



SATURN 8700 Plus USB Specifications

Version 0.3f



Notice

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1 FCC Compliance

This device (Saturn 8700) complies with Part 15, of the FCC Rules and with Industry Canada's licence-exempt RSSs.

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

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. l'appareil ne doit pas produire de brouillage;
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

NOTE:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15, subpart C 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 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.



Changes or modifications in this equipment, not expressly approved by the party responsible for compliance (On Track Innovations Ltd,) could void the user's authority to operate the equipment.

This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numerique de la classe B est conforme a la norme NMB-003 du Canada.

Certificates identifiers:

FCC ID: JNX-OTI-SAT8700P

IC:10533A-OTISAT8700P

Responsible Party:

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4 Revision history

Version	Description	Date
0.1	First version	01-March-2017
0.2	OTI Internal review	20-March-2017
0.3	OTI new logo update	27-Nov-2017
0.3f	Updated FCC declaration	11-Dec-2017

5 Introduction

The Saturn 8700 Plus USB is a FeliCa and NFC contactless reader that includes a visual display and is compatible with EVA mounting standards.

The Saturn 8700 Plus USB is designed specifically for unattended retail environments and supports an extensive range of applications including vending machines, ticketing, toll roads, gaming and gambling machines, kiosks, access control, mass transit gates and more.

Saturn 8700 Plus USB plug-and-play design makes it easy to connect to any existing infrastructure, quickly upgrading it to contactless operations without disrupting ongoing business operations.



Figure 5-1: Saturn 8700 Plus USB

5.1 Supported Applications

The Saturn 8700 Plus USB supports the following contactless applications:

- **EMVCo**
 - Book A – Modular architecture - Certified
 - Book C kernel 2 - MasterCard
 - Book C kernel 3 – Visa
 - Book D – L1 certified
- **Apple Pay**
- **Android Pay**
- **Felica**
 - M-Class device certified
- **Technologies**
 - ISO/IEC 14443 Type A
 - ISO/IEC 14443 Type B
 - ISO/IEC 15693 Vicinity
 - Felica JIS: X6319-4
 - ISO 18092 Active P2P¹
 - Mifare Ultralight
 - Mifare Classic
 - Mifare DESFire²



¹ Supported by hardware. Please contact oti for latest status of firmware support.

² Supported by hardware. Please contact oti for latest status of firmware support.

5.2 Supported Standards

The SATURN 8700 PLUS USB is compatible with the following standards:

- FCC
- CE
- UL
- RoHS compliance
- ISO 9001: 2008
- ISO/IEC 18092
- ISO/IEC 14443 Type A&B
- ISO/IEC 15693
- Mifare
- IP65



6 Technical Specifications

6.1 Product Features

General

- Software configurable, certified smart reader
- oti advanced Host – Reader TLV based protocol
- Contactless transparent communication support
- Modular design by Hardware and Software
- Secured remote software update

RF Interface

- Bi-directional RF interface between Reader and Contactless devices
- Carrier frequency: 13.56 MHz
- Data rate: Up to 848Kbs
- Bluetooth v4.1 BLE (optional)

Communication Links

- USB 2.0 – full speed, HID, MSD

Connectors:

Mini USB

User Interface

- Character Display 2x16 (Japanese + English)
- 3 Push Buttons
- Indication LEDs:
 - 4 green LEDs for open loop payment
 - 2 blue + 2 red for FeliCa payment
 - 3 button indication LEDs
 - RGB LED on the contactless logo
- Audio: Speaker

Power Requirements

- USB bus powered
- 5VDC, 2.5W

SAM Interface

- Two micro SIM Slots

Security

- Cryptographic algorithms - 3DES, AES, RSA
- DUKPT (Derived Unique Key Per Transaction)
- Secure boot loader



Warning: Power supply minimum requirements

Keeping the DC supply voltage within the specified allowed range is crucial to guarantee proper operation of the equipment. The use of AC rectified power supply source, which is not properly filtered, forms a risk of too low voltage dips and hence should be avoided. It is highly recommended to check this issue with proper tools (e.g. oscilloscope) during the reader installation. For more details contact oti technical team via oti's sales representatives.

