

DryCal[®] Nexus NL DC-Lite Accessory Module Manual

DryCal[®] Nexus NL Specifications

Size 3" H x 4" W x 6" D • 76 mm H x 102 mm W x 152 mm D

Weight 32 oz. • 914 g

Power Source Power supplied from the DC-Lite via connecting cable. Optional AC power using the DC-Lite single-station adapter. Input: 100-120 VAC, 50 to 60 Hz. Output: 12 VDC, 2.5mm plug center positive. Optional input: 200-240 VAC, 60 Hz.

Electronics LCD function display and alphanumeric keypad.

Temperature Range 0-55 °C

Humidity Range 0-70% non-condensing

Printer Port Standard parallel (Not compatible with printers that require Microsoft[®] Windows[™])

Serial Port RS-232 compatible

Warranty 1 year

Routine Maintenance offered by Bios is elective and is not included as a warranty item. All specifications are subject to change.

Please contact Bios or visit our web site at www.biosint.com for the most current information.

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1.0 Unpacking Checklist

Your quality Bios product has been packaged with care and includes all components necessary for full operation. Please take a moment to check that you have received the following items. If you believe you have not received a full shipment or have questions, please contact Bios immediately.

Your Nexus NL Kit Includes

- DryCal Nexus NL Data Logging and Communication Module
- Single Station AC Adapter
- Interface Cable
- Instruction Manual
- Warranty Registration Card

2.0 General Description

The DryCal Nexus NL data logging and communication module expands the capabilities of the DryCal DC-Lite primary flow meter. When used with the DC-Lite for checking air flow rates, the Nexus NL provides volumetric flow rate readout, time and date stamping, sample ID numbers and either source or employee ID numbers. A time delay function allows readings to be taken at user-defined intervals for flow stability testing and process stability reviews.

Nexus NL also allows the user to save, print or export flow rate data. Depending upon the save format, up to fifty employee or flow source sample records can be stored in the unit's memory. An RS-232 port and a standard parallel port are available for data transfer to a PC or for printing. A supplemental manual is included with the Nexus as a guide for connection to a PC.

3.0 Theory of Operation

The Nexus NL is a communication and data storage module for the DryCal DC-Lite.

When Operating the Nexus

- Attach the Nexus to the DC-Lite with the included interface cable.
- Turn the units on by pressing the **On** button on DC-Lite keypad. If the DC-Lite is already on, attach the interface cable between the two units and press the white reset button on the back of the DC-Lite.
- The DC-Lite is controlled by the Nexus and the Nexus keypad is used for input.
- The DC-Lite 5-minute automatic shut off feature is extended to 60 minutes while it is connected to the Nexus.

When using the Nexus NL with the DryCal DC-Lite the only connection between the two instruments is the 25-pin interface cable. The Nexus is powered by the DC-Lite through this cable. Attach the connecting cable to the Nexus port labeled "DryCal", see Figure 1.

When downloading stored data after the flow measuring functions are completed it is not necessary to have the DC-Lite connected to the Nexus. At that time, the Nexus can be powered by the included AC adapter. The receiving jack for the adapter is located on the right hand side of the Nexus housing.

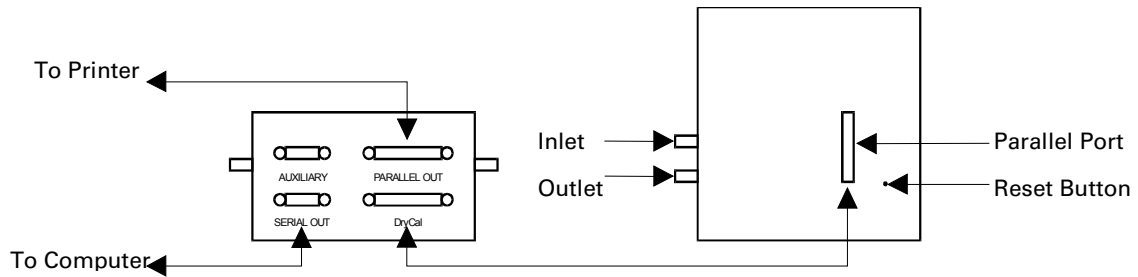


Figure 1. DC-Lite & Nexus Connecting Ports.

Vflow	52.3	ml/m
Vavg	53.5	#08
		P Off
		S Off

Or

Vflow	2.645	L/m
Vavg	2.540	#08
		P Off
		S Off

Figure 2. Typical Run Screen.

