

Advantech's Oil & Gas Solutions

Certified Products & Solutions for
Oil & Gas Applications

- ✓ Industrial Panel PCs & Monitors
- ✓ Embedded Automation Computers
- ✓ Industrial Connectivity & Communication
- ✓ Data Acquisition Modules
- ✓ Wireless Remote Terminal Unit

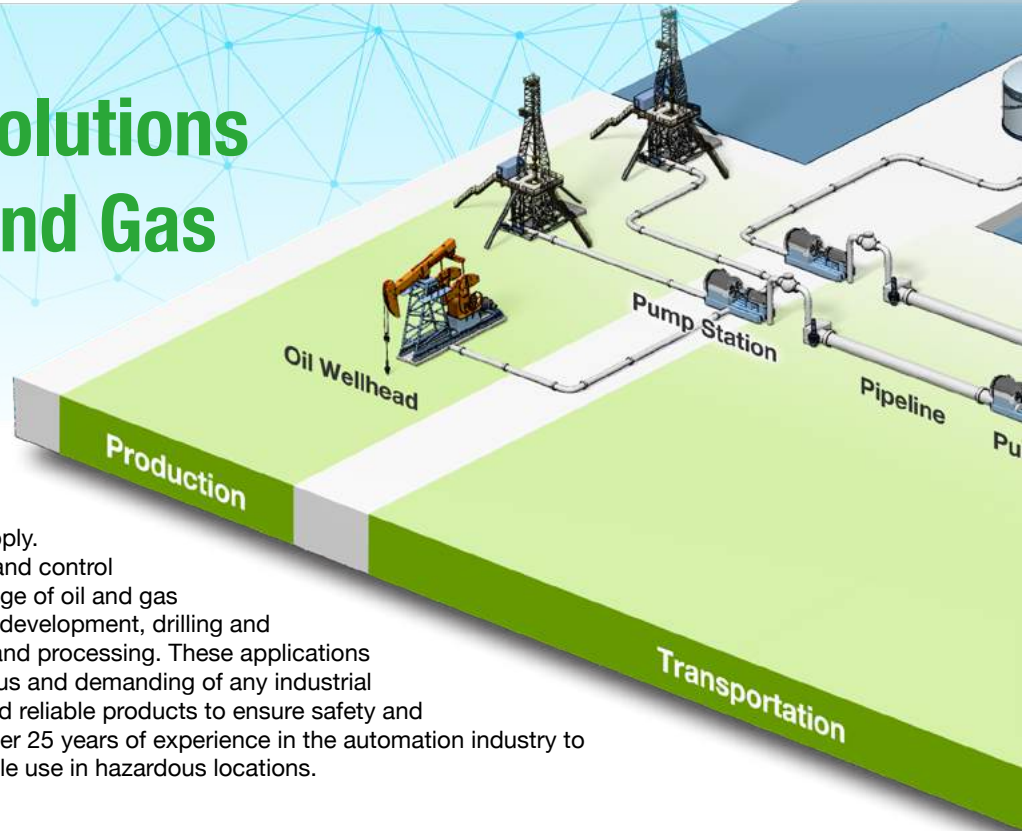


ADVANTECH

Enabling an Intelligent Planet

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Industrial Solutions for the Oil and Gas Industry



The Oil and Gas industry is still at the heart of the world's energy supply. Efficient and accurate monitoring and control systems are important at every stage of oil and gas production—from exploration and development, drilling and production, to fuel transportation and processing. These applications are still some of the most dangerous and demanding of any industrial application, and require rugged and reliable products to ensure safety and efficiency. Advantech leverages over 25 years of experience in the automation industry to design different solutions for reliable use in hazardous locations.

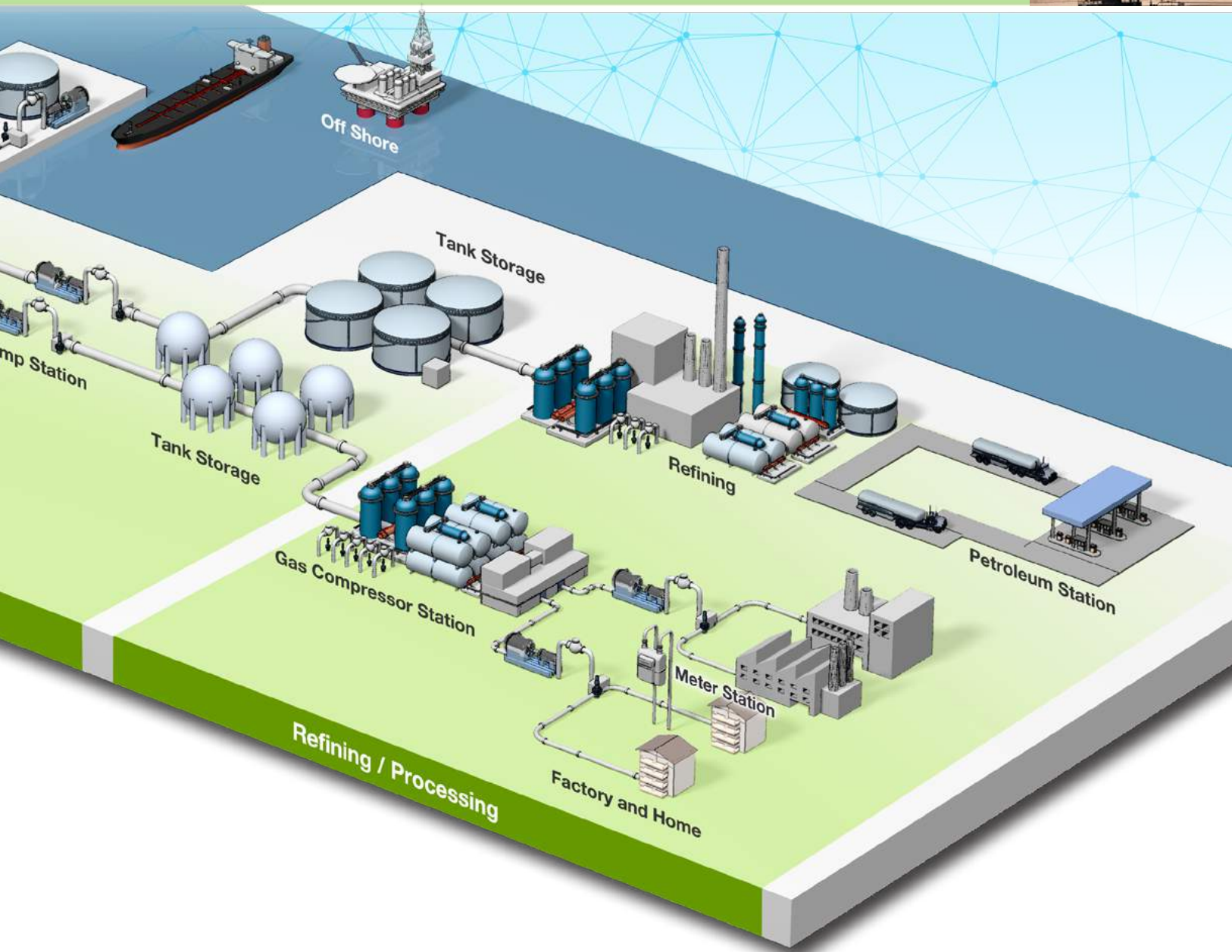
Certification Definition - Class I, Divisions 1 and 2

Hazardous locations facet potential hazards (e.g., fires, explosions, etc.) under normal or abnormal conditions. These locations typically feature the presence of flammable gases, vapors and liquids, or combustible dusts and fibers. According to the National Electrical Code NEC, there are three types of hazardous area categorized by Class—Class I (gases, vapors, and liquids), Class II (dusts), and Class III (fibers and flyings). Division 1 means normally explosive and hazardous and Division 2 means not normally present in an explosive concentration exist accidentally. Class I directly applies to oil and gas market applications. For example, petroleum refineries, gasoline storage facilities, dispensing areas, and utility gas plants. The gases and vapors of Class I locations are divided into codes A, B, C, and D according to the substance ignition temperature, its explosion pressure, and other flammable characteristics. Temperature classes also exist to designate permissible surface temperatures of electrical equipment required for normal operations in specific environments.

