Waters Bus SAT/IN

Satellite Interface Module

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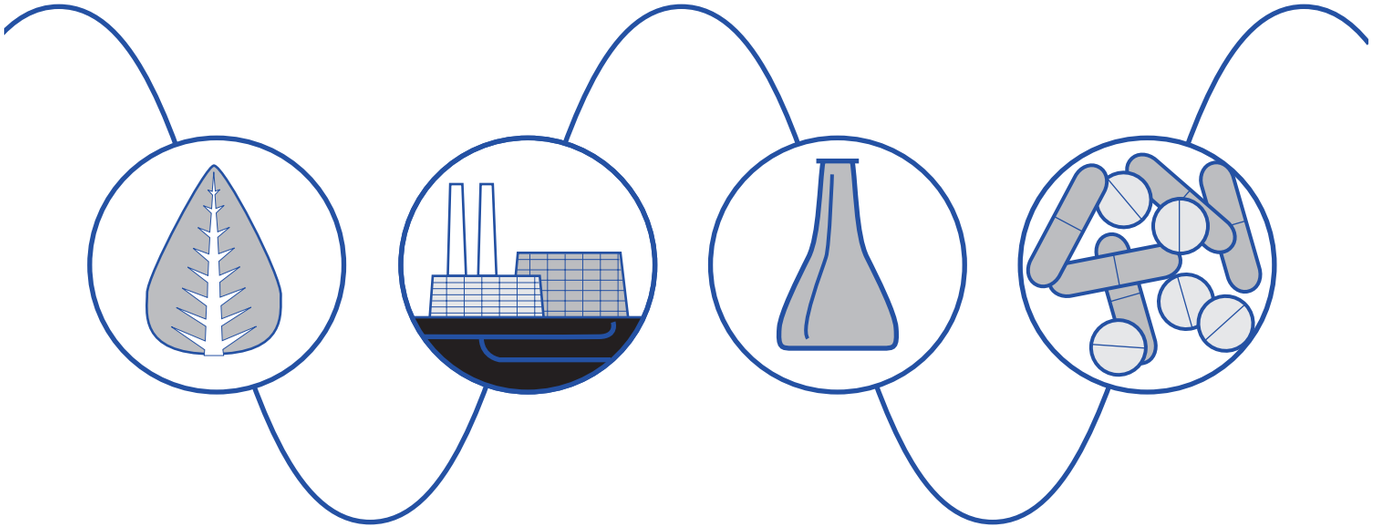
Waters Bus SAT/IN Module

Installation Guide



Waters

34 Maple Street
Milford, MA 01757

200409TP, Revision 2

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NOTICE

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Attention: *The Bus SAT/IN Module may be used for IN VITRO diagnostic applications. This is a highly sensitive instrument. Read this installation manual before use.*

When using the instrument, follow generally accepted procedures for quality control and methods development.

If you observe a change in the retention of a particular compound, in the resolution between two compounds, or in peak shape, immediately take steps to determine the reason for the changes. Until you determine the cause of a change, do not rely upon the results of the separations.

Attention: *This equipment generates and uses radio frequency energy. If not installed and used strictly in accordance with the user's guide, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference, in which case you must take measures to correct the interference at your own expense.*

Attention: *To meet the regulatory requirements of immunity from external electrical disturbances that may affect the performance of this instrument, do not use cables longer than 9.8 feet (3 meters) when you make connections to the screw-type barrier terminal strips. In addition, ensure you always connect the shield of the cable to chassis ground at one instrument only.*

The Installation Category (Overvoltage Category) for this instrument is Level II. The Level II category pertains to equipment that receives its electrical power from a local level, such as an electrical wall outlet.

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Canadian Emissions Notice

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set forth in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans les règlements sur le brouillage radioélectrique édictés par le Ministère des Communications du Canada.

Symbols Used on the Bus SAT/IN Module

	Alternating current
	Protective conductor terminal
	Caution, risk of electric shock (high voltage)
	Caution or refer to manual

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Record the following numbers when installing the Waters Bus SAT/IN module

Bus SAT/IN module serial number (from label on rear panel)	
Detector connected to Channel 1	
Detector connected to Channel 2	
Device on Event 1 and 2	
Device on Event 3 and 4	
Device on Event 5 and 6	
Device on Event 7 and 8	

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How to Use This Guide

Purpose

The *Waters Bus SAT/IN Module Installation Guide* contains information needed to install a Waters™ Bus SAT/IN™ module. The Bus SAT/IN module translates signals from analog devices to digital form, and transmits those signals to the Waters Bus LAC/E card inside a host personal computer.

Audience

This installation guide is intended for anyone who must install a Bus SAT/IN module. This guide assumes that the Waters Bus LAC/E™ card is installed in the host computer and working properly.

Structure of this guide

The *Waters Bus SAT/IN Module Installation Guide* is divided into sections. Each page is marked with a footer, providing easy access to all information within the chapter. The table below describes the material covered in each section.

