

FLEXEDGE® FOR EASY REALIZATION OF OPENVPN

Topics such as digitization and IoT (Internet of Things) are increasingly gaining momentum in the industrial environment, with preventive maintenance, predictive analytics, machine learning, and remote monitoring/troubleshooting among the driving factors. In many cases, it's becoming more challenging to securely connect operators in the field with the control room.

First would be to incorporate remote capabilities into the process, such as implementing remote maintenance concepts. This demands a solution that meets a wide range of requirements: -enable independent communication of the plant's control system -guarantee a level of data security -offer cost effective solutions to collect and transfer large volumes of data -easy to install and operate. OpenVPN becomes a powerful automation tool by harnessing the work of a secure, virtual network coupled with the use of flexible edge controllers.



A virtual private network (VPN) provides a good basis for continuous and secure communication between different machines, especially in large areas with or without remote access. As the name suggests, a virtual network does not require its own physical network; it uses the existing infrastructure for communication. A VPN tunnel creates a secure and encrypted tunnel between multiple devices in the field. It securely connects devices in remote locations, or disparate devices on the plant floor, regardless of the physical network configuration. Also, it establishes a virtual network that allows secure communication between the devices and the control center, both inside a plant and externally. The benefits of this secure connectivity are that from a central location firmware can be updated, data can be collected, and applications can be monitored and controlled remotely. VPN tunnels are also very useful for remote troubleshooting since the ability to remotely access end devices can save a lot of time and money.

OpenVPN - Proven on Many Platforms

A popular VPN solution, OpenVPN, is available for all common operating systems, offers secure data encryption, and can be configured via the web or command line interface. However, for industrial applications, there are some challenges: real-world networks using a “VPN tunnel” can be connected via Wi-Fi, cellular, or satellite radio often in harsh environments, which could result in intermittent lost connectivity thus reducing the reliability of the network. Therefore, the protocols used for data exchange must be able to handle such disturbances while maintaining the integrity of the data.

Future-Proof Automation Platform

So how can an OpenVPN solution be implemented and adapted to the respective application? In principle, there are two scenarios to consider: for the first scenario, there is communication within certain areas, like a closed network within a plant: and the second scenario, there is remote access externally, such as a cross-site information exchange.

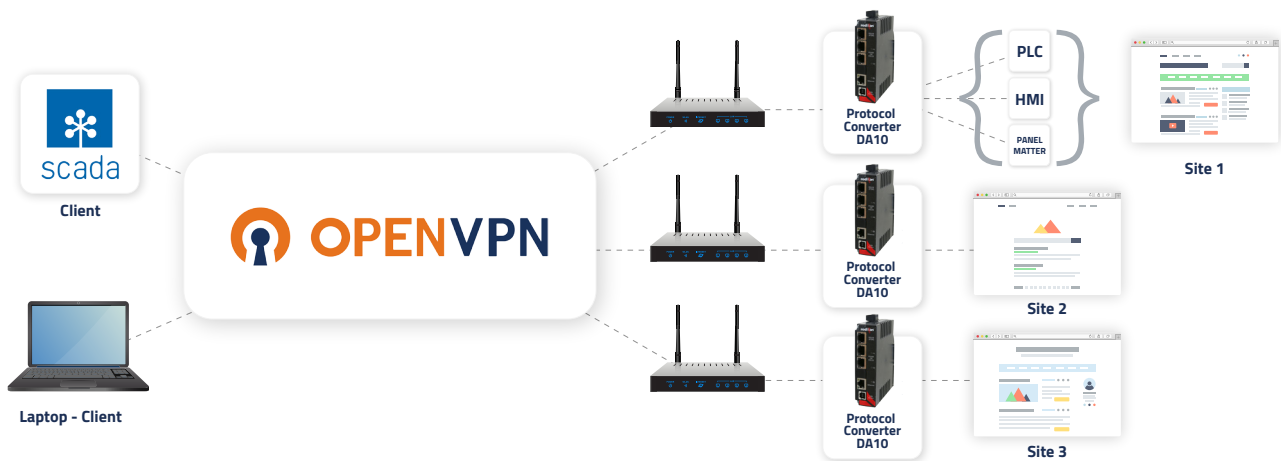


Figure 1: Normal Open VPN Installation

The FlexEdge® Advanced IIoT edge controller powered by Crimson® software provides a reliable solution that addresses both plant floor and remote location network connectivity requirements. This OpenVPN solution can be used in a wide variety of applications and scenarios without the need for additional tools.

