



MiniSmart™ Card Reader
TTL
Partial Insert
User's Manual



80061506-001

Rev. B 5/06

#460

FCC WARNING

This equipment has not been tested to comply with Part 15 of the FCC Rules for a digital device. This device is designed to be incorporated into a product that will be tested to comply with all regulatory requirements. The MiniSmart is designed to the standards for compliance to FCC and CE requirements.

©2005 International Technologies & Systems Corporation. All rights reserved.

ID TECH is a registered trademark of International Technologies & Systems Corporation. MiniSmart and Value through Innovation are trademarks of International Technologies & Systems Corporation.

LIMITED WARRANTY

ID TECH warrants to the original purchaser for a period of 12 months from the date of invoice that this product is in good working order and free from defects in material and workmanship under normal use and service. ID TECH's obligation under this warranty is limited to, at its option, replacing, repairing or giving credit for any product which has, within the warranty period, been returned to the factory of origin, transportation charges and insurance prepaid, and which is, after examination, disclosed to ID TECH's satisfaction to be thus defective. The expense of removal and reinstallation of any item or items of equipment is not included in this warranty. No person, firm, or corporation is authorized to assume for ID TECH any other liabilities in connection with the sales of any product. In no event shall ID TECH be liable for any special, incidental or consequential damages to Purchaser or any third party caused by any defective item of equipment, whether that defect is warranted against or not. Purchaser's sole and exclusive remedy for defective equipment, which does not conform to the requirements of sales, is to have such equipment replaced or repaired by ID TECH. For limited warranty service during the warranty period, please contact ID TECH to obtain a Return Material Authorization (RMA) number & instructions for returning the product.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. THERE ARE NO OTHER WARRANTIES OR GUARANTEES, EXPRESS OR IMPLIED, OTHER THAN THOSE HEREIN STATED. THIS PRODUCT IS SOLD AS IS. IN NO EVENT SHALL ID TECH BE LIABLE FOR CLAIMS BASED UPON BREACH OF EXPRESS OR IMPLIED WARRANTY OF NEGLIGENCE OF ANY OTHER DAMAGES WHETHER DIRECT, IMMEDIATE, FORESEEABLE, CONSEQUENTIAL OR SPECIAL OR FOR ANY EXPENSE INCURRED BY REASON OF THE USE OR MISUSE, SALE OR FABRICATIONS OF PRODUCTS WHICH DO NOT CONFORM TO THE TERMS AND CONDITIONS OF THE CONTRACT.

The information included herein is believed to be accurate and reliable, however, no responsibility is assumed by ID TECH, for its use, nor for any infringements or patents or other rights of third parties which may result from its use.

The information contained herein is provided to the user as a convenience. While every effort has been made to ensure accuracy, ID TECH is not responsible for damages that might occur because of errors or omissions, including any loss of profit or other commercial damage. The specifications described herein were current at the time of publication, but are subject to change at any time without prior notice.

Table of Contents

DESCRIPTION ----- 1

INSTALLATION ----- 1

OPERATIONS ----- 2

SPECIFICATIONS ----- 3

FLEX CABLE PIN-OUT ASSIGNMENTS ----- 4

APPENDIX A – Mechanical Outline Drawing ----- 5

APPENDIX B – References & Abbreviations ----- 7

DESCRIPTION

This document provides the information to incorporate and operate a TTL MiniSmart Card reader. The reader provides a convenient means to integrate a smart card application into a product. The MiniSmart provides the connections between an ISO 7816 compatible Smart Card (ICC) and the user's application device (Host). The interface with the Host is through direct connections to the smart card via a landing type ICC connector assembly. All ICC signals are available to the host via a 10-conductor flex cable that exits the rear of the chassis.

The reader chassis is very compact and has an open design that allows debris to fall away and not obstruct the card contacts. The chassis is molded from a UL-94V0 rated material, which is a glass and lubricant-filled engineering plastic that serves as a guide for the card. The smart card connector has gold-plated contacts that "land" on the IC's contacts with a slight "wiping" action to ensure a dependable connection and long life. The reader has a rear "card seated" switch to detect a card fully-seated condition and to support EMV tear requirements.

