invitrogen™

by life technologies™

BenchPro™ 4100 Card Processing Station

For automated processing of routine washing and reagent incubation steps of standard laboratory procedures

Catalog no. WP0001

Rev. Date: 9 September 2010
Part no. 25-1049

MAN0001752

User Manual

Contents

Product Contents

BenchPro™ 4100 Card Processing Station

The contents of the BenchPro™ 4100 Card Processing Station are listed below:

Component	Quantity
BenchPro™ 4100 Card Processing Station	1
Specific Power Cord (for U.S./Canada/Taiwan/Japan, Europe, and UK)	3
Reagent Bottles (set 1)	4 × 250 ml
Reagent Bottles (set 2)	4 × 125 ml
Reagent Vials	12 × 25 ml
Drain tubing for auto-drain with attached connector (6 feet length)	1
Quick Reference Card (QRC)	1
Instruction Manual	1

See page 4 for specifications and description of the BenchPro™ 4100 Card Processing Station, and page 8 to install the instrument.

Upon Receiving the Instrument

Examine the unit carefully for any damage incurred during transit. Any damage claims must be filed with the carrier. The warranty does not cover in-transit damage.

BenchPro™ 4100 Western Card

The BenchPro™ 4100 Western Card is used with the BenchPro™ 4100 Card Processing Station for western blotting application and is available separately from Invitrogen (page 33):

Product	Catalog no.
BenchPro™ 4100 Western Card	WP1001

The BenchPro™ 4100 Western Card box includes 10 BenchPro™ 4100 Western Cards and 10 Blot Holders.

Safety Information

Safety

Follow the instructions in this section to ensure safe operation of the BenchPro™ 4100 Card Processing Station. The BenchPro™ 4100 Card Processing Station is designed to meet EN61010-1 Safety Standards. To ensure safe, reliable operation, always operate the BenchPro™ 4100 Card Processing Station according to the instructions in this manual. Failure to comply with the instructions in this manual may create a potential safety hazard, and will void the manufacturer's warranty and void the EN61010-1 safety standard certification. Invitrogen is not responsible for any injury or damage caused by use of this instrument when operated for purposes which it is not intended. All repairs and service should be performed by Invitrogen.

In an emergency, immediately turn the Power Switch Off and unplug the instrument.

Informational Symbols

The symbols used on the BenchPro™ 4100 Card Processing Station and in the manual are explained below:

Caution

The **Caution** symbol denotes a risk of safety hazard. Refer to accompanying documentation.

WEEE

The **WEEE** (Waste Electrical and Electronic Equipment) symbol indicates that this product should not be disposed of in unsorted municipal waste. Follow local municipal waste ordinances for proper disposal provisions to reduce the environmental impact of WEEE. Visit www.invitrogen.com/weee for collection and recycling options.

Used on the instrument to indicate an area where a potential shock hazard may exist.

User manual.

Product Specifications

BenchPro™ 4100 Card Processing Station Specifications

Environmental Conditions

Input Power:	100–240 VAC, 3.0 Amps, 50–60 Hz
Installation site:	Indoor use only
Altitude:	Up to 2,000 meters
Operating Temperature:	4–40°C
Maximum Relative Humidity:	80% for temperatures up to 31ºC decreasing linearly to 50% relative humidity at 40ºC
Noise Level:	<70 dBa

Specifications

Instrument Type:	Benchtop processor unit with 4 slots
Sample Processing:	1 to 4 membranes/run
Processing Time:	Variable (see each protocol for details)
Instrument Dimensions:	18.6 inches (w) × 23.9 inches (d) × 12.7 inches (h)
Weight:	30 pounds (13.6 kg)
Built-in Features:	Digital display, light LED

The BenchPro™ 4100 Card Processing Station including the BenchPro™ 4100 Western Card is compatible with standard nonhazardous laboratory reagents. **Do not** use organic solvents in the card or with the instrument.

BenchPro™ 4100 Western Card Specifications

The BenchPro™ 4100 Western Cards are used with the BenchPro™ 4100 Card Processing Station and are available from Invitrogen (page 33). For details on the BenchPro™ 4100 Western Cards, see page 5. The specifications for the BenchPro™ 4100 Western Cards are listed below:

Card Dimensions:	18.5 cm × 16 cm
Card Materials:	Mixed plastics and metal foil
Membrane Size:	Suitable for use with mini blot (8.5 × 8.5 cm)
Card Tip Dimensions:	13.2 cm × 6.5 mm

CE

The CE mark symbolizes that the product conforms to all applicable European Community provisions for which this marking is required. Operation of the BenchPro™ 4100 Card Processing Station is subject to the conditions described in this manual.

The protection provided by the instrument may be impaired if the instrument is used in a manner not specified by Invitrogen.

C US

A CSA mark with the indicators "C" and "US" means that the product is certified for both the U.S. and Canadian markets, to the applicable U.S. and Canadian standards.

Unpacking the BenchPro™ 4100 Card Processing Station

Unpacking Instructions

Follow the instructions below to unpack the BenchPro™ 4100 Card Processing Station. The weight of the instrument is 30 pounds (13.6 kg).

1. Cut plastic tapes and remove the outer box. Save the outer box and other packaging material (in case you need to transport or ship the unit).
2. Remove the plastic bag from the top containing the manual and QRC, and then remove plastic bags containing the power cords and plastic drain tubing from spaces around the instrument.
3. Remove the BenchPro™ 4100 Card Processing Station from the box and place on a flat, level surface.
4. Remove any tape holding the reagent drawer and tray parts. The plastic bottles and vials are placed in position in the tray during shipping.
5. Set up the BenchPro™ 4100 Card Processing Station as described on page 8.

BenchPro™ 4100 Card Processing Station

Front View

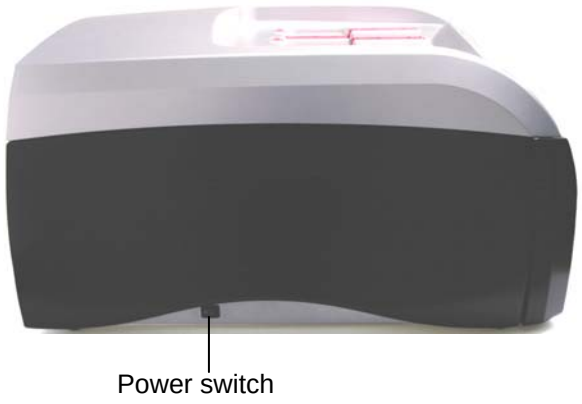
The front view showing various parts of the BenchPro™ 4100 Card Processing Station is shown below.

Rear and Side View

The rear and side view showing various parts of the BenchPro™ 4100 Card Processing Station are shown below.

The USB A port (bottom) is used to connect a USB memory drive and the USB B port (top) is used to connect to a personal computer. The AC inlet is to connect to the power outlet on the wall and the auto-drain fitting is to connect the drain hose quick disconnect fitting to the unit.

Side View



Rear View

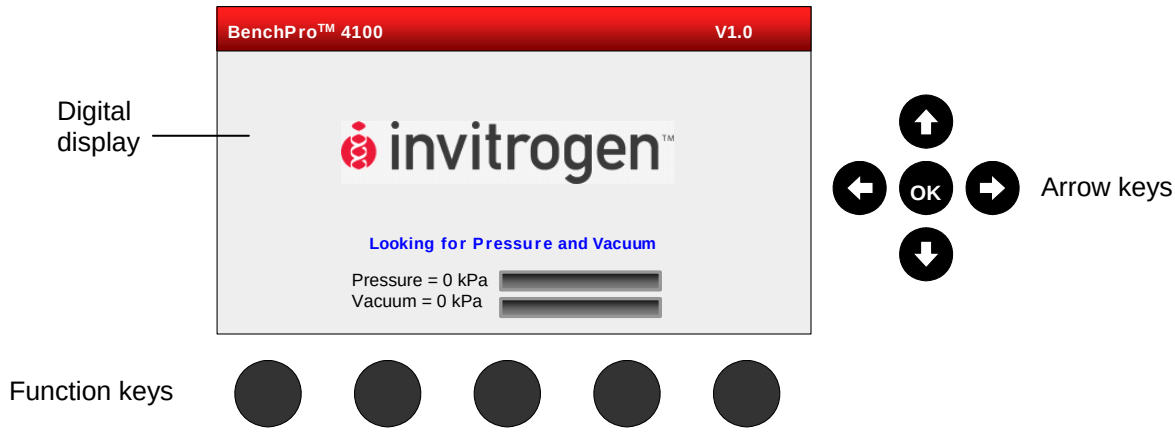
Continued on next page

BenchPro™ 4100 Card Processing Station, Continued

User Interface

The user interface of the BenchPro™ 4100 Card Processing Station consists of:

- The Digital Display that shows the protocol that is in use and various steps of the protocol.
- Power and Status lights indicate the status of the run or error.
- Various function keys that are used to enter parameters and operate the instrument.
- Directional arrow keys allow you to navigate menus and select protocols or steps during instrument setup and operation.



Introduction

Overview

Introduction

The BenchPro™ 4100 Card Processing Station is an automated benchtop device that uses electronic solenoid technology to control the transfer of on-board compressed air and vacuum to a disposable card for automated, fast, and reproducible processing of routine steps for standard laboratory procedures. The BenchPro™ 4100 Card Processing Station allows processing of up to four cards in parallel with up to four different reagent sets.

The BenchPro™ 4100 Card Processing Station automates routine manual processing steps for standard laboratory procedures such as western immunodetection while maintaining performance comparable to manual processing.

See page 4 for details on various parts of the system.

System Components

The BenchPro™ system consists of:

- BenchPro™ 4100 Card Processing Station

  The BenchPro™ 4100 Card Processing Station with BenchPro™ 4100 Western Cards allows automated processing of incubation and washing steps for up to four membranes at a time. The instrument is a simple, user friendly benchtop unit that is preprogrammed with two WesternBreeze® immunodetection protocols and one standard ECL protocol. See page 4 for details.

