



80140502-001

User Manual

Spectrum Pro

PCI PTS 4.X Hybrid Insert Reader

USB / RS232 Interface

CE FC

80140502-001

Rev. B 7/18/2018

Copyright © 2018 ID TECH. All rights reserved.

ID TECH
10721 Walker St.
Cypress, CA 90630

support@idtechproducts.com Visit: <http://www.idtechproducts.com>

This document, as well as the software and hardware described in it, is furnished under license and may be used or copied online in accordance with the terms of such license. The content of this document is furnished for information use only, is subject to change without notice, and should not be construed as a commitment by ID TECH. While every effort has been made to ensure the accuracy of the information provided, ID TECH assumes no responsibility or liability for any unintentional errors or inaccuracies that may appear in this document.

Except as permitted by such license, no part of this publication may be reproduced or transmitted by electronic, mechanical, recording, or otherwise, or translated into any language form without the express written consent of ID TECH.

ID TECH and ViVOpay are trademarks or registered trademarks of ID TECH.

Warranty Disclaimer: The services and hardware are provided "as is" and "as-available" and the use of the services and hardware is at its own risk. ID TECH does not make, and hereby disclaims, any and all other express or implied warranties, including, but not limited to, warranties of merchantability, fitness for a particular purpose, title, and any warranties arising from a course of dealing, usage, or trade practice. ID TECH does not warrant that the services or hardware will be uninterrupted, error-free, or completely secure.

Revision History

Revision	Date	Description of Changes	By
50	2/23/2015	Preliminary Version	CH
51	3/10/2015	Revise low power mode	CH
52	10/27/2015	Expanded description of Features and Benefits Default sleep timeout value is 120 seconds	KT
A	5/17/2017	Update status LED table, add low-power mode details, correct various items.	KT
B	7/18/2018	Updated installation and 3-view drawings.	KT

Table of Contents

1. INTRODUCTION	5
2. FEATURES AND BENEFITS.....	5
3. ABBREVIATIONS.....	5
4. APPLICABLE DOCUMENTS	6
5. FRONT AND BACK VIEW	6
RS232 COMMUNICATION SETTINGS	7
6. SPECIFICATIONS	7
6.1 SUPPLY POWER	7
6.2 RELIABILITY AND ENVIRONMENT	8
6.3 ENVELOPE DRAWING	9
7. MOUNTING INSTRUCTIONS	10
8. LED MANAGEMENT	10
8.1 FRONT LED STATUS	11
8.2 DIAGNOSTIC LED STATUS.....	11
9. OPERATION PROCEDURE	14

1. Introduction

Spectrum Pro is a PCI PTS 4.X and SRED certified outdoor hybrid insert reader which can read both magstripe cards and chip cards using a single slot. 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 Triple DES (TDES) encryption to ensure MagStripe and Smart card data will always be protected.

The Spectrum Pro integrates directly with ID TECH's SmartPIN L100 keypad for a complete Chip & PIN solution. It can also use an optional contactless antenna from Kiosk III for outdoor and unattended applications such as parking, vending machines, kiosks, ATMs, and other POS systems.

Integrators and application developers can create apps that communicate with Spectrum Pro using ID Tech's Universal SDK, which provides a comprehensive Windows-based development environment for programmatic control of the unit. Developers can also communicate with Spectrum Pro directly using UART and/or USB-HID. For details, see the P/N 80132402-002 *Spectrum Pro Low Level API Manual*. This manual contains the complete firmware-level API guide for controlling Spectrum Pro directly, through serial commands. The low-level API manual can be downloaded from:

<https://atlassian.idtechproducts.com/confluence/display/KB/Spectrum+Pro+-+downloads>

2. Features and Benefits

- EMV Level 1 and Level 2 certified
- PCI 4.X certification with SRED support
- MasterCard M/Chip 3.0
- PBOC level 1 and 2
- Supports TDES encryption with DUKPT key management
- Reads up to 3 tracks of card data
- Two SAM modules
- Front switch, card seated switch, and latch
- IP 65 rating and IK 10
- Low power sleep mode and stop mode

3. Abbreviations

AAMVA	American Association of Motor Vehicle Administrators
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

