



Oil and gas

*Network solutions for tough
and hazardous environments*



35 years at the leading edge of industrial data communications

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Specifications are subject to change without notice due to continuous product development and improvement.

Westermo provides a full range of data communications solutions for demanding applications in the transport, water and energy markets among others. For the past 35 years, we have been at the forefront of technological development and often pushed the limits of what is technically possible.

The staff at Westermo offers the highest possible service to help customers to select, configure and install the best solution for their specific needs. Our knowledge goes far beyond our own product range, regardless of whether the installation is in a substation, water treatment plant or alongside a railway.

In order to provide the best possible support, we have local presence in more than 35 countries through our authorized distributors and own offices.

Since 2008 Westermo has been part of the Beijer Electronics Group, a company with unique knowledge of the HMI and industrial automation business.

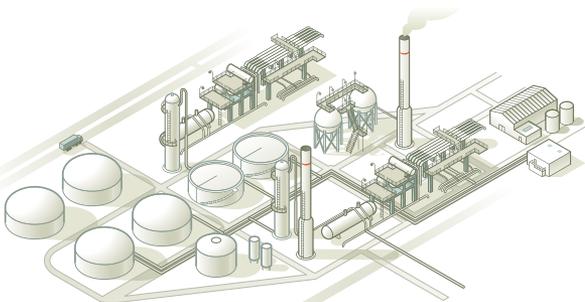




Westermo provides secure and future-proof solutions for the oil and gas industry

The oil and gas sector is the prime driving power behind developments in the global economy. Continuous modernization of the industry is crucial in order to maintain the adequate supply of upstream and downstream oil products for worldwide consumption. Future proof automation and data communications within the sector is pivotal in improving operational efficiency and safety. Rugged equipment such as Westermo's Ethernet Switches for oil and gas play a big role in refineries, chemical plants, offshore and on-shore oil rigs and pipelines as they are used to monitor extensive complexes and transportation facilities.

Energy companies are looking more closely at their safety processes and regulations, finding places to improve and working to ensure the safety of their employees and the environment. The oil and gas industry can succeed only with the use of high end technology featured in Westermo's product lines. Major oil and gas companies rely on Westermo to recommend the right solution to ensure that their production stays on schedule and that they manage their hazardous environments in the best possible way.



The following product characteristics are representative of the high standard achieved by Westermo:

Safety: ATEX, IECex and DnV approvals

Robustness: Capable of withstanding extreme temperatures, humidity, shock, vibrations and EMC.

Reliability: With Westermo's Operating System (WeOS), a fast network recovery is guaranteed, avoiding any unacceptable downtime.

Future proof: All products are designed to accept any future upgrades

Interoperability: Westermo's products are tested together with a wide range of devices available on the market in order to ensure operational harmony in any given network.

Redundancy: Redundant power supply connection is a standard feature.

Operational savings: Low power consumption translates into lower operational expenses.

Capital savings: A healthy mix of media features guarantees a reduced and manageable investment.

High end quality: All products are produced in-house using industrial grade components and comprehensive testing is carried out throughout the production process.

Certified to operate in extreme environments

Certified to operate in marine environments



Maritime facilities are known for their harsh environments. Brutal offshore climate and weather conditions are factors which underscore the importance of making sure that products used for operation are robust enough to withstand these persistent conditions over longer periods. Existing oil platforms, rigs and pipelines are being upgraded and modernized to the highest standards. Only specified and tested products may be used for certain networks on an offshore facility.

An approval issued by Den Norske Veritas (DnV) confirms a device's ability to withstand wide temperatures, humidity, extreme vibrations, shock and EMC noise. Common questions asked by the industry are: Is the solution future proof? Is the product water and dust proof? Is the product condensation proof? Can it withstand high humidity and heated platforms.

