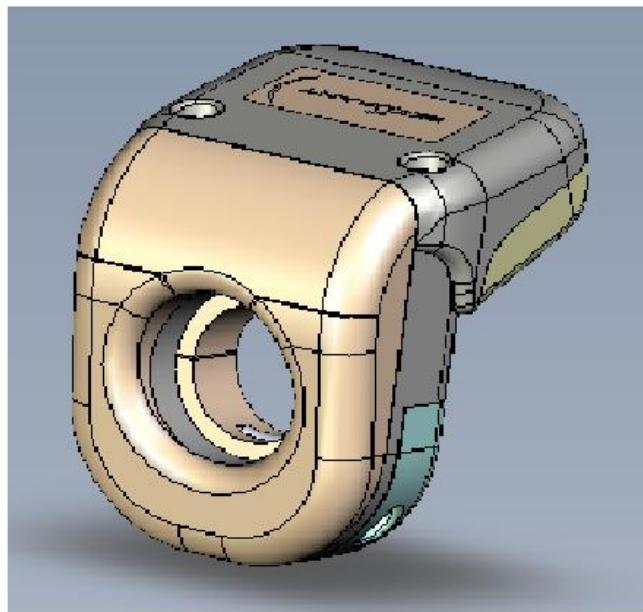


SecurNozzle Installation and Operating Manual



To prevent damage to the product or injury to yourself or others, read this manual in its entirety before using this equipment. Keep this manual where all those who use the product will read it. **SIGNIFICANT CONSEQUENCES COULD RESULT FROM FAILURE TO OBSERVE THE PRECAUTIONS LISTED IN THIS MANUAL.**

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Warning! Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

1. Safety First

The SecurNozzle is a convenient and effective part of the fuel control system but can be hazardous when used improperly. To avoid injury to yourself or others, please review the following information before using the SecurNozzle.

1.1. ***Installing and Uninstalling the SecurNozzle Battery***

Batteries may leak or explode if improperly handled. Observe the following safety precautions when handling the SecurNozzle battery:

- The SecurNozzle battery must be installed and uninstalled only by a Securant Certified Technician. Installing or uninstalling of the SecurNozzle battery by other than a Securant Certified Technician can be DANGEROUS.
- Installing or uninstalling batteries in proximity to fueling facilities is DANGEROUS. DO NOT install or uninstall the SecurNozzle battery on fueling station premises or within 300 feet of a fuel pump.
- SecurNozzle batteries must be installed or uninstalled only by Securant Certified Technician in a Technical Service Center not in close proximity to fueling facilities. Technical Service Centers must be technically prepared for battery installations and void of any explosive materials. Temperature in the Technical Service Center must be within the range of 0°C to +50°C (32°F to 122°F).
- Only use batteries specifically approved for use in the SecurNozzle.
- Do not short or disassemble the battery.
- Do not attempt to insert the battery upside down or backwards.
- Do not expose a battery to fire or extreme heat.
- Do not immerse in or expose the battery to water.
- Do not transport or store the battery with metal objects.
- Do not drop the battery.
- Batteries are prone to leakage when fully discharged. To avoid damage to the SecurNozzle, the battery should be removed from the SecurNozzle when no charge remains.
- Discontinue use immediately should you notice any changes in the battery, such as discoloration or deformation.
- Do not allow bridging of battery contacts (wires) with conductive (metallic) objects.



A recyclable lithium battery powers this device. Please call 1-800-8-BATTERY for information on how to recycle a battery.

1.2 USING THE SECURNOZZLE

Observe the following safety precautions when handling the SecurNozzle:

- Use this product only for its intended use as described in this manual.
- Do not use batteries or other components not specifically approved by Securant.
- Discontinue use immediately in the event of malfunction.
- In the event of malfunction or breakage due to drops or other accidents, the product should be repaired only by a Certified Securant Technician.
- In the event you observe an unusual behavior of the SecurNozzle, disconnect the SecurNozzle unit. Continued operation could result in injury.
- Do not disassemble the SecurNozzle. Touching internal parts could result in injury.

2. NOTICES

- Securant reserves the right to change the specifications described in this manual at any time without prior notice.
- Securant will not be held liable for any injury or damages resulting from the use of this product.

