

# BICS Global Roaming SIM

## Technical Specifications

### Overview

The BICS Global Data Roaming SIM is designed for easy global M2M/IoT SIM deployment. Using the SIMcontrol platform, spend is managed in near real-time on individual SIM level regardless of the mobile network it is connected to.



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# 1. Activation Process

1. Open a SIMcontrol account if you don't yet have one. Accounts are available in South African Rand (ZAR), Kenyan Shillings (KES), or Euros (EU).
2. SIMs are supplied by us in an inactive state, and are automatically activated when added to SIMcontrol.
3. SIM ICCID numbers (identifiers) will be emailed to you with the order.
4. Create a Usage Rule to load and manage SIM airtime balances.
4. When adding SIMs on SIMcontrol, choose "**BICS**" as the network.
6. Add SIMs to SIMcontrol using the ICCID as identifier.
7. Load SIMs with airtime balance before testing.
8. Remember to update your device APN settings.

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## 2. APN & Device Settings

- APN name (for device setting): **flickswitch**
- Username: [blank]
- Password: [blank]
- MCC/MNC Codes: [auto-allocated]
- SIM PIN: PINs are deactivated as default.
- Network code: 20628
- **NB:** Data Roaming must be enabled on your device settings  
APN should be configured on the device  
Recommended to put “network selection” in the automatic mode

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## 3. IP Management & Firewall

- Fully managed Radius service.
- SIMs have Static Private IP's.
- From the outside, SIMs have dynamic IP + port blocks.
- Standard Internet breakout.
- No custom data routing or firewall configurations.
- IMEI lock available on request.

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## 4. Data Sessions & Update Frequency

- A positive airtime balance is required on the SIM for it to connect.
- On session establishment, airtime equal to 5MB of data usage will be reserved.
- If your device allows for multiple concurrent sessions, each session will require a reservation.
- If the airtime balance is not enough to cover 5MB, it will reserve a lesser amount (equal to the available airtime amount).
- It is suggested to have a minimum airtime balance to cover at least 5MB of data traffic, or more if your device allows for multiple concurrent sessions.
  
- Being a roaming SIM, device firmware must allow for enough time to attach to the network, and to try multiple IMSI's.
- Suggested timeout is at least **240 seconds**.
- Data will stop flowing when SIM airtime balance runs out. (This is session based, so SIM can show a small negative SIM balance).
- Airtime balances showing on SIMcontrol are updated 3 x per day but can be live-checked manually at any time from the platform.
- Recharge Rules are triggered on balance checks. Allow sufficient recharge threshold to cover at least 1 day's use.

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## 5. Billing

- Minimum billing increments: Between 1kb and 10Kb (depending on local network it is roaming on)
- There are no in-bundle or out of bundle rates. The SIM's airtime balance is depleted at the per-MB rate for each network it is roaming on.
- Latest data price list (per country) can be requested at any time.

## 6. SMS

- You can send configuration SMS's to the SIM.

- *Sending SMS's to a device (SMS-MT):*

*From the SIMcontrol platform:* SMS's can be sent to the device using the SIMcontrol platform. Click on the SIM number. On the SIM detail screen look for "Send SMS" button. SMS's to SIMs are charged to the individual SIM balance at published rate. Return messages (replies) are not shown.

*From a phone or other SMS provider:* You can send an SMS from any phone or bulk SMS service to a Flickswitch Global SIM. If the device supports SMS-MO (return SMS), it can then respond to the number which sent the MT SMS. The SIM airtime balance will still be charged at published rate to deliver an SMS to the device (billed against the airtime/balance on the SIM). For this to work, please request that we share the SIM MSISDN's with you.

- *SMS's from a device (SMS-MO):* SMS's can be sent from a device whilst roaming. SMS's are billed at different rates depending on the country it is roaming in. Please ask us for the latest country SMS price list.

