Crestron **DIN-AP3**
DIN Rail
3-Series™ Automation Processor
Operations & Installation Guide

CRESTRON®

Regulatory Compliance

As of the date of manufacture, the DIN-AP3 has been tested and found to comply with specifications for CE marking and standards per EMC and Radiocommunications Compliance Labelling.

Federal Communications Commission (FCC) Compliance Statement

CAUTION: Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Industry Canada (IC) Compliance Statement

CAN ICES-3(B)/NMB-3(B)

The specific patents that cover Crestron products are listed at patents.crestron.com.

This document was written by the Technical Publications department at Crestron.

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DIN Rail 3-Series Automation Processor: DIN-AP3

Introduction

The DIN-AP3 is a 3-Series™ control processor designed for lighting and automation applications. DIN rail mounting enables modular installation alongside Crestron® DIN Rail lighting and automation control modules and other third-party DIN rail mountable devices.

Features and Functions

- 3-Series engine
- SD™ card slot, expandable to 32 GB
- 10/100 Ethernet | SSL encryption
- Two 4-Pin Cresnet® connectors
- 2 RS-232/RS-422/RS-485 COM ports
- 4 IR/serial ports
- 8 Versiport I/O ports
- 4 Low-voltage 1 Amp relay ports
- Supports Crestron Fusion™ and SNMP remote management
- Configurable via Crestron D3 Pro® software
- 9M wide DIN rail mounting
- Native BACnet®/IP support*

* License required. The DIN-AP3 support a maximum of 500 BACnet objects when dedicated for BACnet use only. Actual capabilities are contingent upon the overall program size and complexity.

3-Series Engine

Today's commercial buildings and custom homes comprise more technology than ever before, and all these systems need to be networked, managed, and controlled in fundamentally new ways. The IP-based 3-Series engine platform is engineered from the ground up to deliver a network-grade server appliance capable of faithfully handling everything from boardroom AV and home theater control to total building management.

3-Series processing embodies a distinctively robust, dynamic, and secure platform to elevate your system designs to higher levels of performance and reliability. Compared to other control systems, 3-Series processing provides a pronounced increase in processing power and speed with more memory, rock solid networking and IP control, and a unique modular programming architecture.

DIN Rail Installation

The DIN-AP3 is designed to snap onto a standard DIN rail for installation in a wall mount enclosure or mounted on a wall panel. Wiring connections are made using detachable screw terminals positioned along the top and bottom, clearly accessible from the front for easy installation and servicing. All setup controls and connections are positioned on the center front panel. When installed in an enclosure utilizing 45 mm cutouts, the DIN-AP3's front panel stays accessible while all other connections are concealed.

System Integration

The DIN-AP3 provides for the integration of non-Crestron devices and subsystems through a host of control interfaces. Four isolated relays and eight Versiport I/O ports are built in to accommodate all kinds of sensors, contactors, door strikes, and other low-voltage controls. Two bidirectional RS-232 COM ports and four IR/serial ports allow for the integration of everything from simple shade controllers to advanced security systems. Additional interfaces and controllers can be added easily using Crestron's DIN Rail series lighting and automation modules.

Cresnet

Cresnet is the communications backbone for Crestron lighting modules, wall box dimmers, shade controllers, thermostats, keypads, touch screens, and many other devices. This flexible 4-wire bus streamlines the wiring of a complete Crestron system. The DIN-AP3 includes a pair of Cresnet master ports (paralleled) capable of supporting approximately 20 typical devices. Larger systems with more than 20 devices can be handled by adding the DIN-HUB Cresnet Distribution Hub (sold separately). Connectivity for multiple homeruns can be facilitated using one or more DIN-BLOCK Cresnet Distribution Blocks (sold separately). Additionally, at least one DIN-PWS50 Cresnet Power Supply (sold separately) is required to power the DIN-AP3 and any connected Cresnet devices.

Ethernet and e-Control 2

Built-in 10/100 Ethernet facilitates secure high-speed network connectivity, enabling extensive capabilities for remote system maintenance and control, and providing an interface to other Crestron control systems. Native features include a built-in e-mail client to report system troubles and other functions to the owner or service company via instant email notification. An onboard Web server provides the foundation for Crestron's exclusive e-Control®2 Xpanel technology, providing secure IP-based remote control.

Crestron Fusion™ and SNMP—For large facilities utilizing multiple DIN-AP3 processors and other control systems, Crestron Fusion Help Desk software delivers a comprehensive solution for remote monitoring and asset management. Also, built-in SNMP support enables similar capability using third-party network management software, allowing full control and monitoring from the IT Help Desk or NOC in a format that is familiar to IT personnel.

D3 Pro Software

Crestron D3 Pro software eliminates the need for custom programming, providing a complete design, development, and documentation solution for the lighting professional.

BACnet/IP

Native support for the BACnet/IP communication protocol provides a direct interface to third-party building management systems over Ethernet, simplifying integration with HVAC, security, fire and life safety, voice and data, lighting, shades, and other systems. Using BACnet/IP, each system runs independently with the ability to communicate together on one platform for a truly smart building*.

* License required. The DIN-AP3 supports a maximum of 500 BACnet objects when dedicated for BACnet use only. Actual capabilities are contingent upon the overall program size and complexity.

Specifications

Specifications for the DIN-AP3 are listed in the following table.