3. Introduction

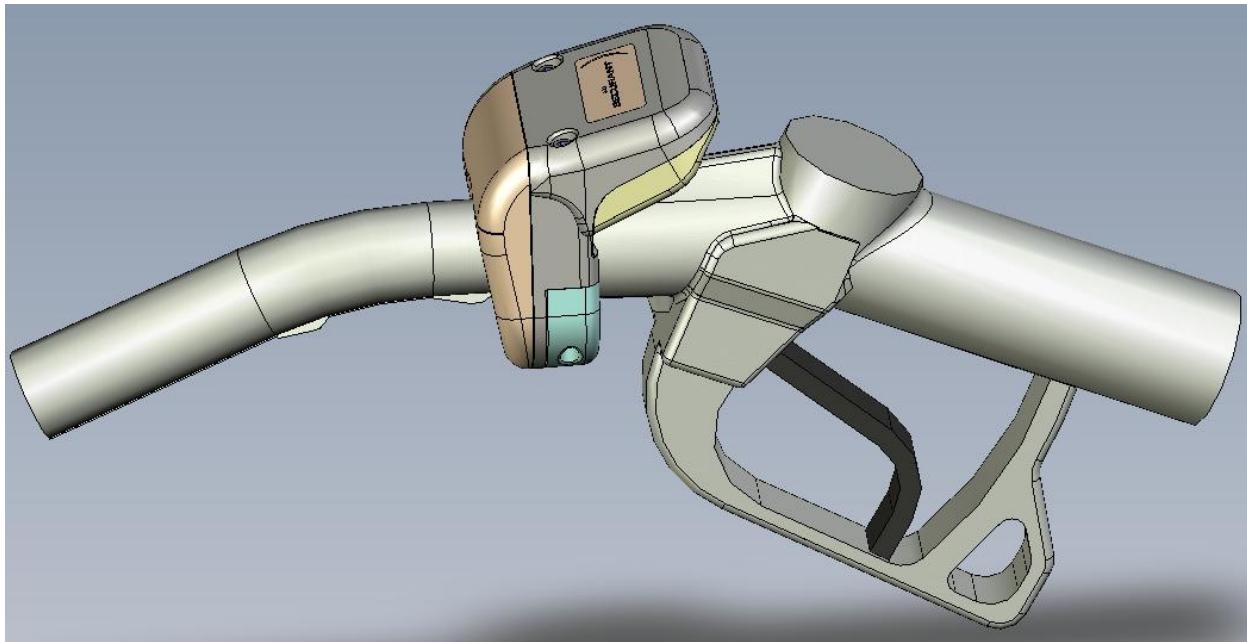


Figure1. SecurNozzle installed on a pump nozzle.

3.1. *Device Short Description*

The SecurNozzle is part of the wireless control mechanism of FuelSafe, Securant's fuel control system.

The SecurNozzle is installed on the fueling nozzle. It is a battery-operated device that reads the information from a 125 KHz RFID tag installed on the fuel inlet of the vehicle and transmits this vehicle identification information using 2.4GHz ZigBee 802.15.4 communication to the Secur-e-Pump – the main device of the Fuel Control System.

3.2. *System Organization*

FuelSafe is a multidisciplinary system for fuel station automation based on wireless communication. FuelSafe uses two major wireless communication technologies:

- ZigBee 802.15.4
- RFID 125KHz communication

The basic FuelSafe system includes the following products:

- SecurPC: Standard PC with proprietary SW

Securant Fueling Systems (Israel) Ltd.
Tel: +972 (0)3 6894550; Fax: +972 (0)3 6894540.
55 Igal Alon St., Tel-Aviv 67891, ISRAEL

- SecurGate (Access Point): ZigBee 802.15.4, connected to the SecurPC
- Secur-e-Pump Fuel pump controller: The Secur-e-Pump consists of a communication router including ZigBee communication, internal Power Supply, 220V relays for mechanical pump and a central controller. Each Secur-e-Pump possesses Full Function Device (FFD) capabilities (of the ZigBee). Each SecurNozzle possess Reduced Function Device (RFD) capabilities.
- SecurNozzle: The SecurNozzle is a unit that reads an RFID tag installed on the fuel inlet of a vehicle and transmits the vehicle ID number through a ZigBee port to the Secur-e-Pump. The SecurNozzle is powered with a 3.6 V standard Lithium battery.
- SecurRing: The SecurRing is an off-the-shelf RFID tag device. The SecurRing is installed on the fuel inlet neck of the vehicle. It is a passive unit that receives energy from the SecurNozzle and transmits data back to the _____.
- SecurTag: The SecurTag is installed on the vehicle's inside front window. The SecurTag communicates through ZigBee with the Secur-e-Pump. The SecurTag is powered by a 3.6 V standard Lithium battery.

