



Infrastructure

Utilities | Energy | Agriculture | Oil & Gas | Mining

About Winmate

Founded in 1996, Winmate Inc. is a pioneer in rugged computing technology. Winmate has provided business leaders worldwide with reliable, robust solutions for the most challenging industrial conditions for over two decades. From R&D to manufacturing to in-house testing, Winmate Inc. manages the entire product development process with ready-made products available for quick deployment. Today Winmate's innovative approach has helped countless enterprises at every level with equipment automation and seamless Industrial Internet of Things (IIoT) integration.

From the industrial display, panel PC, HMI, embedded systems to rugged mobile devices, Winmate caters to industries ranging from transportation and logistics to marine and military, railway, oil, and gas, and provides customization services to create a unique solution for specific customer requirements.

The Winmate Difference

Innovation and Ruggedness

With innovation and ruggedness, our products are designed to meet the requirements of vertical markets' environmental standards.

Engineering Intelligence

We are committed to maintaining the highest standards in engineering excellence to ensure our products deliver reliability, durability, and optimized performance.

Quality Commitment

Quality assurance and entire engineering processes are conducted in-house. It is why we invested significantly in our state-of-the-art testing facility with additional global support.



Efficiency

Our team is committed to efficiency and maintaining the shortest possible development cycles. The whole development process is conducted in-house to achieve the market advantage in speed and quality from design to testing.

Reliability

Reliability, service, and support are part of our foundation. Every product scrutinizes industrial standards testing to verify electrical, mechanical, thermal, and firmware design performance.

Customized Solutions

Years of experience allow Winmate to offer customized solutions for different applications.

From product design to accessories, our engineering team designs and support the system integration process.

- CUSTOMIZED CONFIGURATION
- CUSTOM OS IMAGE
- CUSTOM BIOS
- FNCLOSURE DESIGN
- PERIPHERALS AND OPTIONS
- CUSTOM-DESIGNED ACCESSORIES

Technical Know-How

We understand that access to cutting-edge solutions purposely built for their applications is imperative for enterprises operating in rugged or potentially hazardous environments. As a result, Winmate locates its resources from project research and design, software development and customization, product verification and validation, and in-house testing to research and implement the latest technologies available.

The latest technologies we deploy for our rugged products:



- Dry and wet optical bonding
- Panel enhancement for sunlight readability
- Anti-reflection (AR) and anti-glare (AG) glass protection coating
- Light sensor
- Hyper dimming
- Electronic potting
- Touch screen integration: projected capacitive, resistive, or SAW touch

- Waterproof enclosure
- Military EMI and mesh coating
- Wireless capabilities
- Data capture devices integration
- Defroster for ultra-low temperature environments
- Stainless steel SUS 316/ AISI 316
- Shock and vibration resistance
- Wide-range operation temperature

Field Service Solutions

Overview

Field service workers face various challenges working in remote locations and unfamiliar environments, and every minute of downtime results in lost revenue. Access to critical information and wireless communications are top priorities for workers to provide fast service. Winmate provides rugged mobile solutions capable of increasing productivity in the field.

Our rugged mobile solutions are built to withstand the rigors of the harshest environments and are designed to improve the efficiency and productivity of field workers. Durable portable computers allow workers to access information anytime, no matter where the task brings them. Wireless connectivity, data collection, and data transfer features allow workers to keep in touch with the operations control all day long.

Our rugged mobile computers include:

- The latest Android™ or Windows® operating system
- Advanced data collection options
- Durable design

Winmate's rugged mobile computers are built to last, reducing the total cost of ownership over time. Retailers, manufacturers, logistics companies, and field service organizations all choose Winmate mobile computers every day to improve daily operations.

Technology

Winmate offers Android and Windows-based rugged mobile computers with additional application-focused features such as barcode scanners, RFID, and NFC readers. All the devices are solid, waterproof, and drop resistant.

Application-focused features:

- Built-in barcode, RFID, fingerprint scanners
- Wireless connectivity 3G/4G LTE, WLAN, BT, GPS
- Waterproof and dustproof enclosure
- Shock, drop, and vibration resistance





RUGGED TABLETS

Portable and wireless rugged tablet computers can survive in any environment and get real work done.



VEHICLE-MOUNTED COMPUTERS

Rugged vehicle-mounted computers are used for data collection in the warehouse and logistic applications, designed to fit seamlessly into forklifts, trucks, and other vehicles.



