gemalto
security to be free

M2M CONNECTIVITY SOLUTIONS & SERVICES

Welcome to a smarter connected world!

AUTOMOTIVE

Welcome to a world where the hottest new connected device has four wheels. Vehicles are being transformed into mobile offices, media screening rooms and personal assistants offering convenient features such as mobile 4G connectivity for multiple devices, simultaneous Internet radio and movie streaming, eCall capabilities, up to the minute 3D navigation guidance and much more.

MHEALTH

Welcome to a world where physicians track chronic disease and patient well-being in real time, communicating treatment plans before critical conditions arise. Secure mHealth solutions are advancing modern medicine and improving patient outcomes while reducing office visits, saving time and expense.

Gemalto's M2M connectivity solutions, services and world leading digital security expertise enable trust in our connected world.

Partnership

Collaboration to provide guidance.

Security

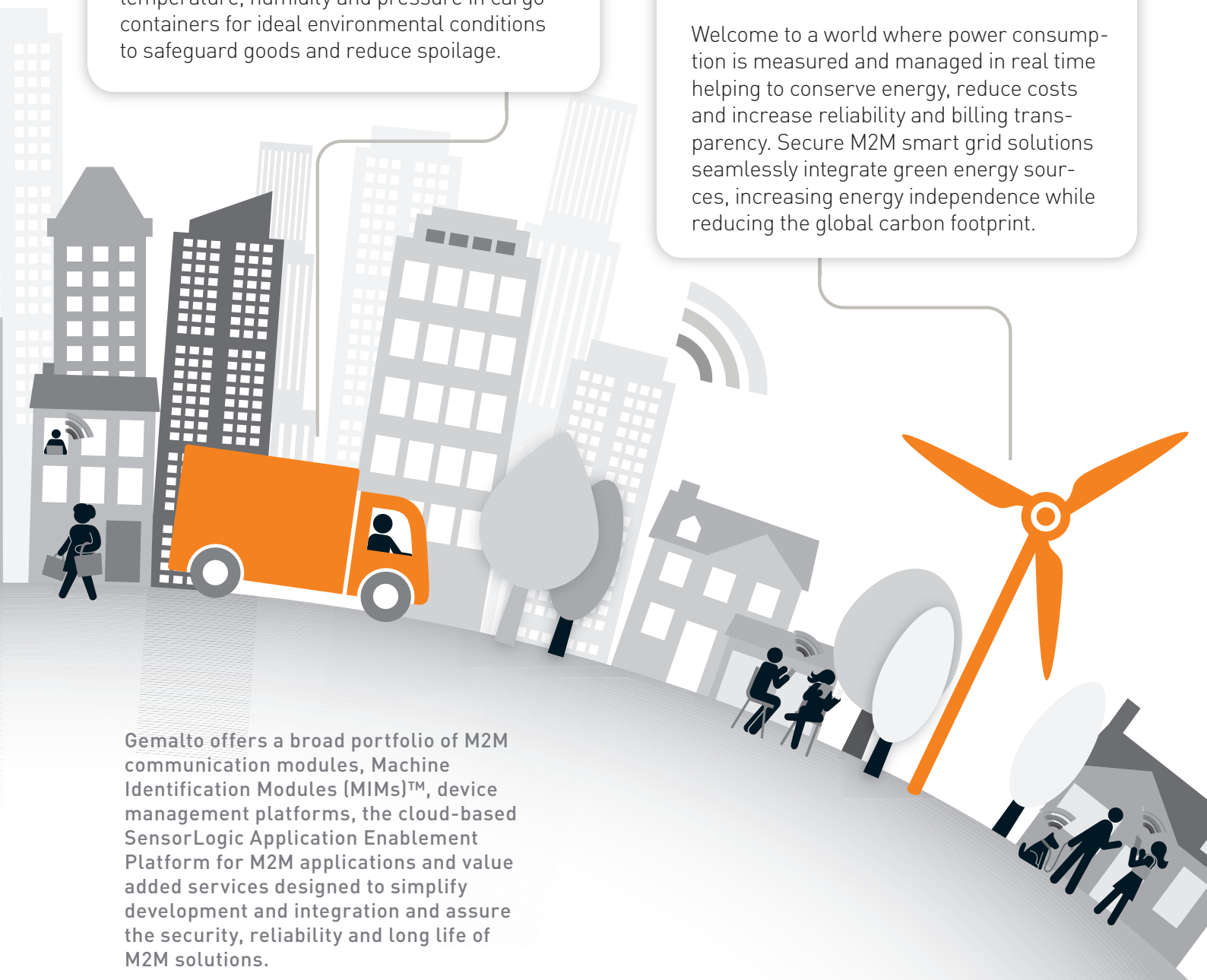
World leader in digital security.

TRACKING & TRACING

Welcome to a world where manufacturing and distribution companies can "see" products 24-7 and change routes and schedules in real time to improve productivity and ensure on time delivery. M2M solutions automatically adjust temperature, humidity and pressure in cargo containers for ideal environmental conditions to safeguard goods and reduce spoilage.

SMART ENERGY

Welcome to a world where power consumption is measured and managed in real time helping to conserve energy, reduce costs and increase reliability and billing transparency. Secure M2M smart grid solutions seamlessly integrate green energy sources, increasing energy independence while reducing the global carbon footprint.



Gemalto offers a broad portfolio of M2M communication modules, Machine Identification Modules (MIMs)™, device management platforms, the cloud-based SensorLogic Application Enablement Platform for M2M applications and value added services designed to simplify development and integration and assure the security, reliability and long life of M2M solutions.

Simplicity

Solutions to simplify the connected world.

Expertise

M2M market leader for close to 20 years.

Security

Security Consulting and Evaluation

Gemalto has a long and successful history of providing security solutions for IT, governments, banks and mobile network operators. Security is in Gemalto's DNA. Our team of Security Labs experts has the knowledge and experience required to deliver secure cryptography, mobile and server security, and tamper resistant solutions.

As the landscape of our digital lives expands and Machine-to-Machine (M2M) solutions are developed at an ever faster pace, an urgent need has emerged to secure these solutions and ensure the privacy and integrity of the data they communicate. Whether you are designing a new M2M device or want to evaluate the security level of an existing solution, Gemalto provides the expertise and technology required to enable trust in our increasingly connected world.

