



Value through Innovation



PiP User Manual

80160500-001 Rev. C
16 December 2020

IDTECH
10721 Walker Street, Cypress, CA 90630-4720
Tel: (714) 761-6368 Fax (714) 761-8880
www.idtechproducts.com

Copyright © 2020 International Technologies and Systems Corporation. All rights reserved.

ID TECH

10721 Walker Street

Cypress, CA 90630 USA

This document, as well as the hardware and software it describes, is furnished under license and may only be used in accordance with the terms of such license. The content of this paper is furnished for informational use, subject to change without notice, and not to be construed as a commitment by ID TECH. ID TECH assumes no responsibility or liability for any 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, recorded, or any other method, or translated into another language or language form without the express written consent of ID TECH. ID TECH is a registered trademark of International Technologies and Systems Corporation. ViVOpay and Value through Innovation are trademarks of International Technologies and Systems Corporation. Other trademarks are the property of the respective owner.

Warranty Disclaimer: The services and hardware are provided "as is" and "as-available," and the use of these services and hardware are at the user's 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, title, fitness for a particular purpose, and any warranties arising from any 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.

FCC warning statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The user manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: The grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter and must be installed to provide a separation distance of at least 20cm from all persons.

Changes or modifications to the PiP not expressly approved by ID TECH could void the user's authority to operate the PiP.

IC Compliance Warning

Operation is subject to two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Cautions and Warnings



	Caution: The PiP should be mounted 1-2 feet away from other PiPs. Can be adjusted based on lane setup.
	Warning: Avoid close proximity to radio transmitters which may reduce the capability of the reader.

Table of Contents

1. OVERVIEW	5
1.1. Universal SDK.....	5
1.2. Encryption.....	5
1.3. Features	5
1.4. Approvals	5
1.5. Regulatory	5
2. PIP SPECIFICATIONS	6
3. PIP INSTALLATION	7
3.1. Parts List	7
3.2. Mounting the PiP	7
3.2.1. Mounting Screws.....	7
3.3. Connecting to Power.....	8
3.4. Communication via USB	8
3.5. Connecting to the Data Port.....	8
3.6. Using the PiP for Value-Added Services.....	8
3.7. Making a VAS Transaction	8
3.8. Notes on Installation Locations.....	8
4. PIP LED STATUS INDICATOR	9
5. RF INTERFERENCE	9
6. FIRMWARE UPGRADE	11
7. CUSTOMER SUPPORT	12

1. Overview

The ID TECH PiP is a compact, standalone NFC device, designed to support loyalty programs that register via NFC phones. It is also great as an access control device as it supports Apple VAS and Google Smart Tap as well as Mifare and other closed-loop protocols..

1.1. Universal SDK

A feature-rich Windows-based Universal SDK is available to aid rapid development of applications that talk to PiP. The SDK is available for the C# language on Windows and comes with sample code for demo apps. To obtain the SDK and other useful utilities, demos, and downloads, be sure to check the Downloads link on the [ID TECH Knowledge Base](#) (no registration required).

1.2. Encryption

PiP supports ECC.

1.3. Features

PiP supports the following:

- Apple VAS
- Google Pay Smart Tap
- USB HID & KB
- Suitable for retail, entertainment, and other locations that use loyalty value-added services but do not require payment
- Consumer Intuitive: Equipped with an LED and sound to provide visual and audible cues to enable a smooth and seamless experience

This document assumes that users are familiar with their host systems and all related functions.

