

2020

AIoT Transportation Solution

Enhancing efficiency and safety for various transportation applications

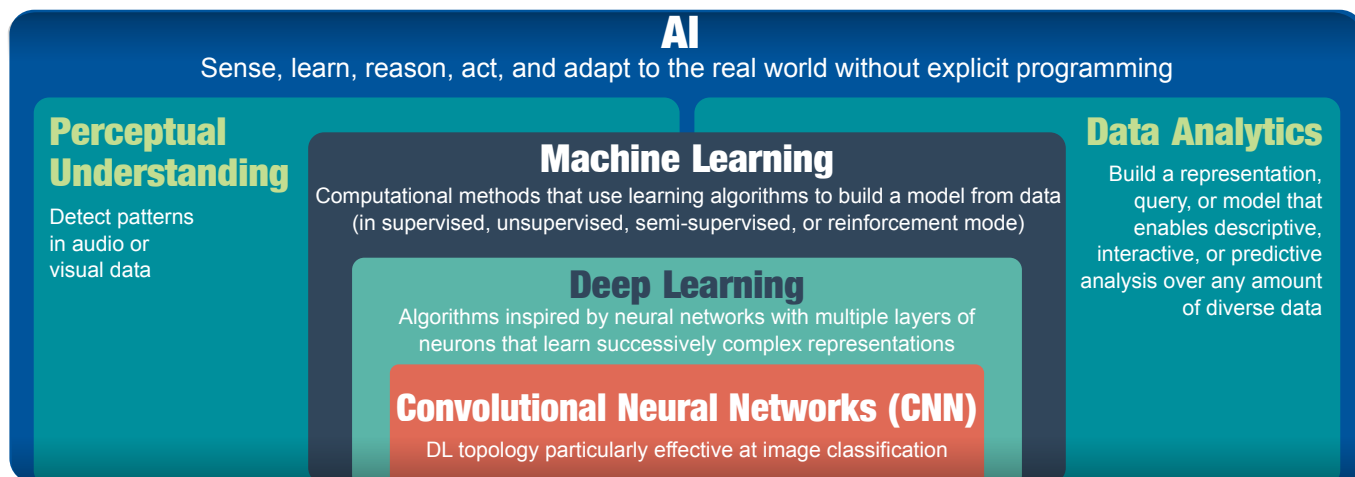


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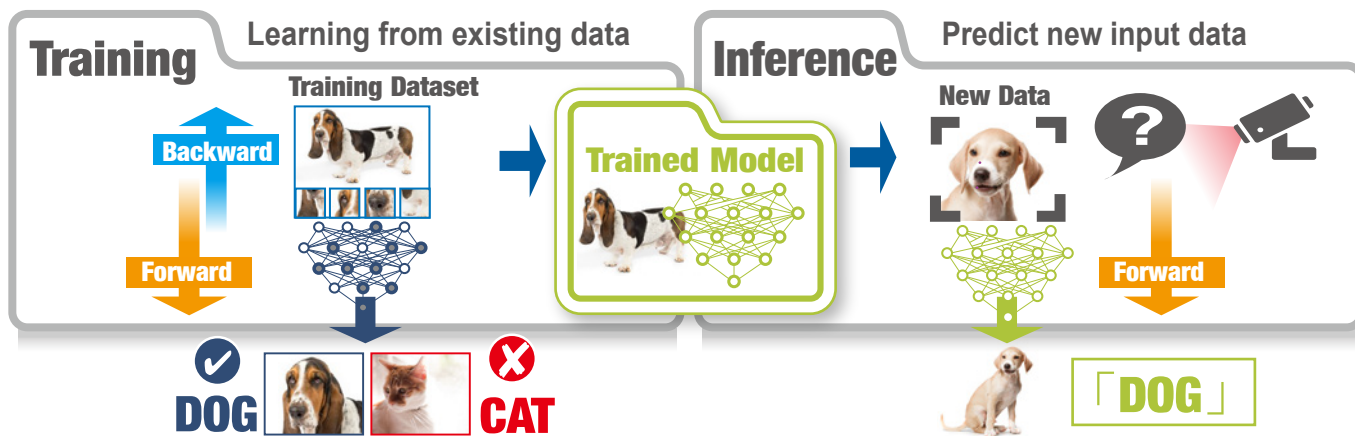
www.ieiworld.com

Deep learning and inference

Deep learning is part of the machine learning method. It allows computational models that are composed of multiple processing layers to learn representations of data with multiple levels of abstraction. Deep neural network and recurrent neural network architectures have been used in applications such as object recognition, object detection, feature segmentation, text-to-speech, speech-to-text, translation, etc. In some cases the performance of deep learning algorithms can be even more accurate than human judgement.



