

The most configurable IoT gateway

CHESTER is a highly configurable IoT gateway for Industry 4.0, smart city, e-metering, and agricultural applications.

The device connects sensors, actuators, PLC controllers, and other devices to the internet through the LPWAN communication technologies (NB-IoT, LTE-M, and LoRaWAN are supported). These technologies enable reliable connectivity from distant and deep indoor places.

CHESTER features a robust, waterproof, IP67-rated enclosure for harsh environmental conditions. In addition, its wide operating temperature range and battery-optimized power consumption enable outdoor deployment.



Application elasticity

One modular device covering a wide spectrum of IoT projects



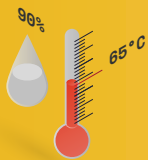
LPWAN connectivity

Communication to the internet from the most distant places



Low-power design

Reliable operation from a primary cell battery for several years



IP 67 protection level

Enclosure to withstand harsh environmental conditions



Bluetooth Low Energy

For diagnostics, parametrization, and device firmware upgrades



Custom branding

Full OEM branding service, including custom color printing

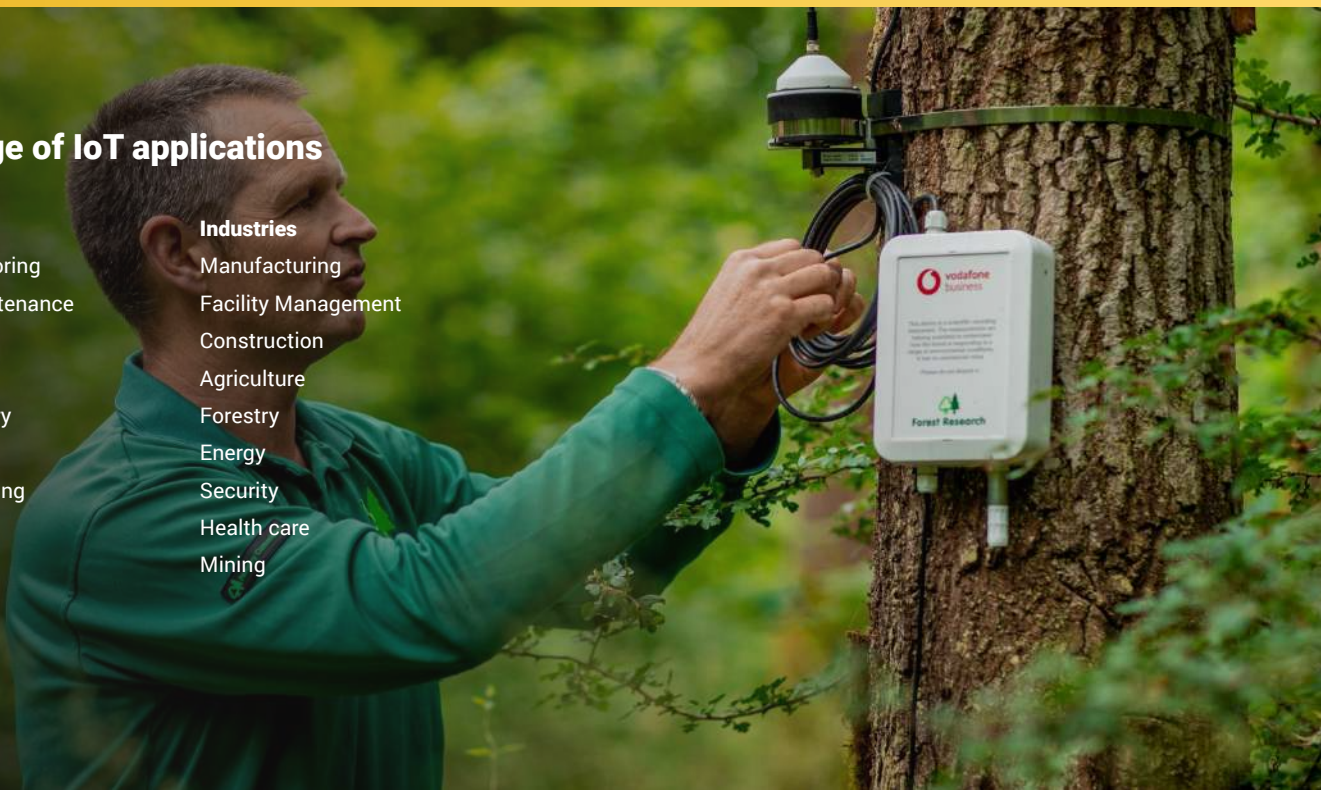
Wide range of IoT applications

Use cases

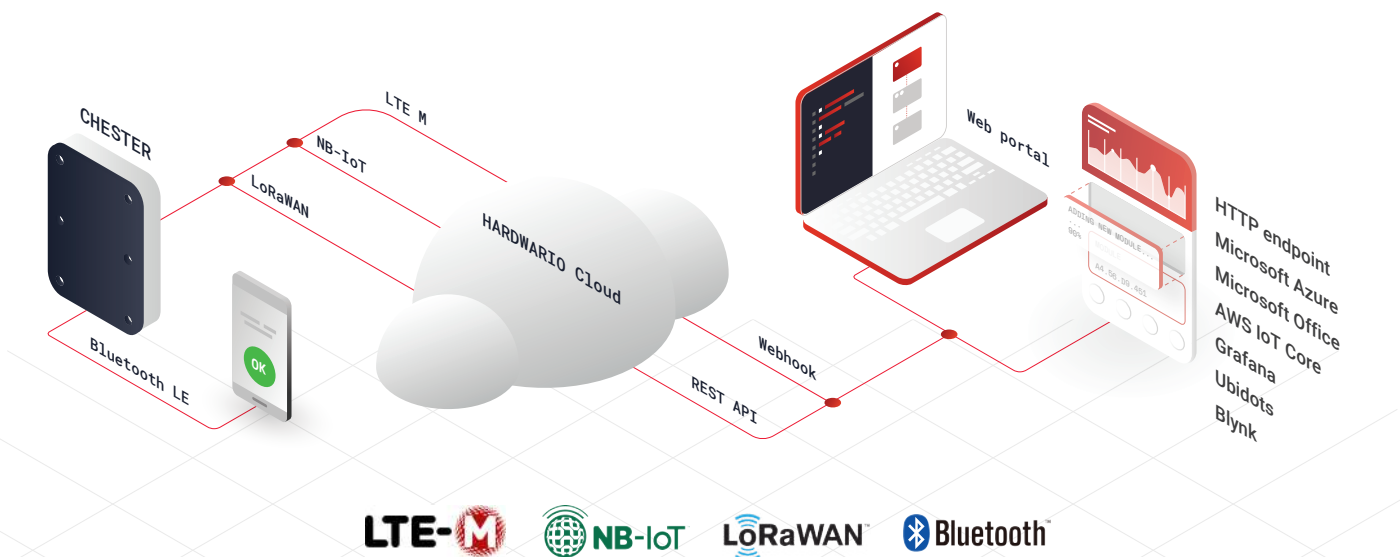
- Machine monitoring
- Predictive maintenance
- Event alerting
- Smart metering
- Sensor telemetry
- Asset tracking
- Air quality sensing
- Remote control
- Data logging

Industries

- Manufacturing
- Facility Management
- Construction
- Agriculture
- Forestry
- Energy
- Security
- Health care
- Mining



Reliable connectivity and easy integrations



What the most configurable means

LPWAN connectivity

NB-IoT and LTE-M (Cat M1) with global bands support
SIM card for LTE as a SIM chip (eSIM) or Nano-SIM
LoRaWAN with support for 868/915 MHz

Dynamic antenna system

Software selection between internal and external antenna
Software selection between LTE and LoRaWAN path
External antenna connects via u.FL connector

Bluetooth Low Energy 5.0

Device setup and diagnostics from smartphone
Communication with other BLE devices
Device firmware upgrades in the field

GNSS positioning module

Support for GPS, Galileo, GLONASS
High-sensitivity receiver chipset u-blox M8
Flexible power control for low-power tracking

Flexible power management

Power device from a replaceable primary 3.6 V Lithium cell
Rechargeable battery from CHESTER-Z top-cover module
External power delivered via extension modules

Onboard 3-axis MEMS accelerometer

Detection of device orientation and tilt event
Recognition of device vibration
Possibility to configure dynamic range and sensitivity

Two slots for extension modules

Supports combinations of modules for various project needs
Signals are routed to terminal blocks for full flexibility
Soldered from the bottom side for enhanced reliability

Push-in style terminal blocks

Interface to various external I/O or power sources
All terminals feature a transient voltage protection
Parallel terminal blocks for convenient wiring

Integrated 1-Wire bus interface

Support for multiple DS18B20 thermometers
Integration with HARDWARIO Machine Probe
Integration with HARDWARIO Soil Sensor

Other integrated peripherals

8 MB flash memory for data logging
Accurate digital temperature sensor
3-color LED for instant state recognition

Additional available interfaces

I2C communication bus on a terminal block and a connector
Optional external LED, push button, and tamper switch on a connector
System connector with I2C bus and power sink/source
Optional external battery pack on a connector
Two Sparkfun QWIIC connectors for a variety of 3rd party accessories

Peripherals

Temperature sensors

Digital 1-Wire
Pt100
Pt1000
Support for thermocouples

Proximity sensors

Inductive
Capacitive
Optical
Magnetic

Water quality

Conductivity
PH level
Oxygen
Temperature

Linear sensors

Flow
Pressure
Weight
Distance
Current
Voltage

Location sensors

Position (GNSS)
Orientation (accelerometer)

Event detectors

Motion (PIR)
Push button
Shock and tilt
Dendrometers

Air quality

Temperature
Dust particles
Carbon dioxide

Soil parameters

Temperature
Moisture

Interfaces

Digital inputs

Dry contacts
PLC outputs

Digital outputs

Power relays
Open collector

Analog inputs

Signal 0-10 V
Signal 4-20 mA

Communication

RS-485
IO-Link
1-Wire
UART
I2C



Operating input voltage	3.6 V
Idle power consumption	< 150 μ A
Peak power consumption	500 mA
Battery capacity	7700 mAh
Thermometer accuracy	\pm 0.3 $^{\circ}$ C
Humidity sensor accuracy	\pm 3 %
Operating temperature range	-40 to +70 $^{\circ}$ C
Storage temperature range	-40 to +85 $^{\circ}$ C
Dimensions	175 \times 130 \times 45 mm
Protection level	IP67

Simple programmability with open SDK

Build your own application on top of nRF Connect SDK with the underlying Zephyr OS. With embedded C as a primary programming language and support for Visual Studio Code as the development IDE you can use Windows, macOS or Linux development environments. Flashing and debugging is available via J-Link or Bluetooth Low-Energy.

Simple-to-use APIs for common application tasks

- RTOS thread manipulation and data synchronization
- Logging facility
- LTE and LoRaWAN communication
- Bluetooth Low Energy
- Drivers for integrated peripherals
- Drivers for extension modules
- User settings
- Data logging
- Flashing and debugging via J-Link



Extensions

Module	Interface	Example usage
CHESTER-A0	AC/DC power module	Power CHESTER from isolated AC/DC converter 230 V / 5 V
CHESTER-A2	2x relay + CHESTER-A0	Control 2x power relay 230 V / 16 A + see CHESTER-A0
CHESTER-G	8x isol. input + isol. power	Isolate (galvanically) 8x digital input and power line
CHESTER-K	3x diff. input + 5 V boost	Measure 3x sensor w/ differential output requiring 5 V supply
CHESTER-Z1-0	Battery backup + DC/DC	Power CHESTER from rechargeable battery w/ DC/DC converter
CHESTER-Z1-F	4x button + CHESTER-Z1-0	Scan 4x illuminated push-button w/ buzzer + see CHESTER-Z1-0
CHESTER-X0	4x analog/digital input	Scan 4x DI from PLC; sense dry contact; measure 0-10 V
CHESTER-X1	IOLink master interface	Communicate with modern IOLink sensors and actuators
CHESTER-X2A	TTL/UART interface	Communicate with RFID reader with TTL/UART output
CHESTER-X2B	RS-485 interface	Communicate with RS-485/Modbus RTU sensor or PLC
CHESTER-X3A	1x 24b ADC for RTD	Measure industrial RTD thermometer Pt100/Pt1000
CHESTER-X3B	2x 24b ADC for RTD	Measure 2x industrial RTD thermometer Pt100/Pt1000
CHESTER-X3C	1x 24b ADC for thermocouple	Measure thermocouple - type B/C/E/J/K/N/R/S/T
CHESTER-X3D	2x 24b ADC for thermocouple	Measure 2x thermocouple - type B/C/E/J/K/N/R/S/T
CHESTER-X4	DC/DC converter 6 - 28 V DC	Power CHESTER from industrial DC line (e.g. 24 V)
CHESTER-X5	±30 V analog input	Measure differential voltage input with a wide DC range
CHESTER-X6	Bus interface + 5 V boost	Communicate with many low-power nodes over a single wire
CHESTER-X7	1x diff. input + 5 V boost	Measure sensor w/ differential output requiring 5 V supply
CHESTER-X8	Precise accelerometer	Accurately measure tilt and inclination
CHESTER-X9	4x low-side switch	Control external relays with protected low-side switches



Custom integrations
and branding on
customer's request



Extended 3-year
warranty and 100-day
trial period



Personal technical
support in the
deployment phase