

Installation and Configuration

Dry Contact I/O SmartSlot Card

AP9613



This manual is available in English on the APC website www.apc.com.

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Safety Overview

Important Safety Information

Follow all applicable electrical codes for your installation area.

Read the instructions carefully to become familiar with the equipment before trying to install, operate, service or maintain it. The following special messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.

WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, **can result in** death or serious injury.

CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury.

NOTICE

NOTICE addresses practices not related to physical injury including certain environmental hazards, potential damage or loss of data.

Product Overview

Introduction

The Schneider Electric™ Dry Contact I/O SmartSlot Card (AP9613) is a management product that provides the following features:

- **UPS status information** presented through 6 fully isolated output relays. This is expandable to 8 using universal input/output ports and optional Dry Contact I/O Accessory (AP9810)
- **UPS control and testing** by using 4 opto-isolated input contacts. An additional 4 input contacts (non opto-isolated) may be added using universal input/output ports and an optional Dry Contact I/O Accessory (AP9810)
- **UPS control and testing based on environmental conditions** using universal input/output ports and an optional Environmental Sensor (AP9335T or AP9335TH)
- **screw terminal connectors** for easy integration into various management systems
- a **Configuration Utility user interface** to customize your setup, see “Connecting to the configuration utility” on page 12

For more details, see “Showing the product detail” on page 3, “Configuring the Dip Switches” on page 6, “Installing” on page 8, “Specifications” on page 13.

Product description

The Schneider Electric Dry Contact I/O SmartSlot Card consists of a printed circuit board assembly. It installs in the SmartSlot of the UPS host device. The product contents are:

- the Dry Contact I/O SmartSlot Card
- the USB A to Mini B cable (to access the Configuration Utility, see “Connecting to the configuration utility”)
- this printed manual

Hardware and software requirements and tools needed

The Dry Contact I/O SmartSlot Card works with most APC by Schneider Electric UPS devices with an output rated less than or equal to 160kVA and an available SmartSlot.

While most devices meet this requirement; verify the compatibility of your device by locating it on the APC website, www.apc.com, and checking for compatible accessories.

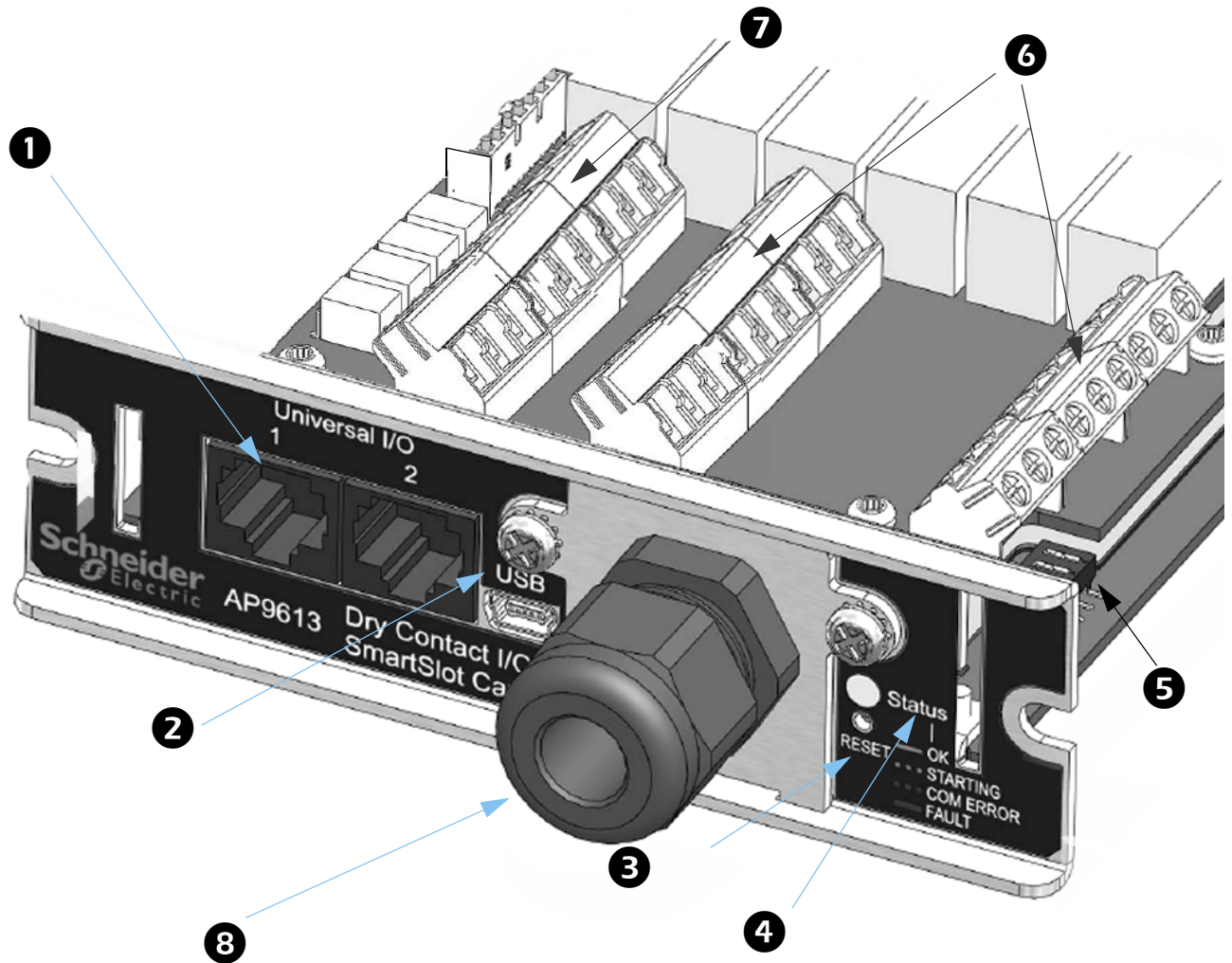
You need the following tools:

