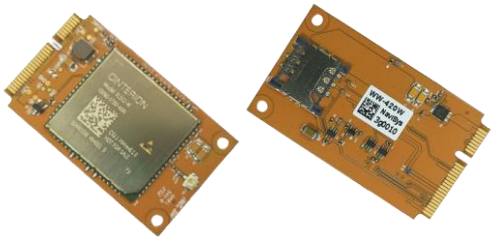
# *WW-420, 4G LTE / 2G GSM*

# *Mini PCIe Card with SIM Holder*



RoHS Compliant

## Overview

WW-420 PCI Express Mini Card is designed based on Telit Cinterion 4G LTE technology with seamless fallback to 2G networks.

It supports both 4G LTE Cat1 and 2G GSM/GPRS/EDGE wireless WAN technologies. Not only exhibits excellent hardware/radio frequency performance, it also supports rich software for fast product development. Following the PCI Express Mini Card standard, it could be easily applied in devices with PC architecture.

It is an ideal solution for the vast number of M2M and industrial IoT applications that are not dependent on speed but that requires the longevity of LTE networks, while still providing 2G connectivity to ensure complete population and geographic coverage as LTE rolls out.

Following the Cat.1bis standard, .WW-420 requires only 1 antenna and thus saves the cost and space of 1 antenna.

## Applications

- Financial / Security / Payment / Inventory / Healthcare
- Kiosk / Digital Signage / Intelligent Vending Machine
- POS / Automatic Meter Reading / Smart Meters
- School Bus / Transit / Taxi / Police
- Tracking & Tracing / Fleets Management
- Mobile Internet Terminal / Fixed Wireless Terminal
- Remote Monitoring / Telematics / eHealth
- Agriculture / Connected Sensors
- Smart City

## Features

- Both 4G LTE and 2G GSM/GPRS/EDGE support.
- PCI Express Mini Card standard V1.2 compliant
  - Communication via USB
  - Network status indication
  - Remote host wakeup support
- Powered by Telit Cinterion ELS62-W module
  - LTE Cat 1 (MHz)
    - 700 (B28)
    - 800 (B20)
    - 850 (B5)
    - 900 (B8)
    - 1800 (B3)
    - 1900 (B2)
    - 2100 (B1, B4, B66)
    - 2600 (B7)
    - TDD2300 (B40)
    - TDD2500 (B41)
    - TDD2600 (B38)
  - GSM/GPRS/EDGE (MHz)
    - 850, 900, 1800, 1900
- Only 1 antenna is required following the Cat.1bis standard.
- Lowest power consumption Cat.1 solution
- USB 2.0 High Speed (480Mbit/s) device interface, Full Speed (12Mbit/s) compliant
- Onboard SIM card holder (for Micro-SIM)
- Embedded IP stack with IPv4 and IPv6
- Secure connection with TLS/DTLS

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- Internet Services TCP/UDP server/client, DNS, Ping, HTTP/FTP/MQTT/CoAP client etc.
- **eSIM** support, BIP (Bearer Independent Protocol)
- SIM Access Profile (SAP)
- Abnormal temperature protection of module board (out of -20~85℃)
- Drivers support for various Windows, Linux/Android platforms.

## Technical Specifications

### Wireless WAN

| | |
|---|---|
| Frequency bands | 4G LTE Bands<br>● 700 (B28)<br>● 800 (B20)<br>● 850 (B5)<br>● 900 (B8)<br>● 1800 (B3)<br>● 1900 (B2)<br>● 2100 (B1, B4, B66)<br>● 2600 (B7)<br>● TD2300 (B40)<br>● TD2500 (B41)<br>● TD2600 (B38)<br>2G Bands<br>● 850 (B5)<br>● 900 (B8)<br>● 1800 (B3)<br>● 1900 (B2) |
| Output power (according to Release 99) | Class 3 for LTE 2100,LTE FDD Bd1<br>Class 3 for LTE 1900,LTE FDD Bd2<br>Class 3 for LTE 1800,LTE FDD Bd3<br>Class 3 for LTE 2100, LTE FDD Bd4<br>Class 3 for LTE 850, LTE FDD Bd5<br>Class 3 for LTE 2600, LTE FDD Bd7<br>Class 3 for LTE 900, LTE FDD Bd8<br>Class 3 for LTE 800, LTE FDD Bd20<br>Class 3 for LTE 700, LTE FDD Bd28<br>Class 3 for LTE 2000, LTE TDD Bd34<br>Class 3 for LTE 2600, LTE TDD Bd38<br>Class 3 for LTE 1900, LTE TDD Bd39<br>Class 3 for LTE 2300, LTE TDD Bd40<br>Class 3 for LTE 2500, LTE TDD Bd41<br>**2G GSM/GPRS/EDGE (Release 99)**<br>Class 4 for 850 (B5) / 900 (B8I) GMSK<br>Class 1 for 1800(B3I) / 1900 (B2) GMSK<br>Class E2 for 850 (B5) / 900 (B3) 8-PSK<br>Class E2 for 1800(B3)/1900 (B2) 8-PSK |
| **LTE** Features 3GPP Release 13 | DL max. 10 Mbps,<br>UL max. 5 Mbps<br>UE CAT 1bis supported |
| **GSM/GPRS/ EGPRS** features | Data transfer<br>GPRS:<br>● Multi-slot Class 12<br>● Full PBCCH support<br>● Mobile Station Class B<br>● Coding Scheme 1 – 4<br>EGPRS:<br>● Multi-slot Class 12<br>● PBCCH support<br>● Mobile Station Class B<br>● Downlink coding schemes – MCS 1-9<br>● Uplink coding schemes – MCS 1-9 |
| Audio | Support for Voice over LTE (VoLTE), i.e. Voice Service via IMS (IP-based Multimedia Subsystem) and CSFB |
| SMS | Point-to-point MT and MO<br>Cell broadcast<br>Text and PDU mode<br>Storage: SIM card plus SMS locations in mobile equipment |
| AT commands | Hayes 3GPP TS 27.007, TS 27.005, Cinterion M2M AT commands for |