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## 7. Roaming & Network Selection

### **General**

- SIMs can not be locked to a specific country.
- SIMs will be able to connect to either a single or to multiple networks in each country. Please consult latest network list for country and local network info.

### **Connection Reset**

- SIM connection can be purged (“Cancel Location” command) through the SIMcontrol platform.
- This will force disconnect the SIM from all networks, and allow the device to re-establish a fresh connection.

## 7. Roaming & Network Selection

### Which local network will the SIM use?

- The SIMs are Non-Steered, making it possible for your devices to choose the best signal in any given area.
- The SIM card plays no role in the network selection, it's fully up to the device.
- For previously connected SIMs, a device will typically first try to connect to the network where they were previously attached.
- In rare cases, you may want to force the device to connect to a specific local network (using AT command). This removes best network selection.
- If a country is served by more than one IMSI out of the multi IMSI SIM, it will firstly attach to the network(s) available via the first IMSI selected by the SIM. If a 'better' network is only available via the second IMSI, it will only be selected if the device couldn't connect at all with the first tried IMSI.

	IMSI 1	IMSI 2
<b>Network A</b>	Not Allowed	High Radio signal
<b>Network B</b>	Medium Radio signal	Medium Radio signal
<b>Network C</b>	Medium Radio signal	Not Allowed

*[Note: V1 SIMs (deployed pre-Feb '21) has a preferred PLMN list. There, the device would select the visible network which is higher in the list first.]*

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## 8. Allowed

- **Data:** Yes
- **SIM-originated SMS (SMS-MO):** Yes
- **Platform-originated SMS to the SIM (SMS-MT):** Yes - Can be sent via SIMcontrol platform or phone
- **Voice:** No
- **USSD:** No

## 9. Basic Troubleshooting

- Is the SIM loaded on SIMcontrol?
- Is the Network on SIMcontrol showing as as “BICS”?
- Has airtime been loaded on the SIM? Does it have a current (refreshed) positive balance?
- Is the device powered up?
- Has the device APN setting been set up correctly?
- Has data roaming been activated on the device settings?
- Change device settings to 2G, 3G or LTE? Some local networks may not support LTE.
- Do you have network coverage?
- Does the device respond to a SMS?
- **Test:** Does the SIM work in a smartphone that has roaming enabled and APN set correctly?
- For further assistance please consult our [Help Desk](#)

# 9. Advanced Troubleshooting (1)

## Device Requirements and Recommendations

How to ensure proper device interworking with a Multi-IMSI SIM solution?

Device should have a 3 minute minimum active period:

- o IMSI rotation may fail if this isn't ensured. Sleep mode (or disabling modem) in between will disrupt the IMSI rotation sequence.
- o This minimum threshold may be higher for devices which need to scan different NB-IoT/LTE-M bands. In this case, we recommend fine tuning your device by reducing the number of bands scanned.

Device (terminal and modem) should support SIM Toolkit Application protocol:

- o Release 99 implementation is mandatory, in order to ensure successful applet logic.
- o IMSI rotation will fail if support of this application is not guaranteed.

This protocol is specified by:

3GPP TS 11.14 (v8 / Rel99).

3GPP TS 31.111 (includes USIM Application Toolkit for 3/4G networks).

STK support in devices is mandatory to handle Multi-IMSI solutions.

## 9. Advanced Troubleshooting (2)

### **Which commands within the STK are used for the Multi-IMSI solution?**

Multi-IMSI applet is relying on the following standard STK Proactive commands:

- Setup Menu
- Provide Location Info
- Timer Management
- Refresh

Full details of the functioning of commands above can be found in both specifications 3GPP TS 11.14 and 3GPP TS 31.111.