- #1 Phillips screwdriver for screw terminals
- #2 Phillips screwdriver for SmartSlot screws
- a wrench of size 1" or 25.4 mm, or adjustable, to tighten the grommet

For the Configuration Utility, you need: Windows (XP, 2003, 2008, Vista, or 7) and Internet Explorer browser v7 or higher.

Showing the product detail

Itemizing the features of the Dry Contact I/O SmartSlot Card



Item Description

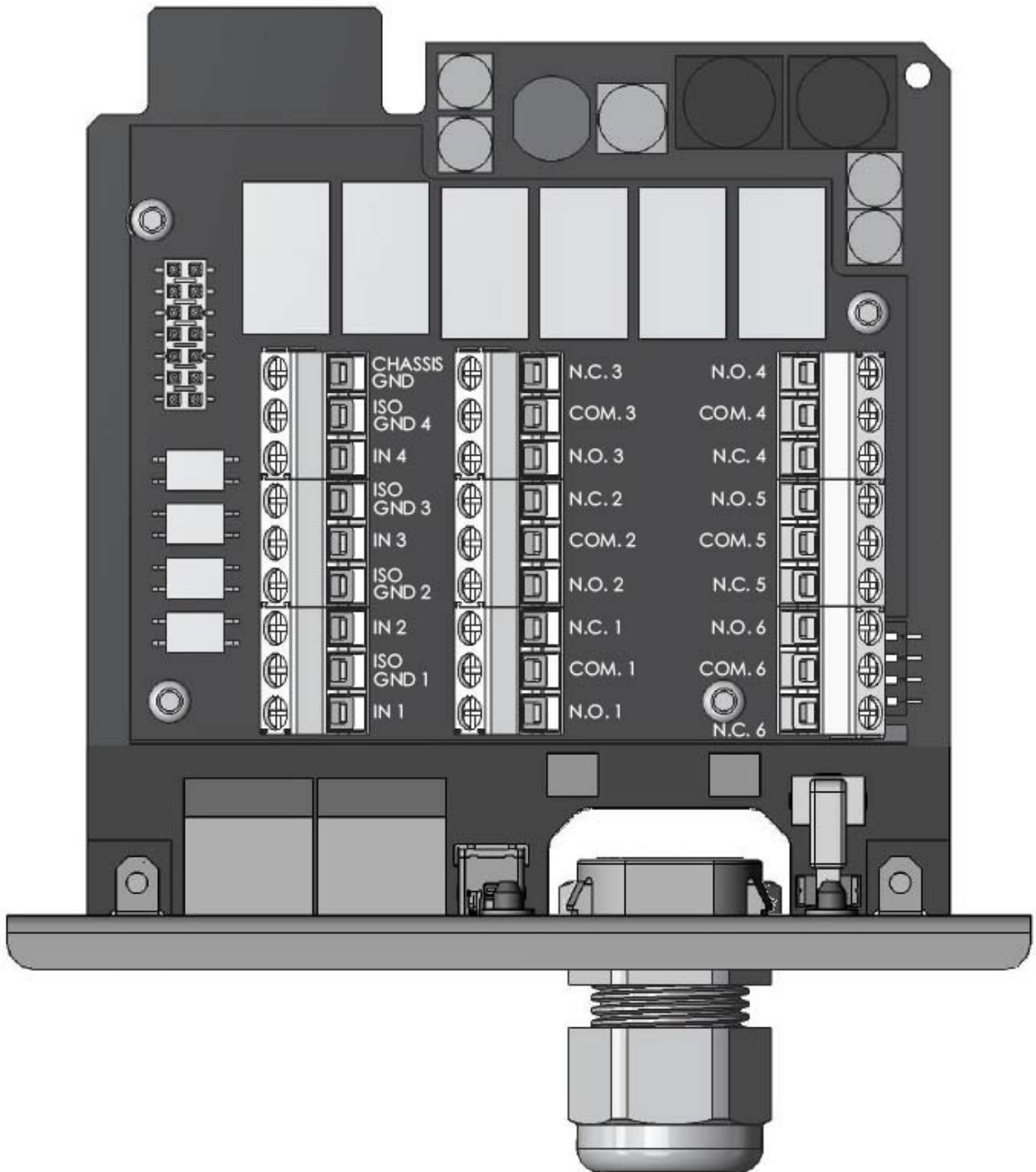
- 1** Universal I/O ports 1 and 2 These support the AP9335T/ TH and AP9810 dry contact accessories
- 2** USB cable connector Connecting this to your PC enables usage of the Configuration Utility.
- 3** Reset button Use an appropriately sized, non-metallic tool to press the Reset button.