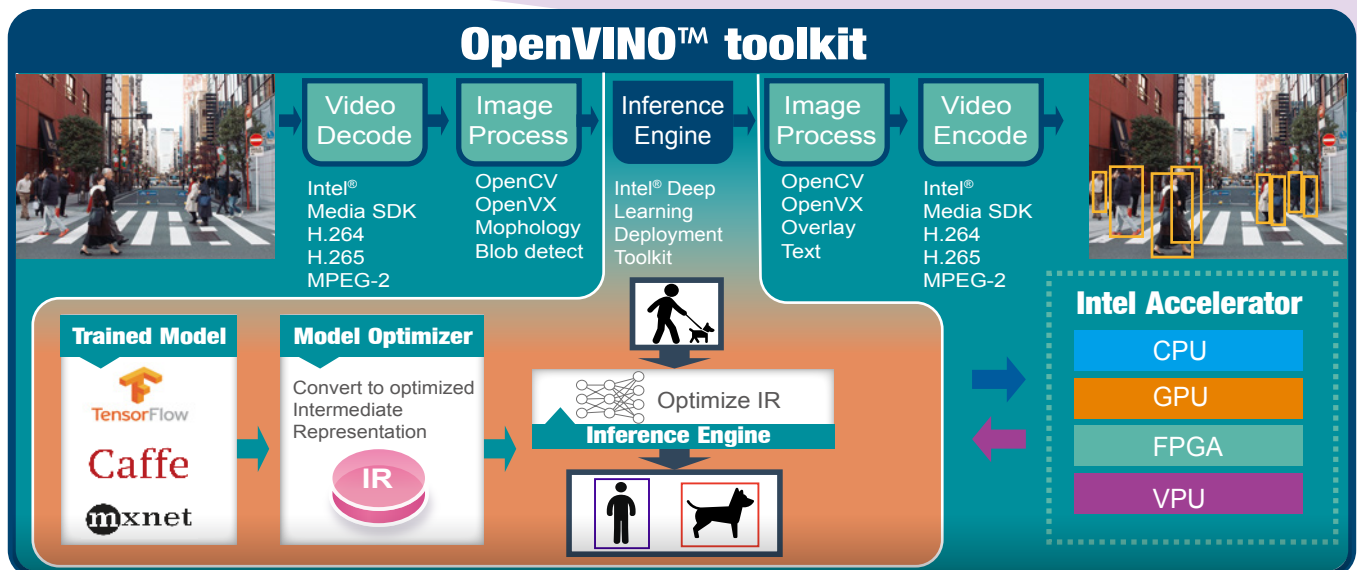
In the past, machine learning required researchers and domain experts knowledge to design filters that extracted the raw data into feature vectors. However, with the contributions of deep learning accelerators and algorithms, trained models can be applied to the raw data, which could be utilized to recognize new input data in inference.



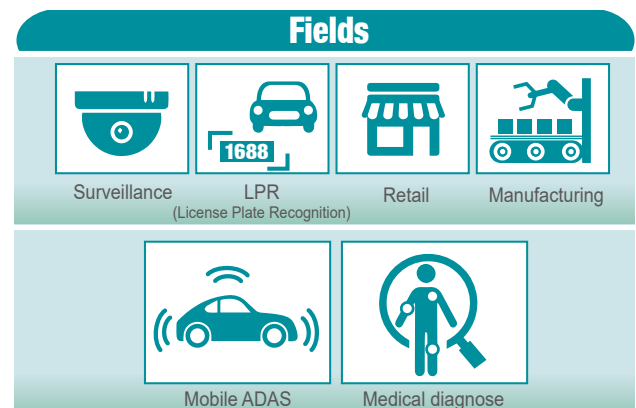
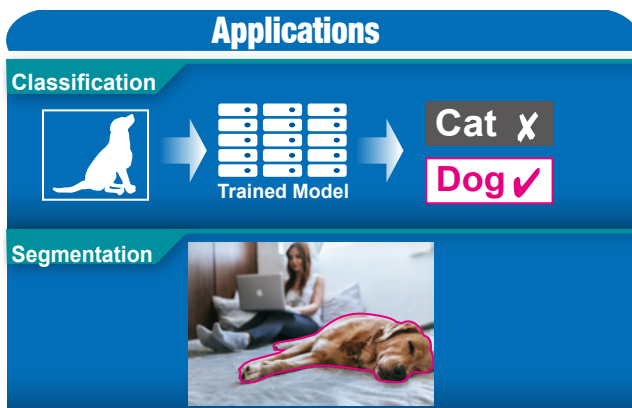
- **OpenVINO™ toolkit**

Open Visual Inference & Neural Network Optimization (OpenVINO™) toolkit is based on convolutional neural networks (CNN); the toolkit extends workloads across Intel® hardware and maximizes performance.

It can optimize pre-trained deep learning model such as Caffe, MXNET, Tensorflow into IR binary file then execute the inference engine across Intel®-hardware heterogeneously such as CPU, GPU, Intel® Movidius™ Neural Compute Stick, and FPGA.



• Applications



• Surveillance

Traffic

The IVS-300-ULT3 in-vehicle system can be utilized to capture data and send traffic to a control center to optimize a traffic light system. It can also perform license plate recognition (LPR) to help law enforcement if vehicles break traffic laws or help parking services identify available parking spaces to assist drivers in congested urban areas.

