

ITxPT-Ready, Edge AI, Public Transport

On-Board Computer OBC800

• 5G/LTE • Wi-Fi 6 • GNSS • MI2 Connector



The OBC800 on-board computer is purpose-built for public transport, rail and commercial fleet operators. Driven by a high-performance octa-core ARM Cortex processor with a built-in AI accelerator, it delivers responsive HMI, driver-assistance inference and rich edge analytics. ITxPT VCG-Ready architecture integrates 5G/LTE, Wi-Fi 6, 4 x Gigabit Ethernet, FMS CAN, J1939/ OBD-II and dual-band GNSS with on-module Dead Reckoning, for seamless deployment alongside ticketing, AVL, passenger information and CCTV subsystems. Native support for Linux and Docker containers, combined with a TPM 2.0 hardware root-of-trust and EU RED-DA cybersecurity baseline, ensures long-term maintainability and secure over-the-air upgrades across the entire fleet lifecycle.



Solution



Features and Advantages

Robust 5G & Wi-Fi 6 connectivity

Supports 5G NR Sub-6 (SA/NSA, 3GPP Rel.16) with up to 2.4 Gbps downlink, or LTE Cat 6 (300/50 Mbps) for cost-optimised deployments. Concurrent 2x2 MIMO Wi-Fi 6 (802.11ax, 2.4/5 GHz, WPA3) plus 4 x Gigabit Ethernet enables in-vehicle backbone for ticketing and CCTV.

Driving behavior & safety monitoring

100 Hz raw IMU data feeds real-time detection of harsh acceleration, hard braking, sharp turns and impact events. Combined with the on-board AI accelerator, OBC800 supports optional driver fatigue / distraction inference for ADAS-lite passenger-safety scenarios on buses and coaches.

Fleet management platform

Supports access to InHand or a 3rd-party fleet management platform to perform task assignment, route planning, vehicle tracking, real-time messaging, geofencing, etc.

GNSS + Dead Reckoning (all-in-one)

Dual-band L1+L5 receiver simultaneously tracks GPS, BDS, Galileo, GLONASS, QZSS and NavIC, reducing multi-path effects in urban canyons and shortening cold-start time. The all-in-one module integrates a 6-axis IMU and Dead Reckoning fusion for continuous positioning in tunnels and depots, with drift below 2% of distance travelled.

Vehicle diagnostics & FMS

Dual CAN 2.0B channels: one user CAN plus a dedicated FMS / J1939 / OBD-II interface compliant with bus & coach industry standards. Diagnostic data, odometer, fuel level and door status are exposed via ITxPT IP-Bus services for unified fleet analytics and predictive maintenance.

Cybersecurity foundation

Infineon TPM 2.0 (SLB9670) anchors verified boot, encrypted storage and per-device certificates. EU RED-DA (2024/30/EU) cybersecurity baseline and PSA Level 1 certification roadmap, with signed OTA, role-based access control and full audit logging for GDPR-compliant fleet operations.

ITxPT VCG-Ready

Compliant with ITxPT v2.x VCG (Vehicle Communication Gateway) module specification covering IP-Bus, FMS, Time, GNSS-Position, VehicleInfo, MQTT and SystemMonitoring services. Pre-integrated as a drop-in replacement alongside INIT, Trapeze and IVU ecosystems with minimal integration effort.