INSTALLATION

The MiniSmart Partial Insert Reader can be mounted in any orientation, but the preferred orientation is with the printed circuit board facing up (top side up), so that debris will not accumulate on the smart card connector. On the top of the reader are six threaded inserts for reader mounting. The mounting screw size is M2. All the inserts are accessible from the top; the two rear inserts are also accessible from the bottom of the reader. See the mechanical outline drawing in Appendix B.

When mounting the reader using screws, the screw length is critical and dependent on location of the inserts used. The two front and two center inserts are positioned in blind holes; the screw length must be 3.75mm maximum, plus the thickness of the mounting bracket. The two rear inserts are positioned in through holes. If the reader is mounted from the bottom, the screw length must be 7.0mm minimum, plus the thickness of the mounting bracket.

Although the reader accepts cards without a bezel, one of two optional molded bezels is available. They provide an additional card guide and facilitate some bulkhead mountings. The bezel is attached to the chassis using the front or rear mounting inserts. The attached bezel increases the overall reader thickness.

The bezels are designed to mount integrally to the application bulkhead via studs at both ends. A bezel is available with either a flush mount (flat face) or extended nose (with additional card guide "lead-in"). An optional spring-loaded "gate" is available in the optional bezels. The gate minimizes the intrusion of dust, dirt, and the insertion of foreign objects into the reader. The gate easily opens to permit card insertion. See Appendix A for mechanical outline drawings of the two bezel types.

OPERATIONS

The MiniSmart Card reader (TTL Model) is a convenient, reliable means to connect a host system to a Smart Card. The MiniSmart provides the complete Smart Card guide/support function and the ICC connector.

Cards are inserted and withdrawn to support the application. Card insertion or withdrawal notification is provided by a rear seated switch connected through the MiniSmart interface cable. This is the SW signals and more information is available in Flex Cable Pin-Out Assignments section.

With the MiniSmart TTL Reader, the host must perform all ICC control & communication operations. As an option, the MiniSmart Intelligent Reader is available and provides all communication functions.

SPECIFICATIONS

Host Interface

Physical Layer: Direct connection to ICC contacts

ICC Connection

Compliance: ISO/IEC 7816-1, 2 and EMV 2000

Mechanical

Media Thickness: 0.03 Nominal (0.025 minimum; 0.035 inches maximum)

Dimensions: Depth: 1.06 inches (26.9 mm)

Width: 2.28 inches (55.8 mm)

Height: 0.39 inches (10.0 mm)

ICC Contacts: Contact force, position & plating per ISO7816 or EMV

Reader Weight: 0.35 oz (10 g) without optional bezel

Electrical

Power Supply: Specified by ICC type and function

Current: 150 mA max (each connector contact)

ICC contacts: 0.5 Ohms Maximum

Card Seated Switch: 5.0 Ohms Maximum

Durability

ICC Contacts & Switch: 1,000,000 cycles minimum*

Chassis & Bezel: 1,000,000 card cycles minimum*

MTBF: Not applicable

* All wear reliability is based on operation in a benign environment.

Environmental

Temperature: 32° F to 158° F (0° C to 70° C) Operating

Temperature: -40° F to 185° F (-40° C to 85° C) Storage

Humidity: Maximum 90% non-condensing

FLEX CABLE PIN-OUT ASSIGNMENTS

The MiniSmart provides a 10-conductor flex cable for all signals. The cable has one end directly connected to the MiniSmart PCB. The other end can be connected using a ZIF connector. There are many connector manufactures; one example is the Molex connector, P/N: 52771-1090 (RoHS P/N: 52271-1079) 1.00mm (.039") Pitch FFC/FPC Connector, Right Angle, SMT, ZIF, Bottom Contact Style, 10 Circuits.