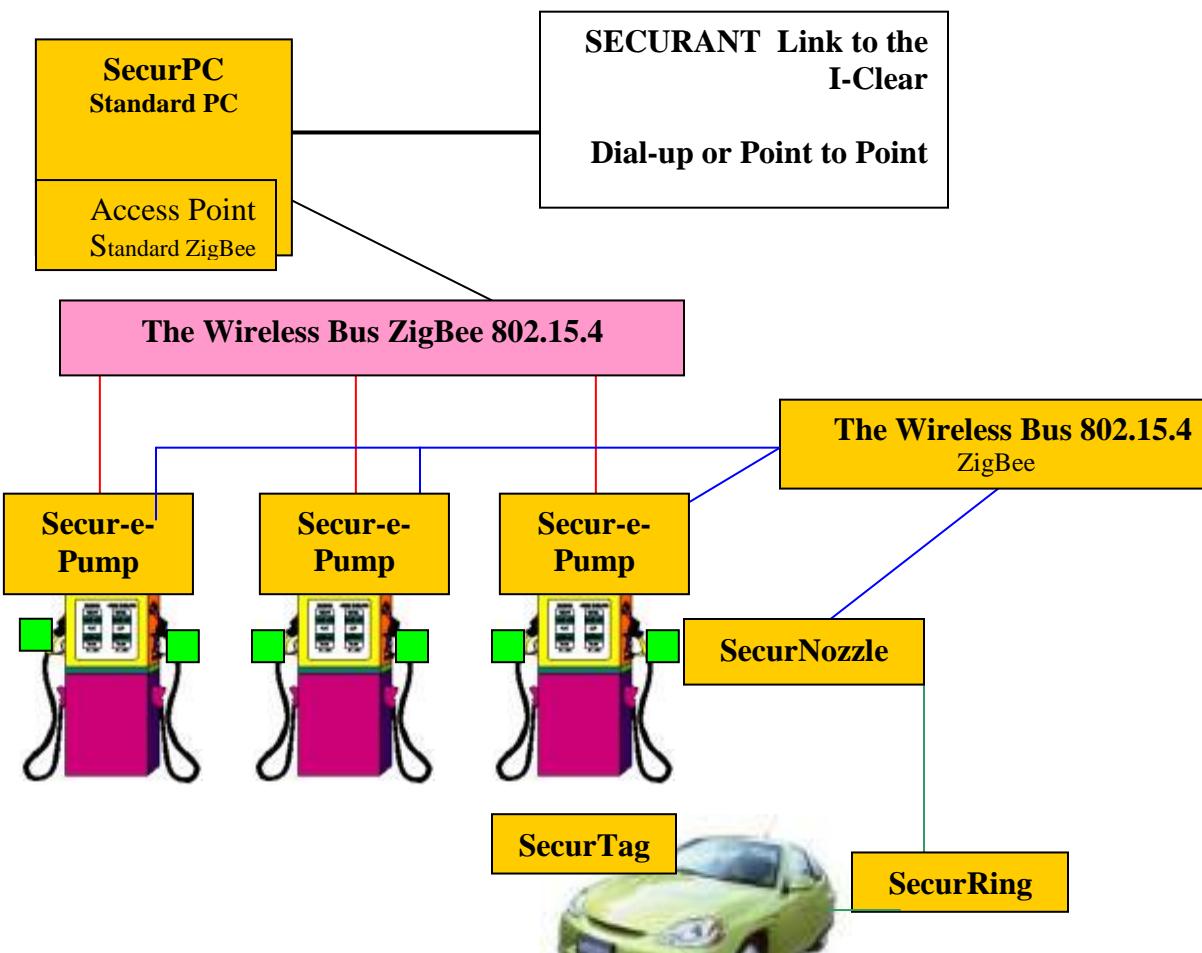


Figure 2: Securant System Illustration

4. SecurNozzle Functional Description

4.1. SecurNozzle Key Features

4.1.1. Accelerometer

The SecurNozzle accelerometer is a two-axis +/- 2g/6g linear accelerometer directly interfaced to the SecurNozzle main controller. The SecurNozzle accelerometer is a motion sensor used to activate the system from its power-saving sleep mode.