DIN-AP3 Specifications

SPECIFICATION	DETAILS
Memory	
SDRAM	256 MB DDR3
Memory Card	Expandable up to 32 GB using SD compatible card (not supplied)
Operating System	3-Series control engine; real time, preemptive multi-threaded / multitasking kernel; Transaction-Safe Extended FAT file system; supports up to 10 simultaneously running programs

(Continued on following page)

DIN-AP3 Specifications (Continued)

SPECIFICATION	DETAILS
Ethernet	10/100 Mbps; auto-switching, auto-negotiating, auto-discovery, full/half duplex, industry-standard TCP/IP stack, UDP/IP, CIP, DHCP, SSL, IEEE 802.1X; SNMP; BACnet/IP[1]; IPv4 or IPv6, Active Directory authentication, IIS v.6.0 Web Server, SMTP e-mail client, installer setup via Crestron Toolbox or MSIE[2]; supports all e-Control, Smart Graphics XPanel, Crestron Mobile®, Crestron Fusion™, and RoomView® applications
Power	
Cresnet Power Usage	8 watts (0.33 amps @ 24 volts dc)
Default Net ID	02
Environmental	
Installation Location	Indoor use only
Temperature	23º to 104º F (0º to 40º C)
Humidity	10% to 90% RH (non-condensing)
Heat Dissipation	26 Btu/h
Enclosure	Light gray polycarbonate housing with polycarbonate label overlay, UL94 V-0 rated, 35 mm DIN EN 60715 rail mount, DIN 43880 form factor for enclosures with 45 mm front panel cutout, occupies 9 DIN module spaces (162 mm)

(Continued on following page)

DIN-AP3 Specifications (Continued)

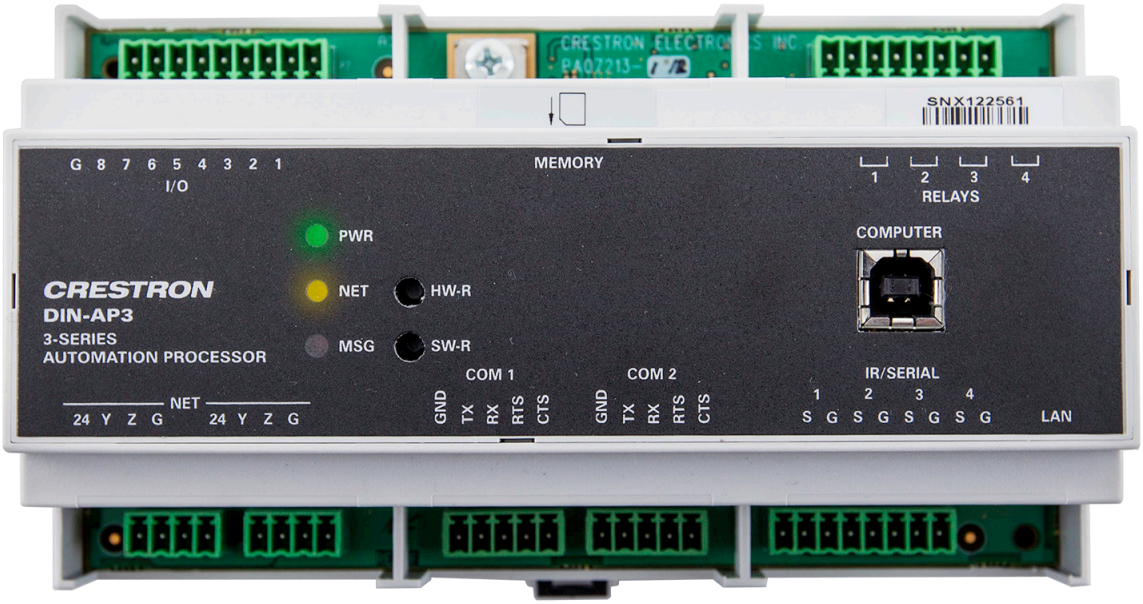
SPECIFICATION	DETAILS
Dimensions	
Height	3.72 in (95 mm)
Width	6.28 in (160 mm)
Depth	2.29 in (59 mm)
Weight	10 oz (277 kg)
Available Accessories:	
3-Series BACnet/IP Support	3-Series Native BACnet/IP License
DIN-1DIMU4	DIN Rail Universal Dimmer, 1 feed, 4 channels
DIN-2MC2	DIN Rail Motor Control, 2 feeds, 2 channels
DIN-4DIMFLV4	DIN Rail 0-10V Fluorescent Dimmer, 4 feeds, 4 channels
DIN-8SW8	DIN Rail High-Voltage Switch, 8 feeds, 8 channels
DIN-AO8	DIN Rail Analog Output Module
DIN-BLOCK	DIN Rail Cresnet Distribution Block
DIN-HUB	DIN Rail Cresnet Distribution Hub
DIN-IO8	DIN Rail Versiport Module
DIN-PWS50	DIN Rail 50 Watt Cresnet Power Supply

1. License required. The DIN-AP3 support a maximum of 500 BACnet objects when dedicated for BACnet use only. Actual capabilities are contingent upon the overall program size and complexity
2. Web-based installer setup requires the Microsoft® Internet Explorer® Web browser running on a Windows® PC.