CLASSES	GROUPS	DIVISIONS	
		1	2
Class I : Gases, vapors, and liquids	A: Acetylene. B: Hydrogen, gases or vapors of equivalent hazard. C: Ethyl-ether vapors, ethylene, or cyclo-propane. D: Gasoline, hexane, naptha, benzene, butane, propane, alcohol, etc.	Normally explosive and hazardous	Not normally present in an explosive concentration (but may accidentally exist)

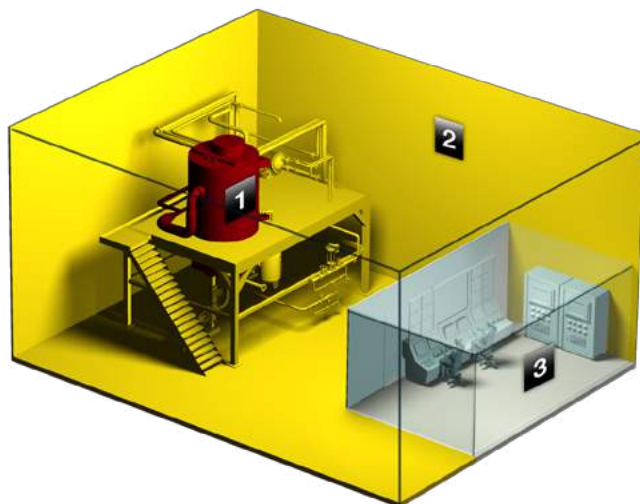
TEMPERATURE CLASSES

- T6 85 ~ 100 °C (185 ~ 212 °F)
- T3 200 ~ 300 °C (392 ~ 572 °F)
- T5 100 ~ 135 °C (212 ~ 275 °F)
- T2 300 ~ 450 °C (572 ~ 842 °F)
- T4 135 ~ 200 °C (275 ~ 392 °F)
- T1 450 °C + (842 °F +)



Hazardous and Non-hazardous Locations

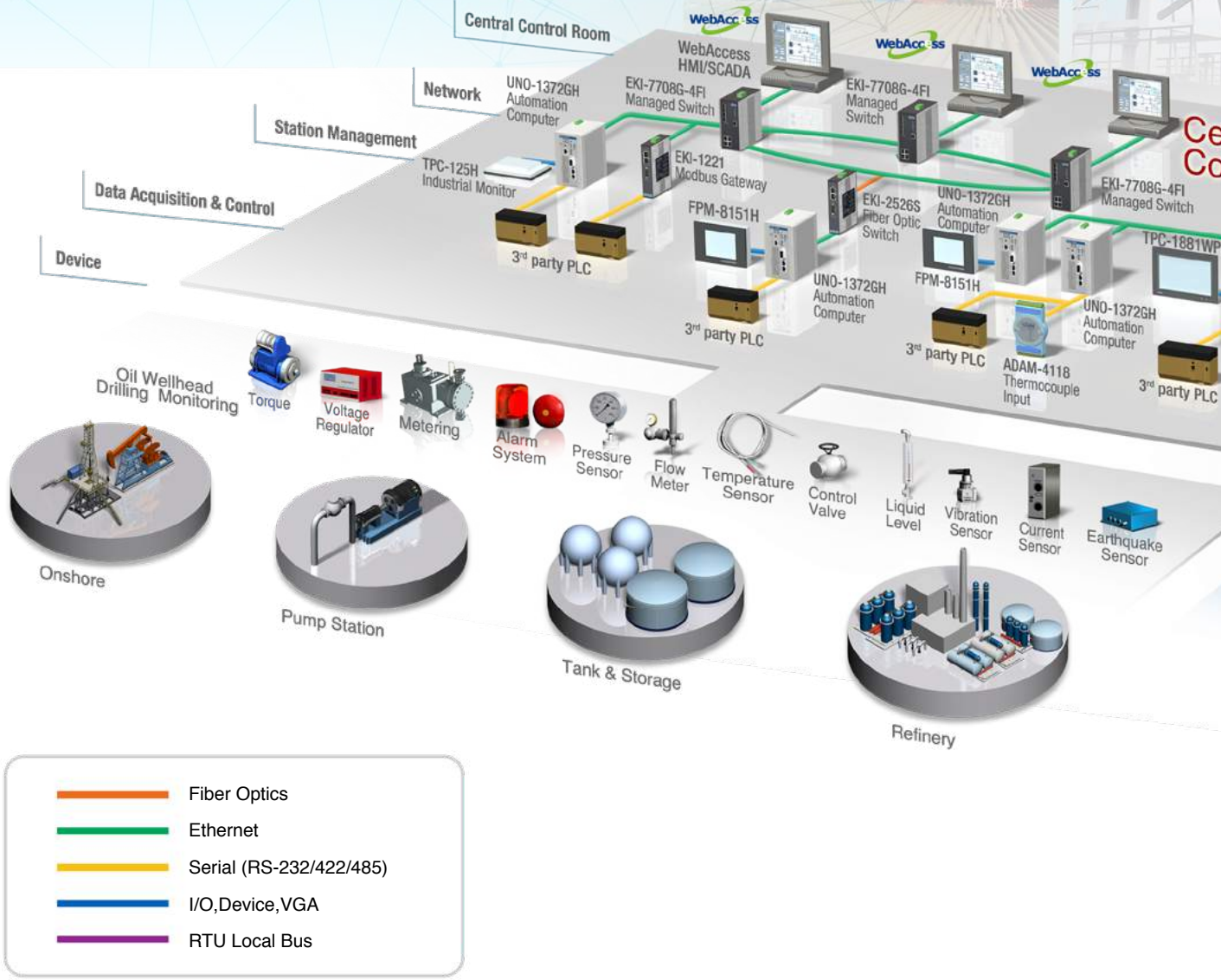
Below is a conceptual diagram of Class I, Division 1 & 2 hazardous areas and non-hazardous areas.



- 1** Class I, Division I Area
- 2** Class I, Division II Area
- 3** Non Hazardous Location

Advantech's Certified Products and Solutions

Advantech continues to provide vertical market-oriented product solutions to fulfill various application needs. Advantech's CID2 certified product ranges includes HMI, Industrial Communication, Embedded Automation Computers, and Data Acquisition modules. These solutions suit the demanding requirements of diverse oil and gas applications. Furthermore, Advantech's standard range can be used in non-hazardous locations, such as facility control and management for the oil and gas industry.