1.4. Approvals

- Apple VAS & Google SmartTap

1.5. Regulatory

- FCC Part 15
- CE Mark
- UL certified
- REACH

2. PiP Specifications

Hardware	
MTBF	30,000 POH
Transmitter Frequency	13.56 MHz +/- 0.01%
Transmitter Modulation	ISO 14443-2 Type A Rise/Fall Time: 2-3 μ sec. Rise, < 1 μ sec fall ISO14443-2 Type B Rise/Fall Time: < 2 μ sec. each; 8% - 14% ASK ISO 18092 ISO 21481 (PCD & NFC)
Receiver Subcarrier Frequency	847.5 KHz
Receiver Subcarrier Data	ISO 14443-2 Type A: Modified Manchester ISO 14443-2 Type B: NRZ-L, BPSK ISO 18092 ISO 21481 (PCD & NFC)
Typical Read Range	0-4cm
Physical	
Length	75.77 mm
Width	70.44mm
Depth	14mm
Environmental	
Operating Temperature	0°C to 55°C (32°F to 131°F) [non-condensing]
Storage Temperature	-20°C to 60°C (-4°F to 139°F) [non-condensing]
Operating Humidity	Maximum 95% (non-condensing)
Storage Humidity	Maximum 95% (non-condensing)
Transit Humidity	Maximum 95% (non-condensing)
Operating Environment	Indoor
IK Rating	N/A
IP Rating	N/A
Electrical	
Reader Input Voltage	+5V(USB port-powered)
Working Current	450mA@25°C Auto polling mode
Maximum field strength	TBD
Battery (for real-time clock)	Minimum of 3 years
Power Consumption	Idle (RF Field off): <275mW During Polling: <1000mW Rated: <900mW

3. PiP Installation

This section provides information on installing a PiP.

3.1. Parts List

Verify that you have the following hardware for installing the PiP:

- PiP
- Micro-USB cable (included)

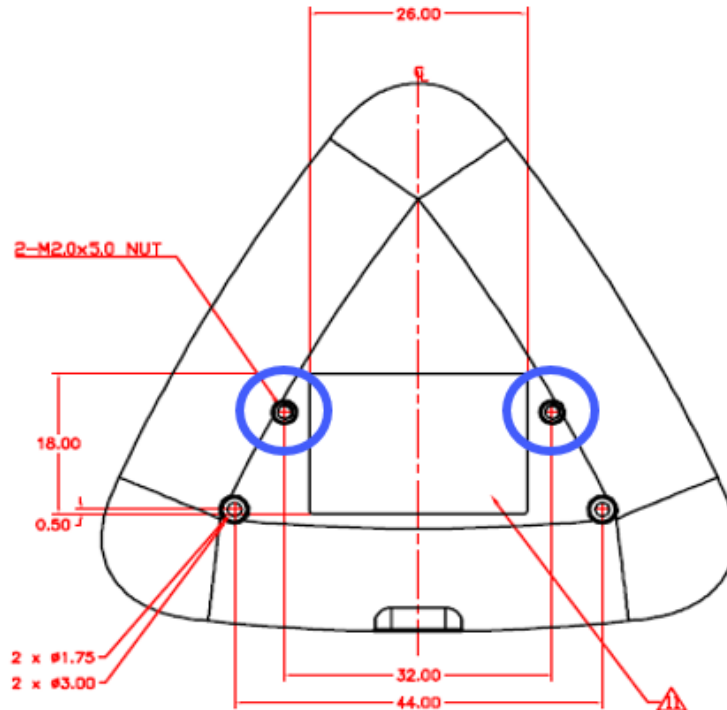
3.2. Mounting the PiP

Warning: The RF field of the PiP is sensitive to the proximity of metal. There are three options for mounting the PiP to a metal surface:

- Mount with the RF emitting surface of the antenna at least 1cm forward of any metal.
- Mount with the RF emitting surface of the antenna at least 1cm behind any metal. This will reduce the effective range of the antenna.
- Mount flush with the metal, but allow a minimum of 1cm distance from the metal

3.2.1. Mounting Screws

The back of the PiP has two holes for mounting screws (circled in blue below). Make sure that the depth of the screws used for mounting does not exceed 4mm.



3.3. Connecting to Power

The PiP is powered through the USB port.

3.4. Communication via USB

The PID is 4480 (hex) and the VID is 0ACD (hex).

3.5. Connecting to the Data Port

The PiP transfers data via the USB connector.

