

#### The product line is based on family concepts: TinyOne<sup>®</sup>, ME, LE and ZigBee<sup>®</sup>

TinvOne® family, consisting of TinvOne® Lite, Tinv-One® Plus and TinvOne® Pro products pin-to-pin compatible dedicated to wireless applications operating in the ISM band (868 and 915 GHz), thus providing efficient power consumption management, low-data rates, and long distance.

TinyOne<sup>®</sup> Lite, TinyOne<sup>®</sup> Plus and TinyOne<sup>®</sup> Pro are delivered with proprietary Star Network Stack and proprietary Low Power Mesh Stack. Telit's stack is fully configurable and upgradeable over-the-air from a point-to-point communication to a star communication with listen before talk and allows mesh networking with efficient power consumption management. The efficient power management process enables multiyear battery powered operation, simple installation, and auto association including self healing and autorepair functionalities as well as mobility functions.

ME Family is the latest generation of Wireless M-Bus products compliant with EN13757 part 4 and part 5 Wireless M-Bus standard optimized for one- or twoway data exchange with gas, water, heat and electricity meters and concentrators.

LE Family is the best solution for ultra low power and low latency time applications that require point-topoint or multipoint (broadcast) network communication operating in ISM band (868MHz and 433MHz). Simple plug and play protocol Star Network Stack for RF communication is ideal to replace applications with communication over cable.

**NE Family** is based on Telit proprietary protocol Low Power Mesh concept with the cluster-tree network structure

ZigBee® ZE family offers an extremely compact form factor with complete pin-to-pin alignment. The family consists of low-power digital radios based on the IEEE 802.15.4 standard at 2.4 GHz for wireless networks and uses a standard communication protocol dedicated to a range of markets and applications such as home automation and control, building automation. advanced metering, and telecom applications.

The ZigBee® ZE family OEM modules are based on the same concept while providing a small SMD component for optimized integration ranging from 1mW up to 100mW. The modules are offered with or without an embedded antenna and are available with the proven world-class in-house ZigBee® PRO stack.

Moreover ME, LE, NE and ZE family are fully pin-to-pin compatible.

#### Telit designs wireless data transmission solutions for machine-to-machine applications.

Telit's product portfolio offers a wide range of innovative and reliable RF solutions ranging from ready-to-use wireless radio modems to OEM RF modules and RF

Solutions from Telit operate in the license-free worldwide ISM frequency bands of 433 MHz, 868 MHz, 915 MHz, and 2.4 GHz and are available in both standardized and proprietary low-power, low-data rate RF technologies for the m2m/industrial markets.

The long-term experience and extensive expertise in cost-effective state-of-theart radio solutions allow a significant reduction in TCO (total cost of ownership) and time-to-market. Additionally, having full IP stack ownership and a multi-chip vendor approach ensure continuity of supply and highly reliable products.

#### 433 MHz band

- Frequency: 433.05 434.79 MHz
- Application: Europe, Australia, South Africa, Asia
- Standard: ETSI 300-220
- Power: up to 25 mW
- Duty cycle: 10% to 100%
- Family: ΙF

#### 868 MHz band

- Frequency: 868.00 870.00 MHz
- Application: Europe
- Standard: ETSI 300-220
- Power: 5 to 500 mW (Depending on sub-band)
- Duty cycle: 0.1 to 100% (Depending on sub-band)
- Families:
- -TinyOne® Lite/Plus/Pro
- -PowerOne™
- -ME, LE, NE

#### 915 MHz band

- Frequency: 902.00 928.00 MHz
- Application: U.S., Canada, Australia
- Standard: FCC 15.247
- Power: 1 W with possibility to have 6dB gain antenna
- Duty cycle: Frequency Hopping Spread Spectrum, 400 ms allowed per channel, hop on 50 channels min
- Families: TinvOne® Pro

#### 2.4 GHz band

- Frequency: 2400 2483.5 MHz
- Application: Worldwide
- Standard: IEEE 802.15.4
- Power: 2.5 mW to 100 mW
- Duty cycle: N/A
- -ZE51-2.4 / ZE61-2.4 (ZigBee® compliant)