4.1.2. RF-ID Reader

The SecurNozzle RF-ID reader is a standard 125kHz reader with generic 100kHz to 150kHz range and communication range of 10cm which uses “Half duplex – full hand shake” transaction protocol. When activated, the RF-ID reader searches for a Transponder (RF-ID passive tag).

4.1.3. ZigBee Module

The SecurNozzle wireless communication ZigBee module is based on the Ember EM250 chipset, a true single-chip 2.4 GHz IEEE 802.15.4 compliant RF transceiver with MAC support. The Zigbee module complies with worldwide regulations covered by EN 300 440 (Europe), CFR47 Part 15 (US) and ARIB STD-T-66 (Japan) and is designed for low-power, low-voltage wireless applications.

The ZigBee module was developed for use in fuel station wireless network communication and data transfer.

4.2. System Regular Functionality

The FuelSafe system authorizes fueling transactions after reading a vehicle’s ID, transmitting the ID data to the pump, communicating through a SecurPC to Securant’s system and receiving authorization for the initiation of a fueling transaction.

More specifically, the system operates as follows:

A client vehicle arrives at a fuel station.

The vehicle driver removes the SecurNozzle from its place and inserts it into the vehicle's fuel tank neck.

Environmental Endurance Conditions	
The Accelerometer “wakes up” the SecurNozzle and initiates communication with the SecurNozzle – Secur-e-Pumpnetwork.	

Utilizing the RF-ID Reader and Zigbee module, the SecurNozzle reads the vehicle's unique ID number and transmits the vehicle's ID to the _____ network for fueling authorization.

Each Secur-e-Pump acts as a local coordinator for several nozzles.

The Secur-e-Pump unit senses the environment while searching for Nozzles requesting beacons. When a valid request is located, the Secur-e-Pump acknowledges the SecurNozzle with a beacon and a data exchange initiates.

The RF-ID Reader communicates with the RF-ID tag Transponder, reads its unique ID and transfers the data to the Secur-e-Pump controller. The transponder is a device attached to the vehicle's fuel tank that contains data to uniquely identify the vehicle. The vehicle data is periodically read by the proximity reader.

Upon confirmation that the vehicle is authorized to receive fuel, the fueling transaction is authorized and fuel can be dispensed into the authorized vehicle.

4.3. *Environmental Description and Regulations*

Operating Temperature	From -40°C to 80°C
Storage Temperature	From -40°C to 100°C
Relative Humidity	< 97% non-condensing, IEC 68-2-30
Environmental Safety	
Intrinsic Area regulation standards	EN 60079, UL 913, CSA C22.2 No. 157 3 rd Ed Intrinsic Safety for Hazardous Location
Electromagnetic compatibility regulations	ETSI EN 300 330-V1.3.1 (2001-06) and ETSI EN 300 330-V1.1.1 (2001-06).
Mechanical Endurance	
Mechanical Vibration endurance standard	IEC 68-2-6, Test Fc; 20 g, 20 - 500 Hz, 3 axes, 10 cycles per axis
Mechanical Shock endurance standard	IEC 68-2-27, Test Ea; 200 g, half sine, 3 ms, 3 axes, 6 shocks per axis

5. Installing, Starting and Stopping the SecurNozzle

The SecurNozzle and all of its components, including the battery, must be assembled, disassembled, installed or uninstalled only by Securant Certified Technician. Installing or uninstalling of the SecurNozzle or any SecurNozzle component, including the battery, by other than a Technician can be DANGEROUS and immediately voids all product warranties.

5.1. *Installing the Battery on SecurNozzle*

The SecurNozzle battery has to be assembled in the SecurNozzle and replaced only by a Securant Certified Technician specially instructed in this function. The battery should be installed or uninstalled only in a Technical Service Centers specially equipped for this installation and located a minimum of _____ feet from any fueling facility. .

