Quectel GSM Module

Product Overview

February, 2020

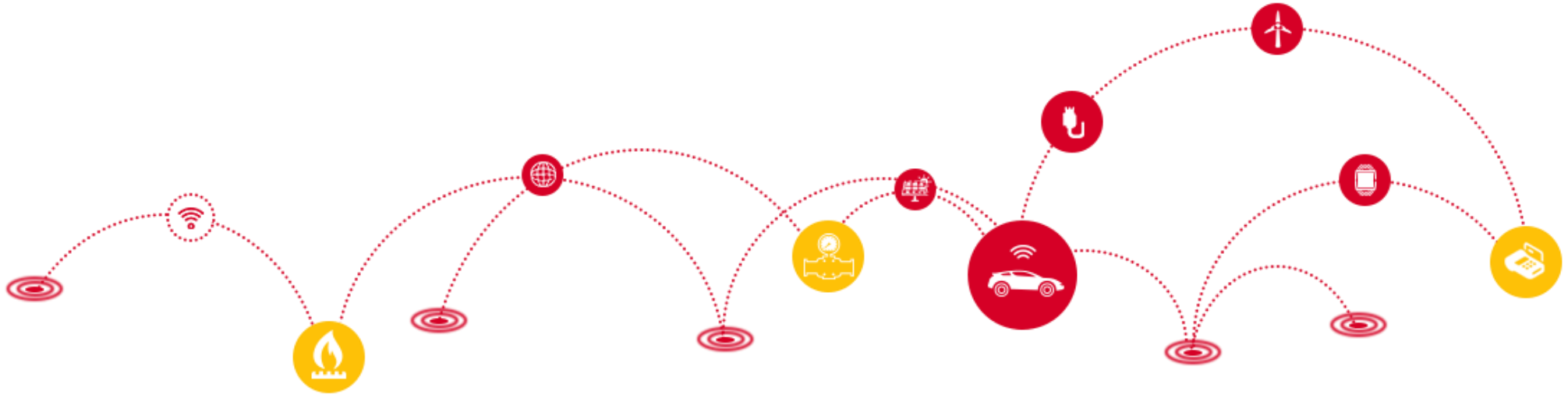
GSM Roadmap

Specifications

Technologies

GSM Module Differences

Applications



GSM Modules Roadmap

Not recommended for new designs

M10
- Quad-band
- LCC Form Factor

M95
- Quad-band
- LCC Form Factor

M66-DS
- Quad-band
- LCC Form Factor

M89
- Quad-band
- **LGA Form Factor**

M08-R
- Quad-band
- **LCC Form Factor**

Compatible Design

M66
- Quad-band
- LCC Form Factor

M66 R2.0
- Compatible with M66
- Quad-band
- LCC Form Factor

M65
- Compatible with M66
- Quad-band
- LCC Form Factor

	H1	H2	H1	H2
2017	2018		2019	

GSM Roadmap

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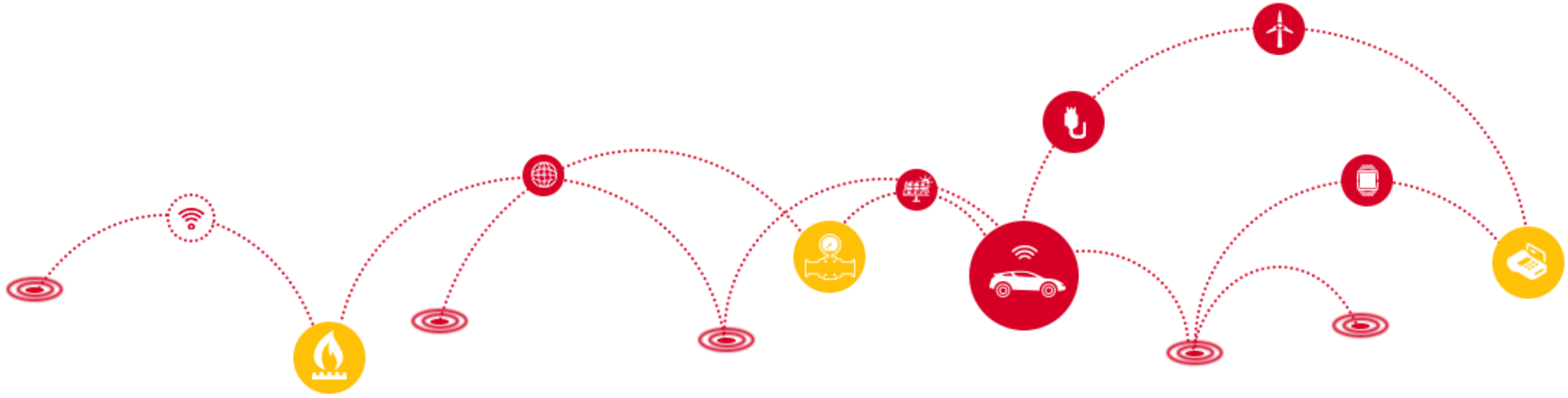


M89 Specifications

18.8mm × 26.7mm × 2.3mm
GPRS Multi-slot Class 12
85.6kbps DL/ 85.6kbps UL

QUECTEL® Build a Smarter World

Model	M89
Quad-Band	**850/ 900/ 1800/ 1900MHz**
Dimension	18.8mm × 26.7mm × 2.3mm
Data Rate	85.6kbps DL/ 85.6kbps UL
Supply Voltage	3.3V~4.6V, 4.0V Typ.
Consumption	3.0mA @DRX=5 3.0mA @DRX=9
SMS/Voice	Supported
Interfaces	(U)SIM/ UART/ Audio/ RTC/ GPIO/ Antenna
Protocols	TCP/ UDP/ PPP/ FTP/ HTTP(S)/ POP3/ SMTP(S)/ USSD/ QNTP/ QPING/ SSL
Features	eCall DTMF Audio Play/ Audio Recording QuecFOTA® QuecFile CMUX SSL
Certification	**Regulatory:** CE/ Anatel

M08-R Specifications

17.6mm × 15.7mm × 2.4mm
GPRS Multi-slot Class 12
85.6kbps DL/ 85.6kbps UL

Model	M08-R
Quad-Band	850/900/1800/1900MHz
Dimension	17.6mm × 15.7mm × 2.4mm
Data Rate	85.6kbps DL/ 85.6kbps UL
Supply Voltage	3.45V~4.25V, Typ. 4.0V
Consumption	1.3mA① @DRX=5 1.2mA① @DRX=9
SMS/Voice	Supported
Interfaces	(U)SIM/ UART/ RTC/ Audio/ GSM Antenna
Protocols	TCP/ UDP/ PPP/ HTTP/ NTP/ PING/ TTS/ FTP/ SSL/ HTTPS/ MQTT/ IPv6*
Features	Audio Playing/ Audio Recording QuecCell QuecFOTA® DFOTA QuecFile CMUX QuecOpen® QuecLocator®
Certification	**Regulatory:** CE

"" means under development.*
① means average value, for reference only.