#### Short Range to GSM | GPRS **Gateways**

#### Terminal

Short Range to GSM | GPRS Gateways



ARM9 220 MIPS Embedded Quad Band GPRS GPRS Class 10 RoHS Compliant

Linux

SR to GSM/GPRS

Embedded TCP/IP Stace

Telit GG863-SR is an all-in-one gateway terminal that brings together the GSM/ GPRS and short-range technology, hosting programmable GE863-PRO3 and any of the short-range modules from Telit's wide product offer in a unique cost-saving. fully customized solution. Thanks to the possibility of choosing among different ISM bands (433MHz, 868MHz, 915MHz and 2.4GHz), protocol stacks (ZigBee, M-Bus or proprietary), network topologies (Star, Mesh, Cluster tree) and coverage (from 70m to 4km), time to market and total cost of the final application are significantly reduced. The behavior of the gateway can be customized through the embedded Linux complete development environment and dedicated libraries for GSM and short range, thus simplifying integration in a

#### Terminal

License-Free System for Frequencies <1 GHz

License-Free System

for Frequencies <1 GHz



ETSI Certified Device RoHS and WEEE Compliant Embedded S-One or M-One Stack Low Power Mode RS232, RS422 and RS485 Serial Interface DOTA - Upgradeable and Configurable Over-the-Ai Network Compatibility TinyOne™ Plus with -Pn IP67 IP67 Casing Standby: 70µA Complete Terminal with 6-40V Power Supply



The TinyOne® Plus IP67 terminal is compliant with European Directive 1999/05/EC requirements, low-cost RF solution in the license-free 868 MHz ISM band for harsh environments and weather conditions. The terminal includes a 25 mW multi-channel radio module with advanced proprietary embedded standard firmware (S-One) or mesh networking (M-One), and a reinforced hard metal casing with removable quarter antenna. With a power supply range of 6-40 V, supporting RS232/RS485/RS422 serial interfaces and an efficient low-power mode, this terminal is optimal for outdoor applications such as telemetry, irrigation, urban traffic control, or urban display control and is capable of transmitting data up to 1,500 m. TinyOne® Plus is compatible with the extended 500 mW TinyOne® Pro, for backbone network topology and is upgradeable over-the-air.



ETSI Certified Device ant with European Directive 1999/05/EC requirements, low-cost RF and long-range RoHS and WEEE Compliant solution in the license-free 868 MHz ISM band for harsh environments and weather Embedded S-One or M-One Stack conditions. The terminal is the 500 mW extension of the TinvOne® Plus 25 mW and is multi-channel capable of transmitting Low Power Mode data up to 4,000 m. With a power supply RS232, RS422 and RS485 Serial Interfac range of 6-40 V. supporting RS232/RS485/ RS422 serial interfaces, advanced proprietary embedded standard firmware (S-One) or mesh low-power networking (M-One), and a reinforced hard metal casing with Network Compatibility TinyOne Pro with -Plus removable quarter antenna, this terminal is optimal for long-range outdoor applica-IP67 IP67 Casing tions such as remote monitoring for the water, petroleum, and gas industries, traffic lights, and irrigation. TinyOne® Pro is Standby: 70µA compatible with the TinyOne® Plus backbone network topology and is upgradeable

over-the-air.

The TinyOne® Pro IP67 terminal is compli-



ETSI Certified Device RoHS and WEEE Compliant Embedded S-One Stack + Mult, Protocol Modes

High Performance for Long-Range Application RS232, RS422 and RS485 Serial Interfa

Mod-, Profi-, JBus and Unitelway Compatible 1/0s Deported Analog and Digital I/Os

IP65 or IP67 Casing for Harsh Environments

Complete Terminal with 6-40V Power Supply

PowerOne™ 868 MHz terminals are compliant with European Directive 1999/05/EC requirements RF solution for long-range reliable wireless data transmission. With a line-of-sight range of 16,000 m and featuring the powerful S-One embedded firmware, these 500 mW terminals bring high efficiency to wireless applications such as rural and urban telemetry, GPS data transmission for localization & fleet management, urban display monitoring, weather stations control and industrial control and are compatible with Profi-Bus, ModBus, and Unitelway protocols. PowerOne™ terminals are available in a metallic IP65 or IP67 casing, with fixed or removable guarter antenna, with a power supply range of 6-40 V, support RS232/ RS485/RS422 serial interfaces, and provide integrated or external I/O copy management.