Product Offerings

HMI/SCADA Software



Industrial PCs and Monitors



Industrial Ethernet Switches



Media Converters

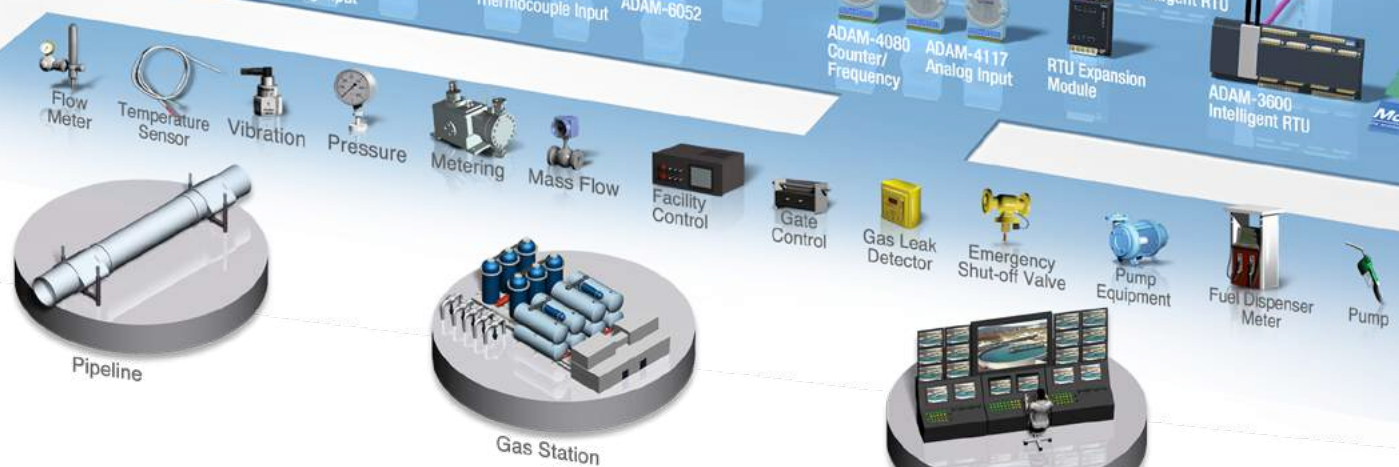
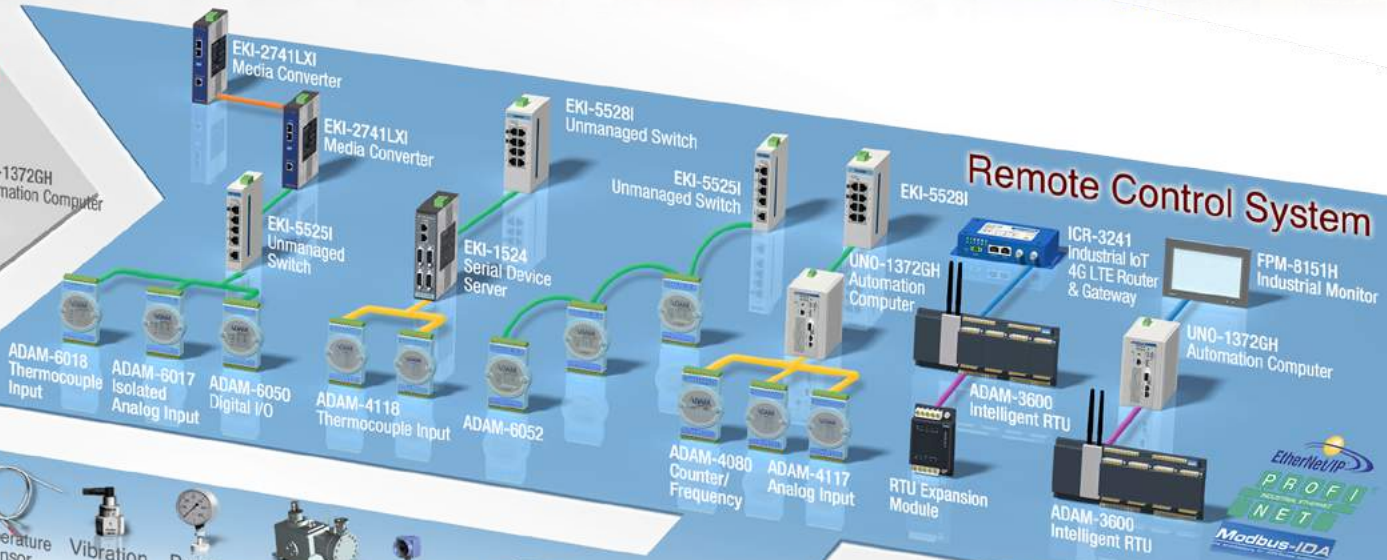




Centralized Control System



Remote Control System



Serial Device Servers

Modbus Gateways

Domain-Focused Edge Gateways

Data Acquisition Modules

Repeaters / Converters

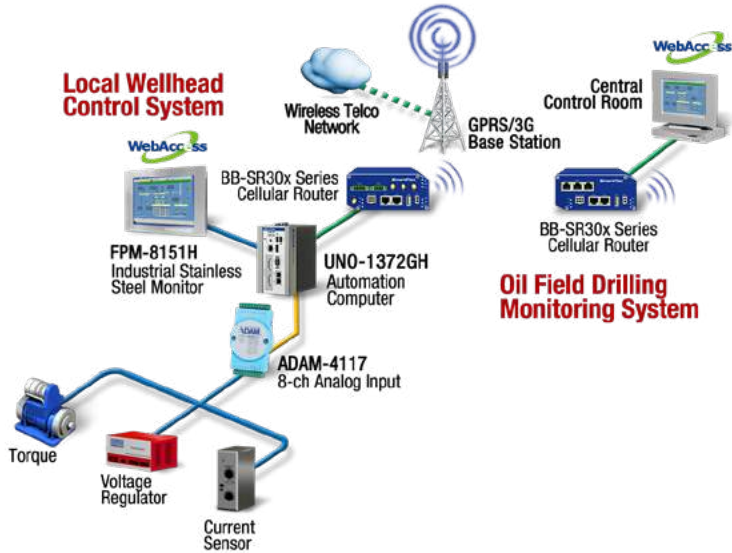
Remote Terminal Unit





Oil Field Drilling Monitoring System

Oil reservoirs typically extend over an area several hundred kilometers across. Full exploitation entails multiple wells scattered across an oil field. In addition, there may be exploratory wells probing the edges, pipelines to transport the oil elsewhere, and support facilities. Oil fields may be located far from civilization making logistics extremely complicated.



■ System Description

This system was created to help monitor the status of drills in an oilfield— automatically alerting technicians if the torque, voltage, current, or amp values exceed safe limits. These sensors are connected to an ADAM-4117, which is in turn connected to an UNO-1372GH for data processing and an FPM-8151H for local display and monitoring. This system is built at the base of the oil drill and connects back to the central control room through a BB-SR30x series cellular router. This enables the control room to monitor over 800 drills across multiple oil fields with the help of WebAccess.