Title	Description
Chapter 1, Introduction	Describes the Bus SAT/IN module and its connection to other components of the chromatography system.
Chapter 2, Installation	Contains procedures for unpacking and connecting the Bus SAT/IN module to the Bus LAC/E card and other devices.
Chapter 3, Using the Bus SAT/IN Module	Describes the powerup sequence of the Bus SAT/IN module.
Appendix A, Bus SAT/IN Module Specifications	Provides Bus SAT/IN module specifications.
Appendix B, Spare Parts	Provides part numbers for spare parts.
Appendix C, Warranty Information	Provides warranty and service information.

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Related Millennium documentation

The table below lists other guides in the Millennium Chromatography Manager documentation set that include information about Bus SAT/IN module operation.

Bus LAC/E Card Installation Guide	How to install the Bus LAC/E card.
System Configuration Guide	Describes how chromatographic instrumentation is connected and addressed as part of the Millennium Chromatography Manager system. Also covers software installation, computer hardware installation, and operating requirements.
Millennium Software User's Guide: Volumes I and II	Describes how to use Millennium software. Includes software features, and describes Millennium software acquisition, integration, and quantitation theory.
Millennium Software Troubleshooting Guide	Aids in identifying and resolving problems you may encounter when using Millennium software.

Related Adobe™ Acrobat Reader Documentation

For detailed information about using the Adobe Acrobat Reader, refer to the *Adobe Acrobat Reader Online Guide*. This Online Guide covers procedures such as viewing, navigating and printing electronic documentation from Adobe Acrobat Reader.

Printing From This Electronic Document

Adobe Acrobat Reader lets you easily print pages, pages ranges, or the entire electronic document by selecting **Print** from the File menu. For optimum print quantity, Waters recommends that you specify a Postscript printer driver for your printer. Ideally, use a printer that supports 600 dpi print resolution.

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Conventions Used in This Guide

This guide uses the following conventions to make text easier to understand.

- **Purple Text** indicates user action. For example:

  Press **0**, then press **Enter** for the remaining fields.

- *Italic* text denotes new or important words, and is also used for emphasis. For example:

  An *instrument method* tells the software how to acquire data.

- Underlined, Blue Color text indicates hypertext cross-references to a specific chapter, section, subsection, or sidehead. Clicking this topic using the hand symbol automatically brings you to this topic within the electronic document. Right-clicking and selecting **Go Back** from the popup context menu brings you back to the originating topic. For example:

  If the Bus SAT/IN module does not require a BCD cable, proceed directly to Section 2.6, Connecting the Power Supply.

Notes, Attentions, and Cautions

- Notes call out information that is important to the operator. For example:

  Note: *Record your results before you proceed to the next step.*

- Attentions provide information about preventing possible damage to the system or equipment. For example:

Attention: *To avoid damaging the detector flow cell, do not touch the flow cell window.*

- Cautions provide information essential to the safety of the operator. For example:

Caution: *To avoid chemical or electrical hazards, always observe safe laboratory practices when operating the system.*

Caution: *To avoid the possibility of electrical shock and possible injury, always turn off the detector and unplug the power cord before performing maintenance procedures.*

Caution: *To avoid the possibility of burns, turn off the lamp at least 30 minutes before removing it for replacement or adjustment.*

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1 Introduction

This chapter is intended as an overview to the Bus SAT/IN module. Perform all Bus SAT/IN module procedures in the order specified in this guide.

Attention: *Do not power up this unit until all procedures described in this guide are performed. Improper powerup can damage the unit and void the warranty.*

Attention: *The Bus SAT/IN module does not have an ON/OFF switch. Always disconnect the power cord at either the wall outlet or the power supply before attaching or removing the connection to the Bus SAT/IN module. Failure to do so may damage the unit.*

1.1 Bus SAT/IN Overview

The Waters™ Bus SAT/IN™ (Satellite Interface) module is an A/D (analog-to-digital) converter (Figure 1-1). The Bus SAT/IN module contains two individual A/D converters, allowing conversion of two independent channels of data on two time bases.

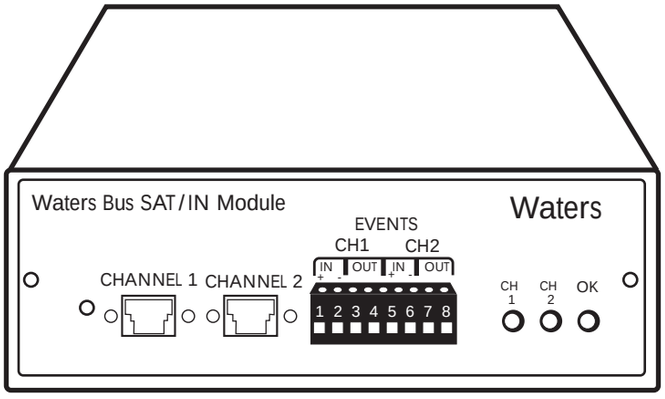

Figure 1-1 Waters Bus SAT/IN Module

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1

1.2 Bus SAT/IN Module Connections

This section covers:

- Bus SAT/IN to Bus LAC/E connection
- Bus SAT/IN module channels
- Event input and output
- Flow of data

Bus SAT/IN-to-Bus LAC/E connection

The Bus SAT/IN module communicates with the Bus LAC/E™ card through the Bus LAC/E I/O Distribution Box (Figure 1-2). The I/O Distribution Box accepts up to four Bus SAT/IN modules.