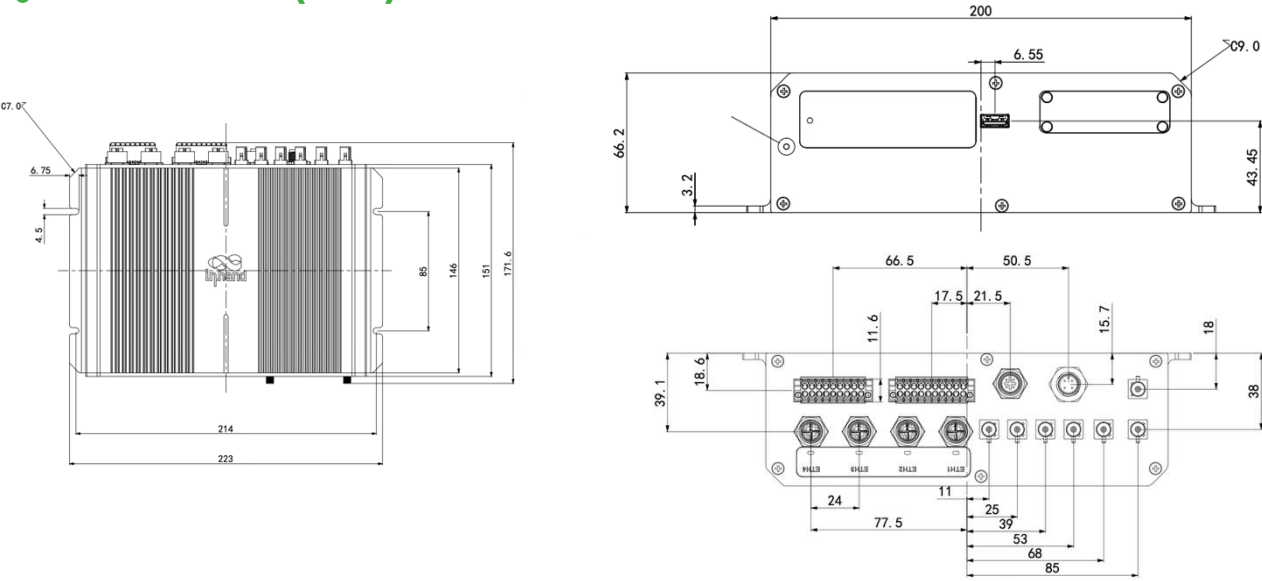
Edge AI & containerized apps

A built-in 6 TOPS AI accelerator delivers on-vehicle inference for passenger counting (APC), driver-behavior recognition, anomaly detection and CCTV analytics. The Linux runtime ships with Docker for containerized custom AI workloads, deployed and updated via remote OTA orchestration.

Rail & Bus grade reliability

EN 50155 Class T1 (-25 to +70 deg C, full functional), EN 61373 Cat 1 Class B shock & vibration and EN 45545-2 HL2 fire & smoke resistance. Die-cast aluminum housing, IP40 ingress protection, 9-36 VDC isolated input with delayed ignition; M12 connectors meet rail and heavy-duty bus engineering standards.

Dimensions (mm)



* The quantity of antenna ports depends on the model.

Product Specifications

OBC800 Hardware Specifications

Hardware Platform

CPU	Octa-core ARM Cortex (4x A72 @ 2.2 GHz + 4x A53 @ 1.8 GHz), 6 TOPS NPU	RAM	4GB LPDDR4X (x32, single chip)
Flash	64GB eMMC 5.1 + M.2 B Key NVMe SSD up to 2TB	GPU	ARM Mali GPU, OpenGL ES 3.2 / Vulkan 1.2

Satellite Navigation

GNSS Receiver	Dual-band L1+L5 multi-GNSS: GPS, BDS, Galileo, GLONASS, QZSS, NavIC		
Built-in Sensor	6-axis IMU (3-axis gyro + 3-axis accel) with on-module Dead Reckoning fusion		
Positioning Accuracy	CEP50 ≤ 1.5 m (open sky); DR drift < 2% of distance (GNSS denied)	SBAS	WAAS, EGNOS, MSAS, GAGAN
Tracking Sensitivity	Acquisition: -148 dBm, Tracking: -165 dBm, Re-acquisition: -160 dBm	Update Rate	GNSS: 1-10 Hz · IMU raw: 100 Hz · DR fused: 10 Hz

Interfaces

Cellular	5G NR Sub-6 (SA/NSA, 3GPP Rel.16) or LTE Cat 6 (selectable by SKU)		
Ethernet	4 x Gigabit Ethernet, M12 X-coded		
Antenna	Cellular 4 x FAKRA D-coded, Wi-Fi 2 x FAKRA I-coded GNSS 1 x FAKRA C-coded		
Indicator	Power, System, GNSS, Cellular, Signal, Wi-Fi, BLE		

Wi-Fi & BLE

Frequency	2.4 GHz, 5 GHz (2x2 MU-MIMO)	Protocol	Wi-Fi 6 (IEEE 802.11ax)
Maximum Throughput	Up to 1.2 Gbps PHY (Wi-Fi 6, 80 MHz, 2x2)	Mode	AP / Client / Mesh
Bluetooth	Bluetooth 5.0 + BLE (combo module)	BT Topology	BR/EDR + BLE, Master/Slave & Central/Peripheral, multi-point

