

Introduction

The purpose of this application note is to explain how to correctly insert the SIM card into the Argon 100 GSM remote temperature monitor, and to debug the network connection if the product doesn't work as expected.

SIM Insertion Method

Remove all power to the Argon 100 by unplugging the power supply. Although the unit has been designed so that no damage should occur if the SIM card is plugged into a powered unit, it is good practice to insert the SIM card without power applied to prevent any possibility of damage.

Line up the SIM card and the Argon 100 as shown in Figure 1. Note that the SIM card is polarized and the correct orientation is determined by the position of the cut corner of the SIM card.



Figure 1: Argon 100 and SIM card orientation

Take the SIM card and without twisting or turning it, insert it into the slot on the side of the Argon 100 as shown in Figure 2.



Figure 2: Inserting the SIM

Push the SIM card fully into the slot. The SIM card should go fully into the Argon 100 so that no part of the SIM card protrudes. A click should be heard when the SIM has been fully inserted. A fully inserted SIM will disappear 1-2mm into the unit. A pen, paperclip or screwdriver may be required to push the SIM card fully into the Argon 100 as shown in Figure 3.



Figure 3: Fully inserted SIM card

If the SIM card protrudes from the unit as shown in Figure 4 then the SIM card has not been properly inserted and needs to be pushed further into the SIM card slot.



Figure 4: Incorrectly inserted SIM

Once the SIM card has been inserted, apply power. Dependant on network coverage, it may take up to 2 minutes before the unit will register on a network. However, in most cases this should take no more than 15 seconds.

Argon 100 Debugging

There are 3 holes beside the SIM card holder behind which are LEDs that will be visible if turned on. There are 3 LEDs: Blue, red and green as shown in Figure 5.

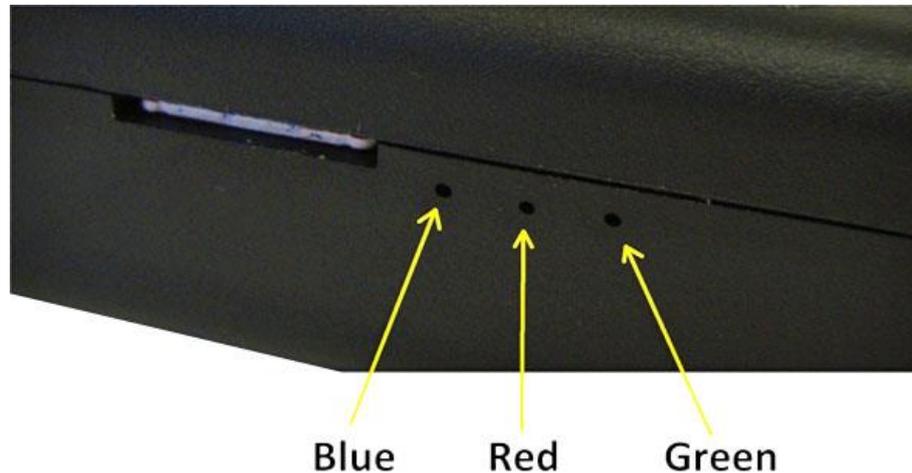


Figure 5: LED positions

When power is first applied to the Argon 100, all three LEDs will briefly illuminate. The red LED can be used for network connection debugging purposes, and the green LED can be used to determine that the main Argon application firmware is working correctly.

Red LED

There are 4 states indicated by the red LED:

On continuously	Ringing or call in progress
Off	Unit powered off
Blinking once/second	Searching for network/not registered/turning off
Blinking once every 3 seconds	Registered, full service

If the LED is blinking once/second, there are a number of fault possibilities that need to be checked:

1. Try SIM in a mobile phone at the site. Does it register on a network? Is it possible to send a text message (i.e. is there credit on the SIM)?
2. Is the antenna connected properly?
3. Is the SIM card seated properly?
4. Does the SIM card have a pin number active on it (if so, the pin number needs to be disabled before insertion into the Argon 100).
5. Does the network provider support the 2G network used by the Argon 100? The Argon 100 supports quad band GSM but not UMTS (3G) or CDMA. In the UK, this means that the 3 network will not work as they only support UMTS. A good guide to network operator support can be found at http://en.wikipedia.org/wiki/Mobile_country_code. Any operator supporting GSM850, GSM900, GSM1800 or GSM1900 will work with the Argon 100.

Once the LED starts blinking once every 3 seconds, the Argon 100 has been successfully attached to a mobile network and is now ready for operation. A more robust method of proving that the Argon 100 is attached to the network is to make a voice call (from another GSM or a land line) to the voice number of the SIM card. Although the Argon 100 will not answer, the red LED will light continuously indicating that the call is ringing on the Argon 100.

Green LED

The green LED indicates what the application in the Argon is doing, and any faults that it encounters. In normal operation, the green LED will blink between 1 and 5 times, within 20 seconds or so of the last activity. The normal operation indications are:

Number of Flashes	Description of action
1	Main loop processed
2	Read temperature
3	Alert triggered
4	Log triggered
5	Notify successful

Normally there will be a single flash to indicate the start of the loop followed soon after by 2 flashes to indicate a temperature read. What happens after that will depend on the alarm and log settings set up when the unit was configured. If no further action is required by the application after a temperature read, the main loop should commence again after about 20 further seconds.

Error messages described by the Green LED are:

Number of flashes	Description of Error
11	No temperature read
12	Notify failed
13	HTTP socket: Open failed
14	HTTP socket: Missing 200 OK response
15	HTTP socket: Too much data
16	HTTP socket: Disconnected
17	HTTP socket: Timeout
18	Temperature read failed
19	GSM network not registered

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