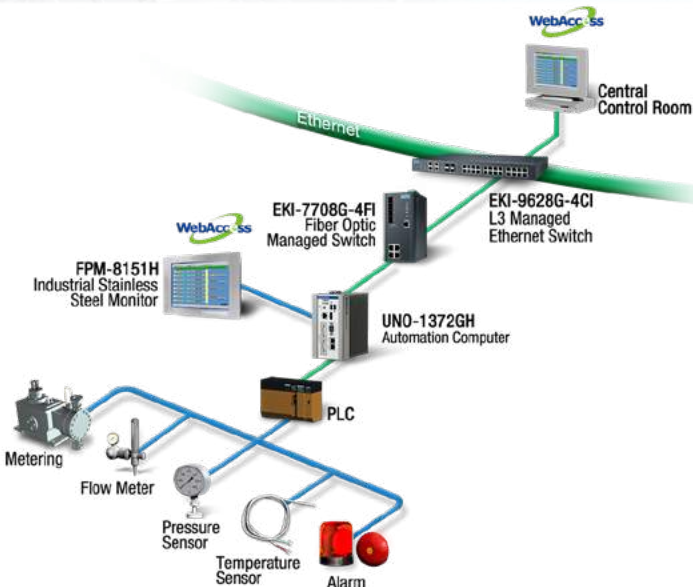
■ Benefits

Advantech WebAccess is a browser-based HMI/SCADA softwarepackage designed for powerful architectures with multiple SCADA servers and client applications. All the features found in conventional HMI and SCADA software packages are available in an ordinary browser including animated graphics displays, real-time data control, trends, alarms and logs for efficient remote diagnostics and maintenance.



Pump Station Monitoring System

The oil and gas industry includes global processes of exploration, extraction, refining, transporting, and marketing. Oil is transported through cross continental pipelines using pump stations. It usually flows at an approximate speed of 1 ~ 6 m (3.2 ~ 19.6 ft) per second.



■ System Description

This monitoring system was placed every 30 km (18.6 mi) in 80 pump stations along a cross-continental pipeline. This system allows engineers to monitor all of the stations from a central control room through WebAccess. The pump stations themselves feature diverse installed sensors for metering pressure and temperature. These sensors are linked to a PLC which is connected to UNO-1372GH for data processing, and an FPM-8151H which enables local pump status checking by technicians. These devices are then connected to an EKI-7559SI, which transmits data back to a central control room through fiber optic cabling.

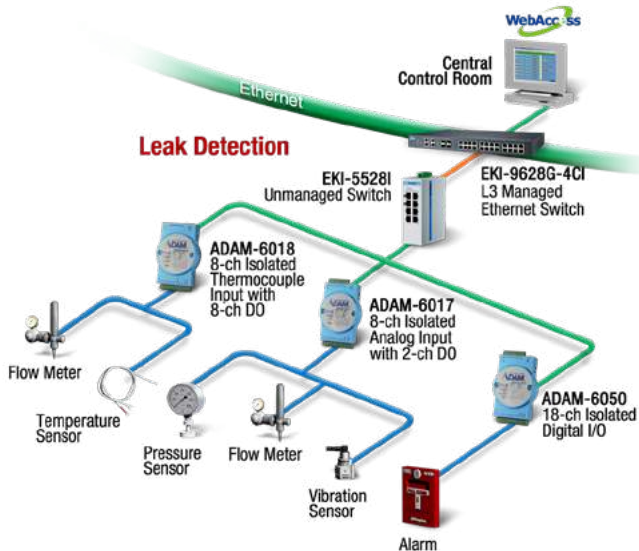
■ Benefits

Class I, Division 2 certification guarantees reliable performance in harsh environments. EKI-7708G's fiber optic capabilities helps central control room engineers view the status of each pump station, enabling fast and efficient response in an emergency.



Oil Pipeline Monitoring

Oil pipelines are made from 0.91 ~ 1.82 m (3 ~ 6 ft) steel or plastic tubes. They have an inner diameter ranging between 10.1 to 121.9 cm (4 ~ 48 in). Most pipelines are buried at a typical depth of about 0.91 ~ 1.82 m (3 ~ 6 ft). As crude oil contains varying amounts of wax, buildups may occur within a pipeline. Often these pipelines are inspected and cleaned using pipeline inspection gauges. These gauges can detect anomalies in the pipes such as dents, metal loss/corrosion, cracking, or other mechanical damage.



System Description

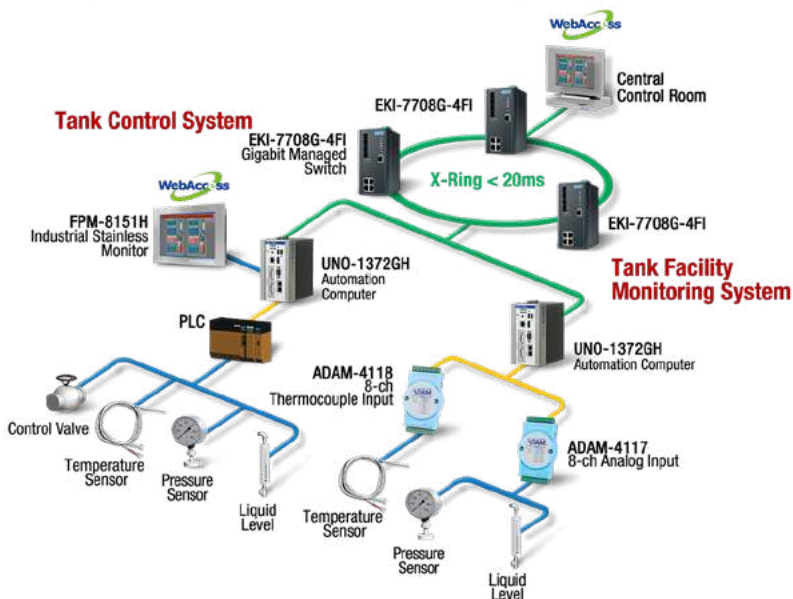
This system helps monitor and transmit the temperature, pressure, flow, and vibration data in an oil pipeline that stretches from China into Russia. Its sensors are connected to a series of ADAM modules—namely, ADAM-6017, ADAM-6018 and ADAM-6050. These modules help process and transmit data to a control room using an EKI-5528I.

Benefits

ADAM-6018 is an excellent temperature data acquisition module for the industrial automation market. In addition to 8 T/C input channels, the ADAM-6018 is equipped with 8 digital output channels including auxiliary alarm outputs or pure outputs. ADAM-6017 is designed with 8 analog inputs and 2 digital outputs to satisfy industrial requirements. Each analog channel can configure an individual range for variety of applications. ADAM-6050 is a high-density I/O module featuring built-in a 10/100 based-T interface for seamless Ethernet connectivity. This module provides 12 digital input and 6 digital output channels with 2000V_{RMS} isolating protection.

Tank Storage Monitoring

This application was setup to help monitor a fueling operation. The information and machine diagnostic data will be collected and sent back to the office and corporate headquarters. An accurate monitoring system not only measures fuel levels, but also temperatures, and estimated volume information.



System Description

The more than 400 Liquefied Natural Gas storage facilities connected to this system necessitate local tank control and remote monitoring. Most oil, fuel, or chemical storage units located in hazardous areas demand constant pressure, liquid levels, control valve, and temperature monitoring. A SCADA-based system for real-time data collection and transmission is essential for plant and personnel safety. A PLC is installed to handle local tank control. Data related to control and monitoring is processed by UNO-1372GH Atom E3845 1.91GHz computers and is accessible in the central control room through EKI-7708G Ethernet switches.

