

Industrial Cellular Routers & Gateways

ICR-1645

4G LTE Industrial Connectivity Gateway



Features

- Industrial ruggedized design
- LTE Cat.4 with 3G/2G fallback
- 2 × SIM for redundancy
- 5 × Ethernet 10/100/1000 Mbps
- Wide operational temperature range
- Optional wall-mount and DIN-rail kits
- Linux based OS & SW customization
- Optional 1 × WiFi 5, IEEE802.11ac (ICR-1645W)
- Optional GNSS receiver (ICR-1645G)

Introduction



Industrial connectivity gateway ICR-1645 series is designed for wireless communication to enable connection of IP devices and serial buses to a cellular network. Industrial M2M and IoT applications include kiosks, industrial PCs, HMIs, traffic controllers, meters, UPS systems, and much more. The peak downlink data rate for LTE Cat.4 is approximately 150 Mbps. Also in the uplink, LTE Cat.4 provides a peak data rate of 50 Mbps.

The ICR-1645 router is equipped with Five Gigabit Ethernet ports for 1xWAN + 4xLAN and optional digital I/O (1x DI, 1x DO) and Serial (1xRS232 + 1xRS485) connectivity. ICR-1645 can be optionally equipped with WiFi 5 or GNSS. The gateway supports VPN tunnel creation using various protocols to ensure safe communications. The gateway provides diagnostic functions which include automatic monitoring of the wireless and wired connections, automatic restart in case of connection losses, and a hardware watchdog that monitors the router status.

The connectivity gateway is based on ICR-OS operation system. Open Linux platform enable wide possibilities of programming customer SW applications in Python, C/C++. Router supports uploading of certain RouterApps (basic features only), that would extend standard firmware functionalities.



WebAccess/VPN

WebAccess/DMP

Order Codes

Model no. - Order Codes	Region	5 × Gigabit Ethernet	2 × SIM	1 × RS232 1 × RS485 1 × DI, 1 × DO	GNSS	WiFi 5 1T1R
ICR-1645-EU-A	EMEA	✓	✓			
ICR-1645W-EU-A	EMEA	✓	✓	✓		✓
ICR-1645G-EU-A	EMEA	✓	✓	✓	✓	
ICR-1645-CN-A	China	✓	✓			
ICR-1645W-CN-A	China	✓	✓	✓		✓
ICR-1645G-CN-A	China	✓	✓	✓	✓	

*- The router is compatible with cellular networks in the indicated region. The importer/operator needs to check locale legislation (standards, national Telecom approvals, etc.) and compare with standards available for the product if possible to operate the router in the target region legally.

Specifications

System		Environmental	
CPU	Cortex-A7 1.2GHz, ARMv7	Power Supply	9 – 48 VDC (2-pin terminal block)
Memory	RAM - 256 MB NAND Flash - 512 MB (60 MB for RouterApps, 26.7 MB for customer data)	Consumption	Without WiFi Idle 2.7W / Average 3.7 W / Maximum 5.5 W With WiFi Idle 3.6W / Average 4.8 W / Maximum 6.8 W
Watchdog	HW Watchdog	Operating Temperature	-30 to +75°C
Interfaces		Storage Temperature	-40 to +85°C
Ethernet	5× Ethernet, RJ45, 10/100/1000Mbps	Humidity	5 to 95 %
Serial Lines (Optional - ICR-1645 only)	1× RS232 (Tx, Rx, GND, RTS, CTS) 1× RS485 (Data-, Data+, GND) (10-pin terminal block with Digital I/O)	IP Cover	IP30
I/O (Optional - ICR-1645 only)	1× Digital Input (Dry contact) 1× Digital Output (Open Drain, 48 V / 100 mA) (10-pin terminal block together with RS232,RS485)	Physical Characteristics	
Reset Button	Reboot (< 4 s) / Factory reset (> 4 s)	Dimensions	116 × 39 × 113.5 mm (W × H × D)
LED Indicators	PWR: green only, blinking while system is ready SIG: green/orange/red for good/fair/poor signal SIM: green/orange for SIM1/2 USR: user define for WiFi, serial, DI/O etc. USR: user define for WiFi, serial, DI/O etc. ETH0 & ETH1 on RJ45	Enclosure	Metal Case with grounding screw
		Mounting	Wallmount Din-Rail (optional)
		Weight	ICR-1645W: 468g (excluding accessories) LTE Antenna: 25.2g WiFi Antenna: 7.8g Wall-mount bracket: 50g

