Value through Innovation

80140502-001

User Manual

Spectrum Pro

PCI PTS 4.X Hybrid Insert Reader

RS232 Interface

80140502-001
Rev 51 3/10/2015

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Revision History

Revision	Date	Description of Changes	By
50	2/23/2015	Preliminary Version	CH
51	3/10/2015	Revise low power mode	CH

Table of Contents

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1. Scope

Spectrum Pro is a PCI PTS 4.X with SRED certified outdoor hybrid insert reader which can read both magstripe card and chip card. Meeting the latest requirements of the payment industry, the Spectrum Pro is EMV Level 1 and Level 2 approved and features DUKPT key management with TDES or AES encryption algorithms to ensure MagStripe and Smart card data is protected.

The Spectrum Pro also has the ability to be integrated with ID TECH's SmartPIN L100 for a Chip &PIN solution, and with an optional contactless antenna from Kiosk III for outdoor and unattended applications such as parking, vending machines, kiosks, ATMs and other POS systems.

2. Features and Benefits

- EMV Level1 and Level 2 certified
- PCI 4.X certification with SRED function supported
- Support TDES and AES encryption algorithms with DUKPT key management
- Reads up to 3 tracks of card data
- Two SAM modules
- With front switch, card seated switch and latch
- IP 65 rating and IK10 (targeted)
- Low power sleep mode and stop mode

