PROTECT

Ground Loops

Noises

Voltage Surges

Lightning

Sparks

CommFront®
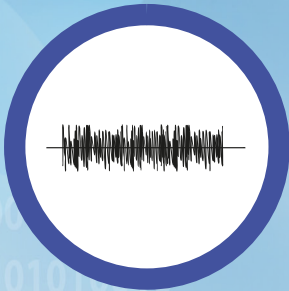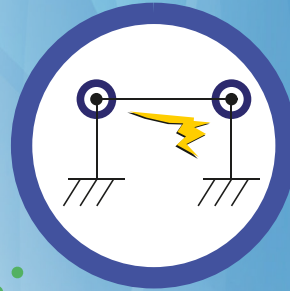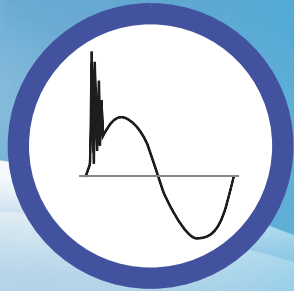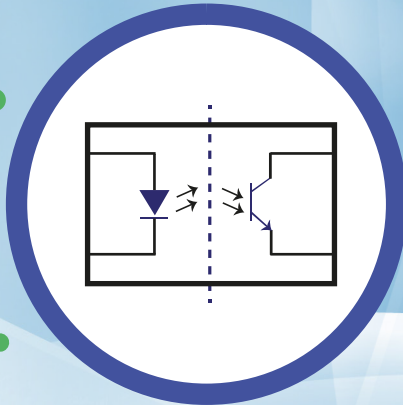
Communications made easy

PROTECT

SAFEGUARDING YOUR ASSETS
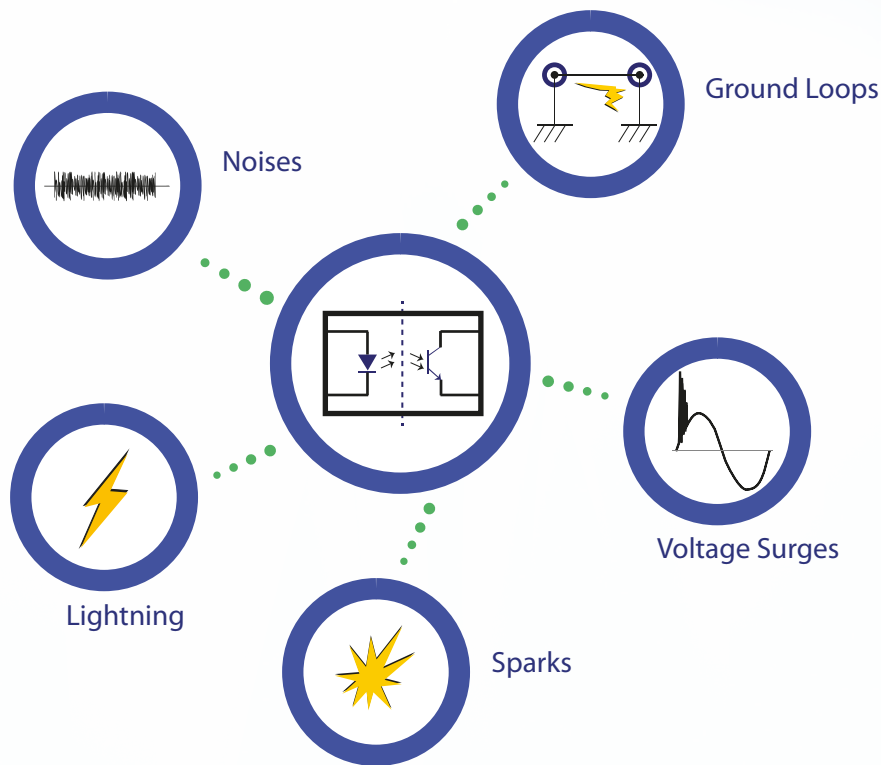## FROM ALL ELEMENTS

Noises

Ground Loops

Voltage Surges

Lightning

Sparks

The world of data communication is busy, even noisy. Industrial communication systems, such as balanced RS-485/RS-422, often require transmission between multiple devices over long distances. While having many devices communicating with each other on the same twisted-pair cable is robust and cost-effective, it also introduces two major challenges. First, because of the long distances and the surrounding electrical devices/equipment, RS-485/RS-422 networks are often exposed to electrical noises, remote lightning, and line surges, which can cause transient voltage to run across the serial communication system and the valuable equipment. Second, because multiple devices (nodes) are connected, the ground potential at different nodes could be different, which can cause ground currents to flow through "the path of least resistance" via either the common earth ground or the ground wire. Both voltage and current surges can cause serious damage to valuable, mission-critical equipment such as computers, PLCs, and industrial manufacturing and data processing equipment; these surges can even endanger human lives. Ground loop problems also exist on unbalanced signals that rely on the ground pin being zero volts, such as RS-232 and USB.