6.2 Product Technical Specifications

The performance/electrical specifications for each feature of the SATURN 8700 PLUS USB reader are given in the table [below](#).

Table 6-1: Performance/Electrical Specifications

Feature	Specification
■ RF Interface:	
RF Carrier Frequency	13.56 MHz
RF Output	450mW (@50ohm load)
■ Bluetooth	Bluetooth Low Energy (BLE) v4.1 (Optional)
■ Micro SIM Interface	
■ USB Communication:	
USB 2.0 Full speed	Composite HID, MSD
■ Connectors	
USB	Mini USB connector
■ Display:	
Character Display	2 lines of 16 characters each
Character set	Japanese Kana and Western Latin
■ Indicators:	
Monochrome LED	8 programmable on-board LEDs (GB GB GR GR)
Monochrome LED	3 button indication LEDs
RGB LED	Contactless logo illumination
Audio	Speaker
■ Electronic Board Power Requirements:	
5VDC, Pmax<2.5W	From USB bus in USB only
■ Mechanical:	
Dimensions (See Figure 8-1 Error! Reference source not found.)	H – 105.0 W – 85.0 D – 26.8
Weight (reader with gasket)	170 gr.
■ Temperature:	
Operating	-20°C to 70°C (-4°F to 158°F)
■ Environment:	
IP rating	IP65

7 Interface cable

The Saturn 8700 Plus USB uses standard USB cable (1.8m) with a mini-USB upstream connector on the reader side and a USB Type A downstream connector on the host side.

The reader is USB powered; no additional power supply is required.

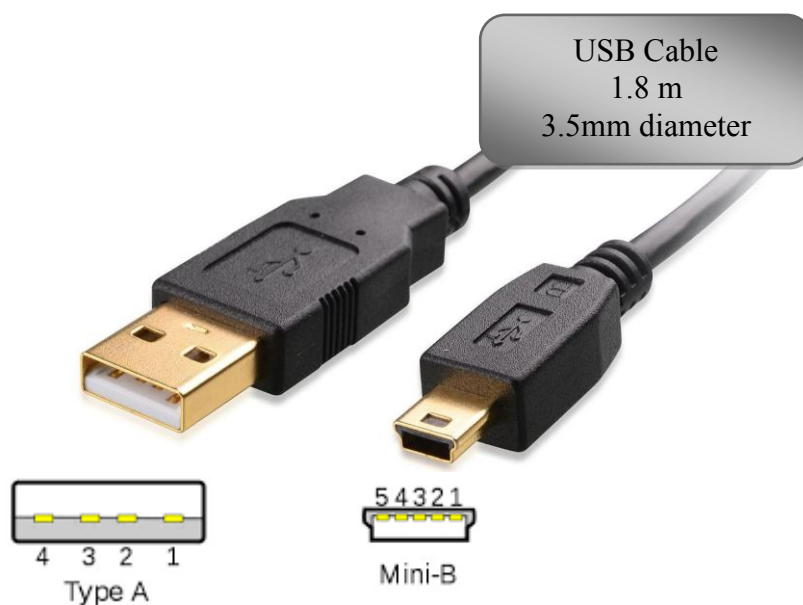


Figure 7-4: USB Cable

Host USB Downstream Connector		Reader Mini USB Upstream Connector	
VCC	1	1	VCC
D-	2	2	D-
D+	3	3	D+
GND	4	5	GND

Figure 7-5: USB Connection chart

8 Dimensions

The reader and the mounting bracket dimensions are given in the charts below.

All the dimensions are in millimeters.