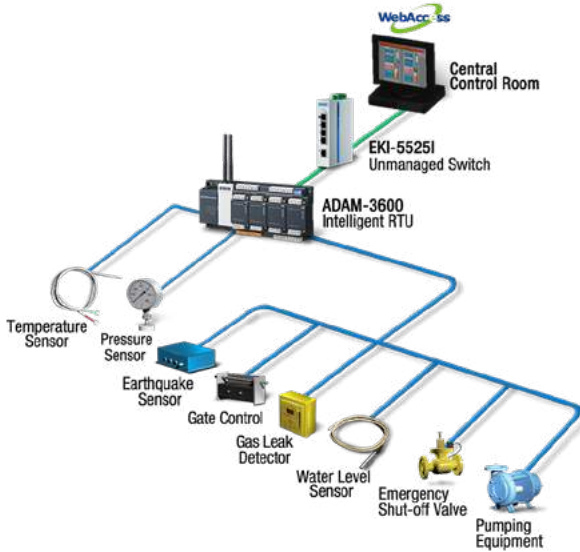
Benefits

In the remote monitoring system of local tanks, the temperature, pressure and liquid levels need to be sent to central control room. UNO-1372GH provides serial communication ports and fast Ethernet interfaces. ADAM-4117 AI and ADAM-4118 thermocouple modules take charge of pressure, liquid levels, and temperature data acquisition. Central control room technicians use Advantech's WebAccess, web-based SCADA software to analyze data from all of the fuel stations.



Equipment Safety Status Monitoring

Supervisory control and data acquisition systems in refineries primarily acquire real-time factory meter data, alerts, and alert design. These systems then give immediate feedback to management systems.



■ System Description

Unmanned compressor stations require reliable monitoring systems. The intelligent Remote Terminal Unit (RTU) is an ideal edge DAQ platform for local emergency control tasks as well as data acquisition and logging. It utilizes diverse I/O interfaces to gather data on several remote devices. It then preprocesses and converts data through communication protocols. Finally it transfers data via an EKI-5525I unmanaged Ethernet switch. EKI-5525I enables secure real-time monitoring in a control room. This solution enables managers to control and monitor situations as they arise.

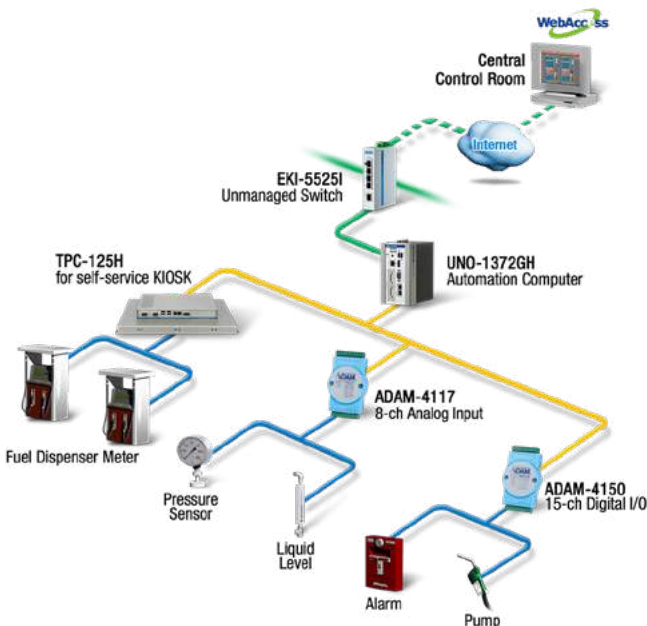
■ Benefits

Advantech's ADAM-3600 RTU delivers reliable and continuous monitoring capabilities; allowing compressor stations to operate safely even without technicians on hand, providing a safe and secure environment for gas compression and transportation.



Fueling Station Management

This project implemented a gasoline pump control system for the dispensing, metering, and monitoring of gasoline tanks at a gas station. This fully automated system streamlined the process of dispensing gasoline and is supported by real-time connectivity between the gas station and its corporate headquarters.



■ System Description

This control and management platform is a turn-key solution UNO-1372GH integrated with ADAM-4000. The ADAM-4080 counter/frequency Input module with two 32-bit counter input channels and a built-in programmable timer for frequency measurement helps manage the data gathered by fuel dispenser meters. ADAM-4117 analog input modules gather tank levels and pressure information. ADAM-4150 digital input/output modules are in charge of trigger alarms and pump on/off toggling. The control and management platform can transmit all information via EKI-5525I Ethernet switch to a designated location.

■ Benefits

In this application Advantech's turn-key system and software are a cost-effective solution. All the products installed provide excellent safety and reliability. The ADAM-4100 series modules are compact, versatile sensor-to-computer interface units designed for reliable operation in harsh environments. Their built-in microprocessors, encased in rugged industrial-grade ABS+PC plastic, independently provide intelligent signal conditioning, analog I/O, digital I/O, LED data displays, and a user-friendly address mode for convenient address reading.



Advantech WebAccess

Browser-based HMI and SCADA Software



Powerful Architecture for Multiple SCADA Servers and Client Applications

Advantech WebAccess is a browser-based software package for human-machine interfaces (HMI), supervisory control, and data acquisition (SCADA). All the features found in conventional HMI and SCADA software packages including animated graphics displays, real-time data control, trends, alarms, and logs are available in an ordinary browser. Advantech WebAccess is based on standard Internet architecture. Its basic components include SCADA node, project node, client and thin client. Advantech WebAccess also features the key functions below.



Remote Diagnostics and Maintenance to Enhance Management Efficiency

Advantech's engineering projects, configurations, graphics building (DRAW), historical data analysis, automatic report generation, and software management (download, start and restart remote nodes) is performed using a standard web browser. If there is any troubleshooting needed, the operator can use a web browser to remotely operate the system. This can significantly increase the efficiency of maintenance operations and reduce the corresponding costs.

Redundant SCADA & COM Ports to Assure Reliable Communications

Advantech WebAccess is built-in to redundant SCADA and COM ports functionality, assuring continuous, reliable communications to automation equipment.

Integrated Audio, Video and Graphic Animations

Advantech WebAccess supports live full-motion video, audio, Adobe Flash, and Windows Media to increase operating efficiency. This enables the monitoring of trends, alarms, and data in a single display.

Free Dynamic DNS Services to Reduce Infrastructure Construction Costs

To decrease the inconvenience of varied IP address and increase convenient network access, Advantech WebAccess provides free dynamic Domain Name System (DNS) services. This function not only reduces infrastructure construction costs, but also provides easy domain network access.

Centralized Data Gateway to WISE-PaaS Cloud Services

By configuring calculated and whitelisted data to WISE-PaaS Cloud services, data from different sites can be analyzed together for further centralized management. The analyzed information can provide advanced scope for resource consumption as well as equipment maintenance and forecasting, benefiting management scope and planning.



Data Acquisition Modules

Advantech's FM approved remote I/O modules, including repeaters, converters, and both RS-485-based and Ethernet-based remote data acquisition modules, provide ideal industrial automation, control, and measurement solutions for confronting harsh environments and demanding applications. What's more, with wide operating temperatures and multiple mounting methods, Advantech's ADAM series can be implemented in diverse applications, making the system always connected and reliable.