Security

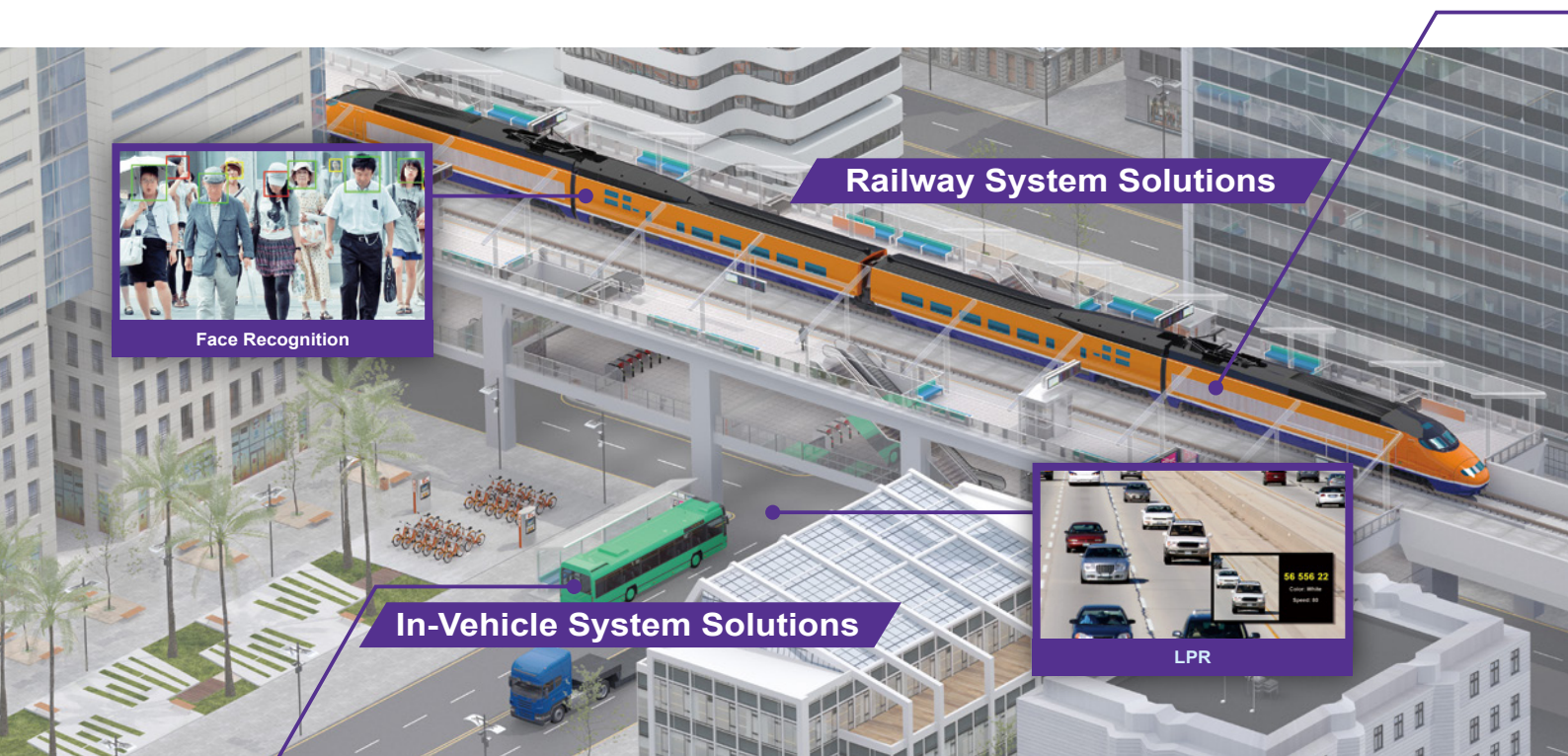
With the algorithms developed using the IVS-300-ULT3 in-vehicle system, trained deep neural networks now have inference capabilities to identify suspicious persons to alert law enforcement or for security departments to early warning scenarios.



AIoT transportation solution

IEI has for decades been dedicated to industrial automation. IEI smart transportation solutions focus on railway, vehicle, and marine intelligent solutions. Smart transportation helps enterprise and people to improve efficiency during the journey from varied data acquisition, analysis, and precise prediction. Furthermore, with real-time streaming NVR (Network Video Recorder) logs, critical moments can be recorded when accident happens, therefore enhancing safety of drivers and passengers on the move.

IEI has a complete line of transportation products which are fanless and designed to resist vibration, shock, and extreme temperatures. IEI's transportation products support iRIS solution which is an easy way to remotely control and manage all your devices.



• Fleet Management Application

With the increasing rate of motor vehicle, the surveillance application is becoming more importation for the city. Therefore, IEI IVS Series and IKAPC Series combine all communication systems in our device to provide powerful fleet management. In addition, road surveillance can be applied through the IVS Series to ensure passenger and traffic safety. With these features provided by our in-vehicle systems, enterprises are allowed to track vehicles through the system.

• Advertising System Application

New generation digital signage is used in a more efficient way to get more passengers' attention. IEI offers the IDS Series for digital signage application, which can be integrated with taxi, bus, and train. The IDS Series can easily provide real-time messages, traffic information, and advertisement to passengers at the public transportation station. The IDS Series is designed with multiple independent displays, and the iRIS module can be installed to achieve remote management from a variety of devices simultaneously.



