PARAGON
APPLICATION SYSTEMS

# Implementing EMV in Canada: Proving your program with end-to-end online testing

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If you are a financial institution, merchant, or processor in Canada, you participate in a complex and sophisticated online payment system. In fact, this premiere electronic payments system successfully supports the largest number of PIN-based debit transactions worldwide (with a reported 3.1 billion debit transactions in 2005). Now you will become the first in North America to make what many define as a paradigm shift in payment processing: implementation of the EMV (Europay MasterCard Visa) standard for the Integrated Chip Card (ICC).

In the next five years, sweeping changes are scheduled: an anticipated 100 million ICCs will be issued by 2011, ABMs and retail terminals (and the software that supports them) will be upgraded or replaced, retailers will be taught to use the new technology, and consumers will be encouraged to try it. Despite the enormity of the changes coming, there are some principles that do not change: before the first EMV transaction can be completed, your transaction handling software must be updated, customized, tested, refined—and re-tested.

## Your place in a changing landscape

Where do you fit into this new Canadian frontier? Are you a financial institution that drives ABMs/ATMs or POS devices and connects to Interac, Visa, or MasterCard? Or an Indirect Connector to Interac through a gateway such as Everlink? Are you a merchant that connects to a payments gateway such as Moneris? EMV testing is not “one size fits all”. Your environment, your payment schemes, and your business plan determine your test requirements.

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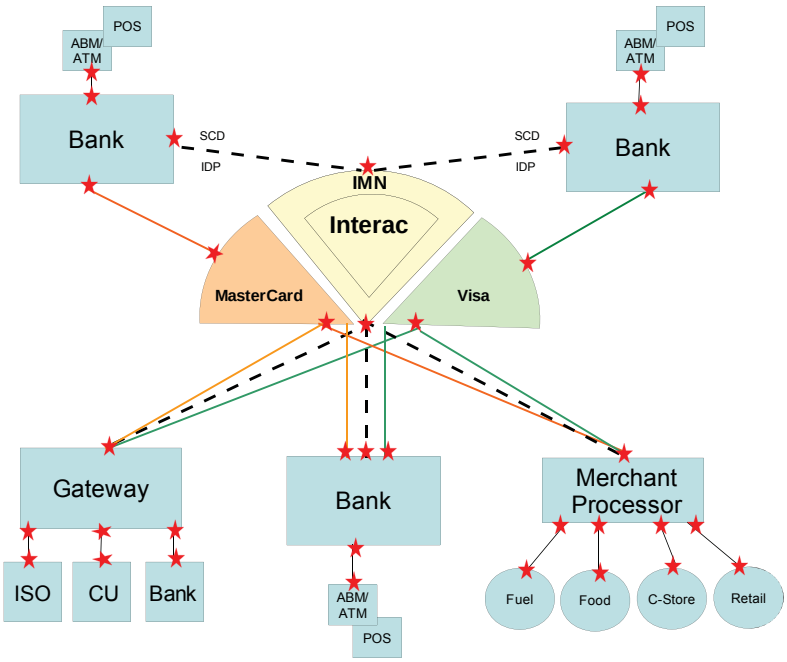
# Extensive changes require extensive testing

As you consider all the through-points in your system, it becomes clear that no matter what role your organization plays in the new payments infrastructure, the requirement for testing is a certainty. You must test all formats ("wide" testing) and all functions ("deep" testing) with flexible, easy-to-use tools that ensure repeatable, verifiable testing.

- Test your interfaces, device handlers, and routing through your host to any switch interfaces (Interac, Visa, and/or MasterCard), merchant processors, and payments gateways.
- Test all messages with all devices—and test them with all your card payment schemes (Visa, MasterCard, American Express, and Interac). Test the encryption algorithms required to generate and validate EMV encryption codes.
- Test your cards. Verify tagged data elements. Test issuer scripts for card blocking, PIN changing, and more.

How do you identify the right test tool—and the right vendor—for the testing critical to your EMV success?