M66/M66-DS/M66 R2.0/M65 Specifications

17.7mm × 15.8mm × 2.3mm
GPRS Multi-slot Class 12
85.6kbps DL/ 85.6kbps UL

QUECTEL
Build a Smarter World

Model	M66	M66-DS	M66 R2.0	M65
Platform	MT6261D	MT6261D	MT6261M	RDA8955L
Quad-band	**850/ 900/ 1800/ 1900MHz**	**850/ 900/ 1800/ 1900MHz**	**850/ 900/ 1800/ 1900MHz**	**850/ 900/ 1800/ 1900MHz**
Supply Voltage	3.3V~4.6V, 4.0V Typ.	3.3V~4.6V, 4.0V Typ.	3.3V~4.6V, 4.0V Typ.	3.45V~4.25V, 4.0V Typ.
Consumption	1.3mA @DRX=5 1.2mA @DRX=9	1.3mA @DRX=5 1.2mA @DRX=9	1.3mA @DRX=5 1.2mA @DRX=9	1.2mA @DRX=5 1.1mA @DRX=9
SMS/Voice	SMS & Voice	SMS & Voice	SMS & Voice	SMS & Voice
Interfaces	(U)SIM/ UART/ PCM/ RTC/ Audio/ GSM & BT Antenna/ SD	(U)SIM/ UART/ PCM/ RTC/ Audio/ GSM & BT Antenna/ SD/ ADC	(U)SIM/ UART/ PCM/ RTC/ Audio/ GSM Antenna	(U)SIM/ UART/ RTC/ Audio/ ADC/ GSM Antenna
Protocols	TCP/ UDP/ PPP/ FTP/ HTTP/ SMTP/ CMUX/ SSL	TCP/ UDP/ PPP/ FTP/ HTTP/ SMTP/ CMUX/ SSL	TCP/ UDP/ PPP/ FTP/ HTTP(S)/ SMTP/ CMUX/ SSL/ MQTT	TCP/ UDP/ PPP/ HTTP/ NTP/ PING/ FTP/ SSL*/ MQTT*/ HTTPS*/ IPv6*
Features	eCall DTMF Audio Play/ Audio Recording QuecFOTA® QuecCell QuecFile QuecOpen® BT 3.0 (SPP/ HFP)	eCall DTMF Audio Play/ Audio Recording QuecFOTA® QuecCell QuecFile QuecOpen® BT 3.0 (SPP/ HFP) DSDS	eCall DTMF Audio Play/ Audio Recording QuecFOTA® QuecCell QuecFile BT 3.0 (SPP/ HFP)	DTMF* QuecOpen®* Audio Play/ Audio Recording QuecCell QuecFOTA® QuecLocator®* QuecFile CMUX
Certification	**Carrier:** Vodafone/ Deutsche Telekom **Regulatory:** GCF/ CE/ UCRF/ FCC/ Anatel/ FAC/ ICASA **Others:** BT SIG	**Carrier:** Deutsche Telekom **Regulatory:** CE	**Regulatory:** CE	**Regulatory:** CE

"" means under development.*

M95/M10 Specifications

QUECTEL
Build a Smarter World

Model	M95	M10 Not recommended for new designs
Platform	MT6261M	MT6261M (OC: M10FA-03-STD) MT6261A (OC: M10FA-16-CPU)
Quad-band	**850/ 900/ 1800/ 1900MHz**	**850/ 900/ 1800/ 1900MHz**
Dimensions	23.6mm × 19.9mm × 2.65mm	29.0mm × 29.0mm × 3.6mm
Data Rate	85.6kbps DL/ 85.6kbps UL	85.6kbps DL/ 85.6kbps UL
Supply Voltage	3.3V~4.6V, 4.0V Typ.	3.3V~4.6V, 4.0V Typ.
Consumption	1.3mA @DRX=5 1.2mA @DRX=9	1.3mA @DRX=5 1.2mA @DRX=9
SMS/Voice	SMS & Voice	SMS & Voice
Interfaces	(U)SIM/ UART/ RTC/ Antenna/ Audio/ PCM	(U)SIM/ UART/ Audio/ RTC/ Antenna/ GPIOs/ SD
Protocols	PPP/ TCP/ UDP/ FTP/ HTTP/ SMTP/ CMUX/ SSL/ MQTT	PPP/ TCP/ UDP/ HTTP/ FTP/ MMS/ SMTP/ CMUX
Features	eCall QuecFOTA® DTMF Dual SIM Audio Play/ Audio Recording QuecCell	eCall QuecFOTA® DTMF CMUX QuecOpen® (For OC M10FA-16-CPU only)
Certification	**Carrier:** Vodafone/ Telenor/ Rogers **Regulatory:** GCF/ CE/ UCRF/ FCC/ PTCRB/ IC/ Anatel/ NCC/ RCM/ ICASA **Others:** ATEX	**Regulatory:** CE/ IC/ SRRC/ NAL