- BenchPro™ 4100 Western Card

  The BenchPro™ Card is a disposable card that is inserted into the slot on top of the BenchPro™ 4100 Card Processing Station. The card holds the membrane to be processed in a Blot Holder. During operation, reagents are pumped from reagent bottles and vials located in the reagent tray, into the card and around the membrane. The order of reagents used and timing of protocol steps are based on the protocol selected.

- Reagents (not supplied with the instrument)

  Currently the BenchPro™ 4100 Card Processing Station is available for immunodetection applications using the BenchPro™ 4100 Western Card. The BenchPro™ 4100 Card Processing Station is compatible for use with a variety of immunodetection reagents and protocols. All commonly used immunodetection reagents are supported. The reagents are added to the supplied reagent bottles and vials and placed in the reagent tray prior to use.

Continued on next page

System Overview

The BenchPro™ 4100 Card Processing Station performs automated reagent processing using electronic solenoid technology developed by Invitrogen.

To use the BenchPro™ system for immunodetection protocol, you will:

1. Perform western transfer of proteins to nitrocellulose or PVDF membrane using standard procedures.
2. Assemble the reagent bottles and vials containing the required reagents for immunodetection and place the reagent bottles and vials on the reagent tray in the instrument.
3. Insert the BenchPro™ 4100 Western Card into the card slot on the BenchPro™ 4100 Card Processing Station.
4. Transfer the membrane to the Blot Holder which is then inserted into the BenchPro™ 4100 Western Card.
5. Select and run the pre-programmed immunodetection protocol of choice or program and run your own custom protocol.

During the automated immunodetection protocol, reagents are pumped from reagent bottles and vials located in the reagent tray, into the card and around the membrane. The order of reagents used and timing of protocol steps are based on the selected protocol. After each step is completed, the reagents are cycled into the waste container or back into the reagent bottle and vial, if desired. At the end of the protocol, the Blot Holder is removed from the card and the membrane is removed from the Blot Holder. Perform membrane incubation in substrate as recommended by the substrate manufacturer or follow your usual detection protocol.

Features

Important features of the BenchPro™ system are listed below:

- User-friendly BenchPro™ 4100 Card Processing Station design with a disposable BenchPro™ Card for easy, automated reagent processing for standard laboratory procedures such as immunodetection
- Ability to perform simultaneous processing of 1–4 membranes with different reagent sets using the **same** protocol
- No cross contamination between samples as reagents for each membrane are isolated
- Two pre-programmed WesternBreeze® immunodetection protocols, one ECL protocol, and the option to customize up to 20 immunodetection protocols
- Optional auto-drain feature on the waste tray removes the need for frequent emptying of waste reagents
- Provides consistent, reliable results comparable to manual processing
- Built-in safety features in the instrument enhance user safety

Continued on next page

Purpose of the Manual

This manual provides the following information:

- Details and specifications on the BenchPro™ 4100 Card Processing Station and BenchPro™ 4100 Western Card
- Unpacking and installing the BenchPro™ 4100 Card Processing Station
- Operating the BenchPro™ 4100 Card Processing Station with a disposable BenchPro™ 4100 Western Card
- Cleaning and maintaining the BenchPro™ 4100 Card Processing Station
- Troubleshooting

Description of Parts

Introduction

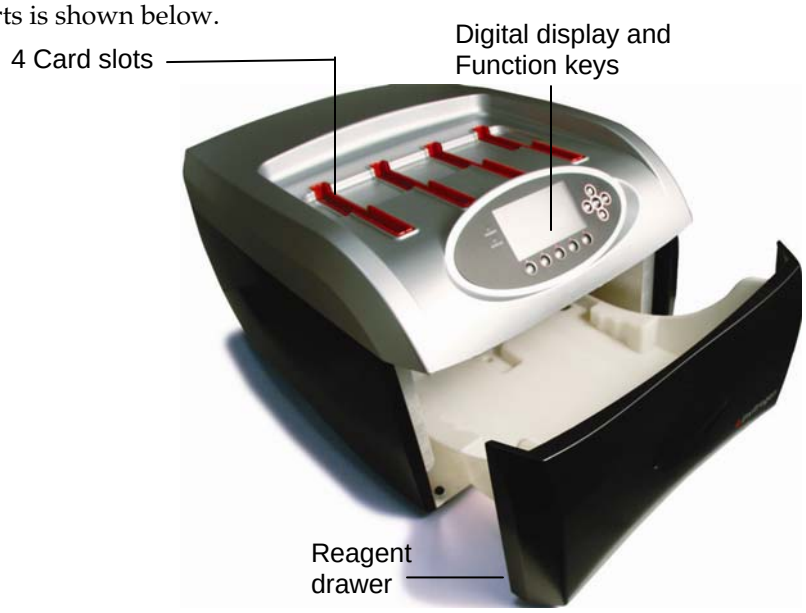
The various parts of the BenchPro™ 4100 Card Processing Station and BenchPro™ 4100 Western Card are described below.

BenchPro™ 4100 Card Processing Station

The BenchPro™ 4100 Card Processing Station is a benchtop, automated processing unit capable of processing 1–4 experimental samples. The BenchPro™ 4100 Card Processing Station when used with a BenchPro™ 4100 Western Card delivers the reagents from the reagent tray to the sample for processing based on the selected protocol. The BenchPro™ 4100 Card Processing Station and Western Card are designed to accommodate overnight protocols of up to 19 hours of continuous operation.

See page ix for a front and rear view of the device.

The front view of a BenchPro™ 4100 Card Processing Station identifying various parts is shown below.



Reagent Drawer Unit

The Reagent Drawer Unit contains the reagent tray assembly which holds vials of reagents for use with the desired protocol, a clean-assist attachment designed to streamline reagent cleaning, and a Waste Basin, used to collect waste solutions (page 6 for details).

Card Slots

Each BenchPro™ 4100 Card Processing Station unit features 4 card slots that allow the insertion of disposable BenchPro™ Cards (see next page for details on the card) into the unit. There is no need to use all 4 cards at the same time. You can use a single card or from 1 and 4 cards at a time. **Do not insert anything (fingers, pipette, or liquid) into the card slots as it may cause harm to you or damage the unit.**

Digital Display with Function Keys

The digital display along with the function keys is used to operate the instrument and choose or customize the processing protocol.

Continued on next page

BenchPro™ 4100 Western Card

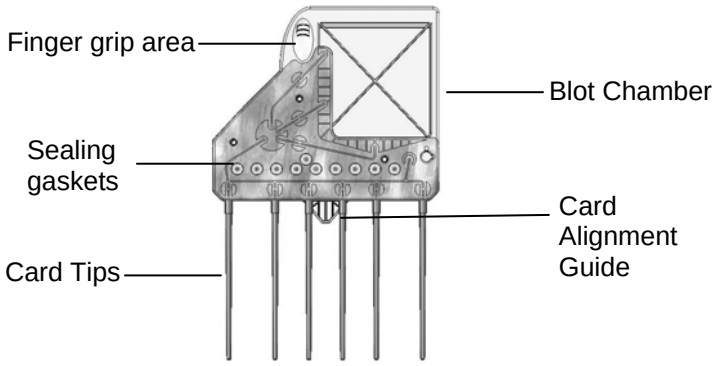
The BenchPro™ 4100 Western Card is a disposable, plastic card designed for use with the BenchPro™ 4100 Card Processing Station (see figure below). The BenchPro™ 4100 Western Card aspirates reagents from the reagent bottles and vials into the blot chamber in a sequence determined by the protocol. Once the blot chamber is full, the solution is recirculated within the chamber for a specified incubation period after which the solution is directed to the waste basin or, optionally, back into the container from which the reagent was drawn.

The preprogrammed or custom protocols control the volume of reagents required and incubation times used.

BenchPro™ 4100 Western Cards are available from Invitrogen (page 33). Always store the BenchPro™ 4100 Western Card in the supplied box to prevent any damage to the card. To avoid damaging the card:

- Do not drop the card or bend card tips.
- Always handle the card from the top side (away from the card tips). A finger grip area is located at the upper left of the card to aid with handling.
- Do not manually add any solution to the blot chamber.

Note: If you accidentally damaged the BenchPro™ 4100 Western Card, you can purchase additional cards from Invitrogen ((page 33).



Blot Chamber

The blot chamber holds the transfer membrane (one full mini blot or one half-mini blot). During the immunodetection procedure, various reagents (as specified by the protocol) are channeled into the chamber for incubation with the transfer membrane. The blot chamber is designed to allow the membrane to be completely immersed in solution during all steps of the protocol.

Card Tips

The Card Tips are plastic tips that are attached to the card and inserted into the reagent bottles and vials in the reagent tray. During the procedure, the tips aspirate reagents from containers in the tray into the blot chamber, and are also used to return reagents back into the same vials after use and direct reagents into the waste basin.

Card Alignment Guide

The Card Alignment Guide aids with the proper positioning of the card into the slot so the tips are aligned correctly into the reagent bottles/vials.

Continued on next page

Description of Parts, Continued

Reagent Drawer Unit

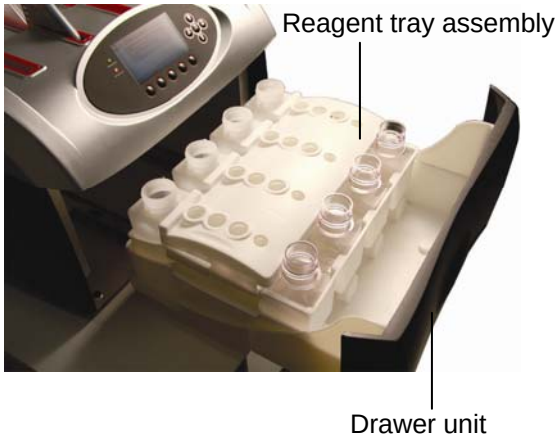
The Reagent Drawer Unit contains the Reagent tray assembly, Clean-assist attachment and Waste Basin.

The Reagent Tray, Waste Basin, and one set of reagent bottles and vials are included with the instrument. Upon receipt, store the reagent bottles and vials in a cool, dry place.