8.1 Saturn 8700 Plus USB dimensions

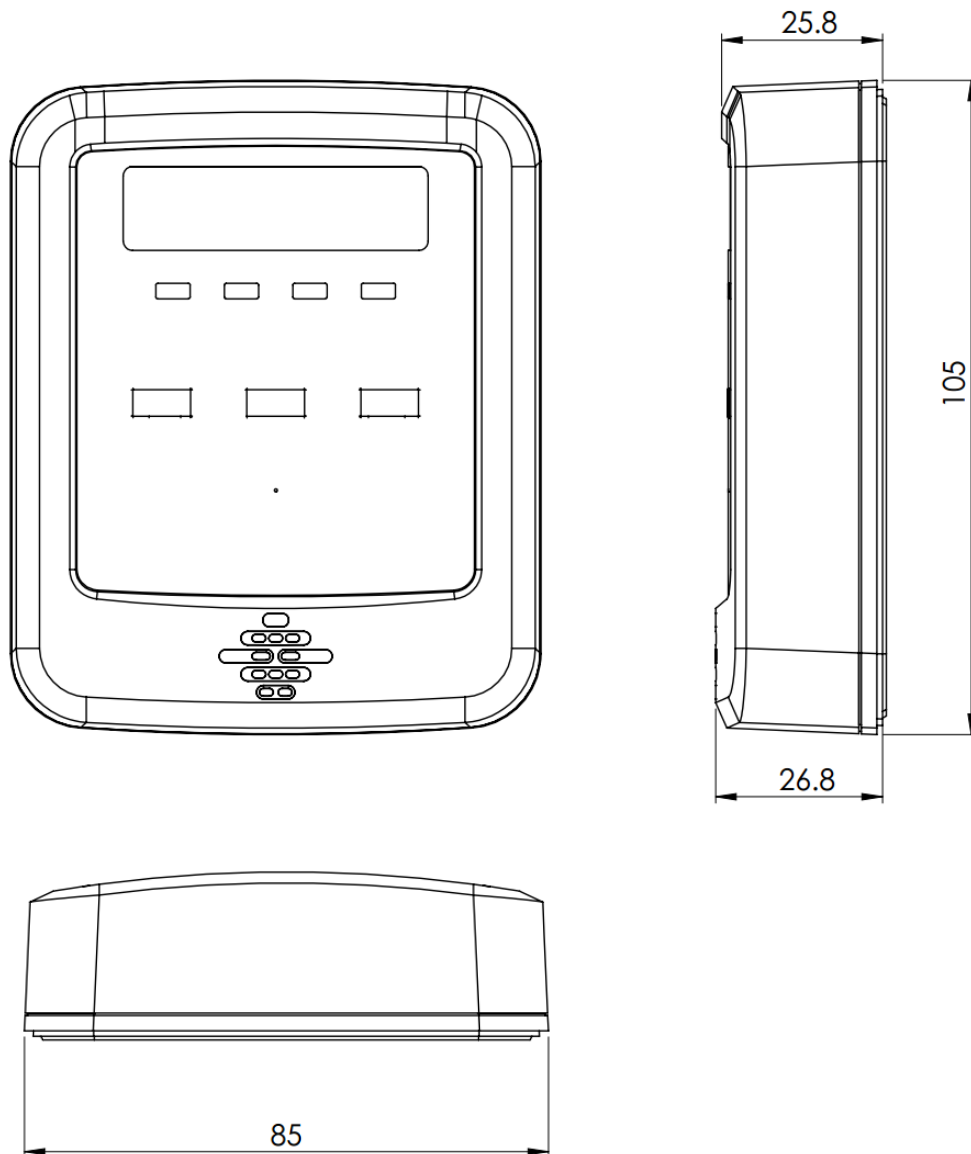


Figure 8-1: Saturn 8700 Plus USB reader dimensions

8.2 Mounting Bracket dimensions

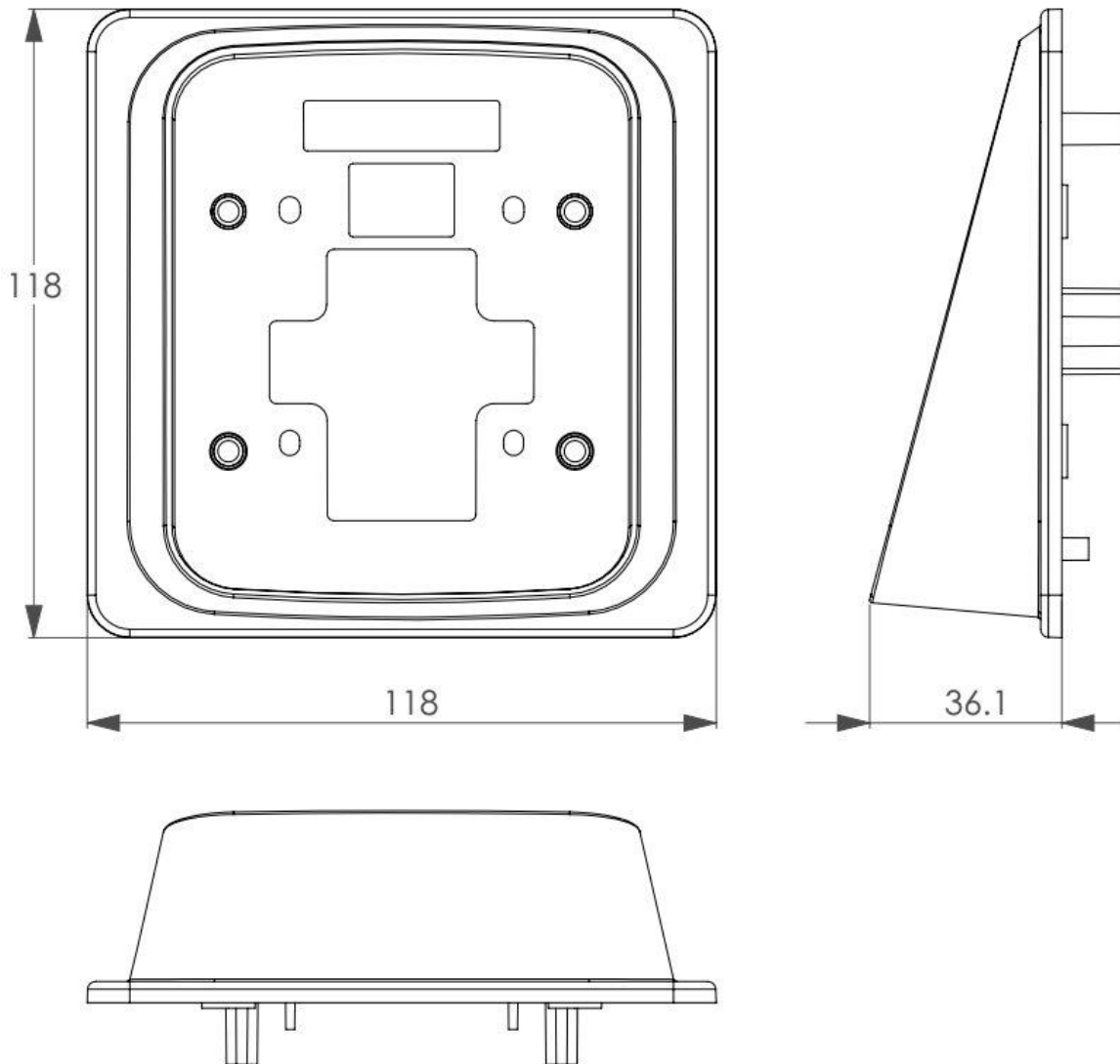


Figure 8-2: Saturn 8700 Plus USB mounting bracket dimensions

Note: The sealing gasket adds 1.1 mm to the depth, so the total maximum depth is 37.2 mm

9 Saturn 8700 Plus USB Mounting

Saturn 8700 Plus USB can be mounted to the vending machine with a angular mounting bracket. Both, the reader and the bracket supplied with a sealing gasket that prevents water leaking into the machine after mounting is completd.

