A large, stylized 'A' graphic in the background, composed of three overlapping loops in light blue, light red, and light yellow. The loops are thick and have a slight gradient.

Internet de las cosas, tecnologías y
soluciones celulares
Thales

Carlos González (FAE)

Helping
Innovation

📄 Introducción

- 📄 Sobre Thales

📄 Internet de las cosas, tecnologías y soluciones celulares

- 📄 Internet de las cosas, aplicaciones, tecnologías y soluciones.
- 📄 Módulos para IoT, 2G, 3G, LTE, NB-IoT, Cat-M.
- 📄 Terminales y Gateways para IoT, 2G, 3G, LTE, NB-IoT, Cat-M.
- 📄 Modem Cards MiniPCle para IoT, 2G, 3G, LTE, NB-IoT, Cat-M.
- 📄 SoM's para IoT, 2G, 3G, LTE, NB-IoT, Cat-M.
- ☐ IoT Development, Plataformas, Ide & Dev Kits disponibles.
- ☐ Tarjetas SIM Industriales.
- 📄 Internet de las cosas, seguridad y gestión que deben tenerse en cuenta.

📄 Preguntas



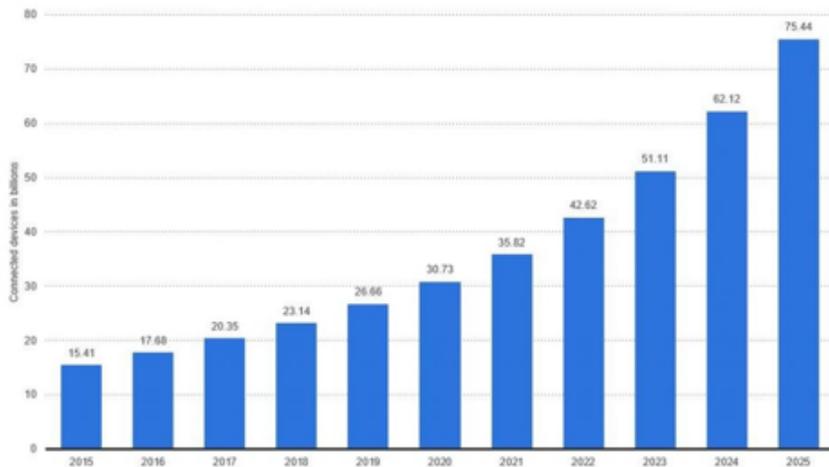
Introducción THALES

- ❑ Compañía multinacional francesa de electrónica líder en soluciones tecnológicas aplicadas a Defensa, Aeronáutica, Seguridad, Transporte y Espacio, además es centro de competencia para todo el mundo en Espacio, Seguridad de Infraestructuras Críticas y Transporte. Cuenta con más de 64.000 empleados en todo el mundo.
- ❑ En 2019 completó la adquisición de Gemalto, creando un líder global en identidad digital y seguridad. Con Gemalto, Thales cubre toda la cadena de decisiones críticas en un mundo ya digital, desde la generación de datos por parte de sensores hasta la asistencia para la toma de decisiones en tiempo real.
- ❑ Involucrados en electrónica industrial, electrónica médica, monitorización de seguridad e Internet de las cosas (IOT).

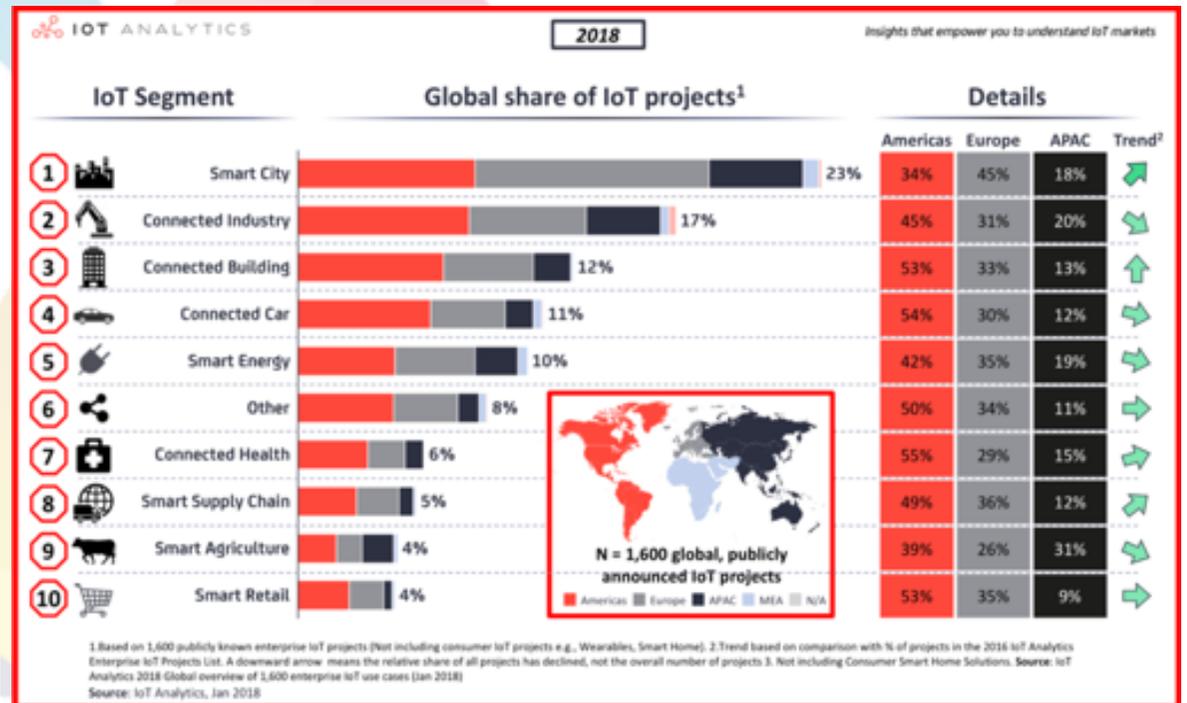
? Crecimiento IOT:

Internet of Things - number of connected devices worldwide 2015-2025

Internet of Things (IoT) connected devices installed base worldwide from 2015 to 2025 (in billions)