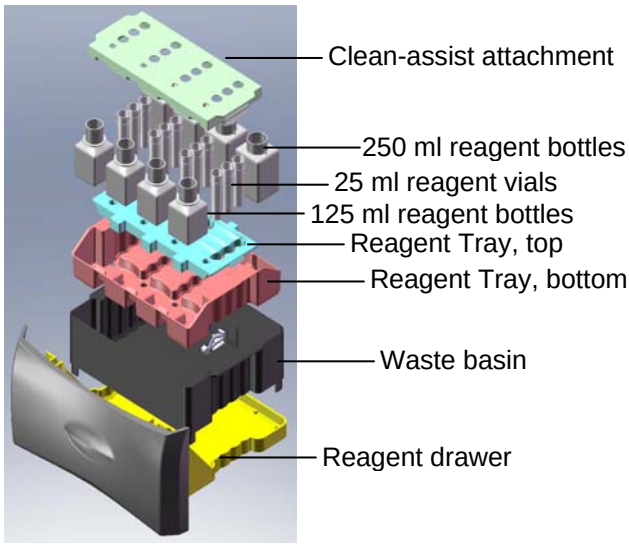
The Reagent Tray Assembly is composed of:

- Waste Basin is used to collect the waste during the protocol and contains a waste drain valve to drain the waste
- Reagent Tray Bottom that holds the reagent bottles and vials
- One set of reagent bottles (250 ml and 125 ml each) and vials (25 ml) are supplied with the unit and also available separately (page 33)
- Reagent Tray top
- Clean-assist attachment (optional) allows you to discard any unused reagents into the sink without having to remove the vials separately.

Instrument with Reagent Drawer open



Reagent Tray Assembly



Continued on next page

Description of Parts, Continued

Blot Holder

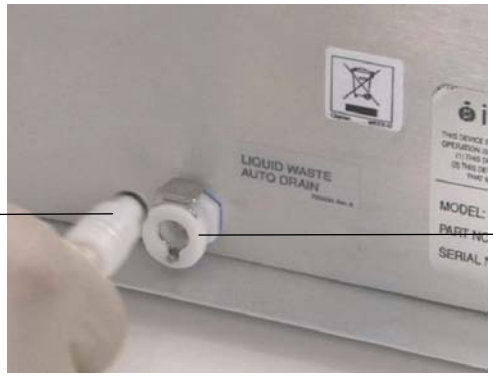
The Blot Holders (set of 10) are supplied with the BenchPro™ 4100 Western Cards. The Blot Holder enables easy transfer of the membrane in and out of the card and prevents the membrane from sticking to the card chamber sides during processing.

Methods

Getting Started

Installing the BenchPro™ 4100 Card Processing Station

1. Unpack the BenchPro™ 4100 Card Processing Station as instructed on page viii.
2. **Three power cords are shipped with the instrument to ensure that the cord you use is compatible with your local socket format.**
3. Place the BenchPro™ 4100 Card Processing Station on a level laboratory bench. Keep the area around the instrument clear to ensure proper ventilation of the unit.
4. **For your safety:** Position the instrument properly such that the **power** switch located on the instrument's left side and the AC inlet located on the rear of the unit (page ix) are easily accessible. Be sure to position the instrument such that it is easy to disconnect the unit.
5. Ensure the AC power switch is in the **Off** position (page ix).
6. Attach the power cord to the AC inlet and then to the electrical outlet. Use only properly grounded AC outlets and power cords.
7. Attach the 6' drain tubing supplied with the unit to the waste outlet if automatic waste draining is desired (page 6) by pushing the quick connect fitting of the tubing into the hose connector of the auto drain outlet in the rear of the instrument.



You are ready to use the BenchPro™ 4100 Card Processing Station. See page 11 for details.

Using BenchPro™ 4100 for the First Time

If you are using the BenchPro™ 4100 Card Processing Station for the first time,

- Unpack the reagents bottles and vials from the package, and store the bottles and vials.
- You may wish to rinse the Waste Basin, Reagent Tray Top and Bottom, and Clean-assist attachment with water before use (see page 22 for cleaning and maintenance of parts). Be sure to place all parts back properly in the instrument before use.
- Review the preprogrammed protocols to ensure that one of the protocols meets your requirements (page 9) or program a custom protocol (page 23).

Continued on next page

Selecting a Preprogrammed Protocol

You need to select an appropriate protocol on the BenchPro™ 4100 Card Processing Station prior to assembling the unit with the transfer membrane and reagents.

To create a custom protocol, see page 23.

1. Press the power switch (located on the left side of the unit, page ix) to turn **ON** the BenchPro™ 4100 Card Processing Station. The Power status light turns green and the instrument performs a self test of electrical and pneumatic systems.

   Once the status check is complete (air pressure and vacuum reach nominal values as indicated on the display), the **Protocols** screen is displayed.

2. Select the appropriate preprogrammed immunodetection program by using the **Up/down** arrow keys to move cursor to the program and then press **OK**.

   Choose WesternBreeze (95 min) for a faster WesternBreeze® immunodetection protocol wherein the incubation and wash times are reduced resulting in sensitivities of 55% to 90% of the standard protocol depending on the antigen/antibody.

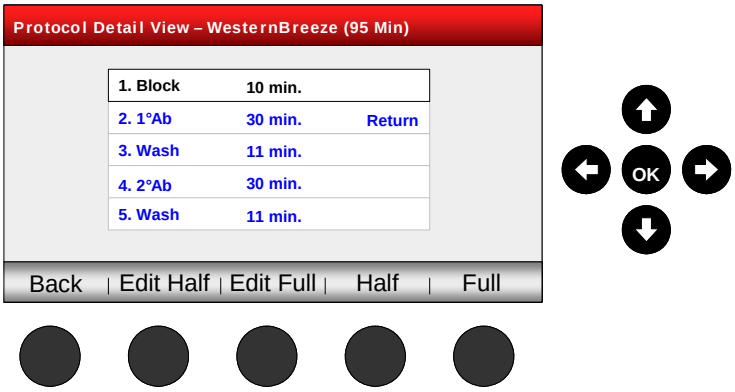
   Choose WesternBreeze (176 min) for a standard WesternBreeze® immunodetection protocol using standard washing, blocking, and antibody incubation steps and time.

   Choose ECL protocol for a standard ECL detection.

   To create a custom protocol, see page 23.

Note: The preprogrammed protocols have a lock icon next to each protocol indicating that these protocols are locked for editing.

3. The **Protocol Detail View** is displayed. Verify the protocol steps shown by navigating with the **Up/down** arrow keys.



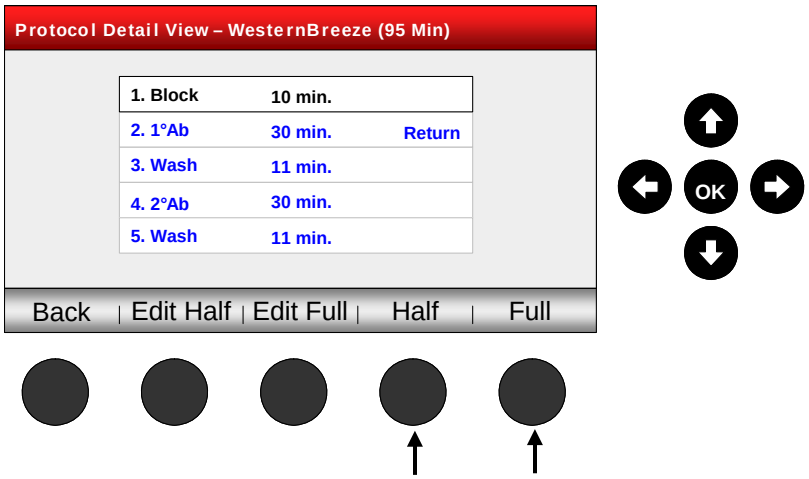
Continued on next page

Selecting a Preprogrammed Protocol, Continued

If changes are required, press the **Edit Half** or **Edit Full** function key and proceed to editing the protocol (page 23).

Note: Selecting Half or Full allows the instrument to calculate reagent volumes required for each step. If maximum available reagent volumes are exceeded, an error message screen is displayed.

4. Select the option to run a protocol for half or full membrane by pressing the **Half** or **Full** function key.



5. The **Run** menu is displayed. Proceed to assembling the unit with reagents and membrane as described on page 12.

General Guidelines

Introduction

General guidelines for using the BenchPro™ 4100 Card Processing Station with BenchPro™ 4100 Western Card are discussed below.

Recommended Cards

To use the BenchPro™ 4100 Card Processing Station for immunodetection, you need to purchase the BenchPro™ 4100 Western Card from Invitrogen. Ordering information is on page 33. **Do not** use any other cards with the unit.

Important

- Up to 4 BenchPro™ 4100 Western Cards can be used to process an identical number of membranes. If loading fewer than 4 cards, verify that the reagent bottles and vials are also loaded in the tray in an order corresponding to the cards. The unit automatically detects which slots contain cards and only slots containing the cards function during processing.
- Always load reagent bottles and vials in the reagent tray without caps to allow the Card Tips to draw the solution into the blot chamber.
- Always load the reagent bottles and vials before inserting the card into the instrument. The Blot Holder containing the membrane may be inserted into the card before or after the card is loaded into the unit.

To obtain the best results, follow these recommendations:

- Wear gloves, laboratory coat, and safety glasses during handling the membranes, assembling reagents, or cleaning the system.
- The BenchPro™ pre-programmed immunodetection protocols are designed to use one primary antibody and one secondary antibody. If your detection protocol requires an additional detection reagent (required when using a biotin-streptavidin reagent pair), you need to modify the protocol as well as reagent addition to the reagent bottles.

  For example, load blocking solution in the 125 ml reagent bottle instead of 25 ml vial. This would allow the use of 25 ml vials for the primary antibody and biotin-streptavidin pair.
- Always use the BenchPro™ 4100 Card Processing Station with BenchPro™ 4100 Western Cards for immunodetection protocols.
- The BenchPro™ 4100 Card Processing Station is compatible for use with nitrocellulose or PVDF transfer membranes and a variety of immunodetection reagents. **Do not** use expired reagents.
- Before closing the reagent drawer**, be sure to remove caps of the reagent bottles and vials.**
- Make sure the membrane is of an appropriate size to fit in the Blot Holder to ensure proper insertion and processing of the membrane. Always place the membrane in the Blot Holder before placing the holder in the chamber.
- Discard the card and waste contents appropriately after use. **Do not reuse the card.** The instrument detects used cards by a color indicator spot at the lower right hand corner of the card which turns red after the card is used.