Conductor	Signal Name
1	C1, VCC
2	C5, GND
3	C2, RST
4	C6, NC/VPP
5	C3, CLK
6	C7, I/O
7	C4, NC/FUSE
8	C8, NC/PROG
9	SW
10	SW

Note: See Appendix A for flex cable conductor number 1 location.

C1 – C8

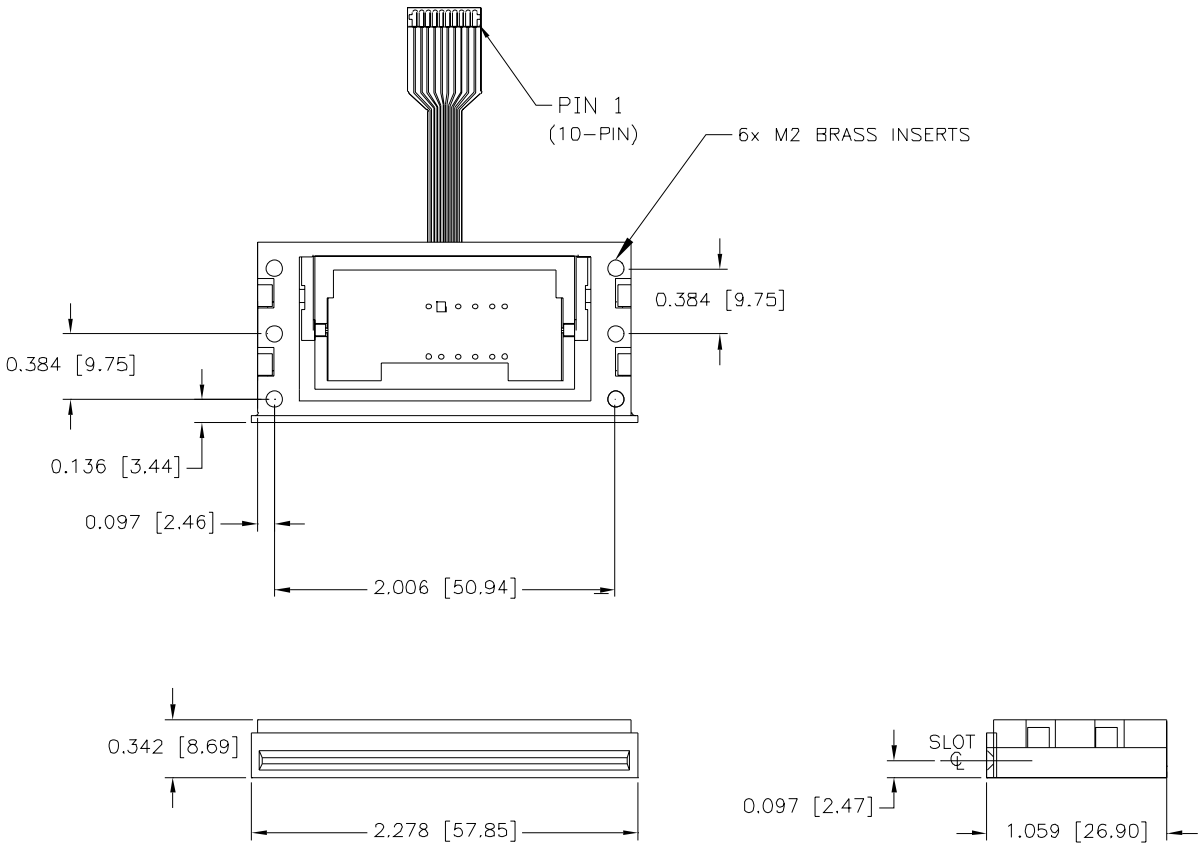
These signals are specified by ISO 7816 standards. Refer to the standards for specific information. Each signal is directly connected to the corresponding ICC contact through the Smart Card connector. There is a 2.2µf capacitor in parallel with C1 and C5 for power supply decoupling.