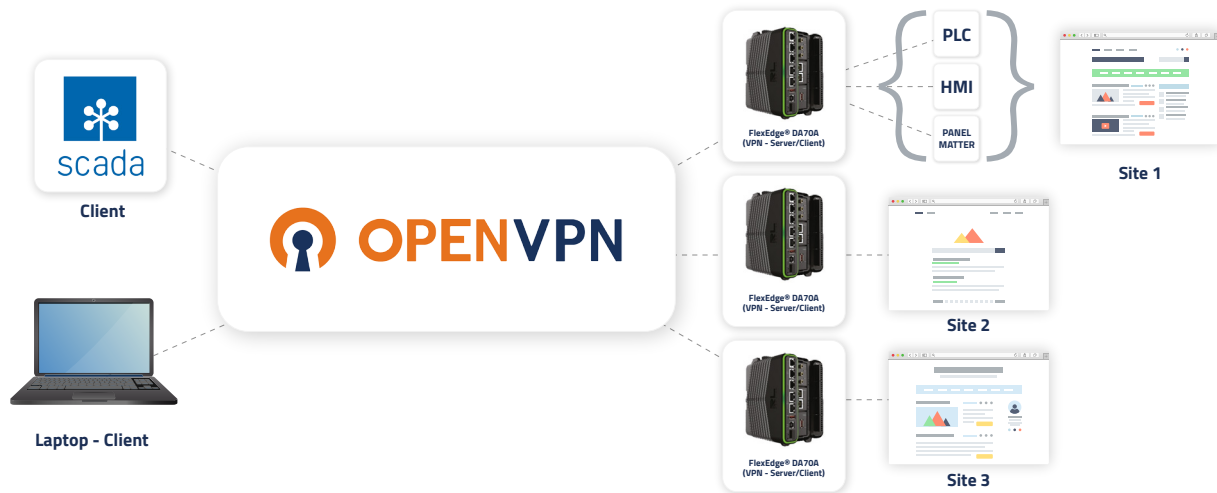


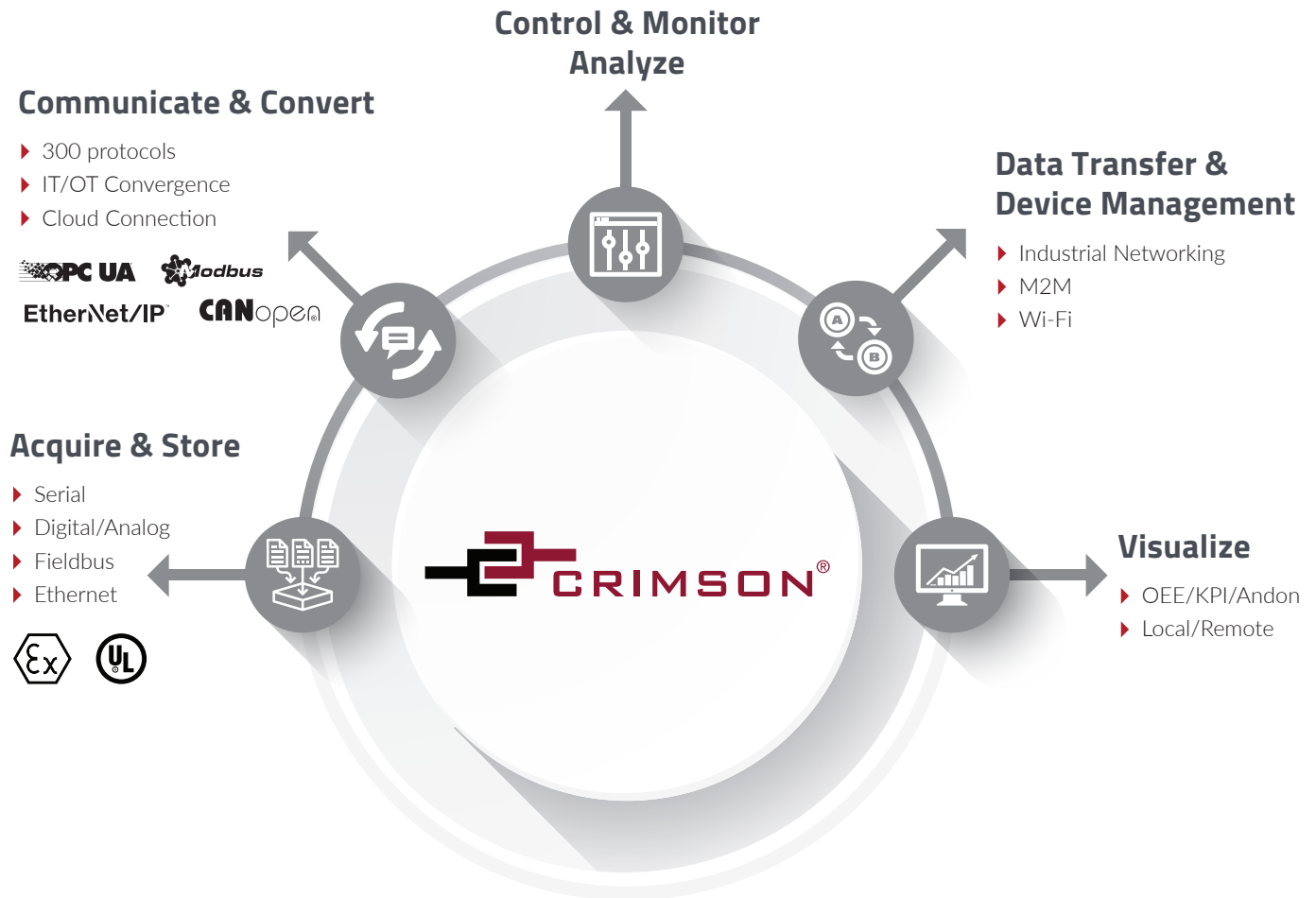
Figure 2: Open VPN Installation with FlexEdge®