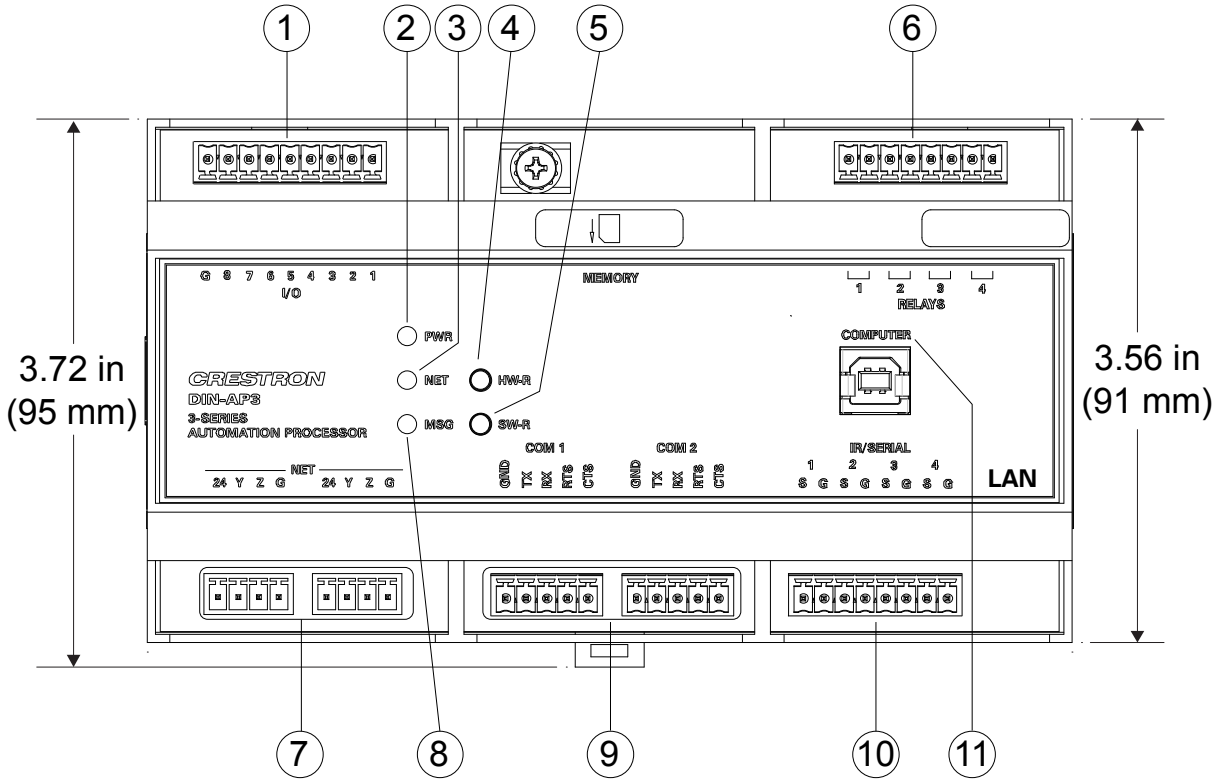
Physical Description

This section provides information on the connections, controls, and indicators available on the DIN-AP3.

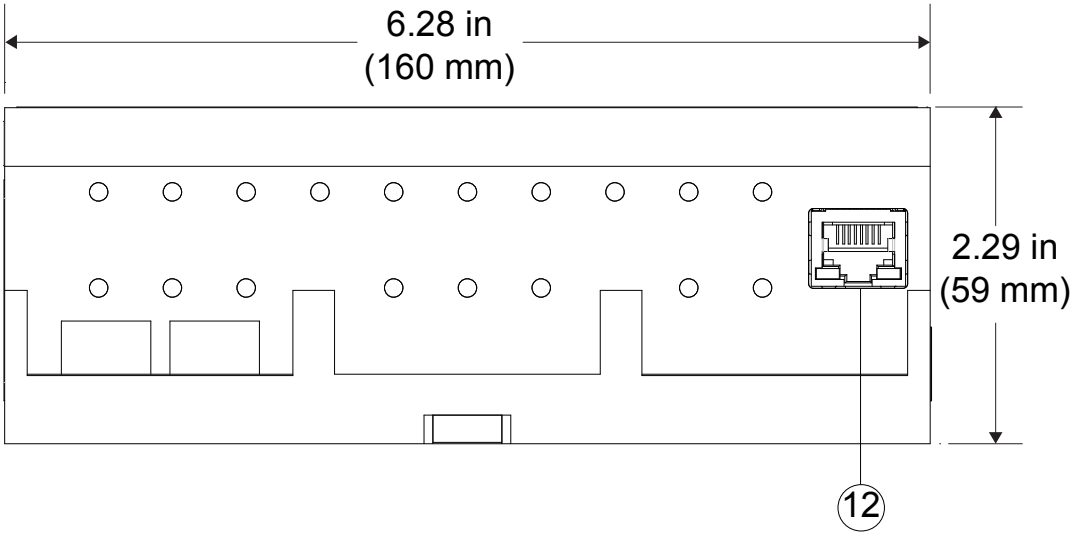
DIN-AP3 Physical View



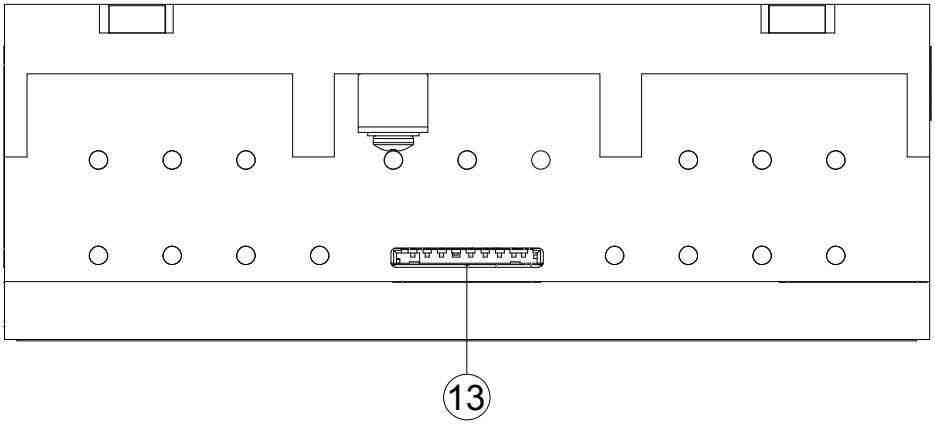
DIN-AP3 Overall Dimensions – Front View



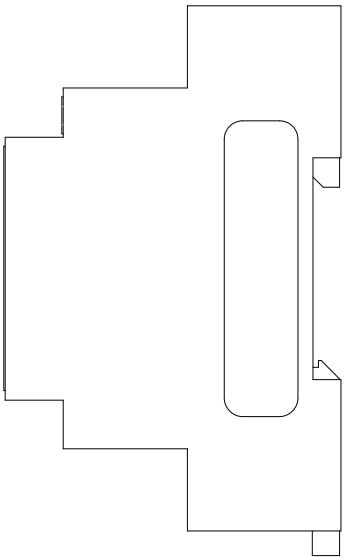
DIN-AP3 Overall Dimensions – Bottom View



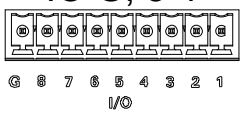
DIN-AP3 Physical Drawing – Top View



DIN-AP3 Physical Drawing – Side View

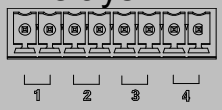
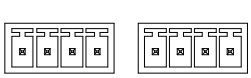