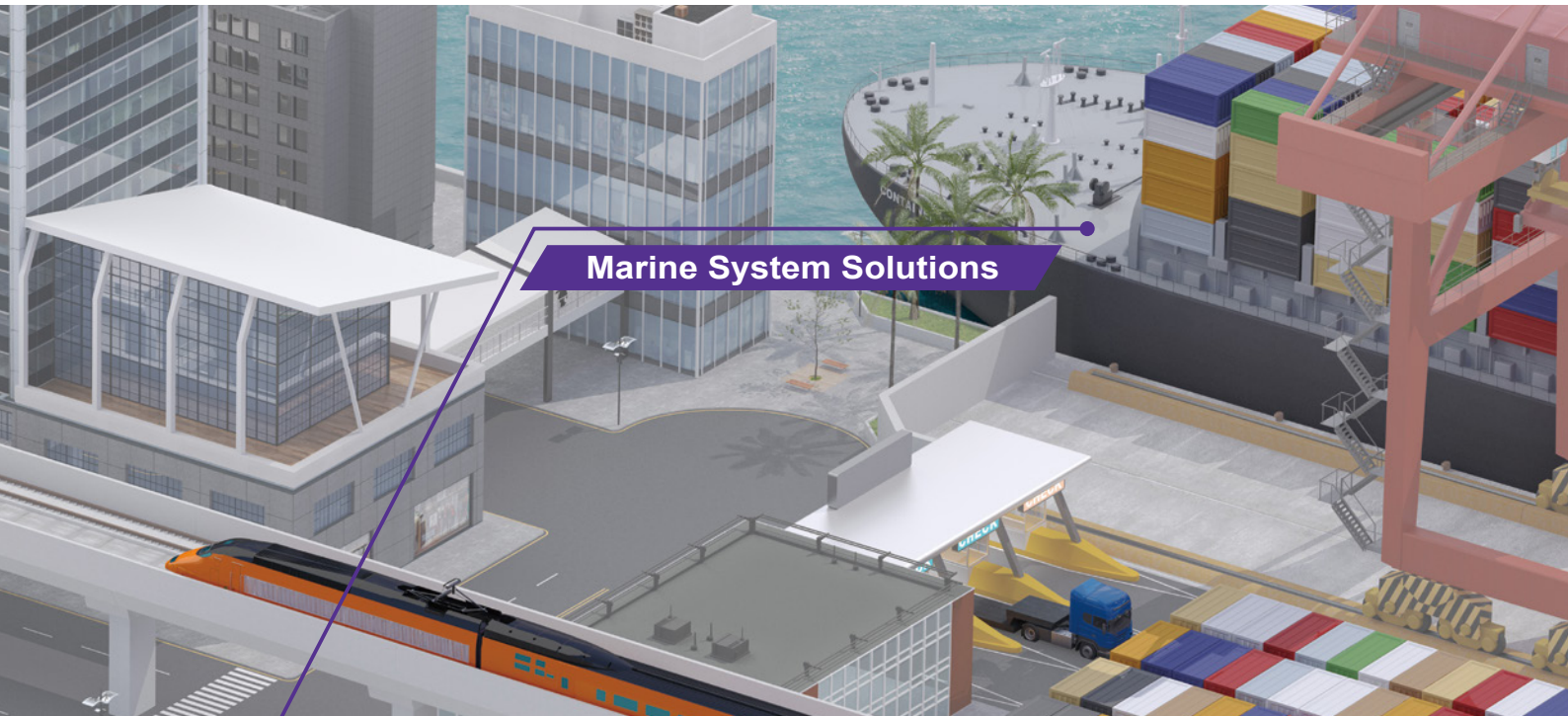
• Automatic Fare Collection Application

Automatic Fare Collection System (AFC) for public transport consists of ticket vending machines and automatic gate machines. In this application, IEI offers the TANK-600 series which has multiple COM ports for connecting between data terminal equipment and data communication equipment. The TANK-600 series can fulfill user's demand to connect a large number of ticket vending machines and gate machines, giving customers a whole new experience of AFC.



• Public Transportation Application

Public transportation system includes taxi, bus, truck, and railway. IEI offers the IRS Series for public transport, especially for rolling stock application. The IRS Series is compliant with EN50155 standard and equipped with M12 connectors to enhance shock and vibration resistance for public transit operation. The IRS Series combines passenger information system (PIS), network video recorder (NVR) for surveillance and data transmission for remote control into one powerful, integrated system.



Marine System Solutions



• Integration of Multiple Systems on Bridge

The common bridge systems usually need to collect and analyze many observation data, including anemometer stations, speed logs, weather condition and GPS signal. A powerful and reliable system is necessary for handling these complicated data. IEI marine computer and embedded box possess high performance CPU with reliable fanless design to overcome the ruggedized marine environment.

• The Application of Signage at Open Deck

For large cruise ship, a variety of information is displayed at open deck areas. The marine monitor possesses many sophisticated features, including IP 66 dust- and water-proof front panel, wide-range operating temperatures, multi-point capacitive touch, wide viewing angles and OSD control, providing a good visual experience toward customers and sailors.



In-Vehicle System Solutions

IEI has a total solution for multi-vehicle monitoring and dispatching system, allowing enterprises to track vehicles through the system, and to prevent loss of goods in transit. We combine all communication system and fleet management with our IoT solution to help enterprises on tracking their goods through electronic maps, internet access, and mobile communication system with 3.75G/Wi-Fi/Bluetooth/GPS/RFID in real time and into safety.