There are a few methods of voltage and current surge protection in the industry, and the most effective are Optical Isolators and Surge Protectors:

Optical Isolators

An optical isolator (or opto-isolator) is used to block high voltages and transients so that a surge in one part of the system will not disrupt or destroy other parts. Optical isolation uses an LED (Light Emitting Device) and a photosensitive transistor to transfer data across the isolation barrier - typically an air gap; in other words, data is transmitted using light instead of electrical signals, so there is no physical connections between the grounds and the data lines, thus removing the ground loop problems and effectively preventing electrical surges and spikes from destroying other parts of the system. Furthermore, because optical isolation uses light to transmit data across the isolation barrier, it also gains the advantage of immunity from electrical- and magnetic-field interference. This makes optical isolation an effective solution in industrial areas where strong electric or magnetic fields could be present.

Surge Protectors

The main function of a surge protector is to limit the voltage introduced to an electrical device by either blocking or shorting to ground any voltages above a safe threshold. Surge protectors are mainly used for protecting power and data lines against electrical surges and spikes, including those caused by lightning. However, it is important to note that solely relying on surge protectors could be insufficient or even do more damage than good, as in the cases of improperly installed or poorly selected surge protectors. In many applications, surge protectors are used in conjunction with optical isolators to provide much more effective protection.

OPTICAL ISOLATORS

From 3-wire to 7-wire RS-232 isolators, 2-wire RS-485 to 4-wire RS-422 isolators, and USB isolators to USB/RS-232/RS-485/RS-422 optically isolated converters, CommFront has all the optical isolation devices to protect your assets from unexpected events. If off-the-shelf product does not provide enough security for you, we can even tailor-make the devices, which are customizable right down to the nuts and bolts.

RS-232	RS-485/RS-422	USB

Model: CVT-232A-3

Description: Industrial 3-Wire Port-Powered RS-232 Isolator

Key Features:
- 5000V optical isolation for TX, RX, and GND
- Port powered
- Rugged industrial grade
- Operating Temperature: -40°F to 185°F
- Built-in 600W surge protection
- Built-in 15KV ESD protection
- Operates reliably from 30 to 38.4K baud

Model: RPT-485_422-4

Description: Industrial RS-485/RS-422 Isolator/Repeater/Converter

Key Features:
- 2500V optical isolation
- Rugged industrial grade
- Operating Temperature: -40°F to 185°F
- Built-in 600W surge protection
- Built-in 15KV ESD protection
- Supports wide range of DC inputs (9 to 30VDC)
- Direct DIN-rail (rack) or wall/panel mounting
- Operates reliably from 300 to 115.2K baud

Model: USB-ISO-3

Description: Industrial USB2.0 Isolator

Key Features:
- 5000V optical isolation
- USB 2.0 compatible
- Rugged industrial grade
- Operating Temperature: -40°F to 185°F
- Plug and play, no software drivers required
- Supports low and full-speed data rates: 1.5Mbps, 12Mbps

Model: CVT-232B-3

Description: Industrial 7-Wire Port-Powered RS-232 Isolator

Key Features:
- 2500V optical isolation for TX, RX, RTS, CTS, DTR, DSR, and GND
- Port powered
- Rugged industrial grade
- Operating Temperature: -40°F to 185°F
- Built-in 600W surge protection
- Built-in 15KV ESD protection
- Operates reliably from 300 to 19.2K baud

Model: HUB-485-4

Description: Industrial 4-Port RS-485 Hub

Key Features:
- 2500V optical isolation
- Rugged industrial grade
- Expands one RS-485 network into four star-configured networks
- Operating Temperature: -40°F to 185°F
- Built-in 600W surge protection
- Built-in 15KV ESD protection
- Supports wide range of DC inputs (9 to 30VDC)
- Direct DIN-rail (rack) or wall/panel mounting
- Operates reliably from 300 to 115.2K baud

Model: USB-Serial-3

Description: Industrial Opto-Isolated USB to RS-232/RS-485/RS-422 converter

Key Features:
- 2500V optical isolation
- USB port powered, no external power required
- Rugged industrial grade
- Converts USB to RS-232/RS-485/RS-422
- Operating Temperature: -40°F to 185°F
- Built-in 600W surge protection
- Built-in 15KV ESD protection
- Supports all major Windows, Linux, and Mac
- Direct DIN-rail (rack) or wall/panel mounting
- Operates reliably from 300 to 115.2K baud

