

# Technical Disclosure Commons

---

Defensive Publications Series

---

November 2021

## SEMI-PERMANENT SIM LOCKING DESIGN

HP INC

Follow this and additional works at: [https://www.tdcommons.org/dpubs\\_series](https://www.tdcommons.org/dpubs_series)

---

### Recommended Citation

INC, HP, "SEMI-PERMANENT SIM LOCKING DESIGN", Technical Disclosure Commons, (November 15, 2021)

[https://www.tdcommons.org/dpubs\\_series/4716](https://www.tdcommons.org/dpubs_series/4716)



This work is licensed under a [Creative Commons Attribution 4.0 License](https://creativecommons.org/licenses/by/4.0/).

This Article is brought to you for free and open access by Technical Disclosure Commons. It has been accepted for inclusion in Defensive Publications Series by an authorized administrator of Technical Disclosure Commons.

## ***Semi-Permanent SIM Locking Design***

### **Abstract**

A SIM is used to authenticate a device with the cellular network. Depending on the end user and product design form factor SIMs maybe placed in different places.

Typically, a SIM device is designed into a product to provide a balance between convenience and security. For example, a user may want the convenience to “swapping” out the SIM easily, but at the same time wants to secure the SIM and prevent it from being removed by others easily. Many consumer devices such as cell phone, tablets and/or notebooks have very highly integrated form factor which do not allow for the user to typically open the device and access the inner components. For SIM installation, these devices typically have the SIM externally available for the user to install the SIM, however this convenience also imposes a security risk, as the SIM device is also easily accessible to others wanting to take or even maliciously swap the SIM card.

In a notebook form factor, where a design may want convenience for first time SIM install and then want the SIM to be secured and locked afterward, we present this solution to cover both aspects in a single design.

### Typical SIM Tray Design

SIM trays are typically designed with a recessed portion that allows the SIM to be constrained to the tray and not move around.

This same basic SIM slot design solution is being leveraged by the solutions described below in that once the SIM is placed in the SIM tray it will not move around, since it has a recessed area where the SIM will sit firmly once placed in the tray and not allowed to move in any XY direction.

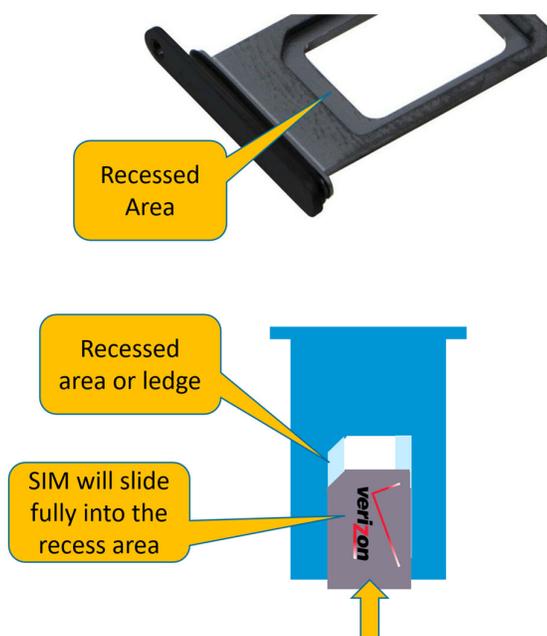


Figure 1: Shows a typical SIM tray design on a modern computing device

### Unique Lockable SIM solution

The original design allows a user to have push/push access to the SIM. However, this is not very secure as anyone can access the slot from outside the unit and remove the card or replace it with a different insecure network. Some slots even provide a small pinhole, that is used to trigger the eject mechanism, but here again anyone with a SIM key or even a paper clip can easily gain access to the SIM slot.

Our solution allows for a user to install the SIM and lock it in place. Once the SIM tray is installed with SIM in the unit, it can be locked into the unit. Multiple variants of this design are described below.

- **Single Insertion Lock design** – This would allow users to choose between original design (push/push) and a lockable first-time design. Likely the vendor would be provided SIM tray option in the box at time of purchase. Once user installs the SIM in SIM trays and inserts into platform, it can no longer be removed without opening the unit. This prevents access to swapping/removing the SIM without a much more intensive activity. Thereby making the SIM more secure from theft.