- Fanless and rugged design for harsh environment
- Rugged design for vibration and shock resistance
- Wide range DC power input design

- Wireless communication
- CAN bus and OBD-II support for vehicle system
- In-Vehicle device compliant with the E-Mark standard



PPC-F08B-BT

- Low power consumption
- IP65 compliant front panel
- Dual GbE for backup



DM-F24A

- Robust IP65 aluminum front bezel
- Aesthetic ultra-thin for panel mount installation
- Wide temperature support



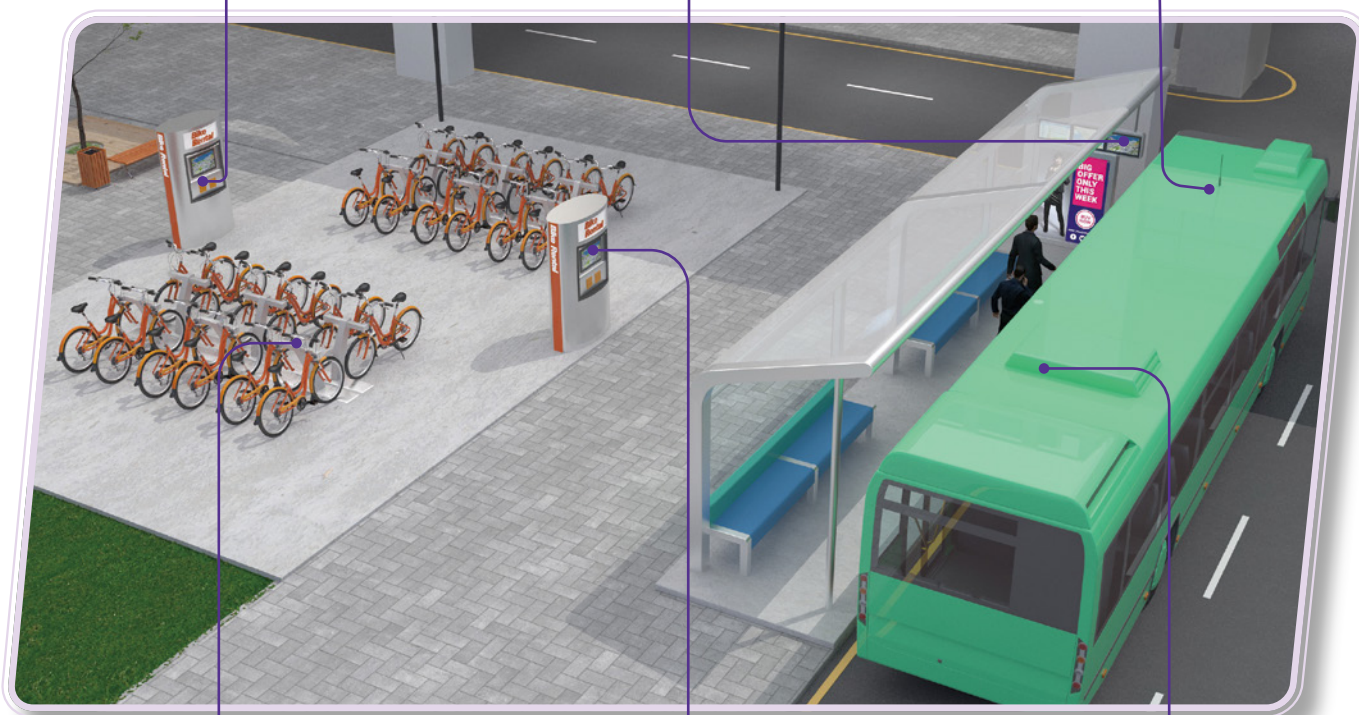
IVS-300-ULT3

- Skylake ULT platform (COM Express CPU card)
- 4 x PoE IEEE802.3af
- Optional 3G/Wi-Fi/Dead Reckoning

Traffic Information System

Passenger Information System

Video Surveillance



Public Bike Rental System

Kiosk

Fleet Management



TANK-620-ULT3

- Fanless system with Intel® Celeron® 3855U processor
- Full-size PCIe Mini & M.2 M-key for expansion
- Up to 14 COM ports



New

DRPC-230-ULT5

- Fanless system with Intel® Core™ i5-8265U 1.6GHz processor
- Full-size PCIe Mini & M.2 A-key & PCIe x4 for expansion
- Up to 6 COM ports



AFOKAR-08A

- 8" TFT LCD with projected capacitive touchscreen
- Built-in GPS receiver
- Built-in OBD-II/J1939

Railway System Solutions

IEI railway system (IRS) series is compliant with the EN 50155 standard and meets the requirements for railway environments. The IRS-100 has multi-function capability, making it not only a surveillance system but also an entertainment system, such as control unit, passenger information system (PIS) and network video recorder (NVR). Among these technologies, using IP cameras for surveillance application is getting popular.

- High-performance CPU with Intel® Core™ processor
- Fanless design for rolling stock products and supports hot-swappable SATA SSD module
- Operation reliability and maintainability

- Real-time network communication for train drivers and control center
- Special design for tough environment and wide operation temperature range
- Fully compliant with EN50155 certificate for rolling stock products



Control Room

- Connection (LTE, 3G, wireless)
- Real-time railway information monitoring & recording