Connectors, Controls & Indicators

#	CONNECTORS*, CONTROLS & INDICATORS	DESCRIPTION
1	IO G, 8-1 	(1) (1) 9-pin 3.5 mm detachable terminal block comprising (8) “Versiport” digital input/output or analog input ports (referenced to GND); Digital input: Rated for 0-24 volts dc, input impedance 20 kΩ, logic threshold >3.125 V low/0 and <1.875 V high/1; Digital output: 250 mA sink from maximum 24 volts dc, catch diodes for use with “real world” loads; Analog input: Rated for 0-10 volts dc, protected to 24 volts dc maximum, input impedance 21 kΩ with pull-up resistor disabled; Programmable 5 volts, 2 kΩ pull-up resistor per pin
2	PWR LED	Amber indicates power supplied to unit via either **NET** port; Green indicates firmware upload is complete
3	NET LED	Amber LED indicates Cresnet bus activity
4	HW-R Button	(1) Recessed miniature push button for hardware reset (reboots the processor)

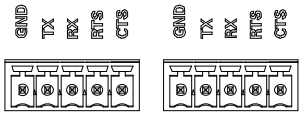
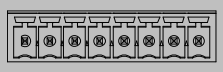
(Continued on following page)

Connectors, Controls, and Indicators (Continued)

#	CONNECTORS*, CONTROLS, AND INDICATORS	DESCRIPTION
5	SW-R Button	(1) Recessed miniature push button for software reset (restarts the SIMPL program)
6	Relays 1-4 	(1) 8-pin 3.5 mm detachable terminal blocks comprising (4) normally open, isolated relays; Rated 1 amp, 30 volts ac/dc; MOV arc suppression across contacts
7	NET – 24 Y Z G 	(2) 4-pin 3.5 mm detachable terminal blocks, paralleled; Cresnet port and 24 volt dc power input; Cresnet master port **24**: Power (24 Vdc) **Y**: Data **Z**: Data **G**: Ground
8	MSG LED	Red LED indicates processor has generated an error message

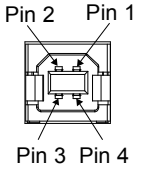
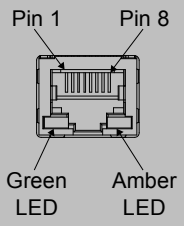
(Continued on following page)

Connectors, Controls, and Indicators (Continued)

<table>
<tr><th>#</th><th>CONNECTORS*, CONTROLS, AND INDICATORS</th><th>DESCRIPTION</th></tr>
<tr><td>9</td><td>COM 1-2
 
</td><td>(2) 5-pin 3.5 mm detachable terminal block;
Bidirectional RS-232/422/485 port;
Up to 115.2 kBb;
Hardware and software handshaking support
<table>
<tr><th>RS-232</th><th>RS-422</th><th>RS-485</th></tr>
<tr><td>GND</td><td>GND</td><td>GND*</td></tr>
<tr><td>TX</td><td>TX-</td><td>TX-/RX-</td></tr>
<tr><td>RX</td><td>RX+</td><td>Not Used</td></tr>
<tr><td>RTS</td><td>TX+</td><td>TX+/RX+</td></tr>
<tr><td>CTS</td><td>RX-</td><td>Not Used</td></tr>
</table>
* A ground terminal connection is recommended but not required. Ground potential difference must be under ±4 V.</td></tr>
<tr><td>10</td><td>IR/SERIAL 1-4
 
</td><td>(1) 8-pin 3.5 mm detachable terminal block comprising (4) IR/Serial output ports;
IR output up to 1.2 MHz;
1-way serial TTL/RS-232 (0-5 volts) up to 115.2 kBb;
Individual signal generator per port, allowing simultaneous firing of all ports</td></tr>
</table>

(Continued on Following Page)

Connectors, Controls, and Indicators (Continued)

<table>
<tr><th>#</th><th>CONNECTORS*, CONTROLS, AND INDICATORS</th><th>DESCRIPTION</th></tr>
<tr><td>11</td><td>COMPUTER
 
</td><td>(1) USB Type B female, USB 1.1 computer console port (cable included)
<table>
<tr><th>PIN</th><th>DESCRIPTION</th></tr>
<tr><td>1</td><td>+5 Vdc</td></tr>
<tr><td>2</td><td>Data -</td></tr>
<tr><td>3</td><td>Data +</td></tr>
<tr><td>4</td><td>Ground</td></tr>
</table></td></tr>
<tr><td>12</td><td>LAN
 
</td><td>(1) 8-wire RJ-45 with 2 LED indicators;
10/100BASE-T Ethernet port;
Green LED indicates link status;
Amber LED indicates Ethernet activity
<table>
<tr><th>PIN</th><th>SIGNAL</th><th>PIN</th><th>SIGNAL</th></tr>
<tr><td>1</td><td>TX +</td><td>5</td><td>N/C</td></tr>
<tr><td>2</td><td>TX -</td><td>6</td><td>RX -</td></tr>
<tr><td>3</td><td>RX +</td><td>7</td><td>N/C</td></tr>
<tr><td>4</td><td>N/C</td><td>8</td><td>N/C</td></tr>
</table></td></tr>
<tr><td>13</td><td>MEMORY
  </td><td>(1) SD card slot;
Accepts up to 32 GB for memory expansion (SD memory card not included)</td></tr>
</table>

***** Interface connectors for **I/O 1-8**, **RELAYS 1-4**, **NET**, **COM 1-2**, and **IR/SERIAL 1-4** ports are provided with the unit.

Setup

Network Wiring

When wiring the Cresnet/Ethernet network, consider the following:

- Use Crestron Certified Wire.
- Use Crestron power supplies for Crestron equipment.
- Provide sufficient power to the system.

CAUTION: Insufficient power can lead to unpredictable results or damage to the equipment. Use the Crestron Power Calculator to help calculate how much power is needed for the system (www.crestron.com/calculators).

For networks with 20 or more devices, use a Cresnet Hub/Repeater (CNXHUB, sold separately) to maintain signal quality.

For more details, refer to "Check Network Wiring" on page 26.

For general information on connecting Ethernet devices in a Crestron system, refer to the Crestron e-Control Reference Guide (Doc. 6052) at www.crestron.com/manuals.

