal of accessories.

7.D. Certificate of Decontamination

Disinfection and decontamination are required prior to shipping the instrument and instrument accessories for repair. Instruments returned must be accompanied by a signed and dated Certificate of Decontamination, which must be attached to the outside packaging of the instrument.

To disinfect and decontaminate: Wipe off the magnetic rod assembly, plunger bar, inside platform, and inside and outside surfaces using a cloth dampened with 70% ethanol then a cloth dampened with a 1–2% bleach solution in deionized water. Follow immediately with a cloth dampened with deionized water to remove any residual bleach from the instrument surfaces. Repeat the procedure as many times as required to effectively disinfect and decontaminate the instrument.

Failure to confirm disinfection and decontamination will result in decontamination charges before the instrument will be serviced.

Select either (A) or (B):

- A. I confirm that the returned items have not been contaminated by body fluids or by toxic, carcinogenic, radioactive, or other hazardous materials.
- B. I confirm that the returned items have been decontaminated and can be handled without exposing personnel to health hazards.

Circle the type of material used in the instrument: Chemical Biological Radioactive**

Briefly describe the decontamination procedure performed:

Date: _____

Place: _____

Signature: _____

Name (block capital letters): _____

** The signature of a Radiation Safety Officer is also required if the instrument was used with radioactive materials.

This instrument is certified by the undersigned to be free of radioactive contamination.

Date: _____

Place: _____

Signature: _____

Name (block capital letters): _____



7.E. Warranty Information

Limited Warranty and Service Guidelines

Promega warrants to the original purchaser that the Promega Maxwell® 16 Instrument will be free from defects in materials and workmanship for a period of one year from the date of delivery. Promega agrees, as its sole responsibility under this limited warranty, and upon prompt notice of a defect, to repair or replace (at Promega's discretion) any instrument discovered to be defective within the warranty period. Expendable items are not covered by this warranty. This warranty does not include repair or replacement necessitated by accident, neglect, misuse, unauthorized repair or modification of the instrument. The instrument may not be returned without a proper Return Authorization Number from Promega, as described below.

This warranty and the remedies set forth herein are exclusive and in lieu of all other express or implied warranties (including implied warranties of merchantability, fitness for a particular purpose and noninfringement), and no other warranties shall be binding upon Promega. In no event shall Promega be liable for any special, incidental or consequential damages resulting from the use or malfunction of this instrument or the system with which it is used.

In addition to the standard limited warranty that comes with the Maxwell® 16 Instrument, a premier warranty and various service agreement options are available for purchase. If you purchased a premier warranty or service agreement for your Maxwell® 16 Instrument, please refer to those specific terms. See Section 7.F, Related Products.

To obtain service during the warranty period, please take the following steps:

1. Write or call the company that sold you the instrument and describe as precisely as possible the nature of the problem.
2. Carry out minor adjustments or tests as suggested by your technical contact.
3. If the instrument is still not functioning properly, YOU MUST OBTAIN A PROMEGA RETURN AUTHORIZATION NUMBER.
4. Before returning the instrument, you will be responsible for cleaning it and providing a Certificate of Decontamination to Promega in accordance with instructions.
5. After obtaining a Return Authorization Number and signing the Certificate of Decontamination, pack the instrument carefully (damage incurred in shipping due to improper packaging is not Promega's responsibility), write the Return Authorization Number on the outside of the package and ship it to the address provided by your technical contact.
6. Shipping to and from Promega will be paid by Promega pursuant to directions to be provided. The instrument will be repaired free of charge for all customers within their warranty period.
7. Under no circumstance can an instrument be returned without proper authorization. This authorization is needed to ensure that the problem is not a minor problem that can be easily handled in your laboratory and to determine the nature of the problem so that repairs can be handled appropriately.

Out of Warranty Service

Contact Promega or your local Promega representative. We will be happy to assist you by telephone at no charge. Repair service, if needed, will be billed at a flat rate to be agreed upon in advance. Your invoice will include shipping.

7.F. Related Products

DNA Purification Kits

Product	Size	Cat.#
Maxwell® 16 Blood DNA Purification Kit	48 preps	AS1010

Sufficient for 48 automated isolations from up to 400µl whole blood samples.

Product	Size	Cat.#
Maxwell® 16 Cell DNA Purification Kit	48 preps	AS1020

Sufficient for 48 automated isolations from tissue culture or bacterial cells.

Product	Size	Cat.#
Maxwell® 16 Tissue DNA Purification Kit	48 preps	AS1030

Sufficient for 48 automated isolations from up to 50mg tissue samples.

Product	Size	Cat.#
Maxwell® 16 Mouse Tail DNA Purification Kit	48 preps	AS1120

Sufficient for 48 automated isolations from mouse tissues.

Product	Size	Cat.#
Maxwell® 16 FFPE Tissue LEV DNA Purification Kit	48 preps	AS1130

Sufficient for 48 automated isolations from formalin-fixed, paraffin-embedded tissue samples.

Product	Size	Cat.#
Maxwell® 16 FFPE Plus LEV DNA Purification Kit	48 preps	AS1135

For Laboratory Use. Sufficient for 48 automated isolations from formalin-fixed, paraffin-embedded tissue samples.

Product	Size	Cat.#
Maxwell® 16 Cell LEV DNA Purification Kit	48 preps	AS1140

Sufficient for 48 automated isolations from up to 1×10^4 cells.

Product	Size	Cat.#
Maxwell® 16 LEV Blood DNA Kit	48 preps	AS1290

Sufficient for 48 automated isolations up to 400µl whole blood samples.

Product	Size	Cat.#
Maxwell® 16 Buccal Swab LEV DNA Purification Kit	48 preps	AS1295

Sufficient for 48 automated isolations from buccal swabs.