Nexus Display Abbreviations

- Vflow** Volumetric flow rate for the single reading.
- Vavg** Volumetric flow rate for the averaging sequence.
- #** The number of readings in an averaging sequence.
- P Off** Print off
- P Bst** Print burst
- P All** Print all
- P Avg** Print average
- S Off** Save status "Off"
- S On** Save status "On"

When saving data the Print selection controls the number of readings that are saved.

Examples

- P Bst** Allows for the user to save only the number of readings in a single averaging sequence, typically 10 readings. This number may be increased or decreased through the setup menus up to a maximum of 99 readings. The Nexus and DC-Lite will automatically stop at the end of the sequence.
- P All** Allows for saving every reading continuously or until the **Stop** button is pressed or the available memory is used up.

4.0 DryCal DC-Lite & Nexus NL Operating Instructions

4.1 Factory Default Settings

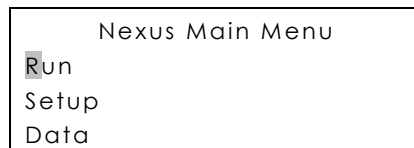
The Nexus NL has a number of user-definable features and settings. If you wish to change any of these settings, refer to Section 5.0, Setting User Preferences.

	Default	Options
1 Number of readings in an averaging sequence	10	1-100
2 Sample Rate	00	User-defined, 0-60 Minutes
3 Print Headings	On	Single or Off
4 Printing Format	Narrow	Wide-1 or Wide-2
5 Time	AM/PM	24 Hr
6 Date	MT/DT/YR	DT/MT/YR or YR/MT/DT
7 ID Type	Employee	Source

4.2 Turning the Nexus Power On When Connected to a DC-Lite

The Nexus may be powered either by connection to a DryCal DC-Lite flow calibrator via the 25-pin interface cable or by the included stand-alone AC adaptor.

- 1 Ensure that the Nexus is connected to a DC-Lite via the 25-pin interface cable.
- 2 Press the **On** button on the DC-Lite to turn the Nexus on. When the Nexus is connected to the DC-Lite through the parallel port the Nexus is powered by the DC-Lite.
- 3 After the unit is turned **On**, "Nexus Control" should be displayed on the DC-Lite LCD along with a battery indicator. If "Nexus Control" is not displayed on the screen and the two instruments are properly connected to one another via the interface cable. Press the white recessed **Reset** button on the back of the DC-Lite while they are connected.
- 4 The DC-Lite has an energy saving 5-minute inactivity shut-off feature. When the Nexus is connected via the connecting cable the auto shut-off will be extended to 60 minutes.
- 5 After powering up, "Nexus Main Menu" will be displayed on the Nexus LCD and "Nexus Control" will be displayed on the DC-Lite LCD.



4.3 Taking Readings

The DC-Lite and the Nexus should be connected the interface cable and the DC-Lite should display "Nexus Control" on the LCD display. When the DC-Lite and the Nexus are connected, all operating functions will be controlled from the Nexus keypad. To return to the Nexus Main Menu from the Run Screen press the **▲** button.

Taking a Single Reading

- 1 From the "Main Menu" press the **Enter** button on the Nexus keypad.
- 2 The next screen allows for setting up a "Save" and/or "Print" format. If you do not wish to print or save at this time press enter with the cursor on the "Save Off" selection. For more information on these options see Section 6.0

Save Menu
Save Off
Format Vol./Avg.
Printer Off

- Press **Enter** to progress to the "Run" screen. (Shown below). Depending upon the flow range, the unit indication will read in liters per minute or milliliters per minute.

Vflow	l/m
Vavg	#
	P Off
	S Off

- On the Nexus keypad, press the **Read** button once to obtain a single flow measurement. The flow measurement will appear on the LCD.

Vflow	1.437 l/m
VAvg	1.437 # 01
	P Off
	S Off

- Continue this procedure to obtain the required number of flow readings.

Taking Auto-Repeat Readings

Readings can be taken continuously in the auto-repeat mode for hands-free operation.

- Press and hold the **Read** button on the Nexus keypad, until a reading starts, then release the button. This will begin a continuous read session.
- To stop the continuous read session, press the **Stop** button once.

All successive readings in an averaging sequence will be used to calculate the average flow. The Nexus will automatically clear the average after ten readings and begin a new averaging sequence unless the number in the averaging sequence has been changed from the factory default setting. For more information see Section 6.0.