Edge controllers are devices that enable the connection of cloud technologies to production floor operations and machines. They are located at the “outer edge” of the factory and translate the internal communication of a variety of fieldbuses into IP communication. OPC UA or MQTT are most commonly used for data exchange. All existing devices are then connected to a SCADA system or the cloud via FlexEdge. Initiatives such as IIoT, Connected Factory, and Industry 4.0 can be brought to life easily thanks to the point-and-click functionality of the Crimson software.

Conversion of More Than 300 Protocols

The main features of Crimson are the ability to convert more than 300 protocols, data acquisition and preparation for SCADA or ERP systems, data logging, and pre-configured MQTT connections to accommodate the most common cloud providers. Users can select a trusted cloud platform to remotely monitor, control, or develop maintenance concepts for their Industry 4.0 application.

The intuitive and graphical point-and-click configuration environment of Crimson allows users to easily create applications for remote monitoring, OT/IT connectivity, or sending data to the cloud. With pre-installed Bootstrap and JavaScript libraries, a responsive design that automatically adapts to the size of mobile devices, and support for HTML5, CSS, and HTTPS operations, it is also possible to quickly create custom dashboards for an instant overview of processes and KPI monitoring.



The FlexEdge controller is scalable and can be field upgraded to adapt to future needs as an application framework grows or changes, providing a future-proof solution. The controller can be expanded by up to ten hot-swappable I/O modules for high-density analog, discrete, PID, relay, and SSR options. LED lights on the modules facilitate on-site fault diagnosis. In addition, up to three field-installable communication slots (sleds) are available to integrate LTE cellular, Wi-Fi, or serial interfaces, as well as Ethernet or USB functions. With multiple industrial protocol options, including OPC-UA and DNP3, data is processed even if connectivity is interrupted or restricted, and operation continues without the loss of data. For example, with OPC UA, data is exchanged in real-time during normal operation; however, if a communication problem occurs, the affected data is stored and sent again as soon as the connection is restored.

High Flexibility and Easy Installation

In the practical implementation of OpenVPN communication, the automation platform is very flexible. The FlexEdge solution can be set up as a classic server/client solution or as OpenVPN in the cloud. In each case, separate subnets are used, each with logical boundaries that can be defined to enable clean separation. Despite the many possibilities, the realization of a VPN network, for example, is much easier than usual.

Traditionally, an OpenVPN connection for each device is configured online via the web or command line interface. Usually, this requires a relatively large amount of knowledge about how such a network works. The FlexEdge with Crimson solution simplifies the process and makes it possible to perform the configuration offline. This saves time because the configuration can be prepared offsite. The same basic configuration can also be used for multiple devices and updated at any time via the device management system if required. The data can easily be backed up during scheduled preventive maintenance.

One other critical requirement for a VPN is a mandatory certificate. Every OpenVPN solution needs a key certificate to work securely. The keys are typically generated by the IT department. FlexEdge powered by Crimson provides a tool that generates this certificate in an intuitive way and allows operations personnel with little IT knowledge the ability to set up a secure and redundant OpenVPN quickly, saving time and money. Additional functions can also be activated within the software as required, for example, extended logic control. When making changes to or expanding an application on the plant floor, no new components are needed, just upgrade your existing device.

Using FlexEdge, as your OpenVPN solution, offers easy-to-use secured remote access for multiple industrial protocols that ensure data integrity throughout your application.



FLEXEDGE®
 **OPENVPN**



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