DnV classification ensures:

- ⌘ Application of modern safety principles
- ⌘ Adequate certification of safety critical components and systems meeting international and regional standards.
- ⌘ Reduced risk
- ⌘ Makes oil and gas facilities safer

Westermo's products have the following competitive advantages for offshore application:

- ⌘ Hazard rated for safe operation in offshore oil rigs and gas fields
- ⌘ Hardened features such as rugged enclosure
- ⌘ Tolerance of wide temperature variations
- ⌘ Suitable for rugged work places
- ⌘ Guaranteed high band width and operation under severe conditions



Certified to operate in explosive environments

Personnel in the oil and gas industry frequently operate in hazardous environments that are highly infused with inflammable components. Explosive atmospheres can be caused by gases, mists, vapours or by combustible dusts. With a certain level of concentration of these substances, a source of ignition may be all that is needed to cause a disastrous explosion. The ramifications are both loss of life and destruction of material. Preventing releases of hazardous substances which can be the cause of explosive atmospheres and preventing sources of ignition are two widely used ways of reducing risks using ATEX or IECEx certified equipment.



The mainstream certification schemes for electrical networks in hazardous areas in operation around the world are ATEX & IECEx

- ⌘ ATEX (Europe but with international acceptance)
- ⌘ IECEx (International)

The following countries are signed up to the IECEx scheme:

Australia, Brazil, Canada, China, Croatia, Czech Republic, Denmark, Finland, France, Germany, Hungary, India, Italy, Japan, Korea, Malaysia, Netherlands, New Zealand, Norway, Poland, Romania, Russia, Singapore, Slovenia, South Africa, Sweden, Switzerland, Turkey, UK, USA.





Designed to meet the harsh requirements of the oil and gas industry



Thermal management

Heat management is an important tool used by many of Westermo's products in increasing heat dissipation and maintaining an acceptable temperature level. This helps to optimize operational efficiency in extreme and fluctuating temperatures. Here are a number of Westermo features which help manage assailing temperatures:

- ⌘ Low power consumption.
- ⌘ High heat dissipation. This is possible with the application of industrial paste between the enclosure and the boards. Components capable of emitting higher levels of heat are targeted.
- ⌘ The industrial grade components used ensure that the products are operational under wide ranging temperatures (-40 C. to 70 C.) . There is no need for fans or holes in the device.



Security

The risk of intrusion is omnipresent and many of the recent cyber attacks which have targeted international oil facilities have been very destructive and in some cases pushed oil production to a grinding halt for months.

- ⌘ DMZ (DeMilitarised Zone) security structures to be created.
- ⌘ Interface based firewalls: Ports or groups of ports can be divided and firewalls constructed between them.



Effective dust protection

Westermo offers solutions and products which are certified at ingress levels ranging from IP40 to IP65.