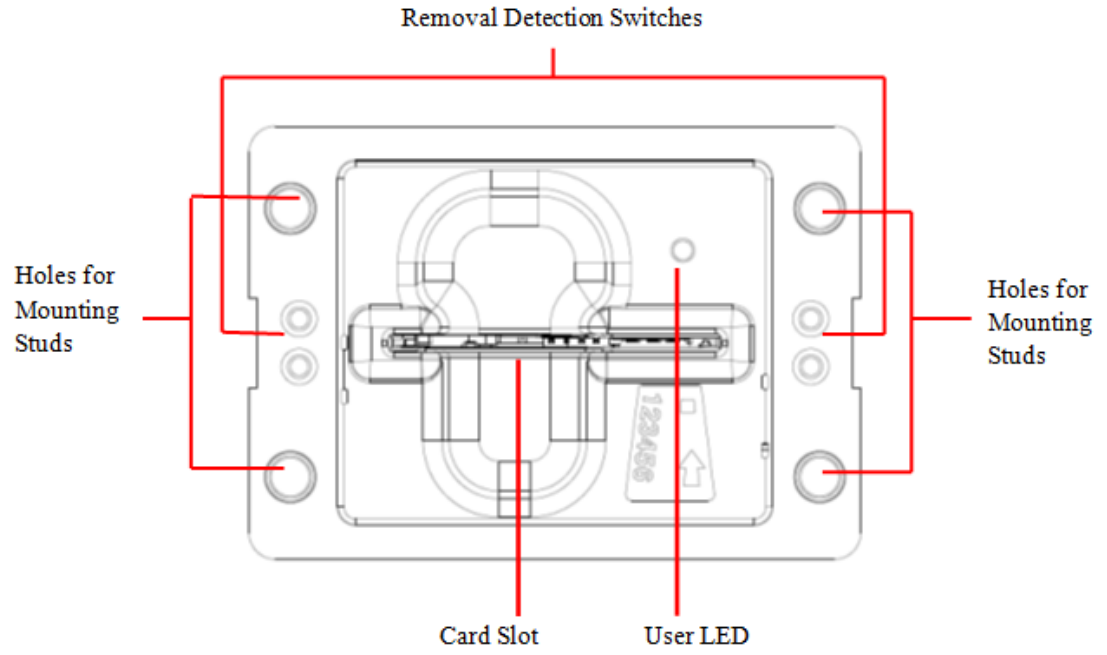
3. Abbreviation

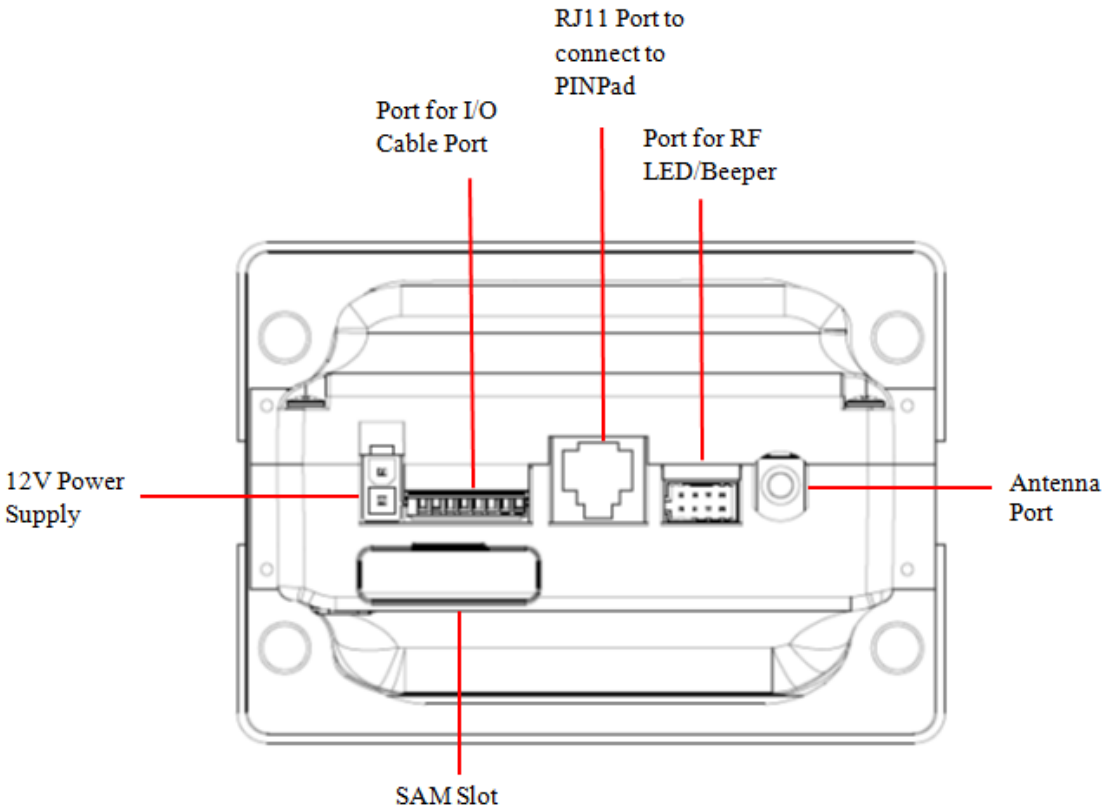
AAMVA	American Association of Motor Vehicle Administrators
AES	Advanced Encryption Standard
DES	Data Encryption Standard
MSR	Magnetic Swipe Reader
TDES	Triple Data Encryption Standard
PCI	Payment Card Industry
POS	Point of Sale
USB	Universal Serial Bus
PCI	Payment Card Industry
SRED	Secure Reading and Exchange of Data
EMV	Europay, MasterCard and Visa

4. Applicable Document

ISO/IEC 7813 – Identification cards, Physical Characteristic
ISO/IEC 7811 – Identification cards, Recording Techniques, Magnetic Stripe

5. Front and Back View





6. Specification

6.1 Supply power

- Supply voltage:
  - DC 12V to support latch
  - DC 5V without supporting latch
- Working current: 300mA
- Sleep mode current: TBD
- Stop mode current: TBD
- Reader can wake up from Sleep mode by card insertion or a command.
- Reader can wake up from Stop mode by card insertion