Other Interfaces

Automotive Interfaces	1 x CAN 2.0B 1 x FMS CAN 2.0B (J1939 / OBD-II)	Digital I/O	11 x DI (wet/dry), 4 x DO (open-collector, 200 mA)
Serial Ports	1 x multi-protocol serial port, RS232 / RS485 / RS422 (software selectable)	Audio	Line-out stereo, Mic-in (vehicle PA / driver intercom)
USB	1 x USB 3.0 Type-C (data + 5V/3A)		

Power Supply

Connectors	VIN 1 +, VIN 1 -, IGT, VIN 2 +, VIN 2 -, M12 A-coded Male, 5-pin		
Input Voltage	9-36 VDC isolated (24V nominal), ISO 7637-2 transient protected		
Protection	Reverse polarity, transient surge, over-voltage, delayed ignition (programmable 0-60 min)		
Operating Power	Typical 8 W (GNSS+DR+Wi-Fi+LTE), Max 12 W (5G active)		

Mechanical

Installation	Wall-mounting (bracket included)	Protection Rating	IP54
Cooling	Passive (fanless, conduction)	Housing	Die-cast aluminum, anodized
Dimensions (W*D*H)	210 * 165 * 55 (mm)	Real Time Clock	Battery-backed RTC (CR2032)
SIM Card Slot	2 x nano-SIM (dual-SIM single-standby)	SIM Card Spec.	nano-SIM (4FF)
Weight	≈ 1.6 kg		

OBC800 Software Specifications

Operating System

OS	Yocto Linux 5.0 LTS (kernel 6.1, 10-year support)	Container Runtime	Docker 28.3
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Network Protocols

IP Application	IPv4/IPv6 dual-stack, DHCP server/client, DNS relay, DDNS, SSH, HTTPS, MQTT
IP Routing	Static routing, default route

Network Security

Firewall	Stateful firewall, ACLs, NAT/PAT, port forwarding
Access Control	Role-based access control (admin / operator / read-only), audit logging
PKI & Crypto	TPM 2.0 (SLB9670), PEM, PKCS#12, SCEP, OpenSSL 3.x, signed firmware
VPN	IPSec (IKEv2), OpenVPN, WireGuard
Cybersecurity	EU RED-DA 2024/30/EU compliant, PSA Level 1 roadmap, secure boot, encrypted storage, signed OTA, ISO/SAE 21434 aligned

Reliability

Link Backup	Dual-SIM failover, cellular/Wi-Fi backup
Link Detection	Heartbeat probes, ICMP/HTTP-keepalive, auto-redial on disconnect
Watchdog	Hardware + software watchdog
Offline Buffering	Store-and-forward of telemetry / events / video metadata when offline

ITxPT Services

IP-Bus	Supported per ITxPT v2.x (mDNS service discovery, MQTT bus)	Time	ITxPT Time service (GNSS-disciplined NTP)
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ITxPT Modules

Protocol	VCG, GNSS-Position, FMS, VehicleInfo, MQTT, SystemMonitoring
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Device Management

Configuration	Local Web UI (HTTPS), SSH, CLI
OTA Upgrade	InHand Connect Service, signed OTA, batch fleet deployment
Network Diagnostics	Ping, Traceroute, tcpdump, syslog, remote console, can-utils

Standards & Certification

Vehicle Standards	ECE-R10, ECE-R118, ISO 16750 / EN 50155 T1, EN 50121-3-2, EN 61373, EN 45545-2
Certification	CE (RED-DA), UKCA, FCC, E-Mark, ITxPT v2.x, EN 50155, RoHS 3 (work in progress)

Environment

Operating Temp.	-25 °C ~ +70 °C (EN 50155 T1) / -13 °F ~ +158 °F
Storage Temp.	-40 °C ~ +85 °C / -40 °F ~ +185 °F
Humidity	5%-95% RH non-condensing (EN 50155)

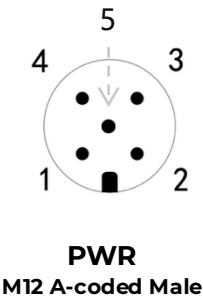
Application Services

Vehicle Telemetry	FMS/J1939/OBD-II, GNSS+DR via ITxPT/MQTT
Event Alarm	DI, harsh-driving, network/service loss, power, temperature, voltage
Notification	SMS, Email, MQTT, DO