Identity Code

NOTE: The latest software can be downloaded from the Crestron Web site (www.crestron.com/software).

Net ID

The Net ID of the DIN-AP3 has been factory set to **02**. The Net ID is defined as the "Master" control system on the Cresnet network and cannot be changed.

IP ID

The IP ID is set within the DIN-AP3's IP table using Crestron Toolbox™. For information on setting an IP table, refer to the Crestron Toolbox help file.

Installation

Ventilation

The DIN-AP3 should be used in a well-ventilated area. The venting holes should not be obstructed under any circumstances.

To prevent overheating, do not operate this product in an area that exceeds the environmental temperature range listed in the table of specifications. Consider using forced air ventilation to reduce overheating. Consideration must be given if installed in a closed or multi-unit rack assembly since the operating ambient temperature of the environment may be greater than the room ambient temperature. Contact with thermal insulating materials should be avoided on all sides of the unit.

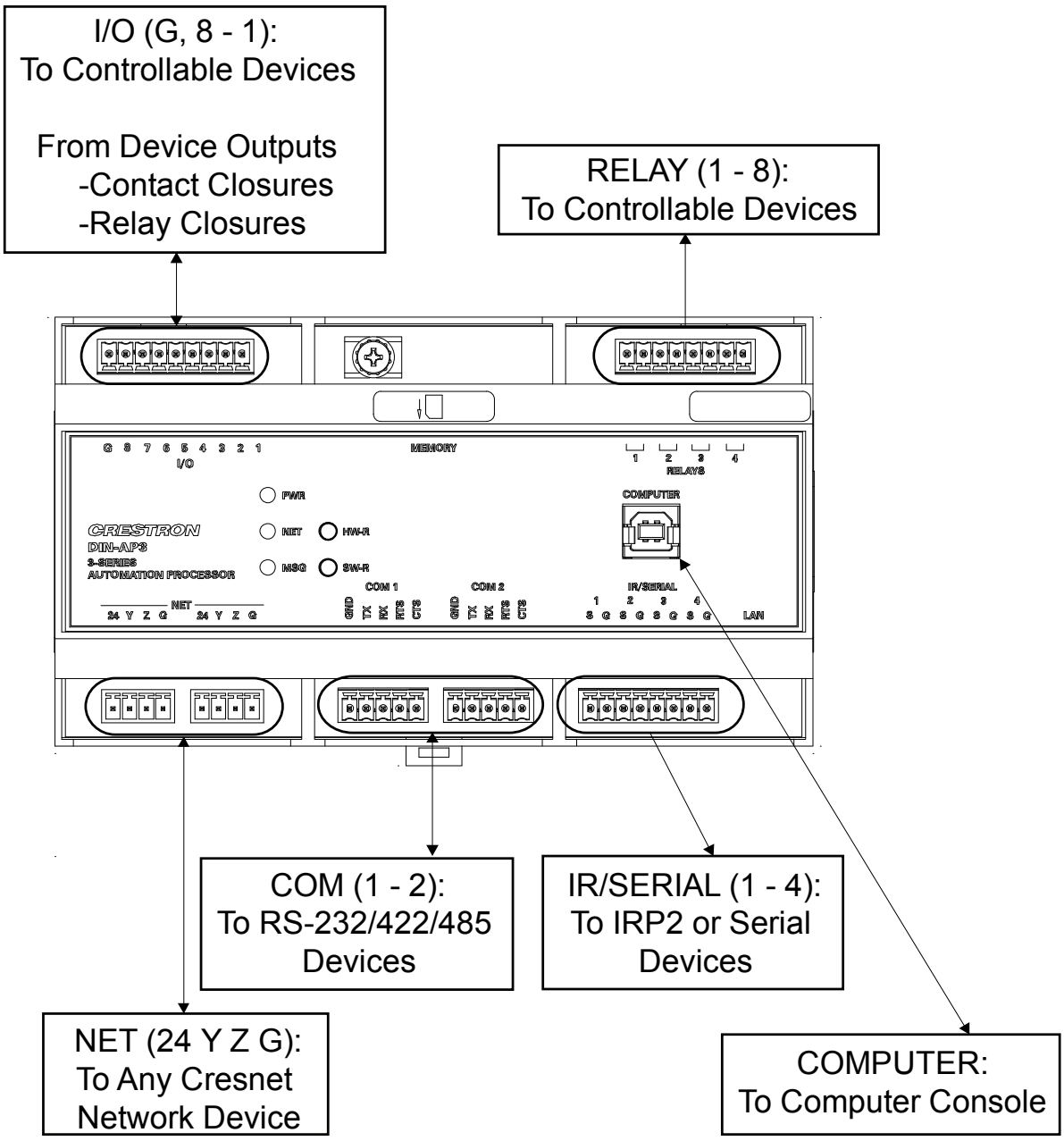
Hardware Hookup

Make the necessary connections as called out in the illustration that follows this paragraph. Refer to "Network Wiring" on page 14 before attaching the 4-position terminal block connectors. Apply power after all connections have been made.

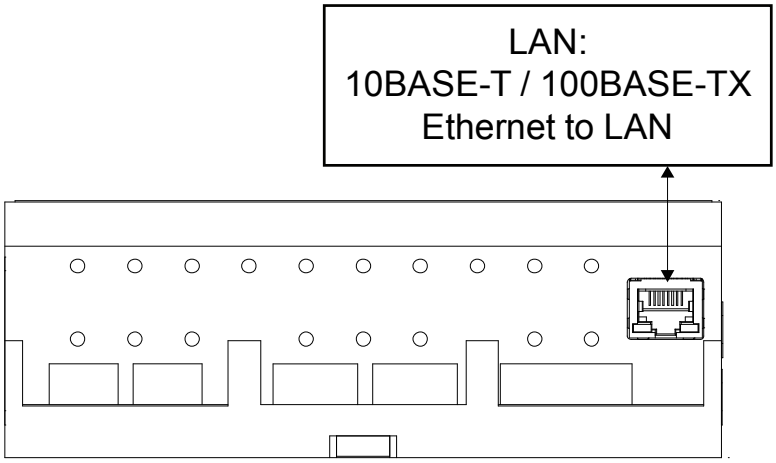
When making connections to the DIN-AP3, note the following:

- Use Crestron power supplies for Crestron equipment.
- The included cable cannot be extended.