Battery installation must be performed in accordance with the SecurNozzle manufacturing instructions utilizing proper parts and materials as defined by the SecurNozzle Bill of Materials including certified sealing material, glue and screws.

Only batteries defined in the SecurNozzle Bill of Materials should be installed in the SecurNozzle. Installation of any battery other than a battery specified in the SecurNozzle Bill of Materials can be DANGEROUS and may cause injury.

SecurNozzle Battery Assembly

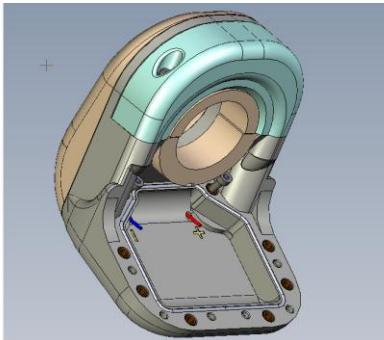


Figure 3: SecurNozzle

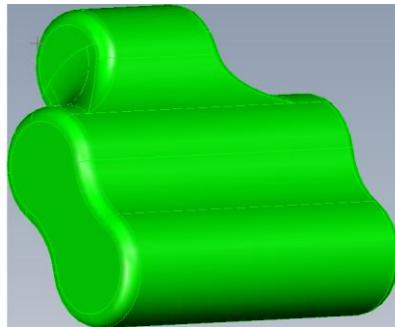


Figure 4: SecurNozzle Battery

Step 1: Solder two battery wires to SecurNozzle wires – Red to the Red and Black to the Black. Isolate soldered wire places with heat-shrinks.

Step 2: Place the battery into the SecurNozzle as indicated in Figure 5.

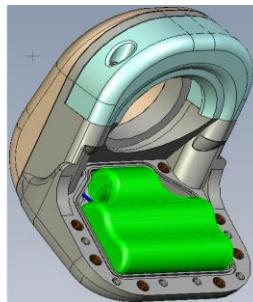


Figure 5: SecurNozzle with battery in place

Step 3: Add sealing and glue to cover the contact surfaces of the SecurNozzle and battery cover.

Step 4: Place the battery cover in its place as indicated in Figure 6.

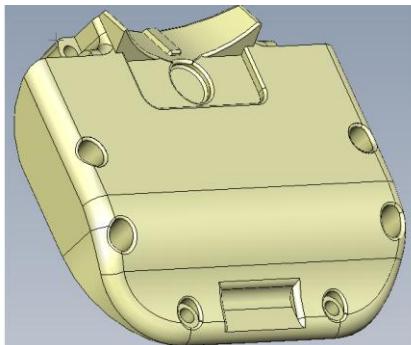


Figure 6: SecurNozzle Battery Cover

Step 5: Fasten the battery cover utilizing the six screws.

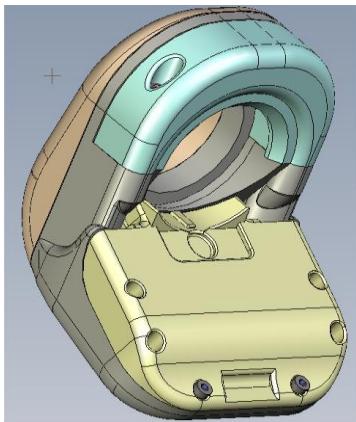


Figure 7: _____

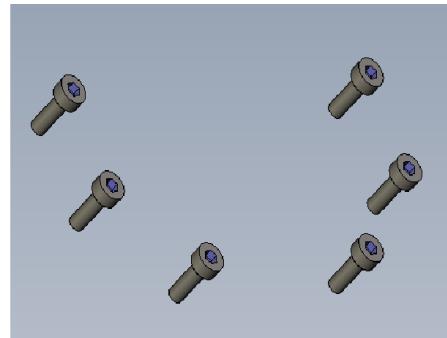


Figure 8: SecurNozzle Screws

5.2. *SecurNozzle Pre-Installation Verification*

The SecurNozzle must be verified immediately after the battery assembly is complete, and prior to installing the SecurNozzle on a fuel pump.

The verification is performed using Securant's SecurNozzle verification PC program, with the assistance of the SecurPC and SecurGate.

5.3. *Installing the SN on fuelling station*

The SecurNozzle device assembled with the battery and verified by the SecurNozzle verification PC program is ready for installation on a fuel pump nozzle.