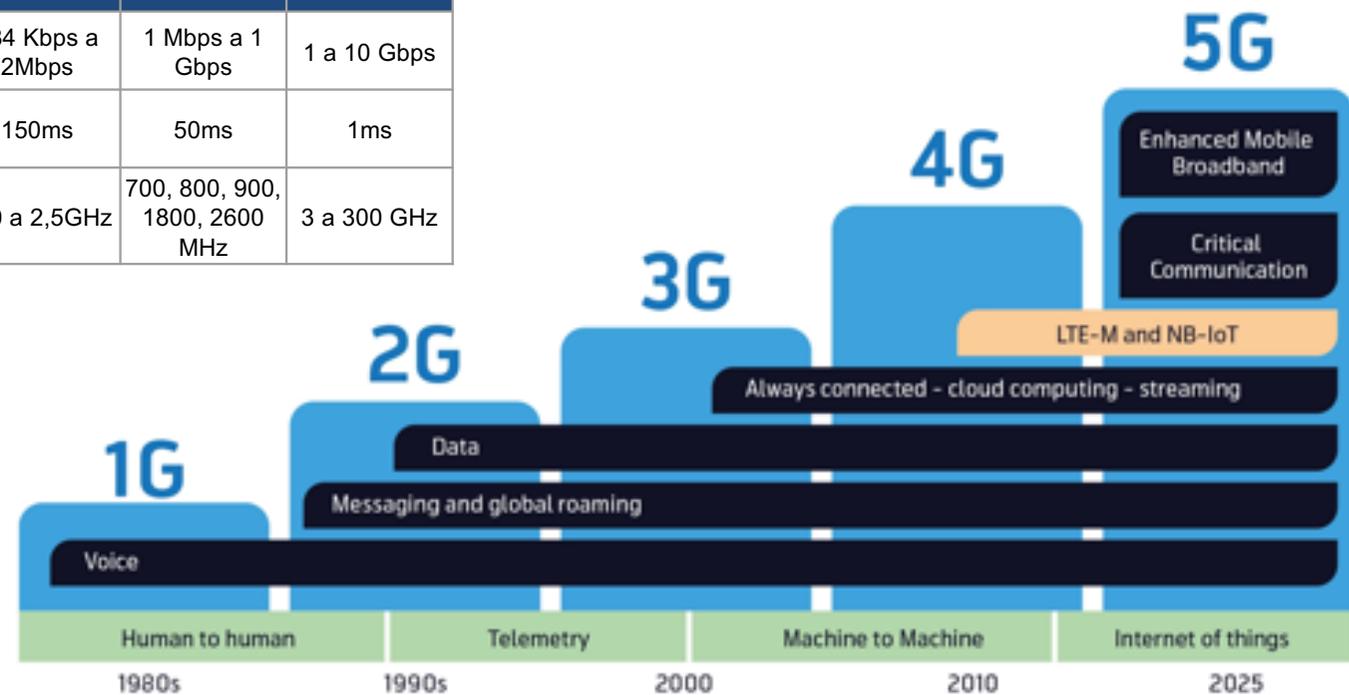


statista

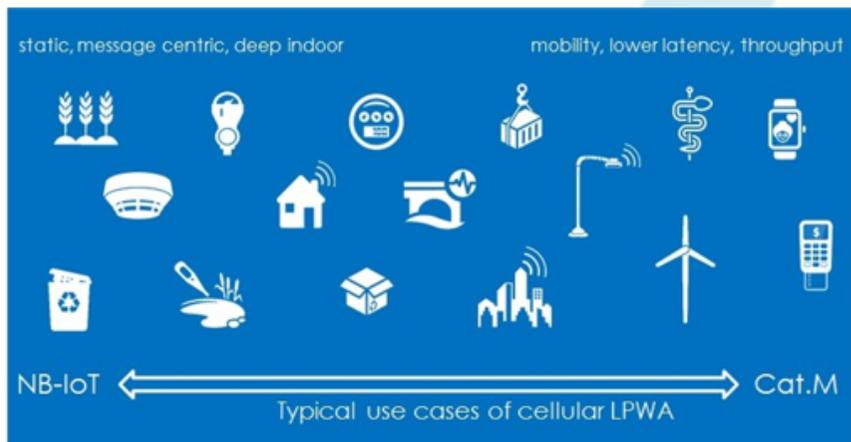


- ❑ **Energía**
 - Smart Meters
- ❑ **Automoción**
 - Vehículos conectados
- ❑ **Internet de las Cosas Médicas (IOMT)**
 - Dispositivos médicos (Wearables, medidores de presión sanguínea, monitores de ritmo cardíaco, etc)
- ❑ **Seguridad y sistemas de automatización**
 - Sensores de movimiento, transmisión de vídeo, sensores en el hogar, etc
- ❑ **Seguimiento de activos (Asset Tracking)**
 - Flotas de vehículos, contenedores, etc
- ❑ **Terminales de Pago (POS)**

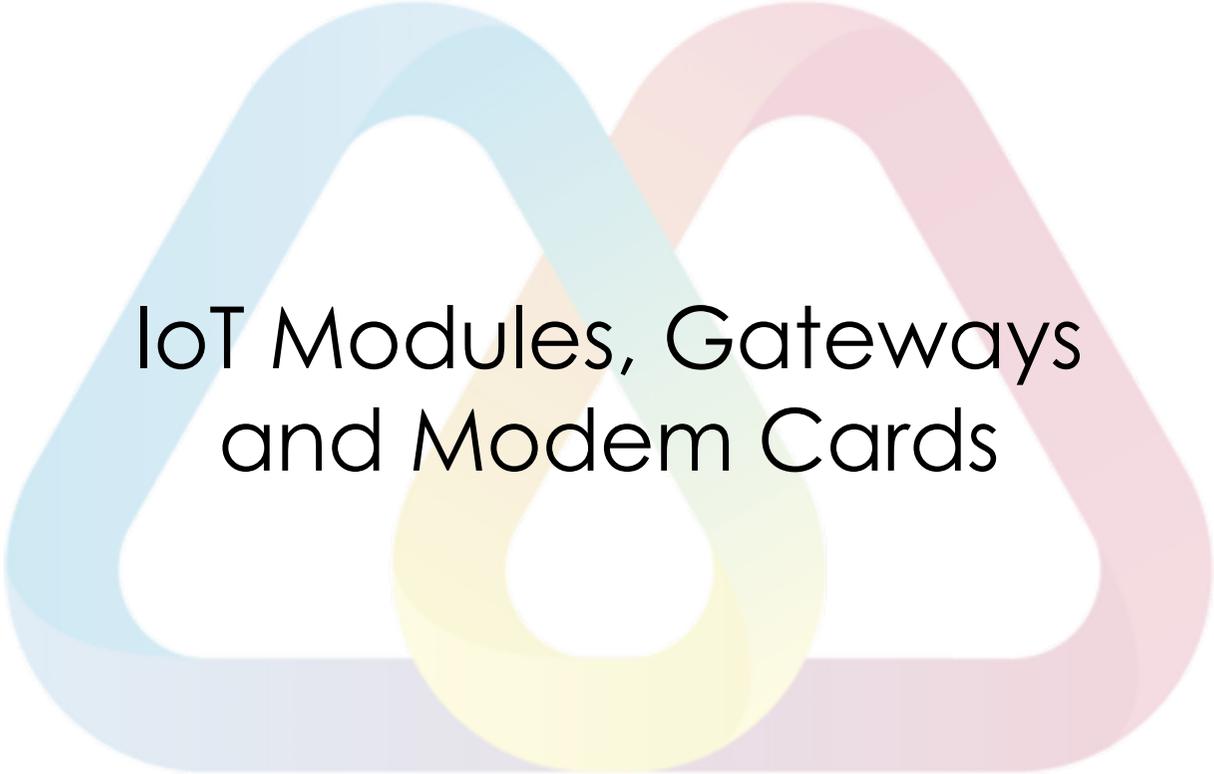
Generación	1G	2G	3G	4G	5G
Velocidad	1 a 2,4 Kbps	14 a 64 Kbps	384 Kbps a 2Mbps	1 Mbps a 1 Gbps	1 a 10 Gbps
Latencia	-	-	150ms	50ms	1ms
Frecuencia	800-900 MHz	850-1900 MHz	800 a 2,5GHz	700, 800, 900, 1800, 2600 MHz	3 a 300 GHz



? LPWAN



		LTE Cat.M1 (LTE Cat.M)	LTE Cat. NB (NB-IoT)
SYSTEM BANDWIDTH		1,4MHz CAT M1 5Mhz CAT M2	
DATA RATE (peak) (UL/DL)	☁️	1Mbps/1Mbps CAT M1 7Mbps/4Mbps CAT M2	☁️
COVERAGE / PENETRATION	📶	20/23dBm	📶
LATENCY	🕒	10ms to 4s	🕒
MOBILITY	🚚	Connected mobility with some limitations (inter freq. handover)	🚶
VOICE	📞	restricted voice for simple use case	1100 1010 0101
BATTERY LIFE	🔋	extended with PSM or eDRX	🔋
ANTENNA	📡	single Antenna	📡
APPLICATION	Ⓜ️	FOTA capable	Ⓜ️



IoT Modules, Gateways and Modem Cards

- ❑ Todos los estándares de tecnología móvil disponibles
 - Incluidos 5G , LTE, NB-IoT y LTE Cat.M.
- ❑ Productos de IoT fiables en los entornos más extremos y mayor vida útil
- ❑ Tecnologías innovadoras compatibles
 - Módulos personalizables para adaptarse a necesidades específicas mediante la integración de otras tecnologías como Java TM, GPS / GLONASS, SL Agent, SIM Access Profile y más.
- ❑ Rápido proceso de aprobación
 - Las certificaciones de operador de red local y FTA garantizan un rápido proceso de aprobación, y todos los productos cumplen con las regulaciones ambientales RoHS y WEEE para cumplir con las directivas legislativas.