SURGE PROTECTORS

Data networks are often exposed to high-voltage and/or high-current electrical surges and spikes, including those caused by lightning. Our passive, rugged, industrial-grade surge protectors are designed for direct industrial DIN-rail mounting and they come with two (2) or three (3) stages of surge protection – Gas Discharge Tube (GDT), protection resistors, and Transient Voltage Suppressor (TVS) - for maximum protection. From 2-wire RS-485, 4-wire RS-422/RS-485, to 10/100/1000M Ethernet, CommFront's surge protectors safeguard your data lines and provide you with peace of mind.
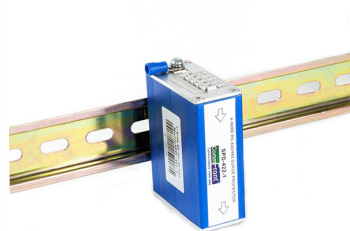
2-Wire RS-485	4-Wire RS-485/RS-422	10/100/1000M Ethernet

Model: SPD-485-1

Description: Industrial 2-Wire RS-485 Surge Protector (Passive)

Key Features:
- Protects 2-wire RS-485 lines (including the shield wire)
- 3-stage of surge protection
- Rugged industrial-grade
- Operating Temperature: -40°F to 185°F
- Direct DIN-rail (rack) mounting
- Operates reliably from 0 to 10M baud

Model: SPD-422-1

Description: Industrial 4-Wire RS-422/RS-485 Surge Protector (Passive)

Key Features:
- Protects 4-wire RS-422/RS-485 lines (including the shield wire)
- 3-stage of surge protection
- Rugged industrial-grade
- Operating Temperature: -40°F to 185°F
- Direct DIN-rail (rack) mounting
- Operates reliably from 0 to 10M baud

Model: SPD-ETH-1

Description: Industrial 10/100/1000M Ethernet Surge Protector (Passive)

Key Features:
- Protects 10/100/1000M Ethernet devices (all lines are protected)
- 2-stage of surge protection
- Rugged industrial-grade
- Operating Temperature: -40°F to 185°F
- Direct DIN-rail (rack) mounting
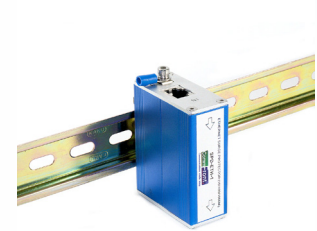- Operates reliably from 0 to 1G baud

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sales@commfront.com
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CVT-232A-3	CVT-232A-4	CVT-232B-3	RPT-232-3	CVT-485-3	CVT-422-3

CVT-485_422-3	CVT-485_422-3(25)	CVT-485_422-4	RPT-485_422-4	HUB-485-4	USB-Serial-3

USB-ISO-3	SPD-485-1	SPD-422-1	SPD-ETH-1

KEY FEATURES

- Rugged industrial grade.
- Built for harsh environments and interfacing with mission-critical equipment.
- Protects your expensive equipment from potential harms including ground loops, transient surges, lightning, and spikes.
- Options of in-line or DIN-rail/wall mounting.

Model	Description
CVT-232A-3	Industrial 3-Wire RS232 Isolator (Port-Powered/Isolated)
CVT-232A-4	Industrial 3-Wire High-Speed RS232 Isolator (Externally-Powered/Isolated)
CVT-232B-3	Industrial 7-Wire RS232 Isolator (Port-Powered/Isolated)
RPT-232-3	Industrial RS232 Repeater (Port-Powered/Isolated)
CVT-485-3	Industrial RS232 to RS485 Converter (Port-Powered/Isolated)
CVT-422-3	Industrial RS232 to RS422 Converter (Port-Powered/Isolated)
CVT-485_422-3	Industrial RS232 to RS485/RS422 Converter (Port-Powered/Isolated)
CVT-485_422-3(25)	Industrial 25-Pin RS232 to RS485/RS422 Converter (Port-Powered/Isolated)
CVT-485_422-4	Industrial High-Speed RS232 to RS485/RS422 Converter (Externally-Powered/Isolated)
RPT-485_422-4	Industrial RS485/RS422 Isolator/Repeater/Converter (Externally-Powered/Isolated)
HUB-485-4	Industrial 4-Port RS485 Hub/Splitter(Externally-Powered/Isolated)
USB-SERIAL-3	Industrial USB to RS232/RS485/RS422 Converter(Port-Powered/Isolated)
USB-ISO-3	Industrial USB 2.0 Isolator (Port- or Externally-Powered/Isolated)
SPD-485-1	Industrial 2-Wire RS-485 Surge Protector (Passive)
SPD-422-1	Industrial 4-Wire RS-422/RS-485 Surge Protector (Passive)
SPD-ETH-1	Industrial 10/100/1000M Ethernet Surge Protector (Passive)

Industrial Communication Solutions
RUGGED. SIMPLE. RELIABLE.