G-WIN PANEL PC

Rugged Panel PC are used for data collection in the warehouse and logistic applications, designed to fit seamlessly into forklifts, trucks, and other vehicles.

Success Story

Field Work Inspection



Background

Inspection systems for industrial fieldwork are essential for safeguarding public areas and industrial operations. With portable digital radiography (DR) technology, field workers can use its x-ray scanning features to evaluate power lines and even preventive maintenance in oil or gas applications. Likewise, accurate DR systems can be used for industrial surveillance and construction site evaluations where a precise panel PC could be the difference between life and death.

Core Products

Industrial Panel PC

• 13.3" Ultra-Rugged Tablet M133WK Series

Main Challenges

- Accurate x-ray inspections in industrial fieldwork
- Exposure to different weather conditions
- Responsive touch screen
- High performance

Why Winmate

- Sunlight readable display with optical bonding technology
- Highly sensitive PCAP touchscreen
- Rugged design, IP65 water and dustproof
- High performance and fanless cooling system

DIGITAL
RADIOGRAPHY
FOR EVALUATION
AND PREVENTIVE
MAINTENANCE
IN FIELD SERVICE
APPLICATIONS.



Application Diagram: Portable Digital Radiography

Application Story

Industrial Field Work



Background

Field service workers face various challenges working in remote locations and unfamiliar environments, and every minute of downtime results in lost revenue. Access to critical information and wireless communications is the top priority for workers to provide fast service. Winmate comes with rugged mobile solutions capable of increasing productivity in the field.

Core Products

- Rugged mobile computer E430 Series, E500 Series
- Rugged tablet M101 Series

Main Challenges

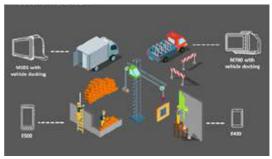
- Changing weather conditions
- Work in remote locations
- Data collection

RUGGED MOBILE DEVICES TO PERFORM INSPECTION, UTILITY CONTROL AND REAL-TIME



Why Winmate

- Rugged design
- Shock, drop, and vibration resistance
- Wireless communications



Application Diagram: Industrial Field Work





Barcode Reader NFC RFID Reader

Application



Delivery Services

"RUGGED MOBILITY IN A POCKET-SIZED DEVICE"

A famous chain store now uses versatile 4.3" Rugged Mobile Computer E430 with integrated 1D/2D barcode scanner to increase delivery services' efficiency. Ultimate productivity and data collection tools combined in a pocket-sized device to speed up delivery time and increase customer satisfaction

4.3" Android Rugged Handheld Computer **E430RO8**







RUGGED EFFICIENCY ON-THE-GO.

22

- 4.3", 480 x 800, PCAP touchscreen
- Qualcomm[®] Snapdragon[™] 660 (Octa-Core 2.2 GHz)
- Android 9.0

3 GB RAM, 32 GB eMMC

8 MP webcam, 13 MP rear camera with autofocus

Ambient light sensor, E-compass, Gyro & acceleration aensors

WLAN, BT

USB 3.0 Type C (OTG), docking connector

NFC (Read / Write, Peer-to-Peer mode)(Optional)

260g lightweight portability

IP65 waterproof and dustproof

MIL-STD-810G shock, vibration and drop resistance

5" Ultra-Rugged Handheld Computer

E500QK













RUGGED DESIGN BUILT TO SURVIVE.

- 5", PCAP touchscreen
- Qualcomm[®] Snapdragon[™] 660 (Octa-core 2.2 GHz)
- Android 9.0

Optical bonding for sunlight viewability

8MP Front / 13MP Rear Camera

WLAN, BT. GPS/AGPS

19 keypad include power key

Military standard connector (default USB + Power, optional LAN & Audio)

Ambient Light Sensor, E-compass, Gyro, Acceleration Sensors, Automatic Screen Rotation

Battery operating time up to 20 hr

IP67 waterproof and dustproof

MIL-STD-810G shock, vibration and drop resistance

Custom configuration





Docking Connector NFC RFID Reader



Application



Field Training Exercises

"COMPACT AND DURABLE HANDHELD COMPUTER"

Rugged specifications of the compact E500QK handheld computer mean that military personnel can take photos, enter data, and take photos in any harsh environment. The latest Android operating system offers tremendous potential for developing or adapting mobile computer applications, allowing the military to acquire the newest technology rapidly.





