



## mSATA SSD as Additional Storage

This section contains the following topics:

- [mSATA Overview, on page 1](#)
- [IR829M SKUs, on page 1](#)
- [Using the mSATA SSD, on page 2](#)
- [Displaying the Wear Leveling Data for the mSATA SSD, on page 3](#)
- [IR829M: MIB support for mSATA Wear Ratio and Usage, on page 3](#)
- [IR829M OIDs, on page 5](#)

## mSATA Overview

Previously, IR829 IOx/Guest-OS legacy systems on which end users can host applications, came with a disk storage of 4GB to store user data. Functionality has been added to the IR829 product line with new SKUs allowing for an mSATA SSD to add 50 GB or 100 GB of available storage.

The pluggable mSATA cards are NOT hot-swappable, the device must be powered down to install or remove it. The cards are installed in the mSATA slot (formerly known as Limited Modularity slot). Additional details are available in the Cisco IR829 Industrial Integrated Services Router Hardware Installation Guide: <https://www.cisco.com/c/en/us/td/docs/routers/access/800/829/hardware/install/guide/829hwinst.html>



**Note** The mSATA SSD is accessible only from IOx, not IOS. For IOx CLI operation, see the command set available in the following section of the Software Configuration Guide: [https://www.cisco.com/c/en/us/td/docs/routers/access/800/829/software/configuration/guide/b\\_IR800config/b\\_guestos.html](https://www.cisco.com/c/en/us/td/docs/routers/access/800/829/software/configuration/guide/b_IR800config/b_guestos.html)



**Note** As with any IR800 platform, for IOx, use the Fog Director or Local Manager to install applications and access the new mSATA disk storage provided on IR829M PIDs.

## IR829M SKUs

The IR829M SKUs provide the following capabilities:

- Integrated Storage and Compute for IOx Edge application
- 100GB / 50GB industrial grade mSATA SSD integrated storage for IR829
- Integrated PoE to power up to four IP devices such as IP cameras
- Single & Dual LTE WAN redundancy with high reliability
- Dual Band WiFi connectivity
- Advanced routing based on signal strength, cellular technology, etc.
- Ignition Power Management to reduce downtime
- GPS for location-based services Accelerometer and Gyroscope for vehicle/driver safety
- Integrated storage has Industrial, Automotive, Railway, Marine and Military certifications

The IR829 SKUs are available in the following product IDs:

- IR829M-2LTE-EA-\*K9 (Dual LTE)
  - Dual LTE IR829 with mSATA SSD connector and POE
  - US, Canada and Europe
- IR829M-LTE-EA-\*K9 (Single LTE)
  - Single LTE IR829 with mSATA SSD connector and POE US, Canada and Europe

## Using the mSATA SSD

Functionality-wise, there are no configuration and troubleshooting differences to the end-user in IOS or IOx, with or without mSATA. The system simply recognizes the additional storage. There are some CLI commands that will show information that pertains to the mSATA storage. Examples are show inventory, and show platform msata.

```
IR829#show inventory
NAME: "IR829M-2LTE-EA-EK9", DESCR: "IR829M-2LTE-EA-EK9 chassis"
PID: IR829M-2LTE-EA-EK9, VID: V01, SN: FGL214591HB
NAME: "IR800-IL-POE", DESCR: "POE module"
PID: IR800-IL-POE, VID: V01, SN: FOC21452WHT
NAME: "mSATA module", DESCR: "mSATA module 100G"
PID: IR-SSD-mSATA-100G, VID: V00, SN:
NAME: "Modem in slot 0 on Cellular1/0", DESCR: "Sierra Wireless MC7455 4G-EA"
PID: MC7455, VID: 1.0, SN: 352009080067148
NAME: "1000BASE-T SFP", DESCR: "1000BASE-T SFP"
PID: GLC-TE, VID: G3., SN: AVC193822W4
NAME: "Modem in slot 1 on Cellular0/0", DESCR: "Sierra Wireless MC7455 4G-EA"
PID: MC7455, VID: 1.0, SN: 352009080067155
```

In the above example, note that the IR829 PID changed to IR829M if the mSATA is available. The mSATA PID states if it is a 50GB or 100GB module. The same information is displayed using the show diag command as well.

```
IR829#show platform msata
SSD Lifetime:
Lifetime Remaining: 99% -> 99% of the net disk read/write lifetime is remaining
```

```
Memory:
  Size: 99G.          -> Total disk size in Gigabytes
  Used: 93G.          -> Used disk space, inclusive of IOx CAF, IOx application, data,
etc.
  Available: 6.1G.     -> Remaining disk space in Gigabytes
  Usage: 94%.          -> Usage in percentage, same as Guest-OS 'df -h' command output
display
```

In the above example, note that the output shows SSD lifetime remaining, disk storage size, usability and availability in Gigabytes.