Modules



Cinterion® EHS6 Wireless Module

Global 3G with Java™ embedded



Five Band 3G HSPA



Multi Design Capability (LGA)



USB 2.0 High Speed Compatible



Embedded TCP/IP Stack



**FOTA Configurable
Free of Charge**



Java embedded



RLS Monitoring (Jamming Detection)



Advanced Temperature Management



eCall / ERA GLONASS Compliant



Bearer Independent Protocol

General Features

- | 3GPP Rel.7 Compliant Protocol Stack
- | Five Bands UMTS (WCDMA/FDD)
Bands: 800, 850, 900, 1900 and 2100 MHz
- | Quad-Band GSM
Bands: 850, 900, 1800 and 1900 MHz
- | SIM Application Toolkit, Class 3, with BIP and RunAT support
- | Embedded IP stack
- | Control via standardized and extended AT commands (Hayes, TS 27.007 and 27.005)
- | TCP/IP stack access via AT command and transparent TCP services
- | Secure Connection for client IP services
- | Internet Services TCP/UDP server/client, DNS, Ping, FTP client, HTTP client
- | Supply voltage range 3.1 - 4.5 V, highly optimized for minimal power consumption. (Baseband) Supply voltage range 2.8 - 4.5 V (RF-PA)
- | Dimension: 27.6 x 25.4 x 2.3 mm
- | Weight: 3 g
- | Operating Temperature: -40 °C to +90 °C

Special Features

- | USB interface supports multiple composite modes and a Linux-/Mac-compliant mode
- | Firmware update via USB and serial interface
- | Real time clock with alarm functionality
- | Multiplexer according 3GPP TS 27.010
- | RLS Monitoring (Jamming detection) in 2G and 3G
- | Informal Network Scan
- | Customer IMEI/SIM-Lock as variant
- | Integrated FOTA, configurable and free of charge

Java Open Platform

- | Java™ ME 3.2
- | Secure data transmission with HTTPS/SSL
- | Multi-Threading programming and Multi-Application execution
- | 10 MB RAM and 10 MB Flash File System

Interfaces (LGA Pads)

- | Pad for GSM/WCDMA Antenna
- | USB 2.0 HS interface up to 480 Mbps
- | High speed serial modem interface ASCO

Cinterion® PLS63 Series

LTE Cat. 1 with 2G/3G fallback for global and regional IoT connectivity



Global and Regional LTE coverage with fallback options

- | LTE Cat 1, Global and multiple Regional variants with latest network bands grouping
- | 3G and 2G fallback



Fully Featured modem implementation

- | Integrated IP connectivity
- | VoLTE and CS voice
- | Thales extended set of AT commands



Lower Total Cost of Ownership

- | Embedded GNSS
- | Embedded SIM



State of the art security

- | Secure boot
- | Secure key store
- | Key life cycle management



Easy Connectivity and Lifecycle Management

- | Secure enrollment toward main cloud platforms
- | Remote update and device management

General Features

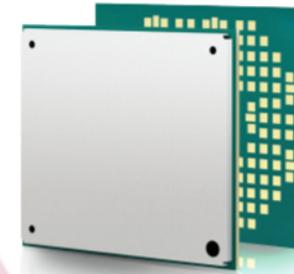
- | 3GPP Rel.9 Compliant Protocol Stack
- | FDD-LTE: bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 18, 19, 20, 26, 28, 66
- | TD-LTE: bands 38, 40, 41
- | UMTS (WCDMA/FDD): bands 1, 3, 2, 4, 5, 6, 8, 19
- | Quad Band GSM: 850, 900, 1800, 1900 MHz
- | Integrated GNSS support (GPS/BeiDou/GLONASS/Galileo)
- | SIM Application Toolkit, letter classes b, c, e with BIP and RunAT support
- | Control via standardized and extended AT commands (Hayes, TS 27.007 and 27.005)
- | Embedded IP stack with IPv4 and IPv6 support
- | TCP/IP stack access via AT command and transparent TCP/UDP services
- | Secure Connection with TLS/DTLS
- | Internet Services TCP/UDP server/client, DNS, Ping, HTTP, SMTP, FTP client
- | LGA pad soldering mount, MSL3
- | Supply voltage range: 3.0 - 4.5 V
- | Dimension: 33 x 29 x 2.6 mm
- | Operating temperature: -40°C to +85°C
- | RoHS compliant

Interfaces

- | Power Supply for Baseband, Radio Domain
- | Pads for RX-Diversity /MIMO Antennas
- | Pads for GNSS antenna
- | USB 2.0 interface up to 480 Mbps
- | High speed serial modem interface ASCO
- | 16 GPIO lines shared with DSR, DTR, DCD (all ASCO), ASC1 (RXD, TXD, RTS, CTS), SPI, Fast-Shutdown, Network-Status-Indication, PWM, Pulse-Counter lines, TX-Indicator, 700MHz-Indicator
- | ADC and I2C interface
- | Digital audio interface (PCM and I2S modes)
- | Dual UICC and U/SIM card interfaces 1.8V/3V
- | Lines for Module-On and Reset
- | DAI
- | SGMII

Cinterion® PLS8 Wireless Module

Best In Class LTE Connectivity for the Industrial IoT



4G Penta Band LTE Tri Band
UMTS/DC-HSPA+

GPRS/EDGE Quad/Dual Band

Multi Design Capability (LGA)

USB 2.0 High Speed Compatible

Embedded TCP/IP Stack

Full voice Support

GPS/A-GPS/GLONASS

Extended Temperature Range

Multi OS Support

Bearer Independent Protocol

General Features

- | PLS8-E: LTE (20,8,3,7,1); 3G (8,3,1); 2G Dual Band
- | PLS8-US: LTE (17,5,4,2); 3G (5,4,2); 2G Quad Band
- | PLS8j: LTE (1,3,19); 3G (1,19)
- | PLS8-X: LTE (13,17,5,4,2); 3G (5,4,2); 2G Quad Band
- | PLS8-V: LTE (13,4,2)
- | LTE (FDD 3GPP Release 9; 2x2 DL-MIMO)
- | UMTS/HSPA (FDD) 3GPP Release 8; Rx diversity
- | GSM/GPRS/EDGE 3GPP Release 6; DARP/SAIC
- | SIM Application Toolkit, 3GPP release 99
- | Control via AT commands (Hayes, TS 27.007, TS 27.005)
- | Fully integrated GPS/GLONASS solution (Qualcomm gpsOne Gen8A)
- | Supply voltage range 3.3 - 4.2 V, highly optimized for minimal power consumption
- | Dimension: 29 × 33 × 2,2 mm (PLS8-V /-X: H= 2,9mm)
- | Operating Temperature Range: -40 °C to +85 °C
- | RoHS and REACH compliant, EuP support