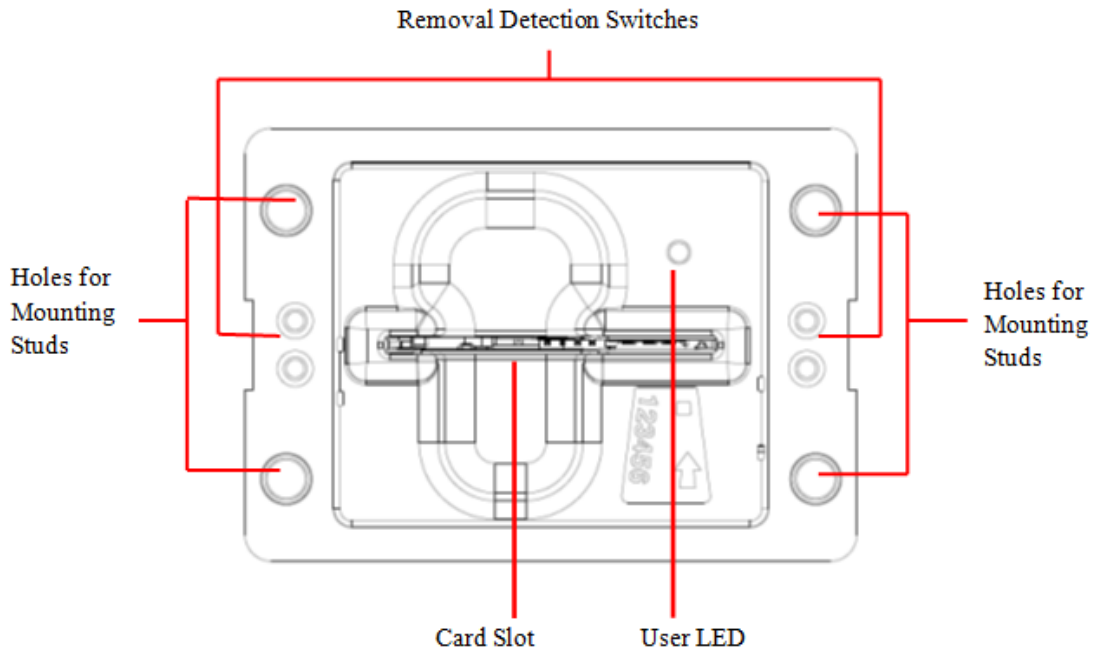
PCI
SRED
EMV

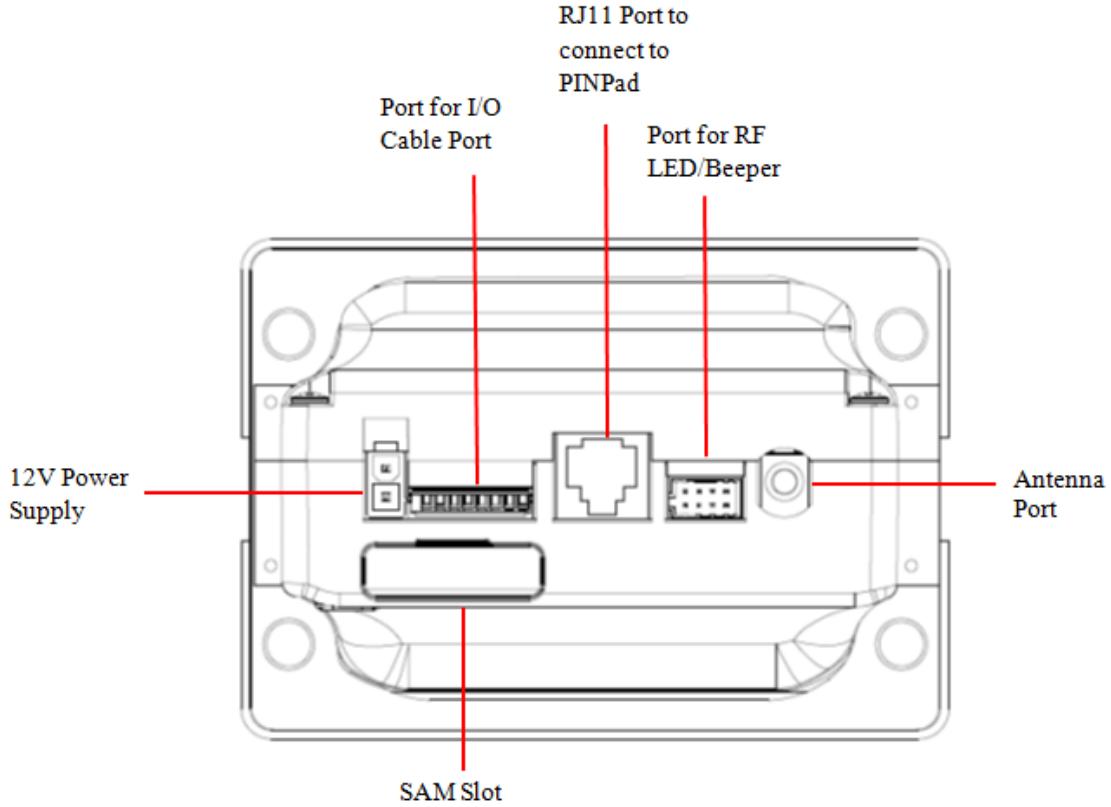
Payment Card Industry
Secure Reading and Exchange of Data
Europay, MasterCard, and Visa