#### **License-Free System** for Frequencies <1 GHz

final application.

#### Compact

License-Free System

PowerOne<sup>™</sup> 868 MHz RF modules





High Performance for Long-Range Application





1/0s Deported Analog

PowerOne™ OEM RF modules, working in the license-free 868 MHz ISM band are high power radio solutions for long-range applications. Due to high RF performance and the powerful S-One embedded firmware, the modules are perfectly suited for long distance data transmission systems. These RF modules include RS232/RS485/RS422 serial interfaces and are ModBus, ProfiBus, JBus, and Unitelway compatible. The modules can be easily integrated into an application, thus reducing valuable development time and costs for industrial applications, I/O management, GPS data transmission for localization & fleet management, and urban display monitoring.

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#### **Embedded**

License-Free System Embedded

TinyOne® Lite 868 MHz RF modules





TSI ETSI Compliant

RoHS and WEEE Compliant Embedded S-One or M-One Stack





DOTA - Upgradeable and Configurable Over-the-Air TTL RS232 Interface + Digital and Analog I/Os 2.54 mm DIP Adapter Available M-Bus Compatible

TinyOne® Lite OEM RF modules are based on Telit's TinyOne® concept and are optimized for highly reliable communications and provide ultra-low-power for maximum battery life at a low price for applications ranging from energy management and building control to machine health monitoring. Available with or without integrated antenna, these pre-certified SMD RF modules provide a TTL RS232 interface, integrated digital and analogical I/Os, work in the license-free ISM band of 868 MHz, and offer the advanced embedded proprietary S-One stack including and optional wireless M-Bus and M-One stack. These modules are easily integrated into a system, thus reducing development time and cost while providing highly-reliable communications and ultralow-power for maximum battery life in a wide range of sensor network applications such as those in the growing AMR/AMI market.

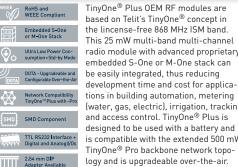
#### **License-Free System** for Frequencies <1 GHz

#### **Embedded**

License-Free System Embedded

TinyOne® Plus 868 MHz RF modules











ETSI Compliant

RoHS and WEEE Compliant

Embedded S-One or M-One Stack

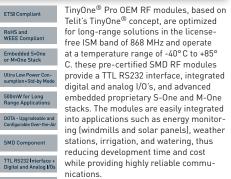
500mW for Long Range Applications

SMD Component

SAW Filter Best-in-Class Interference Immunity

2.54 mm DIP Adapter Available







Ultra Low Power Con

sumption+Std-by Mo

500mW for Long Range Application:

DOTA - Upgradeable as Configurable Over-the-

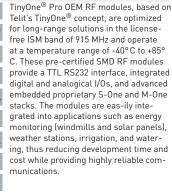
SMD Component

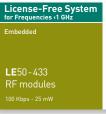
TTL RS232 Interface Digital and Analog I/O

2,54 mm DIP Adapter Available

FCC Compliant Edit

















Telit LE50-433 modules are the latest generation of multi-band multi-channel radio module with advanced proprietary embedded stack easy to integrate and use in point-to-point or star network communication. LE50-433 modules operate in 433 MHz band with ultralow power stand by mode, efficient wake up on radio and budget link of 123 dB (119 dB for EU). Available in LGA format, these pre-certified RF modules provide TTL RS232 interface, integrated digital and analog I/Os and can be integrated into a system, thus reducing development time and cost for applications in building automation, irrigation, tracking, lightning and access control, LE50-433 is also pin-topin compatible with other modules form Telit LE Family (LE50-868), ZE Family (ZigBee 2007 and PRO stack), NE Family (Mesh low power) and ME Family (Wireless M-Bus).