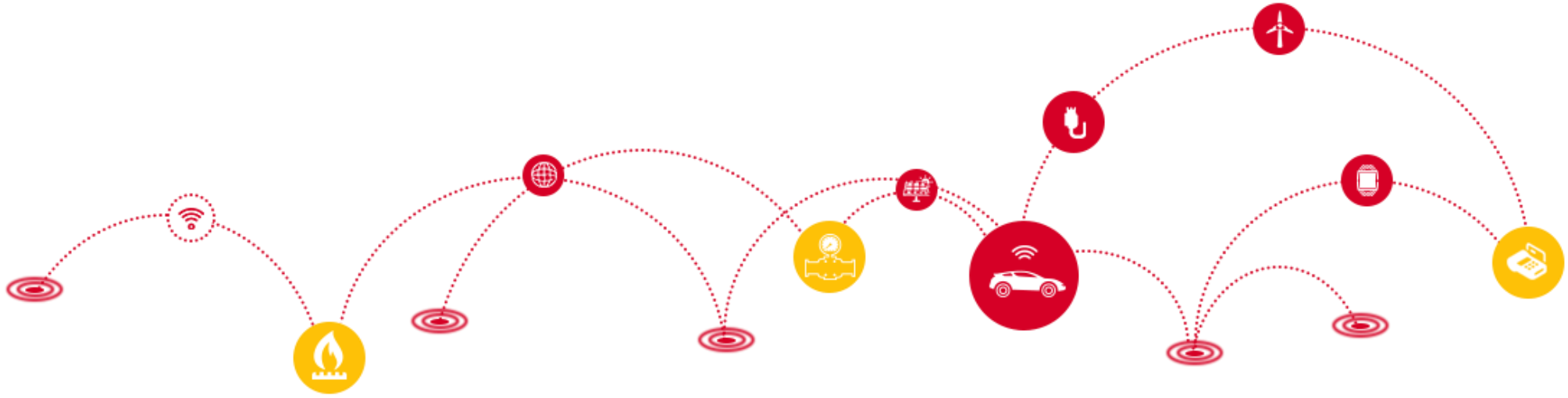
GSM Roadmap

Specifications

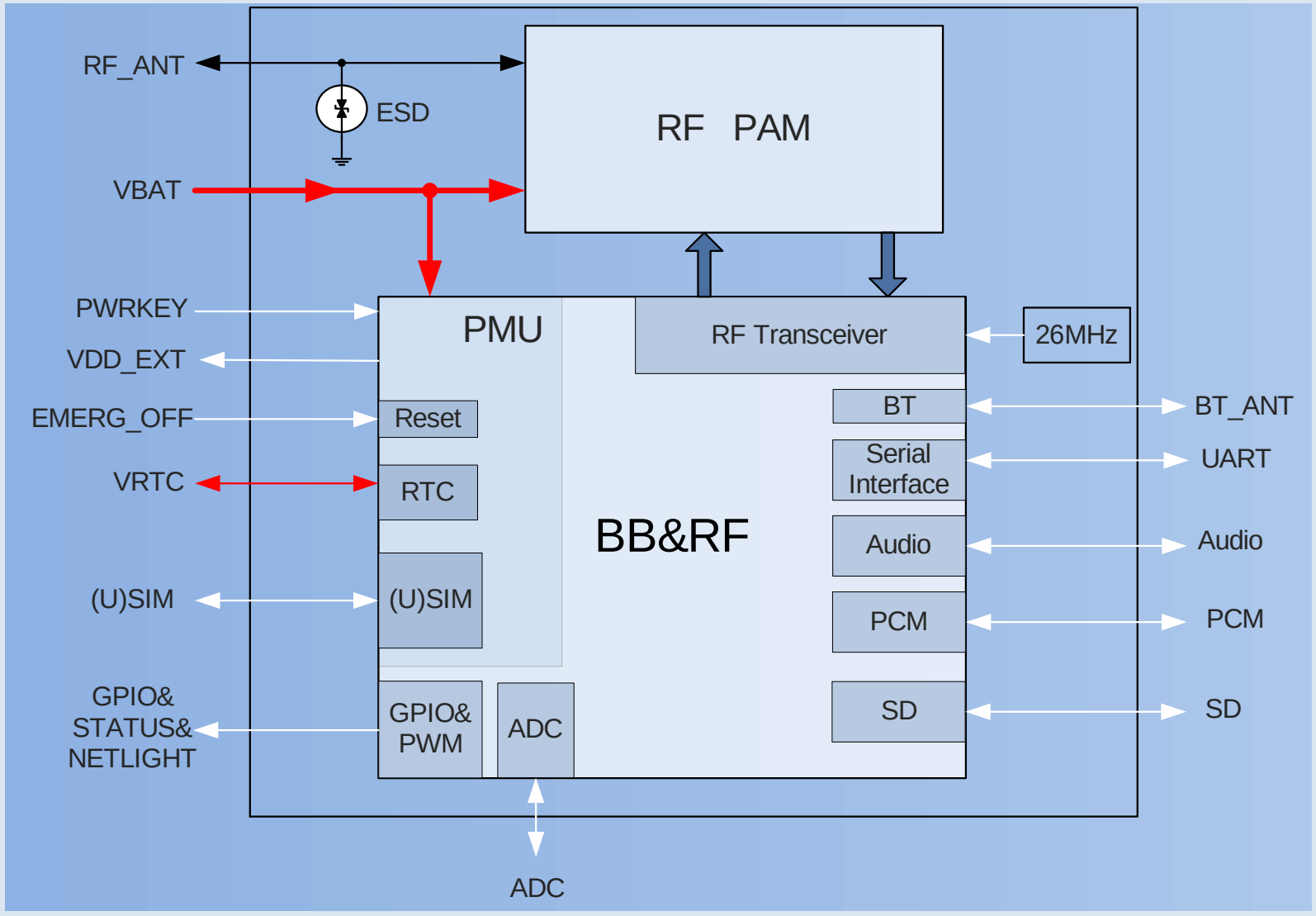
Technologies

GSM Module Differences

Applications



Hardware Architecture



The block diagram is for reference only and varies among different modules.

Software Advantages

Enhanced Features

- QuecFOTA®
- QuecCell
- QuecFile
- QuecOpen® Optional
- BT 3.0 Optional
- DSDS Optional
- Audio Play/Audio Recording

Quality Guarantee

- Reliable network protocols
- Steady flash protection mechanism
- Superior audio algorithms
- High sensitivity

Abundant Protocols

- TCP/UDP
- PPP
- FTP
- NTP
- PING
- HTTP
- TTS
- SMTP
- MMS
- SSL
- MQTT

Flexible Applications

- eCall
- DTMF

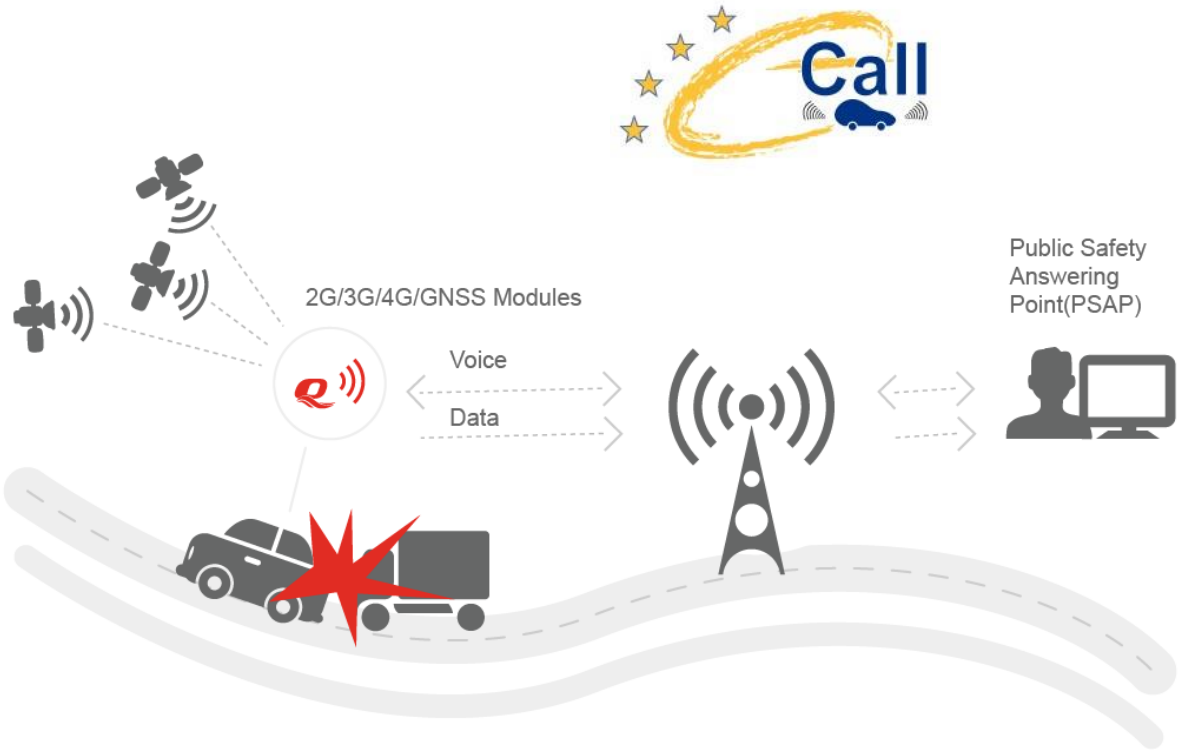
Enhanced AT Commands

- Standard V.25ter AT commands
- 3GPP TS 27.007 (GSM 07.07)
- 3GPP TS 27.005 (GSM 07.05 SMS)
- TCP/IP stack AT commands
- STK (SIM Application Toolkit)
- Quectel defined AT commands

NOTE: "Optional" means supported only on selected module models.

eCall

A car will have an electronic safety system automatically calling emergency services in case of a serious accident. Even if the driver is unconscious, the system will inform rescue workers of the crash site's exact whereabouts, and the rescues will be on its way within minutes. The system is named as “**eCall**”.



- *Quectel supports eCall in 2G/3G/4G/GNSS modules and has been working on the function since late 2011.*
- *Quectel has enough development experience on eCall to support and assist customers with eCall application development.*

QuecFOTA®

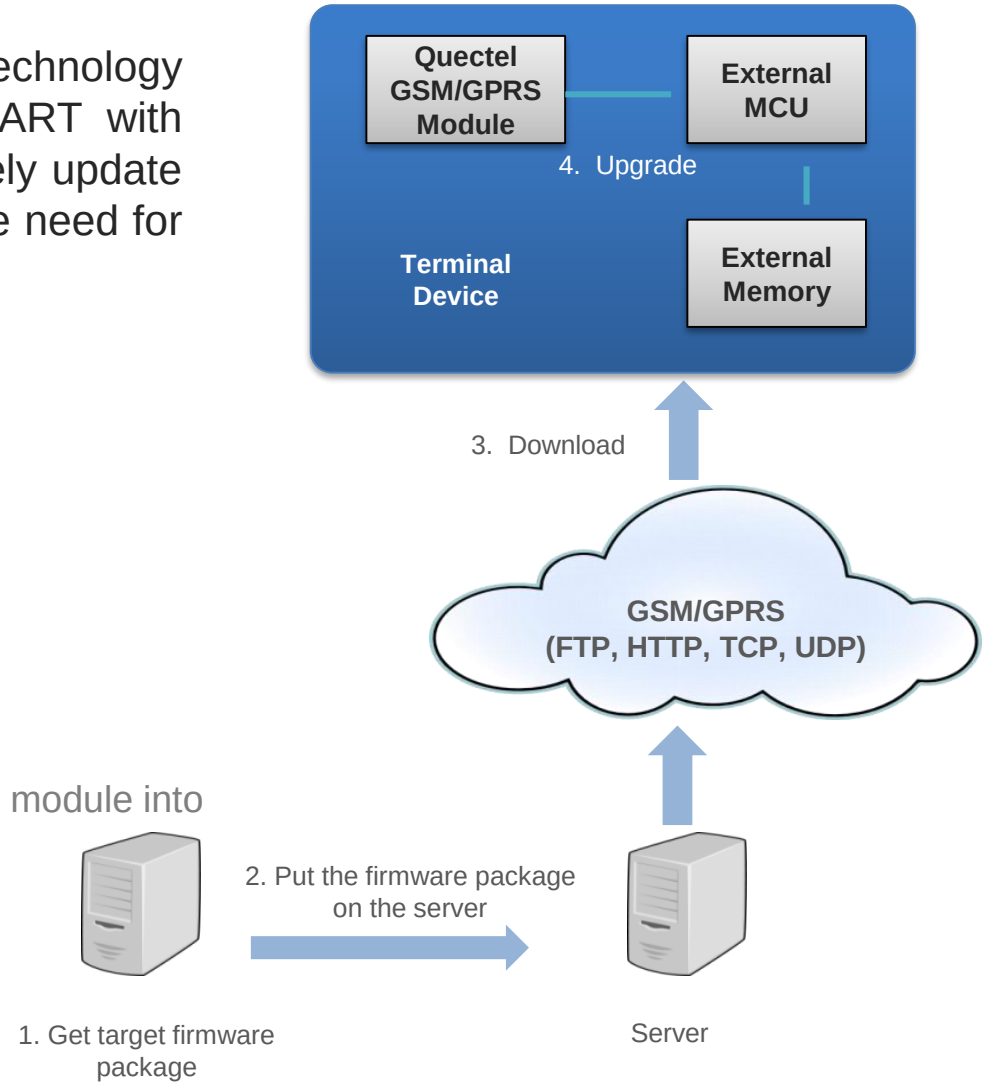
FOTA refers to Firmware Upgrade Over-The-Air. QuecFOTA® technology provides a solution to update module's firmware by MCU via UART with Quectel protocols. It enables mobile device manufacturers to remotely update firmware. The new firmware can be delivered over the air, without the need for users to bring the device to a service facility.

Firmware Upgrade Process via QuecFOTA®

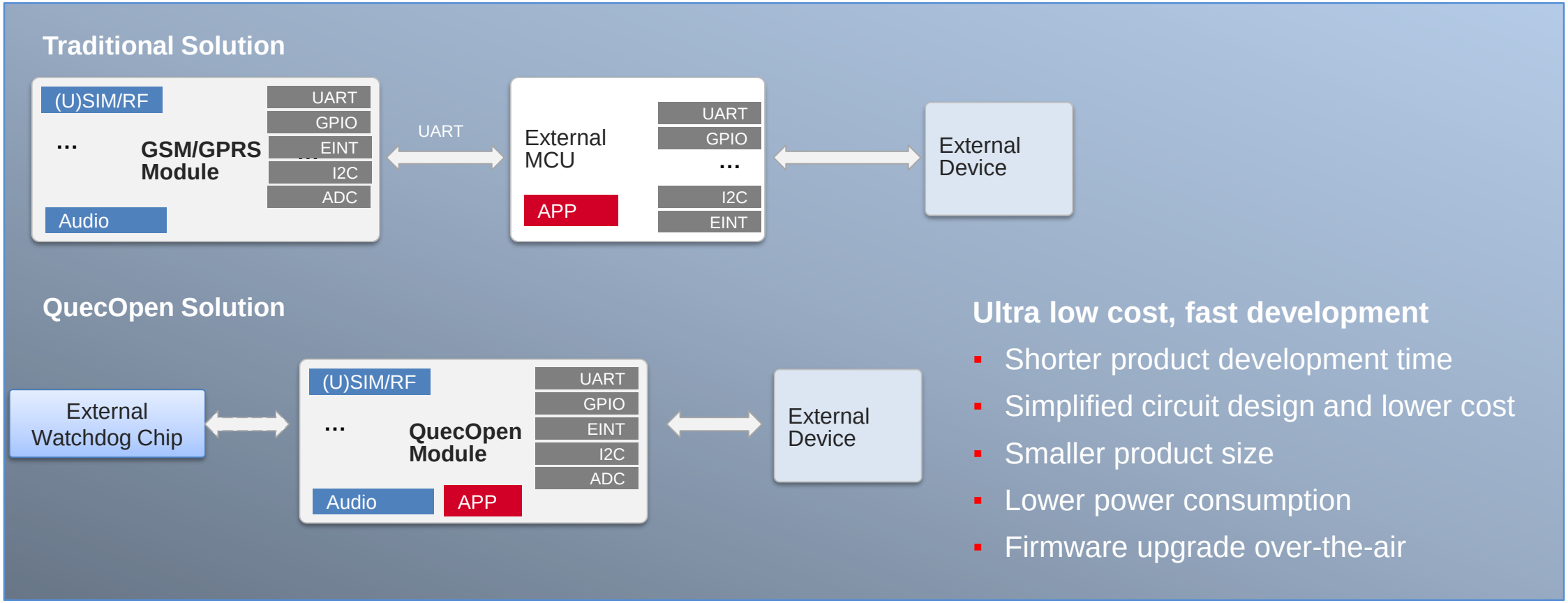
- **Get target firmware package**
- **Put the firmware package on the server**
- **Download the firmware package**
- **QuecFOTA® Synchronization**

  To update the firmware, the MCU must synchronize with module and put the module into command mode.
- **QuecFOTA® Packet**

  Then MCU packets the new firmware and sends the packet to the module.

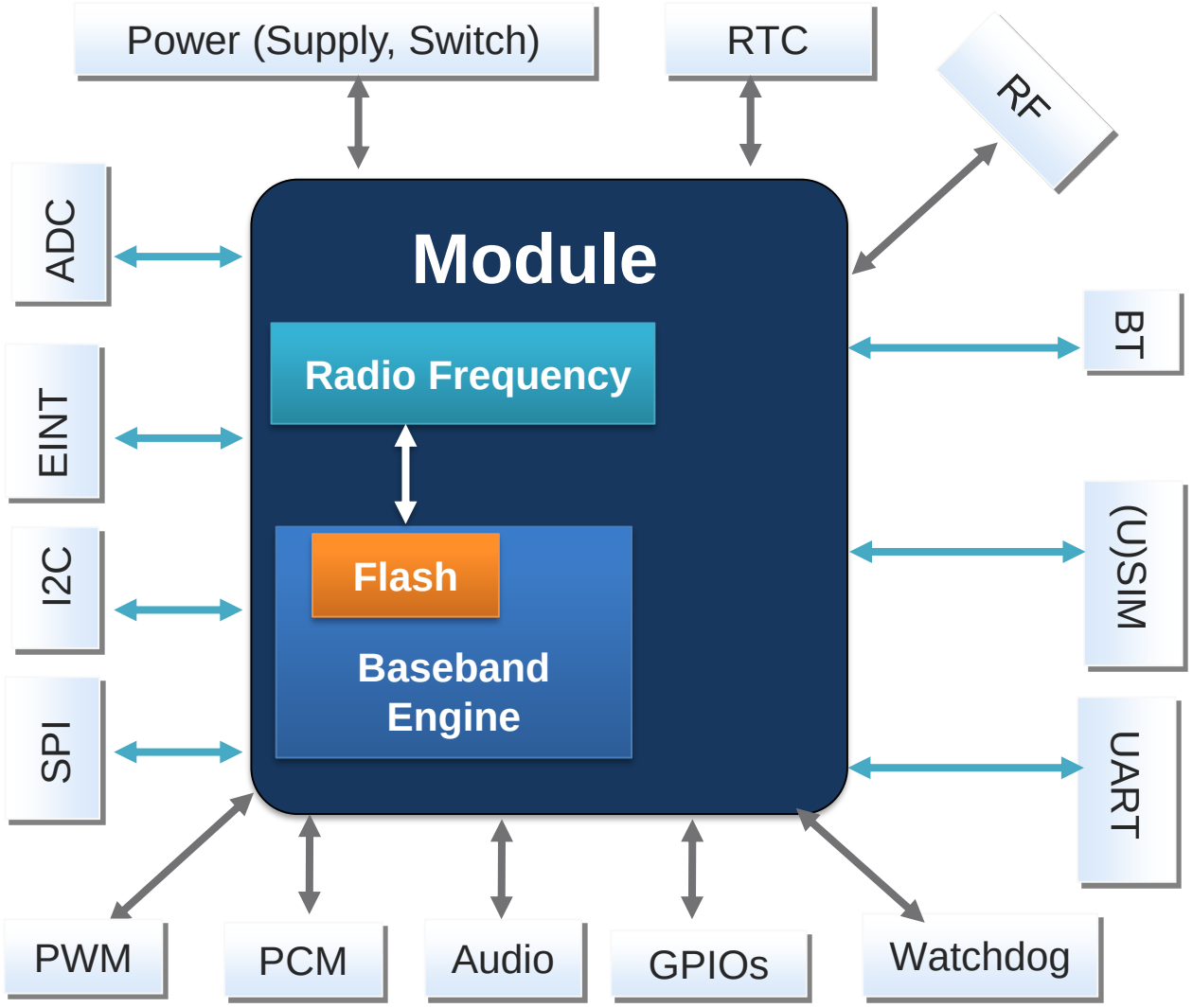


QuecOpen® Solution



QuecOpen® is an embedded development solution for M2M field. As compared with traditional solutions, QuecOpen® solution can make hardware design easier for developers. It enables customers to create innovative applications and then download them directly into Quectel GSM/GPRS modules to run.

QuecOpen® - Hardware Architecture



Hardware Architecture

- Power supply
- Power switch
- RTC
- UART
- ADC
- PCM
- Audio
- BT
- (U)SIM
- GPIOs
- PWM output
- EINT
- I2C
- SPI
- Watchdog
- RF

Bluetooth Function - Bluetooth 3.0 Profiles

Profile: SPP

Laptop or PC

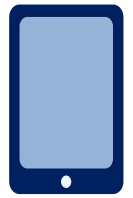
Series Data

Laptop or PC

Profile: HFP

Simple Headset

Hands-Free Unit installed in car



Mobile Phone

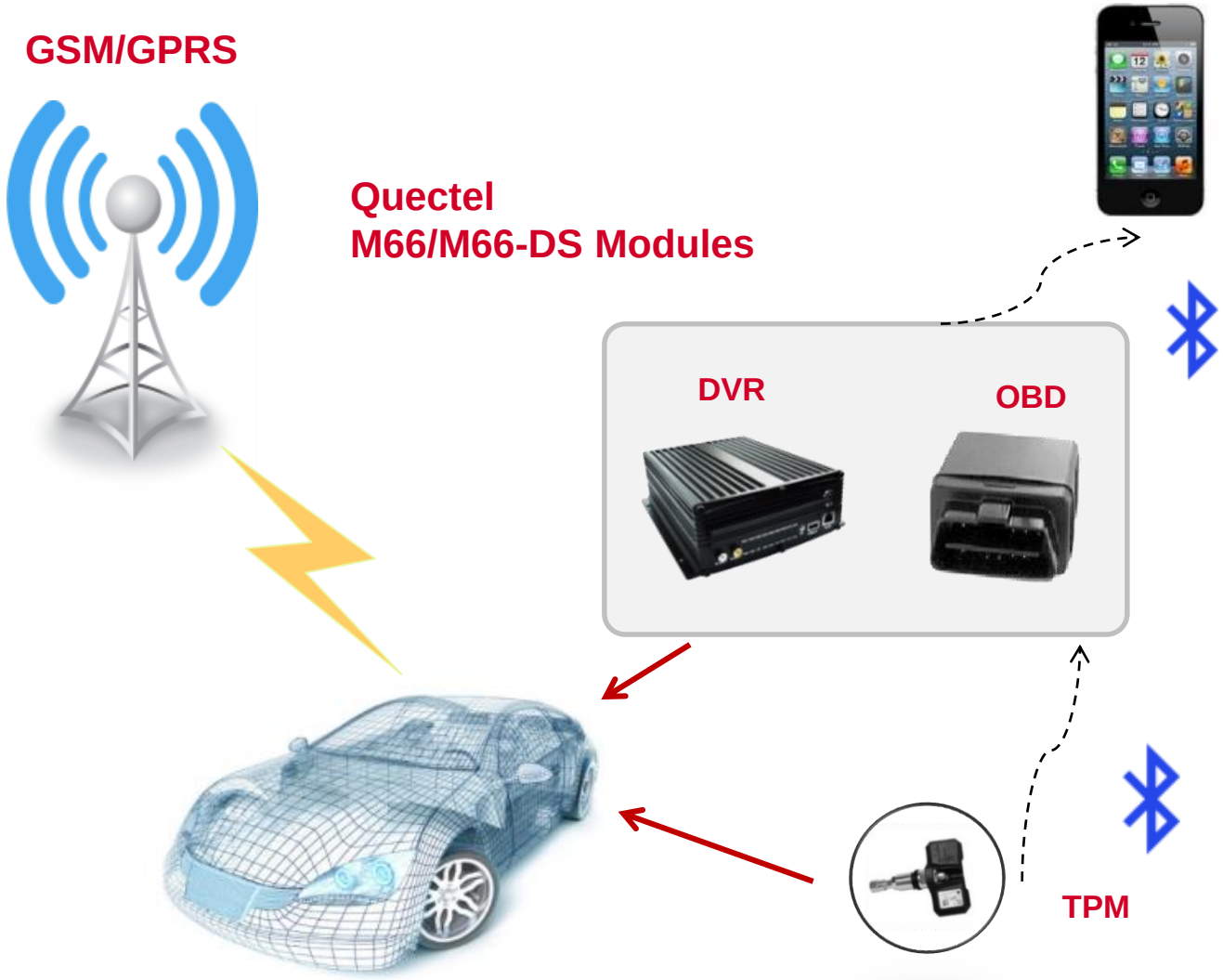
Cellular Connection

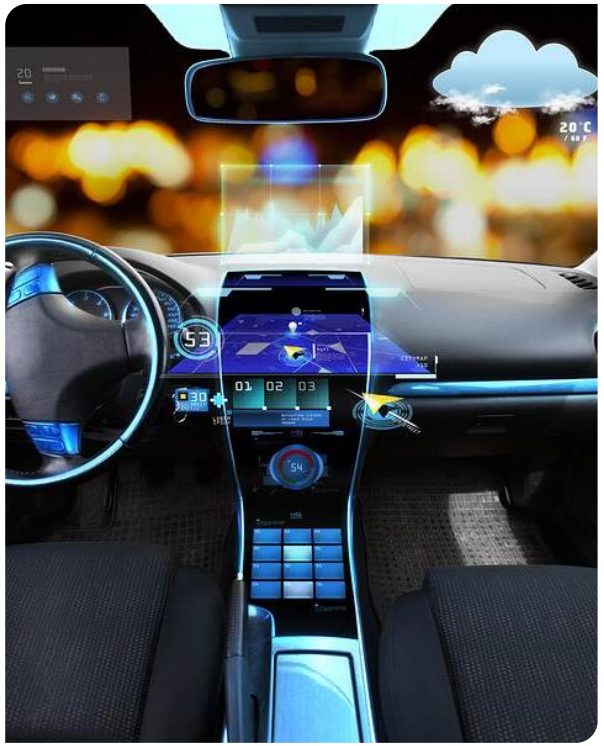
Public Wireless Network

Quectel M66/M66-DS Modules

NOTE: BT 3.0 is supported on Quectel M66/M66-DS modules only.

Bluetooth Applications

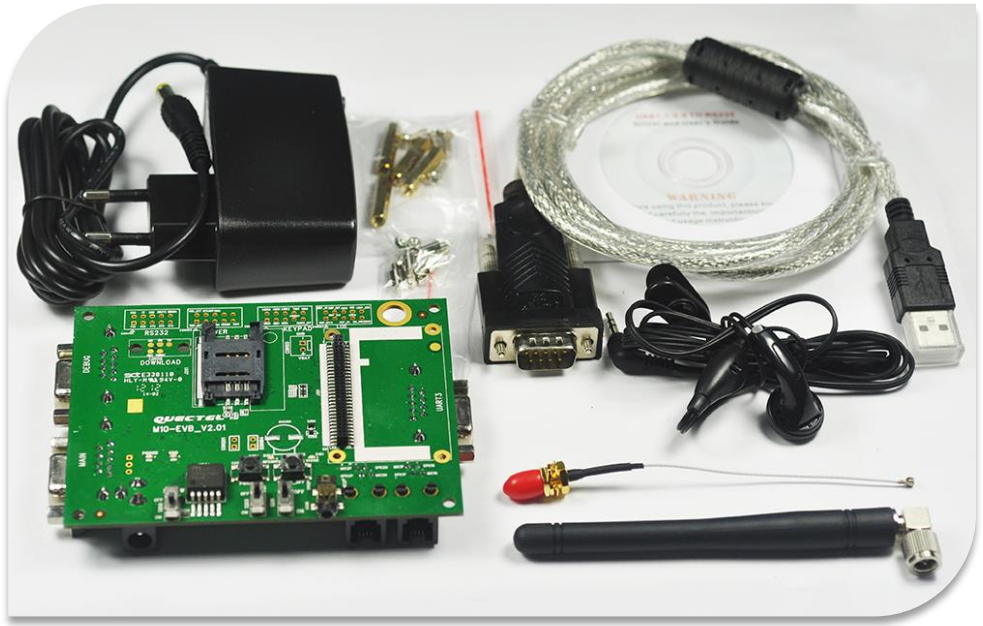




Application on Vehicles

NOTE: BT 3.0 is supported on Quectel M66/M66-DS modules only.

Support Package (1)



Technical Materials Package

- Specification
- Hardware Design
- AT Commands Manual
- GSM EVB User Guide
- Reference Design
- Footprint&Part in PADS and Protel Formats

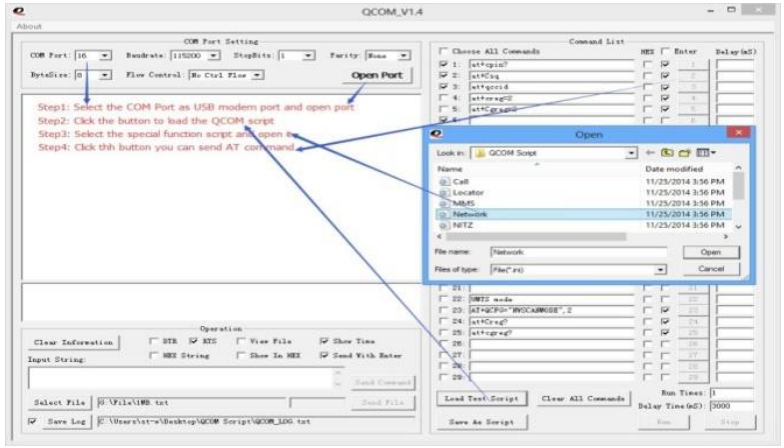
GSM-EVB Kit

- Accessories
  - GSM EVB
  - 5V DC Power Supply
  - GSM Antenna
  - USB Data Cable
  - USB-UART Converter Cable
  - RF Cable for GSM Antenna Connection
  - Disk
- Interfaces
  - RS-232 interfaces
  - Power supply
  - Antenna interface
  - Debug UART interface①
  - Handset interface
  - Earphone interface
- Features
  - Network status LED
  - Power key
  - Emergency off key