4.4 Stopping a Flow Reading Sequence

Press the **Stop** button to end a continuous read session.

4.5 Resetting the Averaging Sequence

Press and hold the **Reset** button to clear the display.

4.6 Soft Reset

The Nexus may be reset any time by removing external power from the instrument by unplugging the DC-Lite interface cable and/or the AC adaptor. All user settings will be maintained. All unsaved flow data will be lost.

4.7 Hard Reset

A "Hard Reset" restores the Nexus to its factory default settings. In order to perform a "Hard Reset" press the 1, 4, 7 and 0 buttons simultaneously and then apply power to the Nexus by either connecting to the DC-Lite via the interface cable or by applying power to the Nexus by connecting to the AC adaptor. All unsaved flow data will be lost.

5.0 Setting User Preferences

The DryCal Nexus NL offers a wide array of user-definable preferences, such as number in averaging sequence, frequency of flow readings, time and date formats and display units.

Selections are made by pressing the **Select** button to highlight a desired menu or screen. A cursor will blink, highlighting the current selection. Pressing the **Enter** button will then enter that selection. Pressing the **Select** button scrolls through that menu's options. When the desired field is selected the ▲ and ▼ buttons scroll through that selection's options. Once the desired setting is entered, press the **Enter** button to advance to the next Setup Menu. To return to the previous menu or to return to the main menu from any setup screen, select either the "Back" or "Main Menu" selection and press **Enter**. Preference settings need only be entered once. Setup data is lost only if the internal alkaline batteries are removed or permitted to discharge completely.

5.1 Entering the Setup Menu

- 1 From the "Nexus Main Menu" screen press the **Select** button once to highlight "Setup".
- 2 Press the **Enter** button once to enter the Setup screen.

5.2 Setting Readings in Average & Sample Rate

Selecting Setup Menu 1 allows the user to set the number of flow readings to include in an averaging sequence and the sample rate frequency.

Menu choices:

To Average: 1-100
Sample Rate: 0-65 min

- 1 Choose the field to be modified by pressing the **Select** button.
- 2 Use the ▲ and ▼ buttons to select the desired quantity.
- 3 Press **Select** to choose another field to be modified or press **Enter** to advance to the next menu.

5.3 Setting Print Options

Selecting Setup Menu 2 allows you to set printer options such as printing headings with time and date stamps or printing without headings for raw data analysis. Printer output formats may also be selected as "Narrow", "Wide1" and "Wide2" using ▲ and ▼ buttons. Experiment with selections to determine the best choice for your printer.

Menu Choices:

Headings Off, On
Narrow, Wide1, Wide2

- 1 Choose the field to be modified by pressing the **Select** button.
- 2 Use the ▲ and ▼ buttons to select the desired format.
- 3 Press **Select** to choose another field to be modified or press **Enter** to advance to the next menu.

5.4 Setting Time & Date Formats

Selecting Setup Menu 3 allows the user to change time and date formats.

Menu choices:

Time: AM/PM, 24 hr

Date: YR/MT/DT, MT/DT/YR, DT/MT/YR

- 1 Choose the field to be modified by pressing the **Select** button.
- 2 Use the ▲ and ▼ buttons to select the desired format.
- 3 Press **Select** to choose another field to be modified or press **Enter** to advance to the next menu.

5.5 Setting ID Type

The Nexus allows the entry of employee or source identification numbers to track calibration data. Selecting Setup Menu 4 allows the user to select the type of identification numbers to be used for sample ID stamping and subsequent data retrieval when data logging is activated.

Menu choices:

ID Type: Employ, Source

- 1 Use the ▲ and ▼ buttons to select the desired format.
- 2 Press **Enter** to advance to the next menu.

5.6 Setting Date & Time

This screen displays the date and time. Selecting this screen allows the user to set the current date and time.

- 1 Press the **Select** button to highlight the first choice in the series.
- 2 Use the ▲ and ▼ buttons to select the desired setting.
- 3 Press the **Select** button to advance to the next entry field.
- 4 Press the **Enter** button two times when the desired date and time has been set.

6.0 Data Options

You can print directly from the DC-Lite without using the Nexus; however, if you wish to log, time, date, sample ID number and source or employee ID number the print function should be set up through the Nexus. Likewise, the Nexus can be configured to log data internally for subsequent printing or download.