RS-485 I/O Modules - Analog Input/Output



Model Name	ADAM-4015	ADAM-4117	ADAM-4118	ADAM-4019+	ADAM-4024
Description	6-ch RTD Module with Modbus	Robust 8-ch Analog Input Module with Modbus	Robust 8-ch Thermocouple Input Module with Modbus	8-ch Universal Analog Input Module with Modbus	4-ch Analog Output Module with Modbus
Resolution	16-bit				12-bit
I/O Channel	AI: 6 differential	8 differential			AO: 4; DI: 4
AI Sampling Rate	10 Hz	10/100 Hz (total)		10 Hz	-
Certifications	Class I Division 2 Groups ABCD T5, RoHS, UL, CE, FCC				
Operation Temperature	-10 ~ 70 °C (14 ~ 158 °F)	-40 ~ 85 °C (-40 ~ 185 °F)		-10 ~ 70 °C (14 ~ 158 °F)	

RS-485 I/O Modules - Digital Input/Output



Model Name	ADAM-4150	ADAM-4051	ADAM-4055	ADAM-4056SO
Description	Robust 15-ch Digital I/O Module with Modbus	16-ch Digital Input Module with Modbus	16-ch Isolated Digital Input Module with Modbus	12-ch Sink Type Isolated Digital Output Module with Modbus /12-ch Source Type Isolated Digital Output Module with Modbus
Channel	DI: 7; DO: 8; Counter: 7 (32-bit)	DI: 16	DI: 8; DO: 8	DO:12 Source type
Counter/pulse output	3khz counter for DI, 1khz pulse output for DO	-	-	-
Certifications	Class I Division 2 Groups ABCD T5, RoHS, UL, CE, FCC			
Operation Temperature	-40 ~ 85 °C (-40 ~ 185 °F)	-10 ~ 70 °C (14 ~ 158 °F)		



Dual Watchdog Timer

All ADAM-4100 robust family modules provide two watchdog timers. The watchdog will reboot the system when the module hangs, and the communication watchdog will re-initialize the RS-485 network if there is no communication for a specific time.



Advanced Security and High Reliability

ADAM-6000 Peer-to-Peer output modules cannot be controlled by non-authorized PCs. It can be controlled by its paired input module. When communication between pairs of ADAM-6000 modules is broken, the digital output module can generate pre-defined values to ensure communications.



Ethernet I/O Modules - Analog Input/Output



Model Name	ADAM-6015	ADAM-6017	ADAM-6024	ADAM-6050	ADAM-6051	ADAM-6052
Description	7-ch Isolated RTD Input Modbus TCP Module	8-ch Isolated Analog Input Modbus TCP Module with 2-ch DO	12-ch Isolated Universal Input/Output Modbus TCP Module	18-ch Isolated Digital I/O Modbus TCP Module	14-ch Isolated Digital I/O Modbus TCP Module with 2-ch Counter	16-ch Source-type Isolated Digital I/O Modbus TCP Module
Resolution	16-bit		16-bit for AI / 12-bit for AO	-	-	-
AI/O Channel	7 RTD	8 AI	6 AI / 2 AO	-	-	-
AI Sampling Rate	10/100 Hz (total)		10 Hz (total)	-	-	-
DI/O Channel	-	2 DO	2 DI / 2 DO	16DI (3khz counter)/ 6 DO (5khz pulse output)	12DI (3khz counter)/ 2 counter (4.5khz) / 2DO (5khz pulse output)	8DI (3khz counter)/ 8 DO (5khz pulse output)
Certifications	Class I Division 2 Groups ABCD T5, RoHS, UL, CE, FCC					
Operation Temperature	-10 ~ 70 °C (14 ~ 158 °F)			-40 ~ 70 °C (-40 ~ 158 °F)		

Repeaters / Converters



Model Name	ADAM-4510I	ADAM-4520I
Description	Robust RS-422/485 Repeater	Robust RS-232 to RS-422/485 Converter
Network	RS-422/485	RS-232/422/485
Comm. Speed (bps)	1,200 ~ 115.2k	
Comm. Distance	Serial: 1.2 km	
Isolation Voltage	3,000 V _{dc}	1,000 V _{dc}
Certifications	Class I Division 2 Groups ABCD T5, RoHS, UL, CE, FCC	
Operation Temperature	-40 ~ 85 °C (-40 ~ 185 °F)	

Repeaters / Converters



Model Name	BB-485DRCI	BB-485DRCI-PH	BB-FOSTCDRI BB-FOSTCDRI-INV	BB-FOSTCDRI- PH-MT	BB-2320PDRI BB-4850PDRI	BB-2320PDRI-PH BB-4850PDRI-PH	BB-USR602 BB-USR604	BB-UHR304 BB-UHR307	BB-UHR204 BB-UHR207	
Description	Industrial Isolated Converter	Hardened Industrial 2kV Isolated Converter	Industrial 2kV Isolated Serial to Fiber Converters	Hardened Industrial 2kV Isolated Serial to Fiber Converters	Industrial 2kV Isolated Repeaters	Hardened Industrial 2kV Isolated Repeaters	2kV Isolated Converters	4kV Isolated Hubs	Non-isolated Hubs	
Connector 1	DB9F		Terminal block		DB9F or TB		2 or 4 DB9M	4 or 7 Type A female		
Connector 2	Terminal block		Fiber, multi-mode, ST		DB9M or TB		Type B	1 Type B female		
Protocol	RS232 to RS422/485		Serial to fiber optic		RS-232 or RS-422/485		USB 1.1/2.0 to serial	USB 1.1, 2.0		
Isolation	2kV (input, output, power)		2kV (input, output, power), EMI, RFI		2kV (input, output, power)		2kV isolation, 15kV air, 8kV ESD	4kV isolation, 15kV air, 8kV ESD	-	
Data Rate	Up to 115.2kbps						480 Mbps full-speed USB; 921.6 kbps serial	12 Mbps, full-speed	480 Mbps, high-speed	
Operating Temperature	-40 ~ 80 °C (-40 ~ 176 °F)	-40 ~ 85 °C (-40 ~ 185 °F)	-40 ~ 80 °C (-40 ~ 176 °F)	-40 ~ 85 °C (-40 ~ 185 °F)	-40 ~ 80 °C (-40 ~ 176 °F)	-40 ~ 85 °C (-40 ~ 185 °F)	-40 ~ 80 °C (-40 ~ 176 °F)			
Enclosure	IP 30, plastic	IP 30, metal	IP 20, plastic	IP 30, metal						
Mounting	35mm DIN rail	Panel	35mm DIN rail	Panel	35mm DIN rail	Panel (DIN rail option)	DIN rail, panel	Desk, DIN rail, panel		
Power Input	10 - 48V _{dc}						10 - 30V _{dc}			
Industrial Bus	Modbus ASCII, RTU, Allen-Bradley® DH-485		Modbus ASCII, RTU		Model# BB-4850PDRI: Modbus ASCII, RTU, Allen-Bradley® DH-485		Model# BB-4850PDRI-PH: Modbus ASCII, RTU		-	
Special Features	-	-	Model# BB-FOSTCDRI-INV has inverted fiber state	-	Signal extension 15m/1.2km	Signal extension 15m/1.2km	High retention USB ports			
Certifications	UL C1/D2, UL508, FCC, CE		UL C1/D2, FCC, CE						UL C1/D2, FCC, CE, KCC (7-port only)	

Industrial Communication

Advantech provides interconnected solutions with industrial networking, device connectivity, and industrial wireless technology. With industrial-grade product design, Advantech's network communication products have passed the harsh tests of various vertical markets, such as IEC 61850 for substation automation, EN50155 for railway automation, and UL508 safety for industrial control equipment. In order to fulfill the connecting needs of hazardous applications, Advantech offers a comprehensive line of UL approved Class , Division 2 Groups A, B, C, D industrial communication solutions, including industrial ethernet switches, media converters, serial device servers, and modbus gateways.