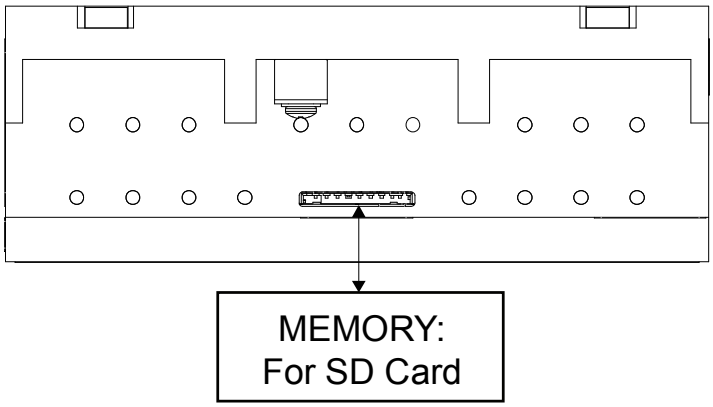
Hardware Connections for the DIN-AP3 – Front View



Hardware Connections for the DIN-AP3 – Bottom View



Hardware Connections for the DIN-AP3 – Top View



NOTE: Ensure the unit is properly grounded by connecting the chassis ground lug to an earth ground (building steel).

NOTE: To prevent overheating, do not operate this product in an area that exceeds the environmental temperature range listed in the table of specifications.

Additional Configuration

The DIN-AP3 can be configured from a Web browser. For details, refer to "Online Configuration" on page 21.

Uploading and Upgrading

Crestron recommends using the latest programming software and that each device contains the latest firmware to take advantage of the most recently released features. However, before attempting to upload or upgrade it is necessary to establish communication. Once communication has been established, files (for example, programs or firmware) can be transferred to the control system (or device). Finally, program checks can be performed (such as changing the device ID or creating an IP table) to ensure proper functioning.

NOTE: Crestron software and any files on the Web site are for authorized Crestron dealers and Crestron Service Providers (CSPs) only. New users must register to obtain access to certain areas of the site (including the FTP site).

Establishing Communication

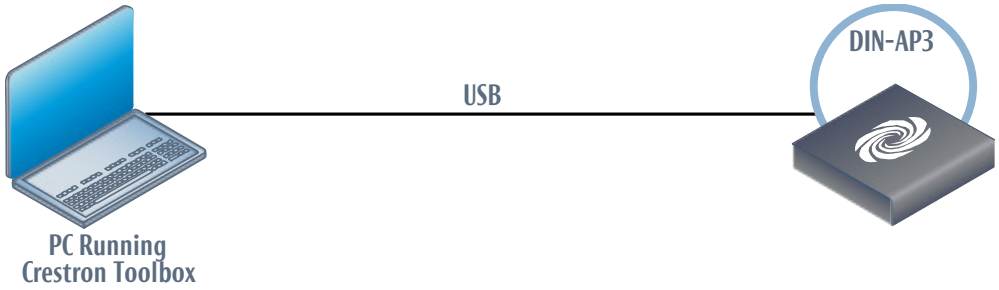
Use Crestron Toolbox for communicating with the DIN-AP3; refer to the Crestron Toolbox help file for details. There are two methods of communication: USB and TCP/IP.

USB

NOTE: Required for initial setup of Ethernet parameters.

NOTE: Required for loading projects and firmware.

USB Communication



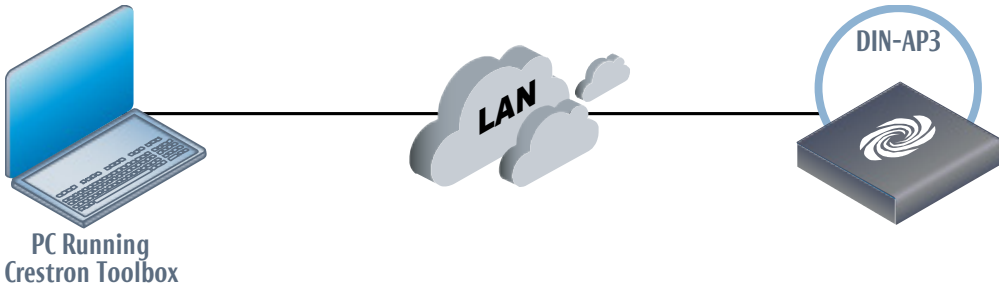
The **COMPUTER** port on the DIN-AP3 connects to the USB port on the PC via the included Type A to Type B USB cable:

1. Click **Tools | System Info**.
2. Click the icon.

3. For *Connection Type*, select *USB*. When multiple USB devices are connected, identify the DIN-AP3 by entering "DIN-AP3" in the *Model* text box, the unit's serial number in the *Serial* text box or the unit's hostname (if known) in the *Hostname* text box.
4. Click **OK**. Communications are confirmed when the device information is displayed.

TCP/IP

Ethernet Communication



The DIN-AP3 connects to PC via Ethernet:

1. Use the Device Discovery Tool (click the icon) in Crestron Toolbox to detect all Ethernet devices on the network and their IP configuration. The tool is available in Toolbox version 1.15.143 or later.
2. Click on the DIN-AP3 to display information about the device.

Programs and Firmware

Program or firmware files may be distributed from programmers to installers or from Crestron to dealers. Firmware upgrades are available from the Crestron Web site as new features are developed after product releases. One has the option to upload programs via the programming software or to upload and upgrade via the Crestron Toolbox. For details on uploading and upgrading, refer to the Crestron Studio help file, SIMPL Windows help file, or the Crestron Toolbox help file.

Crestron Studio / SIMPL Windows

If a Crestron Studio (or SIMPL Windows) program is provided, it can be uploaded to the control system using Crestron Studio (or SIMPL Windows) or Crestron Toolbox.

Firmware

Check the Crestron Web site to find the latest firmware. (New users must register to obtain access to certain areas of the site, including the FTP site.)

Upgrade DIN-AP3 firmware via Crestron Toolbox.

1. Establish communication with the DIN-AP3 and display the "System Info" window.
2. Select **Functions | Firmware…** to upgrade the DIN-AP3 firmware.

Configure for Operations

Before setting up the DIN-AP3 the time and time zone need to be set. The DIN-AP3 can also be further configured using a Web browser.

Set Date and Time

1. Establish communication with the DIN-AP3 as described in "Establishing Communication" on page 18.
2. In Crestron Toolbox, select **Functions** | **System Clock…**.
3. Set the date and time.

Online Configuration

The DIN-AP3 can be configured using the built-in Web-based setup tool.

1. Using Internet Explorer, navigate to http://xxx.xx.xx.xxx/setup where xxx.xx.xx.xxx is the IP address of the control system.

   NOTE: The Web-based setup tool is only accessible from Internet Explorer.

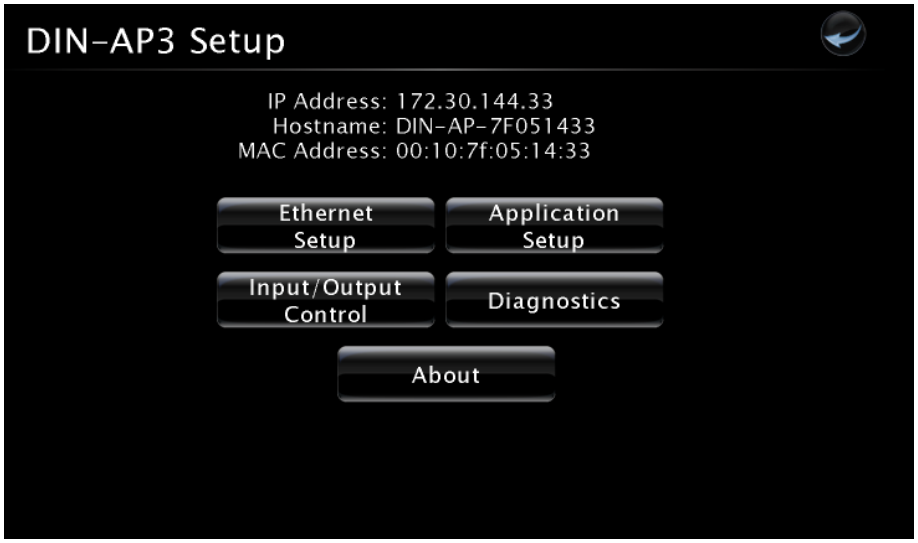
   NOTE: If a security warning is displayed, click **Install** to continue.

   The control system's splash screen is displayed.

Splash Screen

2. Click **Setup** to display the "DIN-AP3 Setup" menu.

"DIN-AP3 Setup" Menu



The "DIN-AP3 Setup" menu displays the IP address, hostname and MAC address of the device. It also allows access to various setup and programming screens. The "DIN-AP3 Setup" menu contains buttons for **Ethernet Setup**, **Application Setup**, **Input/Output Control**, **Diagnostics**, and **About**, as shown in the illustration above.

3. Click one of the following options:
   - **Ethernet Setup** – Configures the DIN-AP3's Ethernet settings and displays DHCP, hostname, IP address, subnet mask, default router, domain, and MAC address settings.

     ⇒ Click **Advanced Settings** to specify DNS servers, Web server settings, and SSL settings.

     ⇒ Click **MyCrestron Dynamic DNS** to configure the myCrestron.com Dynamic DNS service.

     ⇒ Click **Ethernet Diagnostics** to test Ethernet communications.

     ⇒ Click **Reboot** to reboot the DIN-AP3.
   - **Application Setup** – Selects programs to be loaded on startup and controls which program(s) are running.
   - **Input/Output Control** – Configures the COM ports, operates the relays, and monitors the Versiports.
   - **Diagnostics** – Displays information about the connected devices, hardware configuration, and error logs.
   - **About** – Displays firmware information.
4. Click the  icon to return to the previous screen.

Problem Solving

Troubleshooting

The following table provides corrective action for possible trouble situations. If further assistance is required, please contact a Crestron customer service representative.

DIN-AP3 Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Device does not function.	Device is not communicating with the network.	Use Crestron Toolbox to poll the network. Verify network connection to the device.
	Device is not receiving power from a Crestron power source.	Use the provided Crestron power source. Verify connections.
	Device is not receiving sufficient power.	Use the Crestron Power Calculator to help calculate how much power is needed for the system.
MSG LED illuminates.	Hardware or software failure.	Verify that hardware configuration matches software configuration. Use Crestron Toolbox to display the error log.

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DIN-AP3 Troubleshooting (Continued)

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Compilation error RLCMCVT166 and RLCMCVT177.	Poor analog versus serial signal definition in the SIMPL Windows program.	Confirm properly defined signal definition in the program.
System locks up.	Various.	Hold down **SW-R** button on control system front panel to bypass program and communicate directly with processor. Refer to "Troubleshooting Communications" in the Crestron 3-Series Control System Reference Guide (Doc. 7150) at www.crestron.com/manuals for more details.
Cresnet device does not respond.	Device not wired correctly.	Verify Cresnet wiring.
	Improper NET ID used.	Verify that device ID matches NET ID in the program.
Loss of functionality due to electrostatic discharge.	Improper grounding.	Check that all ground connections have been made properly.

(Continued on following page)

DIN-AP3 Troubleshooting (Continued)

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
A/V system device does not respond.	IRP2 or serial port not placed properly.	Verify placement of IRP2 (hold phosphor card under IRP2 while pressing button) and tighten serial cables.
	Used wrong IR/serial port.	Verify that proper IR or serial port is defined.
	Serial cable not wired correctly.	Verify that serial cable is wired correctly for RS-232, 422, 485.
	Device is not receiving sufficient power.	User the Crestron Power Calculator to help calculate how much power is needed for the system.

Check Network Wiring

Use the Right Wire

To ensure optimum performance over the full range of the installation topology, use Crestron Certified Wire only. Failure to do so may incur additional charges if support is required to identify performance deficiencies because of using improper wire.