Barcode Reader

NFC RFID Reader



Application



Forklift Solution

"FROM FIXED MOUNTING TO PORTABLE SOLUTION"

The compact M700DM8 rugged tablet with custom vehicle docking delivers a portable and robust solution for warehouse management and route optimization.

7" Rugged Android Tablet M700DQ8 Series







COMPACT. DURABLE. VIBRATION RESISTANT.

• 7", 1280 x 720, PCAP touchscreen

Qualcomm[®] Snapdragon[™] 660, Octa-core up to 2.2 GHz

Android 9.0

3 GB RAM, 32 GB eMMC

Support Hand/ Gloves and Rain mode

Ambient light sensor, E-compass, Gyro & acceleration aensors, automatic screen rotation

8 MP webcam, 13 MP rear camera with autofocus

USB 3.0 Type C (OTG), docking connector

WLAN, BT, GPS/GLONASS

NFC (Read / Write, Peer-to-Peer mode)(Optional)

550g lightweight portability

IP65 waterproof and dustproof

MIL-STD-810G shock, vibration and drop resistant

10.1" Windows Rugged Tablet M101S



ROBUST TABLET TO WITHSTAND INDUSTRIAL USE.

- 10.1", 1920 x 1200, PCAP touchscreen
- Intel® Core™ i5-7200U Kaby Lake 2.5 GHz, up to 3.1GHz
- Intel® Core™ i5-7300U Kaby Lake 2.60 GHz, up to 3.5 GHz
- Windows 10 IoT Enterprise (Optional)

4 GB DDR4 SDRAM, 128 GB SSD, micro SDXC card slot

Light sensor, g-sensor, Gyro

2 MP webcam. 8 MP rear camera with autofocus

HF RFID 13.56MHZ (Optional)

USB 3.0 Type-A, USB 3.0 Type-C, docking connector

WLAN, BT, GPS, GLONASS

IP65 waterproof and dustproof

MIL-STD-810G shock, vibration and drop resistance

Custom configuration











Reader





Port



High Capacity Battery 16hr

Application



Delivery Service

"INSTANTLY ACCESS ORDER INFORMATION"

The M101S rugged tablet with an LTE module and barcode scanner boosts productivity and speeds up delivery services, giving quick access to order information anywhere you go. The solution includes a vehicle cradle for in-vehicle mounting and charging.





Memory

Storage





HF RFID Reader

Barcode Reader



WWAN

Application



Connected Truck

"CONNECTIVITY FOR VEHICLES ON THE ROAD"

Winmate developed a smart truck solution for a heavy-duty vehicle. Installed on a dashboard by vehicle cradle, the 8" rugged tablet M900P and custom designed vehicle gateway VG-100 now connect in-vehicle systems and allow status monitoring of a semi-truck in Europe.

8" Windows Rugged Tablet M900P/ PT Series



**** PORTABLE AND POWERFUL**SOLUTION

- 8", 1280 x 800, PCAP touchscreen
- Intel® Pentium® N4200 (2M Cache, up to 2.5 GHz)
- Windows 10 IoT Enterprise

4 GB LPDDR4, 64 GB SSD

Light sensor, g-sensor, Gyro, E-compass

2 MP webcam, 8 MP rear camera with autofocus

WLAN, BT, GPS, GLONASS

USB 3.0 (Type A), USB 3.0 (Type C), docking connector

D-sub for vehicle gateway connection

Built-in smart card reader (Default M900PT)

IP65 waterproof and dustproof

MIL-STD-810G shock, vibration and drop resistance

10.1" Windows Rugged Tablet

S101TG



RUGGED ENOUGH TO WITHSTAND WEAR & TEAR.

- 11th generation Intel[®] Tiger Lake processor
- 1920 x 1200 WUXGA with PCAP touch
- Anti-glare Treatment

Sunlight readability technology

2MP webcam, 8MP Auto-focus rear camera

IP65 waterproof and dustproof

MIL-STD-810H shock, vibration, and drop

1D/2D barcode reader

Ethernet thru Giga LAN (RJ45)

Real-time data and wireless connectivity

Brilliant 10.1" display with ultimate touch csapability

Custom configuration







Memory

Storage WWAN







GigaLAN Port

AIN Battery Hotswap

Expansion Port



Micro HDMI Port

Application



Industrial Field Work

"MOBILE DEVICES BUILT TO WITHSTAND THE HASSLE OF INDUSTRIAL USF"

Field workers equipped with modern technologies for remote data collection and communications with back office finish tasks faster and more efficient







Memory

Storage

Reader







HF RFID Reader







High Capacity Battery 16hr

Expansion

Port

Application



Substation Field Work

"RUGGED AND MOBILE **DEVISE TO STREAMLINE** FIFI D WORKERS **FFFICIENCY**"

Field workers in power substations usually work outside and require mobile devices to perform inspection, utility control and instant reporting.