7.F. Related Products (continued)

RNA Purification Kits

Product	Size	Cat.#
Maxwell® 16 LEV simplyRNA Cells Kit	48 preps	AS1270

Sufficient for 48 automated isolations from cell samples.

Product	Size	Cat.#
Maxwell® 16 LEV simplyRNA Tissue Kit	48 preps	AS1280

Sufficient for 48 automated isolations from tissue samples.

Product	Size	Cat.#
Maxwell® 16 LEV simplyRNA Blood Kit	48 preps	AS1310

Sufficient for 48 automated isolations from fresh blood in EDTA collection tubes.

Product	Size	Cat.#
Maxwell® 16 Total RNA Purification Kit	48 preps	AS1050

Sufficient for 48 automated isolations from tissue, cells or blood samples.

Product	Size	Cat.#
Maxwell® 16 Tissue LEV Total RNA Purification Kit	48 preps	AS1220

Sufficient for 48 automated isolations from up to 25mg tissue samples.

Product	Size	Cat.#
Maxwell® 16 Cell LEV Total RNA Purification Kit	48 preps	AS1225

Sufficient for 48 automated isolations from up to 1×10^6 tissue culture cells.

Viral Purification Kit

Product	Size	Cat.#
Maxwell® 16 Viral Total Nucleic Acid Purification Kit	48 preps	AS1150

Each system contains sufficient reagents for 48 automated isolations.

Forensic or Paternity Lab-Related Products

Product	Size	Cat.#
DNA IQ™ Reference Sample Kit for Maxwell® 16	48 preps	AS1040
Sufficient for 48 automated isolations from forensic or paternity reference sample types.		

Product	Size	Cat.#
DNA IQ™ Casework Pro Kit for Maxwell® 16	48 preps	AS1240
Sufficient for 48 automated isolations from forensic casework samples.		

Protein Purification Kit

Product	Size	Cat.#
Maxwell® 16 Polyhistidine Protein Purification Kit	48 preps	AS1060

Warranties

The **Standard Warranty**, included in the system price, covers all parts, labor and shipping to and from our depot repair location as well as a loaner instrument upon request. The loaner will be shipped via standard ground shipment and will arrive in 5 to 7 working days. If you no longer have your Maxwell® 16 shipping carton, we will provide you with a box for shipment of the instrument back to our service technicians. We will repair it and return it to you performing to original factory specifications.

Product	Cat.#
Maxwell® 16 Premier Warranty	SA2000

If uptime is critical, the **Premier Warranty** can be purchased as an upgrade to the standard warranty. The **Premier Warranty** provides you with your choice of a loaner instrument within 1 working day or on-site repair by a factory trained service technician. Like the standard warranty, it covers all parts, labor and shipping to and from our depot repair location as well as a loaner instrument upon request. Additionally, this option includes one preventive maintenance visit during the term of the agreement.

Service Agreement Options

Product	Cat.#
Maxwell® 16 Standard Service Agreement	SA2010

After the warranty period is over, you can continue to receive the same comprehensive service and support from Promega as you did when your system was under warranty. The **Standard Service Agreement** covers all parts, labor and shipping to and from our depot repair location as well as a loaner instrument upon request. If your Maxwell® 16 needs repair, we will provide a box for shipment of the instrument back to our service facility. We will repair it and return it performing to original factory specifications.



7.F. Related Products (continued)

Service Agreement Options (continued)

Product	Cat.#
Maxwell® 16 Premier Service Agreement	SA2015

Our **Premier Service Agreement** provides maximum flexibility and uptime. The agreement covers all parts, labor and shipping charges. You can utilize our depot repair and receive a loaner instrument in 1 working day or you can elect to have one of our service technicians service it in your lab. Additionally, the Premier Service Agreement includes one annual preventive maintenance visit per year.

Product	Cat.#
Maxwell® 16 Preventive Maintenance	SA2020

In order to keep your instrument at peak performance, Promega recommends the Maxwell® 16 instruments receive a preventive maintenance check after every 12 months of use. During this procedure, our qualified service personnel test the instrument, check parts for wear and replace them as needed. Additionally the instrument is aligned and performance is verified.

Product	Cat.#
Maxwell® 16 Installation Qualification	SA1001

The Installation Qualification provides a series of formal on-site instrument checks, delivers written documentation of instrument functionality, and demonstrates that everything ordered with your instrument is supplied and installed in your laboratory. Upon delivery to the lab, the instrument and its components will be visually inspected and reviewed for completeness. Following the inspection, the instrument will be powered on to confirm that the system is properly functional.

Product	Cat.#
Maxwell® 16 Operational Qualification	SA1011

The Operational Qualification demonstrates that the Maxwell® 16 will function according to its operational specifications. An instrument specialist will check the instrument's alignment and then perform an operational test run to ensure that all of the hardware modules function correctly. Following the documentation of these tests, familiarization training with the instrument's operators will occur. The specialist will also explain all of the sections of the instrument log book.

Product	Cat.#
Maxwell® 16 Installation and Operational Qualification Package	SA1021

The Installation and Operational Qualification package includes all of the components from both SA1001 and SA1011 in one service product.

8. Summary of Changes

The following changes were made to the 11/15 revision of this document:

1. Removed EU Declaration of Conformity.
2. Updated patent statement.

©U.S. Pat. Nos. 7,721,947 and 7,891,549 and other patents pending.

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Windows is a registered trademark of Microsoft Corporation.

Products may be covered by pending or issued patents or may have certain limitations. Please visit our Web site for more information.

All prices and specifications are subject to change without prior notice.

Product claims are subject to change. Please contact Promega Technical Services or access the Promega online catalog for the most up-to-date information on Promega products.