### **Under which conditions will the Multi-IMSI applet will trigger an IMSI rotation?**

- Device will be forced to reboot and use a new IMSI identity after a 2 minute period when:
- Network attach is rejected by all networks with the current IMSI (e.g. none of the available networks in this location are allowed in the Roaming Profile with the current IMSI).
- Device lands in a new country where the priority IMSI isn't currently active .
- The SIM card being notified that the network has "Limited Service" (timeouts during the Authentication procedure or poor coverage for a extended period of time).

# 9. Advanced Troubleshooting (3)

## **What is the forbidden PLMN list and how does it impact network searching?**

The forbidden PLMN list is dynamically stored in the SIM and maintained by the device. When a device attempts to connect to a network and is denied, it will insert that network to the fPLMN list, thus preventing it from attempting to connect to the same network again.

If all available networks are added to the fPLMN list, the only way to ensure the modem will keep trying to connect will be to either make manual registration attempts (possible in phones but very unlikely in IoT devices) or clean the content of the fPLMN list.

The Multi-IMSI applet will clear the fPLMN list content after every IMSI rotation.

## **What other best practices are recommended to optimize the device behaviour?**

Recommendations we advise to firmware and app developers for an improved service:

- The fPLMN list should be cleared by the device after every power cycle.
- Perform manual network attach when device is out of service for an extended period of time.

## 9. Advanced Troubleshooting (4)

### **Which network will my device choose to connect to?**

The first time a SIM attempts to connect in a country, if no other preferences are explicitly set, a device will choose based on the signal strength coming from all the available networks. If the strength is better than -85 dBm, a network will be chosen randomly, if the signal strength is lower, the network with the highest signal strength will be selected.

Remark: Networks contained in the forbidden PLMN list will be ignored by the modem during this phase.

For subsequent connections, the SIM will normally instruct the device to register under the last used network (and with the same technology), minimizing the registration time.

Inside a country, BICS is not steering to any specific networks, apart from the screening based on the customer's Roaming Profile or blacklisting.

## 9. Advanced Troubleshooting (5)

### **My device is up and running but it's not trying to connect to any network**

This can be caused by one of following reasons:

- Full fPLMN list. To solve this situation, it's highly recommended to have means on the device to clear the forbidden PLMN list periodically, like this new registration attempts will occur, and eventual IMSI rotation will be triggered.
- Out of coverage.
- Stuck on an IMSI without available networks.

### **My device is attached but it cannot exchange any data**

This can be caused by one of following reasons:

- APN isn't configured, hence data session isn't created.
- APN in the device isn't aligned with the APNs present in the APN group.
- Network interface isn't associated to the EPS bearer.

## 9. Advanced Troubleshooting (6)

### **My device is unable to switch IMSIs**

This can be caused by one of following reasons:

- Active period of the device is shorter than 3 minutes.
- Unexpected STK call flow between device and applet.
- Modem is not supporting STK or debugging mode is active.

### **Samsung Regional block**

Some Samsung handset devices don't allow SIMs to function which belong to a different region to the one they are trying to operate in. A call (longer than 5 mins) using a different SIM provider (as BICS SIMs do not support voice service) will unblock the device.

# Frequently Asked Questions

### How long does SIM supply take?

Orders of less than 500 SIMs will typically be shipped within 3-4 working days. Contact us for timing on larger orders.

### Does my airtime balance expire?

No. Once airtime has been loaded to an individual SIM it does not expire. All data transactions are billed against the remaining airtime quota at set country rates.

### Are there any out-of-bundle charges?

No, usage is always billed against the airtime at the per-MB rate.

### Can a session be stopped from the platform?

Yes, data flow to the SIM can be stopped at any time.

### What is the airtime SIM balance shown on SIMcontrol?

This is the remaining spend available in currency on the SIM. The balance shown is updated 3 x per day. You can update the live SIM balance at any time by clicking "Balance Check SIM".

### Can I suspend a SIM card?

Yes, you can suspend a SIM at any time. There will be no further fees or charges.

# Technical Support



Log a ticket with our [Help Desk](#)

**Or call:** +27 (0)87 943 7222



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