IRS-100-ULT3

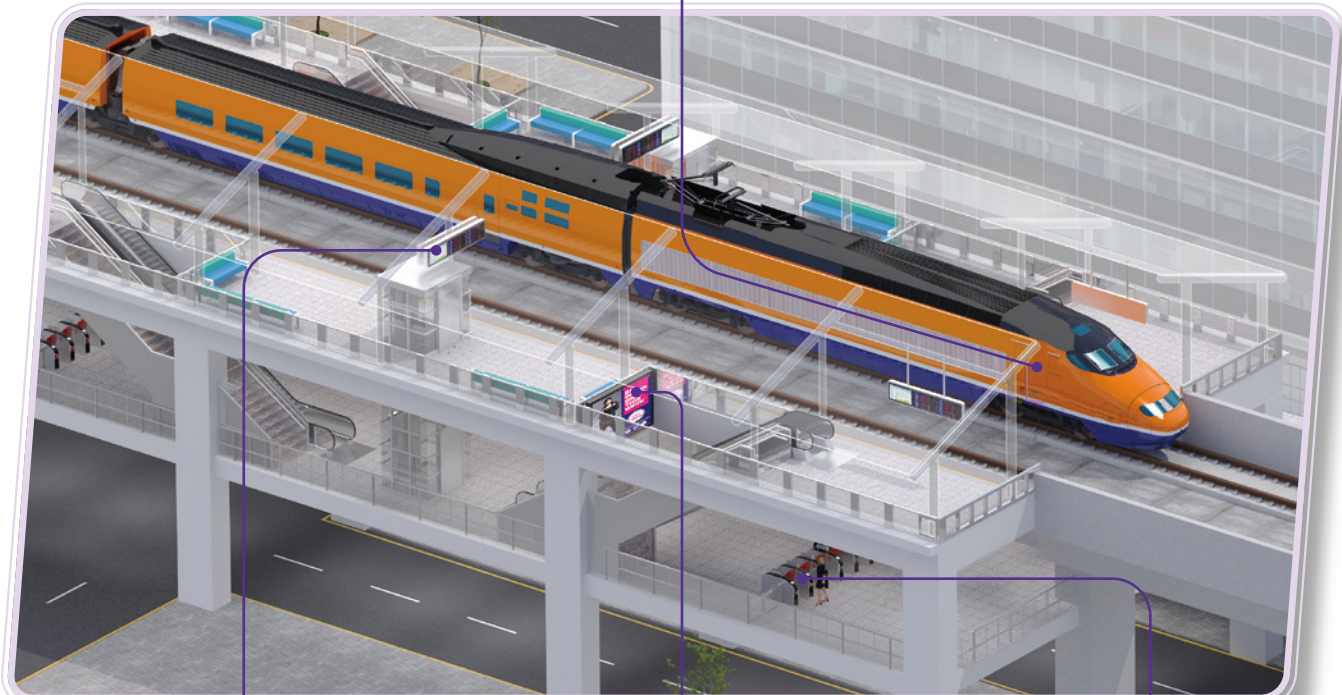
- Ruggedized dual M12 LAN port and dual SIM card design
- 24V DC / 110V DC
- Compliant with EN50155-T3



ISR-2G-LTE-E-WL-GPS

- Industrial secure wireless router
- LTE dual SIM
- Wi-Fi + GPS

Train Surveillance



Passenger Information System



DM-F24A

- Robust IP65 aluminum front bezel
- Aesthetic ultra-thin for panel mount installation
- Wide temperature support

Digital Signage



IDS-310-AL

- One M.2 A key & full-size PCIe Mini for expansion
- High resolution display

Automatic Fare Collection System



TANK-620-ULT3

- Fanless system with Intel® Celeron® 3855U processor
- Full-size PCIe Mini & M.2 M-key for expansion
- Up to 14 COM ports

New

Marine System Solutions

The maritime field faces critical environmental challenges, therefore the reliable and rugged systems is essential. IEI provides professional marine-grade embedded box, panel PCs and monitors with leading technologies and industrial grade materials which are perfect for applications on the dock, on the open deck, or in the control room or bridge. Considering various and complicated marine environment and real applications, IEI introduces a total solution from harbor to ship which provides customers a reliable environment.

- Fanless and front IP 66 design for marine environment
- DNV compliant isolation protection on COM and power
- Wide temperature design and flat-bezel PCAP touch

- Multiple video input and output for marine monitor
- Dual isolated AC/DC input with redundant power protection
- Remote OSD setting through LAN, RS-232, RS-422 and RS-485



AFOKAR-08A

- 8" TFT LCD with projected capacitive touchscreen
- Built-in GPS receiver
- Built-in OBD-II/J1939