WiFi - optional (ICR-1645W)	
Antenna	1 × R-SMA connector
Standards	IEEE802.11 ac/a/b/g/n 2.4GHz / 5GHz
Data Rate	Up to 433Mbps
Security	WEP, TKIP, AES, WPA, WPA2, WPA3, 802.1X
Modes	AP mode or STA mode

GNSS - optional (ICR-1645G)	
Antenna	1× SMA connector
Systems	GPS, GLONASS, BeiDou, Galileo, QZSS
Protocol	NMEA 0183
Ac Time-to-First-Fix	Warm start: 26 s, cold 35 s

Cellular Interface	
SIM Slots	2× SIM (Micro SIM – 3FF)
Antennas	2× SMA Female (1× Main, 1× Diversity)
LTE Parameters	ICR-16xxx-EU: LTE-FDD Bands: B1 (2100 MHz), B3 (1800 MHz), B7 (2600 MHz), B8 (900 MHz), B20 (800 MHz), B28A (700 MHz) LTE-TDD Bands: B38 (2600 MHz), B40 (2300 MHz), B41 (2500 MHz) ICR-16xxx-CN: LTE-FDD Bands: B1 (2100 MHz), B3 (1800 MHz), B5 (850MHz), B8 (900 MHz) LTE-TDD Bands: B34 (2000MHz), B38 (2600 MHz), B39 (1900MHz), B40 (2300 MHz), B41 (2500 MHz) Transfer rate: LTE-FDD: 150 Mbps (DL), 50 Mbps (UL) LTE-TDD: 130 Mbps (DL), 30 Mbps (UL)
UMTS Parameters	ICR-16xxx-EU: WCDMA: B1/B8 Transfer rate: 384 kbps (DL/UL) ICR-16xxx-CN: WCDMA Bands: B1/B8 Transfer rate: 384 kbps (DL/UL) TD-SCDMA Bands: B34/B39 Transfer rate: 2.4 Mbps (DL), 2.2 Mbps (UL)
EVDO/CDMA Parameters	CR-16xxx-CN: CDMA800 Transfer rate EVDO: 3.1 Mbps (DL), 1.8 Mbps (UL)
GSM Parameters	Supported frequencies: EGSM900/ DCS1800 Transfer rate: GPRS: 107 kbps (DL), 85.6 kbps (UL) EDGE: 296 kbps (DL), 236.8 kbps (UL)

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Software	
Operating System	ICR-OS (Linux based)
Application Development	Open Linux, BASH, C
Networking Features and Protocols	DHCP, NAT/PAT, SSH, VRRP, PPPoE, SNMP, SMTP, Dynamic DNS client, DNS proxy, VLAN, QoS, NTP Client/Server, Backup Routes, Port Forwarding, Host Port Routing, Ethernet Bridging, Load Balancing, IPv6 Dual Stack
Industrial Protocols and IoT	*Modbus TCP2RTU, Modbus to MQTT
Security	HTTPS, SSH, SFTP, DMZ, Firewall (IP Filtering, MAC address filtering, Inbound and outbound Port filtering) VPN Tunneling – WireGuard, OpenVPN, IPsec with IKEv1 and IKEv2, GRE, L2TP, PPTP Authentication – RADIUS, TACACS+, 2FA Encryption – DES, 3DES, AES, RSA, MD5, SHA
Firmware Management	Automatic firmware updates – server, locally via LAN or remotely via WAN Over-the-Air cellular module firmware updates
Diagnostic/Log	Status – Signal strength, data usage, detailed long term statistics One CLICK report – Current configuration, factory identification, routing table Log – System log, reboot log, kernel log Remote diagnostics (via SSH)
Event Engine	StartUp script & up/down script (own rules based on digital inputs, network parameters, data usage, timer, power)
Configuration	Web server, SSH, four configuration switchable profiles, automatic configuration update from server, backup & restore configuration
Advanced Software Tools	WebAccess/DMP – Remote device provisioning, monitoring & management platform WebAccess/VPN – Advanced secure networking platform

*Functionality is available with installed Router App

Standards & Regulations	
Radio	EN 301 511, EN 301 908-1, EN 301 908-2, EN 301 908-13, EN 303 413, EN 301 893, EN 300 328
EMC	EN 301 489-1, EN 301 489-17, EN 301 489-19, EN 301 489-52, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-11
Safety	EN 62368-1
National	CE, UKCA
Mechanical	EN 60529, EN 60068-2-27, EN 60068-2-64
Climatic	EN 60068-2-1, EN 60068-2-2, EN 60068-2-14, EN 60068-2-30
Environmental	REACH, RoHS3, WEEE
Cellular Module Approvals*	ICR-16XX-EU: GCF/ CE/ UKCA/ NCC/ RCM ICR-16XX-CN: SRRC/ NAL/ CCC

*- Approvals are valid for the integrated cellular module inside the router only. Cellular module approvals are not always applicable for the whole router – see “Standards and Regulations” chart for complete router approvals available.