Industrial Ethernet Switch



Model Name	EKI-2726FHPI	EKI-5524MMI/MMI-ST	EKI-5524SSI/SSI-ST	EKI-5525I	EKI-5526I	EKI-5526I-EI/MB/PN	EKI-5528-PNMA	EKI-5528I	EKI-5528I-EI/MB/PN
Description	4GE PoE +2G SFP w/4 802.3at PoE Industrial Switch	4+2MMF 10/100Mbps Switch, (w/ST), -40 ~ 75 °C (-40 ~ 167 °F)	4+2SMF 10/100Mbps Switch, (w/ST), -40 ~ 75 °C (-40 ~ 167 °F)	5-port 10/100Mbps Switch, -40 ~ 75 °C (-40 ~ 167 °F)	16-port 10/100Mbps Switch, -40 ~ 75 °C (-40 ~ 167 °F)	16FE Switch, (w/ EtherNet/IP, TCP/IP or PROFINET), Wide Temperature	8FE Switch with PROFINET MRP Master	8-port 10/100Mbps Switch, -40 ~ 75 °C (-40 ~ 167 °F)	8FE Switch with EtherNet/IP, TCP/IP or PROFINET, Wide Temperature
Port Number	6	6	6	5	16	16	8	8	8
Certification	CE, FCC, UL61010								



Model Name	EKI-5626CI	EKI-5626CI-EI/MB/PN	EKI-5629CI	EKI-5629CI-EI/MB/PN	EKI-5725I	EKI-5726FI	EKI-5726I	EKI-5728I	EKI-5729FI
Description	16+2G Combo Gigabit Ind. Switch, -40 ~ 75 °C (-40 ~ 167 °F)	16FE+2G Switch with EtherNet/IP, TCP/IP or PROFINET, Wide Temperature	8+2G Combo Gigabit Switch, -40 ~ 75 °C (-40 ~ 167 °F)	8FE+2G Switch with EtherNet/IP, TCP/IP, PROFINET, Wide Temperature	5-port Full Gigabit Ind. Switch, -40 ~ 75 °C (-40 ~ 167 °F)	16G+2G Full Gigabit Ind. Switch, -40 ~ 75 °C (-40 ~ 167 °F)	16-port Full Gigabit Switch, -40 ~ 75 °C (-40 ~ 167 °F)	8-port Full Gigabit Switch, -40 ~ 75 °C (-40 ~ 167 °F)	8G+2G Full Gigabit Switch, -40 ~ 75 °C (-40 ~ 167 °F)
Port Number	18	18	10	10	5	18	16	8	10
Certification	CE, FCC, UL61010								

Industrial Injector

Media Converter



Model Name	EKI-2711HPI	EKI-2741FHPI	EKI-2741FPI	EKI-2742FPI	EKI-2541M/MI	EKI-2541S/SI
Description	High power 60W PoE Injector	Gigabit Media Converter SFP with 1x PoE 60W	Gigabit Media Converter SFP with 1x PoE 802.3at	Gigabit Media Converter SFP with 2x PoE 802.3at	Ethernet to multi-mode Fiber Media converter, (Wide Temperature)	Ethernet to single-mode fiber media converter, (Wide Temperature)
Port Number	2	2	2	3	2	2
Certification	UL61010 (UL508) C1D2				UL60950 C1D2	



Serial Device Servers



Model Name	EKI-1521/I/CI	EKI-1522/I/CI	EKI-1524/I/CI
No. of Ethernet Port	2	2	2
No. of Serial Port	1	2	4
Ethernet Interface	10/100 Mbps		
Serial Type	RS-232/422/485		
Connector	Ethernet	RJ45	
	Serial	DB9	
Baud Rate	50 ~ 921.6 kbps , any baud rate setting		
Operating Mode	Virtual COM, TCP Server, TCP Client, UDP, Peer to Peer, AT Command, and RFC2217 modes		
Driver	32-bit/64-bit Windows 2000/XP/Vista/7, Windows Server 2003/2008, Windows CE 5.0/6.0, and Linux		
Certifications	Class I Division 2 Groups ABCD T4, UL/cUL 60950-1, FCC, CE, RoHS		

Model Name	BB-VESR901 BB-VESR902D
No. of Ethernet Port	1 (RJ45)
Ethernet Interface	10/100
No. of Serial Port	1 (DB9 or TB) 2 (TB)
Serial Type	RS-232/422/485
Data Rate	Up to 230.4 kbps
Power	10 to 48V DC
Operating Temperature	-40 ~ 85 °C (-40 ~ 185 °F)
Enclosure	IP30
Mounting	35mm DIN (panel option)
Certifications	FCC, CE, UL, UL C1/D2

Modbus Gateways



Model Name	EKI-1221	EKI-1222	EKI-1224
No. of Ethernet Ports	2	2	2
No. of Serial Ports	1	2	4
Ethernet Interface	10/100Mbps		
Serial Type	RS-232/422/485, software selectable		
Ethernet Feature	Dual Ethernet Redundancy		
Configuration	Windows Configuration Utility, Web-Browser Console		
Operating Mode	Modbus RTU Master, Modbus RTU Slave, Modbus ASCII Master, and Modbus ASCII Slave modes		
Baud Rate	50 bps ~ 921.6 kbps		
Certifications	Class I Division 2 Groups ABCD T4, UL/cUL 60950-1, FCC, CE, RoHS		

Model Name	BB-MESR901 BB-MESR902T
No. of Ethernet Port	1 (RJ45)
Ethernet Interface	10/100
Modbus	TCP, ASCII, RTU
No. of Serial Port	1 (DB9 or TB) 2 (TB)
Serial Type	RS-232/422/485
Data Rate	Up to 230.4 kbps
Power	10 to 48V DC
Operating Temperature	-40 ~ 85 °C (-40 ~ 185 °F)
Enclosure	IP30
Mounting	35mm DIN (panel option)
Certifications	FCC, CE, UL, UL C1/D2

Cellular Router and Gateways



Model Name	SmartFlex BB-SR303, BB-SR305	SmartFlex BB-SR300
Type	Flexible 4G Router & IoT Gateway	Wired LAN Router
CPU / RAM	Cortex A8 CPU at 1GHz 256 MB flash memory, 512 MB RAM, 128kB M-RAM	Cortex A8 CPU at 1GHz 256 MB flash memory, 512 MB RAM, 128kB M-RAM
OS	Linux	Linux
SIM / Ethernet ports / Serial Ports	2x SIM, 2x-5x (10/100Base-T), RS232* / RS422* / RS485*	5x (10/100Base-T)
Other Ports / Expansions	USB Host, I/O (2xIN, 1xOut), SD Card, PoE* (PD, PSE)	USB Host, I/O (2xIN, 1xOut), SD Card, PoE* (PD, PSE)
Wi-Fi / GNSS	Yes* / Yes*	Yes* / -
Operating Temperature	-40 ~ 75 °C (-40 ~ 167 °F)	-40 ~ 75 °C (-40 ~ 167 °F)
Casing	Plastic* / Metal*	Plastic* / Metal*
Certification	Anatel, CE, FCC/IC, UL C1D2/ATEX, E-Mark	Anatel, CE, FCC/IC, UL C1D2/ATEX, E-Mark

Industrial Monitors and Controllers

Carrying industrial automation technology into the oil and gas industry, Advantech offers industrial monitors, the FPM series, two categories of automation controllers including embedded automation computers, the UNO-1372GH, and Programmable Automation Controllers, the APAX series, to fulfill various application needs. Both the FPM and UNO-1372GH have passed Class I, Division 2 Groups A,B,C,D certification, which extends use to hazardous applications. UNO-1372GH is fanless, with no internal cabling and no moving parts, with a wide power input range and dual Ethernet to assure reliability and security.