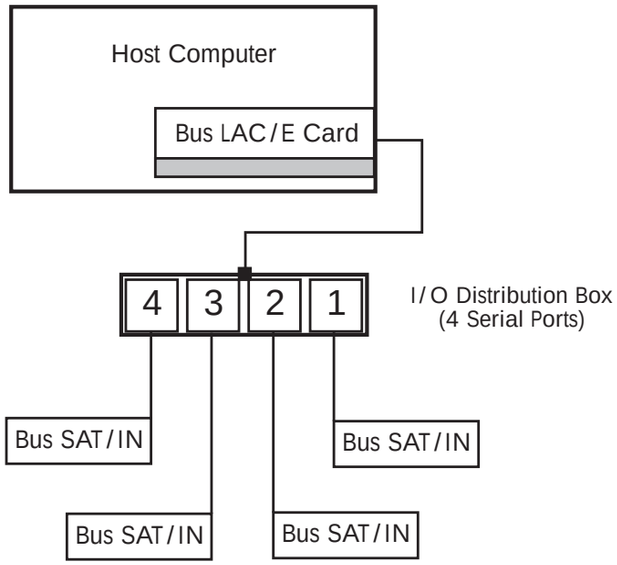

Figure 1-2 Bus SAT/IN to Bus LAC/E Card Connections

Bus SAT/IN module channels

The Bus SAT/IN module has two independent channels, and converts data from two detectors (up to eight channels of data for each Bus LAC/E card). Figure 1-3 illustrates the Bus SAT/IN module channels.

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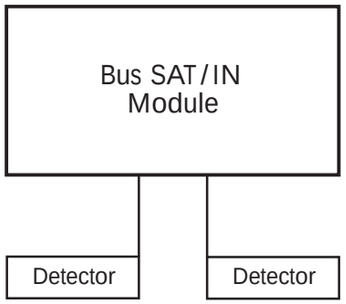

Figure 1-3 Bus SAT/IN Module Channels

Event input and outputs

The Bus SAT/IN module has two event input signal connections and two event output signal connections.

Flow of data

The Bus SAT/IN module:

1. Receives analog signals from detectors
2. Converts the analog signals to digital format
3. Sends the digital signals through the Bus LAC/E I/O Distribution Box to the Bus LAC/E card inside a host computer

The Bus LAC/E card sends the data to a host PC running Millennium software (Figure 1-4).

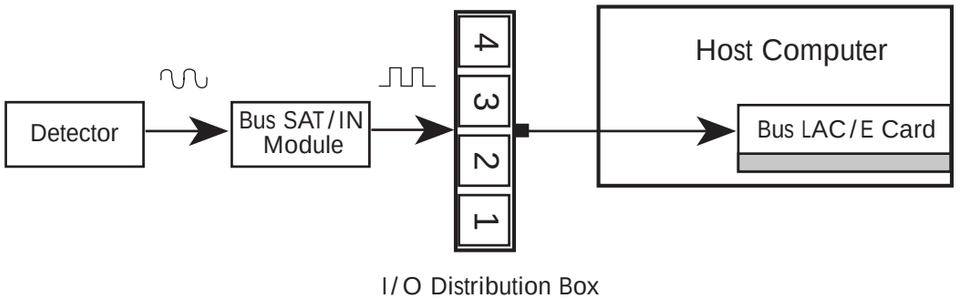

Figure 1-4 Data Flow When Using the Bus SAT/IN Module

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Figure 1-5 illustrates multiple Bus SAT/IN modules and a Bus LAC/E card configuration designed to collect eight channels of data.