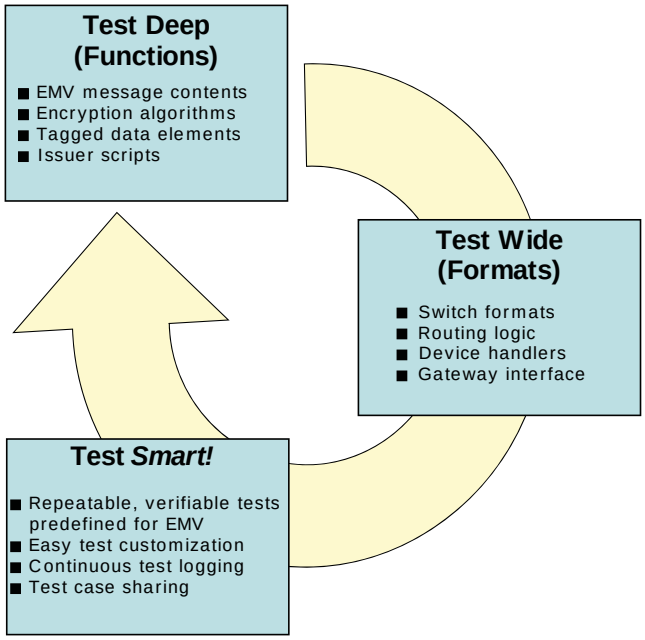

The challenge: to find a test solution that enables you to thoroughly test your endpoints and internal systems, your EMV cards, and your devices.

The catch? The solution must let you test quickly and easily so that a test plan this thorough is actually feasible—and provide test results you can rely on.

# Facing the challenge of EMV testing

Paragon Application Systems can help you meet the challenge of thorough end-to-end online EMV testing. And we have the real-world experience to help you understand and successfully implement EMV at your institution.

ATMulator Plus simulates an EMV-enabled ABM to enable ICC transaction flow testing—even before you have upgraded your first ABM to EMV. FASTest simulates EMV transactions sent through a switch (such as Interac, or a debit or credit card processor), a Point of Sale (POS) device, or your host application—without having to configure a real device or schedule test time with a card issuer. And, in addition to "deep" and "wide" testing, Paragon's solution is packed with features and functions to make testing easier, faster, and *smarter*—like Paragon's 'soft' cards (that is, virtual cards stored in a card database) that reduce your dependency on often difficult-to-acquire EMV test cards.




Paragon offers a product suite that enables testing of all formats ("wide" testing) and all functions ("deep" testing) with flexible, easy-to-use tools that ensure repeatable, verifiable testing.

## Paragon's soft card database: Virtual ICCs for improved testing

- Test with supplied ICC applications for Interac, Visa, MasterCard, and American Express ICCs
- Avoid issues with often difficult-to-acquire EMV test plastics
- Gain visibility into the chips of your existing test plastics

## ATMulator Plus: Device simulation

- Add ICC states and screens to your ABM configurations
- Test state flows and interaction with your host application (even before you have a test ABM upgraded for EMV)
- Validate host cryptographic processing and issuer script processing such as PIN changes, application blocking, and card blocking
- Document testing with screen captures, receipts, and more
- Test beyond EMV with ATMulator's simulation of non-EMV-specific ABM functions and faults

## FASTest: Network and host simulation

- Simulate EMV transactions sent through a credit or debit card processor, a new Point of Sale (POS) device, or your host application
- Test immediately with the provided scripts, easily edit them for customized testing, or import production data to quickly create your own tests
- Schedule tests to run automatically, day or night
- Track test results for each session, as well as historical data
- Easily compare test results



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## "Wide" testing: Testing your EMV formats

Simulate and test all the formats in your system. Use Paragon's FASTest to simulate your host system, device handlers, or external interfaces (switches), and ATMulator to initiate EMV transactions identical to those from real ABMs.

### Test your switch formats

Verify that all your switch formats (Interac, Moneris, Visa, and MasterCard) are ICC ready.

### Test your routing logic

Accurately test using a variety of ICC formats such as Visa, MasterCard, American Express, and Interac—all supported by Paragon's test solution. Quickly simulate either an EMV card issuer or EMV transaction acquirer without having to configure a real device or schedule test time with a card issuer.

### Test your device handlers

Simultaneously design and test ABM configuration changes related to EMV transactions at your Diebold, NCR, or Wincor ABMs. See what the customer sees and do what the customer does during EMV transactions.

### Test your gateway interfaces

Available in over 60 financial message formats, FASTest enables you to test EMV transactions sent through a credit or debit card processor (such as Relay, Cybergateway or SPDH), a new Point of Sale (POS) device, or your host application. Easily move from testing one format to another.

## "Deep" testing: Testing your EMV functions

Essential to your EMV testing is verifying all EMV functionality—testing your ability to process successful transactions as well as to handle exceptions.

### Test EMV messages

Easily edit EMV test messages—using wizards to populate message fields with valid data (or even invalid data for "what if" scenarios).

### Validate and generate EMV cryptograms

Quickly and automatically validate and generate EMV cryptograms for ARQCs and ARPCs. (And Paragon's solution also validates non-EMV encryption such as triple DES and DUKPT.)

### Test EMV tagged data

Use the Paragon card database to see the tagged data values stored in your ICCs, as well as to control the state of the card, specify encryption keys, and more.

