



# The ExpressCard™ Compliance Program

## A Brief Overview of the ExpressCard Compliance Program

# ExpressCard™



The ExpressCard Compliance Program is designed to give the consumer the confidence that they can buy host systems or modules bearing the ExpressCard brand knowing that they will work together. This improvement in the end user experience is

expected to help grow the market for ExpressCard products by making it feasible for complete novices to add hardware devices to their systems. The improvement is expected to be most apparent on Desktop PCs where adding hardware to the system previously required opening the case to insert a board. Establishing the reliability and predictability of products that bear the ExpressCard brand is central to the expanded use of the technology.

### Compliance Checklist Coverage

- End user ExpressCard products
  - Modules
  - Systems
- Components
  - Slot Power Switch
  - Connectors
- Module/System manufacturers to use compliant connectors and power switches
  - If not using existing components, manufacturers are responsible for also testing those elements

### Compliance Program Coverage

Category	Coverage	Source
<b>USB Interface</b>	Protocol and electrical elements need to meet the current USB 2.0 test standard	USB-IF
<b>PCI Express Interface</b>	Functional, protocol and electrical elements meet PCI Express 1.0a	PCI SIG
<b>Mechanical</b>	Connector and card elements all need to meet the specified dimensions and tolerances	Checklist
<b>Durability</b>	Friction surfaces must allow for the number of insertion and removal cycles defined in the Standard	Checklist
<b>Power Supply</b>	Host and modules must perform with supplies within range defined in the Standard	Checklist
<b>Power Dissipation</b>	Operating range of host slots and modules must be within the thermal range specified in the Standard	Checklist
<b>Inter-operability</b>	Establishing that modules work with systems	Interop Event
<b>Regulatory</b>	Not part of Compliance Program	N/A
<b>Applications</b>	Not part of Compliance Program	N/A

### Interoperability Events

- Participants are module and system manufacturers
  - Connectors and Power controllers tested indirectly
- Modeled on similar events set up by USB IF
  - Held in an "Embassy Suites" style hotel
  - Module manufacturers visit each system manufacturer in turn and complete a predefined set of tests
  - System manufacturers assigned a fixed location
  - At end of event, PCMCIA correlates results to determine pass/fail results
- Two categories of testing
  - Interoperability checklist: mandatory for compliance submittals
  - Additional test coverage: does not affect compliance test results, but provides additional value to participants

### Interoperability Coverage

- Standard defines behavior for the following cases:
  1. Initial module insertion
  2. Graceful removal
  3. Hot insertion
  4. Surprise removal
  5. Cold insertion
  6. Sleep/suspend removal
  7. Sleep/suspend insertion
  8. Hibernation removal
  9. Hibernation insertion
- Interoperability checklist intends to verify appropriate behavior for a given module and system combination

### Compliance Process

1. Complete self-administered checklist for product
  - Designed to ensure product meets the ExpressCard Standard
  - Different checklists exist for different product categories
2. Attend an interoperability test event
  - To be scheduled about four times per year
  - Co-located with either PCI Express or USB event
3. Apply for license to use ExpressCard logo
  - Proof of successful checklist and interoperability testing
4. Product entered into PCMCIA database and Comp. ID issued
  - Product may use the ExpressCard logo

(over)

ExpressCard is a trademark of PCMCIA.

\* All product and company names herein may be trademarks of their registered owners.

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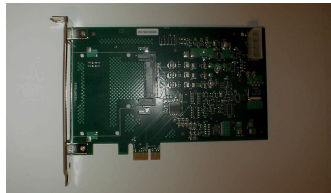


## Compliance Test Fixtures

PCMCIA will make the following test fixtures available:

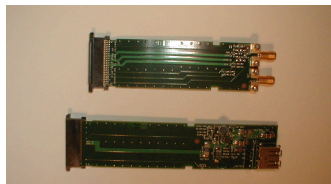
1. Plug-in board for PCI Express desktop systems which provides a fully functional ExpressCard Slot
  - Works in PCI Express CEM slot
  - Supports both PCI Express and USB interfaces

Test Fixture will be available from PCMCIA, providing a fully functional ExpressCard slot



2. ExpressCard module to support signal integrity testing of PCI Express portion of host ExpressCard implementation
3. USB module to support signal integrity testing of USB portion of host ExpressCard implementation

PCI Express (top) and USB 2.0 (bottom) testing modules support signal integrity testing



## Self Qualification

- Companies may apply to be allowed to self certify
  - May be appropriate if they have numerous product releases & cycles
- Requirements
  - Ability to maintain and run interoperability test suite
    - Will include range of systems and ExpressCard modules
  - Enrollment in similar programs for other industry groups, such as USB self certification
- Company still needs to submit registration & passing compliance report for each product to PCMCIA for compliance IDs

## Third-Party Test Houses

- Some manufacturers may be unable to attend the interoperability events and/or be unable to self-certify
- PCMCIA is working with commercial test houses to provide a "Turnkey" solution for a fee
  - Manufacturer provides test-house with a module or system
  - Test house executes checklist and interoperability tests
  - Provides manufacturer with a registration/compliance report packet ready for submittal to the PCMCIA
- Details will be published on PCMCIA web site

## What You Can Do Now

- System Vendors:
  - Prepare your roadmap now for ExpressCard implementations
    - Choose your chipsets
    - Test your ACPI solutions
  - Join PCMCIA and participate
- Module Vendors:
  - CardBus and PC Cards - choose your migration path
  - New technologies - PCI Express, USB or both?
  - Join PCMCIA and participate
- Review materials available on PCMCIA web site:
  - [www.expresscard.org](http://www.expresscard.org)
- Plan to participate in first compliance workshop
  - Watch [www.expresscard.org](http://www.expresscard.org) for details

## About PCMCIA

The PCMCIA is the leading trade association for plug-in modular I/O expansion for personal computers and notebooks. Founded in 1989, the association has over 120 members and developed the 16-bit PC Card and CardBus standards.

### PCMCIA

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