10.1" Windows Rugged Tablet **M101P Series**



OPTIMUM SIZE, **MAXIMUM PRODUCTIVITY**

- 10.1", 1920 x 1200, PCAP touchscreen
- Intel[®] Pentium[®] N4200 (2M Cache, up to 2.5 GHz)
- Windows 10 IoT Enterprise (Optional), Linux Ubuntu 20.04 (Optional)

4 GB LPDDR4, 128 GB SSD, micro SDXC card slot

Light sensor, g-sensor, Gyro

2 MP webcam, 8 MP rear camera with autofocus

Anti-glare touch treatment

USB 3.0 Type-A, USB 3.0 Type-C, docking connector

WLAN, BT, GPS, GLONASS

IP65 waterproof and dustproof

MIL-STD-810G shock, vibration, and drop resistance

11.6" Windows Rugged Tablet M116K Series



HIGH PROCESSING POWER IN A RUGGED ENCLOSURE.

- 11.6", 1920 x 1080, PCAP touchscreen
- Intel[®] Core[™] i5-7200U 2.5 GHz, up to 3.1 GHz
- Intel[®] Core[™] i5-7300U 2.60 GHz, up to 3.5 GHz
- Windows 10 IoT Enterprise (Optional), Linux Ubuntu 20.04 (Optional)

4 GB DDR4, 128 GB SSD

Light sensor, g-sensor, Gyro

2 MP webcam, 8 MP rear camera with autofocus

Anti-glare touch treatment

WLAN, BT, GPS, GLONASS

USB 3.0 (Type A), USB 3.0 (Type C)

TPM 2.0, Kensington lock

IP65 waterproof and dustproof

MIL-STD-810G shock, vibration, and drop resistance

Sunlight readable screen with an anti-glare solution

Custom configuration







Memory

Storage

WWAN







GigaLAN

Reader

Barcode HF/ UHF RFID Reader



Micro HDMI Port

Application



Warehouse Management

"TRUSTWORTHY **PERFORMANCE** ACROSS THE LOGISTICS FCOSYSTEM"

The M116 series rugged tablet is purpose-built for warehouse. transportation, and field service applications. The M116 series delivers excellent performance, multiple wireless connectivity options, and data capture

modules for various enterprise mobility applications. Use it all day, thanks to the hot-swap battery design.







Memory

Storage

ΙΛ/\Λ/Δ ΝΙ







GigaLAN Port

Barcode Reader

HF RFID Reader





Expansion

Micro Port **HDMI** Port

Application



Automotive Manufacturing

"SUITABLE FOR FACTORY **ENVIRONMENT"**

The M116P series rugged tablet features high processing capabilities, wireless connectivity options, and data capture modules for extraordinary performance.

11.6" Windows Rugged Tablet M116P Series



BRILLIANT SUNLIGHT READABLE SCREEN.

- 11.6", 1920 x 1080, PCAP touchscreen
- Intel[®] Pentium[®] N4200 1.1 GHz, up to 2.5 GHz
- Windows 10 IoT Enterprise (Optional)

4 GB LPDDR4, 128 GB SSD

Light sensor, g-sensor, Gyro

2 MP webcam, 8 MP rear camera with autofocus

WLAN, BT, GPS, GLONASS

USB 3.0 (Type A), USB 3.0 (Type C)

Smart Card Reader (Default M116PT)

Kensington lock

IP65 waterproof and dustproof

MIL-STD-810G shock, vibration, and drop resistance



Oil & Gas



Overview

Oil rigs and remote pipeline locations are the most dangerous and challenging work environments anywhere. Winmate rugged computers are designed for the harsh environments of an oil refinery or a drilling rig and come with ATEX Zone 2 and Class 1 Division 2 (C1D2) certifications. By employing automated processes, oil and gas companies can increase production wells, improve production control, and reap the benefits of modern technologies.