Holding the button for 5 seconds reboots the Card. Holding the button for 25 seconds resets the Card to the factory defaults. (The status light flashes green when you do this).
- 4** Status indicator
 - SOLID GREEN indicates communications and operations are fine
 - FLASHING GREEN indicates the Card is initializing
 - FLASHING RED indicates a communication fault
 - SOLID RED indicates a non-operational fault
- 5** Dip switches These are located near the back of the front panel on the right-hand side. See the “Location of dip switches” and “Configuring the Dip Switches” sections.
- 6** Output relay terminals Connections for alarm outputs.
See “Itemizing the input contact and output relay terminal blocks”and “Ratings for input contacts and output relays”.
- 7** Input contact terminals Connections for control inputs.
See “Itemizing the input contact and output relay terminal blocks”and “Ratings for input contacts and output relays”.
- 8** Cord grip Supports the cabling that is used to control external devices, or to connect up external switches. The bare wires connect to the terminal blocks on the Card.

The cord grip is plastic and can secure a single cord with a diameter range of 5.8 – 10mm. This limits the number of conductors (inside the cord) and the power ratings.

Itemizing the input contact and output relay terminal blocks

Number of positions on each terminal block	9
Tightening torque	0.35 N.m
Tightening torque max	0.4 N.m
Wire stripping length	5 mm
Minimum wire gauge	0.14 mm ² (26 AWG)
Maximum wire gauge	2.5 mm ² (14 AWG)



Configuring the Dip Switches

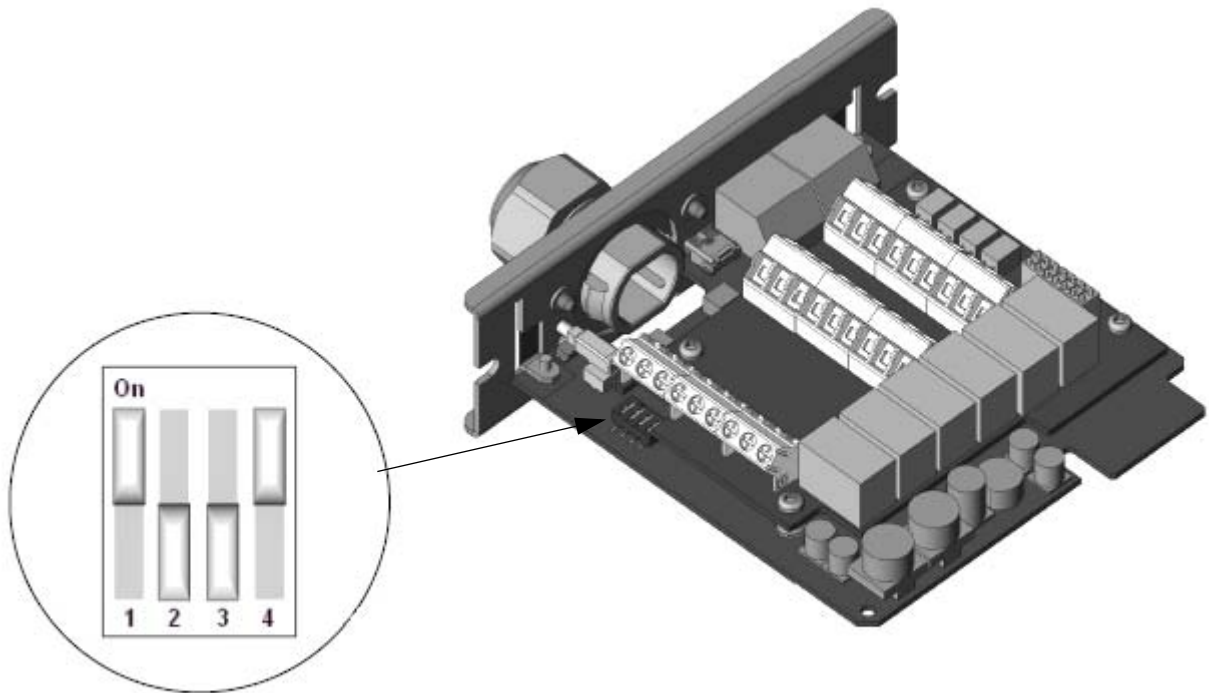
The Dry Contact I/O SmartSlot Card requires configuration before testing, final installation, and use.