Accessories

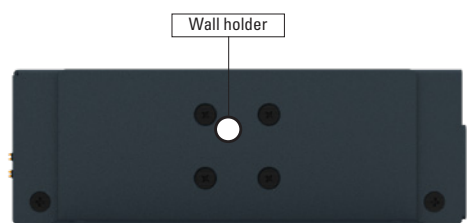
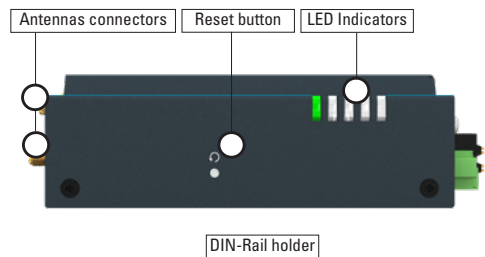
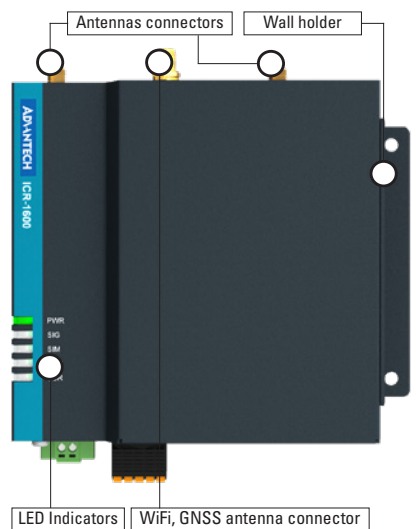
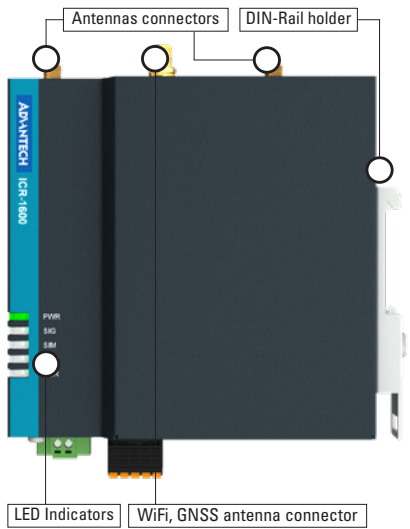
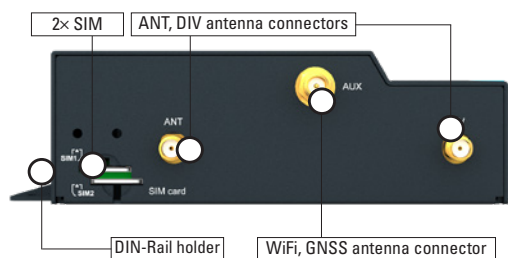
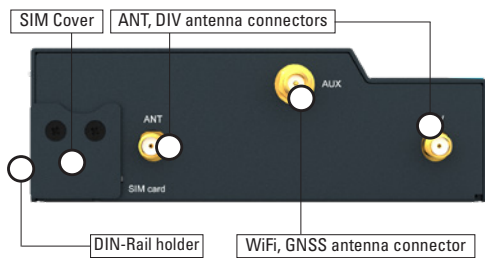
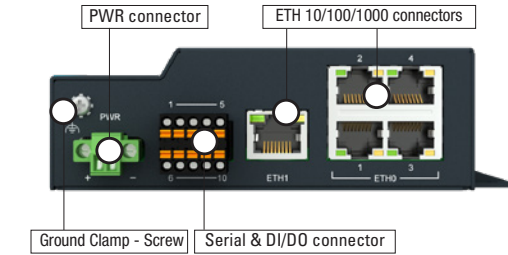
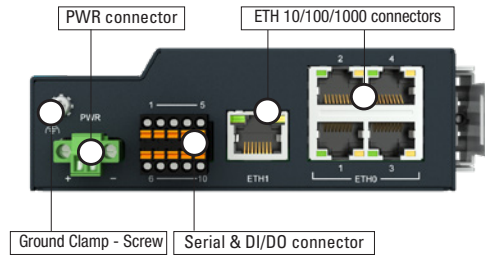
Part Number	Description	Included in the package
1751000532-01	2x LTE antenna	✓
1751000533-01	1x WiFi antenna, 2.4 / 5GHz (for ICR-1645W only)	
1652008574-01	10-pin Serial / IO connector (for ICR-164x only)	
1652002024	2-pin Power connector	
1960115642N001	Wall-mount bracket	
OPT1-DIN-ICR1X-00	DIN-Rail brackets (30 mm)	Optional
BB-RPS-v2-WR2-EU	Power supply, 12V/1A, 2-pin, UK plug	Optional
BB-RPS-v2-WR2-UK	Power supply, 12V/1A, 2-pin, UK plug	Optional
BB-RPS-v2-WR2-US	Power supply, 12V/1A, 2-pin, US plug	Optional
OPT1-ANT-GNS-20	Active GNSS antenna, magnetic base, SMA-M (optional for ICR-16xxG)	Optional