9.1 Bracket Mounting

Using the special mounting bracket allows mounting the Saturn 8700 Plus USB at 15 degress from the mounting surface. The images below illustrates the Saturn 8700 Plus USB Bracket mounting.



Figure 9-1: Saturn 8700 Plus USB Bracket Mount

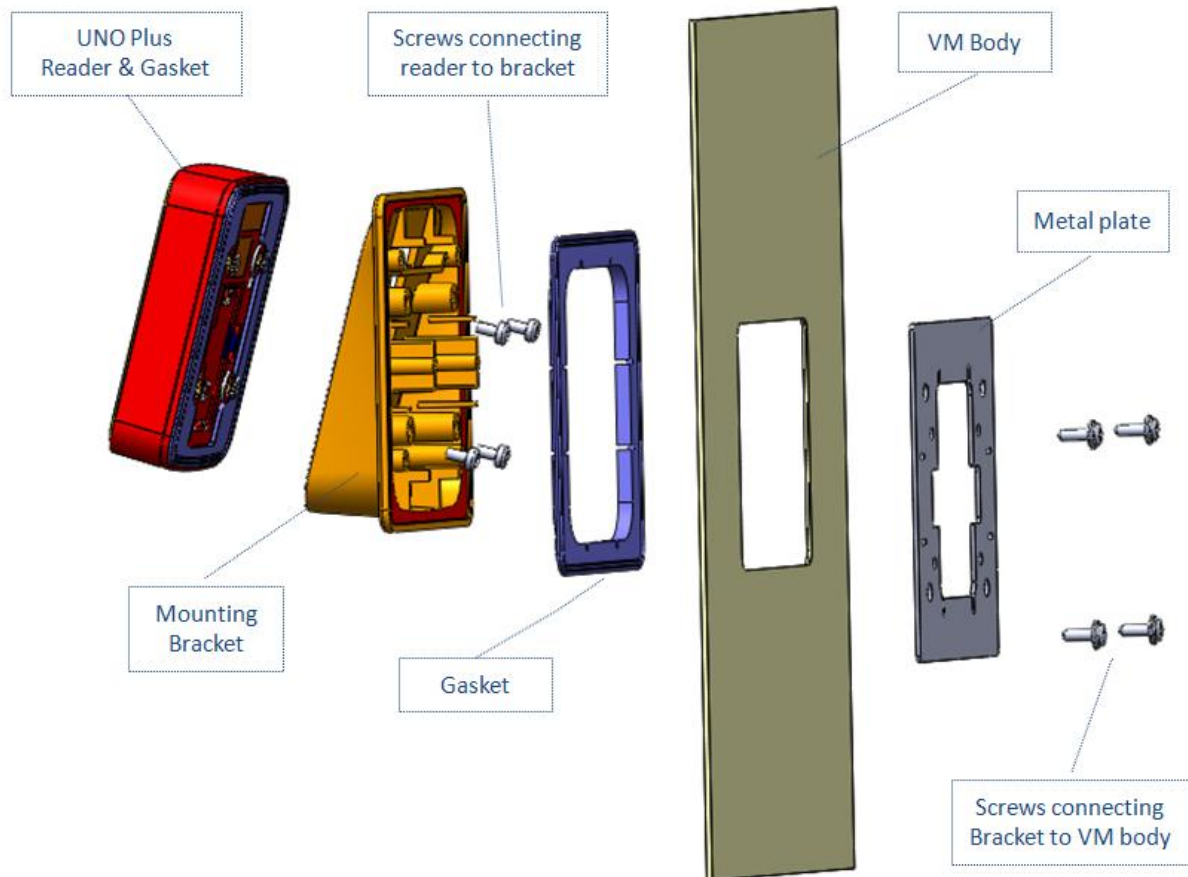


Figure 9-2: Bracket mount – explode view

The Bracket mounting option requires a 102x90 mm cutout in the vending machine front panel.