See “Location of dip switches” directly below and “Dip switches: input and outputs”.

Location of dip switches



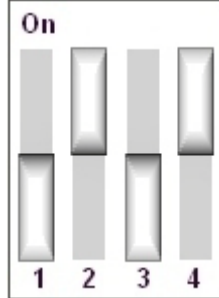
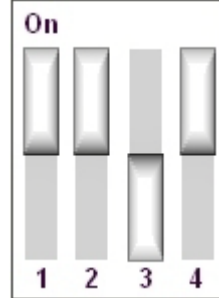
The “callout” below points to the location of the dip switches on the card, and shows one possible configuration: ON-OFF-OFF-ON.

See the other possible configurations at “Dip switches: input and outputs”



Dip switches: input and outputs

The table below lists the four possible configurations, with their corresponding inputs and outputs.

	Configuration 1	Configuration 2	Configuration 3	Configuration 4*
	 <p>OFF-OFF-OFF-ON</p>	 <p>ON-OFF-OFF-ON</p>	 <p>OFF-ON-OFF-ON</p>	 <p>ON-ON-OFF-ON</p>
Inputs	Device Actions			
1	Turn the UPS on.			See Configuration Utility
2	Turn the UPS off.	Turn the UPS off safely.		
3	Start UPS self-test.			
4	Shut down the UPS when on battery except for self-test or runtime calibration.	Put the UPS in bypass, if bypass is available on the UPS.	Shut down the UPS when on battery except for self-test or runtime calibration.	
Outputs	Device State			
1	The UPS is on-battery (e.g., during a power failure, self-test, or runtime calibration).			See Configuration Utility
2	The UPS has a low battery.			
3	The protected load is not receiving power from the UPS or communication between the UPS and the Relay I/O Card has been lost.			
4	Replace the UPS battery.	UPS commanded to turn on (echo of Input 1).		
5	The UPS is overloaded.	The UPS is in bypass by selection from software, front panel, or rear panel.	UPS commanded to turn off gracefully (echo of Input 2).	
6	Any UPS fault or self-test failure.	Any UPS fault, self-test failure, or overload.	Any UPS fault, self-test failure, overload, or replace battery	


* With this setup (the factory default), the Configuration Utility is used automatically.

Installing

See “Planning your installation” directly below, “Installation steps” on page 10, and “Connecting to the configuration utility” on page 12.

Planning your installation

Operating considerations

⚠ DANGER	
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH	
	Read and understand this manual and the manuals of the UPS before installing this card. Installation must be performed by qualified personnel. The user is responsible for compliance with all international and national electric code requirements.
Failure to follow these instructions will result in death or serious injury.	

Note the following characteristics of the Dry Contact I/O SmartSlot Card when making decisions regarding system integration:

- The coils for all output relays are normally energized. The Card will generate all possible alarms in case of a system fault, such as cable failure, removal of the Dry Contact I/O SmartSlot Card, severe UPS battery discharge, or catastrophic hardware failure on the Card.
- All output relays are isolated from each other and from the UPS system ground.
- All input contacts are isolated from the UPS system ground but are common to each other
- Control inputs are driven by user-supplied dry contact outputs. The dry contact closure sensing voltage available on these inputs is nominally 5 VDC at less than 1 mA. All control inputs are referenced to the UPS system ground.
- All control inputs must be stable for a minimum of one second to be considered valid. Longer delays can be set through the Configuration Utility. Control inputs can be asserted indefinitely.
- Be careful to assert just a single input to a device. Avoid initiating simultaneous, conflicting actions, e.g. input #1 (turn the UPS on) and input #2 (turn the UPS off).
- Control inputs are acted upon immediately after validation. However, there are several UPS conditions that can cause an input to be ineffective, such as self-test or runtime calibration. For confirmation of inputs, we recommend that an output be configured and monitored appropriately to determine the effectiveness of an input.
- Do not wire this Dry Contact I/O SmartSlot Card when the power is on.
- The installation of this Dry Contact I/O SmartSlot Card must follow applicable building and electrical codes.
- Do not use this card to control voltage exceeding 30 VAC or VDC.
- For proper operation, ensure that the UPS is grounded and the Dry Contact I/O Card is secured with two screws to the UPS.