Special Features

- | USB interface supports multiple composite modes and a Linux-/Mac- compliant mode
- | Firmware update via USB
- | BIP (Bearer Independent Protocol)
- | IP services (Client & server, TCP/IP & UDP, transparent & nontransparent) from Rel.3.0 onwards and for PLS8-X /-V
- | Multiplexer according to 3GPP TS 27.010
- | Automatic Carrier Switching (PLS8-X)

Interfaces

- | 156 pad LGA mount
- | Pads for primary, secondary Antenna and GNSS
- | Digital audio interfaces (PCM or I2S) (PLS8-US/-E)
- | USB 2.0 HS interface up to 480 Mbps
- | 2 UICC (SIM/MIM) interfaces 1.8V / 3V from Rel.3.0 onwards and for PLS8-X /-V Serial Interface (UART)
- | 10 GPIOs including Network Status and Low Current Indication, 2 ADCs

Cinterion® PLPS9 IoT Wireless Module

LTE Cat 16 Advanced Pro Connectivity With 3G and 2G Fallback



General Features

- PLPS9: State of the art Industrial LTE Advanced Pro
- LTE 3GPP Rel.12, Rel.13 platform
- 4x4 MIMO (4 antenna interface)
- UMTS/HSPA (FDD) 3GPP Release 8; Rx diversity
- GSM/GPRS/EDGE 3GPP Release 6; DARP/SAIC
- HoRxD (Higher Order Receive Diversity) with up to 4 antennas i.e. 3dB better sensitivity (over 2 antenna solutions)
- Integrated gpsOne 9HT support (GPS, Glonass, Beidou, Galileo)
- SIM Application Toolkit, 3GPP release 99
- Control via AT commands (Hayes, TS 27.007, TS 27.005)
- Supply voltage range 3.3 - 4.2 V, highly optimized for minimal power consumption
- Dimension: 48 x 36 x 3mm
- Operating Temperature Range: -40 °C to +95 °C
- RoHS, RED and REACH compliant, EuP support

Special Features

- Scalable memory size (RAM, Flash)
- AS-DIV (Antenna Switch Tx Diversity) for better performance in mobility scenarios
- Voice Support for LTE via VoLTE or CSFB (Circuit Switched Fallback)
- Global coverage on 2 SKUs
- Secure Boot Feature

Interfaces (LGA Pads)

- 4 antenna design
- 4 ADC inputs for antenna detection circuitry
- LGA mount
- Ethernet & WiFi (802.11p) & BT via PCIe 2.1 (5Gbps single lane)
- USB 3.0 super speed (5 Gbps)
- 2 UICC (SIM/MIM) interfaces 1.8V / 3V
- 15 programmable GPIOs including wakeup and low current indication
- Serial interfaces (UART, I²C, USIM)
- Audio interface (I²S, PCM)

4G LTE Advanced Pro Cat 16

Multi Band 3G and 2G Fallback

USB 3.0 High Speed Compatible

Embedded TCP/IP Stack

GPS / A-GPS / GLONASS

FOTA

HoRxD with Four Antennas

Multi Design Capability (LGA)

Thales IoT Security

Voice Over LTE plus CSFB

Cinterion® EXS82/62 Wireless Module Platform

LTE-M, NB-IoT and 2G connectivity



-  **5G** LTE-M NB-IoT 2G*)
-  **Integrated SIM**
-  **Advanced Power Management System**
-  **Embedded IP Stack**
-  **Incremental FOTA Updates**

-  **Embedded Processing**
-  **State of the Art Security**
-  **Multi Design Capability (LGA)**
-  **Secure Cloud Enrollment**

General Features

- FDD/LTE Bands 1, 2, 3, 4, 5, 8, 12, 13, 14, 18, 19, 20, 25, 26, 27, 28, 66, 71, 85.
- Quad-Band GSM: 850, 900, 1800 and 1900 MHz (*)
- Integrated GNSS support (GPS/BeiDou/Galileo/GLONASS)
- Compatible with Cinterion® Industrial module footprint
- SIM Application Toolkit with BIP
- Control via standardized commands (Hayes, TS 27.007 and 27.005) and Cinterion® AT commands
- Embedded IPv4 and IPv6 TCP/IP stack access via AT command and transparent TCP/UDP services
- Internet Services: TCP server/client, UDP client, DNS, Ping, HTTP client, FTP client, MQTT client
- Secure Connection with TLS/DTLS
- Supply voltage range: 2.6-4.8 V
- Dimensions: 27.6 x 18.8 x 2.3 mm
- Weight: approx. 2.5 g
- Operating temperature: -40°C to +90°C

Interfaces

- Pads for primary LTE antenna and GNSS antenna
- 2 High-speed 8 line serial interfaces
- USB 2.0 interface (**)
- UICC and U/SIM card interface 1.8V
- SPI, I2C, PWM signal line
- ADC interface

Special Features

- Optional eSIM included
- Firmware updatable via interface and Over the Air (OTA) / incremental FOTA
- LWM2M support with MODS (Module Services)
- Best in class power consumption current with eDRX and PSM
- Advanced Security
- Embedded Processing (**)

Gateways



Cinterion® EHS6 Terminal

3G Highspeed M2M Gateway powered by Java



-  **Five Band 3G HSPA**
-  **Quad Band GPRS / EDGE Class 12**
-  **Ethernet Interface**
-  **Java Embedded**
-  **USB 2.0 High Speed Compatible**
-  **Advanced Temperature Management**
-  **Embedded TCP/IP Stack**
-  **RLS Monitoring (Jamming Detection)**
-  **FOTA Configurable & Royalty-Free**
-  **Flexible Mounting**

Products	EHS6T USB	EHS6T LAN	EHS5T
Cinterion module	EHS6	EHS6	EHS5-E/-US
RS-232 (Sub-D)	•	•	-
USB (USB-B)	•	-	•
Weidmüller connector (GPIOs, SPI, I2C, RS-485)	•(no RS-485)	•(no RS-485)	•
Ethernet (RJ45)	-	•	-
Power supply (RJ11)	•	•	•
RF antenna	•	•	•

Cinterion® EHS6 Terminal

3G Highspeed M2M Gateway powered by Java

General Features

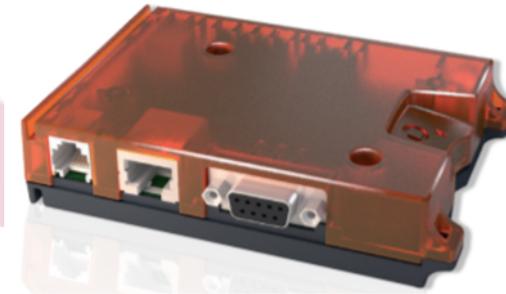
- | 3GPP Rel.7 Compliant Protocol Stack
- | Five Bands UMTS (WCDMA/FDD)
Bands: 800, 850, 900, 1900 and 2100 MHz
EHS5T: Dual Band (900, 2100 MHz)
- | Quad-Band GSM
Bands: 850, 900, 1800 and 1900 MHz
EHS5T (900, 1800 MHz)
- | SIM Application Toolkit, letter class "b", "c", "e"
- | Control via standardized and extended ATcommands (Hayes, TS 27.007 and 27.005)
- | TCP/IP stack access via AT command and transparent TCP services
- | Secure Connection for client IP services
- | Internet Services TCP/UDP server/client, DNS, Ping, FTP client, HTTP client
- | PoE - Power over Ethernet, optional (EHS6TLAN only)
- | Supply voltage range 8 – 30 V
- | Dimension: 115 x 86 x 26 mm (incl. connectors)
- | Weight: approx 130g
- | Operating Temperature: -30 °C to +65 °C