| | compatibility |
|---|---|
| SIM<br><br>UICC | SIM Application Toolkit:<br>SAT letter classes b, c, e with BIP<br>Support of 3 V and 1.8 V SIM/USIM cards |
| USB | USB 2.0 High Speed (480Mbit/s) device interface. Full Speed (12Mbit/s) compliant |

## Electrical Data

| | |
|---|---|
| Power supply | 3.3 ± 0.3 V (VCC) |
| Power consumption measurement at full functioning (For reference only, physical values depend on cellular environment, antenna etc.) | Average: 420mA, max: 490mA @<br>Uplink + Downlink: 14 Mbps<br>RSRP: -81 dBm,<br>RSRQ: -11 dB,<br>SINR: 17 dB<br>FDD, Band 1, MCC 466, MNC 01<br>DL BW: 10 MHz / UL BW: 10MHz<br>Environment temperature: 18℃ |

## Environmental Data

| | |
|---|---|
| ELS62-W board temperature/ | -20 ~ 85℃+ (normal operation)<br>85 ~ 90℃*+ (extended operation)<br><-20 or >90 ℃ + (automatic shutdown) |

* Occasional deviations from spec may occur

+ Airflow: min. 1 m/s

## Mechanical Data (mm) - (full-mini card)

30 x 50.9 x 4.65 (w/ SIM holder)

## 52-Pin Definition

| Name | PINs | Function | I/O |
|---|---|---|---|
| VCC | 2,24,39,41,52 | 3.3V power supply,<br>Min 3.0V, Max 3.6V | Input |
| GND | 4,9,15,18,21,26,27,29,34,35,37,40,43,50 | Ground | Input |
| USB_DM | 36 | USB data signal minus | I/O |
| USB_DP | 38 | USB data signal plus | I/O |
| LED | 42! | Open Drain active Low<br>WWAN status indicator; | Output |
| SIM_VCC | 8! | Power for SIM card | Output |
| SIM_DATA | 10! | SIM data signal | I/O |
| SIM_CLK | 12! | SIM clock signal | Output |
| SIM_RESET | 14! | SIM reset signal | Output |
| nWAKE | 1 | Open drain, active low<br>wakeup signal | Output |
| nRESETv | 22 | Min 10ms active low reset signal, | Input |
| PCM_CLK# | 45! | PCM clock | Output |
| PCM_RXD# | 47! | PCM data into card | Input |
| PCM_TXD# | 49! | PCM data out of card | Output |
| PCM_SYNC# | 51! | PCM synchronization | Output |
| NC | Remaining pins | No connection | - |

! Leave these pins open if they are not used

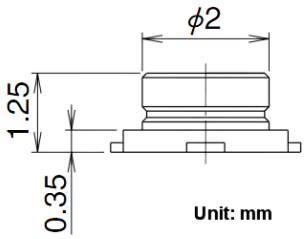
# Reserved pins used, proprietary

v No connect (NC) for specified model

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| | | | |
|---|---|---|---|
| 1 | nWAKE | VCC | 2 |
| 3 | NC | GND | 4 |
| 5 | NC | NC | 6 |
| 7 | NC | SIM_VCC | 8 |
| 9 | GND | SIM_DATA | 10 |
| 11 | NC | SIM_CLK | 12 |
| 13 | NC | SIM_RESET | 14 |
| 15 | GND | NC | 16 |
| 17 | NC | GND | 18 |
| 19 | NC | NC | 20 |
| 21 | GND | nRESET | 22 |
| 23 | NC | VCC | 24 |
| 25 | NC | GND | 26 |
| 27 | GND | NC | 28 |
| 29 | GND | NC | 30 |
| 31 | NC | NC | 32 |
| 33 | NC | GND | 34 |
| 35 | GND | USB_DM | 36 |
| 37 | GND | USB_DP | 38 |
| 39 | VCC | GND | 40 |
| 41 | VCC | LED | 42 |
| 43 | GND | NC | 44 |
| 45 | PCM_CLK | NC | 46 |
| 47 | PCM_RXD | NC | 48 |
| 49 | PCM_TXD | GND | 50 |
| 51 | PCM_SYNC | VCC | 52 |

## RF Connector: I-PEX Receptacle




Note. Corresponding plug cable: diameter of 1.13mm

## Ordering Information

WW-420x, where x = U, V as shown below

| Feature \ Model | U | V |
|---|---|---|
| Pin 22 (nRESET) | Y | NC |

* Connection Manager for PC Windows available

*This document is subject to change without notice.

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