- Use only a single cord with the plastic cord grip.



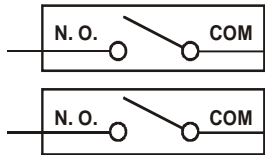
See “Ratings for input contacts and output relays” on page 14 in “Specifications”.

Connection strategies

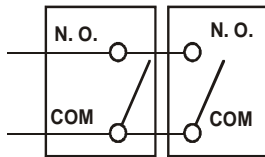
You can connect the alarm outputs of the Dry Contact I/O SmartSlot Card in several ways to meet the requirements of your management systems or switched load. Both normally open (N.O.) and normally closed (N.C.) systems are accommodated in any combination of AND or OR configurations.

You can combine Dry Contact I/O SmartSlot Card alarm outputs to form compound outputs, such as “replace battery OR fault” or “on-battery AND low battery.”

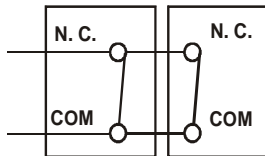
N. O. AND



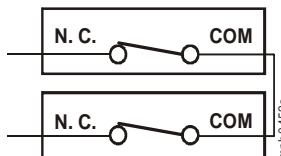
N. O. OR



N. C. AND



N. C. OR



mph10462a

Installation steps



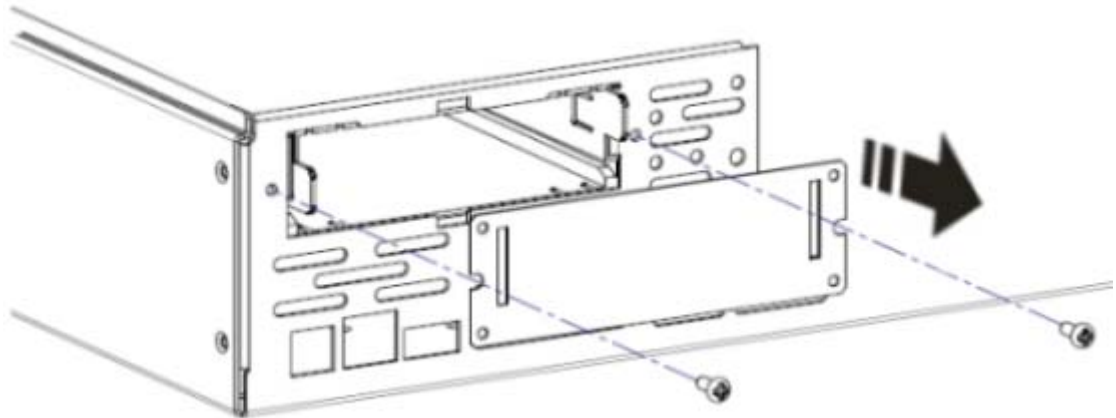
Warning: After installation, it is strongly recommended that you fully test your configuration before putting it into a production environment.

1. Make all connections to the Dry Contact I/O SmartSlot Card to support your configuration before continuing. See “Itemizing the input contact and output relay terminal blocks” on page 5 for information on making the connections.

