Features at a Glance

WIDE RANGE OF INTERFACES

Integrated Cortex M4F Microcontroller exposes SPI, QSPI, USART, ADC, I2C, GPIO, and JTAG.

CAT M1 / NB-IOT / BLUETOOTH 5 - ALL WITH CO-LOCATED RADIO CERTIFICATION

Simplified certification process with reduced costs - multi-wireless integration at its very best for your risk reduction

DEPLOY WITH CONFIDENCE

Wireless security, smart power management, and popular cloud service integration helps your device continue gathering data autonomously.
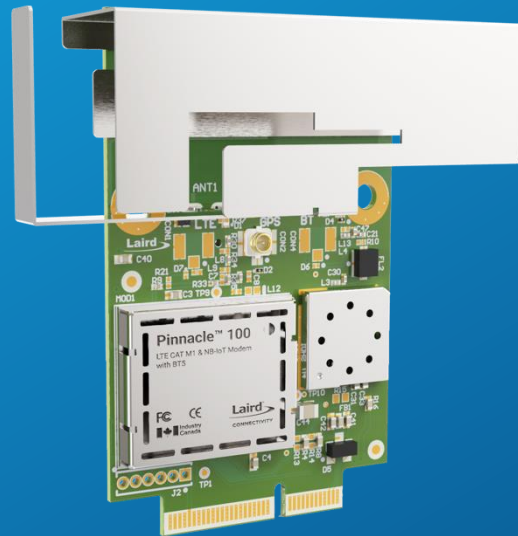
ZEPHYR RTOS

The Zephyr tools suite simplifies complicated configurations, and our DVK environmental sensor and sample test apps get you up and running quickly.

CERTIFIED FOR DEPLOYMENT AROUND THE WORLD

Regulatory approvals for FCC (USA), IC (Canada), ETSI (Europe). Carrier certified for Vodafone, T-Mobile US, AT&T, and Verizon. [all pending].

PERSONAL SUPPORT FOR YOUR IMPLEMENTATION

Free antenna scans, design reviews, on-site EMC support and a global team of FAEs and Tier 2 support help accelerate your product to market.

Laird™ CONNECTIVITY

Pinnacle™ 100 Modem

LTE CAT M1 & NB-IoT Modem with integrated Bluetooth v5
Cellular End Device certified

- Integrated or external antennas
- Hostless operation – Full flexibility of Zephyr RTOS
- Low power operation – eDRX and PSM
- Powerful MCU on board with integrated Bluetooth v5 including LE long range and Mesh
- Complete radio and cellular certifications
- Wide input voltage range

The Pinnacle™ modem seamlessly incorporates a powerful Cortex M4F controller, full Bluetooth v5 and LTE CAT M1/NB-IoT capabilities – all with full regulatory certifications and LTE carrier approvals.

Develop your application directly on the M4F controller using Zephyr RTOS to cut BOM costs and power consumption. Take advantage of the Zephyr community, Laird's sample code (cellular, Bluetooth) and hardware interfaces, OR use our hosted mode AT commands set.

This innovative modem family also offers complete antenna flexibility – on-device, off-board, as well as external antennas – to give you design flexibility, reduce complexity, and simplify your overall product solution.

Extremely power conscious, the Pinnacle 100 is ideal for battery-powered devices operating at the edge of your IoT networks, seamlessly bridging the cellular WAN to the Bluetooth PAN. It's never been easier to bridge wireless Bluetooth 5 sensor data to cloud services like AWS IoT over a low-power LTE connection.

- **LTE CAT M1 / NB-IoT radio via Sierra HL7800**
  - o **(Altair ALT1250)** – LTE bands 1, 2, 3, 4, 5, 8, 12, 13, 20, 28
  - o **Nordic nRF52840** – BT v5, Coded PHY (Long range), 2MPHY
- **Onboard Cortex-M4F Microcontroller** – 32-bit @64 MHz, 256 KB of RAM, 1 MB internal flash, 8MB QSPI
- **Industrial Temp Range** – Operating range -40° to +85° C
- **Globally & Carrier Certified** – FCC, IC CE, BT SIG plus PTCRB, GCF and **End Device** certified – AT&T, Verizon, Vodafone (all pending)
- **Flexible Programming** – Design your way: Hostless mode via Zephyr RTOS or Hosted mode AT Command Set
- **Secure Firmware Upgrade** – Comes pre-programmed with Laird's secure bootloader
- **Antenna Options** – Unique integrated antenna variant plus external variant with U.FL connectors