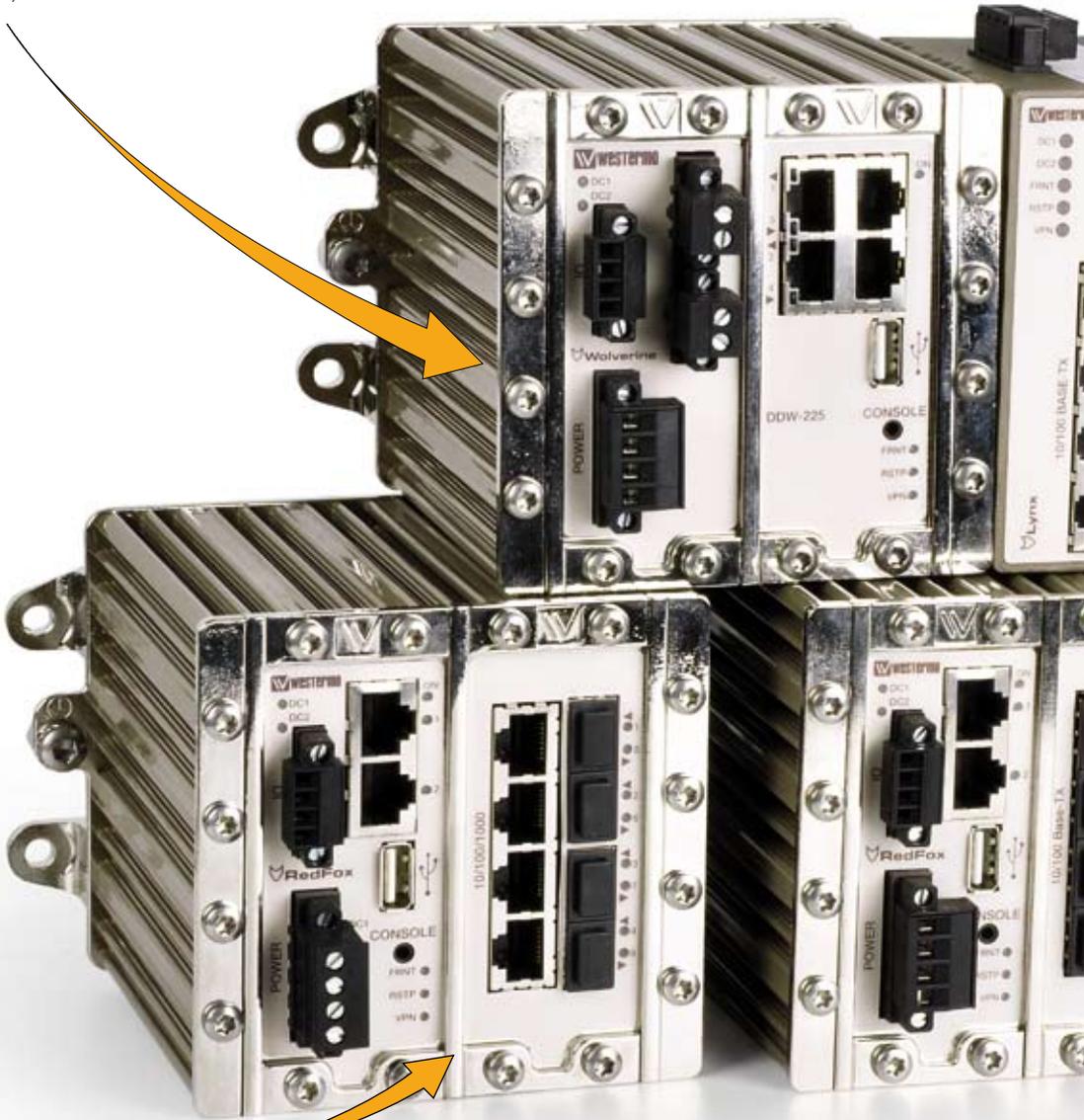
These ingress levels are generally higher than those offered by peers on the global market. The ingress of solid particles such as dust and sand, which is common in areas such as the deserts of the Middle East, can not only be harmful to the equipment which would invariably affect operations, but it can also be dangerous to the operator:

- ⌘ The level 4 in IP40 describes the protection against solid objects greater than 1mm in diameter. This would include normal sized sand particles.
- ⌘ The level 6 in IP65 describes a dust tight device with no ingress of dust.

Westermo Robust

Connecting Mission Critical Systems

A metal enclosure like no other. The enclosure's design meets important military standards.