4. Applicable Documents

ISO/IEC 7813 – Identification cards, Physical Characteristic
ISO/IEC 7811 – Identification cards, Recording Techniques, Magnetic Stripe
80132401-002 – ID Tech Spectrum Pro Low Level API Manual

5. Front and Back View





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)

6. Specifications

6.1 Supply power

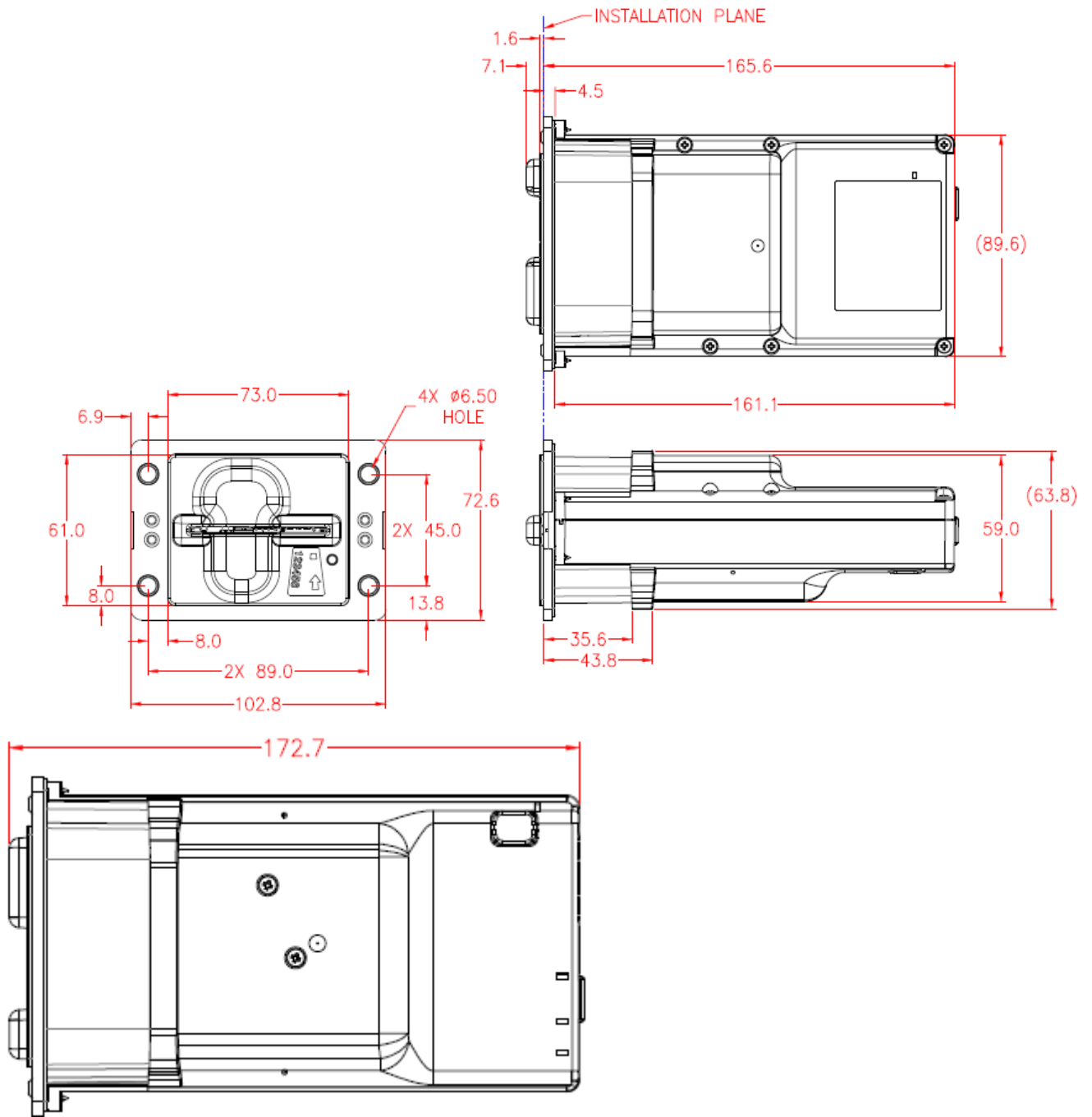
- Supply voltage:
 - DC 5V without supporting latch
 - Additional DC 12V to support latch if latch is needed

- Operating current
 - o Idle – 100mA
 - o Max – 120mA
- USB suspend current: 200 uA
- Sleep mode current: 20 uA
- Stop mode current:
 - with UART wakeup, 16 uA
 - with no UART wakeup, 10 uA
- Reader falls into sleep mode after it is idle for specified time duration. The default time duration is 120 seconds. (This can be adjusted, or even disabled.)
- Reader can be commanded to go to Stop mode (which is a special very-low-power consumption mode).
- Reader can wake up from Sleep mode by card insertion or via UART command. Response time: < 100 ms.
- Reader can wake up from Stop mode by card insertion.
- Power-Off to Power-On time: < 500 ms