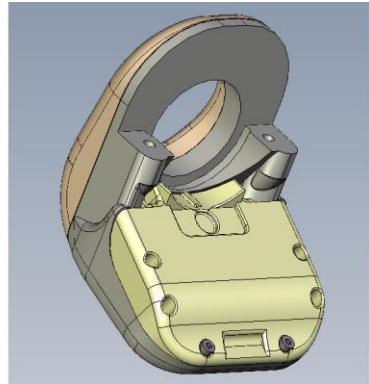


Figure 9: SecurNozzle

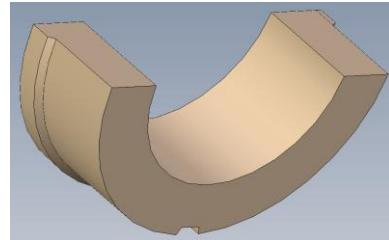


Figure 10: Rubber Insert

Step 1: Place the rubber insert into the SecurNozzle as indicated in Figure 11.

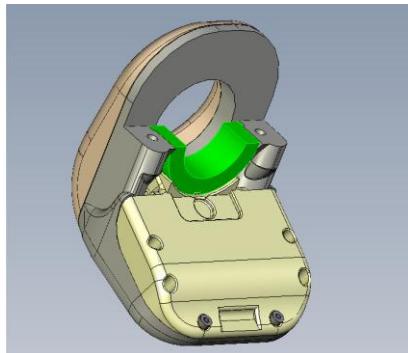


Figure 11: SecurNozzle with Rubber Insert in place

Step 2: Insert the SecurNozzle over the nose of a nozzle as indicated in Figure 12.

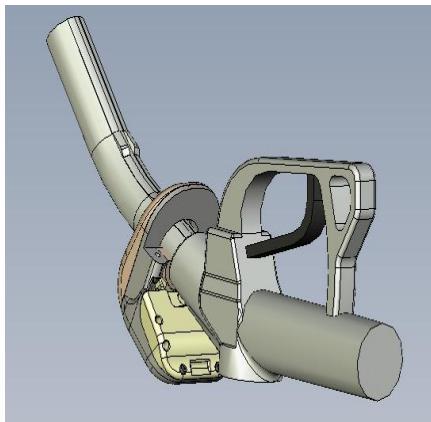


Figure 12: SecurNozzle on fuel nozzle

Step 3: Attach the second rubber insert as indicated in Figure 13.

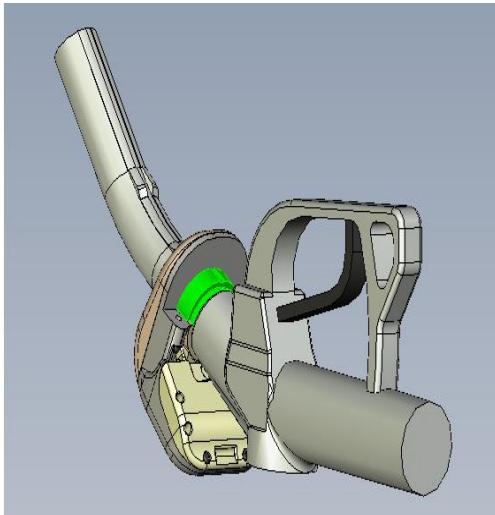


Figure 13: SecurNozzle with second rubber insert

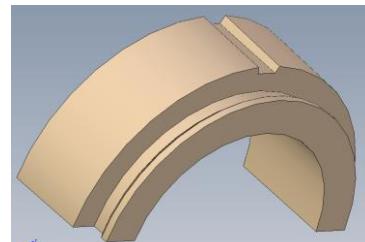


Figure 14: Rubber Insert

Step 4: Place the plastic bracket on the SecurNozzle and secure in place with the screws as indicated in Figure 15.