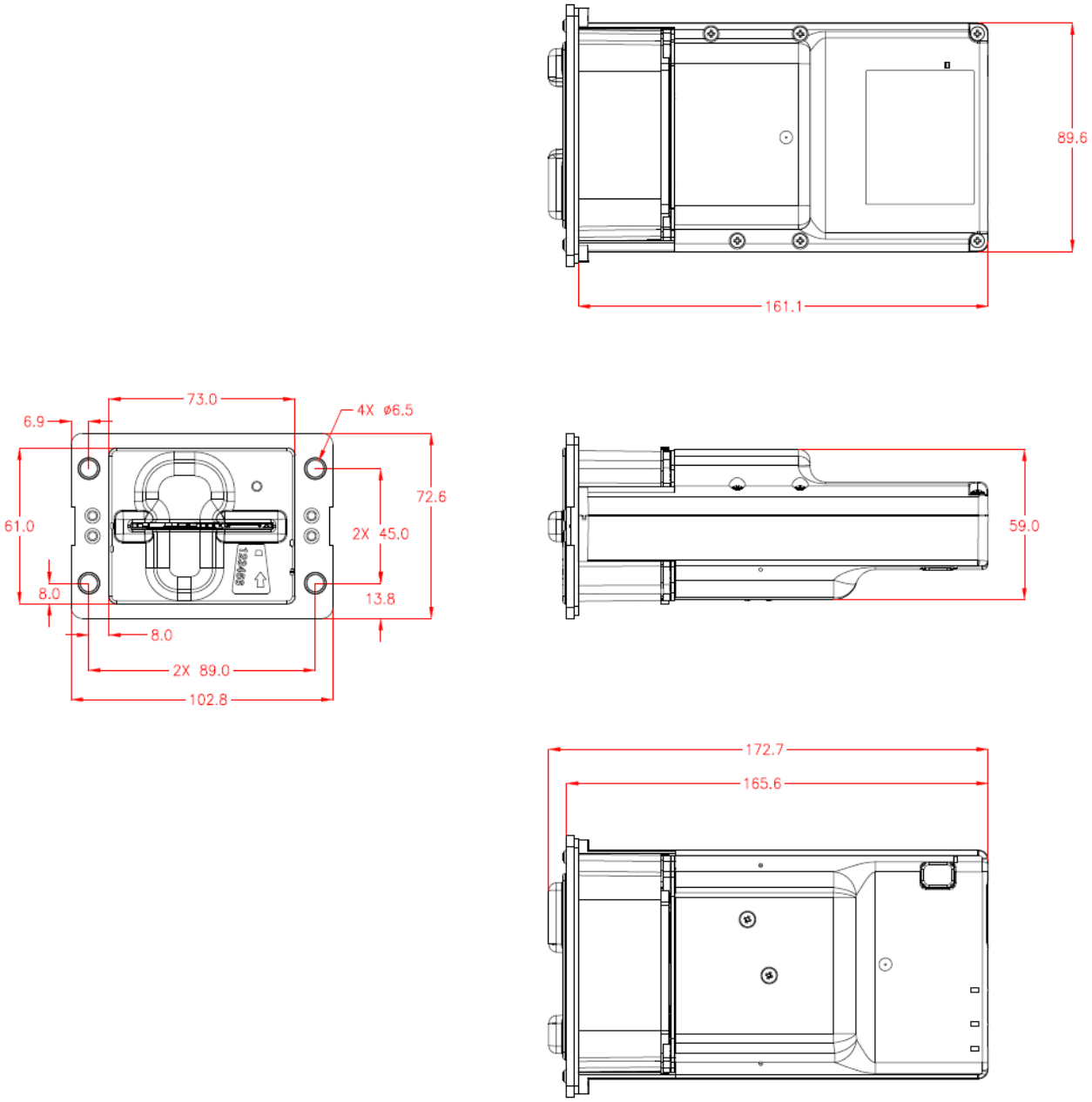
6.2 Reliability and Environment

- Reliability
  - Magnetic Head Life: 1,000,000 passes minimum
  - Rail and Cover Life: 1,000,000 passes minimum