Connect the Nexus to the DC-Lite as described in Section 4.2

6.1 Selecting a Print Setting

The Nexus contains four unique print settings. These settings are chosen by pressing the **Print** button on the Nexus . A new print setting is selected each time the **Print** button is pressed. The default setting is "Off" . When the power is initially turned on the printer setting will always be in the "Off" position. The four setting are:

- 1 **Off** Printer is off.
- 2 **Bst** The printer will print an averaging sequence -10 readings if left in the factory default setting - and stop. Readings will also stop after the number in the averaging sequence has been met.
- 3 **All** Readings will print continuously.
- 4 **Avg** Prints the final reading and the final sequence average only. The print "Avg" mode will print the final average continuously averaging sequence after averaging sequence until the stop button is pushed.

Vflow	2.032 L/m
VAvg	1.996 #04
	P Bst
	S Off

5 After a print selection has been made (“Bst” shown above).

To Print

1 From the “Run” screen, press and hold the **Stop** also (Reset) button. This will advance to a save/print format menu (“Save Menu”). For printing the only leave the “Save” function in the “Off” position and confirm that the “Print” function is set properly.

Save Menu	
Save	Off
Format	Vol./Avg.
Printer	Bst

6.2 Printing Data

From the “Save Menu” (shown above), confirm the proper print selection. To print only, make sure that the “Save” selection remains in the “Off” position. Also, “Format” does not apply to the print process and should be ignored. Both of these refer to saving data only and have nothing to do with the print process.

After printing the desired readings either disconnect the printer or turn the print selection to “Off” if you leave the printer connected.

To eject or release the paper when printing from a laser printer, press the ▼ button from the Nexus keypad.

1 After confirming the proper print setting press **Enter** to advance.

Change ID	
Yes	
No	

2 To select “Yes” press **Enter**.

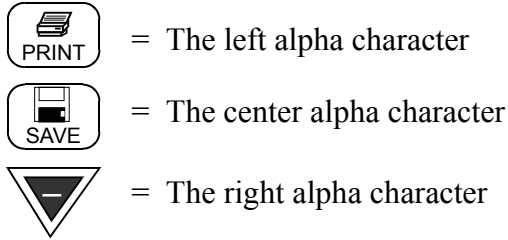
Note:



Selecting “No” will automatically retain the last “Sample ID Number” and “Employee ID number”. This may be useful for pre and post calibration on the same employ or flow source. The time and date will be printed with each set of data. The time will be used to differentiate between the pre and post data. If “No” is desired, press the **Select** button and then **Enter**.

Data Menu	
Sample ID	0001
Employ ID	00000000

- 3 If you selected “Yes” the “Data Menu” (above) will appear. The sample ID number automatically ascends or you can overwrite the number by typing up to 4 digits and pressing **Enter**.
- 4 The employee ID number is the default secondary ID number. To change this number:

- 4.1 Press the **Select** button and the cursor will move to "Employ ID".
- 4.2 Type up to 9 digits for the Employee ID Number .
- 4.3 Alpha characters are also available for the "Employee Number". If you would like to include alpha characters use the following diagram:



To type an (A) press  and then press 

Data Menu	
Sample ID	0001
Employ ID	JohnSmith

- 5 Press **Enter** to advance to the Run screen and the printer will print a heading for the printed data.
- 6 To "Print" a reading sequence, press and hold the **Read** button until a reading is initiated. The Nexus will automatically continue to take the remaining readings in the averaging sequence. See Section 6.1 for other print setting options.

Example of a Sample Printout

```

Sample ID 0001
Employ ID JohnSmith
01/06/99 02:41 PM
VFlow VAvG
2.014 2.025 l/m
  
```

6.3 Saving Data

Saving data is very similar to the printing process except the printer is not necessary.

If at any point you use up all of the available memory a warning message will flash. You will not be able to save additional data until a portion of the old data is deleted.

To save the data, from the "Run" screen:

Vflow	2.032 L/m
VAvg	1.996 # 04
	P Off
	S Off

1 Press **Save** on the Nexus keypad. The Nexus will display the "Save Menu".

Save Menu	
Save	Off
Format	Vol./Avg.
Printer	Off

At the "Save Menu", press ▲ or ▼ to toggle the save function to the on position.

Save Menu	
Save	On
Format	Vol./Avg.
Printer	Off

2 Press **Select/Stop** to move the cursor to the "Format" selection. The Nexus NL has no options other than <Vol./Avg.> This format saves the heading information plus the volumetric readings, Vflow and Vavg for the reading sequence.