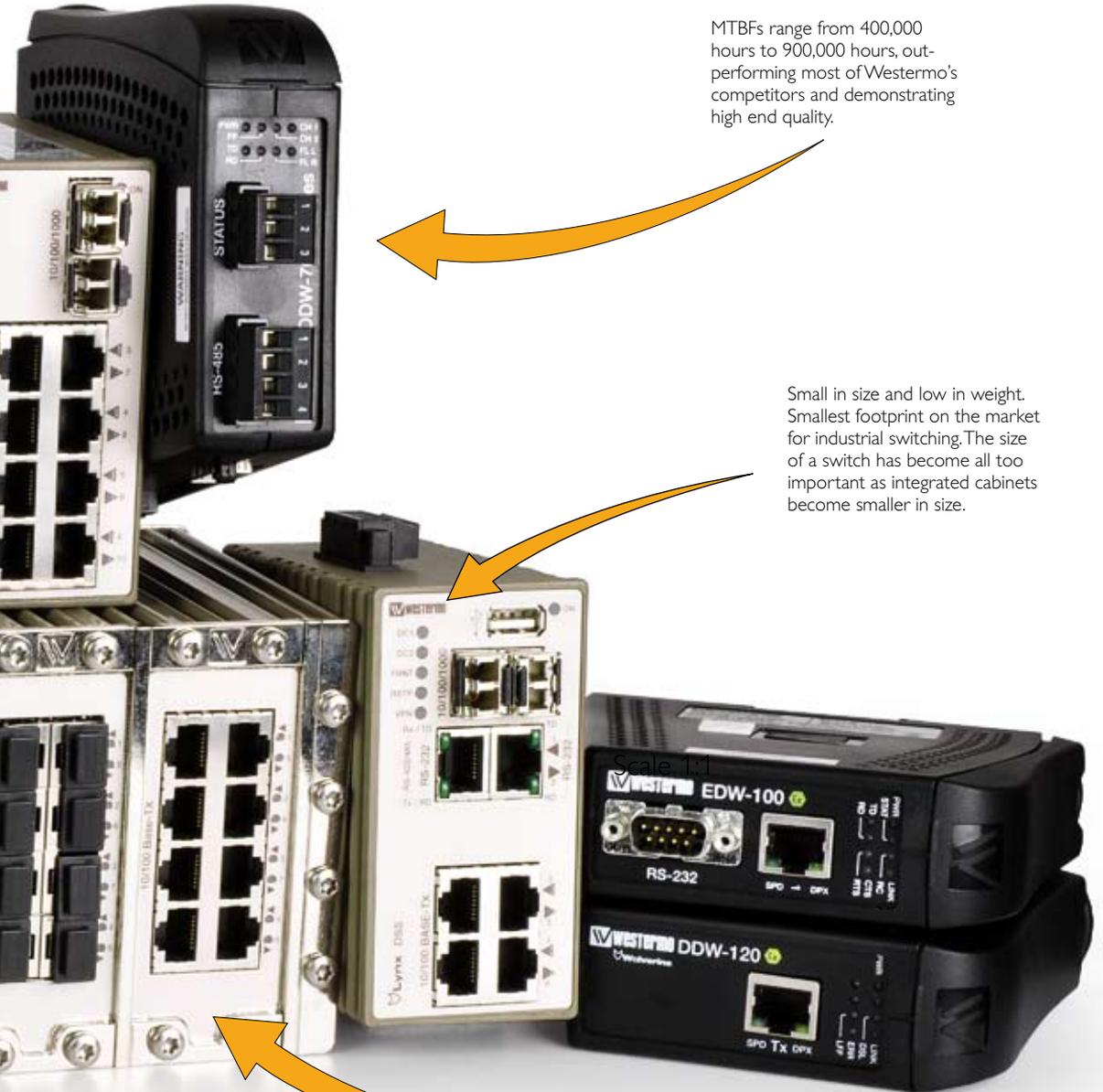


Easy to configure with multiple input/output locations.



Network solutions

Systems in Hazardous Environments



MTBFs range from 400,000 hours to 900,000 hours, outperforming most of Westermo's competitors and demonstrating high end quality.

Small in size and low in weight. Smallest footprint on the market for industrial switching. The size of a switch has become all too important as integrated cabinets become smaller in size.

Ambient temperature range of -40 C. to 70 C. High levels of heat dissipation and low power consumption keep the switches from overheating.

Products

A rugged industrial switch, router and firewall in one box

The RedFox range of industrial layer 3 switches provides enhanced routing functionality, all in a robust, single unit design. The RedFox offers routing, VLAN, IPSec VPN support, DMZ and a powerful firewall in order to segregate networks and protect mission-critical data. With support for Network Address Translation (NAT) and port-forwarding, the RedFox ensures your network is protected from the threats posed by the Internet.

- RFI-10** 10 ports, multiple combinations
- RFI-14** 14 ports, multiple combinations
- RFI-18** 18 ports, multiple combinations



Rugged switches for industrial Ethernet

The Lynx range of managed Ethernet switches are designed for simple use in heavy industrial environments, with an integral DIN-rail clip. Powered by WeOS, the Lynx range provides redundancy, serial RS-232 / RS-485 and fibre support, VLAN and IGMP functions. The layer 3 variants also provide a stateful inspection firewall, static and dynamic IP routing and IPsec VPN support for more advanced networks. The whole Lynx range has DNV approval for marine use.