- Environmental Temperature range:
  - Operating:
  - -13 ºF to 158 ºF (-25 ºC to 70 ºC) non-condensing
  - Storage:
  - -40 ºF to 176 ºF (-40 ºC to 80 ºC) non-condensing
- Relative humidity
  - 10% to 95% non-condensing

- ESD
  - 6kV contact, and 12 kV air discharge per ID TECH ESD testing procedure without permanent damage (targeted)

6.3 Envelope Drawing

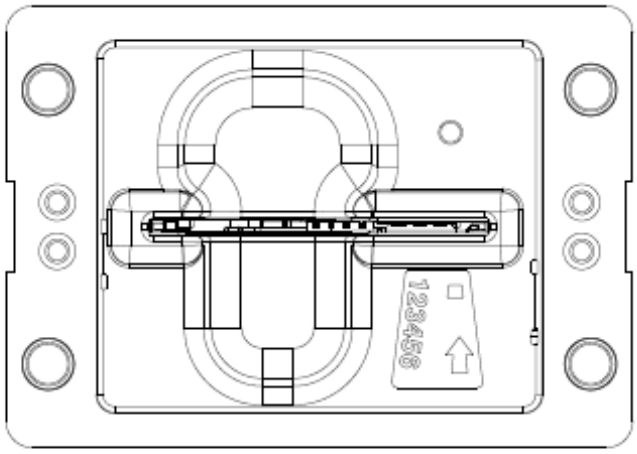


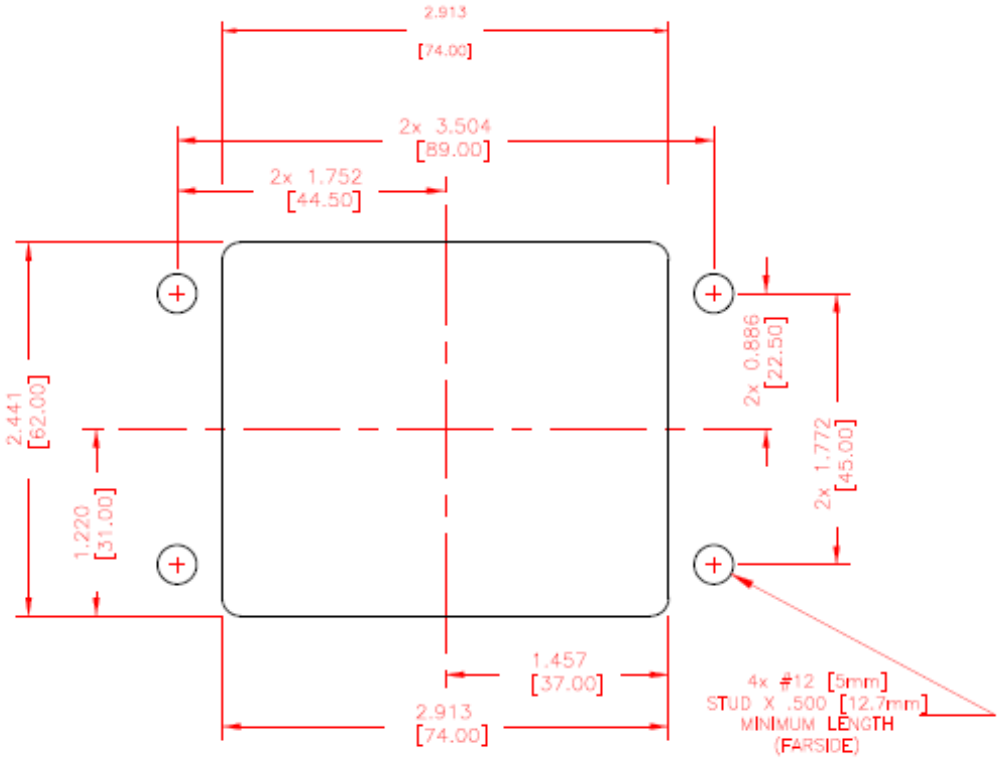
6.4 RS232 Communication Settings

Parameter	Specification
Transmission protocol	Asynchronous
Communication method	Full Duplex
Start bit	1 bit
Data length	8 bits (Bit7: MSB, Bit0: LSB)
Parity	None
Stop bit	1 bit
Transmission speed (Baud rate)	115200 bps (default)

7. Mounting Instruction

The reader can be mounted with either horizontal or vertical direction. The removal detection points must be pressed down when the units is mounted. Please refer to the mounting drawing below.