Technology

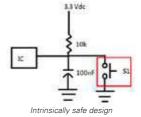
Winmate has technology know-how for the production and development of explosion-proof devices:

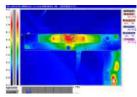
Intrinsic Safety Schematic Design

Our engineers design the intrinsic safety schematics for the explosion-proof product line. Our engineers design the electronic system to ensure that the temperature under all fault conditions can never rise to a value that may cause explosive gasses' ignition.

Non-Sparking Device

Our design guarantees that the ignition of a hazardous atmosphere does not occur. It is achieved by ensuring that only low voltages and currents enter the hazardous area and that no significant energy storage is possible.





Thermal design

Application Story

Operator Control HMI for Oil Drilling Rig



Background

In the Oil & Gas industry, complex process control is required at all stages, from exploration, extraction, and transportation, to the refinement and the distribution of fossil fuels. These processes occur in harsh environments with the constant threat of dangerous substances in the air, where combustion can occur when proper precautions are ignored.

Core products

- ATEX Aluminum Panel PC
- ATEX Stainless Display
- ATEX DIN-Rail Box PC

Main Challenges

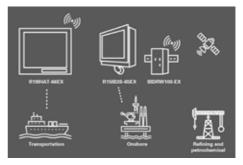
- Hazardous working environment
- Wide operating temperature
- Explosion-proof solution

Why Winmate

- Certified for C1D2. ATEX Zone 2
- Large, high-brightness display with optical bonding technology
- Wide operating temperature



Winmate's ATEX HMI Panel PC



Application Diagram: Hazardous Locations

Application Story

Safe Operation in Hazardous



"With ATEX-Grade Industrial Rugged Panel PCs for Mining, Energy and Utilities Sectors"

Background

The mining sector entails numerous environmental challenges, off-grid location, dust, etc., that demands only the most rugged industrial Panel PCs available on the marketplace. These rugged industrial Panel PCs should assist various fieldwork-related capacities from numerous safety properties and vital technical applications to smoothrun the operations. At the same time, durable to hold up against the harshest climate conditions like severe temperature from subfreezing to extreme heat malfunctioning.

Mining is also a labor-intensive sector, making a sturdy and reputable touchscreen display is required. The devices used should handle on-site duties, increase and speed up work progress. Top-quality, rugged touchscreen PCs must be water- and dustproof, resistant to shock, vibration, drop, and anti-explosion. These features are essential for protecting the stability of the task at hand and ensuring the safety and security of the fieldworkers.

Core products

• R19IHAT-66EX - 19" Intel® Core™ i5/i7 ATEX 1000nits Panel PC

Main Challenges

- Sunlight readability.
- Devices that include external and internal applications to enhance and improve fieldwork.
- Need to withstand extreme weather and environmental conditions.
- Use in the hazardous area.

Why Winmate

- Certified for Hazardous Locations
- Fully Rugged and Waterproof Design
- Tailor-made for Your Needs



Application Diagram: Mining Sector

ATEX DIN Rail Box PC (C1D2) IBDRW100-EX-P







COMPACT.
 FOR HAZARDOUS LOCATIONS.

- Class 1, Division 2 device certified for hazardous area application
- DIN Rail design for Industrial Automation applications
- Onboard Intel[®] Atom[®] Processor E3950 1.6 GHz, up to 2.0 GHz

1 x RS232 / 422 / 485 communication, select thru BIOS

1 x SO-DIMM, DDR3L 1866 MHz, 4GB

Fanless design

4 x Giga LAN, 3 x USB 3.0, 1 x USB 2.0, 1 x VGA, 1 x Line out, 1 x line in, 1 x Mic in, 1 x Power Jack

Fanless, streamlined enclosure for highly efficient heat Dissipation

-40°C~70°C wide operation temperature ranges

AWS IoT Greengrass Certified

Storage Temperature -40°~80°C

Custom configuration

Up to 8 GB υ_{ρ tο} 512 GB

Memory

Storage





WLAN

BT

Application



Petrochemical Processing Plant

"STABLE PERFORMANCE IN A COMPACT RUGGED DESIGN"

Winmate's compact
fanless DIN-Rail Box PC
IBDRW100-EX-P serves as
the system controller of
a monitoring system in a
petrochemical plant to control
and monitor on-site data.