Special Features

- | USB interface supports multiple composite modes and a Linux-/Mac- compliant mode
- | Firmware update via USB and serial interface
- | Real time clock with alarm functionality
- | Multiplexer according 3GPP TS 27.010
- | RLS Monitoring (Jamming detection)
- | Informal Network Scan
- | Programmable hardware watchdog
- | Flexible mounting concept
- | Integrated FOTA, configurable and royalty free
- | Embedded SIM as an option (MIM)

Java Open Platform

- | Java™ ME 3.2
- | Secure data transmission with HTTPS/SSL
- | Multi-Threading programming and
- | Multi-Application execution
- | 10 MB RAM and 10 MB Flash File System

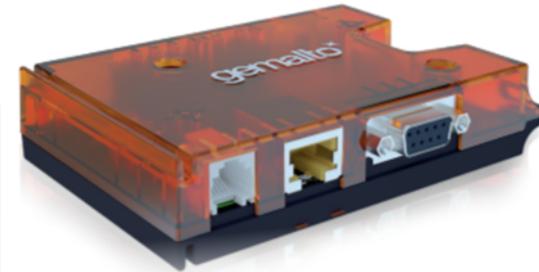


Interfaces

- | Antenna Connector SMA (female) for GSM/WCDMA
- | 20 pin header (Weidmüller) with GPIO's, power, SPI, I²C
- | Mini SIM card reader, 1,8V and 3,0V
- | Embedded SIM as an option (MIM)
- | 2 operating status LED's
- | 4-wire high speed serial interfaces ASC1
- | EHS6-T USB:
 - | USB (B) 2.0 HS interface
 - | Plug-in power supply connector (6-pole Western jack)
 - | V.24/ V.28 RS-232 interface, up to 920kbps, auto-bauding (D-sub 9-pole female socket)
- | EHS6-T LAN:
 - | add. Ethernet interface (NAPT)
- | EHS5T:
 - | RS-485 and USB (B) 2.0 HS interface

Cinterion® PLS62T-W 4G IoT Gateway

LTE Cat 1 IoT Gateway powered by Java



Multi Band LTE Cat 1



Ethernet Interface (ELS61T only)



Embedded TCP / IP Stack



FOTA configurable & royalty-free



USB 2.0 (PLS62T-W only)



3G HSPA 2G GSM



Java embedded



Advanced Temperature Management



RLS Monitoring (Jamming Detection)



Flexible Mounting

Productname	Region	Ethernet	USB	Java™	Frequency Bands
ELS61T-E LAN	EMEA	•		•	LTE [1,3,8,20,28], 2G Dual Band
ELS61T-US LAN	USA (AT&T)	•		•	LTE [2,4,5,12], 3G [2,4,5]
ELS31T-V LAN	USA (Verizon)	•			LTE [4, 13]
ELS61T-AUS LAN	Australia	•		•	LTE [3,5,8,28], 3G [1,5,8]
ELS31T- J LAN	Japan	•			LTE [1, 18, 19]
PLS62T-W USB	Global		•	•	LTE [1,2,3,4,5,7,8,12(17),18,19,20,28], 3G [1, 2, 4, 5, 8, 9, 19], 2G Quad Band
PLS62T-W LAN	Global	•		•	LTE [1,2,3,4,5,7,8,12(17),18,19,20,28], 3G [1, 2, 4, 5, 8, 9, 19], 2G Quad Band

Cinterion® PLS62T-W 4G IoT Gateway

LTE Cat 1 IoT Gateway powered by Java

General Features

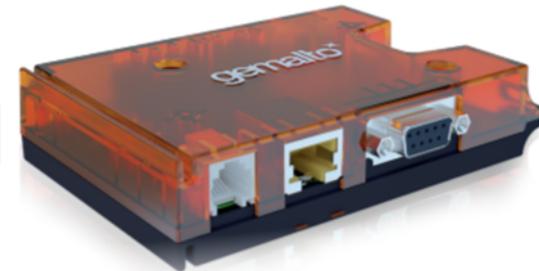
- | 3GPP Rel.7 Compliant Protocol Stack
- | Multiband LTE Cat1 3G, 2G depending on variant
- | SIM Application Toolkit, letter class "b", "c", "e"
- | Control via standardized and extended AT commands (Hayes, TS 27.007 and 27.005)
- | TCP/IP stack access via AT command and transparent TCP services
- | Secure Connection for client IP services
- | Internet Services TCP/UDP server/client, DNS, Ping, FTP client, HTTP client
- | PoE - Power over Ethernet, optional
- | Supply voltage range 8 – 30 V
- | Dimension: 115 x 86 x 26 mm (incl. connectors)
- | Weight: approx 130g
- | Operating Temperature: -30 °C to +65 °C

Special Features

- | Ethernet interface (NAPT) with optional Power over Ethernet (PoE)
- | Real time clock with alarm functionality
- | Multiplexer according 3GPP TS 27.010
- | RLS Monitoring (Jamming detection)
- | Informal Network Scan
- | Programmable hardware watchdog
- | Flexible mounting concept
- | Integrated FOTA, configurable and royalty free
- | Embedded SIM as an option (MIM)

Java Open Platform (ELS61T / PLS62T)

- | Java™ ME
- | Secure data transmission with HTTPS/SSL
- | Multi-Threading programming and Multi-Application execution
- | 18 MB RAM and 31 MB Flash File System



Interfaces

- | Antenna Connector SMA (female) for GSM/WCDMA
- | Diversity antenna (LTE) SMA connector
- | 20 pin header (Weidmüller) with GPIO's, power, SPI, I²C
- | Mini SIM card reader, 1,8V and 3,0V
- | Embedded SIM as an option (MIM)
- | 2 operating status LED's
- | High speed serial modem interface ASCO
- | Plug-in power supply connector (6-pole Western jack)
- | V.24/ V.28 RS-232 interface, up to 920kbps, autobauding (D-sub 9-pole female socket)
- | Ethernet interface (NAPT)

Cinterion® EGX81 Efficient IoT Gateway

LTE M, NB-IoT and 2G connectivity



Multiple MTC technologies for global operation

- 3GPP Rel.14 Cat.M1, Cat.NB1, Cat.NB2, 2G
- Single global SKU option

Time to market acceleration

- Simple connect with plug and play interfaces
- Easy to integrate for quick deployment

Highest efficiency for long term operation

- Revolutionary Power Class 5 (20 dBm)
- Efficient eDRX and PSM

State of the art security

- Secure boot
- Embedded eSIM option
- Secure key store with pre-integrated trusted identities

Easy cloud connectivity and remote management

- MQTT(s) for cloud interworking with public IoT clouds
- Remote firmware updates
- Remote configuration and diagnostics

General Features

- LTE Cat. M1/NB1/NB2
- FDD-LTE Bands 1, 2, 3, 4, 5, 8, 12, 13, 18, 19, 20, 25, 26, 27, 28, 66
- Quad-Band GSM: 850, 900, 1800 and 1900MHz
- Data only
- SIM Application Toolkit with BIP
- Control via standardized commands (Hayes, TS 27.007 and 27.005) and Gemalto M2M AT commands
- Embedded IPv4 and IPv6 TCP/IP stack access via AT command and transparent TCP/UDP services
- Internet Services: TCP server/client, UDP client, DNS, Ping, HTTP client, FTP client, MQTT client
- Secure Connection with TLS/DTLS
- Supply voltage range: 5 - 30 V
- Dimension: 80 x 55 x 23 mm (excluding connectors)
- Operating temperature: -30°C to +75°C
- Weight 65g