Continued on next page

Using the BenchPro™ 4100 Card Processing Station

Introduction

Instructions are provided in this section to use the BenchPro™ 4100 Card Processing Station with the BenchPro™ 4100 Western Card for automated processing of the transfer membrane.

Materials Needed

You will need the following items. Ordering information is on page 33.

- BenchPro™ 4100 Western Card and Blot Holder
- Reagents (blocking buffer, washing buffer, primary and secondary antibody)
- Detection reagent (chromogenic or chemiluminescent substrate)
- Nitrocellulose or PVDF transfer membranes containing blotted proteins

Preparing Reagents

The BenchPro™ 4100 Card Processing Station is compatible with a variety of immunodetection protocols and reagents.

Reagents for WesternBreeze® immunodetection as well as alkaline phosphatase and horse radish peroxidase (HRP) chromogenic and chemiluminescent substrates are available separately from Invitrogen (page 33).

1. Prepare the reagents used for your immunodetection protocol as you would using manual processing or as directed by the reagent manufacturer.

   Prepare reagents directly in the calibrated reagent bottles and vials supplied with the unit, or prepare reagents separately and transfer the required amounts into the supplied reagent bottles and vials.

   Typical reagent volumes for **one run** are listed below:

Reagent	Half Blot	Full Blot	Maximum Vol. Allowed
Blocking solution	13 ml	18 ml	25 ml
Primary antibody in diluent	13 ml	18 ml	25 ml
Secondary antibody in diluent	13 ml	18 ml	25 ml
Wash buffer	Depends on the protocol used*		250 ml
Deionized water (Rinse)	Depends on the protocol used*		125 ml

   *To the required volume of reagent needed, add an additional 10 ml volume to the wash and rinse bottles to allow for unusable residual liquid that the card tips cannot reach. For example, if the required volume is 150 ml, add at least 160 ml of Wash buffer or Rinse to the bottle.

2. Add the reagents to the appropriate container as listed below:

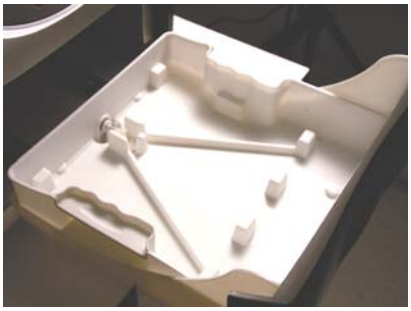
250 ml Reagent bottle	Wash buffer
25 ml Reagent vial (A)	Blocking solution
25 ml Reagent vial (B)	Primary Antibody
25 ml Reagent vial (C)	Secondary Antibody
125 ml Reagent Bottle	Deionized water (Rinse)

3. Proceed to **Assembling the Reagent Tray Assembly,** next page.

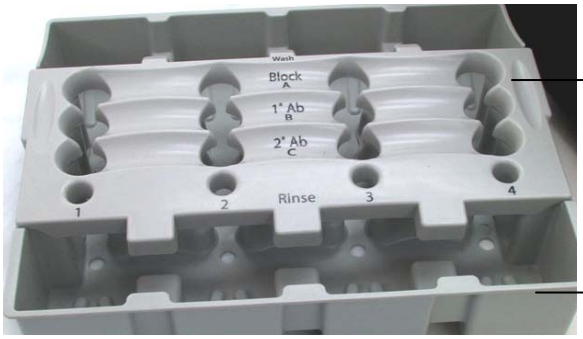
Assembling the Reagent Tray Assembly

Instructions are provided below to assemble the Reagent Tray Assembly with reagent bottles and vials containing the required reagents.

1. Open the drawer unit and place the waste basin into the drawer.



2. Place the Reagent Tray Top on the Reagent Tray Bottom.

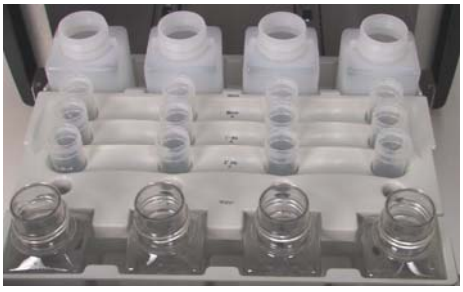


3. Assemble the reagent bottles and vials containing reagents in the correct container **without caps** in the Reagent Tray Bottom. Vials will insert through the Tray Top and seat in the Tray Bottom.

   Start placing the reagent bottles from the **rear of the tray in the order** as shown below and as labeled on the reagent tray:

   a. 250 ml Reagent bottle contains wash buffer
   b. 25 ml Reagent vial contains blocking solution
   c. 25 ml Reagent vial contains primary antibody
   d. 25 ml Reagent vial contains secondary antibody
   e. 125 ml Reagent bottle contains deionized water (rinse)

   Note: You can use 1–4 cards depending on the number of samples that you wish to process. If you are loading less than 4 cards, ensure that the reagent bottles and vials are positioned in the reagent tray rows that correspond to the slots used by the cards.



Continued on next page

Assembling the Reagent Tray Assembly, Continued

4. *Optional:* If you plan to use the Clean-assist attachment, you can attach the Clean-assist attachment to the Reagent tray top as shown below.

5. Place the reagent tray assembly within the Waste Basin. Close the Reagent Drawer unit **completely**.
6. If you are using the auto-drain feature, connect the 6′ plastic tubing provided to the hose connector at the back of the unit as described on page 8.

   For proper draining of waste, maintain the tubing at a height lower than that of the hose connector. If the waste can be poured directly in the sink, then position the hose outlet in the sink. If the waste cannot be poured directly in the sink, position the hose outlet in an appropriate waste container. Consult with your local safety and environmental agency for disposal regulations.
7. Proceed to **Loading the Card**, next page.

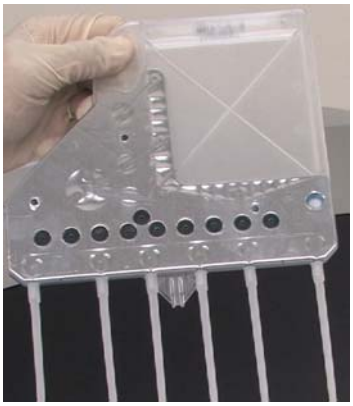
Continued on next page

Loading the Card

Before loading the card and membrane, make sure you have selected the correct protocol or programmed a custom protocol. Be sure to set up reagents in the reagent tray to start the protocol immediately once the membrane is placed in the card to prevent the membrane from drying during reagent or protocol setup.

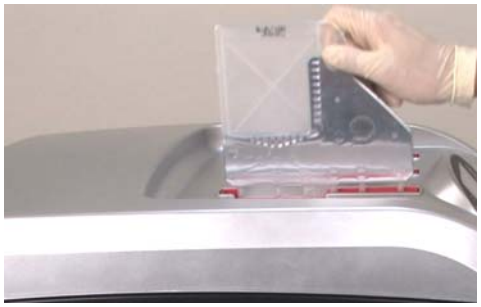
Note: You can run up to 4 cards using different reagent sets but using the **same** protocol.

1. Remove the required number of BenchPro™ 4100 Western Cards and Blot Holders from the box. Always hold the card near the finger grip area at the top of the card. **Do not** hold the card by card tips.



2. Remove the card from the package and insert the card into a slot in the BenchPro™ 4100 Card Processing Station such that the tips are inserted into the reagent bottles and vials placed in the reagent tray. Use the Card Alignment Guide on the side of the slot to ensure the card is placed correctly. When the card is placed correctly in the slot, you will hear a hard click.

   Note: There should not be any resistance to card insertion. If you feel significant resistance, withdraw the card, reposition, and reinsert.



3. After transfer, wash the transfer membrane briefly in water in a tray to remove any gel and transfer buffer components.

   If you are using washed and dried membranes,

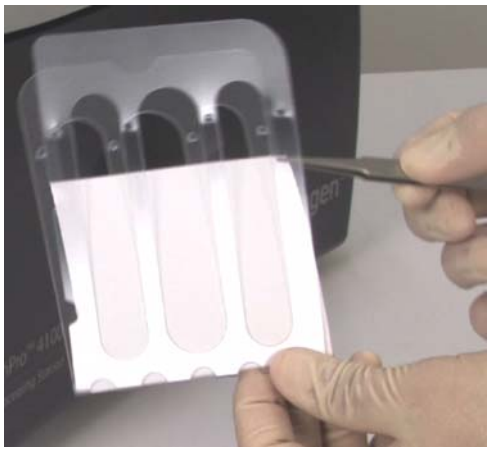
   - Wash nitrocellulose membrane with water for 5 minutes twice in a tray, proceed to Step 4
   - Re-wet the PVDF membrane in methanol in a tray, wash the membrane with water for 5 minutes twice, and then proceed to Step 4

   Note: Use wet or dry nitrocellulose membranes but only use **wet** PVDF membranes. Wetting the membrane before insertion into the instrument results in more even blocking as sometimes dry nitrocellulose can wet unevenly and slowly in places resulting in suboptimal blocking, thereby affecting detection.

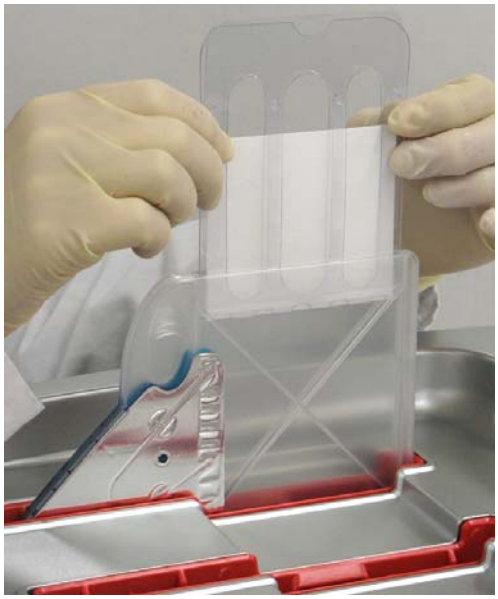
Continued on next page

Loading the Card, Continued

4. Open the Blot Holder by slightly spreading the halves such that the Blot Holder remains open when released to allow easy membrane insertion.
5. Using forceps, place the transfer membrane in Blot Holder. Position one edge of the membrane toward the bottom of the holder, making sure that no portion of the blot extends outside the holder.



6. Holding the sides of the Blot Holder together, slide the Blot Holder containing the membrane into the blot chamber of the card. Transfer membrane insertion is easier if the card is already inserted into the instrument.



7. Proceed immediately to **Running a Preprogrammed Protocol**, next page.

Continued on next page

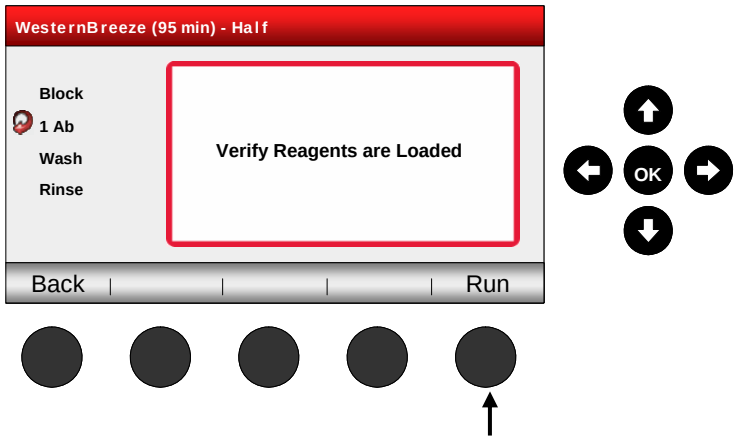
Running a Preprogrammed Protocol

Three immunodetection protocols are preprogrammed into the unit and cannot be deleted or over written by the user as indicated by the lock placed next to protocol names on the **Protocols** screen.

If you have already preprogrammed a custom protocol, then you can use it at this time. **To program a custom protocol, see next page.**

1. If you have already selected the protocol and the half or full blot option, proceed to Step 5.
2. Select a preprogrammed protocol from the **Protocols** screen using the arrow keys (page 9), then press the **OK** button.
3. The **Protocol Detail View** screen is displayed. Verify the protocol using arrow keys.
4. Select the option to run a protocol for half or full membrane by pressing the **Half** or **Full** function keys.

   Note: When the Half option is selected, the card blot chamber is filled approximately half full with reagents allowing the use of smaller reagent volumes when small or half-size blots are processed.
5. The **Run** screen is displayed. Ensure that the cards are loaded with the membrane and reagents are loaded in the reagent tray, before pressing **Run** to start the protocol.



6. Press the **Run** function key to begin the run or the **Back** function key to return to the **Protocols** screen.

   Important: Do not run unused cards without loading reagents into the tray. If the instrument pumps air into the card for ~30 seconds, the card is rendered unusable. The instrument color sensor does not record the color change and discontinue the run. **Before starting the run, always ensure that reagents bottles are loaded with the respective reagents.**

Continued on next page

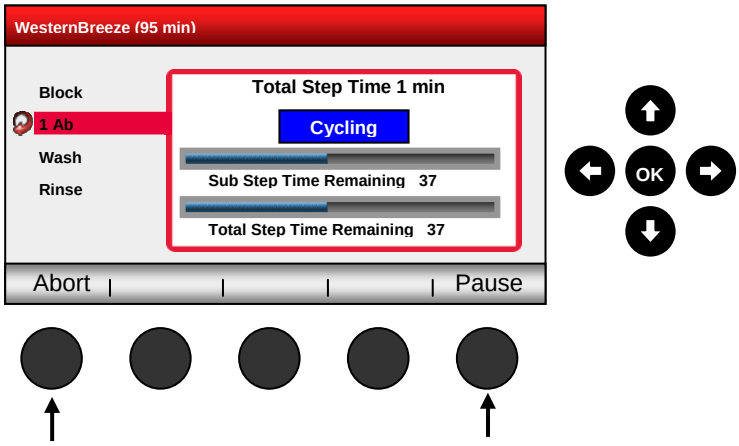
Running a Preprogrammed Protocol, Continued

7. The instrument starts the protocol run, the status light changes to green and you will start to see the solution being pumped into the card chamber.

   Note: The instrument performs process checks in the first few minutes to ensure proper functioning and any errors if detected are displayed in the display screen. Refer to page 30 for a list of error messages. The instrument is designed to run only **new, unused** cards. If any used cards are accidentally used, the instrument detects used cards and displays a used card error message (page 30).

8. While the protocol is running, various steps of the protocol are displayed on the screen with the time remaining for each step/substep as well as the total protocol time remaining.

   Note: The times displayed are for incubation times only and do not include time required for filling the card and empty cycles.



   During the run, the **Abort** function key or **Pause** function key can be used to interrupt the protocol. See page 20 for additional details on the **Abort** and **Pause** functions.

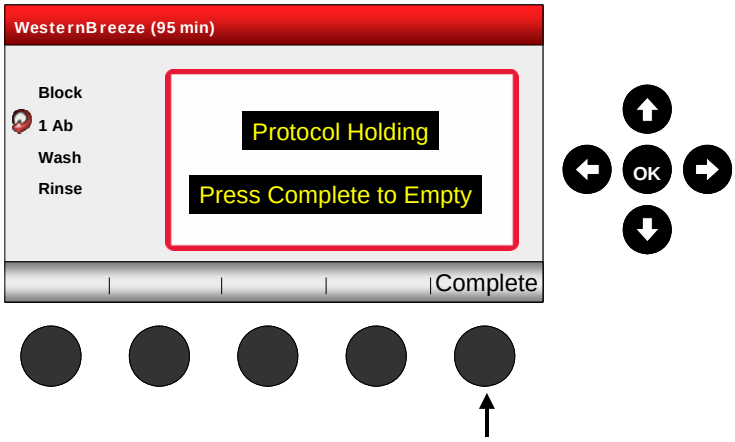
9. Towards the end of the protocol, make sure you have the reagents prepared for the detection step as recommended by the manufacturer.

   Note: If you are using the automatic waste drain feature, the waste collected in the tray is automatically diverted to the sink via the plastic tubing connected to the unit.

Continued on next page

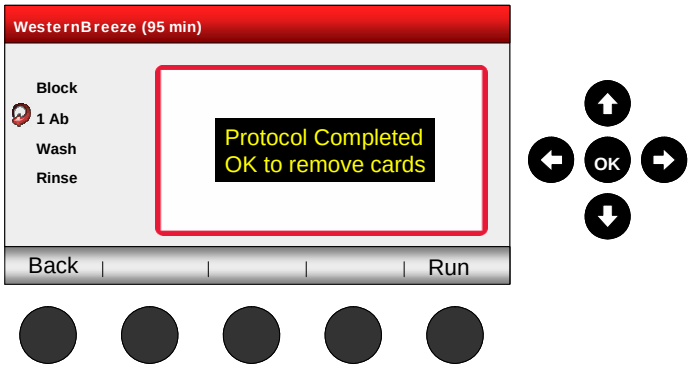
Running a Preprogrammed Protocol, Continued

10. When the protocol is finished, the instrument signals the end of processing with a beep, and flashing green light. Tthe digital display shows **Protocol Holding**.



Note: At this stage, you may keep the card and membrane in the instrument until you are ready to develop the membrane with substrate (total card use time should not exceed 19 hours). The membrane will not dry out as the last reagent is not drained until you press Complete.

11. Press the **Complete** key to drain reagents from cards and release the card. The status light continues to flash green while the reagents are drained and then to a flashing red to indicate card removal.



12. Proceed to **Disassembling the BenchPro™ 4100 Card Processing Station**, below.

Continued on next page

Pausing the Protocol

1. To manually interrupt the protocol, press the **Pause** function key. Using the **Pause** function key stops both the protocol and the timer.

   Note: The **Pause** key can be used to stop the protocol in order to remove the membrane. The card itself cannot be removed from the device, so use forceps to remove the Blot Holder containing the membrane. For convenience, we recommend doing this between steps, when the card is drained of liquid.
2. Press the **OK** button on the directional pad to restart the protocol from the point from which the protocol was paused.

Aborting the Protocol

1. To manually abort the protocol, press the **Abort** function key.

   Note: Aborting the protocol stops instrument operation immediately. After an abort, reagents pumped out of the cards to the waste containers.
2. To restart after an abort, check the reagents or remake reagents because the reagent volumes may have changed or the reagent may be diluted from the reagent in the card if the reagent was recycled to the reagent bottle at the time of the abort step. Use a new card after the abort, especially if reagents are pumped into the card.
3. Press the **Run** function key to restart the protocol from the beginning or the **Back** function key to return to the **Protocols** screen.

Post-run Procedure

To obtain best results, remove the membrane from the card within a few minutes of ending the procedure and draining reagents from the cards.

1. Carefully remove the Blot Holder from the card and then remove the membrane from the holder using forceps. If desired, after removal, place the membrane in water until you are ready to perform detection steps.
2. Proceed to the detection step. For example, for chromogenic detection, place the membrane in a container containing the substrate solution and incubate until the signal is observed.
3. Remove and discard the cards appropriately. **Do not reuse the cards.** The instrument detects used card by a color indicator spot located at the lower right hand corner of the card which turns red when the card is used.

Continued on next page

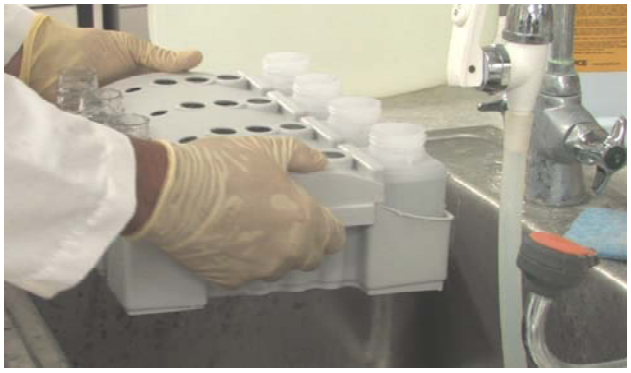
Post-run Procedure, Continued

4. Open the Reagent Drawer Unit and remove the reagent tray assembly. Dispose of any unused reagents in the bottles and vials appropriately.

   Optionally, use the Clean-assist attachment to empty all reagent bottles at once without removing individual bottles.

   To do this, lift the Reagent Tray assembly (upper and lower Reagent Tray pieces with loaded reagent bottles and vials), away from the Waste Basin, then place the Clean-assist attachment on top of the bottles and vials while they are still positioned in the Reagent Tray. While holding the assembly together, invert over a sink to discard all reagents at once.

   Note: The weight of a fully loaded reagent tray and waste tray (trays, bottles, and solution) is 3 kg or 6.6 pounds.

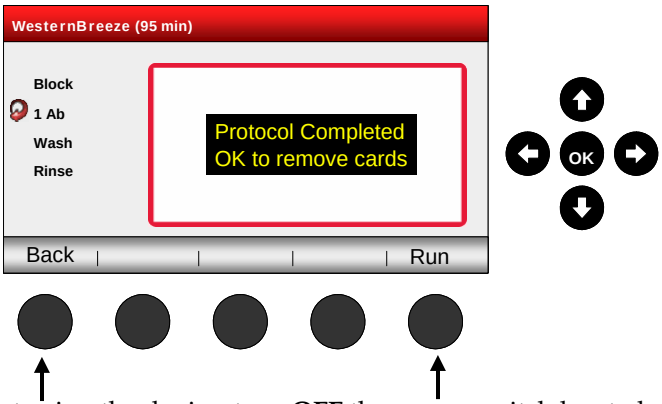


5. Remove the Waste Basin and discard the waste appropriately, if the auto-drain feature is not used. Transport the waste reagents carefully to sink to avoid any spillage. Rinse the Waste Basin with water prior to use.

   Note: If you are using the automatic waste drain feature, the waste collected in the tray is drained via the plastic drain tubing connected to the unit. When using the auto-drain feature, periodically rinse the waste tray to prevent any residue build up.

6. To run another protocol, press the **Back** function key to return to the **Protocols** screen or press the **Run** function key to run the same protocol.

   Load reagent bottles and vials with appropriate reagents, insert new cards, and start the protocol as described above. There is no cooling period required for the unit between runs.



7. If you are not using the device, turn **OFF** the power switch located on the left side of the unit.

Continued on next page

Cleaning and Maintenance

Clean the surface of the BenchPro™ 4100 Card Processing Station with a damp cloth. **Do not** use harsh detergents or solvents to clean the unit. Rinse the reagent tray assembly and waste basin with water after each use. If bottles and vials are to be reused, clean with mild detergent and rinse thoroughly with ultrapure water. **Do not autoclave trays or reagent bottles and vials.** Although all reagent bottles and vials can be reused after washing with mild detergent and rinsing with deionized water, we do not recommend reusing the 25 ml vials to prevent any reagent cross-contamination.

For any other repairs and service, contact Technical Support (page 33). **Do not** perform any repairs or service on the BenchPro™ 4100 Card Processing Station to avoid damaging the unit.

Programming a Custom Protocol

Introduction

Instructions are provided in this section to use the BenchPro™ 4100 Card Processing Station with the BenchPro™ 4100 Western Card for automated processing of the transfer membrane using a custom protocol.

Programming a Custom Protocol

The protocol setup screen allows you to set a custom protocol using various options listed for protocol steps and incubation time.

Note: You can run up to 4 cards using different reagent sets but using the **same** protocol.

You may create a custom protocol by:

- Editing an existing protocol
- Adding/deleting steps from an existing protocol
- Creating a new protocol using new parameters.

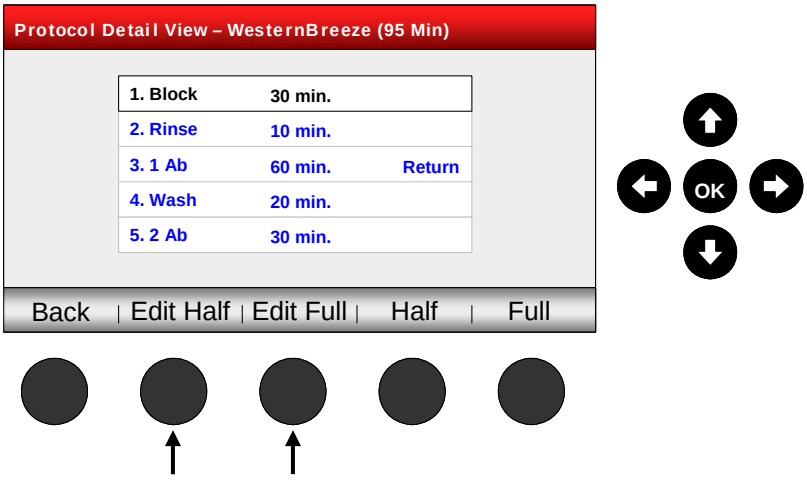
While you can edit an existing standard protocol, you must save the modified protocol with a different name.

Editing Existing Protocol

1. From the **Protocols** screen, select the protocol that you wish to edit by highlighting the protocol using the **Up/Down** arrows and pressing **OK**.
2. The **Protocol Detail View** screen is displayed. Press the **Edit Half** or **Edit Full** function key.

   In the Edit mode, the instrument tracks the reagent volumes required as steps are programmed. The % of maximum available volume is displayed as a bar at the bottom of the screen. When volumes exceed available volumes in reagent bottles and vials, an error message is displayed.

   Note: The **Edit Half** and **Edit Full** functions are used for calculating reagent volumes only, the actual quantity of reagents used is determined by the selecting **Half** or **Full** from the **Run** screen.

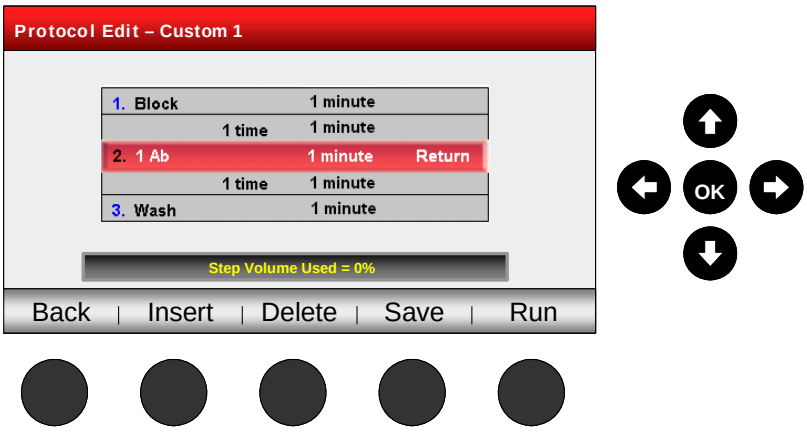


Continued on next page

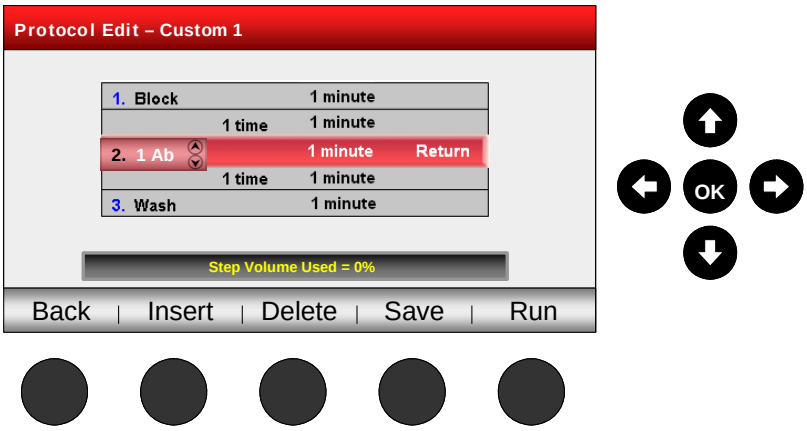
Programming a Custom Protocol, Continued

Editing Existing Protocol, Continued

3. Highlight the step to be edited by using the **Up/Down** arrow keys.



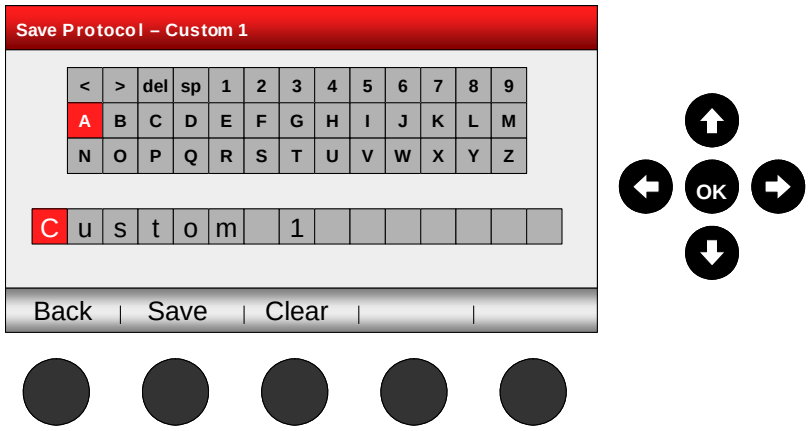
4. Highlight the function to be edited by using the **Right/Left** arrow keys. At the far right is a column to indicate reagent **Return**. If this indicator is set to return, the reagent is returned to the container it was drawn from after use.



Continued on next page

Editing Existing Protocol, continued

5. Change the value of the function using the **Up/Down** arrow keys. The following rules apply:
   - Numeric values change by whole numbers and cannot be less than 1.
   - Options in the first column are **Block, 1°Ab, 2°Ab, Wash, or Rinse**. Selecting these options allow reagents to be drawn from positions 5, 4, 3, 6, and 1 respectively, on the Reagent Tray.
   - Times in the second column, refers to the number of times a step is done.
   - By setting the indicator function at the far right to **Return**, the reagent from the selected step is returned to the container it was drawn from. This is the default setting for primary antibody for pre-programmed protocols.
   - Maximum settings are:
     Custom Protocols = 20
     Substeps = 6
     Steps + substeps = 20
     Step/substep minutes = 999 minutes
     Step/substep times = 20 times
6. After making the changes, press the **OK** button to accept changes and allow navigation away from the edited step.
7. To save the updated custom protocol, press the **Save** function key.
8. Enter the protocol name in the **Save Protocol** screen using letters in the keyboard with the arrow keys.



9. Navigate within the name using **Right/Left** arrow keys. Press the **OK** function key to select the correct letter when displayed.
10. Repeat Step 9 for each letter in the new name. To clear the entered letters, press the **Clear** function key.
11. Press the **Save** function key to save the edited protocol under a new name. The new protocol now appears on the **Protocols** screen.
12. Proceed to assembling the unit with reagents and card (page 12) to perform the custom blotting protocol.

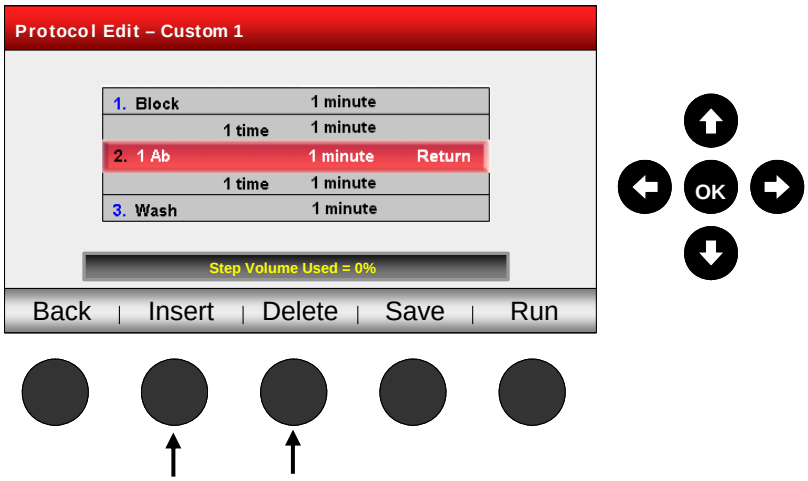
Continued on next page

Programming a Custom Protocol, Continued

Inserting, Adding, or Deleting a Step or Sub-step to Existing Protocol

1. From the **Protocols** screen, select the protocol that you wish to edit by highlighting the protocol using the **Up/Down** arrows and pressing OK.
2. Once the protocol steps are displayed, press the **Edit Half** or **Edit Full** function key.
3. Select and highlight the step to be edited by using the **Up/Down** arrow keys.
4. Press the **appropriate** function key based on the operation that you wish to perform:
   - Select **Insert** function key to place a new line below a highlighted line. After selecting the Insert, press the **Step** function key to add a new step or **Sub-step** function key to add a sub-step within a step.

     For example: If a 1 × 5 minute wash is followed by 1 × 15 minute wash, the 5-minute and 15-minute operations are sub-steps of the 20 minute wash step. Edit the inserted lines as needed as described in **Editing Existing Protocols**, page 23.
   - Select **Delete** function key to delete a highlighted step or sub-step.



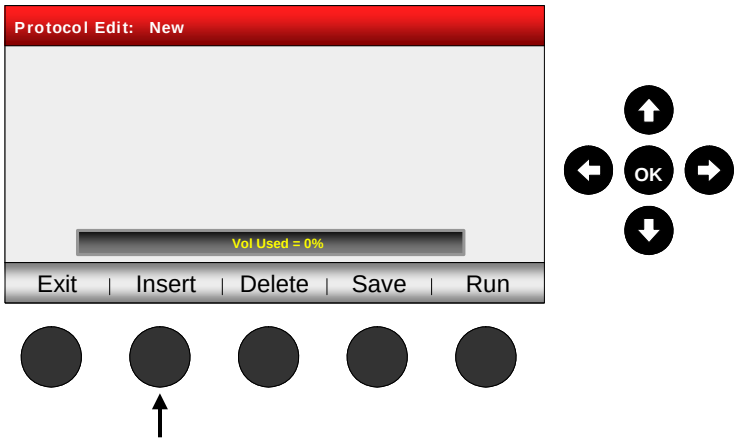
5. After making the changes, press the **OK** button to accept the changes and allow navigation away from the edited step.
6. To save the updated custom protocol, press the **Save** function key and enter the protocol name in the **Save** protocol screen using letters in the on-screen keyboard with the arrow keys (page 23).
7. Press the **Save** function key to save the edited protocol under a new name. The new protocol now appears on the **Protocols** screen.
8. Proceed to assembling the unit with reagents and card (page 12) to perform the custom blotting protocol.

Continued on next page

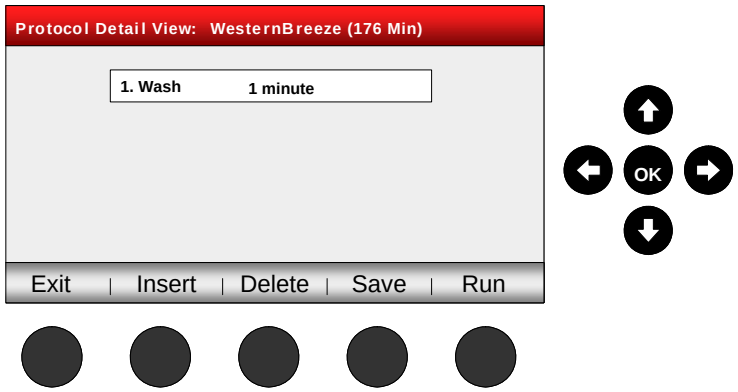
Programming a Custom Protocol, Continued

Creating a New Protocol

1. From the **Protocols** screen, select **New** to create a new protocol.
2. Select **Insert** function key to add steps or substeps.



3. The default step name (Wash) and time (1 minute) are displayed. Edit parameters such as the step description and time for each step by using the **Right/Left** arrow keys.



4. Press the **Substep** function key to add a substep within a step.
5. After making the changes, press the **OK** button to accept changes and allow navigation away from the edited step.
6. Continue repeating Steps 3–5 until all steps of the protocol are added.
7. To save the updated custom protocol, press the **Save** function key and enter the protocol name in the **Save** protocol screen using letters in the on-screen keyboard with the arrow keys (page 23).
8. Press the **Save** function key to save the edited protocol under a new name. The new protocol now appears on the **Protocols** screen.
9. Proceed to assembling the unit with reagents and card (page 12) to perform the custom blotting protocol.

Troubleshooting

Introduction

Review the information below to troubleshoot your experiments using the BenchPro™ 4100 Card Processing Station with BenchPro™ Western Card.

Problem	Cause	Solution
No power (the digital display remains blank and the pump does not run when the power is turned on)	AC power cord is not connected	Check AC power cord connections at both ends. Use the correct cords.
	Fuse has blown	Replace the fuse (page 31). If the problem still persists after verifying that correct power cord is used and the fuse is replaced, contact Technical Support (page 33).
Error message displayed	--	Refer to the list of error messages on page 30.
Accidentally missed adding card, reagents, or reagent bottles	--	Be sure to confirm that you have added the card, reagents, and reagent bottles in the correct order **prior to starting** the protocol. If the run is aborted after the run has begun, you need to restart the run. **Do not r**euse the card, if the run is aborted within a few minutes of starting the run.
Card is difficult to insert	Bottles have caps or card is not oriented correctly	Make sure that the reagent bottles and vials are uncapped when placed in the reagent tray. Insert the card into a slot in the BenchPro™ 4100 Card Processing Station such that the tips are inserted into the reagent bottles and vials placed in the reagent tray. Use the Card Alignment Guide to ensure the card is placed correctly in the slot. When the card is inserted correctly in the slot, you will hear a hard click.
Weak or no signal from the blot	Detection step missed or detection reagents not working	The detection step is not included in the instrument protocol. After the instrument protocol is complete, perform the detection step using your standard detection reagents and protocol manually. Make sure the detection reagents are functional.
	Insufficient incubation with detection reagent	Remove blot from detection reagent when signal-to-noise ratio is acceptable.
	Incorrect order of reagents added	Be sure to add the reagents in the order described on page 13 to ensure all steps are performed correctly.
	Poor or incomplete transfer	Make sure transfer apparatus and membrane sandwiches are assembled correctly. Use appropriate transfer times. After blotting, stain membrane to measure transfer efficiency.
	Protein of interest ran off the gel	Use positive control and/or molecular weight marker to match gel separation range to size of protein being blotted. After blotting, stain membrane to measure transfer efficiency.

Continued on next page

Troubleshooting, Continued

Problem	Cause	Solution
Weak or no signal from the blot	Sample too dilute	Load a larger amount of protein onto the gel.
	Poor retention of proteins or protein weakly bound to membrane	Ensure that transfer buffer contains 10–20% methanol. Use membranes with appropriate binding capacity.
	Inactive or overly dilute primary or secondary antibody	Determine antibody activity by performing a dot blot. Increase antibody concentration as necessary.
High background on the blot	Film overexposed or became wet during exposure	Decrease exposure time or allow signal to further decay. Prevent leakage of solutions by encasing membrane in transparency film and blotting excess substrate from edges before exposure.
	Short blocking time or washing time	Perform each step for the specified amount of time.
	High concentration of primary and/or secondary antibody	Determine optimal antibody concentration by performing a dot blot. Decrease antibody concentration as necessary.
	Membrane, solutions, trays, or vials are contaminated	Use clean glassware and purified water to prepare solutions. Rinse the tray thoroughly with purified water. Although all reagent bottles and vials can be reused after washing with mild detergent and rinsing with deionized water, we do not recommend reusing the 25 ml vials to prevent any reagent cross-contamination. Wear clean gloves at all times. Use forceps when handling membranes.
	Protein is overloaded	Reduce load or dilute concentration of sample.
Non-specific binding on the blot	Insufficient removal of SDS or weakly bound proteins from membrane after blotting	Follow instructions for membrane preparation before immunodetection.
	Short blocking time or long washing time	Make sure that each step is performed for the specified amount of time.
	Affinity of the primary antibody for the protein standards	Check with protein standard manufacturer for homologies with primary antibody.
	Membrane is contaminated by fingerprints or keratin proteins	Wear clean gloves at all times and use forceps when handling membranes. Always handle membranes around the edges.