#### **License-Free System** for Frequencies <1 GHz

#### Embedded

License-Free System

RF modules





TTL RS232 Interface + Digital and Analog I/Os 2,54 mm DIP Adapter Availabl

Embedded In-House Star Network Stack

Telit LE50-868 modules are the latest generation of multi-band multi-channel radio module with advanced proprietary embedded stack easy to integrate and use in point-topoint or star network communication. LE50-868 modules operate in 868 MHz band with ultra-low power stand by mode, efficient cyclic-wake up, budget link of 123 dB and dedicated telemetry mode. Available in LGA format, these pre-certified RF modules provide TTL RS232 interface, integrated digital and analog I/Os and can be integrated into a system, thus reducing development time and cost for applications in building automation, irrigation, tracking, lightning and access control. LE50-868 is also pin-to-pin compatible with Telit ZE Family (ZigBee 2007 and PRO stack), ME Family (Wireless M-Bus) and NE Family (Mesh low power).

# License-Free System

**NE**50-868 RF modules







Telit NE50-868 RF modules are based on Mesh network concept in the license-free 868 MHz ISM band. With adjustable output power from 5 mW to 25 mW NE50-868 modules can reach up to 1500 m in LOS. Advanced proprietary embedded low power mesh stack allows efficient power management on both end nodes and routers. network latency defined on the system requirements by setting different synchronous network time, data rate or message format, connecting up to 100 end nodes per router in a cluster tree architecture that enables scalability. Low power mesh stack is designed for battery powered sensor networks that can be built automatically making it easily to integrated, thus reducing development time and cost for applications in building automation, metering (water, gas, electric), irrigation, tracking, lightning and access control. Telit NE50-868 is pin to pin compatible with ZE Family (Zigbee), ME Family (Wireless M-Bus) and LE Family (Telit Star Network), while future 915 and 433 MHz version are planned.

### License-Free System Wireless M-Bus EN13757 Embedded





TTL RS232 Interface -2.54 mm DIP Adapter Available

Ш M-Bus Compatible Telit ME50-868 modules are the latest generation of Wireless M-Bus products compliant with EN13757 part 4 and part 5 Wireless M-Bus standard optimized for one- or two-way data exchange with gas, water, heat and electricity meters and concentrators, ME50-868 modules operate in 868MHz band with ultralow-power for maximum battery life and have the best budget link on the market of 122dB. Available in LGA format, these pre-certified RF modules provide a TTL RS232 interface, integrated digital and analog I/Os and can easily be integrated into a system, thus reducing development time and cost. ME50-868 is also pin-to-pin compatible with Telit ZE Family (ZigBee 2007 and PRO stack), NE Family (Mesh low power) and LE Family (basic point

to point, broadcast stack).

## IEEE 802.15.4 | ZigBee®

#### **Embedded**

IEEE 802.15.4 | ZigBee

RF modules 250 Kbps - 2.5 mV **ZE** 61 - 2.4

Embedded















The ZE51-2.4 and ZE61-2.4 are compact, SMD and complete ZigBee®-ready modules based on the Texas Instruments CC2530 System on Chip with 256KB flash memory dedicated for ZigBee profiles or custom applications and are optionally available with an integrated antenna. The ZE51-2.4 supports low power modes up to 2.5 mW fully compatible and with the same form factor as ZE61-2.4, the extended version of the low cost ZE51-2.4, having link allocation of 120 dB and 100 mW output power. Telit RF Technologies offers the proven world-class in-house ZigBee® PRO stack easy-to-use C-API. All ZE products are available with fully owned IPR (Intellectual Property Rights) and independently developed ZB PRO stack assuring full technical support during development, deployment and maintenance phases as well as possible dedicated customization to reduce the TCO (Total Cost of Ownership) finally providing a real competitive advantage.