Interfaces

- Antenna Connector SMA (female)
- Mini-SIM card reader, 1.8V and 3.0V
- Plug-in power supply connector (6-pole Western jack @ EGX81 RS232 variant)
- V.24 / V.28 RS-232 interface (D-sub 9-pole female socket) @ EGX81 RS232 variant)
- 6 pin header with RS485 interface, power and ignition/reset @ EGX81 RS485 variant
- Operating status and Watchdog operation indication LED's

Special Features

- Cinterion® IoT Suite Services: software updates, trusted identity
- Driver for Windows® 7 / Windows® 8 / Windows 10
- Driver for Linux
- Firmware update via serial interface
- Real time clock with alarm functionality
- Flexible mounting concept (DIN rail mounting, C-rail mounting, Screw fixing, use of cable ties)
- Programmable hardware watchdog

Cinterion® DGL61-W

LTE Cat. 1, 3G and 2G global connectivity out of the box



Global LTE Cat.1

- | 3GPP Cat.1 with 3G and 2G fallback
- | Single global SKU

Out-of-the-box connectivity

- | USB 2.0 interface and USB-powered for quick and easy device integration
- | Built-in antenna for simplest installation and best RF performance
- | Type approved



Industrial-grade performance

- | Rugged design, extended temperature range
- | Long stable lifecycles



Flexible and customizable

- | Embedded Thales eSIM option
- | Custom firmware option
- | Wall-mounting option for long-term device integration



Remote management

- | Firmware over-the-air updates
- | Remote configuration and diagnostics

General Features

- | Embedded TCP/IP stack with IPv4 and IPv6 support
- | TCP/IP stack access via AT command and transparent
- | TCP/UDP services
- | Secure TCP/IP connectivity, new TSL/SSL engine (TSL1.2)
- | Internet Services TCP/UDP server/client, DNS, Ping, HTTP, SMTP, FTP client
- | Supply voltage range: 5V USB
- | Dimensions: 114.5 x 73.5 x 19.5mm
- | Operating temperature: -25°C to +65°C
- | Integrated Antenna
- | USB cable length: 200mm

Java Open Platform

- | Java ME 3.2 embedded
- | Extended Memory: 18 MB RAM, 30 MB Flash File System
- | Multi-Threading programming and
- | Multi-Application execution

Interfaces

- | Micro-SIM reader, 1,8V and 3,0V
- | Component MIM prepared (optional)
- | 4 operating status LED's
- | USB (B) 2.0 HS (Power over USB)

Special Features

- | Cinterion® IoT Suite Services: firmware updates
- | Driver for Microsoft® 7™, 8™, 10™
- | Driver for Linux
- | Firmware Upgrade via USB and FOTA
- | Flexible wall-mounting concept

Mini PCI Modem Cards



Cinterion® mPLS63-W Performance IoT Modem Card

Plug and play global LTE Cat.1 with 3G/2G fallback from a single SKU



LTE Cat.1



Global coverage with fallback options

- Global LTE Cat.1 from a single SKU
- 3G and 2G fallback
- Data and voice



Compact, plug and play Mini PCIe™ modem card

- Integrated IP connectivity
- VoLTE and CSFB voice, embedded GNSS
- Thales extended set of AT commands



Flexible network usage

- Dual SIM interface and optional eSIM
- Flexible SIM support
- Global MNO approval



State of the art security

- Secure boot
- Secure key store
- Key lifecycle management



Easy connectivity and lifecycle management

- Secure enrollment toward main cloud platforms
- Remote update and device management

General Features

- 3GPP Rel.9 Compliant Protocol Stack
- FDD-LTE: bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 18, 19, 20, 26, 28, 66
- TD-LTE: bands 38, 40, 41
- UMTS (WCDMA/FDD): bands 1, 2, 3, 4, 5, 6, 8, 19
- Quad Band GSM: 850, 900, 1800, 1900 MHz
- Integrated GNSS support (GPS/BeiDou/GLONASS/Galileo)
- SIM Application Toolkit, letter classes b, c, e with BIP and RunAT support
- Control via standardized and extended ATcommands (Hayes, TS 27.007 and 27.005)
- Embedded IP stack with IPv4 and IPv6 support
- TCP/IP stack access via AT command and transparent TCP/UDP services
- Secure Connection with TLS/DTLS
- Internet Services TCP/UDP server/client, DNS, Ping, HTTP, SMTP, FTP client
- Supply voltage range: 3.3 V (+/- 5%)
- Dimension: 50.95 x 30.00 x 4.70 mm
- Data and voice

Special Features

- USB Interface features a composite mode, compliant to Windows, Linux and Mac
- Firmware update via USB
- RLS Monitoring (Jamming detection)
- Informal Network Scan
- Cell ID based Location Support
- Module Services
- eSIM (optional)

Interfaces (52pin edge connector)

- USB 2.0
- 4 GPIO lines
- 3FF UICC card holder (USIM IF#1)
- 2 Hirose 3mm U.FL onboard connectors for Main and RX-Diversity antennas
- GNSS
- Digital audio interface (PCM and I2S modes)

Drivers

- USB, MUX driver for Microsoft® Windows 7™, Microsoft® Windows 8™ and Microsoft® Windows 10™
- Ofono for Linux



Cinterion® LTE Modem Cards

Global Connectivity in LTE Cat 1, Cat 3 and Cat 6 Product Variants



4G LTE Advanced Cat 1, Cat 3 and Cat 6 Solutions

 RLS Monitoring (Jamming Detection)

 2G /3G Fallback Variants

 GPS/A-GPS/ GLONASS*

 USB 2.0 Compatible

 SIM card holder

 Incremental FOTA

 Plug & Play, fits 52-pin express socket

 JAVA Embedded*

	mPLS62-W LTE CAT 1 MODEM CARD	mPLS8 LTE CAT 3 MODEM CARD	mPLAS9 LTE CAT6 MODEM CARD
DIMENSIONS	50.95 x 30 x 5.56 mm	50.95 x 30 x 4.7 mm	50.95 x 32.6 x 5.3 mm
OPERATING TEMPERATURE	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
GENERAL FEATURES	<p>mPLS62-W: 3GPP Release 9</p> <p>Twelve Bands LTE 1, 2, 3, 4, 5, 7, 8, 12, 18, 19, 20, 28</p> <p>Seven Bands UMTS 1, 2, 4, 5, 8, 9, 19</p> <p>Four Bands GSM: 850, 900, 1800 and 1900 MHz</p>	<p>mPLS8-US Variant: Four Bands LTE 2, 4, 5, 17 Three Bands UMTS 2, 4, 5 Four Bands GSM 850, 900, 1800 and 1900 MHz</p> <p>mPLS8-E Variant: Five Bands LTE 20, 8, 3, 1, 7 Three Bands UMTS 8, 3, 1 Two Bands GSM 900, 1800 MHz</p>	<p>mPLAS9-X Variant: Seven LTE-Advanced FDD 12, 13, 17, 29, 5, 4, 2 Three Bands UMTS 2, 4, 5 Four Bands GSM 850, 900, 1800 and 1900 MHz</p> <p>mPLAS9-W Variant: Eleven Bands LTE-Advanced FDD 1, 3, 5, 7, 8, 18, 19, 20, 26, 28A/B Four Bands LTE-Advanced TDD 38, 39, 40, 41 Five bands UMTS 5, 6, 8, 3, 1 Two bands GSM 900, 1800 MHz</p>