3 Press **Select/Stop** to move the cursor to the "Printer" selection.

- If you don't make a printer selection the Nexus will save "All" readings until the memory is either full or you press the **Stop** button
- The Nexus will save approximately 17-20 complete sets of readings when saving in the "Vol./Avg." save format.
- Select "Print Bst" if you would like to save a reading sequence of ten (10) readings only.
- Pressing either ▲ or ▼ buttons will toggle between print selections. "Bst." is the most popular selection because it will allow the unit to stop at the end of one reading sequence. This selection allows you to only save useful information and prevents using too much memory space.

4 When the save setup has been completed, press the **Enter** button to proceed to the "Change ID" screen.

Change ID	
Yes	
No	

5 To select "Yes" press **Enter**.

6 Selecting "No" will automatically retain the last "Sample ID Number" and "Employee ID Number". To select "No", press the **Select** button to toggle, and then press **Enter**.

Data Menu	
Sample ID	0001
Employ ID	00000000

7 If you selected "Yes" The "Data Menu" (above) will appear. Overwrite the current number by typing, up to 4 digits and pressing **Enter**. The "Employee ID Number" is the default secondary ID number.

8 To change this number:

7.1 Press the **Select** button and the cursor will move to "Employ ID".

7.2 Type up to 9 digits for the "Employee ID Number".

7.3 Alpha characters are also available for the "Employee" Number. If you would like to include alpha characters use the following diagram:



= The left alpha character



= The center alpha character



= The right alpha character

To type an (A) press



and then press



Data Menu	
Sample ID	0001
Employ ID	JohnSmith

9 Press **Enter** to advance to the Run screen.

Vflow	L/m
VAvg	#
	P Bst
	S On

10 To save a reading sequence, press and hold the **Read** button until a reading is taken. It will automatically continue to take the remaining readings based on the print setting selected. For more information on print settings see Section 6.1.

11 If you do not wish to save the next reading sequence, press the **Print** button and toggle to the "Off" position. Then press the **Save** button. This will return you to the "Save Menu". Toggle "Save" to the "Off" position with the ▲ or ▼ buttons and proceed to the "Run" screen by pressing **Enter** three times.

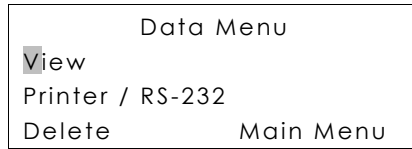
6.4 Viewing Saved Data

Before viewing data you must first return to the "Nexus Main Menu". From the Run screen press either the ▲ or ▼ button to return to the "Main Menu".

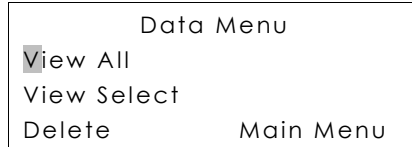
1 Press the **Select** button twice to move the cursor to the "Data" position.

Nexus Main Menu	
Run	
Setup	
Data	

- 2 When the cursor is over the “D” press **Enter** to advance to the “Data Menu”.



- 3 Press **Enter** to advance to the next screen.



To view all data saved

Press **Enter**.

To view the last set of data saved

Use the **Select** button to toggle the cursor to “View Select” and press **Enter**.

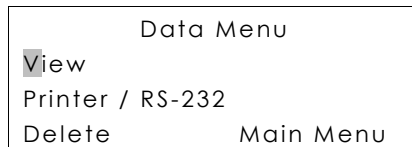
To view a specific set of data saved

Use the **Select** button to toggle the cursor to “View Select” and press **Enter**. Then, overwrite the Sample ID number or the Employee/Source ID number and press **Enter**.

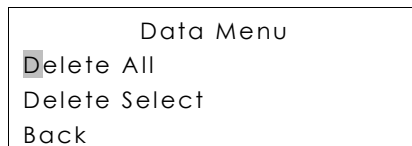
6.5 Deleting Saved Data



- 1 From the “Main Menu” move the cursor with the **Select** button to “Data” and press **Enter**.



- 2 From the “Data Menu” move the cursor with the **Select** button to “Delete” and press **Enter**.



- 3 The cursor will be at the “Delete All” position. Use the **Select** button to toggle the cursor and the **Enter** button to accept a selection.

To delete all data saved

Press **Enter** .