There are also entries shown in the syslog when 15%, 10%, and 5% of the lifetime limit remain:

```
*Jan 30 19:03:00.257: %IOX-4-IOX_SSD_LIFETIME_WARN: SSD Lifetime remaining in module:15
```

```
*Jan 30 19:02:30.157: %IOX-2-IOX_SSD_LIFETIME_CRITICAL: SSD Lifetime remaining in module:5
```

## Displaying the Wear Leveling Data for the mSATA SSD

Feature applies to the IR829M

IOx Local Manager/ Fog Director can now display the wear leveling data for the mSATA SSD on the IR829M products.

In the IOx Local Manager, it is observed by selecting **System > Storage**.

From the IOS command line, you can monitor the lifetime using the **show platform msata** command.

The following example shows a 50G mSATA controller.

```
Router#show platform msata
SSD Lifetime:
Lifetime Remaining: 99%
Memory:
Size: 50G.
Used: 49G
Available: 932M
Usage: 99%
```

After a router reload, it will take a few minutes (approximately 5) before this data will be populated again.

When the SSD lifetime reduces to 15%, 10% and 5% of the lifetime limit, errors start getting reported in syslog.

For example:

```
*Jan 30 19:03:00.257: %IOX-4-IOX_SSD_LIFETIME_WARN: SSD Lifetime remaining in module:15
*Jan 30 19:02:30.157: %IOX-2-IOX_SSD_LIFETIME_CRITICAL: SSD Lifetime remaining in module:5
```

## IR829M: MIB support for mSATA Wear Ratio and Usage

mSATA functionality was added to the IR829 product line to add extra storage in the 15.8.3M release. The PID IR829M has mSATA support available in the device inventory detail. The following table shows the IR829M SKU with the OID:

Table 1: mSATA OIDs

SKU	OID
IR829M-2LTE-EA-BK9	1.3.6.1.4.1.9.1.2610
IR829M-2LTE-EA-AK9	1.3.6.1.4.1.9.1.2610
IR829M-2LTE-EA-EK9	1.3.6.1.4.1.9.1.2610
IR829M-LTE-EA-AK9	1.3.6.1.4.1.9.1.2673
IR829M-LTE-EA-BK9	1.3.6.1.4.1.9.1.2673
IR829M-LTE-EA-EK9	1.3.6.1.4.1.9.1.2673
IR829M-LTE-LA-ZK9	1.3.6.1.4.1.9.1.2609

As part of this enhancement, SNMP support has been added for the following mSATA parameters on the IR829M:

- lifetime remaining (wear leveling)
- memory usage for the mSATA SSD

As part of this enhancement, further SNMP support has been added. There is a new OID name `cevMsataWlIR829` in the existing MIB `CISCO-ENTITY-VENDORTYPE-OID-MIB.my` under the `cevModuleCommonCards` functional group.

For example:

`cevMsataWlIR829` OBJECT IDENTIFIER ::= { `cevModuleCommonCards` 689 } -- mSATA wear ratio and usage for IR829.

The entity OID value is `iso.3.6.1.4.1.9.12.3.1.9.2.689`

The **show platform msata** command gives information about this MIB.

## Example: Actual OID and output of SNMP get/walk on OID

<OID> = STRING: "Lifetime Remaining: 99%, Usage: 30%"

## Feature Details

The following conditions must be met before performing SNMP requests on the IR829M:

- An active mSATA module must be in the IR829M router.
- Verify this using the **show platform msata** CLI.

## Feature Assumptions

- This feature is supported on the IR829M only.

- After a router reload it will take approximately 5 minutes before mSATA data will be populated again. Only SNMP get is allowed on OID `cevMsataWlIR829` and is marked as read-only. Setting its value will not be allowed.
- Configurations to enable SNMP on IR800 are necessary for fetching MIB value.

## IR829M OIDs

There are some new SNMP OIDs created for the new IR829M SKUs

**Table 2: SNMP OIDs**

SKU	OID
IR829M-2LTE-EA-BK9	1.3.6.1.4.1.9.1.2610
IR829M-2LTE-EA-AK9	1.3.6.1.4.1.9.1.2610
IR829M-2LTE-EA-EK9	1.3.6.1.4.1.9.1.2610
IR829M-LTE-EA-AK9	1.3.6.1.4.1.9.1.2673
IR829M-LTE-EA-BK9	1.3.6.1.4.1.9.1.2673
IR829M-LTE-EA-EK9	1.3.6.1.4.1.9.1.2673
IR829M-LTE-LA-ZK9	1.3.6.1.4.1.9.1.2609

Related documentation:

<https://www.cisco.com/c/en/us/support/cloud-systems-management/iox/tsd-products-support-series-home.html>

<https://developer.cisco.com/docs/iox/>