For the past decade, CommFront has built a reputation as a major supplier of rugged and reliable, yet simple, data communication products and solutions. From factories to energy plants, shipyards to transportation terminals, and server rooms to laboratories, CommFront provides complete solutions for data and device connectivity, conversion, protection, extension, and research. CommFront offers the broadest selection of rugged, simple, and reliable data communication and machine-to-machine (M2M) connectivity products, ranging from legacy serial communications to modern TCP/IP communications, copper wire to optical fiber, and D-sub to USB connectivity.

CommFront products have been proven to be reliable and are widely used in critical areas that require safe, reliable, and uninterrupted operation, including:

• Factory Automation	• PoS, ATMs, and Banks
• Building Automation	• PLC, RTU, HMI, and SCADA Systems
• Energy Plants	• Security and Surveillance
• Shipyards and Marine	• Instrumentation
• Transportation	• IT Networks
• Industrial and Commercial Buildings	• Laboratories

Pushing our products to the limit, so you don't have to

Data networks are widely used in automation, control, and communication systems that perform many important tasks ranging from production, automation, communications, security, surveillance, to research. Data networks are mission-critical, and even the shortest downtime or delay can be very costly; furthermore, data networks consist of many different components and are often used over long distances in an electrically noisy environment. Engineering, testing, and troubleshooting can be very time-consuming and challenging. At CommFront, we push our products to their limit over a 3-to-6-month assessment and certifying process, complete with functionality, reliability, and EMC/EMI tests. We test radiation, emissions, and immunity to guarantee the safety of our human users and compatibility with their devices. The industry has many certifying agencies, ranging from the reputable to the less reputable, and from 3 months to 3 days of certification time. CommFront chooses to partner with SGS and TUV because they have the strictest rules and regulations for product testing and certifications. Both SGS and TUV are the Nationally Recognized Testing Laboratories [NRTLs] in North America (approved by the Occupational Safety & Health Administration [OSHA]) and the Notified Bodies in the European Union, the most meticulous and recognized certifying labs in the industry. This makes our products worry- and hassle-free for safety, compatibility, and interfacing with mission-critical equipment.

A reliable data network starts with choosing the right solutions and partners. CommFront engineers have the rich field experience and in-depth knowledge to understand your problems, how to solve them, and most importantly, how to prevent them – right from the design stage. We design and engineer our products not just on the product level but also from the system perspective, for we believe that data communication products do not function by themselves; rather, they are part of a system. Any supplier can sell you a product, but only CommFront is equipped with the rich field experience, world-class certifications, proven track record, and strict ISO quality management system to ensure your total satisfaction.

Communications made easy

THE KEYS TO OUR EXCELLENCE

- Industrial Ruggedness
- Certification by World-Class Labs
- Designed & Manufactured to ISO Standards
- Lead-Free RoHS Compliance
- Applied Reliability Engineering

- Proven Track Record
- 5-Year Replacement Warranty
- 30-Day Money-Back Guarantee
- Free Worldwide Shipping
- Intensive and Fast Support

SAFETY ASSURANCE

CommFront products are strictly certified by SGS/TUV – the world's leading inspection, testing, and certification companies.

QUALITY ASSURANCE

CommFront products are designed and manufactured to ISO 9001 standards. Our quality control system is strictly certified by SGS (Cert No. SG12/04213).

WARRANTY & GUARANTEE

CommFront products have been proven to be reliable. We back our high-quality products with a 5-year replacement warranty and a 30-day risk-free money-back guarantee.

OUR CLIENTS

Throughout the years, CommFront has gained a sterling reputation in the industry, and its clients include many industry leaders. Below are some of our satisfied customers from around the world, just to name a few:

ABB	Hewlett Packard	NASA	Spectra Energy
Advanced Control Systems	Honeywell Corp.	Nissan	Serveron Corp.
Allied Electronics	IBM Corp.	Northrop Grumman	Toshiba
Applied Materials	Intel Corp.	Panasonic	Toyota
AT&T	ITT Corp.	Qualcomm	Thales Comm.
BAE Systems	Johnson Controls	Raytheon Corp.	Tyco Electronics
Boeing	L-3 Communications	Rockwell Collins	University of Nebraska
Cisco	LG Corp.	Samsung	University of Wisconsin
Emerson Power	Lockheed Martin	Schneider Electric	UL Laboratory
Fluke	Microsoft	Seagate	US Robotics
General Electric	Mitre Corp.	Siemens Corp.	Vaddio
Google Inc.	MIT Laboratory	Singapore Technologies	Volvo
Harris Corp.	Motorola	Sirius Satellite	Volkswagen

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