

# Overview

## Introduction to mobile networks

The following table presents the main characteristics of the various mobile networks generations:

Generation	Speed	Technology
2G	9.6/14.4 kbps	TDMA, CDMA
3G	3.1 Mbps (peak) 500-700kbps	CDMA 2000 UMTS, EDGE
3.5G	14.4 Mbps (peak) 1-3Mbps	HSPA
4G	100-300 Mbps (peak) 3-5 Mbps	WiMax, LTE

**A** The gap between 2G to 3G performance for the user is substantial

**B** In today's "online" eco system, users and operators strive to at least provide a 3G level service, to support the demand for live feed & streaming.

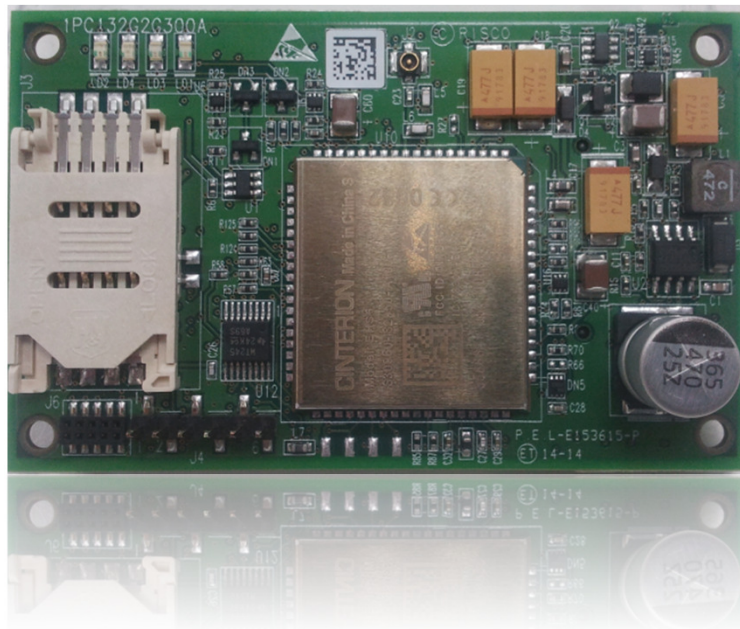


# Configuration Management

## All in one solution

The 3G module hardware contain two variants on the same PCB as follows:

3G variant

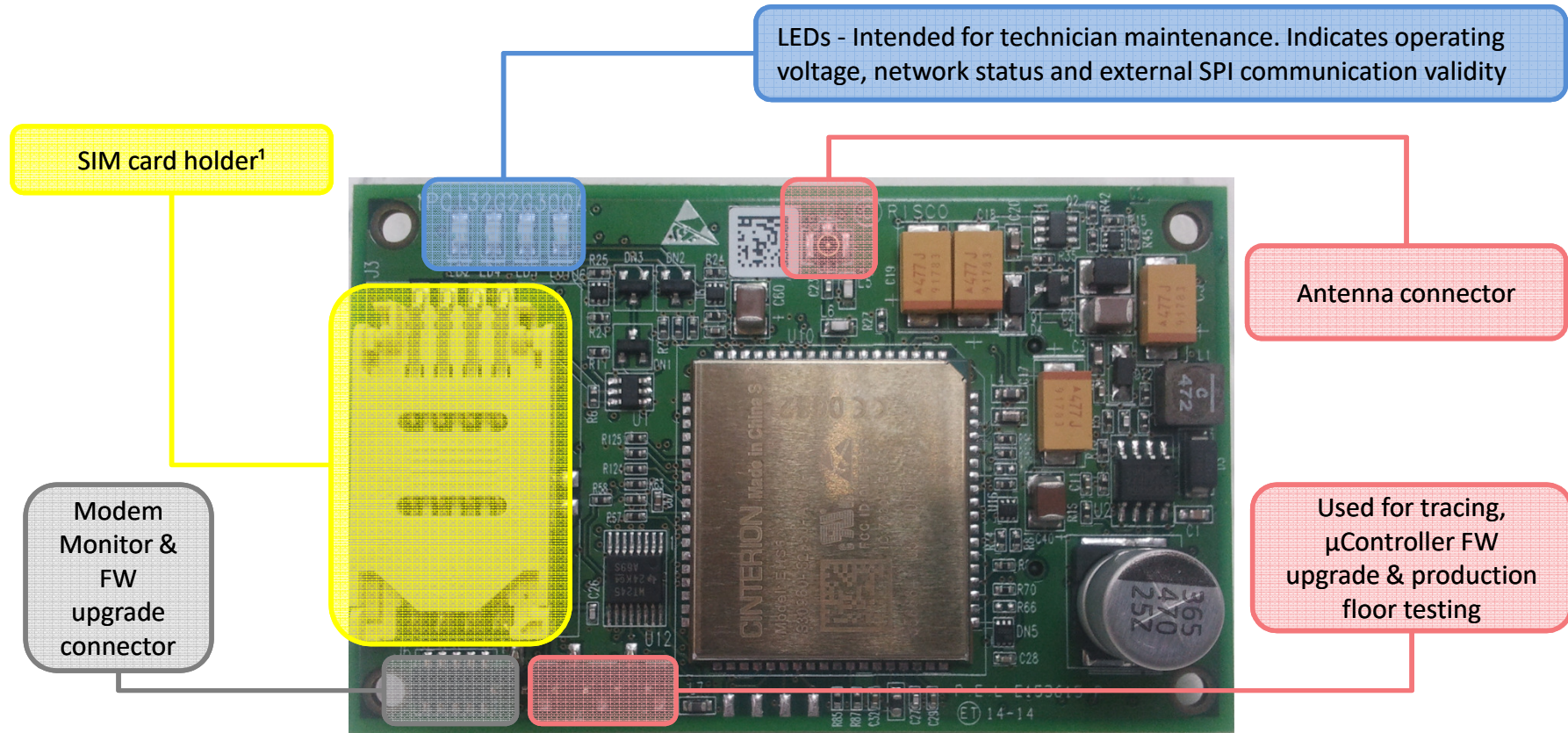


2G variant



# Configuration Management

## Interfaces



<sup>1</sup> The MIM can be found behind the SIM card holder

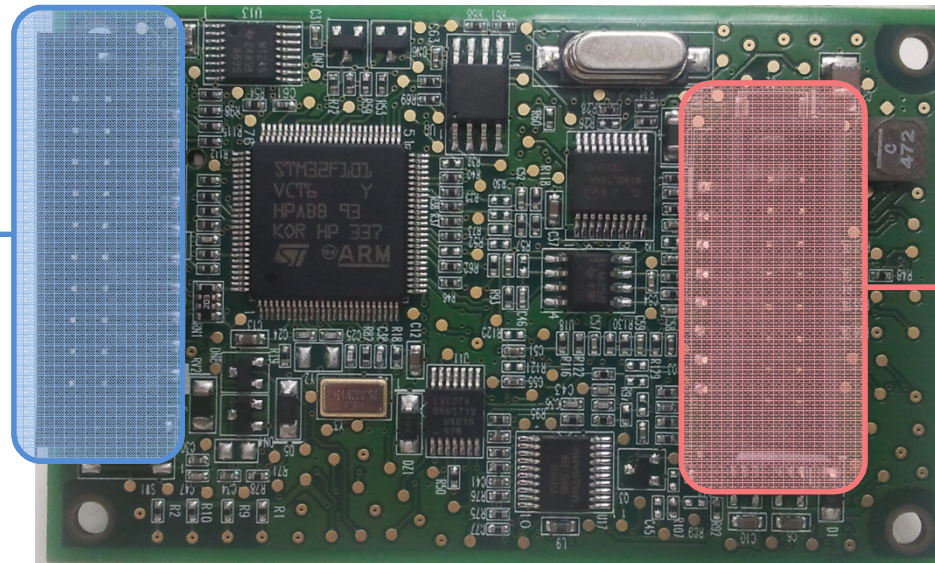


# Configuration Management

## Interfaces - continue

JTAG connector  
(assembly only for development phase)

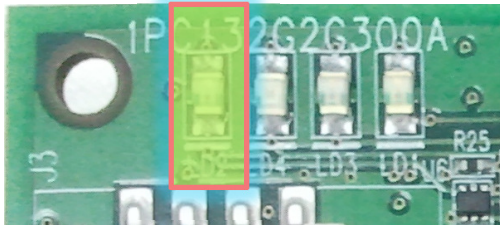
Main connector  
(panel interface)



# System tech. info.

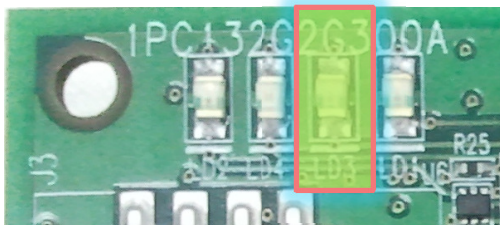
## Status indicated by status LED patterns

### Power LED



LED behavior	Operating status
Permanently off	Module is off
Permanently on	Module is on

### Panel communication LED

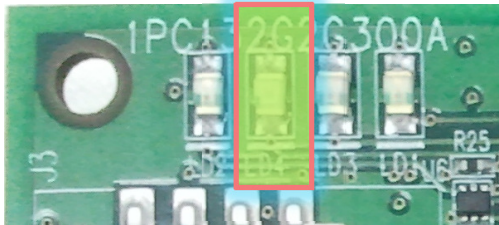


LED behavior	Operating status
Permanently off	No communication with panel
Blinking	Module is communicating with panel

# System tech. info.

## Status indicated by status LED patterns

 2G GSM network status LED

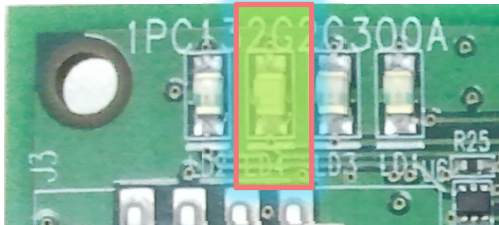


LED behavior	Operating status
Permanently off	Module is off
600 ms on / 600ms off	Limited Network Service: No SIM card inserted or no PIN entered, or network search in progress, or ongoing user authentication, or network login in progress
75 ms on / 3 s off	IDLE mode: The mobile is registered to the GSM network (monitoring control channels and user interactions). No call is in progress
500 ms on / 25 ms off	Packet switched data transfer is in progress
Permanently on	Depending on type of call: Voice call: Connected to remote party. Data call: Connected to remote party or exchange of parameters while setting up or disconnecting a call.

# System tech. info.

## Status indicated by status LED patterns

### 3G GSM network status LED



LED behavior	Operating status
Permanently off	Module is off
10 ms on / 990 ms off	<ul style="list-style-type: none"><li>- GSM CS data call in progress or established</li><li>- GSM voice call in progress or established</li><li>- UMTS voice call in progress or established</li><li>- UMTS CS data call in progress</li></ul>
10 ms on / 1990 ms off	<ul style="list-style-type: none"><li>- GSM PS data transfer</li><li>- UMTS data transfer</li></ul>
10 ms on / 3990 ms off	ME registered to a network. No call, no data transfer
500ms on / 500 ms off	Depending on type of call: Voice call: Connected to remote party. Data call: Connected to remote party or exchange of parameters while setting up or disconnecting a call.