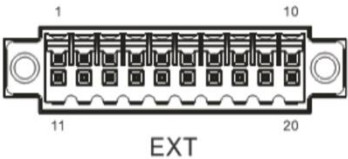
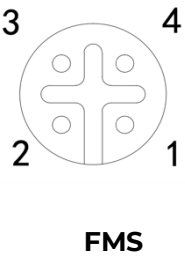


Connectors

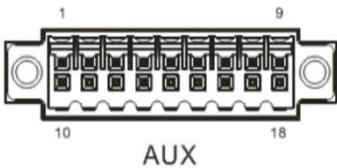
PWR Connector	
PIN	Signal
1	VIN 1 -
2	VIN 2 -
3	VIN 2 +
4	VIN 1 +
5	IGT



FMS Connector	
PIN	Signal
1	CAN_H
2	CAN_L
3	GND
4	NC



EXT Connector										
PIN	1	2	3	4	5	6	7	8	9	10
Signal	GND	DO2	DO4	WHEEL TICK*	GND	RS232_RX RS422_RX+	Left Channel	GND	CAN0_L	RS422_TX+ RS485_A
PIN	11	12	13	14	15	16	17	18	19	20
Signal	GND	DO3	PPS*	FWD*	GND	RS422_RX-	Right Channel	Mic In	CAN0_H	RS232_TX RS422_TX- RS485_B



AUX Connector									
PIN	1	2	3	4	5	6	7	8	9
Signal	DI1	DI2	DI3	DI4	DI5	DI6	DI7	DI8	GND
PIN	10	11	12	13	14	15	16	17	18
Signal	GND	GND	GND	GND	DI9	DO1	DI10	DI11	GND

Ordering Guide

Model code: OBC800-<C>[-<S>]

Model	Cellular	Bands	Storage	Region
OBC800-GLNR	5G NR Sub-6	5G NSA n1/2/3/5/7/8/12/13/14/18/20/25/26/28/29/30/38/40/41/48/66/70/71/75/76/77/78/79 5G SA n1/2/3/5/7/8/12/13/14/18/20/25/26/28/29/30/38/40/41/48/66/70/71/75/76/77/78/79 LTE-FDD B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29/30/32/66/71 LTE-TDD B34/38/39/40/41/42/43/48 LAA 46 WCDMA B1/2/4/5/8/19	64GB eMMC	Global
OBC800-GLC6	LTE Cat 6	LTE-FDD B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29/30/32/66/71 LTE-TDD B34/38/39/40/41/42/43/46(LAA)/48(CBRS) WCDMA B1/2/3/4/5/6/8/19	64GB eMMC	EU

Accessories

Antenna	Order Code	Specifications
5G FAKRA Antenna	AANT110017	5G/LTE Antenna Adhesive Patch, FAKRA-D Purple connector, cable length 3000mm, IP67.
Wi-Fi 6 FAKRA Antenna	AANT060024	Wi-Fi 6 / BLE 2.4 GHz & 5 GHz Antenna, FAKRA-I Beige connector, cable length 3000mm, IP67.
GNSS FAKRA Antenna	AANT040013	Dual-band L1+L5 active GNSS Antenna (GPS/BDS/Galileo/GLONASS), FAKRA-C Blue, 3000mm, IP67.

Cable	Order Code	Specifications
OBC800 Power Cable	SCAB000618	Power & Ignition Cable, 5-pin M12 A-coded, 3000mm.
Ethernet Cable M12 X to RJ45	AETH050002	Ethernet Cable M12 X-coded (8-pin) to RJ45, Cat6a, 2000mm.

About Us

InHand Networks is a leading IoT solutions provider founded in 2001, dedicated to driving digital transformation across industries and empowering customers to unlock their full potential and achieve accelerated growth.

We specialize in delivering industrial-grade connectivity solutions for diverse sectors, such as enterprise networks, industrial and building IoT, digital energy, smart commerce, and mobility. Our comprehensive product portfolio and services cater to various applications worldwide, including smart manufacturing, smart grid, intelligent transportation, smart retail, etc. With a global footprint spanning over 60 countries, we serve customers in China, the United States, France, Germany, the United Kingdom, Italy, and beyond.



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