6.2 Reliability and Environment

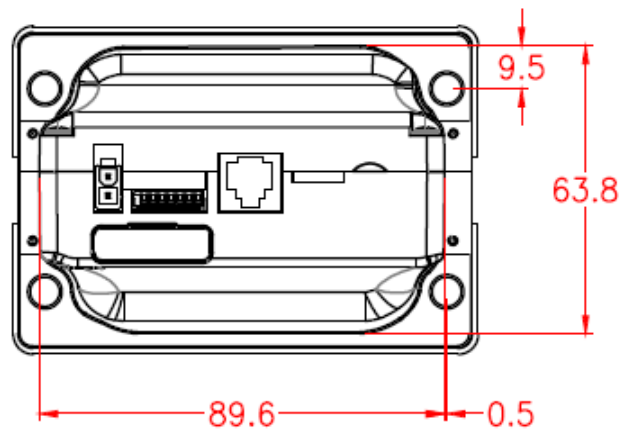
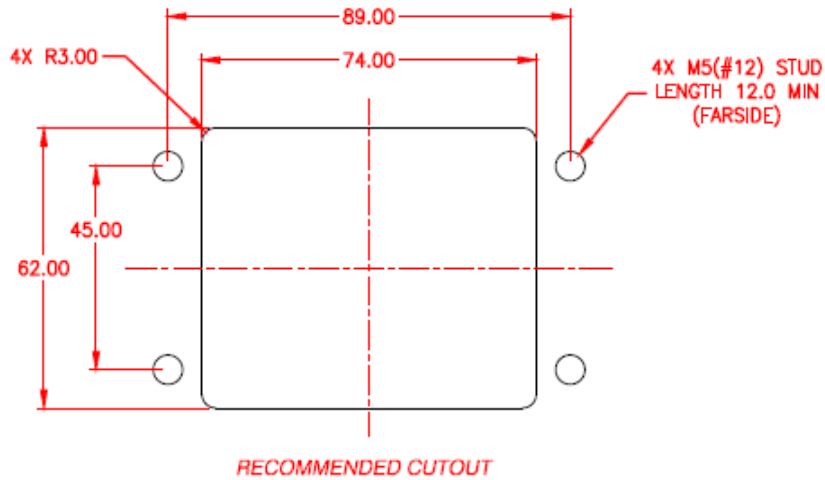
- Reliability
 - Magnetic Head Life: 1,000,000 passes minimum
 - Rail and Cover Life: 1,000,000 passes minimum
- Environmental Temperature range:
 - Operating:
 - 13° F to 158° F (-25° C to 70° C) non-condensing
 - Storage:
 - 40° F to 176° F (-40° C to 80° C) non-condensing
- Relative humidity
 - 10% to 95% non-condensing
- ESD
 - 6kV contact, and 12 kV air discharge, per ID TECH ESD testing procedure, without permanent damage

6.3 Envelope Drawing



7. Mounting Instructions

The reader can be mounted in either a horizontal or vertical orientation. The removal detection points must be pressed down when the unit is mounted. Please refer to the mounting drawing below.



8. LED Management

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

8.1 Front LED Status

- 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 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 starting smart card operation
2	Solid Green	Idle waiting (Smart card processing is complete and the ICC powered off. User can remove the smart card. If the transaction mode was MSR, 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 second.

8.2 Diagnostic LED Status

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

LED status:

1. Off
2. Solid – No communication with its host.
3. Flashing (1 sec on, 1 sec off) – Communicating with its host.

LED Colors:

Amber – Reader requires on-site service actions.

Green – Reader is ready to read cards.

Red – Reader needs to be sent back to the manufacturer.

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		Solid amber normally means the front removal-detection buttons (left side of front bezel) are not depressed. If this possibility is ruled out, check host connectivity.	Check that the removal detection button is fully depressed. Check the communication cable and if host is running.
4	Solid Green	Solid Amber		Power on. First restart and no command sent. In not ready state, and waiting for host to communicate.	State will go to either state 3 or 5 in 30 seconds.	
5	RFU	RFU		RFU	RFU	
6	Flashing Green	Flashing Amber			Firmware downloading and programming	Will go to state 4 in 30 seconds
7	Solid Green	Off			In ready state but no communication with its host	State will go to state 8 in 30 seconds
8	Flashing Green			Command sent to reader; reader waiting for response.		

Spectrum Pro User Manual

9		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.
10		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
11		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 the manufacturer

9. Operation Procedure

A chip card should be inserted with chip side facing up (as shown below). A magstripe card should be inserted with magstripe facing *down* and to the *right* side of the reader. Please see pictures below.

