

# The Right Connection for Class 1/Division 2 Solutions



Connectivity and Communication Solutions Designed to Operate in Hazardous Environments

The Class I, Division 2 (C1D2) safety certification is an OSHA-mandated requirement for devices in many industrial applications. A C1D2 hazardous location is defined as areas where flammable liquids, gases or vapors or combustible dusts exist in sufficient quantities to produce an explosion or fire.

In hazardous locations, specially designed equipment and special installation techniques must be used to protect against the explosive and flammable potential of these substances.

Due to the safety concerns of hazardous locations, the National Electrical Code (NEC) and Canadian Electrical Code (CEC) have developed standards to address these concerns. They have also outlined specific testing procedures the equipment used in these areas need to undergo in order to negate the safety risks.

According to the NEC, there are three types of hazardous locations categorized by three classes: Class 1 (gases, vapors, and liquids), Class II (dusts), and Class III (fibers and flyings). Various hazardous applications in these Class 1 locations may include the following:

- oil field drilling;
- pump station monitoring;
- chemical plants;
- pharmaceutical factories;
- oil pipeline monitoring;
- tank storage monitoring;
- fuel station management and more.

From human machine interface (HMI), embedded automation computers, I/O modules, network gateways, Ethernet switches and more, Advantech offers the C1D2-certified solutions you need to meet regulatory standards and establish safe, reliable data communications in potentially hazardous environments.

Advantech leverages more than 30 years experience in the automation industry to design different product offerings and solutions for reliable use in hazardous locations, including various products that have passed C1D2 Groups A, B, C, D certification.



## What Does “Class 1/ Division 2” Mean?

In North America, all hazardous areas are classified by the likelihood of an ignitable concentration of combustible material.

**Class I** – Flammable gases, flammable liquid produced vapors, and combustible liquid produced vapors. *EX: Natural Gas, Propane, Hydrogen, Methanol, etc.*

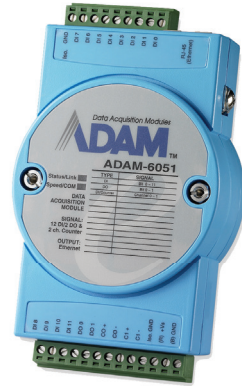
**Division 2** – Ignitable concentrations of flammable gases, flammable liquid-produced vapors, or combustible liquid-produced vapors are not likely to exist under normal operating conditions.

According to the ignition temperature of the substance, its explosion pressure, and other flammable characteristics, the gases and vapors of Class I locations are broken into four groups by the *Codes: A, B, C, and D.*

# IoT Product Solutions for C1D2

## Data Acquisition Modules

Advantech's 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.



- **ADAM-4000 Series:** RS-485 I/O Analog Input / Output Modules and RS-485 I/O Digital Input / Output Modules
- **ADAM-6000 Series:** Ethernet I/O Modules
- **ADAM-4500 Series:** Repeaters / Converters
- **ADAM-3000 Series:** Isolated Signal Conditioning Modules

## Industrial Communications

With industrial-grade product design, Advantech's industrial communication products have passed the harsh tests of various vertical markets, such as IEC 61850 for substation automation and UL508 safety for industrial control equipment. In order to fulfill the networking needs for hazardous applications, Advantech offers a comprehensive line of UL-approved Class I, Division 2 Groups A, B, C, D industrial communication solutions: Industrial Ethernet Switches, Media Converters, Serial Device Servers, and Modbus Gateways.



- **EKI-7000 Series:** Managed Ethernet Switches
- **EKI-2000 Series:** Unmanaged Ethernet Switches
- **EKI-1000 Series:** Serial Device Servers, Programmable Device Servers, Modbus Gateways, Media Converters

## Industrial Panel PCs and Monitors

Carrying industrial automation technology into the oil and gas industry, Advantech offers industrial monitors in the FPM series. The FPM-8151H is a particularly rugged and reliable 15" XGA wide temperature industrial monitor for a variety of industry applications. Equipped with a wide operating temperature range of -20 ~ 60°C (-4 ~ 140°F), it can satisfy the demands of a wide range of harsh industrial applications. The TPC-1881WPH panel PC features an Intel 4th Generation Core i5-4300U 1.9GHz processor with 4GB/8GB. It's designed to be safely operated for a variety of C1D2 industry applications.

- **FPM-8151H:** 15" XGA Industrial Monitor for Hazardous Locations
- **TPC-1881WPH:** 15" XGA Industrial Monitor for Hazardous Locations
- **TPC-1251T-E3BE:** 12" XGA Industrial Monitor Thin-Client Terminal for Hazardous Locations with Intel® Atom™ Processor



## Embedded Automation Computers

The UNO-1372GH is designed to be safely operated in locations that are UL listed for Hazardous Locations with Class I, Division 2, groups A, B, C, D T4A certification. The UNO-1372GH is an Intel Atom DIN-rail PC, which features innovative iDOOR Technology for automation applications. It provides rich I/O, including: 3 x GbE, 3 x USB, 2 x COM, 1 x VGA, 1 x HDMI, Audio, iDoor, 8 x DIO, all of which can be locked with a lockable kit to ensure a spark-free in harsh environment.

- **UNO-1372GH:** C1D2 Intel® Atom™ Quad-Core Control DIN-rail PC



## LTE-WiFi Gateway

The SmartFlex LTE-WiFi Gateway from Advantech provides secure, carrier-flexible connectivity for devices and LANs via LTE networks. The gateway can be used to provide automatic wireless fail-over for wired networks, wireless connectivity for mobile assets, and wireless connectivity for devices in remote locations where cable connections are impractical. SmartFlex is rated C1D2, meeting requirements for hazardous environments.

- **BB-SR305:** SmartFlex for North America
- **BB-SR300 Series:** SmartFlex without 3G/LTE function
- **BB-SR303 Series:** SmartFlex for Europe



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