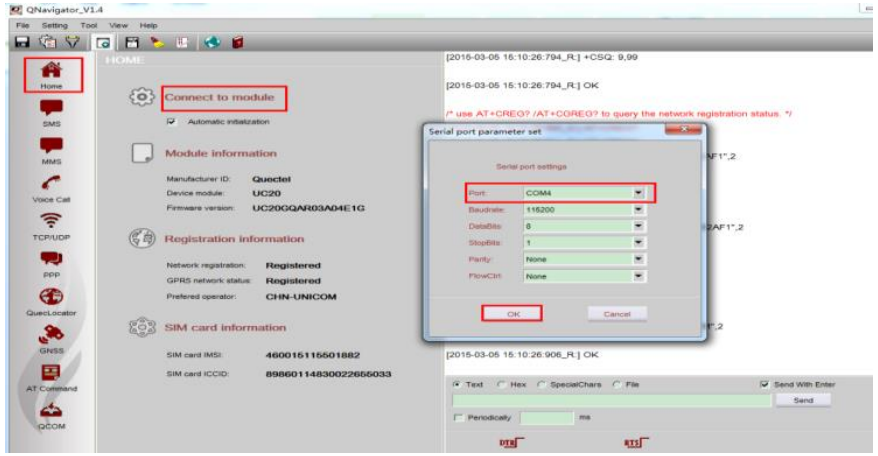
① The debug UART interface of M65 is on TE-A.

Support Package (2)

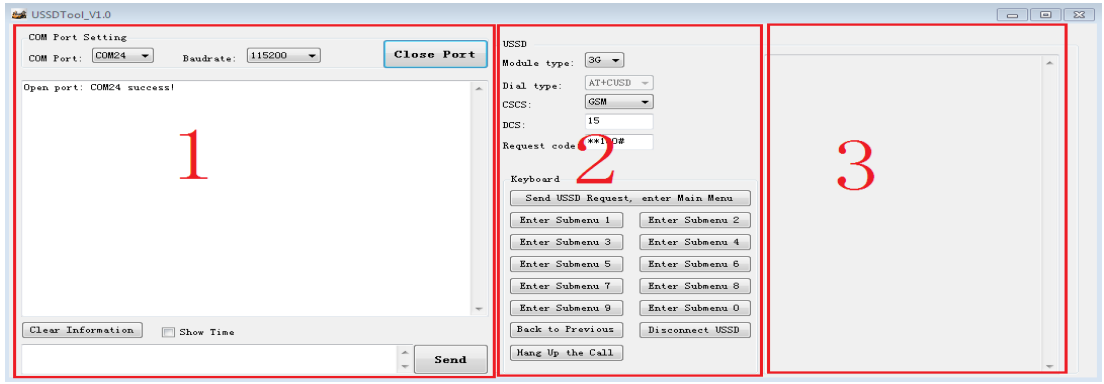
PC tool: QCOM/QNavigator/USSDTool - GSM Test Tool