CAT-M1 · NB-IoT · lte · Bluetooth 5

NORDIC SEMICONDUCTOR · altair semiconductor

Security and Building Automation

Wireless Sensor Connectivity

Internet of Things Connectivity

Connected Home

| CATEGORY	FEATURE	SPECIFICATION
Chipsets	LTE CAT M1 / NB-IoT	Sierra HL7800 (Altair Semiconductor ALT1250)
	Bluetooth 5 / MCU	Nordic Semiconductor nRF52840 (Cortex-M4F, 32 bit @ 64 MHz)
Microcontroller	Memory	256 KB RAM 1 MB Internal Flash
	Interfaces	UART
	Additional Features	QSPI, SPI, ADC, I2C, GPIO, Timers
	Debugging	JTAG, UART
Cellular	LTE Category	LTE CAT M1 / NB-IoT, Release 13 GPP
	Typical transmit power	Up to 23 dBm
	Typical receive sensitivity (CAT-M)	TBC
	Typical receive sensitivity (NB-IoT)	TBC
	Frequency Bands	1, 2, 3, 4, 5, 8, 12, 13, 20, 28
Bluetooth	Standards	Bluetooth v5
	Additional Features	Coded PHY (Long Range), 2MPHY, BLE Mesh
	Class	Class 1 up to +6 dBm max
SIM	Type	4FF Nano SIM card slot Integrated ESIM (future capability)
FW Upgrade	Interface	UART/JTAG
	OTA	Bluetooth and cellular
Power Consumption	Power Save Mode (PSM)	TBC mA
	eDRX	TBC mA
	BLE – TX	TBC mA
	System Deep Sleep	TBC mA
Form Factor	M2 Connector	Double-sided board with M2 style connector interface
Electrical	Operating Voltage	2.2V to 5.5V
Physical	Dimensions	External antenna module: 30.5 x 32 x 4.6 mm Integrated antenna module: 49.2 x 49 x 12.9 mm
	Operating Temperature	-40° to +85° C
	Storage Temperature	-40° to +125° C
Software	Hostless	Zephyr RTOS
	Hosted	AT Command Set
Approvals	Regulatory (pending)	FCC, IC, ETSI, PTCRB / GCF Bluetooth SIG
	Carrier (pending)	Verizon, AT&T (CAT M) – Vodafone (NB-IoT)
	Environmental	REACH and RoHS compliant

For full specifications on the Pinnacle 100 modules, please see the appropriate datasheet.

Ordering Information

PART	DESCRIPTION
453-00010	Pinnacle 100 modem, integrated antenna
453-00011	Pinnacle 100 modem, external antenna
453-00010-K1	DVK, Pinnacle 100 modem, integrated antenna
453-00011-K1	DVK, Pinnacle 100 modem, external antenna

Laird Connectivity Certified Antennas

PART NUMBER	TYPE	FREQUENCY	CONNECTOR
EFF6925A3S-15MHF1	Flex PCB	698–875, 1710–1250 MHz	U.FL
DBA6927C1-FSMAM or FSMAF	Dipole	698–2690 MHz	SMA
001-0014	Flex PIFA	2.4–2.5 GHz	U.FL
NanoBlue-MAF94045	PCB Dipole	2.4–2.5 GHz	U.FL
001-0001	Dipole	2.4–2.5 GHz	RPSMA
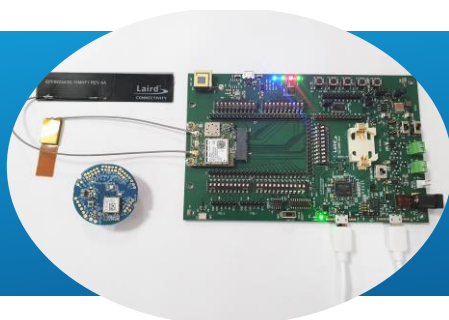
Pinnacle 100 – Development Kit
With Pinnacle LTE modem, dev board, external BLE environmental sensor board, cables, batteries, antennas, plus SIM card and data, and a complete cloud demo environment build on AWS – start now!

Interested in Laird's Pinnacle 100? **Visit us at lairdconnect.com/pinnacle-100-modem**

Laird™
CONNECTIVITY