Industrial PCs and Monitors



Model Name	FPM-8151H	TPC-125H	TPC-1881WP
Size (diagonal)	15" XGA	12"	18.5"
Resolution	1024 x 768	1024 x 768	1366 x 768
Colors	16.2 M	16.2 M	16.7 M
Viewing Angle	160, 140	178/178	170/160
Luminance	350	600	300
Direct VGA Input	Yes	-	-
DVI Input	Yes	-	-
Touchscreen (optional)	Resistive	-	-
OSD (onscreen display)	Yes	-	-
Power Adapter(voltage, AC)	100-240 V	18 W (Typical)	28W Typical, 60W Max. (Without Add-on card)
DC Power Input (voltage)	24 V _{DC}	24V _{DC} +/- 20%	24V _{DC} +/- 20%
Front Panel Ingress Protection	IP65	-	-
Operating Temperature	-20 ~ 60 °C (-4 ~ 140 °F)	-	-
Dimensions (W x H x D)	338 x 68 mm (16.61 x 13.31 x 2.68 in)	311.8 x 238 x 55.4 mm (12.28 x 9.37 x 2.18 in)	488 x 309 x 56.7 mm (19.21 x 12.17 x 2.23 in)
Certifications	Class I Division 2 Groups ABCD T4, UL, CCC, CE, FCC Class A, RoHS	-	-

Embedded Automation Computer



Model Name	UNO-410	UNO-430	UNO1372GH
Certification	C1D2, ATEX (opentype), CE, FCC, UL, CCC, BSMI	C1D2, ATEX (standalone), CE, FCC, UL, CCC, BSMI	C1D2, CE, FCC, UL, CCC, BSMI
Protection	IP40	IP66	IP40
CPU	Intel Atom® X5-E3940, 1.8 GHz Quad Core	Intel Atom® X7-E3950, 2.0 GHz Quad Core	Intel Atom® E3845, 1.91 GHz Quad Core
Onboard RAM	Built-in 8GB DDR3L 1333 MHz, support up to 8GB	Built-in 8GB DDR3L 1333 MHz, support up to 8GB	Built-in 4GB DDR3L 1333 MHz, support up to 8GB
Battery-Backup RAM	-	-	-
Onboard Storage	-	-	-
Hardware Security	onboard TPM 2.0	onboard TPM 2.0	TPM 2.0 (optional)
Display	2 x DP	-	1 x VGA, 1 x HDMI
I/O	2 x RS-232/422/485 (Terminal Block), 4 x USB3.1 Isolated 8DI/ 8DO, 2 X RJ45, 10/100/1000Mbps	2 x isolated RS-422/485, 1 x RS-232 (console), 2 X RJ45, 10/100/1000Mbps	1 x RS232, 1 x RS422/485, 1 x USB 3.0, 3 x USB 2.0, Isolated 4DI/ 4DO, 3 X RJ45, 10/100/1000Mbps, 1 x Line-Out
PCIe/PCI Expansion	1*Full-size mPCIe	1 x M.2 B key 3042 for LTE module 1 x M.2 E key 2230 for Wifi module	2*Full-size mPCIe
Storage	1 x M.2 B key (Both for 3042 LTE Module and 2242 SSD), 1 x 2.5" SSD bay	1 x M.2 B-key (2242)	1 x mSATA 1 x 2.5" HDD bay
SIM Card slot	1 (nano)	1 (standard)	NA
Operating Systems	Win10, Win10 LTSC, AdvLinux	Win10, Win10 LTSC, AdvLinux	WIN7/8, WES7, Win10 Ent., AdvLinux
Mounting	DIN rail mount	Wall mount	DIN rail/ Wall mount
Power Input Range	10-36V _{DC}	10-36V _{DC}	10-36V _{DC}
Operating Temperature	-40 ~ 70 °C (-40 ~ 158 °F)	-40 ~ 70 °C (-40 ~ 158 °F)	-20 ~ 60 °C (-4 ~ 140 °F)
Power Consumption	35W (Typical), 55W (Max)	15W (Typical), 30W (Max)	24W(typical), 50W(Max)
Dimensions (W x D x H)	35 x 105 x 150 mm (1.37 x 4.13 x 5.90 in)	200 x 68 x 200 mm (7.87 x 2.67 x 5.90 in)	85 x 139 x 152 mm (3.34 x 5.47 x 5.98 in)
Weight	1 kg (2.2 lb)	3 kg (6.61 lb)	1.6 kg (3.52 lb)



Automation Controllers

Remote Terminal Unit (RTU)



Model Name	ADAM-3600
Description	Intelligent RTU
CPU	Cortex A8
RAM	DDR3L 256MB
On-Board IO	8 analog inputs, 8 digital inputs, 4 digital outputs
Slot	4 expansion slots
Wireless Communication	Cellular, Wi-Fi, Zigbee
Mini-PCle	1 x half-size, 1 x full-size
SIM Card Slot	Single SIM card slot / Dual SIM card slot
LAN	2
COM	2
USB	1
OS Version	Linux RT 3.12
Certification	CE/FCC



Wide Array of Flexible I/Os

Wide array of on-board I/O and flexible expansion I/O modules supporting different acquisition requirements giving it a high cost performance



Intelligent Connectivity Diagnosis Manager (iCD Manager)

Remotely monitor serial and Ethernet port status and send alarm information during communication failures to help improve intelligent monitoring.



Wide Temperature Range

A -40 ~ 70 °C (-40 ~ 158 °F) operating temperature allows the ADAM-3600 to work in harsh environments and reduces maintenance costs for customers.

Expansion Module for ADAM-3600



Model Name	Category	Channel
ADAM-3617	Analog input module	4
ADAM-3618	Analog input module	4, thermocouple
ADAM-3624	Analog output module	4
ADAM-3651	Digital input module	8
ADAM-3656	Digital output module	8
ADAM-3613	Analog input module	4, RTD
ADAM-3668	Relay module	4

Analog Input	
Signal Input	Differential
Sampling Rate	10 Hz
Voltage Input	'+/- 10 V, +/- 2.5 V
Input Current	0~20 mA, 4~20 mA
Sensor Input	Thermocouple (type J, K, T, E, R, S, B) RTD (Pt100, Pt1000, Balco 500, Ni 518)
ADAM-3613	16-bit

Analog Output	
Output Voltage	0~10 V
Output Current	0~20 mA, 4~20 mA
Resolution	'12-bit

Digital Output	
Output Type	Open collect
Output Voltage	8~30 V _{DC} @ max 200 mA

Digital Input	
Input Type	Sink
Rated Voltage	12/24 V _{DC}
Logic "0" Voltage	'0~5 V _{DC}
Logic "1" Voltage	11~30 V _{DC}

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