3.6. Using the PiP for Value-Added Services

This tests the PiP's ability to read an NFC phone or closed-loop tap card.

3.7. Making a VAS Transaction

The PiP allows for customer loyalty program services using Contactless (NFC) technology. To make a VAS transaction:




1. Present the phone in close proximity to the front portion of the PiP.
2. Orient the phone so that maximum surface area is parallel to the PiP.
3. The phone used for the test should display a rewards screen (steps for using that screen depend on the phone platform).
4. The PiP beeps once to indicate a successful VAS transaction.

3.8. Notes on Installation Locations

- The PiP is designed to be mounted on a surface and in close proximity to any internal motors and electrical devices that may be operating inside a point of sale area. However, the PiP is susceptible to RF and electromagnetic interference. It is important that the unit not be mounted near (within 3 or 4 feet) large electric motors, computer UPS systems, microwave transmitters (Wi-Fi routers), anti-theft devices, radio transmitters, communications equipment and so on.
- Tie all cables neatly with nylon cable-ties and route them so that they are inaccessible and invisible to customers.
- Test the PiP installation using a test card to perform an end-to-end VAS transaction. Even if the transaction is declined (as it should be with a test card), it will prove connectivity all the way through the system. If possible, a manager or some other responsible party should test each PiP on a regular basis (perhaps at the start of each day or at least once per week) with a test card to ensure continued operation and functionality. If the PiP is rebooted on a regular basis (such as every night), it is important to test the contactless reader as soon as possible afterwards to ensure continued communication to the PiP host.

4. PiP LED Status Indicator

The PiP has an LED indicator on the front of the device to indicate reader status.

Device State	LED
Device connected, read successful	 solid
Communicating with host device	 flashing
Bad read	 solid

5. RF Interference

Q. Why do I need to know about RF interference?

A. Contactless communication uses radio frequency technology to send phone data to a contactless terminal reader.

Q. How can RF interference affect contactless communication?

A. RF interference can cause data errors. If RF interference is present, contactless communication devices may operate intermittently or inconsistently.

Q. Where does RF interference come from?

A. Radio frequency interference (RFI) can originate from a wide number of sources at VAS-related locations. Some examples of sources of RF energy and RF interference include:

- AM/FM radio and TV transmitters
- 2-way radios and pagers
- Mobile telephones
- Power lines and transformers
- Medical equipment
- Microwaves
- Electromechanical switches

Q. What should I do if I suspect RF interference exists in my environment?

A. Begin by inspecting your environment for possible sources of RF interference.

Q. Do equipment manufacturers test their devices for RF interference?

A. Electronic equipment is tested for RFI sensitivity by the manufacturers. These tests are performed in a controlled laboratory environment and will often not replicate the types of devices that would be encountered in your point-of-sale (POS) environment.

Q. What RF levels will impact RF operations?

A. Factors that can cause RF interference vary case-by-case. There are no set rules defining a single RF level that will cause RFI. RFI depends on the sensitivity of the equipment under consideration, or how low an interfering signal can be in the presence of the equipment and cause problems.