Cinterion® MV31-W Modem Card

Ultra High-Speed 5G with LTE and 3G Fallback



Supporting the whole 5G spectrum

- Sub 6 GHz operation, with optional millimeter wave support
- Global 5G coverage on one single SKU
- LTE Cat. 20 fallback



Most compact plug and play M.2 data card

- Compact standard 30x42 M.2 with PCIe3.0
- Plug and play support of Windows® 10, Linux and Android



Flexible Network usage

- Dual SIM support with Dual Standby Single Active support
- Main MNOs approval
- Flexible SIM support: Consumer and M2M eSIM with onboard option



True Industrial IoT

- Temp: -40 to +85 C°
- Advanced temperature management
- Special heat dissipation design



Proven cellular configuration

- Unique RF Core encapsulates complexity and increases reliability
- Core cellular configuration tested and approved in high volume computing application

General Features:

- 5G SA and NSA (3GPP Release 15)
 - FR1 FDD-LTE Bands: n1, n2, n3, n5, n7, n8, n12, n20, n28, n66, n71
 - FR1 TD-LTE Bands: n38, n41, n77, n78, n79
 - FR2 mmWave: n257, n258, n260, n261
- LTE Advanced-Pro (3GPP Release 15)
 - FDD-LTE Bands: 1, 2, 3, 4, 5, 7, 8, 12, 13, 14, 17, 18, 19, 20, 25, 26, 28, 29, 30, 32, 66, 71
 - TD-LTE Bands: 34, 38, 39, 40, 41, 42, 46 (IAA), 48 (CBRS)
- UMTS/HSPA+ (3GPP Release 8)
 - FDD Bands: 1, 2, 4, 5, 6, 8, 9, 19
- Optional mmWave support
- Worldwide coverage in single SKU
- 5G Standalone (SA) and Non-Standalone (NSA) Support
- Integrated Dual Frequency GNSS: Simultaneous L1 and L5 supporting GPS, GLONASS, Galileo and Beidou
- Dual SIM with embedded eSIM support

- Supply voltage range 3.14V - 4.8V
- Dimensions (W x L x H): 30mm x 42mm x 2.5 mm - Smallest 5G M.2 data card 30x42
- Temperature range: Extended operation -40°C to +85°C
- Data only

Specifications:

- 5G Sub6 Ghz: Max throughput DL/UL ~4 Gbps/ ~0.7 Gbps*
- 5G mmWave: Max throughput DL/UL ~7 Gbps/~3 Gbps*
- LTE Cat. 20: Max throughput DL/UL 2 Gbps / 150 Mbps*
- HSPA+ Rel8: Max throughput DL/UL 42 Mbps / 11 Mbps*

System on Module (SoM)



Cinterion® CL31 and CW31 System on Module

High-Speed LTE with 2G/3G Fallback, WiFi, Bluetooth and Smart Edge Computing Power



Global coverage

LTE with 3G/2G fallback and with VoLTE/CSFB for worldwide coverage



Enhanced and Scalable Design

Flexibility to serve multiple performance, memory and connectivity (cellular/non-cellular) options with the same design



All-in-one edge-computing platform

Processing power, rich multimedia experience and reliable connectivity packed into one highly integrated package



Biometrics

A wide range of proven Thales biometric solutions pre-integrated



Thales Core Connectivity Solutions ready

State-of-the-art Security, QoS, and zero-touch connectivity with the onboard eSIM

General Features

- | ARM Cortex A53 - Quad Core 2.0 Ghz Processor
- | LTE Cat4 FDD/TDD Rel 11 up to 150 Mbps DL / 50 Mbps UL
- | Android 10 OS Support
- | Dual Band (2.4/5Ghz) single stream 802.11 ac/a/b/g/n WiFi and WiFi HotSpot 2.0 support
- | Bluetooth 5 dual mode (LE and EDR)
- | Integrated GNSS – support for GPS/ GLONASS/ Beidou/ Galileo/ QZSS and full A-GPS capability
- | Video Encode/Decode 1080p @ 30fps
- | OpenGL ES 3.0 3D graphic accelerator and OpenCL 1.1
- | 2GB RAM + 16 GB Flash Memory
- | LGA pad soldering mount
- | Supply voltage range: 3.3 – 4.3V
- | Dimension: 43.2 x 41.4 x 2.9mm
- | Operating temperature: -25°C to +85°C

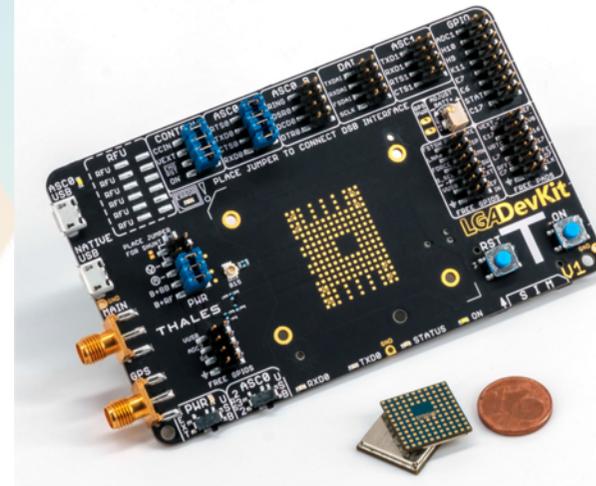
Special Features

- | Android application framework
- | Edge AI support - Android Neuro Network compliant
- | Cellular Voice Support VoLTE/ CSFB
- | Integrated Audio Codec, noise cancellation over MIC
- | Super fast charge with upto 3A
- | TEE support
- | Dual SIM support with dual VoLTE
- | Embedded eSIM ready
- | Global coverage on 2 CL31 SKUs + non-cellular CW31

Interfaces

- | Single Display MIPI DSI 4x Lane interface supporting up to HD+ 1600x720 resolution
- | Triple Camera 3x MIPI CSI 4x Lane interface (3rd MIPI can be divided into two lanes for total 4x Camera interfaces) integrated ISP supports 21 MP / 13+8 MP @ 30fps
- | Complete USB2.0 OTG interface
- | Speaker, earpiece, headphone and 2 MICs for analog audio
- | Complete USB 2.0 OTG interface
- | SD/SDHC card support
- | Analog/Digital audio Interface (I2S, PCM)

Kits de
desarrollo





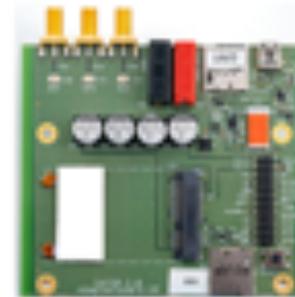
The Cinterion® LGA DevKit

The Cinterion LGA DevKit is designed as a generic development adapter for Cinterion® LGA modules. With a cleverly designed socket, the LGA DevKit offers evaluation of the Cinterion® Module range.



The Cinterion® Module DevKit

Based on the same board as the LGA DevKit, the Cinterion Module DevKit is supplied specifically for a single module.