To delete the last set of data saved

Use the **Select** button to toggle the cursor to "Delete Select" and press **Enter**

To delete a specific set of data saved

Use the **Select** button to toggle the cursor to "Delete Select" and press **Enter**. Then, overwrite the Sample ID number or the Employee/Source ID number and press **Enter**.

To return to the "Main Menu"

Select "Back" and then "Main Menu".

6.6 Downloading Data to a PC

Sample data from the DC-Lite/Nexus can be downloaded to a PC through the serial port on the Nexus. Connect the Nexus to the computer via the "Serial Out" port on the back of the Nexus.

If you have a printer connected to the Nexus a hard copy of the data will be printed also.

- 1 From the "Main Menu" on the Nexus , used the **Select** button to move the cursor to the "Data" position and press **Enter**. The first "Data Menu" will appear.

```
          Data Menu
View
Printer / RS-232
Delete           Main Menu
```

- 2 Using the **Select** button move the cursor to the "Printer / RS-232" position and press **Enter**.

```
          Data Menu
Print All
Print Select
Back
```

Move the cursor to the selection that you prefer, either "Print All" or "Print Select". If you choose "Print Select" you will need to know sample and employee/source ID numbers for data recall, otherwise choose "Print All".

```
          Data Menu
Sample ID 0001
Employ ID 0000
```

- 3 Pressing **Enter** will allow the Nexus to print the data to the Terminal File.

7.0 The Power Supply

The DryCal Nexus is powered by the DryCal DC-Lite via the parallel port. The unit can also be operated using the AC adapter that has been supplied with the Nexus . We suggest that AC operation be used only for downloading information to a PC or while printing stored data. When taking flow measurements the Nexus should be connected to the DC-Lite as shown in Section 3.0 in this manual.

The standard DC-Lite 5-minute auto shut-off feature is automatically extended to 60 minutes when the Nexus and DC-Lite are connected.

7.1 Replacing the Secondary Battery System

There is a secondary battery system in the Nexus that may require replacement on a three to five year cycle. This battery system powers the real time clock and allows for storing the setup preference features. If your unit loses the ability to keep time accurately or if it loses the setup parameters, these batteries may need replacement. Follow the return procedure described in Sections 9.1 of this manual if these symptoms become apparent.

8.0 Maintenance, Quality Assurance

Although the DryCal Nexus is a rugged instrument, certain care and maintenance requirements must still be met. When not in use always store your Nexus in a clean, dry environment. When possible leave the unit on charge. Wipe only with a damp cloth and do not spray with liquid solvents or use abrasive cleaners.

8.1 Return Authorization

Prior to returning your DryCal for service or calibration, please contact Bios International for a RMA number. You can telephone Bios at (800) 663 4977 or (973) 492 8400, or email service@biosint.com.

8.2 Shipment

When shipping the DryCal Nexus please ensure that the packaging is adequate to protect the instrument. When possible the Nexus should be shipped in the original packaging. Bios International Corp. is not responsible for damage that occurs during shipment.

8.3 Calibration

The Nexus NL does not require calibration.

9.0 Limited Warranty

The Bios DryCal Nexus is warranted to the original end user to be free from defects in materials and workmanship under normal use and service for a period of 1 year from the date of purchase as shown on the purchaser's receipt. If the unit was purchased from an authorized reseller a copy of an invoice or packing slip showing the date of purchase may be required to obtain warranty service.

The obligation of Bios International Corporation under this warranty shall be limited to repair or replacement (at our option), during the warranty period, of any part which proves defective in material or workmanship under normal use and service provided the product is returned to Bios International Corporation, transportation charges prepaid.

Notwithstanding the foregoing, Bios International Corporation shall have no liability to repair or replace any Bios International Corporation product:

- 1** Which has been damaged following sale, including but not limited to damage resulting from improper electrical voltages or currents, defacement, misuse, abuse, neglect, accident, fire, flood, act of God or use in violation of the instructions furnished by Bios International Corporation,
- 2** Where the serial number has been altered or removed or
- 3** Which has been repaired, altered or maintained by any person or party other than Bios International Corporation's own service facility or a Bios-authorized service center.

This warranty is in lieu of all other warranties, and all other obligations or liabilities arising as a result of any defect or deficiency of the product, whether in contract or in tort or otherwise. All other warranties, expressed or implied, including any implied warranties of Merchantability and fitness for a particular purpose, are specifically excluded. In no event shall we be liable for any special, incidental or consequential damages for breach of this or any other warranty, express or implied, whatsoever.

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