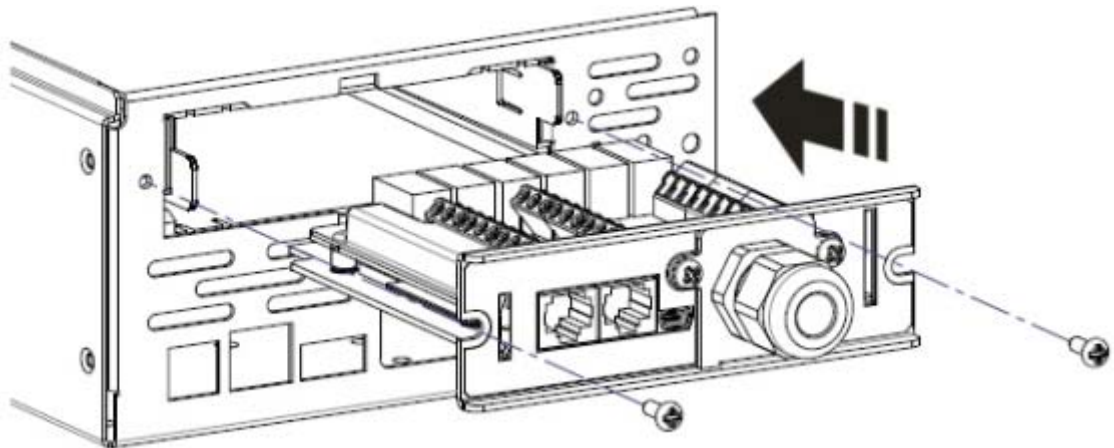


Electrostatic discharge: The Dry Contact I/O SmartSlot Card is sensitive to static electricity. Handle the Card by the end plate only. Do not touch the exposed printed circuit board.

2. Use a #2 Phillips-head screwdriver to remove the two screws retaining the slot cover on the host device. Keep the screws for use later. Keep the slot cover for future use.



3. Orient the Card to fit in the Card slot as shown. Slide the Card all the way into the slot until the end plate is flush with the back panel of the host device.



Trying to install the Card upside down may damage it. Observe the correct orientation of the Card. The sides of the printed circuit board align with the guides in the sides of the Card slot. The slot may be oriented horizontally or vertically in the host device, which must be off.

4. Secure the Card with the screws removed in step 3.



In order to provide proper grounding, the SmartSlot screws must be installed, the metal clamp must be securely tightened, and the UPS must be properly grounded.

5. Ensure the status LED is illuminated (see “Showing the product detail” on page 3).

See “Connecting to the configuration utility” on the following page.

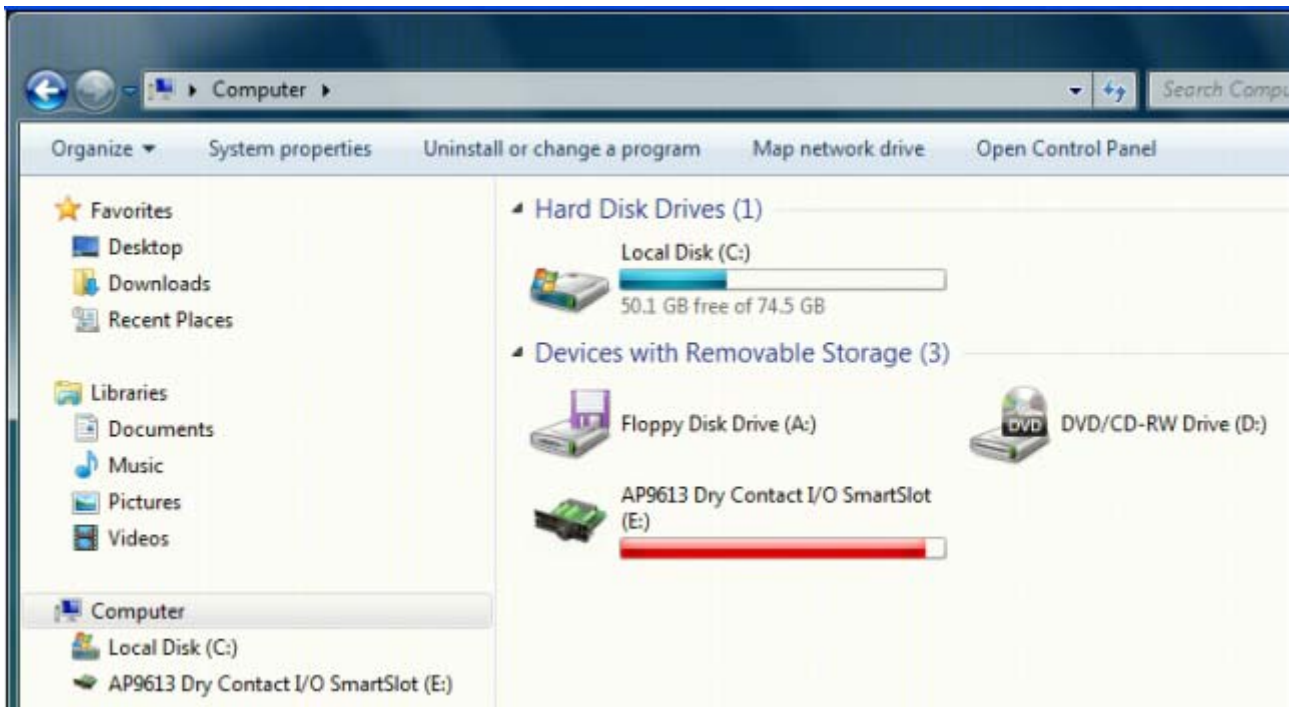
Connecting to the configuration utility

The Configuration Utility does not need to be installed, it runs off the Card. With the Utility, you can:

- review the **status** of your AP9613 Dry Contact I/O SmartSlot Card and Universal I/O ports
- perform **actions** in response to a status change in an input port or to some UPS event
- **change the status of an output relay port** in response to a condition occurring in a device such as your UPS or an environmental monitor
- upgrade the **firmware** on your AP9613 Dry Contact SmartSlot I/O Card

To launch the Configuration Utility user interface, use the USB cable to connect your PC to the port indicated by item #2 on your Dry Contact I/O front panel (see “Itemizing the features of the Dry Contact I/O SmartSlot Card” on page 3).

When the Card is connected to the host PC, it displays as a drive letter on your PC, see drive E in the graphic below for example.



To run the Utility, launch the `runme.hta` file located in the root of the drive.

For information on using the Configuration Utility user interface, refer to its online help.

When you connect your Card with your PC using the USB cable, the Configuration Utility reads a file called `config.lua` on the Card. Each time you save a new configuration using the Utility, this file is overwritten. It is also possible to edit `config.lua` directly using a text editor like Notepad or Microsoft Word.

See the section in the Configuration Utility online help called “Copying your Configuration” for information on copying your configuration to another installation of the Card by copying the `config.lua` file.

Specifications



For all specifications, when there is a difference between the VDE and UL approval standards, use the lower rating.

Electrical, physical, environmental, and approval specifications

Item	Specification
Electrical	
Nominal switching capacity	3A@ 30 VAC or VDC
Rated voltage	24 VDC
Rated current	200 mA
Input Contact (#1–4) and Output Relay (#1–6)	See “Ratings for input contacts and output relays” on page 14
Physical	
Size (height × width × depth)	38.00 x 121.00 x 108.00 mm 1.50 x 4.75 x 4.25 in
Shipping size (height × width × depth)	73.00 x 165.00 x 234.95 mm 2.86 x 6.50 x 9.25 in
Weight	0.14 kg 0.30 lb
Shipping weight	0.45 kg 1.00 lb
Environmental	
Elevation Operating Storage	0 to 3000 m (0 to 10,000 ft) 0 to 15 000 m (0 to 50,000 ft)
Temperature Operating Storage	0 to 40°C (32 to 104°F) -15 to 65°C (5 to 149°F)
Relative Humidity Operating Storage	0 to 95% 0 to 95%

Item	Specification
Approvals	
Emissions and Immunity Verification:	FCC Part 15 Class A, EN 55022 Class A, EN 55024, EN 61000-3-2, EN 61000-3-3, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11

Ratings for input contacts and output relays

	Voltage Rating	Current Rating (Max.)
Input Contact (#1–4)	0–30 VDC Minimum for active: 4.5 V Maximum for inactive: 0.5 V	N/A
Output Relay (#1–6)	0–30 VAC or VDC	3 A per relay (16 A Total Max)

Warranty

Two-Year Factory Warranty

This warranty applies only to the products you purchase for your use in accordance with this manual.

Terms of warranty

APC warrants its products to be free from defects in materials and workmanship for a period of two years from the date of purchase. APC will repair or replace defective products covered by this warranty. This warranty does not apply to equipment that has been damaged by accident, negligence or misapplication or has been altered or modified in any way. Repair or replacement of a defective product or part thereof does not extend the original warranty period. Any parts furnished under this warranty may be new or factory-remanufactured.

Non-transferable warranty

This warranty extends only to the original purchaser who must have properly registered the product. The product may be registered at the APC Web site, www.apc.com.

Exclusions

APC shall not be liable under the warranty if its testing and examination disclose that the alleged defect in the product does not exist or was caused by end user's or any third person's misuse, negligence, improper installation or testing. Further, APC shall not be liable under the warranty for unauthorized attempts to repair or modify wrong or inadequate electrical voltage or connection, inappropriate on-site operation conditions, corrosive atmosphere, repair, installation, exposure to the elements, Acts of God, fire, theft, or installation contrary to APC recommendations or specifications or in any event if the APC serial number has been altered, defaced, or removed, or any other cause beyond the range of the intended use.

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NO SALESMAN, EMPLOYEE OR AGENT OF APC IS AUTHORIZED TO ADD TO OR VARY THE TERMS OF THIS WARRANTY. WARRANTY TERMS MAY BE MODIFIED, IF AT ALL, ONLY IN WRITING SIGNED BY AN APC OFFICER AND LEGAL DEPARTMENT.