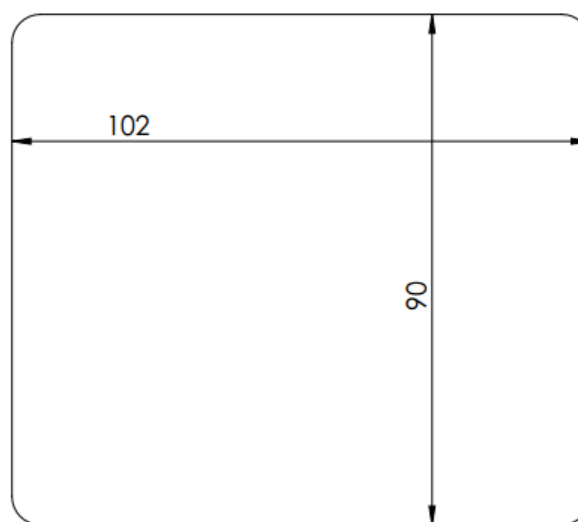


Figure 9-3: Bracket mount – vending machine panel cutout

A metal plate at the internal side of the vendig machines' panel is used for tightening the device to the panel.

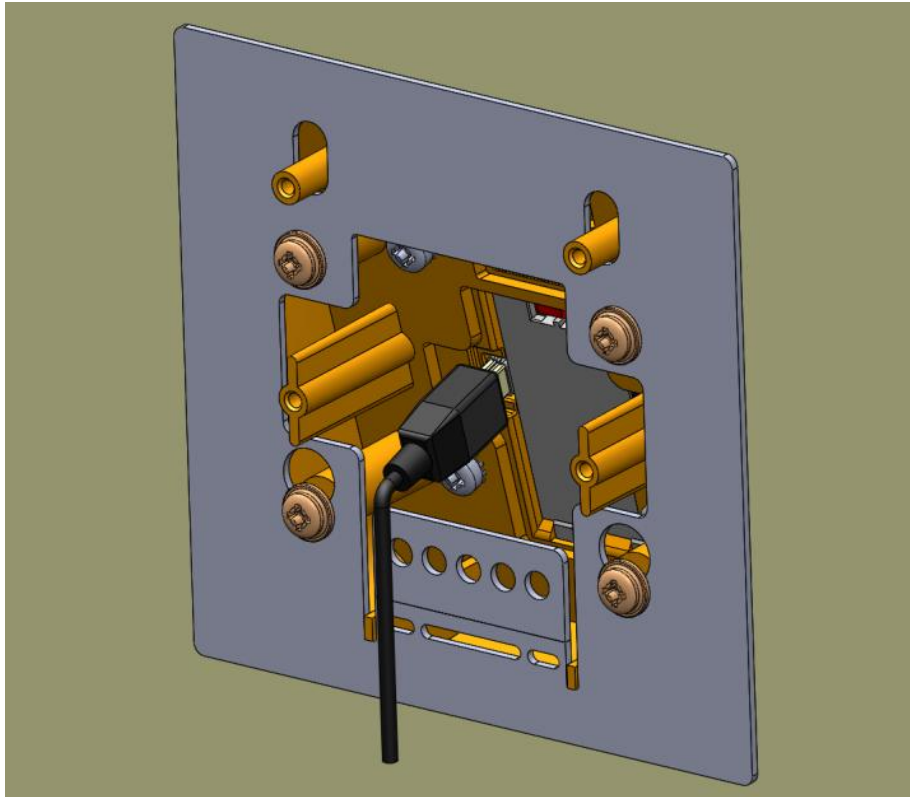


Figure 9-4: Bracket mount – Back View



10 Contact Us

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