### **Product** Range



#### Making machines talk.®

Short Range to GSM   GPRS Gateways	Form Factor	Range	Frequency	Radio Data	Output Power	Core	Cellular	Embedded Stack Option	Antenna Option
GG863-SR Gateway	Terminal	up to 4000 m	433, 868,915 or 2400 MHz	up to 250 Kbps	up to 500 mW	ARM9 200 MHz 128 MB flash/64 MB RAM mit Linux OS	Quad band GSM/GPRS class 10	Mesh, ZigBee or Wireless M-Bus	Removable
License-Free System for Frequencies <1 GHz									
TinyOne <sup>®</sup>	Form Factor	Range	Frequency	Radio Data	Output Power	Sensitivity (BER < 10 <sup>-3</sup> )	Standby	Embedded Stack Option	Antenna Option
TinyOne® Lite 868 MHz RF modules	Embedded	700 m	868 MHz	up to 100 Kcps	up to 10 mW	-105	2μΑ	Mesh, Star & M-Bus	Integrated
TinyOne <sup>®</sup> Plus 868 MHz RF modules	Embedded	1500 m	868 MHz	4.8 to 38.4 Kbps	5, 10 or 25 mW	-105	4µA	Mesh & Star	
TinyOne <sup>®</sup> Plus 868 MHz	Terminal	1500 m	868 MHz	4.8 to 38.4 Kbps	5, 10 or 25 mW	-105	70µA	Mesh & Star	Removable
TinyOne <sup>®</sup> Pro 868 MHz RF modules	Embedded	4000 m	868 MHz	4.8 to 38.4 Kbps	500 mW	-105	4μΑ	Mesh & Star	
TinyOne <sup>®</sup> Pro 868 MHz	Terminal	4000 m	868 MHz	4.8 to 38.4 Kbps	500 mW	-105	70µA	Mesh & Star	Removable
TinyOne® Pro 915 MHz RF modules	Embedded	4000 m	915 MHz	38.4 Kbps	500 mW	-100	4μΑ	Star	
Power0ne™	Form Factor	Range	Frequency	Radio Data	Output Power	Sensitivity (BER < 10 <sup>-3</sup> )	Standby	Embedded Stack Option	Antenna Option
PowerOne™ 868 MHz RF modules	Compact	16000 m	868 MHz	4.8 and 9.6 Kbps	25 to 500 mW	-115	10μΑ	Star	
PowerOne™ 868 MHz	Terminal	16000 m	868 MHz	4.8 and 9.6 Kbps	25 to 500 mW	-115	15µA	Star	Removable
LE Family	Form Factor	Range	Frequency	Radio Data	Output Power	Sensitivity (BER < 10 <sup>-3</sup> )	Standby	Embedded Stack Option	Antenna Option
LE50 - 433 RF modules	Embedded	2000 m	433 MHz	Up to 115.2 Kbps	25 mW	-109	1μΑ (*)	Star	
LE50 - 868 RF modules	Embedded	2000 m	868 MHz	Up to 115.2 Kbps	25 mW	-109	1μΑ (*)	Star	
NE Family	Form Factor	Range	Frequency	Radio Data	Output Power	Sensitivity (BER < 10 <sup>-3</sup> )	Standby	Embedded Stack Option	Antenna Option
NE50 - 868 RF modules	Embedded	1500 m	868 MHz	Up to 115.2 Kbps	25 mW	-103	1μΑ (*)	Mesh	
Wireless M-Bus EN13757	Form Factor	Range	Frequency	Radio Data	Output Power	Sensitivity (BER < 10 <sup>-3</sup> )	Standby	Embedded Stack Option	Antenna Option
ME50 - 868 RF modules	Embedded	2000 m	868 MHz	Up to 100 Kbps	25 mW	-108	1µA (*)	Wireless M-Bus	
IEEE 802.15.4   ZigBee®	Form Factor	Range	Frequency	Radio Data	Output Power	Sensitivity (BER < 10 <sup>-3</sup> )	Standby	Embedded Stack Option	Antenna Option
ZE51-2.4 RF modules / ZE61-2.4 RF modules	Embedded	1 km/4 km	2400 MHz	250 Kbps	2.5 mW /100 mW	-97/-100	1μΑ (*)	ZigBee PR0	Integrated

(\*) wake up on interrupt



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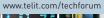
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## We live m2m









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