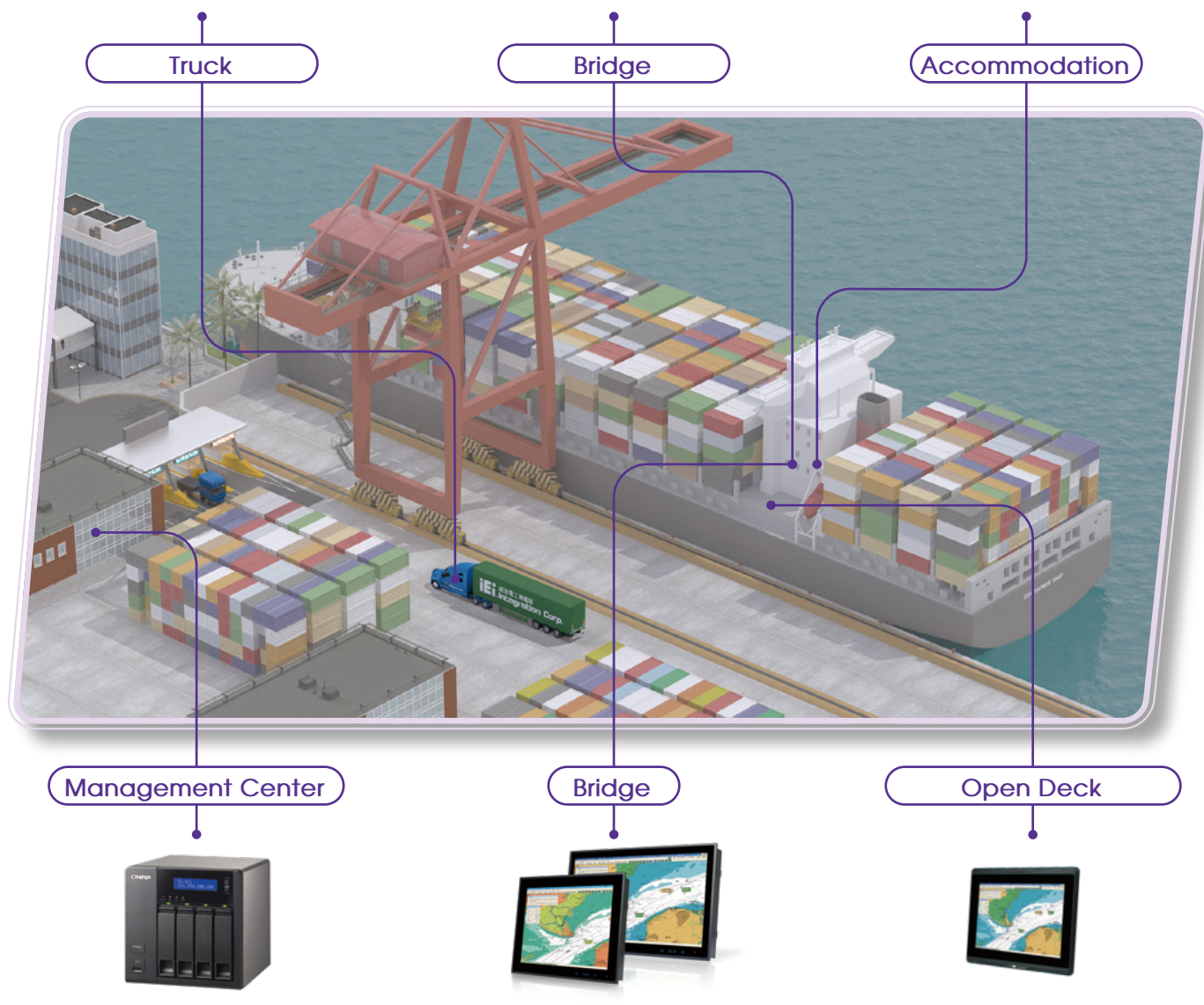
S24A/S19A

- Fanless PPC with Intel® Core™ i5 dual-core processor
- Isolation protection for COM and power
- Compliant with DNV, IEC 60945 4th



SBOX-100

- Triple independent display: HDMI, DVI & VGA
- Wide operating temperature design
- 2 x 2.5" SSD bay with RAID 0/1 function



QNAP NAS

- Thunderbolt support
- Missing mode protection
- Smart power management

S24M/S19

- Wide viewing angle, full range dimming
- Remote OSD control through LAN & COM
- Compliant with DNV, IEC 60945 4th

UPC-F12C-ULT3

- IP66 aluminum enclosure protection
- Optional M12 IO cover
- Built-in wireless function

• Industrial System



Model Name	IVS-110-AL	IVS-200	IVS-300-ULT3	IVS-300-BT
CPU	Intel® Atom™ x5 E3930 processor (dual-core 1.8GHz, 6.5W TDP)	Intel® Core™ i5-5350U Processor	Intel® Skylake ULT or Baytrail processor	
Chipset	SoC	SoC	split IVS-300-ULT3 & IVS-300-BT apart	
I/O	4 x USB 3.2 Gen 1, 1 x RJ-45, 1 x RS-232/422/485, 1 x Printer port, 1 x DB9 OBD-II / J1939	2 x USB 2.0 2 x USB 3.2 Gen 1 4 x RJ-45 2 x DB-9 RS-232/422/485 4 x DB-9 RS-232 (optional)	2 x USB 3.2 Gen 1, 4 x PoE IEEE802.3af, 2 x DB-9 RS-232, 1 x DB-15 isolated RS-422/485, 1 x DB9 OBD-II / J1939	
Display	1 x VGA, 1 x HDMI	1 x VGA, 1 x HDMI	1 x VGA, 1 x HDMI	
Power Input	9 V~ 36 V DC	9 V~ 36 V DC	9 V~ 36 V DC	
Safety/EMC	CE, FCC, E-Mark IP rating : IP 4X compliant	CE/FCC/E-Mark	CE, FCC, E-Mark	
OS	Microsoft® Windows Embedded 8, Microsoft® Windows Embedded Standard 7 E			