Warranty claims

Customers with warranty claims issues may access the APC customer support network through the Support page of the APC Web site, www.apc.com/support. Select your country from the country selection pull-down menu at the top of the Web page. Select the Support tab to obtain contact information for customer support in your region.

Warranty Procedures

Claims

You will need the model number of the Product, the serial number, and the date purchased. A technician will also ask you to describe the problem. If it is determined that the Product will need to be returned to APC you must obtain a returned material authorization (RMA) number from APC Customer Support. Products that must be returned, must have the RMA number marked on the outside of the package, and be returned with transportation charges prepaid. If it is determined by APC Customer Support that on-site repair of the Product is allowed, APC will arrange to have APC authorized service personnel dispatched to the Product location for repair or replacement, at the discretion of APC.

Labor

- APC will support labor costs if a quality issue is found during start-up that is determined to be caused by workmanship or a factory defect.
- The mechanical contractor that is performing the repairs must call APC technical service to obtain a repair authorization number before any work is started.
- The mechanical contractor must provide detailed information, (photos, start-up sheets) to APC technical service before any repairs are started.
- If any repairs are performed without prior authorization, APC will not pay for any labor cost.
- APC will not support claims for any of the following:
 - Truck rental
 - Travel time
 - Rental on recovery machine and cylinders
 - Gas mileage
 - Solder, flux, silver solder, and silver solder flux.
- APC will pay for \$2.50 per pound for refrigerant.

Parts

- APC warrants the parts of their systems for 1 year from startup or 18 months from the ship date. This warranty only covers the cost of the part and not the labor for installation.
- Calls for warranty parts requests need to have specific unit information (serial number, model number, job number) to allow proper identification and processing of the warranty part transaction.
- A purchase order may be required to issue any warranty parts. An invoice will be sent once the part(s) are shipped to the field. You have 30 days to return the part to APC. After 30 days, the warranty invoice will be outstanding, and payment of the invoice will be expected in full.
- Return authorization documentation will be sent with the replacement part. This documentation must be sent back with the defective part to APC for proper identification of the warranty return. Mark the warranty return number on the outside of the package.
- After the part has been received at APC, we will determine the status of the credit based on the findings of the returned part. Parts that are damaged from: lack of maintenance, misapplication, improper installation, shipping damage, and acts of man/nature will not be covered under the parts warranty.
- Any warranty parts request received before 1:00 PM EST will be shipped same day standard ground delivery. Any costs associated with Next Day or Airfreight will be the responsibility of the party requesting the part.
- Return freight of warranty parts to APC is the responsibility of the party returning the part.

Life-Support Policy

General policy

American Power Conversion (APC) does not recommend the use of any of its products in the following situations:

- In life-support applications where failure or malfunction of the APC product can be reasonably expected to cause failure of the life-support device or to affect significantly its safety or effectiveness.
- In direct patient care.

APC will not knowingly sell its products for use in such applications unless it receives in writing assurances satisfactory to APC that (a) the risks of injury or damage have been minimized, (b) the customer assumes all such risks, and (c) the liability of APC is adequately protected under the circumstances.

Examples of life support devices

The term *life-support device* includes but is not limited to neonatal oxygen analyzers, nerve stimulators (whether used for anesthesia, pain relief, or other purposes), autotransfusion devices, blood pumps, defibrillators, arrhythmia detectors and alarms, pacemakers, hemodialysis systems, peritoneal dialysis systems, neonatal ventilator incubators, ventilators (for adults and infants), anesthesia ventilators, infusion pumps, and any other devices designated as “critical” by the U.S. FDA.

Hospital-grade wiring devices and leakage current protection may be ordered as options on many APC UPS systems. APC does not claim that units with these modifications are certified or listed as hospital-grade by APC or any other organization. Therefore these units do not meet the requirements for use in direct patient care.

Disclaimer

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This publication shall not be for resale in whole or in part.

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

APC Worldwide Customer Support

Customer support for this or any other APC product is available at no charge in any of the following ways:

- Visit the APC Web site to access documents in the APC Knowledge Base and to submit customer support requests.
 - **www.apc.com** (Corporate Headquarters)
Connect to localized APC Web sites for specific countries, each of which provides customer support information.
 - **www.apc.com/support/**
Global support searching APC Knowledge Base and using e-support.
- Contact the APC Customer Support Center by telephone or e-mail.
 - Local, country-specific centers: go to **www.apc.com/support/contact** for contact information.

For information on how to obtain local customer support, contact the APC representative or other distributors from whom you purchased your APC product.

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