SPECTRUMPRO MOUNTING

8. LED Management

There are two LEDs. One is user LED on the front bezel of the reader; the other diagnostic LED is on the back.

8.1 Front LED Status

- The reader flashes red LED during start-up.
- Flash amber LED if the initialization or self-check has a problem.
- The LED turns green in idle waiting.
- LED handling for Magstripe card operation
  - The LED will turn red to indicate that the recent magstripe card read was bad.
- LED handling for smart card operation
  - The LED will turn off after powering on the smart card.
  - The Green LED indicates the smart card processing is complete and the ICC powered off. The user can remove the smart card.

State	LED	Indicating
0	Off	No external power
1	Flashing Green	Powering on the smart card and start smart card operation
2	Solid Green	Idle waiting (Smart card processing is complete and the ICC powered off. User can remove the smart card. Or magstripe card data is sent out.)
3	Flashing Red	Reader start-up
4	Solid Red	The recent magstripe card read was bad. Red lasts 1 sec.
5	Solid Amber	For an RS232 reader in PC/SC mode, the LED will turn amber after start-up until the host plug and play "COM enumerator" detects the reader.
6	Flashing Amber	Initialization or self-check has a problem

8.2 Diagnostic LED Status Please provide the front LED status

The LED on the back of Spectrum Pro can be used for diagnostic purpose.

LED status:

1. Off
2. Solid – No communication with its host
3. Normal flashing (1 sec on, 1 sec off) – Communicating with its host
4. Fast flashing (0.5 sec on, 0.5 sec off) – For future use

LED Colors:

Amber – Reader requires on-site service actions.
Green – Reader is ready to read cards.
Red – Reader needs to be sent back to its manufactory.

State	LED			Indicating	Service action
	Green	Amber	Red		
1	Off	Off	Off	No external power	Check the power cable and power supply
2			Solid Red	Power is on, but firmware(either K21 or MaxQ) doesn't run	Dismount the device and send it back to the manufacture.
3		Solid Amber	Off	Power is on, but no communication in 30 seconds	Check the communication cable and if its host is running
4	Solid Green	Solid Amber		Power on, In not ready state, and waiting its host to communicate	State will go to either state 3 or 5 in 30 seconds
5	Flashing Green	Solid Amber		Communicating with its host and activating, not ready to read cards yet	State will go to state 8 in a few minutes or state 4 in 30 seconds
6	Flashing Green	Flashing Amber		Firmware downloading and programming	State will go to state 5 after programming in a

					few minutes or state 4 in 30 seconds
7	Solid Green	Off		In ready state but no communication with its host	State will go to state 8 or state 4 in 30 seconds
8	Flashing Green			In ready state and being polled by its host	
9	Off	Solid Amber		Removal flag on without communication with its host	Check communication cable and removal switch if they are fully engaged and call service center to reactivate the reader
10		Flashing Amber		Removal flag on and communicating with its host	Check removal switch if they are fully engaged and call service center to reactivate the reader.
11		Solid Amber	Solid Red	Reader has no communication with its host, and the crypto driver is not functioning: Crypto MCU is lost or certificates are invalid (may be tampered)	Dismount the reader and send it back to its manufactory
12		Flashing Amber		Reader is communicating with its host, and the crypto driver is not functioning: Crypto MCU is lost or certificates are invalid (may be tampered)	Dismount the reader and send it back to its manufactory

9. Operation Procedure

The operation process should follow the instruction on the terminal screen. A chip card should be inserted with chip facing up. And a magstripe card should be inserted with magstrip facing down and to the right side of the reader. Please see pictures below.