Mini PCIe™ Modem Card DevKit

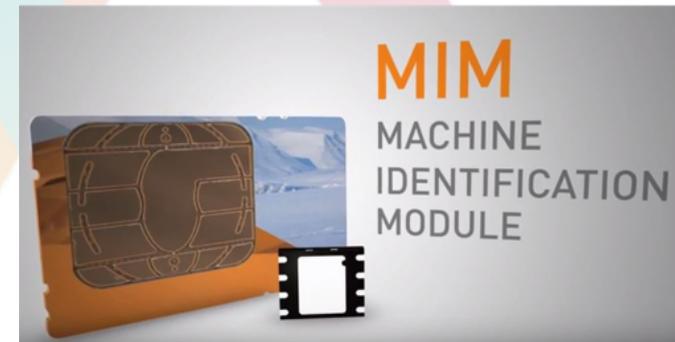
To conveniently evaluate Cinterion LTE Modem Cards the PCIe adapter provides an instant Mini PCIe™ to USB interface.



M.2 Modem Card DevKit

The Development Kit is designed to get started with the high speed Cinterion® M.2 Modem Card product range.

Tarjetas SIM Industriales



Tarjetas SIM optimizadas para:

- ❓ Sobrevive a condiciones extremas de vibración, temperatura y humedad comunes a las aplicaciones M2M
- ❓ Soporta una larga vida útil (por ejemplo, más de 10 años)
- ❓ Ocupa un espacio reducido (miniaturización)
- ❓ Soporte e integración en los procesos de fabricación industrial

Product Family	U-MIM Quad	M2M™ 85	M2M™ 105	™ M2M Quad	™ Auto Quad
Drivers	Miniaturisation	Fit any equipment	Fit any equipment	Industrial grade	Auto grade
	M2M Consumer Electronics	M2M Industrial	M2M Industrial Extended endurance	M2M Industrial Extended endurance	Automotive std Extended endurance
					
Temperature resistance range	GSM standard	-35°C / +85°C	-40°C / +105°C	-40°C / +105°C	-40°C / +105°C
M2M qualification (JEDEC)			*	*	*
e)xtended Life mechanism	as an option	*	*	*	*
Enhanced silicon		*	*	*	*
Burn-in					*
Data retention	10 y / 25°	10 y / 85°	10 y / 85°	10 y / 25°	17 y / 80°

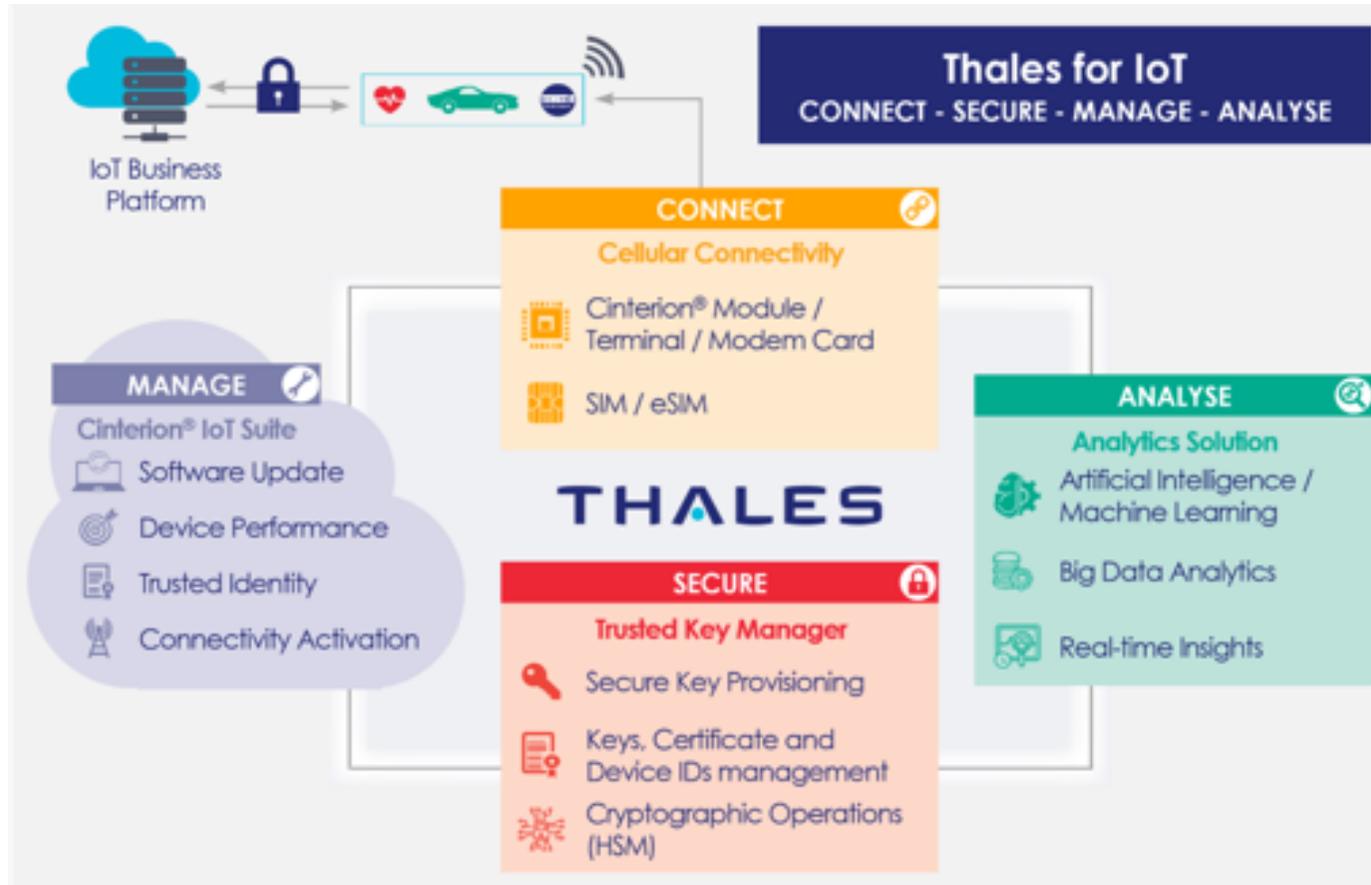
Tarjetas SIM optimizadas para:

- ❓ Sobrevive a condiciones extremas de vibración, temperatura y humedad comunes a las aplicaciones M2M
- ❓ Soporta una larga vida útil (por ejemplo, más de 10 años)
- ❓ Ocupa un espacio reducido (miniaturización)
- ❓ Soporte e integración en los procesos de fabricación industrial

U-MIM Quad	M2M™ B5	M2M™ 105	™ M2M Quad	™ Auto Quad
Ideal for consumer M2M applications	Suitable for replacement of classic SIM in existing modems	Ideal for replacement of classic SIM in existing modems	Miniaturised standardised format (TS 102.671)	Miniaturised standardised format (TS 102.671)
Miniaturised, standardised format (TS 102.671)	Standard SIM card format	Standard SIM card format , made with a more robust material	Resistant to theft	Resistant to theft
Resistant to theft	Ideal for environments up to 85°C	Resistant to harsh environments	Semiconductor packaging (SMD) resistant to high temperature (105°C), shocks, vibrations and humidity	Semiconductor packaging (SMD) resistant to high temperature (105°C), shocks, vibrations and humidity
	Industrial grade - industrial qualification (JEDEC)	Suitable for environments up to 105°C	Industrial grade - industrial qualification (JEDEC)	Industrial grade - industrial qualification (JEDEC)
	Exclusive extended Life mechanism to endure a longer life span	Industrial grade - industrial qualification (JEDEC)	Exclusive extended Life mechanism to endure a longer life span	Automotive requirements compliance (AEC Q100 / TS 16 949)
		Exclusive extended Life mechanism to endure a longer life span		Exclusive extended Life mechanism to endure a longer life span



¿Por qué usar Thales?





Muchas gracias