- **Interior Lock design** – Requires unit to be opened first and then locked in place. Benefit of this design is that only a single tray is needed to be placed in the unit. Like above, however this solution requires the user to open the unit install the SIM and SIM tray and then lock it into place.
- **First Time Locking** - This solution is more of an automated solution. It allows for a push/push design to allow the tray can be ejected using push/push from the exterior of the unit if no SIM is installed in the tray. However, once a SIM is inserted in the tray it will cause the SIM tray to be lockable. To unlock the SIM, the unit must be opened, and the tabs depressed to release. The benefit of this design is that a single SIM tray can be used for easy access (push/push) from outside of unit, and then once SIM is installed it becomes locked.

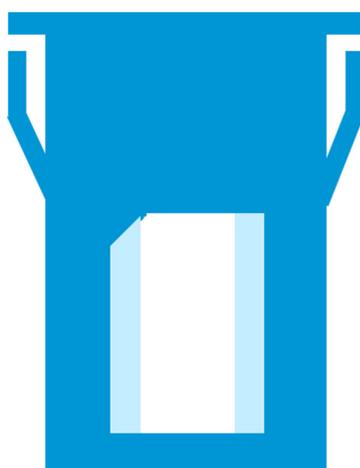


Figure 2: This is a sample drawing of a “Single Insertion Lock” SIM tray design, where once installed the SIM will lock itself into the unit.

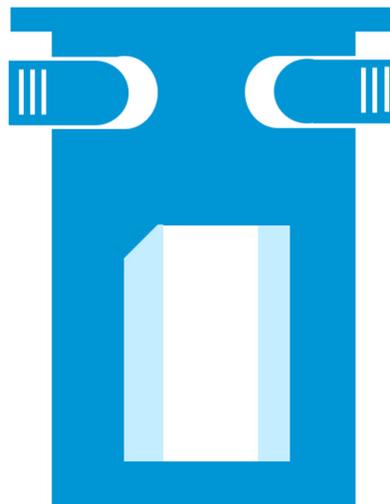


Figure 3: This is a sample drawing of an “Interior Lock” SIM tray design, where once installed the SIM tray can be locked from inside the unit.

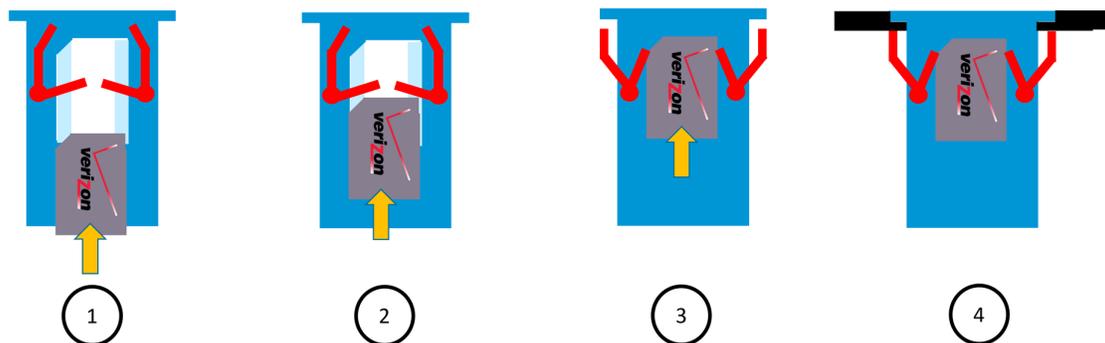


Figure 4: This is a sample drawing of a “First Time Lock” SIM tray design, where the SIM is detected mechanically in the SIM tray. Once the tray (with SIM) is installed in the unit, it will lock itself into the unit. Step 1, SIM is placed into SIM tray. Step 2, SIM begins to trigger the locking fingers. Step 3, the locking fingers on the SIM tray are completely extended. Step 4, the SIM tray is installed and automatically locked into the unit.

*Disclosed by Isaac Lagnado and Danny Farnyih Meng, HP Inc.*