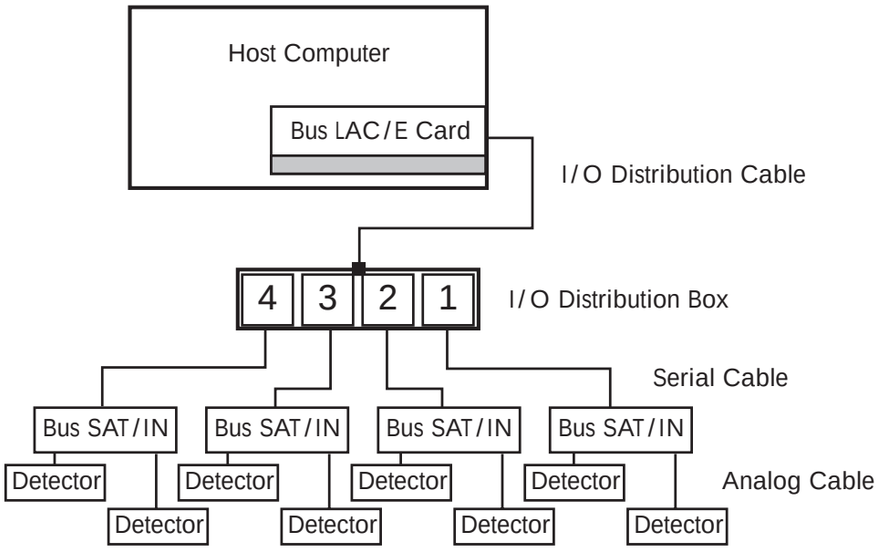

Figure 1-5 Bus SAT/IN Module and Bus LAC/E Card Configuration

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2 Installation

This chapter covers the necessary procedures for installing the Bus SAT/IN module.

2.1 Selecting the Site and Unpacking

Selecting the site

Install the Bus SAT/IN module in an area where:

- The Bus SAT/IN module is up to 4, 8, 16, 32 or 64 meters from the Bus LAC/E I/O Distribution Box, depending on the length of the serial cable. (The startup kit contains an 8 m cable. See Appendix B, Spare Parts for part numbers for other cable lengths.)
- The Bus SAT/IN module is up to two meters (maximum analog cable length) from the detectors to which it is to be connected.
- Bench space is approximately 9 inches wide by 12 inches deep by 4 inches high (23 centimeters by 30.5 centimeters by 10.5 centimeters).

  Note: *Do not stack heavy devices on top of the Bus SAT/IN module.*
- Temperature is 50 to 95 °F (10 to 35 °C).
- Relative humidity is 20 to 80%, non-condensing.
- Vibration and shock are negligible.

Caution: *To avoid chemical hazards, always observe good laboratory practices when handling solvents and performing maintenance.*

Power requirements

The Bus SAT/IN module draws power from a table-model, regulated power supply. See Appendix A, Bus SAT/IN Module Specifications for power supply specifications.

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List of components

The Bus SAT/IN module shipment includes:

Table 2-1 Bus SAT/IN Module Components

Item	Quantity
Bus SAT/IN module	1
Power supply	1
Bus SAT/IN serial cable (8 m)	1
Bus SAT/IN analog cables (2 m)	2
Event cables (1.5 m)	4
Flat-blade screwdriver	1
Waters Bus SAT/IN Module Installation Guide	1

Unpacking

Find the packing list and unpack the shipment. As you unpack, compare all items to the packing list. Save the packing materials for future transport or shipment.

Inspection

If there is any discrepancy between the shipment and the packing list, call the Waters Order Entry Department immediately. If any items are damaged, immediately notify the shipping agent and Waters.

Recording serial number

Before continuing with the installation, record the serial number of the Bus SAT/IN module inside the front cover of this guide, and in the *Waters Bus LAC/E Card Installation Guide*. See bottom of the Bus SAT/IN module for the serial number.

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2.2 Connecting the Serial Cable

The Bus SAT/IN serial cable transmits digital data to the Bus LAC/E card inside the host PC via the I/O Distribution Box. The cable connecting the Bus SAT/IN module to the Bus LAC/E I/O Distribution Box is a six-connector serial cable with modified modular jack (MMJ) connectors.

Procedure

To connect the Bus SAT/IN module serial cable to the I/O Distribution Box:

1. Place the Bus SAT/IN module on a level surface.
2. Insert one end of the Bus SAT/IN serial cable in the connector marked DATA on the Bus SAT/IN module (Figure 2-1). Both ends of the cable are identical.

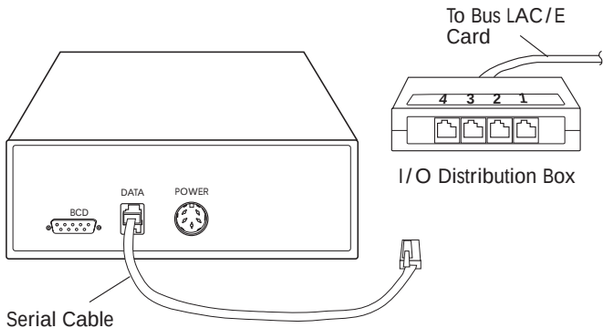

Figure 2-1 Connecting Bus SAT/IN to I/O Distribution Box

3. Insert the other end of the serial cable into the first available Bus SAT/IN port on the Bus LAC/E I/O Distribution Box as shown in Figure 2-1.

2.3 Connecting Analog Cables

Analog cables transmit analog data from the detector to the Bus SAT/IN module.

STOP ***Attention:*** *To meet the regulatory requirements of immunity from external electrical disturbances that may affect the performance of this instrument, do not use cables longer than 9.8 feet (3 meters) when you make connections to the screw-type barrier terminal strips. In addition, ensure you always connect the shield of the cable to chassis ground at one instrument only.*

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Procedure

To connect analog cables:

1. Insert the one end of an analog cable into the CHANNEL 1 port on the Bus SAT/IN module (Figure 2-2).

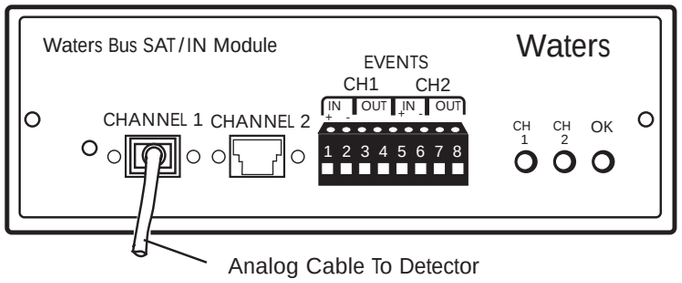

Figure 2-2 Connecting Bus SAT/IN to Detector

Note: *Bus SAT/IN module signal input range is -0.25 to 2.25 volts. Detector signals greater than 2.25 volts will go off scale.*

2. Connect the other end of the analog cable to the proper contacts on a detector (see the operator's manual for the detector). Note the positive (+) and negative (-) markers on the two wires. Connect both wires.

   The detector can be placed up to two meters from the Bus SAT/IN module (maximum analog cable length).

3. To connect a second analog cable to the CHANNEL 2 connector on the Bus SAT/IN module, repeat steps 1 and 2.

If the Bus SAT/IN module does not require Event or BCD cables, proceed directly to Section 2.6, Connecting the Power Supply.

2.4 Connecting Event Cables

Event cables transmit trigger signals between the Bus SAT/IN module and the devices connected to the external event terminals.

Note: *Event In cables are not required if the system includes a Waters 715 UltraWISP or Waters 717plus autosampler.*

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Attention: *To meet the regulatory requirements of immunity from external electrical disturbances that may affect the performance of this instrument, do not use cables longer than 9.8 feet (3 meters) when you make connections to the screw-type barrier terminal strips. In addition, ensure you always connect the shield of the cable to chassis ground at one instrument only.*

Event In connections

The Bus SAT/IN module can accept an inject start signal when an injection occurs. The inject start signal triggers the Bus SAT/IN module to start collecting and converting data.

Note: *The Bus SAT/IN module requires a pulsed inject start signal.*

Event Out connections

The Bus SAT/IN module can send event out (contact closure) signals to trigger external devices. You program Bus SAT/IN module event out signals through the Instrument Method window.

Note: *Refer to the Millennium Chromatography Manager Software User's Guide, Chapter 6, Creating/Modifying an Instrument Method, for information about programming Bus SAT/IN Event In/Out signals.*

Removable terminal strip

The terminal strip on the Bus SAT/IN module is removable to make cable connection easier.

Terminal strip positions

Event In and Out signals correspond to terminal strip positions as follows:

Table 2-2 Event In and Out Terminal Strips

Terminal Strip Position	Event Type	Channel
1 and 2	In	1
3 and 4	Out	1
5 and 6	In	2
7 and 8	Out	2

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Procedure

To connect event cables:

1. Remove the terminal strip from the Bus SAT/IN module (Figure 2-3).

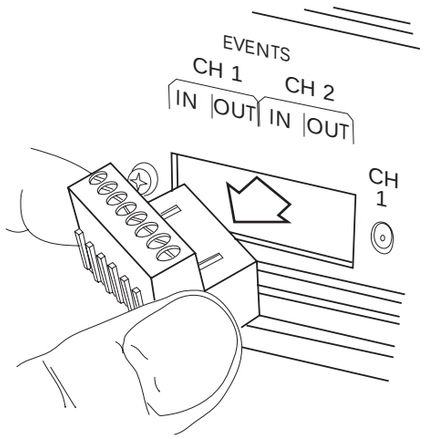

Figure 2-3 Removing the Terminal Strip

2. Connect the two spade connectors at one end of an Event In/Out cable to:
   - To an injector, for an Event In signal
   - To a device to be triggered, for an Event Out signal
3. Insert the two straight leads at the other end of Event In/Out cable into the terminal strip positions (see the “Terminal strip positions” discussion above for additional information). Tighten the screws with a small screwdriver (Figure 2-4).

   Note: *Maintain correct polarity when connecting multiple instruments to Event In/Out terminals.*

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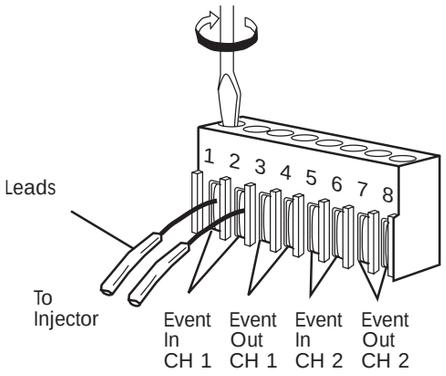

Figure 2-4 Connecting Event Cables

4. Repeat steps 2 and 3 for additional Event In and Event Out connections.

   Note: *One injector can trigger both channels of the Bus SAT/IN module. Instead of using two inject start cables, use a short piece of wire to connect position 1 to position 5, and position 2 to position 6 (Figure 2-5).*

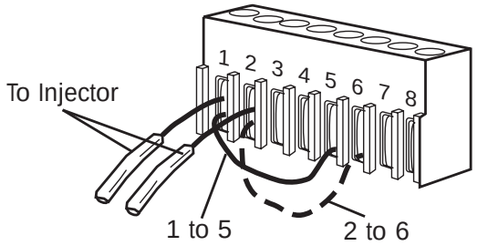

Figure 2-5 Connecting Two-Channel Detector

5. Replace the terminal strip.

If the Bus SAT/IN module does not require a BCD cable, proceed directly to Section 2.6, Connecting the Power Supply.

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2.5 Connecting BCD Cable (Optional)

The BCD (Binary Coded Decimal) connection on the Bus SAT/IN module allows the Bus SAT/IN module to read and record BCD encoded data from Waters autosamplers that support BCD data format. Refer to your autosampler operator's manual for information about BCD formats.

The BCD connection requires:

- Optional BCD instrument interface
- BCD cable

Note: *The BCD-to-Bus SAT/IN cable is not shipped with the autoinjector. The BCD interface and cable must be ordered separately. Contact Waters Customer Service for part numbers.*

Refer to the *Millennium Chromatography Manager Software User's Guide*, Chapter 6, Creating/Modifying an Instrument Method, for information about using the BCD feature.

Procedure

To connect the BCD cable:

1. Connect one end of the BCD cable to the port marked BCD on the rear panel of the Bus SAT/IN module (Figure 2-6).

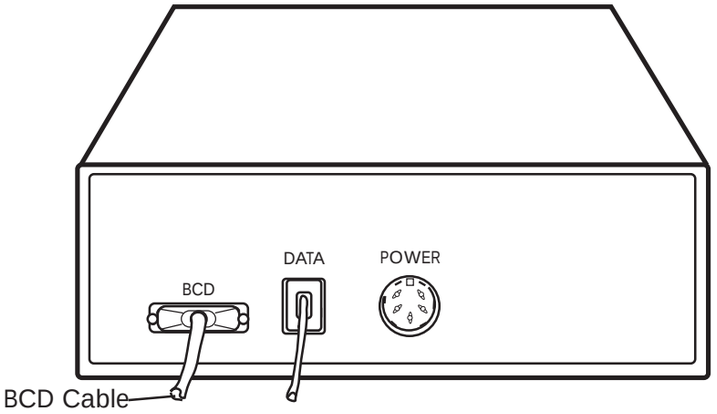

Figure 2-6 Connecting Optional BCD Cable

2. Connect the other end of the cable to the BCD interface.

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2.6 Connecting the Power Supply

The power supply provides power to the Bus SAT/IN module. The power supply automatically adjusts to the input line voltage and provides the required output voltage.

Procedure

Insert the 5-pin plug on the power supply into the 5-pin connector labeled POWER on the rear panel of the Bus SAT/IN module (Figure 2-7). Ensure that the other end of the cord is attached to the power supply.

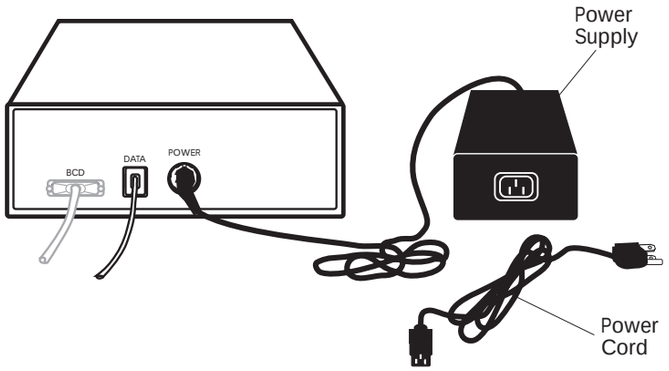

Figure 2-7 Connecting the Power Supply

Attention: *The Bus SAT/IN module and the power supply both do not have an ON/OFF switch. Always disconnect the power cord at either the wall outlet or the power supply before attaching or removing the connection to the Bus SAT/IN module. Failure to do so may damage the unit.*

Once the 5-pin connector is attached to the Bus SAT/IN module, do not remove it except to service the module.

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3 Using the Bus SAT/IN Module

This chapter describes the recommended powerup procedure for the Bus SAT/IN module. It also discusses how to configure the Bus SAT/IN module from Millennium software, as well as how to troubleshoot the Bus SAT/IN module.

3.1 Powerup

When all connections are made, power up detectors and any devices connected to the external event terminals. Refer to the installation guides for each device for powerup procedures.

You connect the Bus SAT/IN power supply to a wall outlet or power strip.

Attention: *The Bus SAT/IN module and the power supply both do not have an ON/OFF switch. Always disconnect the power cord at either the wall outlet or the power supply before attaching or removing the 5-pin connector at the Bus SAT/IN module (see Section 2.6, Connecting Power Supply.). Failure to do so may damage the unit.*

Once the 5-pin connector is attached to the Bus SAT/IN module, do not remove it except to service the module.

Bus SAT/IN module self tests

During powerup, the Bus SAT/IN module performs a series of self tests. During the self-test sequence:

- Channel 1 and Channel 2 LEDs (Light Emitting Diodes) flash once.
- OK LED remains illuminated.

Successful powerup

If the powerup sequence is successful, the OK LED remains lit.

Powerup problems

If the OK LED does not light, check the Bus SAT/IN power supply connections.

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If the OK LED lights, but there is no communication with the Bus LAC/E card, check the DIP switches on the Bus LAC/E card. Be sure that all DIP switches are set to OPEN (Figure 3-1).

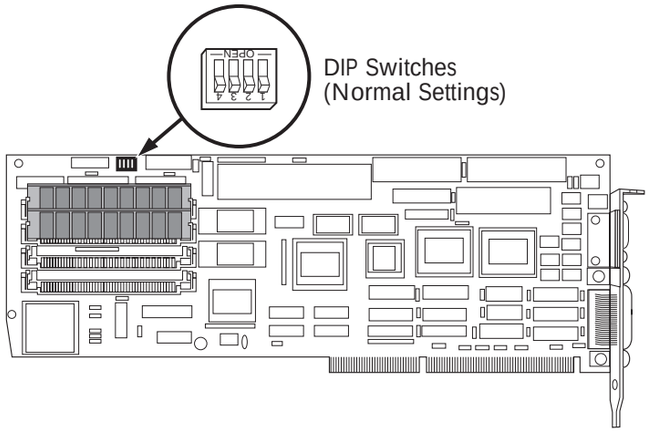

Figure 3-1 Bus LAC/E Card DIP Switch Positions

LED indicators

LED indicators on the front panel reflect the status of the Bus SAT/IN module:

Table 3-1 Summary of LED Indicators

LED	Meaning When Lit
OK	Remains lit when powerup sequence is successful. Indicates power is on.
CH 1 and CH 2	Blink when Bus SAT/IN is acquiring data.

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3.2 Configuring the Bus SAT/IN Module

The Bus SAT/IN module must be identified as a serial instrument connected to the Bus LAC/E card I/O Distribution Box. You add the Bus SAT/IN module using the Configure System window of the Session Manager window.

Adding the connected Bus SAT/IN module to the Configure System window allows the Bus LAC/E card to recognize the serial device on the individual serial ports. Unlike Waters IEEE-488 instruments, serial icons do not appear automatically upon powerup.

Once you add the Bus SAT/IN module, the Bus LAC/E card always associates the device with the assigned serial port (unless you change or physically terminate the connection).

Instruments connected to the Bus SAT/IN module must be identified using **Instruments, Configure LAC/E Serial Ports** command in the Configure System window. You must identify serial instruments before the instrument icons appear in the Available Instruments pane.

Refer to the following chapters in the *Millennium Chromatography Manager Software User's Guide* for instructions on using the Bus SAT/IN module:

- For details on configuring the Bus SAT/IN module as part of a chromatographic system, refer to Chapter 4, Configuring a Chromatographic System.
- For details on developing an instrument method when using a Bus SAT/IN module, refer to Chapter 6, Creating/Modifying an Instrument Method.

3.3 Troubleshooting

If the Bus SAT/IN module does not appear in the instruments list, verify that the DIP switches on the Bus LAC/E card are set to OPEN (Figure 3-1). See the *Waters Bus LAC/E Card Installation Guide* for information about the DIP switches.

If other symptoms of Bus SAT/IN module problems appear during Millennium software operation, refer to the *Millennium Software Troubleshooting Guide*, Chapter 5, Instrument and Acquisition Troubleshooting.

If you cannot correct a condition with the Bus SAT/IN module, you can contact Waters Technical Service at (800) 252-4752, *Canadian and U.S. customers only.* Other customers, call your local Waters subsidiary or call Waters corporate headquarters for assistance at (508) 478-2000 (U.S.).

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Appendix A Bus SAT/IN Module Specifications

A

This appendix contain operating specifications for the Bus SAT/IN module.

Table A-1 Bus SAT/IN Module Specifications

Condition	Specification
Signal input range	–0.25 to 2.25 V
Dimensions Bus SAT/IN module Power supply	 6.33” wide x 9.5” deep x 2.32” high (16.01 cm by 24.13 cm x 5.9 cm) 3.4” wide x 5.87” deep x 2.0” high (8.64 cm wide x 14.91 cm deep x 5.08 cm high)
Weight Bus SAT/IN module Power supply	 1.68 lbs (0.762 kg) 1.34 lbs (0.608 kg)
A/D converter	10 MHz voltage to frequency
Linearity range	0.1% over –0.250 to 2.250 V
Resolution	1 point/sec = 10 million:1 10 points/sec = 1 million:1
Data acquisition rates	0.25, 1, 2, 5, 10, 20, 25, 50, and 100 points/sec
BCD reader	8 bits

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Table A-1 Bus SAT/IN Module Specifications *(Continued)*

Condition	Specification
Power supply	
Input, auto-adjust	90 VAC to 265 VAC, 47 to 63 Hz
Output	+5 VDC, ± 12 VDC
Power output (max)	25 watts
Typical noise	4 to 6 µV, (RMS) inputs shorted
Operating temperature	50 to 95 °F (10 to 35°C)
Operating humidity	20 to 80 % non-condensing

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Appendix B Spare Parts

The following spare parts are recommended for use with the Bus SAT/IN module.

Table B-1 Bus SAT/IN Module Spare Parts

Item	Part Number
Bus SAT/IN module, with Startup Kit and power supply	200415
Bus SAT/IN module only	075-02
Regulated power supply	200459
Event cable	020321
Serial cable, 6 pin, 4 m 8 m 16 m 32 m 64 m	011963 011964 011965 200407 200408
Analog cable	020320
Startup Kit (all cables and screwdriver)	200414
Flat-blade screwdriver	022532
Terminal strips	015158
Waters Bus SAT/IN Installation Guide	200409

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Appendix C Warranty Information

This appendix includes information on:

- Limited Product Warranty
- Shipments, Damages, Returns, and Claims

C.1 Limited Product Warranty

Waters Corporation provides this limited warranty (the Warranty) to protect customers from non-conformity in the product workmanship or materials. The Warranty covers all new products manufactured by Waters and its subsidiaries.

The Warranty is as follows:

Waters warrants that all products sold by them are of good quality and workmanship. The products are fit for their intended purpose(s) when used strictly in accordance with Waters instructions for use during the applicable warranty period.

The foregoing warranty is exclusive and in lieu of all other express and implied warranties, including but not limited to fitness for any other purpose(s). In no event is Waters liable for consequential, economic or incidental damages of any nature. Waters reserves the right not to honor this warranty if the products are abused by the customer. The Warranty is not deemed to have failed of its essential purpose so long as Waters is able and willing to repair or replace any non-conforming part or product.

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Warranty service

Warranty service is performed at no charge and at Waters's option in one of three ways:

- A service representative is dispatched to the customer's facility.
- The product is repaired at a Waters repair facility.
- Replacement parts with appropriate installation instructions are sent to the customer.

Non-conforming products or parts are repaired, replaced with new or like-new parts, or refunded in the amount of the purchase price, when the product is returned. Warranty service is performed only if the customer notifies Waters during the applicable warranty period.

Unless otherwise agreed at the time of sale, warranty service is not provided by dispatching a service representative when the equipment has been removed from the initial installation location to a new location outside the home country of the selling company.

Warranty service exceptions

Warranty service is not performed on:

- Any product or part which has been repaired by others, improperly installed, altered, or damaged in any way.
- Products or parts identified prior to sale as not manufactured by Waters. In such cases, the warranty of the original manufacturer applies.
- Products that malfunction because the customer has failed to perform maintenance, calibration checks, or observe good operating procedures.

Repair or replacement is not made:

- For expendable items such as filament devices, panel lights, fuses, batteries, and seals, if such items were operable at the time of initial use.
- Because of decomposition due to chemical action.
- For used equipment.
- Because of poor facilities, operating conditions, or utilities.

Warranty period

The warranty period begins when the product is installed or, in the case of a customer installation, 15 days after shipment from Waters.

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In no case does the warranty period extend beyond 15 months from date of shipment. If an item is replaced during its warranty period, the replacement part is warranted for the balance of the original warranty period.

The warranty period for the Bus SAT/IN Module is as follows:

Item	Warranty
Bus SAT/IN Module Power Supply	1 year
Cables	90 days
Replacement parts Service workmanship	30 days

C.2 Shipments, Damages, Claims, Returns

Shipments

As all shipments are made free on board (FOB) shipping point, we suggest insurance be authorized on all shipments. Instruments and major components are packed and shipped via surface, unless otherwise required. Supplies and/or replacement parts are packed and shipped via UPS, UPS Blue, air parcel post, or parcel post unless otherwise requested.

Damages

The Interstate Commerce Commission has held that carriers are as responsible for concealed damage as for visible damage in transit. Unpack shipment promptly after receipt as there may be concealed damage even though no evidence of it is apparent. When concealed damage is discovered, cease further unpacking of the unit involved and request immediate inspection by local agent or carrier and secure written report of his findings to support claim. This request must be made within 15 days of receipt. Otherwise, the claim will not be honored by the carrier. Do not return damaged goods to factory without first securing an inspection report and contacting Waters for a return materials authorization number (RMA).

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Claims

After a damage inspection report is secured, Waters will cooperate fully in supplying replacements and handling of a claim which may be initiated by either party.

Returns

No returns may be made without prior notification and authorization. If for any reason it is necessary to return material to us, please contact our Customer Service Department or your nearest Waters subsidiary/representative for a return materials authorization number and forwarding address.

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