### Verify EMV host script processing

Verify host-initiated EMV scripts (for actions such as PIN changing, application blocking, or card blocking) and immediately see the script results. Automatically perform issuer script MACing. Modify individual tag data to change the offline limit for transactions.

### Test EMV configurations

Build configurations to support ICCs at your ABMs and maintain these configurations in load groups. Quickly design ABM screens and build the states needed to instruct the ABM to process ICC data.

# Smart testing: Faster, easier testing for repeatable, verifiable results

Your testing must be comprehensive. Your test results must be valid. And, because your product offerings and services are continually changing, your test solution must be flexible enough to address your test needs beyond the EMV requirements you have today. Paragon's well-designed, easy-to-use solution lets you obtain meaningful, verifiable results.

## Automatically manage IMN connectivity

Paragon tools include a plug-and-play adapter to automatically manage IMN connectivity for Interac testing.

## Improve testing with soft cards

Improve and accelerate testing using 'soft' cards (that is, virtual cards stored in a card database) rather than being limited to third-party test plastics.

- Change any card's tagged values to suit the requirements of any test scenario.
- Use proven ICC applications shipped with Paragon's solution. Easily configure new virtual test cards. Display and maintain ICC values in the card database.
- Test all scenarios without corrupting your chip test cards. For example, block and unblock the soft card repeatedly, rather than blocking your ICC test plastic, which would disable it and render it useless.
- Easily load chip card data from existing EMV test cards into Paragon's card database using an industry-standard EMV card reader.

## Quickly set up tests to use now– and for future regression testing

- Construct new tests in minutes by modifying supplied EMV tests with Paragon's wizards and list selections. Or import raw message data from your host (BASE24, eFunds, or other host formats) and modify it for EMV testing.
- Send ABM status messages to indicate processing events from the ABM to the host (such as power up and power fail messages, and NCR CAM flags).
- Use pseudo-programming (through auto replies and user exits) to build customized logic into FASTest's message handling, for example, to quickly test your system's response to a specific field value in a message.
- Share test cases including test groups, scripts, cards, transactions, and messages using FASTest's export/import utility.
- Easily view host-generated EMV function commands.
- With a single click, repeat testing as often as you like.

## Thoroughly document your EMV testing

Evaluate test results using reports and historical data.

- Use detailed transaction flow logs to document ABM testing, including even ABM screen captures and ABM state information.
- Print test results to easily document your EMV testing.

## Schedule unattended, automated testing– 24/7

Schedule continuous integration testing by pre-selecting tests to run automatically 24/7—and receive an e-mail of results or archive them for later viewing (Optional add-on feature).



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# Paragon: An experienced mentor for your EMV testing

Paragon technicians have real-world experience with EMV simulation, configuration, and testing. Need help understanding EMV encryption? Confused by your ICC's tagged data settings? Need to know how to test PIN blocking? Paragon can help. Paragon's Professional Service Specialists combine an in-depth understanding of ePayment systems at the host, processor, and device level with expertise in more than 60 financial transaction message formats. Paragon offers consulting services to help your organization:

- Implement automated testing processes
- Plan and develop comprehensive EMV integration test framework
- Update test cases to support mandates
- Install Paragon software
- Interface Paragon solutions with proprietary applications
- Customize production data files
- Convert ABM configurations
- Test system migration
- Load-test systems for capacity planning
- Conduct pre-certification testing
- Conduct disaster recovery testing

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## When mistakes aren't an option

Comprehensive EMV testing is critical for your organization. Failing to uncover a single coding mistake during testing means that mistake may be passed on to your production system. Errors in production can mean potential loss of revenue and loss of customer confidence.

Paragon has the expertise, real-world experience, and testing solutions to help you avoid those mistakes. Let us become a trusted partner in your EMV implementation.

### About Paragon Application Systems

Paragon Application Systems is the leading global provider of ePayment simulation, configuration, and testing solutions to the financial industry. Today, 400 customers in over 70 countries use Paragon tools to ensure system reliability and reduce time-to-market. Paragon's broad customer base includes 6 of the top 10 US banks, 4 of the 5 FinTech 100 companies and 2 of the top 3 international card networks. Some of our clients include major interchanges such as KNET, NYCE, STAR and Visa; processors such as eFunds, Elan Financial Services, Metavante and Fiserv; banks such as BB&T Corporation, Citibank, First National Bank of South Africa, Oversea Chinese Banking Corporation and United Bulgarian Bank; leading software providers such as ACI Worldwide and CSF International; and 100 credit unions. Visit Paragon Application Systems on the Web at www.paragonedge.com.



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