Calculate Power

CAUTION: Use only Crestron power supplies for Crestron equipment. Failure to do so could cause equipment damage or void the Crestron warranty.

CAUTION: Provide sufficient power to the system. Insufficient power can lead to unpredictable results or damage to the equipment. Use the Crestron Power Calculator to help calculate how much power is needed for the system (www.crestron.com/calculators).

When calculating the length of wire for a particular Cresnet run, the wire gauge and the Cresnet power usage of each network unit to be connected

must be taken into consideration. Use Crestron Certified Wire only. If Cresnet units are to be daisy chained on the run, the Cresnet power usage of each network unit to be daisy chained must be added together to determine the Cresnet power usage of the entire chain. If the unit is run from a Crestron system power supply network port, the Cresnet power usage of that unit is the Cresnet power usage of the entire run. The wire gauge and the Cresnet power usage of the run should be used in the following equation to calculate the cable length value on the equation's left side.

Cable Length Equation

$$L < \frac{40{,}000}{R \times P}$$

Where: L = Length of run (or chain) in feet
R = 6 Ohms (Crestron Certified Wire: 18 AWG (0.75 mm^2))
or 1.6 Ohms (Cresnet HP: 12 AWG (4 mm^2))
P = Cresnet power usage of entire run (or chain)

Make sure the cable length value is less than the value calculated on the right side of the equation. For example, a Cresnet run using 18 AWG Crestron Certified Wire and drawing 20 watts should not have a length of run more than 333 feet (101 meters). If Cresnet HP is used for the same run, its length could extend to 1250 feet (381 meters).

NOTE: All Crestron certified Cresnet wiring must consist of two twisted pairs. One twisted pair is the **24** and **G** pair and the other twisted pair is the **Y** and **Z** pair.

Strip and Tin Wire

When daisy chaining Cresnet units, strip the ends of the wires carefully to avoid nicking the conductors. Twist together the ends of the wires that share a pin on the network connector and tin the twisted connection. Apply solder only to the ends of the twisted wires. Avoid tinning too far up the wires or the end becomes brittle. Insert the tinned connection into the Cresnet connector and tighten the retaining screw. Repeat the procedure for the other three conductors.

Add Hubs

Use of a Cresnet Hub/Repeater (CNXHUB) is advised whenever the number of Cresnet devices on a network exceeds 20 or when the combined total length of Cresnet cable exceeds 3000 feet (914 meters).

Reference Documents

All documents mentioned in this guide are available from the Crestron Web site.

List of Related Reference Documents

DOCUMENT TITLE
3-Series Control Systems Reference Guide
Crestron e-Control Reference Guide

Further Inquiries

To locate specific information or resolve questions after reviewing this guide, contact Crestron's True Blue Support at 1-888-CRESTRON [1-888-273-7876] or, for assistance within a particular geographic region, refer to the listing of Crestron worldwide offices at www.crestron.com/offices.

To post a question about Crestron products, log onto Crestron's Online Help at www.crestron.com/onlinehelp. First-time users must establish a user account to fully benefit from all available features.

Future Updates

As Crestron improves functions, adds new features and extends the capabilities of the DIN-AP3, additional information may be made available as manual updates. These updates are solely electronic and serve as intermediary supplements prior to the release of a complete technical documentation revision.

Check the Crestron Web site periodically for manual update availability and its relevance. Updates are identified as an "Addendum" in the Download column.

Return and Warranty Policies

Merchandise Returns / Repair Service

1. No merchandise may be returned for credit, exchange or service without prior authorization from Crestron. To obtain warranty service for Crestron products, contact an authorized Crestron dealer. Only authorized Crestron dealers may contact the factory and request an RMA (Return Merchandise Authorization) number. Enclose a note specifying the nature of the problem, name and phone number of contact person, RMA number and return address.
2. Products may be returned for credit, exchange or service with a Crestron Return Merchandise Authorization (RMA) number. Authorized returns must be shipped freight prepaid to Crestron, 6 Volvo Drive, Rockleigh, N.J. or its authorized subsidiaries, with RMA number clearly marked on the outside of all cartons. Shipments arriving freight collect or without an RMA number shall be subject to refusal. Crestron reserves the right in its sole and absolute discretion to charge a 15% restocking fee plus shipping costs on any products returned with an RMA.
3. Return freight charges following repair of items under warranty shall be paid by Crestron, shipping by standard ground carrier. In the event repairs are found to be non-warranty, return freight costs shall be paid by the purchaser.

Crestron Limited Warranty

Crestron Electronics, Inc. warrants its products to be free from manufacturing defects in materials and workmanship under normal use for a period of three (3) years from the date of purchase from Crestron, with the following exceptions: disk drives and any other moving or rotating mechanical parts, pan/tilt heads and power supplies are covered for a period of one (1) year; touch screen display and overlay components are covered for 90 days; batteries and incandescent lamps are not covered.

This warranty extends to products purchased directly from Crestron or an authorized Crestron dealer. Purchasers should inquire of the dealer regarding the nature and extent of the dealer's warranty, if any.

Crestron shall not be liable to honor the terms of this warranty if the product has been used in any application other than that for which it was intended or if it has been subjected to misuse, accidental damage, modification or improper installation procedures. Furthermore, this warranty does not cover any product that has had the serial number altered, defaced or removed.

This warranty shall be the sole and exclusive remedy to the original purchaser. In no event shall Crestron be liable for incidental or consequential damages of any kind (property or economic damages inclusive) arising from the sale or use of this equipment. Crestron is not liable for any claim made by a third party or made by the purchaser for a third party.

Crestron shall, at its option, repair or replace any product found defective, without charge for parts or labor. Repaired or replaced equipment and parts supplied under this warranty shall be covered only by the unexpired portion of the warranty.

Except as expressly set forth in this warranty, Crestron makes no other warranties, expressed or implied, nor authorizes any other party to offer any warranty, including any implied warranties of merchantability or fitness for a particular purpose. Any implied warranties that may be imposed by law are limited to the terms of this limited warranty. This warranty statement supersedes all previous warranties.

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