Un to **8 GB** 512 GB

Memory

Storage

Application



Gas Pipe Monitoring

"GAS DISTRIBUTION PROCESS VISUALIZATION AND OPERATOR CONTROL"

ATEX-certified 15" panel PC R15IB3S-65EX visualizes each step of the gas distribution journey from extraction to the refinery to improve production control and monitor possible leakage.

15"ATEX Panel PC

R15IB3S-65EX/ **R15ID3S-65EX**

















OPTIMIZE PERFORMANCE IN HAZARDOUS LOCATIONS.

- 15", 1024 x 768, PCAP touchscreen
- Intel[®] Celeron[®] Processor N2930 (R15IB3S-65EX) Intel® Atom® N2600 Processor (R15ID3S-65EX)
- Windows 7 Embedded Systems (Optional) Windows 10 IoT Enterprise (Optional) Linux Ubuntu 18.04 (Optional)

Class 1, Division 2 & ATEX Zone 2 certified for hazardous area applications

Fanless, streamlined enclosure for highly efficient heat dissipation

Five wire resistive touch screen (Explosion-proof) (R15ID3S-65EX)

Stainless housing

Wide operation temperature from -20 to 50°C

Projected Capacitive Multi-Touch Screen (PCAP) (R15IB3S-65EX)

19"ATEX Panel PC R19IHAT-66EX















OPTIMIZE PERFORMANCE IN HAZARDOUS LOCATIONS. ••

- 19", 1280x1024, 800 nits LCD panel PC (Optional 1000 nits)
- Intel® Haswell Core™ i5-4300U(Optional i7-4650U)
- Windows 7 Embedded Systems (Optional) Windows 10 IoT Enterprise (Optional) Linux Ubuntu 18.04 (Optional)

Class 1, Division 2 & ATEX Zone 2 certified for hazardous area applications

Fanless, streamlined enclosure for highly efficient heat dissipation

Aluminum Housing

Intelligent Heater for working in extreme cold environments -40°C

4GB SO-DIMM, DDR3L 1600 MHz

VESA Mount and Panel Mount

Custom configuration

8 GB

512 GB

Memory

Storage

Application



Field Work Inspection

"INDUSTRIAL ATEX PANEL PC FOR PORTABLE DIGITAL RADIOGRAPHY"

With portable digital radiography (DR) technology, field workers can use its x-ray scanning features to evaluate power lines and even preventive maintenance in oil or gas applications.

Up to 32 GB 512 GB

Memory

Storage





BT

WLAN



HDMI

Application



Oilfield Drilling Monitoring System

"THE HIGHEST STANDARD IN RELIABILITY AND SFRVICE"

The M Series panel PCs was installed as part of an oilfield drilling monitoring system that now allows for better control over operations.

12.1"~23.8" ATEX Panel PC

M Series









EXPLOSION PROOF FOR SAFE OPERATIONS.

- Intel[®] 11th Generation Tiger Lake UP3 Core™ i5 CPU
- Signature true flat display screen with edge-to-edge design
- Aluminum, anti-corrosion treated housing
- Superior sealing with front IP65 protection against dust and water

Projected Capacitive Multi-Touch Screen (PCAP)

Fanless design

Support wide range 9-29 V DC input

Quick & easy removable 2.5" SSD bay slot

Support PCIe x 4 card

Class 1 Division 2, Group A-D, T4 certification

Signature true flat display screen with edge-to-edge design

Superior sealing with front IP65 protection against dust and water

Full Aluminum Alloy enclosure, compact, low weight design, excellent heat dissipation

15" IP65 Stainless ATEX Display R15L600-65EX















EXPLOSION PROOF FOR SAFE OPERATIONS.

- 15", 1024 x 768, 550 nits LCD Panel
- Stainless steel design
- Fanless design

Explosion-proof 5-wire resistive touch

IP65 Certified, dust-proof and water-resistant

Support 9-36V DC input, M12 Type connector

Class 1, Division 2 & ATEX Zone 2 application certification

Wide temperature range -20°C Celsius to 50°C Celsius

Custom configuration





M12 Type RS232

Brightness

Application



Oilfield Drilling Monitoring System

"THE HIGHEST STANDARD IN RELIABILITY AND SFRVICE"

The 15" aluminum display was installed as part of an oilfield drilling monitoring system that now allows for better control over operations.