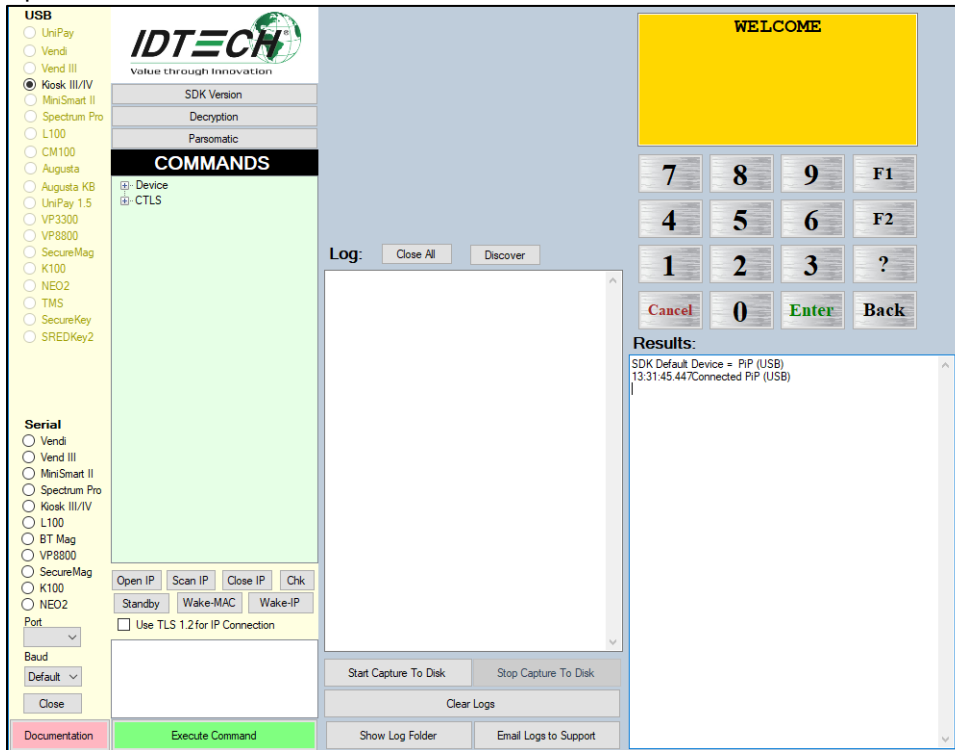
Equipment can be particularly sensitive to very low signal levels of one frequency and yet be quite immune to high signal levels of another frequency - so frequency is an important factor. Some electronic system components are internally shielded and have a very high immunity to interference; but generally, most equipment has not been so engineered.

6. Firmware Upgrade

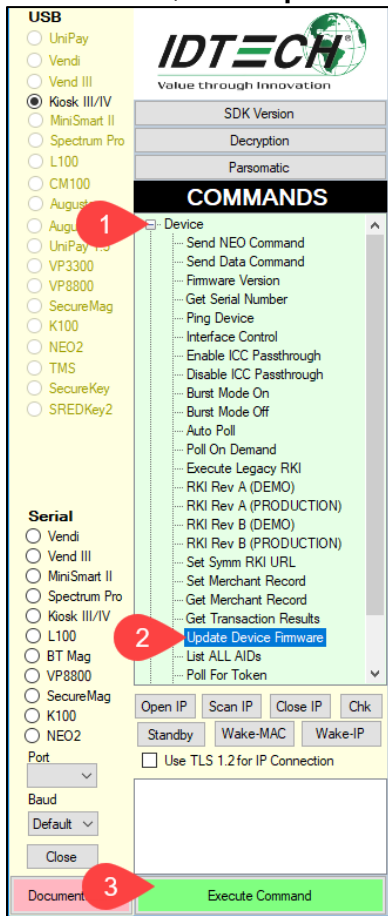
The steps below describe the process for updating PiP firmware via the Universal SDK Demo.

Note: Before you begin, contact your ID TECH representative to receive the most recent PiP firmware. Download the ZIP file and extract it to your computer.

1. Connect the PiP to your PC via USB or serial port.
2. Download and install the latest [USDK Demo](#) app from the ID TECH Knowledge Base (if you cannot access the link, please [contact support](#)).
3. Open the USDK demo from the Windows Start menu.



4. Under **Device**, select **Update Device Firmware**, then click **Execute Command**.



5. Navigate to and select the PiP firmware you downloaded earlier and click **Open**.
6. The PiP will reboot and enter the bootloader, at which point the USDK demo begins updating the device.
7. When the firmware update completes, the PiP will reboot again and the USDK demo will prompt **Firmware Update Successful**.

7. Customer Support

If you are unable to resolve any technical issues, please contact support@idtechproducts.com (sending an e-mail to this address will automatically open a support ticket).