Security Consulting

Gemalto experts provide a thorough overview of security risks to help define the right level of security required for any type of solution:

- Analyze solution specific risks as well as regulatory environments
- Define security requirements ranging from basic software security to integration of tamper resistant secure elements and associated infrastructure
- Define a security validation plan

Security Evaluation

Gemalto performs thorough penetration testing of devices, systems and services to confirm appropriate security solutions and end-to-end architecture before production begins:

- Define evaluation methodology
- Perform state-of-the art evaluation including:
  - Reverse Engineering
  - Physical manipulation (X-Ray, component desoldering, Bus probing)
  - Logical manipulation (build fake apps, exploit Operating Systems and protocol vulnerabilities)
- Deliver a detailed report

Benefits

- Reduce security related costs by implementing security measures in the early phases of product design
- Receive expert advice on how to adopt an end-to-end and future proof security architecture

M2M Secure Elements

In order to fulfill the specific security needs of the most critical M2M applications including smart grid, automotive and healthcare solutions, Gemalto offers M2M Secure Elements in both plug-in or MFF2 form factors delivering the maximum level of security for sensitive M2M devices. The Secure Element brings together smart card level protection with tamper resistance hardware and multi-application capabilities. Gemalto's Secure Element features onboard crypto functions, credentials and certificates storage to secure your data connections. It can help validate the integrity and authenticity of onboard software running on your M2M device.

Key features:

- Javacard Platform
- Global Platform 2.2
- ISO/IEC 7816-3 communication interface
- Hardware and software counter measures against attacks
- Profile personalized with a unique SE identifier
- Profile can be updated with customer specific keys, applets and files
- Common Criteria EAL5+ certification
- Compliant to BSI Security Module Protection Profile for Smart Meter Gateway
- Middleware to facilitate integration in the device

SensorLogic Application Enablement

Build and Deploy M2M Applications Faster & Easier

The Sensor LogicApplication Enablement Platform allows organizations to rapidly build and deploy next-generation machine-to-machine applications that leverage the expanding world of connected devices.

Solutions based on the Platform let people and businesses harness real-time intelligence from connected devices and transform it into actionable insights that drive better business outcomes.

The SensorLogic Platform enables organizations to bring innovative M2M solutions to market faster and at a fraction of the cost of silo approaches. Customers today are using our Platform to create feature-rich, cloud-based applications that are secure, scalable and easy to manage.

The Application Enablement Platform allows you to:

> Connect any type of device over any network.
> Combine real-time device data with contextual. information from cloud applications and enterprise systems to create actionable business intelligence
> Design, build and manage your applications with ease using pre-built services and tools.
> Combine real-time device data with contextual information from cloud applications and enterprise systems such as ERP or CRM to create actionable business intelligence.

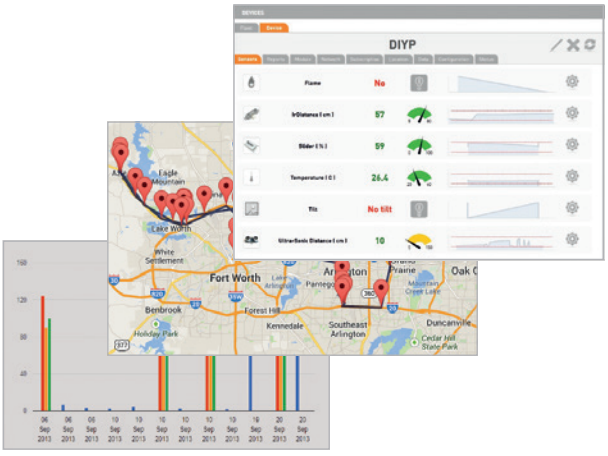
Scales With Your Business

The platform is scalable and flexible enough for your needs regardless of the size and scope of your deployment.

> Easy to use application APIs allow users to add a fleet map with just the click of a mouse to speed up prototyping
> Provides end-to-end vertical application hosting with the highest level of security to ensure privacy of M2M device

Overcomes Complexity, Lowers Costs and Reduces Risks

Works with any kind of device or network and handles the underlying complexity associated with them.



Speeds Time-to-Market

Leverage reusable building blocks to focus on your value add rather than reinventing the wheel.

On-Demand Connectivity

A great potential waiting to be exploited

Addressing the M2M market and other connected devices, we help operators and device manufacturers to offer instant connectivity with fully flexible mobile subscription management throughout the device's entire lifecycle. On-Demand Connectivity is part of the Gemalto's Mobile Trust Net portfolio of solutions, enabling our customers to offer trusted services at every point along the mobile value chain.

The M2M market is looking for solutions that drive down operating costs by improving business process efficiency, and SLAs guaranteeing performance levels around the globe.

The arrival of the always-connected generation along with upgraded mobile networks have fostered the multiplication of devices. Mobile services continue to grow and are transforming how people behave and how businesses engage with them. Mobile connectivity is now an integral part of our everyday lives with a clear focus on immediacy and convenience, and providing an easy way to connect such devices is a strong opportunity for mobile operators and device manufacturers.

But also two main challenges are hindering growth in this market:

- the complex logistics of connecting multiple devices with multiple profiles across multiple countries for both operators and subscribers
- the often painful end user journey to set up a subscription

The answer

To provide an "always-on" user experience, mobile connectivity needs to become a standard feature for devices, adding value and differentiation to both the device itself and content it provides. As such, connectivity providers need to simplify data plans and offer customers flexible subscriptions that can be easily activated and modified as needed.

Our solution

LinqUs On-Demand Connectivity offer provides operators, device makers and service providers with a secure and highly reliable solution to dynamically manage mobile broadband subscriptions whatever the network coverage.
LinqUs On-Demand Connectivity is tailored to both M2M and other connected devices' markets. It provides a simple way to offer adaptable connectivity, based on innovative technology that is set to dramatically increase the deployment of these new connected devices.

What's in the offer?

- **It enables**, providing the infrastructure necessary for future connectivity, including an embedded UICC and the software for remote subscription management.
- **It connects**, using bootstrap services that enable any device to be connected on initial start-up and throughout its whole lifecycle, with full profiles downloaded on first use that can be activated, removed or swapped as required.
- **It offers** value, through services and offers that can be tailored to individual customers according to usage

The benefits

LinqUs On-Demand Connectivity offer helps device makers stand out from the crowd in a highly competitive market, enables telecom operators to provide the right-sized data plans to boost broadband connectivity adoption rate, and offers adapted SLAs to M2M service providers, enabling them to monetize their user base and maximize revenue from connectivity services.

Support

Comprehensive, Customized Global Support Solutions

Implementing GSM/GPRS modules across a wide range of business activities means that developers are continually facing new challenges specific to GSM technology. This is why Gemalto offers comprehensive support services worldwide. Whether you're located in Asia, North America, South America, or Europe, the Wireless Modules support is available anywhere in the world.

You receive local, on-site support either from Gemalto's branch offices or from distributors. If you only offer low unit quantities, native speaker distributors often prove to be the best support contacts. These distributors normally have spare parts and other tools immediately available and can provide help fast.

Our support packages:

- Approval Consulting
- Pre-Approval RF Measurements
- Security Consulting
- SMT production Consulting
- Schematics & Layout Review
- Antenna Consulting
- Basic Sample Review
- Audio Measurement
- SIM Electrical Tests
- Electro Static Discharge Test
- IoT Solution Verification
- Java ME Workshops

Gemalto Support offers

Applications using Cinterion GSM/GPRS modules are numerous, varied, and technically demanding. Thus, customized support packages are needed. That's why Gemalto provides three-phase support for you:

- In the acquisition phase by Technical Sales: This department offers technical support during the pre-sales product selection process. Gemalto consultants inform themselves about the project and advise you in selecting the appropriate radio modules and terminals. Technical Sales works together with customers in coordinating projects and putting together suitable support packages.
- In the implementation phase by Customer Support: This department provides support during the implementation of the project. You are assigned a personal project manager who uses his expert knowledge to ensure the project is completed successfully.
- In the after sales phase by the Support Line: In the event of inquiries or problems, the Support Line continues to offer help and assistance even after the integration process (reachable on the Web or by email or telephone). The Support Line also conducts technical training courses and provides support for new product versions.

Thanks to the comprehensive range of support services of Gemalto, you are able to reduce your development times, costs and risks, and remain competitive with products that meet market demands and employ the latest technology.

Machine Identification Module (MIM)™

The wireless M2M market is growing rapidly worldwide optimizing a wide array of industries and applications including automotive, metering, remote management, industrial data collection, healthcare and more. The requirements of M2M applications present new challenges and, in many cases, a standard SIM card is simply not adapted for the job. That's why Gemalto developed a new, specialized SIM platform called Machine Identification Modules, MIM™. Designed specifically for M2M applications, MIMs ensure that mobile operators can claim and retain a significant stake in this new market while providing new opportunities for M2M integrators, OEMs and customers.

Building upon Gemalto's proven SIM technology, MIMs secure the identity of machines communicating on carrier networks and provide security authentication and ciphering information among other features.
Gemalto MIMs are M2M optimized to:

- Survive extremes of vibration, temperature, and humidity
- Endure a long life span (ex: 10 years)
- Occupy a small footprint (miniaturization)
- Withstand and integrate into industrial
- manufacturing processes

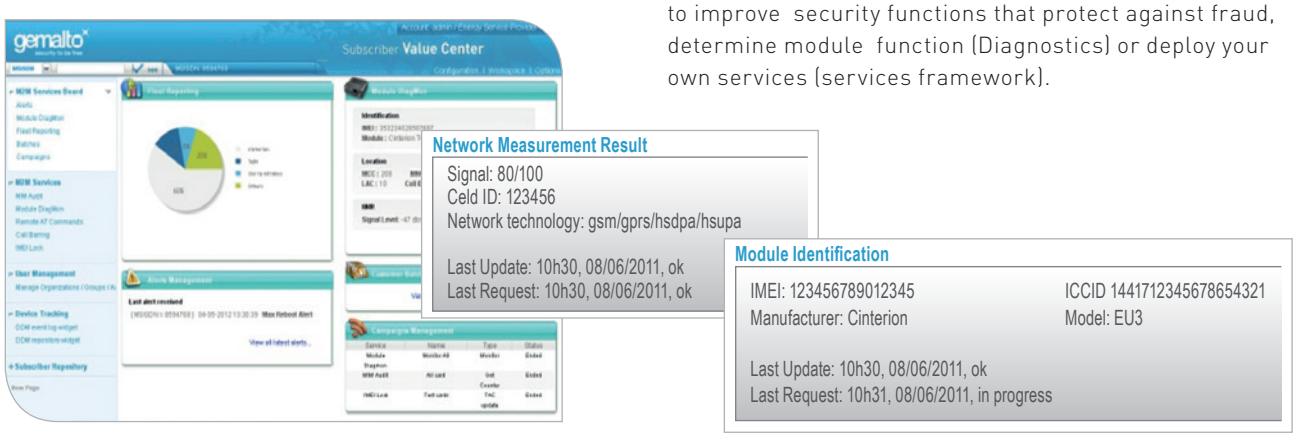
Gemalto MIMs meet the needs of mobile operators and their partners as well as customers in the M2M value chain. This unique platform, which is available in several form factors, is already enabling successful M2M deployments around the world and has been selected by many M2M hardware providers as their preferred solution for secure mobile connectivity.

Product family	U-MIM Quad	M2M^{Plug} 85	M2M^{Plug} 105	^{Full}M2M Quad	^{Full}Auto Quad
					
Temperature resistance range	GSM standard	-35 °C / +85 °C	-40 °C / +105 °C	-40 °C / +105 °C	-40 °C / +105 °C
M2M qualification (JEDEC)			•	•	•
eXtended Life mechanism	As an option	•	•	•	•
Data retention	10 y / 25 °C	10 y / 85 °C	10 y / 85 °C	10 y / 85 °C	**17 y / 80 °C**

MIM Services: Simplifying lifecycle management of M2M Devices

M2M modules and IoT devices require dedicated monitoring and management throughout the long life of applications. Gemalto's Machine Identification Module Services (MIM) Services platform leverage secure software and Over-the-Air services to help MNOs and their customers optimize and manage their deployed assets across their lifespan. The Platform enables regular MIM audits and monitoring to helps detect inappropriate usage so that adjustments can be made Over The Air to preempt service failure. Audit alerts can be set to indicate each time a device goes below a certain signal strength, or when operating temperature exceeds agreed upon Service Level Agreements. Over-the-Air updates allow service providers and MNOs to make adjustments as needed to improve quality of service or protect against evolving cyber threats. The MIM Services Platform comes with a complete and reliable API allowing easy integration in service provider vertical applications.

The MIM Services platform provides all the tools needed to manage the life cycle of deployed MIMs (MIM Audit) and to improve security functions that protect against fraud, determine module function (Diagnostics) or deploy your own services (services framework).



MIM AUDIT

- > **Counters** on file writes and memory wear
- > **Campaigns** to retrieve counters
- > **Alerts** to prempt device end of life

SERVICES FRAMEWORK

- > Deploy your own **business logic on** the MIM
- > **Easy to use** XML based service development language
- > **Ready to use** bricks for **Device, Location & Security**

ANTI FRAUD

- > **Call & SMS** barring
- > **Device detection** and **Lock**
- > **Device Change** notification and reports

ADMINISTRATION

- > User Portal
- > Delegate and manage access privileges for your customers

DIAGNOSTICS

- > **Campaigns** or **Alerts** to retrieve key information
- > **Location** & **Signal quality** monitoring
- > **Remote AT** command execution

REPORTING

- > Fleet intelligence for market analysis

WEB SERVICES

- > Web APIs for all platform features

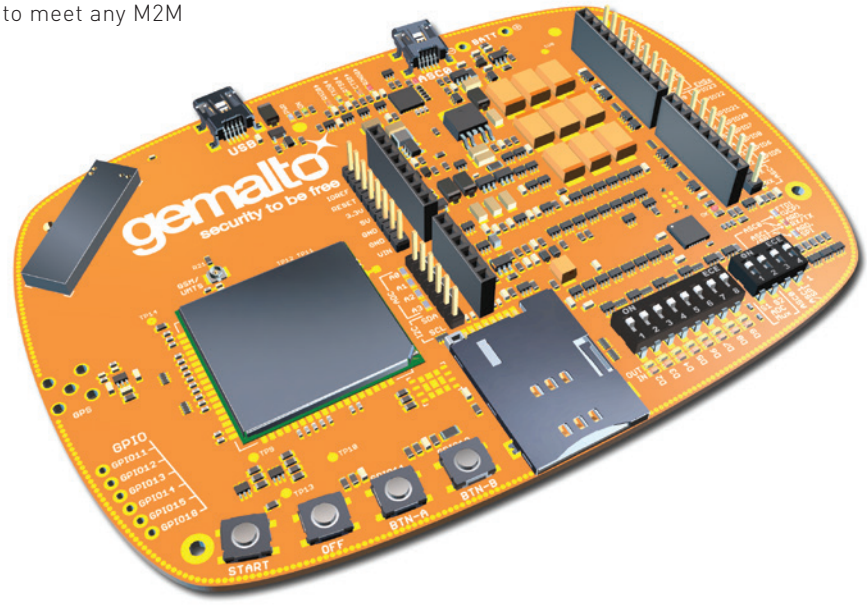
Streamlined M2M Development

Gemalto's comprehensive offering of end-to-end solutions and services is unique in the marketplace offering a single source for all your M2M technology needs. Gemalto's full spectrum, one-stop-shop approach streamlines M2M development and reduces complexity in the ecosystem for developers and OEMs. Well known throughout the industry for unprecedented expertise and market leading support services, Gemalto's global footprint and local market staff provide an unmatched ability to support customers across the complete M2M value chain, across the globe and across all vertical markets.

Cinterion Concept Board

The Cinterion Concept Board, a quick-start development board connects with Arduino-style sensor boards for super fast prototyping. It leverages Java and easily integrates with the cloud-based SensorLogic Service Enablement Platform providing comprehensive application services to connect devices to backend IT networks.

Other tools including a range of starter kits or the Developer Board DSB-mini are also available to meet any M2M application need.



Gemalto M2M Developer Community

As the world catches on to the power of wireless to simplify and improve the way we live, a new age of invention has begun. Today's hottest connected devices include cars, clothing, sunglasses, fitness trackers, and even toothbrushes. The Internet of Everything is here and increasingly more developers and hobbyists are trying their hand at M2M technology. In response, Gemalto created the benchmark M2M Developer Community providing everything necessary to transform creative ideas into trend setting connected devices. It serves as a one-stop-shop covering all the core components of the M2M value chain – from hardware and software to services and security.

The Definitive Source of M2M Expertise, Support and Community

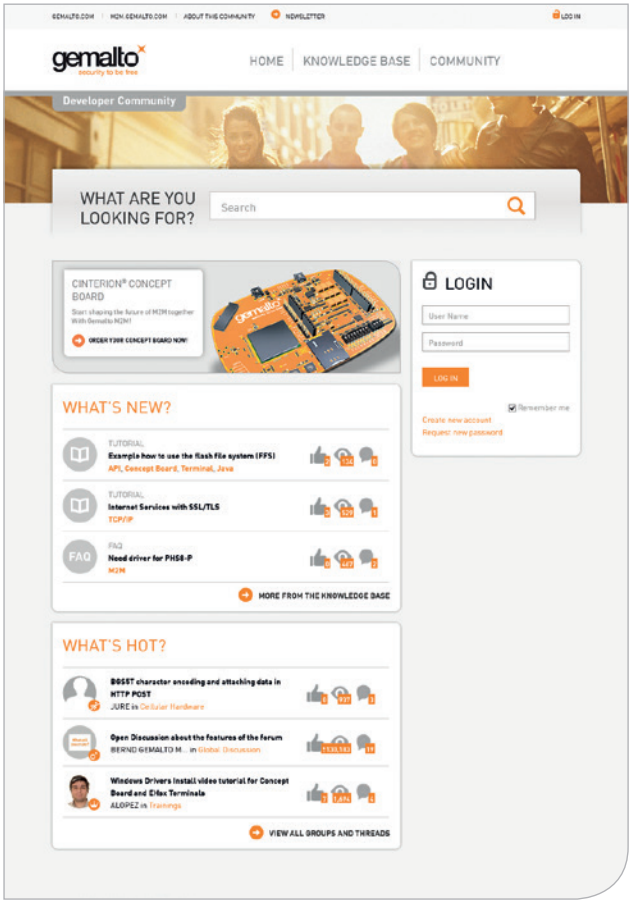
Whether you are just dabbling in M2M for the first time, an experienced hobbyist, or a seasoned M2M developer, the interactive site, provides a wealth of knowledge and resources for adding wireless connectivity to devices, machines and objects. As the industry's definitive source of M2M developer information, tools and support, it is the ideal place to begin projects and take advantage of benefits including:

- A solid knowledge base for beginners including M2M terms, definitions, FAQs, tutorials and step-by-step "how-to" instructions for common tasks
- An interactive online forum where you can discuss challenges and solutions with Gemalto experts and peers, and share your knowledge and expertise with others
- A library of current M2M applications and use cases along with key learnings and best practices from those in the development field
- A source for downloading sample code and re-usable drivers to expedite your project timeline

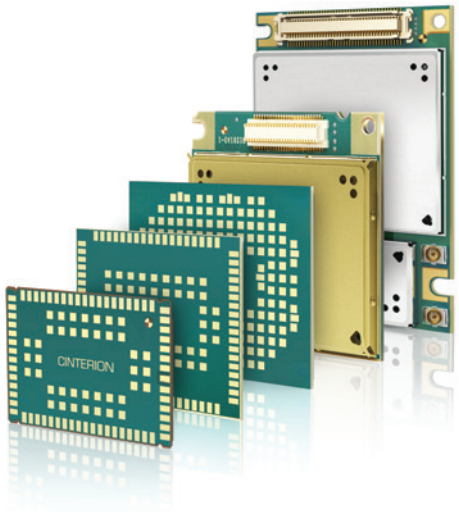
To get started or explore the site in greater detail, visit

DEVELOPER.GEMALTO.COM

to join for free.



Cinterion® Wireless Modules and Terminals



Java™

As part of our Edge-to-Enterprise concept, the embedded Java of the Industrial platform allows seamless integration between application and the backend server – optimizing information collection and processing while ensuring you a future-proof infrastructure.

In addition any infrastructure developed on this platform can easily be migrated to any other Java enabled Cinterion module. The Industrial platform, which embeds intelligence directly in the module, saves you cost and design complexity.

Gemalto is a reliable partner and valued by many vertical market customers for its award-winning modules which enable machines, equipment and vehicles to communicate over wireless networks helping enterprises dramatically cut costs and increase productivity and efficiency. We deliver high-quality GSM/GPRS, HSPA+, CDMA and LTE modules and terminals, and provide leading-edge support for integration, all over the world. Our wireless modules are based on the 3GPP and 3GPP2 standard. This technology provides users with unlimited mobility due to worldwide coverage and the closely interwoven roaming network.

The respective data standards, GPRS, HSPA+ and LTE offer reliable data connections with high data rates enabling data centric applications.

The respective data standards HSPA+ and LTE offer reliable data connections with high data rates enabling data centric applications.

Our modules are readily customized to suit unique needs by combining them with other innovative features such as Embedded System (ES) based on Java™, GPS, and SIM Access Profile. Full type approval (FTA) and local network operator certifications ensure all modules integrate easily into the GSM network. All automotive products comply with ISO TS16949 and VDA 6.2 quality benchmarks to deliver the high quality you have come to expect from Gemalto. What's more, we adhere to RoHS, REACH and WEEE environmental regulations for compliance with legislative directives.

Cinterion® Wireless Modules Product Families

Gemalto is a worldwide leading supplier of cellular machine-to-machine (M2M) communication modules and combines unparalleled M2M engineering expertise and localized worldwide customer support with a strong portfolio of high-quality GSM, GPRS, EDGE, UMTS, HSPA+ and LTE products.

Automotive

The Automotive Products are designed to meet the high requirements of the automotive industry and are developed and manufactured according to VDA 6.2 and TS16949 quality standards.

Industrial Plus

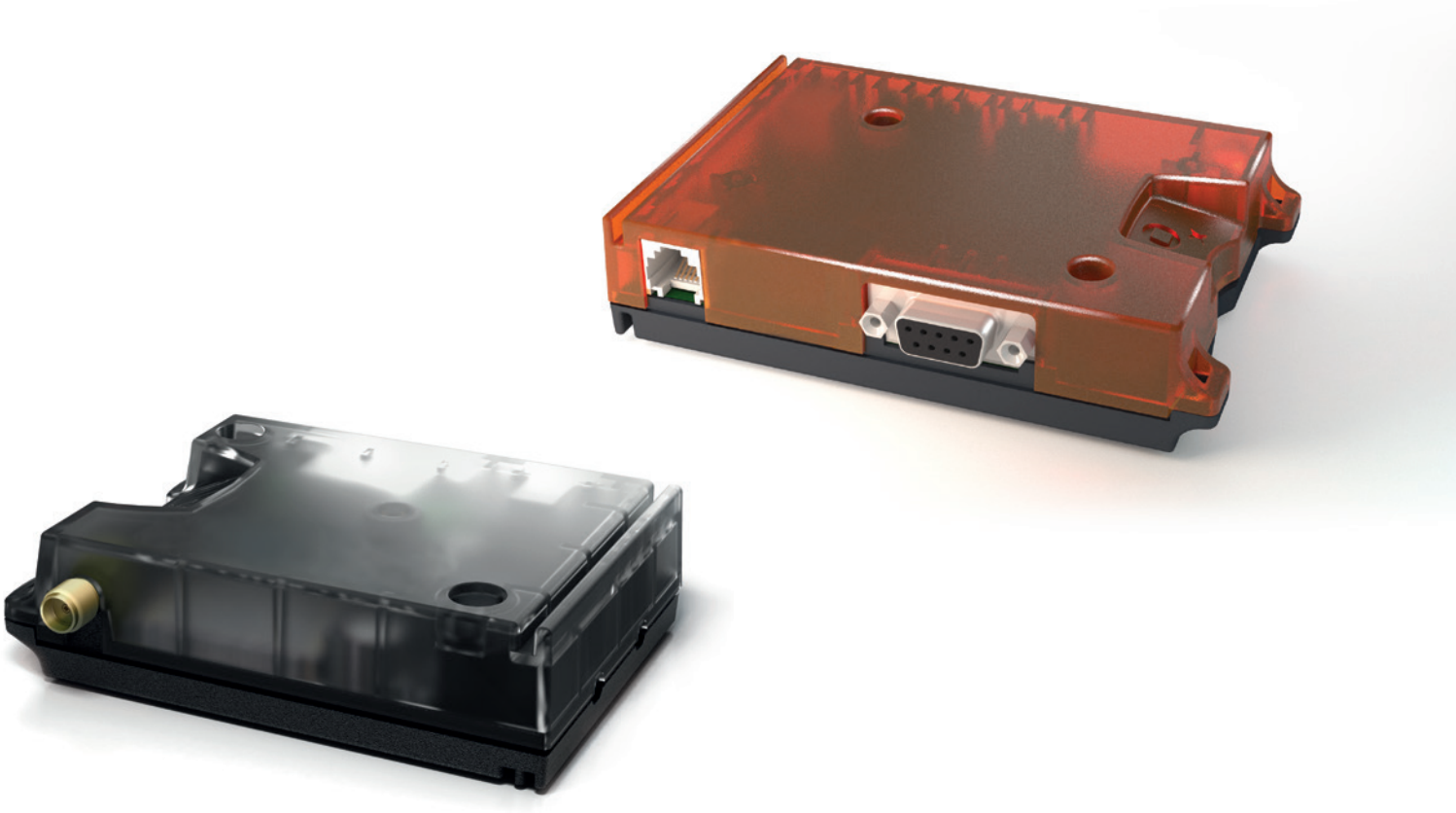
The Industrial Plus Family is designed for applications, which require latest cellular technologies in M2M quality. The wireless broadband technologies LTE, CDMA, UMTS and HSPA including backward compatibility with EDGE, GPRS and GSM are served to meet the global requirements all over the world.

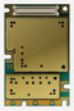
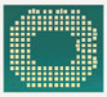
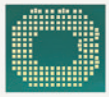
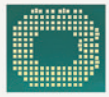
Industrial

Industrial Products offer scalability, compatibility as well as an easy path to future upgrades and added functionality as technology needs expand. Portfolio benefits include maximum flexibility, high functionality, ease of integration, as well as backward and forward compatibility, which ensures a reliable, high quality and cost efficient solution that preserves your technology investment.

Terminals

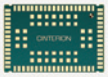
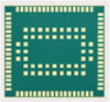
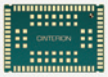
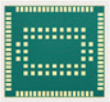
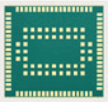
Terminals are an easy and fast way to add M2M communication capabilities to an application. The terminal products can be connected via standard interfaces to the application.



Product family	Automotive					
Product	**AH3***	**AGS2**	**AGS2-E**	**AHS2**	**AHS3***	**ALS3***
	HSPA+	GPRS	GPRS	HSPA+	HSPA+	LTE
						
Frequency bands	**W** 3G (1, 5, 6, 8) 2G (5, 8, 3, 2) **US** 3G (2, 4, 5) 2G (5, 8, 3, 2)	2G (5, 8, 3, 2)	2G (5, 8, 3, 2)	3G (8, 1) 2G (8, 3)	**W** 3G (1, 5, 6, 8) 2G (5, 8, 3, 2) **US** 3G (5, 2) 2G (5, 8, 3, 2)	**E** LTE (20, 8, 3, 1, 7) 3G (8, 3, 1) 2G (8, 3) **US** LTE (17, 5, 4, 2) 3G (5, 4, 2) 2G (5, 8, 3, 2)
Embedded processing						
GNSS	●		●	●	●	●
Dimensions (in mm)	53 x 33.9 x 3.1	27.6 x 18.8 x 2.7	33 x 29 x 2.2	33 x 29 x 2.4	33 x 29 x 2.4	33 x 29 x 2.2
Temperature range	-40 °C to +85 °C	-40 °C to +90 °C	-40 °C to +90 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
Voice	●	●	●	●	●	●
Data Transmission						
LTE						LTE Cat3 100 Mbps
HSPA	HSPA+ 14.4 Mbps			HSPA+ 14.4 Mbps	HSPA+ 14.4 Mbps	HSPA+ 42 Mbps
UMTS	●			●	●	●
CDMA						
EDGE	Class 12			Class 12	Class 12	Class 12
GPRS	Class 12	Class 10	Class 10	Class 12	Class 12	Class 12
CSD	●	●	●	●	●	●
SMS	●	●	●	●	●	●
Fax		●	●			
Embedded TCP/IP	●	●	●	●	●	
Prepared for eCall / ERA GLONASS		●/-	●/-	●/●	●/●	
Interfaces						
Antenna connector	via pogo pads	via LGA pads	via LGA pads	via LGA pads	via LGA pads	via LGA pads
Mounting	80-pin	LGA	LGA	LGA	LGA	LGA
Audio analog/digital	●/●	●/ ●	●/ ●	●/●	●/●	-/ ●
Serial interfaces	●	●	●	●	●	●
USB/Ethernet (NAPT)	●/-			●/-	●/-	●/-
I²C bus		●	●	●	●	
SPI bus						
ADC/DAC		●	●			●
Dedicated multiple GPIOs		●	●	●	●	●
Approvals						
R&TTE / GCF	●	●	●	●	●	●
FCC, UL, IC, PTCRB	●	●	●		●	●
CE	●	●	●	●	●	●
Local operator certifications	●	●	●	●	●	●
Special features						
Over-the-air update						
RLS-Monitor (Jamming Detection)	●	●	●	●	●	
Advanced Temperature Management	●	●	●	●	●	●
WWAN/NDIS driver				●	●	●
RIL driver	●	●	●	●	●	●
Multiplex driver (Windows & Linux)	●	●	●	●	●	
SIM Access Profile	●			●	●	
Advanced Automotive features	●	●	●	●	●	●
IMDS listed & GADSL compliant	●	●	●	●	●	
BIP	●	●	●	●	●	●
Environmental regulations						
RoHS/REACH compliant	●	●	●	●	●	●
WEEE compliant						

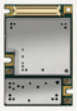
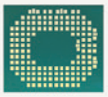
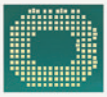
For detailed specification please see hardware interface description.

*) Regional Variants

Product family	Industrial					
Product	**BGS2***	**BGS5**	**BGS8**	**EHS5***	**EHS6**	**EHS8**
	GPRS	GPRS	GPRS	HSPA	HSPA	HSPA
						
Frequency bands	**W** 2G (5, 8, 3, 2) **E** 2G (8, 3)	2G (5, 8, 3, 2)	2G (5, 8, 3, 2)	**E** 3G (8, 1) 2G (8, 3) **US** 3G (5, 2) 2G (5, 2)	3G (1, 2, 5, 6, 8) 2G (5, 8, 3, 2)	3G (1, 2, 5, 6, 8) 2G (5, 8, 3, 2)
Embedded processing		Java™		Java™	Java™	Java™
GNSS			●			GPS
Dimensions (in mm)	27.6 x 18.8 x 2.7	27.6 x 18.8 x 2.7	27.6 x 25.4 x 2.3	27.6 x 18.8 x 2.3	27.6 x 25.4 x 2.3	27.6 x 25.4 x 2.2
Temperature range	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
Voice	●	●	●	●	●	●
Data Transmission						
LTE						
HSPA				HSPA 7.2 Mbps	HSPA 7.2 Mbps	HSPA 7.2 Mbps
UMTS				●	●	●
CDMA						
EDGE				Class 12	Class 12	Class 12
GPRS	Class 10	Class 12	Class 10	Class 12	Class 12	Class 12
CSD	●	●	●	●	●	●
SMS	●	●	●	●	●	●
Fax	●		●			
Embedded TCP/IP	●	●	●	●	●	●
Prepared for eCall / ERA GLONASS	●/-			●/●	●/●	
Interfaces						
Antenna connector	via LGA pads	via LGA pads	via LGA pads	via LGA pads	via LGA pads	via LGA pads
Mounting	LGA	LGA	LGA	LGA	LGA	LGA
Audio analog/digital	●/●	-/ ●	●/●	-/●	●/●	-/●
Serial interfaces	●	●	●	●	●	●
USB/Ethernet (NAPT)		●/-		●/-	●/-	●/-
I²C bus	●	●	●	●	●	●
SPI bus		●		●	●	●
ADC/DAC	●	●	●	●	●	●
Dedicated multiple GPIOs	●	●	●	●	●	●
Approvals						
R&TTE / GCF	●	●	●	●	●	●
FCC, UL, IC, PTCRB	● (BGS2-W)	●	●	●	●	●
CE	●	●	●	●	●	●
Local operator certifications	●	●	●	●	●	●
Special features						
Over-the-air update		●		●	●	●
RLS-Monitor (Jamming Detection)	●	●	●	●	●	●
Advanced Temperature Management	●	●	●	●	●	●
WWAN/NDIS driver						
RIL driver	●	●	●	●	●	●
Multiplex driver (Windows & Linux)	●	●	●	●	●	●
SIM Access Profile						
Advanced Automotive features						
IMDS listed & GADSL compliant						
BIP				●	●	●
Environmental regulations						
RoHS/REACH compliant	●	●	●	●	●	●
WEEE compliant						

For detailed specification please see hardware interface description.

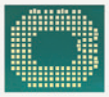
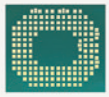
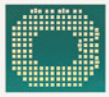
*) Regional Variants

Product family	Industrial Plus					
Product	**PH8*/****	**PHS8*/****	**PXS8**	**PCS3**	**PVS8**	**PLS8***
	HSPA+	HSPA+	CDMA / HSPA+	CDMA	CDMA	LTE
						
Frequency bands	3G (1, 2, 4, 5, 6) 2G (5, 8, 3, 2) **P** 3G (1, 2, 5, 6, 8) 2G (5, 8, 3, 2)	**P/J/K** 3G (1, 2, 5, 6, 8) 2G (5, 8, 3, 2) **US** 3G (5,2) 2G (5,2) **E** 3G (8, 1) 2G (8,3)	3G (1, 2, 5, 6, 8) 2G (5, 8, 3, 2) CDMA2000 BC0, BC1, BC10	CDMA2000 BC0, BC1, BC10	CDMA2000 BC0, BC1, BC10	**E** LTE (20, 8, 3,1, 7) 3G (8, 3, 1) 2G (8, 3) **US** LTE (17, 5, 4, 2) 3G (5, 4,2) 2G (5, 8, 3, 2)
Embedded processing						
GNSS	●	●	●		●	●
Dimensions (in mm)	33.9 x 50 x 3.1	33 x 29 x 2.0	33 x 29 x 2.0	33 x 29 x 2.0	33 x 29 x 2.0	33 x 29 x 2.3
Temperature range	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
Voice	●	●	●	●	●	●
Data Transmission						
LTE						LTE Cat3 100 Mbps
HSPA	HSPA+ 14.4 Mbps	HSPA+ 14.4 Mbps	HSPA+ 14.4 Mbps			HSPA+ 42 Mbps
UMTS	●	●	●			●
CDMA			EV-DO 3.1 Mbps	1x Advanced 153.6 kbps	EV-DO 3.1 Mbps	
EDGE	Class 12	Class 12	Class 12			Class 12
GPRS	Class 12	Class 12	Class 12			Class 12
CSD	●	●	●			●
SMS	●	●	●	●	●	●
Fax						
Embedded TCP/IP	●	●	●	●		
Prepared for eCall / ERA GLONASS						
Interfaces						
Antenna connector	3 x U.FL-R	via LGA pads	via LGA pads	via LGA pads	via LGA pads	via LGA pads
Mounting	80-pin	LGA	LGA	LGA	LGA	LGA
Audio analog/digital	●/●	●/●	●/●	●/●	●/●	-/●
Serial interfaces	●	●	●	●	●	●
USB/Ethernet (NAPT)	●/-	●/-	●/-	●/-	●/-	●/-
I²C bus						
SPI bus						
ADC/DAC						●
Dedicated multiple GPIOs				●		●
Approvals						
R&TTE / GCF	●	●	●			●
FCC, UL, IC, PTCRB	●	●	●	●	●	●
CE	●	●	●	●	●	●
Local operator certifications	●	●	●	●	●	●
Special features						
Over-the-air update		●	●	●	●	●
RLS-Monitor (Jamming Detection)						
Advanced Temperature Management	●	●	●	●	●	●
WWAN/NDIS driver	●	●	●		●	●
RIL driver	●	●	●	●	●	●
Multiplex driver (Windows & Linux)	●	●	●	●	●	
SIM Access Profile						
Advanced Automotive features						
IMDS listed & GADSL compliant						
BIP						●
Environmental regulations						
RoHS/REACH compliant	●	●	●	●	●	●
WEEE compliant						

For detailed specification please see hardware interface description.

*) Regional Variants

**) Regional Variants: Japan PHS8-J, Korea PHS8-K

Product family	Industrial Plus					
Product	**PLS8-X**	**PLS8-V**	**PDS5***	**PDS6**	**PDS8**	**PGS8**
	LTE	LTE	HSPA	HSPA	HSPA	GPRS
						
Frequency bands	LTE (13, 17, 5, 4, 2) 3G (5, 4, 2) 2G (5, 8, 3, 2)	LTE (13, 4, 2)	E 3G (8, 1) 2G (8, 3) US 3G (5, 2) 2G (5, 2)	3G (1, 2, 5, 6, 8) 2G (5, 8, 3, 2)	3G (1, 2, 5, 6, 8) 2G (5, 8, 3, 2)	2G (5, 8, 3, 2)
Embedded processing			Java™	Java™	Java™	
GNSS	●	●			GPS	●
Dimensions (in mm)	33 x 29 x 2.9	33 x 29 x 2.9	33 x 29 x 2.4	33 x 29 x 2.4	33 x 29 x 2.4	33 x 29 x 2.2
Temperature range	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
Voice			●	●	●	●
Data Transmission						
LTE	LTE Cat3 100 Mbps	LTE Cat3 100 Mbps				
HSPA	HSPA+ 42 Mbps		HSPA 7.2 Mbps	HSPA 7.2 Mbps	HSPA 7.2 Mbps	
UMTS	●		●	●	●	
CDMA						
EDGE	Class 12		Class 12	Class 12	Class 12	
GPRS	Class 12		Class 12	Class 12	Class 12	Class 10
CSD	●	●	●	●	●	●
SMS	●	●	●	●	●	●
Fax						●
Embedded TCP/IP	●	●	●	●	●	●
Prepared for eCall / ERA GLONASS					●/●	-/●
Interfaces						
Antenna connector	via LGA pads	via LGA pads	via LGA pads	via LGA pads	via LGA pads	via LGA pads
Mounting	LGA	LGA	LGA	LGA	LGA	LGA
Audio analog/digital			-/●	●/●	-/●	●/●
Serial interfaces	●	●	●	●	●	●
USB/Ethernet (NAPT)	●/-	●/-	●/-	●/-	●/-	
I²C bus			●	●	●	●
SPI bus			●	●	●	
ADC/DAC			●	●	●	●
Dedicated multiple GPIOs	●	●	●	●	●	●
Approvals						
R&TTE / GCF	●	●	●	●	●	●
FCC, UL, IC, PTCRB	●	●	●	●	●	●
CE	●	●	●	●	●	●
Local operator certifications	●	●	●	●	●	●
Special features						
Over-the-air update	●	●	●	●	●	
RLS-Monitor (Jamming Detection)			●	●	●	●
Advanced Temperature Management	●	●	●	●	●	●
WWAN/NDIS driver	●	●				
RIL driver	●	●	●	●	●	●
Multiplex driver (Windows & Linux)	●	●	●	●	●	●
SIM Access Profile						
Advanced Automotive features						
IMDS listed & GADSL compliant						
BIP			●	●	●	
Environmental regulations						
RoHS/REACH compliant	●	●	●	●	●	●
WEEE compliant						

For detailed specification please see hardware interface description.

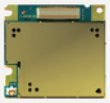
*) Regional Variants

Product family	Terminals				
Product	**BGS2T**	**BGS5T**	**EHS5T**	**EHS6T LAN**	**EHS6T USB**
	GPRS	GPRS	HSPA	HSPA	HSPA
					
Frequency bands	2G (5, 8, 3, 2)	2G (5, 8, 3, 2)	3G (8, 1) 2G (8, 3)	3G (1, 2, 5, 6, 8) 2G (5, 8, 3, 2)	3G (1, 2, 5, 6, 8) 2G (5, 8, 3, 2)
Embedded processing		Java™	Java™	Java™	Java™
GNSS					
Dimensions (in mm)	80 x 55 x 23 [1]	115 x 86 x 26	115 x 86 x 26	115 x 86 x 26	115 x 86 x 26
Temperature range	-30 °C to +75 °C	-30 °C to +65 °C	-30 °C to +65 °C	-30 °C to +65 °C	-30 °C to +65 °C
Voice					
Data Transmission					
LTE					
HSPA			HSPA 7.2 Mbps	HSPA 7.2 Mbps	HSPA 7.2 Mbps
UMTS			●		
CDMA					
EDGE			Class 12	Class 12	Class 12
GPRS	Class 10	Class 12	Class 12	Class 12	Class 12
CSD	●	●	●	●	●
SMS	●	●	●	●	●
Fax	●				
Embedded TCP/IP	●	●	●	●	●
Prepared for eCall / ERA GLONASS					
Interfaces					
Antenna connector	SMA	SMA	SMA	SMA	SMA
Mounting					
Audio analog/digital					
Serial interfaces	RS-232 or RS-485	RS-232	RS-485	RS-232	RS-232
USB/Ethernet (NAPT)		●/-	●/-	-/●	●/-
I²C bus		●	●	●	●
SPI bus			●	●	●
ADC/DAC			●	●	●
Dedicated multiple GPIOs		●	●		●
Approvals					
R&TTE / GCF	●	●	●	●	●
FCC, UL, IC, PTCRB	●	●	●	●	●
CE	●	●	●	●	●
Local operator certifications	●	●	●	●	●
Special features					
Over-the-air update		●	●	●	●
RLS-Monitor (Jamming Detection)		●	●	●	●
Advanced Temperature Management	●	●	●	●	●
WWAN/NDIS driver					
RIL driver			●	●	●
Multiplex driver (Windows & Linux)	●	●	●	●	●
SIM Access Profile					
Advanced Automotive features					
IMDS listed & GADSL compliant					
BIP					
Environmental regulations					
RoHS/REACH compliant	●	●	●	●	●
WEEE compliant	●	●	●	●	●

For detailed specification please see hardware interface description.

*) Regional Variants

[1] ex. connector

Product family	Other Families	
Product	**MC55i-W**	**BG2***
	GPRS	GPRS
		
Frequency bands	2G (5, 8, 3, 2)	**W** 2G (5, 8, 3, 2) **E** 2G (8, 3)
Embedded processing		
GNSS		
Dimensions (in mm)	32.5 x 35 x 2.95	31 x 26.7 x 3
Temperature range	-40 °C to +85 °C	-40 °C to +85 °C
Voice	●	●
Data Transmission		
LTE		
HSPA		
UMTS		
CDMA		
EDGE		
GPRS	Class 10	Class 10/8
CSD	●	●
SMS	●	●
Fax	●	●
Embedded TCP/IP	●	●
Prepared for eCall / ERA GLONASS		
Interfaces		
Antenna connector	U.FL-R	b2b connector
Mounting	50-pin	60-pin
Audio analog/digital	●/●	●/-
Serial interfaces	●	●
USB/Ethernet (NAPT)		
I²C bus		●
SPI bus		
ADC/DAC		●
Dedicated multiple GPIOs		●
Approvals		
R&TTE / GCF	●	●
FCC, UL, IC, PTCRB	●	● (BG2-W)
CE	●	●
Local operator certifications	●	●
Special features		
Over-the-air update		
RLS-Monitor (Jamming Detection)		
Advanced Temperature Management	●	●
WWAN/NDIS driver		
RIL driver	●	
Multiplex driver (Windows & Linux)	●	
SIM Access Profile		
Advanced Automotive features		
IMDS listed & GADSL compliant		
BIP		
Environmental regulations		
RoHS/REACH compliant	●	●
WEEE compliant		

For detailed specification please see hardware interface description.

*) Regional Variants

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