Model Name	IRS-100-ULT3	SBOX-100-QM87
CPU	Intel® Skylake ULT processor	Intel® mobile Core™ i5-4400E (2.7 GHz, 37W)
Chipset	SoC	Intel® QM87
I/O	2 x USB 3.2 Gen 1, 2 x SIM card slot, 1 x M12 connector (USB 2.0), 2 x M12 connector, 2 x DB-9 RS-232/422/485 1.5 kV isolation	1 x PS2 (KB/MS), 2 x USB 3.2 Gen 1, 2 x USB 2.0, 2 x RJ-45 with teaming support, 1 x DB-9 (non-isolated), 4 x RS-232/422/485 (with 2.5 kV isolation), 2 x CAN-bus (with 2.5 kV isolation)
Display	1 x VGA, 1 x DVI-D	1 x VGA, 1 x DVI-D, 1 x HDMI
Power Input	M12 connector: 24 V/110 V DC	Terminal block: 18 V~36 V DC with isolation
Safety/EMC	CE, FCC Compliant with EN50155-TX, EN50121	CE, FCC, DNV, IEC 60945 4 th , IACS-E10, IEC 61174 compliant IP rating: IP22 compliant rear cover
OS	Microsoft® Windows Embedded 8, Microsoft® Windows Embedded Standard 7 E	



Model Name	TANK-620-ULT3	DRPC-230-ULT5	DRPC-130-AL	IDS-310-AL
CPU	Intel® Celeron® 3855U processor	Intel® Core™ i5-8265U 1.6GHz (up to 3.9 GHz)	Intel® Atom™ x5-E3930 processor	N1 SKU: Intel® Celeron® N3350E (up to 2.4 GHz, dual-core, TDP 6 W) J1 SKU: Intel® Celeron® J3455E (up to 2.3 GHz, quad-core, TDP 10 W)
Chipset	SoC	SoC	SoC	SoC
I/O	4 x USB 3.2 Gen 1, 4 x USB 2.0, 2 x RJ-45, 6 x DB-9 RS-232, 8 x DB-9 RS-232/422/485	4 x USB 3.2 Gen 2 (10Gb/s), 3 x RJ-45, 4 x DB-9 RS-232/422/485, 2 x RJ-45 RS-232, 8-bit DIO (4-in/4-out)	4 x USB 3.2 Gen 1, 2 x RJ-45, 4 x DB-9 RS-232/422/485, 1 x DB-9 CAN-bus, 8-bit DIO (4-in/4-out)	3 x USB 3.2 Gen 1, 1 x RS-232/422/485, 2 x RJ-45 PCIe GbE by RTL8111H controller, 2 x Audio
Display	2 x VGA, 1 x LVDS	1 x HDMI, 1 x DP	2 x HDMI	3 x HDMI
Power Input	DC 9~36V	DC 12~24V	DC 12~24V	DC jack: 12 V DC
Safety/EMC	CE, FCC	CE, FCC	CE, FCC	CE, FCC
OS	Microsoft® Windows Embedded 8, Microsoft® Windows Embedded Standard 7 E	Microsoft® Windows® 10	Microsoft® Windows Embedded 8, Microsoft® Windows Embedded Standard 7 E	Microsoft® Windows® 10

• Panel PC Solution



Model Name	PPC-F08B-BT	AFOKAR-08A	IKARPC-W10A	DM-F24A
Size	8" (4:3)	8"	10.1	23.8" (16:9)
Resolution	800 x 600	800 (RGB) × 1280	1280 x 800	1920 x 1080
Brightness (cd/m²)	500	500	350	250
Touchscreen	5-wire resistive type flat touchscreen	Projected capacitive touch with AG coating	Projected capacitive touch with USB interface	Projected capacitive touch with USB interface
CPU	Intel® Celeron® J1900 quad-core on-board SoC, 2GHz	Rockchip RK3399 (Dual-core Cortex-A72 up to 1.8GHz + Quad-core Cortex-A53 up to 1.5GHz)	Intel® Atom™ processor E3826 (dual-core, 1.46 GHz, 7W)	N/A
Safety/EMC	CE & FCC Class A certified	CE, FCC, E-Mark compliant	CE, FCC, E-Mark	CE & FCC certified
IP Rating	IP 65 compliant front panel	IP54 compliant front panel	IP 65 compliant front panel	IP 65 compliant front panel

• Marine Series



Model Name	UPC-F12C-ULT3	S19A	S24A	S19M	S24M
Size	12.1"	19"	24"	19"	24"
Resolution	1024 x 768	1280 x 1024	1920 x 1080	1280 x 1024	1920 x 1080
Brightness (cd/m²)	600	300	300	300	300
Touchscreen	P-CAP/Resistive Touch	Projected capacitive touch with USB interface, 6H			
CPU	6 th generation Intel® Core™ i5 and Celeron® ULT processor	4 th Generation 22nm Intel® Core™ i5-4400E 2.7GHz mobile processor		N/A	N/A
Safety/EMC	CE, FCC	EMC: CE, FCC Safety: DNV, IEC 60945 4 th , IACS-E10, IEC 61174		EMC: CE, FCC Safety: DNV, IEC 60945 4 th , IACS-E10	
IP Rating	IP 66	Front IP 66 / Rear IP 22			

• Computing Accelerator Card

Mustang-MPCI-E-MX2

- PCIe Mini form factor (30 mm x 50 mm)
- 2 x Intel® Movidius™ Myriad™ X VPU MA2485
- Power efficiency, only 5W.
- Operating Temperature: 0°C to 70°C
- Powered by Intel's OpenVINO™ toolkit

Mustang-M2BM-MX2

- M.2 B/M key form factor (22 mm x 80 mm)
- 2 x Intel® Movidius™ Myriad™ X VPU MA2485
- Power efficiency, only 5W.
- Operating Temperature: 0°C to 70°C
- Powered by Intel's OpenVINO™ toolkit



***Specifications are subject to change without prior notice.**

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