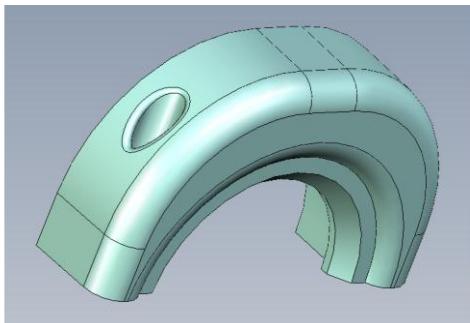


Figure 15: Plastic Bracket

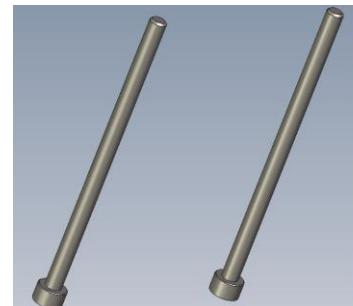


Figure 16: Plastic Bracket Screws

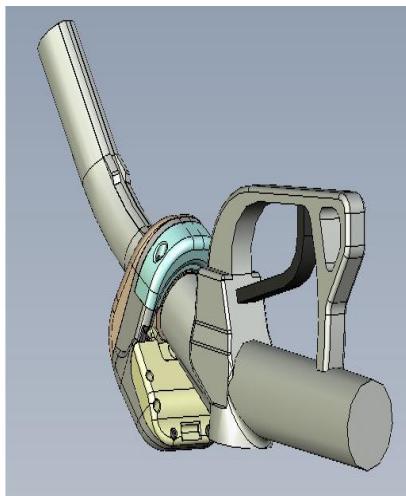


Figure 17: Completely Assembled SecurNozzle

5.4. *Starting the SecurNozzle*

Insert the SecurNozzle into a vehicle's fuel tank neck equipped with an RF-ID tag. Confirm that the pump's display indicates the correct vehicle identification data (registration number, etc).

5.5. *Stopping and Suspending the SecurNozzle*

The SecurNozzle device can be uninstalled by a Securant Certified Technician by following the installation instructions in reverse order and returned to a Technical Service Center for necessary maintenance.

6. Using the SecurNozzle

The SecurNozzle fueling system is used just like a regular fuel nozzle by inserting the nozzle into a vehicle fuel tank neck and initiating fueling.

Caution: Do not allow the SecurNozzle to contact metal or metal content material as it may interfere with the wireless communication devices controlling the fueling process.

7. Limited One-Year Warranty

This product is warranted to be free from defects in materials or workmanship for a period of one (1) year from the original purchase date. For a period of one (1) year from the date of original purchase of the product, Securant will, at its option, either (1) repair the product or (2) replace the product with a comparable model. These remedies are the exclusive remedies under this warranty.

This warranty does not cover damage resulting from misuse, abuse, accident, the attachment of unauthorized accessories, alteration to the product, improper installation, unauthorized repairs or

improper service, malfunction or damage of an operating part from failure to provide the manufacturer's recommended maintenance or any other damage or loss caused by anything other than defects in material or workmanship during ordinary consumer use. This warranty does not cover loss of use during the period the products is at a repair facility or otherwise awaiting repair.

This warranty is invalid if the product has been altered in any manner or serviced by anyone other than a Securant Certified Technician.

THE WARRANTY PROVIDED HEREIN SHALL BE THE SOLE AND EXCLUSIVE WARRANTY. THERE SHALL BE NO OTHER WARRANTIES EXPRESS OR IMPLIED INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE OR USE OR ANY OTHER OBLIGATION ON THE PART OF SECURANT WITH RESPECT TO THE PRODUCTS COVERED BY THIS WARRANTY. SECURANT SHALL HAVE NO LIABILITY FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES. IN NO EVENT SHALL THIS WARRANTY REQUIRE MORE THAN REPAIR OR REPLACEMENT OF ANY PART OR PARTS FOUND TO BE DEFECTIVE WITHIN THE EFFECTIVE PERIOD OF THIS WARRANTY. IF REPLACEMENT PARTS FOR DEFECTIVE MATERIALS ARE NOT AVAILABLE, SECURANT RESERVES THE RIGHT TO MAKE PRODUCT SUBSTITUTIONS IN LIEU OF REPAIR OR REPLACEMENT.

This warranty provides you with specific legal rights. You may have additional rights which may vary from country to country. Because of individual country regulations, some of the above limitations and exclusions may not apply to you.

8. FCC data

Contains: FCC ID: **WZOSNSIV10**

THIS DEVICE COMPLIES WITH PART 15 OF FCC RULES.

OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS.

- (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.
- (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATIONS.