

ER1601

Industrial Edge Computing Gateway

Introduction

eurogard's ER1601 is a new generation of industrial edge computing gateway, supporting global 4G/3G/2G networks for cellular backhaul, with a fully-fledged Debian 11(bullseye) based operating system able to support thousands of existing or new ARMv8 (Raspberry Pi compatible) based applications.

ER1601 supports Docker for easy deployment of applications and benefits from eurogard's latest router OS with enhanced cybersecurity, advanced GUI and a myriad of software features including VPNs, Smart Roaming, SMS remote control and more.

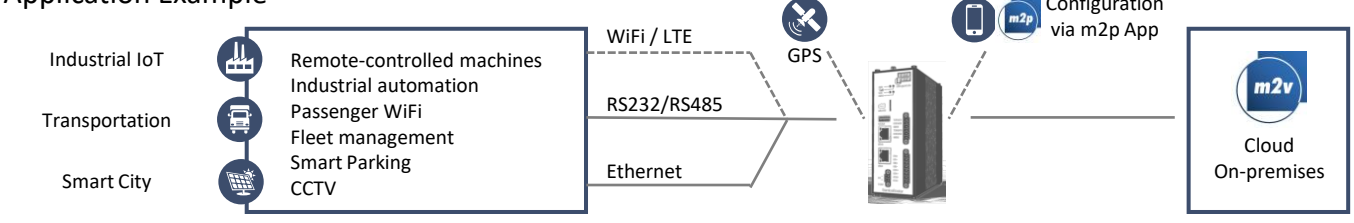
With a quad core 1.6 GHz Cortex A53 CPU and an integrated NPU of 2.3 TOPS that greatly accelerate machine learning inference, ER1601 will take the compute power to the next level, best for the edge computing and edge AI applications, can also be used as a combination of cellular router + embedded PC in all industrial fields.

Together with eurogard's machine to value platform (m2v) that is fully compatible with the ER1601, customers have access to a whole range of IIoT applications to see their machines and their live status worldwide. Remote services, data monitoring, analysis, automatic report generation, alarming strategies and unlimited, individual applications can be applied. Over-the-air updates are supported for Firmware, router configuration and Apps serving as essential "insurance" if anything was not quite right during deployment.

Key Features

- ✓ Highly stable 4G/3G/2G cellular connectivity with global band coverage
- ✓ High performance compute engine with 1.6 GHz CPU, 64 GB eMMC Flash for running complex applications
- ✓ 'Docker' containerization supported
- ✓ Node Red package for IIoT applications
- ✓ 802.11ac Wi-Fi supporting AP and Client modes
- ✓ Bluetooth and Bluetooth 5.2 compliant
- ✓ 2 x RS232/RS485 (software configurable) ports for connection to industrial/legacy devices
- ✓ 2 x DI & 2 x DO for simple monitoring and control
- ✓ Dual SIM card slots for redundant communications + optional eSim support
- ✓ Wide Operating Temperature range for industrial applications
- ✓ Full Modbus TCP and Modbus RTU support including
- ✓ MQTT transfer to eurogard m2v platform
- ✓ Industry protocols compatible: OPC UA, MQTT, Modbus TCP, S7 ISO-on-TCP, BACnet
- ✓ More than 50,000 applications from Debian repository currently available
- ✓ Wireguard/IPsec/OpenVPN/GRE/L2TP/PPTP/DMVPN + more VPN options
- ✓ eurogard fleet management (router/gateway) for effective management of large estates of devices

Application Example



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Specifications

Hardware System

CPU	Quad core Cortex-A53, 1.6 GHz
NPU	2.3 TOPS
RAM	2 GB DDR4
Flash	64 GB eMMC

Cellular Interface

Version	4G, 5G (optional)
Number of antennas	2, 4
Connector	SMA-K
SIM	2 x Mini SIM (2FF)

Frequency Bands

4G: LTE FDD:	B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/B19/B20/ B25/B26/B28
LTE TDD:	B34/B38/B39/B40/B41
3G: WCDMA:	B1/B2/B4/B5/B6/B8/B19
2G: GSM:	B2/B3/B5/B8

GNSS Interface

Version	4G
Number of antennas	1
Connector	SMA-K
Technology	GPS

Ethernet Interface

Ports	2 x RJ45, 10/100/1000Mbps, compliance with 1000BAST-T, LAN or WAN + an additional 1 x RJ45 via USB 3.0 to gigabit port (optional)
Magnet isolation protection	1 KV

Serial Interface

Type	2 x RS232/RS485 (software configurable)
Connector	6-pin 3.5 mm terminal block with lock
ESD protection	8 KV Air, 4 KV Contact
Baud rate	300 bps to 115200 bps
Signal	RS232: TXD, RXD, GND RS485: Data+ (A), Data-(B), GND

DI/DO Interface

Ports	2 x DI + 2 x DO, wet contact
Connector	8-pin 3.5 mm terminal block with lock (DI/DO)
Isolation	Bi-directional optocoupler (DI) Single directional optocoupler (DO)
Absolute maximum VDC	+ 30V DC
Absolute maximum ADC	100 mA
Signal definition	DI1+, DI1-, DI2+, DI2-, DO1+, DO1-, DO2+, DO2-

Bluetooth Interface

Number of antennas	1 (Multiplexing Wi-Fi)
Connector	RP-SMA-K
Standards	Bluetooth 2.1 and 3.0 + Enhanced Data Rate (EDR) + Bluetooth 5.2

Regulatory and Type Approvals

CE incl. RoHS
UKCA
FCC

Wi-Fi Interface

Number of antennas	2
Connector	RP- SMA-K
Standards	802.11 a/b/g/n/ac, 2 x 2 MIMO, supports AP and Client modes
Frequency bands	2.412 - 2.484 GHz (2.4 GHz ISM band) 4.915 - 5.925 GHz (5 GHz ISM band)
Security	WEP 64-bit and 128-bit encryption with H/W TKIP processing WPA/WPA2 (Wi-Fi Protected Access) AES-CCMP hardware implementation as part of 802.11i security standard
Data rate	802.11n: up to 300 Mbps - 2 x 2 MIMO 802.11ac: up to 866.7 Mbps (80 MHz channel)

Others

SD	1 x microSD
Reset button	1 x RST
USB	1 x USB 3.0 (host), Type A, 5V 900mA
LED indicators	1 x RUN, 1 x MDM, 1 x VPN, 1 x Signal
Watchdog	External

Software

Network protocols	PPP, PPPoE, TCP, UDP, DHCP, ICMP, NAT, HTTP, DNS, NTP, SMTP, Telnet, VLAN, HTTPs, DNS, ARP, NTP, SMTP, Telnet, VLAN, SSH2, DDNS, etc.
VPN tunnel	m2s, IPsec, OpenVPN, GRE
Firewall	DMZ, anti-DoS, Filtering (IP/Domain name/MAC address), Port Mapping, Access Control
Remote management	Web, CLI, SMS
Serial port	Transparent, TCP Client/Server, UDP, Modbus RTU Gateway
Others	Smart Reboot, Data Guard, Smart Roaming

SDK (optional)

Operating System	eurogard OS Pro (Based on Debian 11(bullseye))
Supported programming languages	C, C++, Python, Java, Node.js etc. (for users to develop own applications)
Debian Repository	available
Flash available for	SDK 14 GB
RAM available for	SDK 1.5 GB

Power Supply and Consumption

Connector	2-pin 3.5 mm terminal block with lock
Input voltage	9 ~ 60V DC
Power consumption	Idle: 5W Data link: 20W (peak)

Physical Characteristics

Ingress protection	IP30
Housing & Weight	Metal, 567 g
Dimensions	49 x 105 x 128 mm
Installations	Desktop, wall mounting and 35 mm DIN rail mounting
Operating temp.	-40 ~ +70 °C
Storage temp.	-40 ~ +85 °C
Relative humidity	5 ~ 95% RH

Contact **eurogard GmbH**

Kasernenstr. 22| 52064 Aachen | Germany

www.eurogard.de | info@eurogard.de