- L110-F2G** 8 x 10/100BaseTX, 2 x SFP
- L210-F2G** 8 x 10/100BaseTX, 2 x SFP
- L108-F2G** 4 x 10/100BaseTX, 2 x SFP, 2 x RS-232/485
- L208-F2G** 4 x 10/100BaseTX, 2 x SFP, 2 x RS-232/485



Extend your network far beyond the normal limits of Ethernet

The Wolverine series of industrial Ethernet extenders allow cost-effective Ethernet networks to be created over long distances, at high data rates. The SHDSL technology employed makes it possible to reuse many types of pre-existing cabling which in turn can lead to considerable financial savings. With support for transparent point to point connections, multi-drop networks, redundant rings, legacy serial connections and layer 3 routing functions, the Wolverine can meet any demand your application requires.

- DDW-120** 1 x DSL, 1 x 10/100BaseTX
- DDW-225** 2 x DSL, 4 x 10/100BaseTX
- DDW-226** 2 x DSL, 4 x 10/100BaseTX, 1 x RS-232/422



Plug and play simplicity with industrial-grade reliability

The SDW-500 series is a range of 5 port unmanaged industrial Ethernet switches with multiple options for fibre optic and copper connectivity designed for easy use in heavy duty industrial applications. The units supports 802.1Q long packets which allows all standard industrial Ethernet protocols to be used. A number of standard fibre optic connection types are supported including LC, SC and ST.

- SDW-550** 5 x 10/100BaseTX
- SDW-541** 4 x 10/100BaseTX, 1 x 100BaseFX
- SDW-532** 3 x 10/100BaseTX, 2 x 100BaseFX



Reliable serial communications over fibre optic cables

The Westermo range of fibre optic modems ensures reliable communications over multimode and single mode fibre optic cables. With transparent operation, our fibre optic modems act as converters for serial RS-232, RS-422, RS-485 and PROFIBUS protocols. Whether you wish to create a point to point link, a multidrop network or even a redundant ring, our fibre optic converters provide rugged, reliable communications in the harshest environments.

- ODW-710** 1 or 2 SFP, 1 x PROFIBUS DP (RS-485)
- ODW-720** 1 or 2 SFP, 1 x RS-232
- ODW-730** 1 or 2 SFP, 1 x RS-422/485



Converting industrial media is made easy by Westermo

Westermo manufacture an extensive range of industrial serial converters, repeaters and fibre converters. Whether you wish to convert between Ethernet, RS-232 and RS-422 or RS-485, 10/100BaseTX or 1000BaseTX and fibre, Westermo has a solution. Our industrial serial converters / repeaters and fibre converters are designed for use in harsh environments and ensure rugged, reliable communications.

- EDW-100** 1 x 10/100BaseTX, 1 x RS-422/485, 1 x RS-232
- EDW-120** 1 x 10/100BaseTX, 2 x RS-232
- MDW-45** 1 x RS-422/485, 1 x RS-232
- MCW-211** 1 x 10 or 100BaseTX, 1 x 100BaseFX



Customer applications

Distributed control system



Robust long distance fibre optic solution

Application: Connection between a synthetic fuel plant and a power plant in South Africa. Fiber optic modems are used to connect a Honeywell DCS and a Yokogawa DCS.

Products: ODW-730

Why Westermo:

- ⌘ Galvanic isolation
- ⌘ EMC
- ⌘ Temperature
- ⌘ Redundancy

South Africa's
largest energy
conglomerate



Chemical plant monitoring



20 ms ring recovery network

Application: Monitoring network for ExxonMobil refinery and chemical plant.

Products: DDW-225

Why Westermo:

- ⌘ EMC
- ⌘ Temperature
- ⌘ Fast ring recovery

ExxonMobil
Refining & Supply



Offshore power monitoring system



Converting serial data to Ethernet made easy

Application: EDW- 100 to convert RS-485 signal into Ethernet which is then connected to the industrial Ethernet network (ring). The Ethernet ring network forms the backbone communication between the sites to the Power Monitoring System (PMS) located at offshore (Manifa) central processing facility.