For more Antenna accessories visit www.advantech.com

ICR-1645 Views

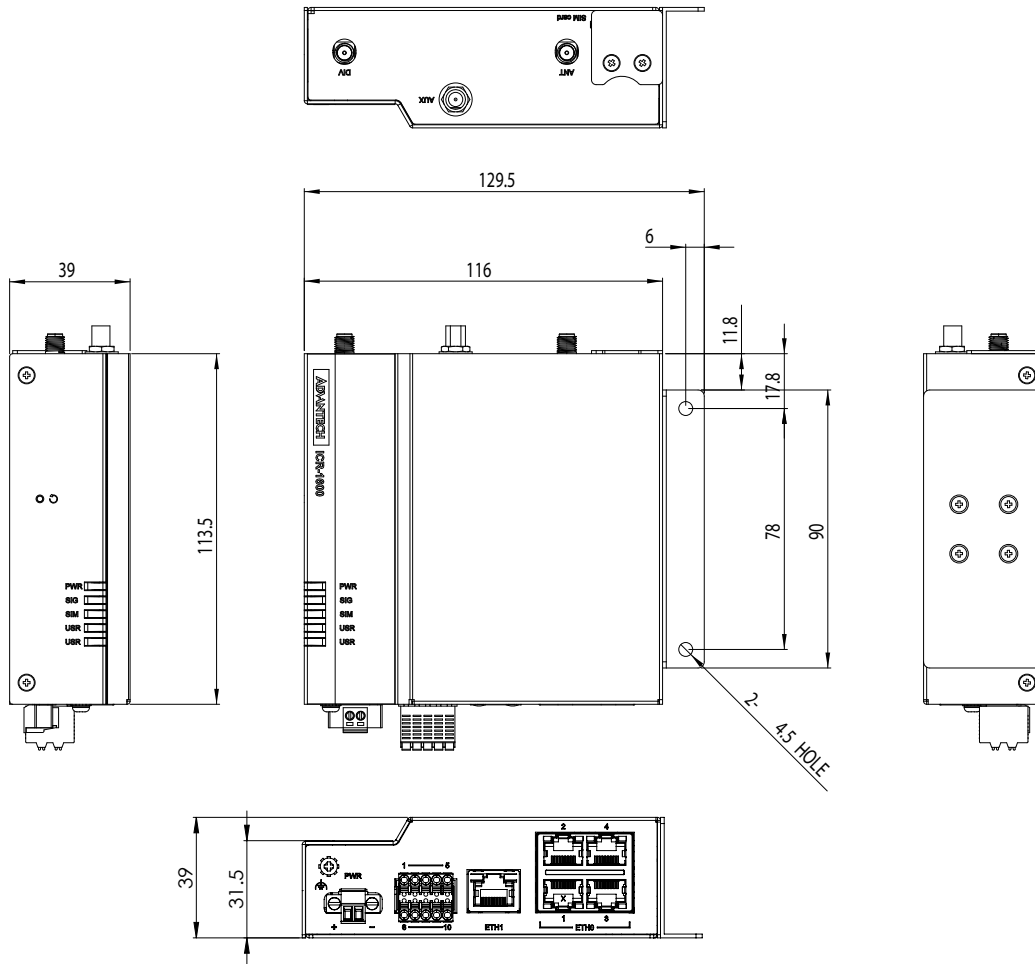
DIN mount

Wall mount



ICR-1645 - Dimensions - Technical Drawing

Wall mount



DIN Mount