BenchPro™ 4100 Card Processing Station Error Messages

Introduction

This section describes the error messages displayed. Most of the error messages are self explanatory and after fixing the error, you should be able to continue with the protocol. Contact Technical Support (page 33) if you need to send the instrument for servicing.

Error	Message/Action
Drawer open close before running	The reagent drawer is open. Make sure the drawer is completely closed before continuing.
Waste detected empty before running	Waste reagents are detected in the waste tray. Empty the waste tray or attach the drain tubing before starting a protocol.
A leak has been detected in the system	An air or vacuum leak has been detected in the system. Call Technical Support (page 33).
No card detected	A protocol was started without a card inserted into any slot. Insert a card and restart the protocol.
Reached max volume	The maximum on board volume for a particular reagent has been reached. Reduce the number of steps or substeps.
Used card(s) in slot x, x, x, x	Replace with unused (new) cards and press OK.
Cannot begin a protocol with a substep	A step must first be entered to enter a substep.
Exceeded max steps + substeps	The maximum number of all steps and substeps in a protocol is 20.
The max number of substeps is six	Cannot add more than 6 substeps to a step.
Please save protocol before running	Save a new or edited protocol before you can run the protocol.
Please save to valid protocol name	A name was not selected for a new or edited protocol. A protocol cannot be named **New**.
You are adding a repeat AB or Block	The volumes in the 25 ml tubes (used for antibodies and blocker) do not allow for more than one use per protocol. You cannot add more than one step for block, primary antibody, and secondary antibody step within a protocol.

Appendix

Replacing the Fuse

Replacing the Fuse

For additional fuses, contact Technical Support (page 33).

Instructions are provided below to replace the 250 V, 1.25 A fuse for the main power socket.

1. Turn **off** the main power switch at the left side of the instrument and detach the power cord from the rear of the instrument.
2. Open the fuse compartment located on the rear of the instrument using a small flat blade screwdriver to gently pry open the fuse compartment.
3. Pull the fuse holder out of the compartment and inspect the fuse. If the fuse is burned or there is a break in the fuse element, replace the 250 V, 1.25 A fuse with the identical type fuse.
4. Place the fuse holder back into the compartment and snap the cover closed.

Repackaging the Instrument

Repackaging and Storage Instructions

If you need to send the instrument to Invitrogen for repair or warranty issues, or you wish to transport the instrument to another location, repackage the unit as follows:

1. Turn **off** the main power switch at the left side of the instrument and detach the power cord from the rear of the instrument.
2. Disconnect the drain tubing connected to the instrument via the connector at the back of the unit.
3. Remove the bottles and vials from the drawer unit and secure the drawer unit with a tape.
4. Place the instrument in the original box including the original packing foam. If you have not saved the original packaging material, the appropriate packaging material for the instrument is available by contacting Technical Support (page 33).
5. Tape the box securely and place appropriate shipping labels for shipping the instrument to Invitrogen. Always transport the box with the instrument in the **upright** position.
6. If the instrument is not to be used for extended periods of time, store the repackaged instrument in an upright position at 4ºC to 40ºC.

Accessory Products

Additional Products

The following products are for use with the BenchPro™ 4100 Card Processing Station and are available separately from Invitrogen.

For more information, visit www.invitrogen.com or contact Technical Support (page 33).

Product	Quantity	Catalog no.
BenchPro™ 4100 Western Card	1 box of 10 cards and 10 blot holders	WP1001
Reagent Vials (25 ml)	50 vials	WP3001
2° Antibody Solution Alk-Phos. Conjugated (anti-mouse)	2 × 100 ml	WP20006
2° Antibody Solution Alk-Phos. Conjugated (anti-rabbit)	2 × 100 ml	WP20007
Novex® AP Chemiluminescent Substrate	100 ml	WP20002
Novex® AP Chemiluminescent Substrate Enhancer (20X)	5 ml	WP20003
Novex® ECL Chemiluminescent Substrate Reagent Kit HRP Chemiluminescent Substrate, Reagent A HRP Chemiluminescent Substrate, Reagent B	 125 ml 125 ml	WP20005
WesternBreeze® Blocker/Diluent (part A and B)	2 × 80 ml	WB7050
WesternBreeze® Wash Solution (16X)	2 × 100 ml	WB7003
Novex® AP Chromogenic Substrate	250 ml	WP20001
Novex® HRP Chromogenic Substrate	250 ml	WP20004
Nitrocellulose membranes, 0.2 µm pores size	20 membrane/filter paper sandwiches	LC2000
Nitrocellulose membranes, 0.45 µm pores size		LC2001
PVDF membranes, 0.2 µm pores size		LC2002
Invitrolon™ PVDF/Filter Paper Sandwiches		LC2005

Antibodies

A large variety of primary and secondary antibodies are available from Invitrogen. For details, visit www.invitrogen.com/antibodies.

Technical Support

Web Resources

Visit the Invitrogen Web site at **www.invitrogen.com** for:

- Technical resources, including manuals, vector maps and sequences, application notes, MSDSs, FAQs, formulations, citations, handbooks, etc.
- Complete technical support contact information
- Access to the Invitrogen Online Catalog
- Additional product information and special offers

Contact Us

For more information or technical assistance, call, write, fax, or email. Additional international offices are listed on our web page (www.invitrogen.com).

Corporate Headquarters:
5791 Van Allen Way
Carlsbad, CA 92008 USA
Tel: 1 760 603 7200
Tel (Toll Free): 1 800 955 6288
Fax: 1 760 602 6500
E-mail: tech_support@invitrogen.com

Japanese Headquarters:
LOOP-X Bldg. 6F
3-9-15, Kaigan
Minato-ku, Tokyo 108-0022
Tel: 81 3 5730 6509
Fax: 81 3 5730 6519
E-mail: jpinfo@invitrogen.com

European Headquarters:
Inchinnan Business Park
3 Fountain Drive
Paisley PA4 9RF, UK
Tel: +44 (0) 141 814 6100
Tech Fax: +44 (0) 141 814 6117
E-mail: eurotech@invitrogen.com

Purchaser Notification

Limited Use Label License No. 5: Invitrogen Technology

The purchase of this product conveys to the buyer the non-transferable right to use the purchased amount of the product and components of the product in research conducted by the buyer (whether the buyer is an academic or for-profit entity). The buyer cannot sell or otherwise transfer (a) this product (b) its components or (c) materials made using this product or its components to a third party or otherwise use this product or its components or materials made using this product or its components for Commercial Purposes. The buyer may transfer information or materials made through the use of this product to a scientific collaborator, provided that such transfer is not for any Commercial Purpose, and that such collaborator agrees in writing (a) not to transfer such materials to any third party, and (b) to use such transferred materials and/or information solely for research and not for Commercial Purposes. Commercial Purposes means any activity by a party for consideration and may include, but is not limited to: (1) use of the product or its components in manufacturing; (2) use of the product or its components to provide a service, information, or data; (3) use of the product or its components for therapeutic, diagnostic or prophylactic purposes; or (4) resale of the product or its components, whether or not such product or its components are resold for use in research. For products that are subject to multiple limited use label licenses, the terms of the most restrictive limited use label license shall control. Life Technologies Corporation will not assert a claim against the buyer of infringement of patents owned or controlled by Life Technologies Corporation which cover this product based upon the manufacture, use or sale of a therapeutic, clinical diagnostic, vaccine or prophylactic product developed in research by the buyer in which this product or its components was employed, provided that neither this product nor any of its components was used in the manufacture of such product. If the purchaser is not willing to accept the limitations of this limited use statement, Life Technologies is willing to accept return of the product with a full refund. For information about purchasing a license to use this product or the technology embedded in it for any use other than for research use please contact Out Licensing, Life Technologies, 5791 Van Allen Way, Carlsbad, California 92008 or outlicensing@lifetech.com

Continued on next page

BenchPro™ 4100 Card Processing Station Warranty

Invitrogen warrants to the original purchaser ("Purchaser") that the BenchPro™ 4100 Card Processing Station ("Instrument") will be free from defects in materials and workmanship for a period of one (1) year from the date of delivery. Invitrogen agrees, as its sole responsibility under this limited warranty, and upon prompt notice of a defect, to repair, replace or refund purchase price, at its discretion, any Instrument discovered to be defective within the warranty period. This warranty does not include repair, replacement, or refund necessitated by accident, abuse, neglect, misuse, unauthorized repair, or modification of the Instrument.

In the event that Invitrogen determines that the Instrument is in need of repair and not replacement, this Standard Warranty includes replacement parts and labor for the Instrument. This Standard Warranty does not include shipment of the Instrument to and from service location or travel cost of service engineer, the costs of which shall be borne by the Purchaser.

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 non-infringement), and no other warranties shall be binding upon Invitrogen. In no event shall Invitrogen 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, even if such damages could be anticipated by Invitrogen.

To obtain service during the warranty period, contact Invitrogen Technical Support for further instruction.

OUT OF WARRANTY SERVICE

Contact Invitrogen Technical Support. We will be happy to assist you by phone at no charge. Repair service, if needed, will be billed depending on the parts replaced and labor hours needed to repair your instrument. You will be billed for shipment of the instrument to the recommended service facility.

For research use only. Not intended for any animal or human therapeutic or diagnostic use.

invitrogen™
by life technologies™

Corporate Headquarters
5791 Van Allen Way
Carlsbad, CA 92008
T: 1 760 603 7200
F: 1 760 602 6500
E: tech_support@invitrogen.com

For country-specific contact information, visit our web site at **www.invitrogen.com**