Products: EDW-100

Why Westermo

- ⌘ Compactness
- ⌘ EMC
- ⌘ Easy to use
- ⌘ Temperature
- ⌘ Fast ring recovery

 **SUMITOMO**

أرامكو السعودية
Saudi Aramco



Cost effective network solution using pre-existing cables

Application: Telemetry system for the gas network in Amsterdam to regulate and monitor real-time usage, alarms and flow measurement.

Products: DDW-1x0 and DDW-22x

Why Westermo

- ⌘ Alternative to fibre
- ⌘ Easy to use
- ⌘ Fast ring recovery



High IP security network solution in extreme environment

Application: Connection to pipeline emergency shutdown system and leak detector located in the northern coast of Algeria. Data collection sent to central SCADA system.

Products: Lynx

Why Westermo:

- ⌘ Temperature
- ⌘ 500,000 MTBF
- ⌘ Low power consumption
- ⌘ IP security
- ⌘ EMC standards



Pipeline emergency shutdown system



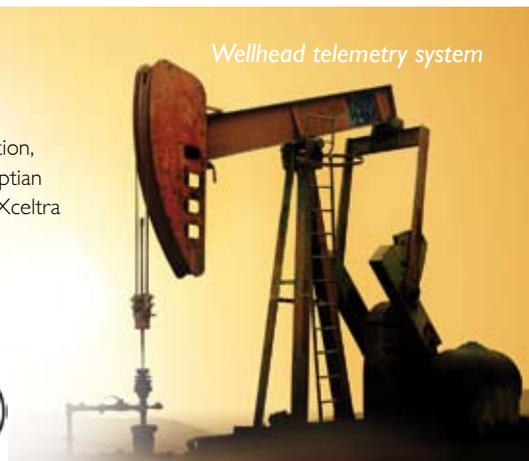
Wireless control system covering a vast geographical area

Application: Routers connected to wellheads and used for operation, monitoring and control in Meleha, the Western Egyptian desert. Egyptian General Petroleum Company (AGIBA) Sourced by ABB Egypt and Xceltra (distributor)

Products: MRD-310

Why Westermo:

- ⌘ Wide temperature range
- ⌘ Easy to use
- ⌘ Security features



Pump station management



Serial ring network with fast reconfiguration

Application: Fibre optic ring connected monitoring and data collection devices along a pipeline and pump stations between Ras Lanouf and Brega, Libya.

Products: ODW-730

Why Westermo:

- ⌘ Ruggedness and high MTBF
- ⌘ Easy to use and fast ring recovery
- ⌘ Temperature specifications



Gas distribution



Data collection from metering devices

Application: Fluxys is the independent operator of both the natural gas transmission grid and storage infrastructure in Belgium. Wolverine extenders are responsible for data transfer of metering/counting end-customer consumption data to central control room.

Products: DDW-22x

Why Westermo:

- ⌘ TBU Line Protection
- ⌘ Industrial ruggedness
- ⌘ Re-use of existing cables
- ⌘ Plug and play



FLUXYS
EXCELLENCE IN GAS TRANSPORT

Gas control system



Secure solution for safety critical application

Application: Gas leakage sensors and INSUM high voltage protection unit are connected to a redundant fibre ring through Ethernet switches.

Products: Lynx

Why Westermo:

- ⌘ Industrial ruggedness
- ⌘ EMC
- ⌘ Fast recovery and redundancy



Westermo 5 year warranty

To ensure the highest quality products, Westermo has a state of the art industrial electronics manufacturing facility in Sweden. To maximize the reliability of the product, testing is carried out at many stages of the manufacturing process.

To demonstrate this confidence in our products, all Westermo products are warranted against defects in design, materials or workmanship for a time period of five years.

- ⌘ Manufacturing to IPC-A-610 under ISO9001-2008 QMS
- ⌘ Solder Paste Inspection and Automated Optical Inspection
- ⌘ X-ray examination and PCB testing
- ⌘ Functional testing
- ⌘ Burn-in testing





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