SW

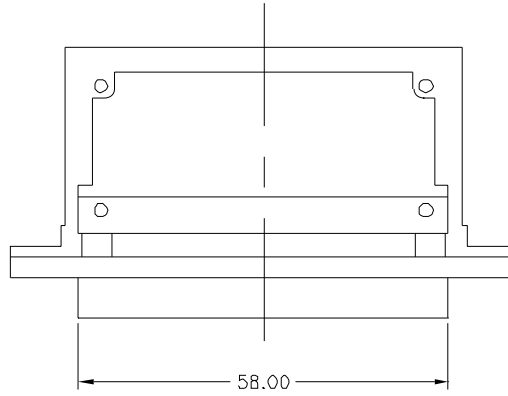
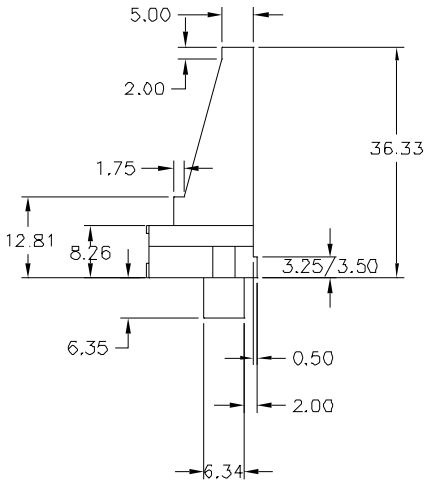
These two outputs provide a direct connection to the card seated switch. When a card is fully seated in the MiniSmart, the switch is closed and provides a contact connection between the two signal connections. The switch contacts will open before the ICC connector disconnects from the ICC contacts.

APPENDIX A

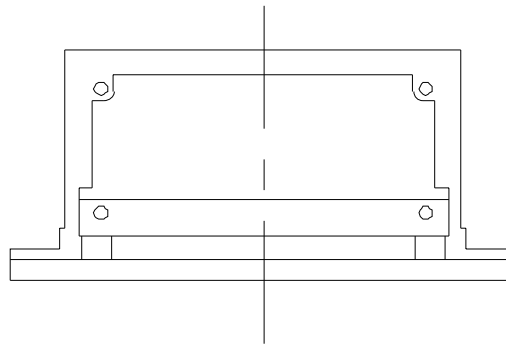
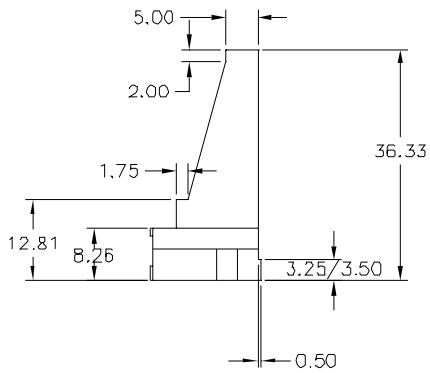
MECHANICAL OUTLINE DRAWING



BEZEL OUTLINE DRAWINGS



Standard Bezel



Flush Mount Bezel

APPENDIX B

REFERENCES

EMV CCS Europay-MasterCard-VISA, Chip Card Specifications
ISO 7816 ISO Standards for ICC (Smart Cards)

ABBREVIATIONS

CMOS	Complimentary Metal Oxide technology
EMV	Europay-MasterCard-VISA (technical consortium)
g	grams
IC	Integrated Circuit
ICC	Integrated Circuit Card (Smart Card or Memory Card)
in	Inches
ISO	International Standards Organization
mA	milliAmpere
mm	millimeters
msec	millisecond
oz	Ounces
μf	micro-Farads
VDC	Volts Direct Current

**We provide our customers with innovative products and superior services,
which makes ID TECH the obvious choice.**

ID TECH is an ISO 9001-2000 Registered Company

Please contact us:

**10721 Walker Street
Cypress, California 90630**

**PH +800 984 1010
PH +714 761 6368
FAX +714 761 8880**

**www.idtechproducts.com
sales@idtechproducts.com**