QCOM

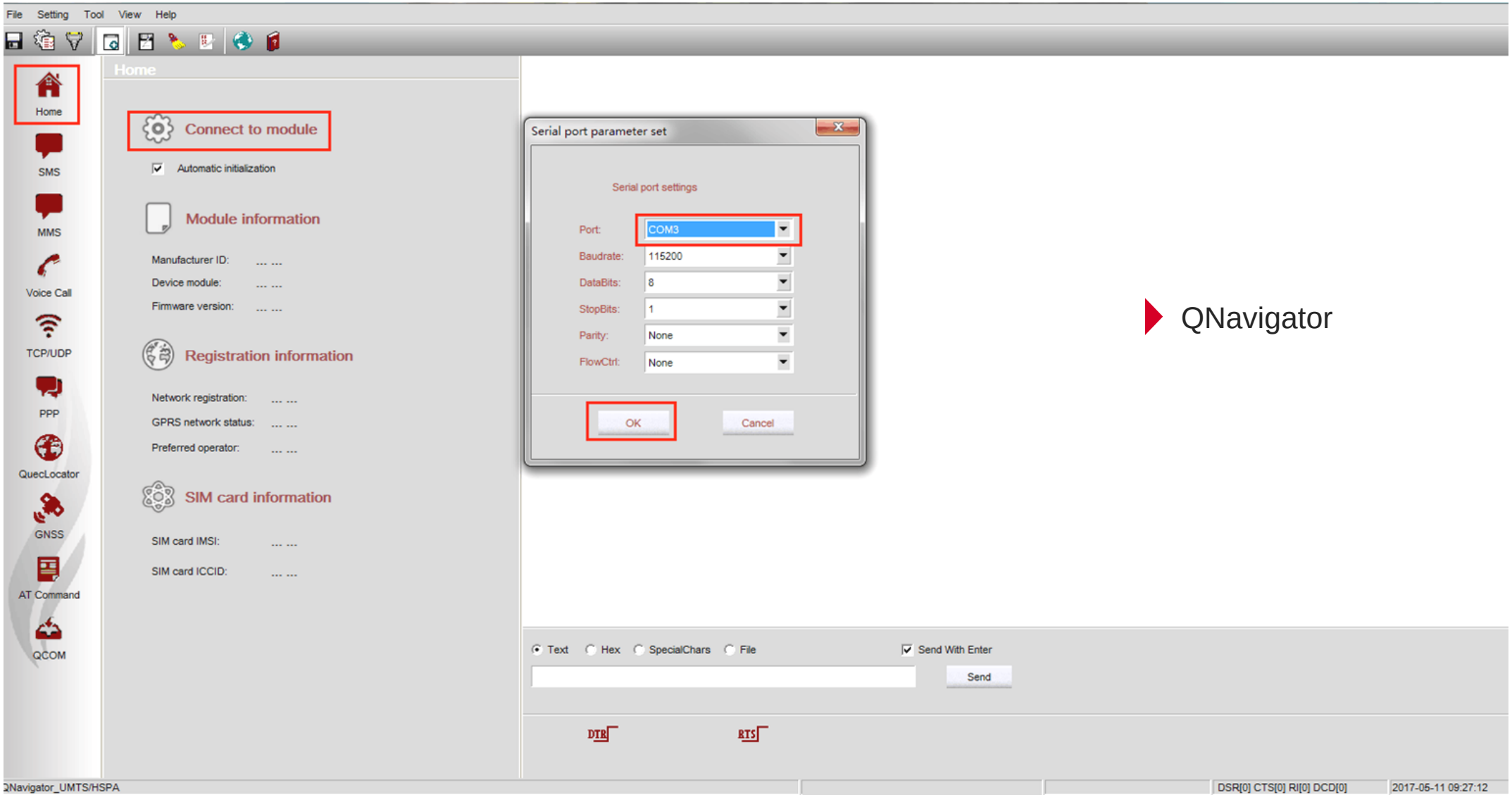


QNavigator



USSDTool

Support Package - QNavigator



- QNavigator

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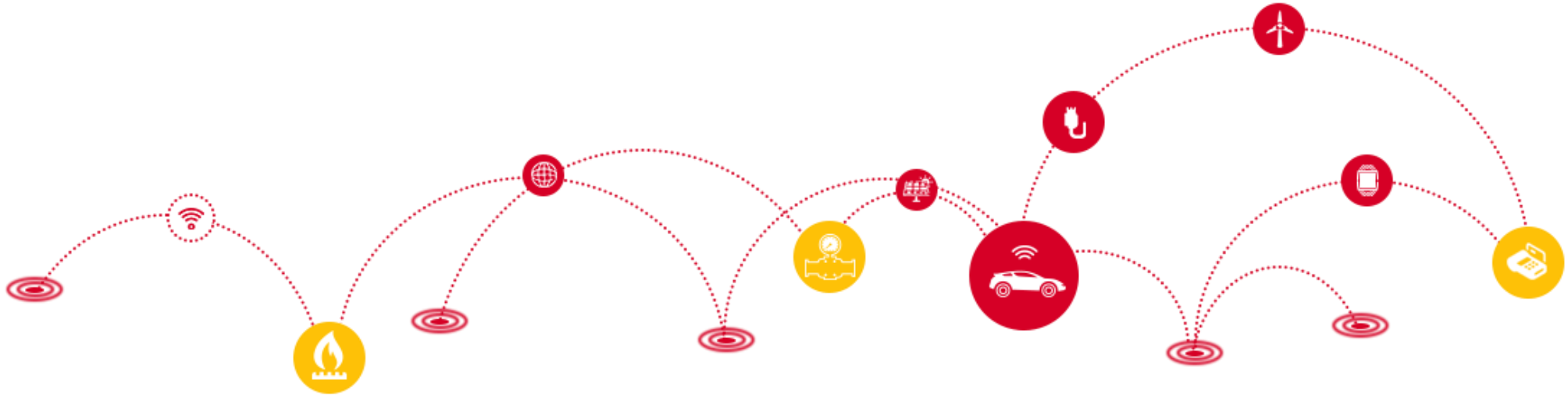

GSM Module Differences Table (1)

		M95	M66	M65	M66 R2.0	M66-DS	M89
General Features	Band	850/900/1800/ 1900MHz	850/900/1800/ 1900MHz	850/900/1800/ 1900MHz	850/900/1800/ 1900MHz	850/900/1800/ 1900MHz	850/900/1800/ 1900MHz
	Flash Size (bit)	24M	32M	32M	24M	32M	32M
	Dimension	23.6mm × 19.9mm × 2.65mm	17.7mm × 15.8mm × 2.3mm	17.7mm × 15.8mm × 2.3mm	17.7mm × 15.8mm × 2.3mm	17.7mm × 15.8mm × 2.3mm	18.8mm × 27.6mm × 2.3mm
Software Functions	SSL/ MMS/ SMTP(S)	Yes	Yes	Yes	Yes	Yes	Yes
	Audio Recording	Yes	Yes	Yes	Yes	Yes	No
	Audio Play	Yes	Yes	Yes	Yes	Yes	Yes
	TTS	No	No	No	No	No	No
	QuecOpen®	No	Yes	Yes	No	Yes	No
	UFS	No	Yes	Yes	No	Yes	No
	BT 3.0 (SPP/HFP)	No	Yes	No	Yes	Yes	No

GSM Module Differences Table (2)

		M95	M66	M65	M66 R2.0	M66-DS	M89
Hardware Interfaces	External (U)SIM1	Yes	Yes	Yes	Yes	Yes	Yes
	External (U)SIM2	Yes	No	No	No	Yes	No
	Analog Audio	2	1 input, 2 output	1 input, 2 output	1 input, 2 output	1 input, 2 output	1 input, 1 output
	Digital Audio	Yes (Multiplexing Function)	Yes	No	Yes	Yes	No
	Main UART	Yes	Yes	Yes	Yes	Yes	Yes
	Debug UART	Yes	Yes	Yes	Yes	Yes	Yes
	Auxiliary UART	No	Yes	Yes	Yes	Yes	No
	SD Card	No	Yes	No	No	Yes	No
	Temperature Detection	Yes	No	No	No	Yes	No
	Internal SIM IC	Yes (Multiplexing Function)	No	No	No	No	No
	BT 3.0	No	**Yes**	No	**Yes**	**Yes**	No
	I2C	No	Yes (For QuecOpen® Version Only)	Yes (For QuecOpen® Version Only (Multiplexing Function)	No	Yes (For QuecOpen® Version Only)	No
	SPI	No	Yes (For QuecOpen® Version Only)	No	No	Yes (For QuecOpen® Version Only)	No

"" means under development.*
"Multiplexing Function" means the function is multiplexed from other interface pins.
"Compatible Function" means the function is not supported by default, but can be supported through hardware modification/upgrade.

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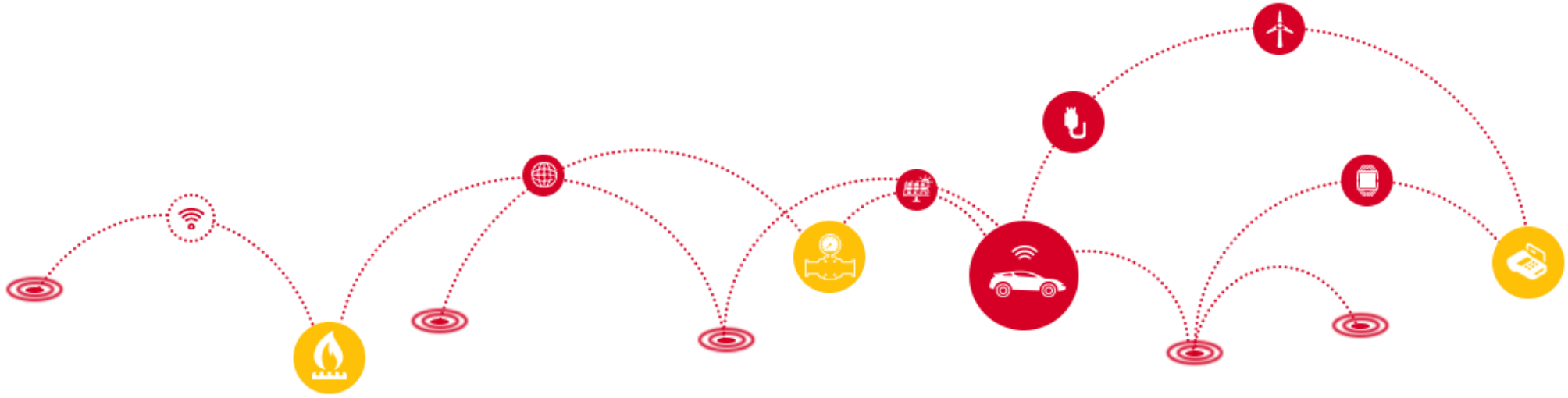

Target Applications

Smart Metering
(Water/Gas/ Electricity)

Payment
(Wireless POS/ Cash Register)

Personnel/ Pet Tracking

Security & Surveillance

Transportation

Telematics

Industrial PDA

Thank you!

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