

SecFlow[®]-1

Ruggedized SCADA-Aware Router Gateway



- Compact ruggedized SCADA-aware router gateway for serial and Ethernet devices, supporting IEC-101, IEC-104, Modbus, and DNP3 protocols
- Resilient 3G/HSPA+/LTE cellular network uplink for maximum service continuity with multi-service Ethernet and Serial (RS-232/RS-485) interfaces
- Integrated SCADA-aware firewall and L3 VPN with IPsec for secure connection over public networks
- IEC 61850-3/IEEE1613 compliance
- Withstands harsh environment

SecFlow-1 is an Ethernet router gateway, a member of RAD's SecFlow suite of ruggedized Ethernet products.

With a unique built-in packet processing SCADA-aware engine, it fits mission-critical industrial applications. It is most suitable for infrastructure at utility companies with remotely distributed sites, connected to a SCADA control center. SecFlow-1 is installed at remote locations, forwarding Ethernet or serial traffic over fiber optic or cellular links.

SecFlow-1 features one FE UTP port and one GbE SFP port, two serial RS-232 ports or one RS-232 plus one RS-485, and a cellular modem with two SIM cards for maximum link resiliency.

SecFlow-1 utilizes Ethernet ports for new IEC 61850 compliance IEDs for automation and teleprotection in substations.

SecFlow-1 is equipped with serial interfaces for connectivity of legacy RTUs with new IP-based IEDs. SecFlow-1 gateway converts legacy IEC-101 protocol to IP-based IEC-104, enabling seamless communication from the IP SCADA to both the old and new RTUs. This provides a single box solution for multi-service applications and smooth migration to all-IP networks.

The gateway is designed for installation under harsh environmental conditions. It features DIN-rail mount, IP30 protection level, wide operating temperature range (-40°C/-40°F to +70°C/158°F) without fans, and EMI immunity (IEC61850-3, IEEE1613, and EN50121-4).

MARKET SEGMENTS AND APPLICATIONS

SecFlow-1 addresses the following markets:

- Distributed automation in secondary substations
- Smart meter concentration
- Out-of-band management using cellular uplink.

INTEROPERABILITY

SecFlow-1 operates with SecFlow-2.

SCADA-AWARE FIREWALL

SecFlow-1 features an integrated firewall per port, providing a network-based distributed security designed especially for SCADA applications.

The device monitors SCADA commands (IEC 104 and DNP3 TCP), using deep packet inspection, to validate if they fit the intended application purpose.

Note: SCADA-aware firewall is a license-based feature.

SecFlow

ROUTER AND VPN SERVICES

SecFlow-1 features static routing, OSPF, NAT.

The device features a VPN gateway with two operation modes:

- Inter-site connectivity using IPsec tunnels
- Remote user access, using SSH.

Inter-site VPN based on IPsec encrypted link ensures L3 transparent connection of the Ethernet networks sites.

For remote access, the router uses an SSH-encrypted tunnel, with user authentication and specific access authorization.

MANAGEMENT

The device can be managed via the SecFlow element manager, which provides local management for SecFlow devices.

SecFlow-1 also supports a variety of access protocols, including CLI, Telnet, and TFTP.



SecFlow-1

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Specifications

ETHERNET

Fast Ethernet Port

1 x 10/100BaseT, RJ-45 connector

Autonegotiation IEEE 802.3ab

GbE Port

SFP socket

100BaseFx/1000BaseSx/Lx

10/100/1000BaseTx

Autonegotiation IEEE 802.3ab

Max Frame Size

1.5 kB

SERIAL INTERFACE

2 RS-232 ports

1 RS-485 (4-wire) + 1 RS-232 port

Serial transparent tunneling byte mode

Serial-to-Ethernet protocol gateway
(IEC-60870-5-101, IEC-60870-5-104)

Terminal server frame and byte mode

CELLULAR MODEM

Dual-SIM cellular modem for HSPA+/EVDO
or LTE networks (technology backward-
compatible)

Configurable Cellular authentication using
PAP or CHAP

NETWORKING

SCADA gateway for IEC101/104,
ModBus RTU/TCP and DNP3

L3 mGRE DM-VPN

L3 IPsec VPN

ROUTER

Static routing

OSPFv2

IPv4

NAT

MANAGEMENT

Control Port

Interface: RS-232

Connector: RJ-45

Management Options

Command-line interface with
password-protected access and
authorization levels

Telnet/SSH

RADview

SFTP

Multi-user TACACS+ (up to 5 authorized
users configured on the server or locally)

TIMING

Local time setting

NTP, SNTP

SECURITY

SFTP client

SCADA-aware firewall (license-based)
supporting IEC 104 and DNPT-TCP

Learning and simulation modes

Access lists L3-L4

IPsec

X.509 certification (license-based)

Dynamic Key Exchange

AES

3DES

RESILIENCE

Conditioned/scheduled system reboot

OSPF v2

Cellular ISP redundancy (SIM cards backup)

DIAGNOSTICS

Statistic counters per port

Syslog

LEDs

DDM

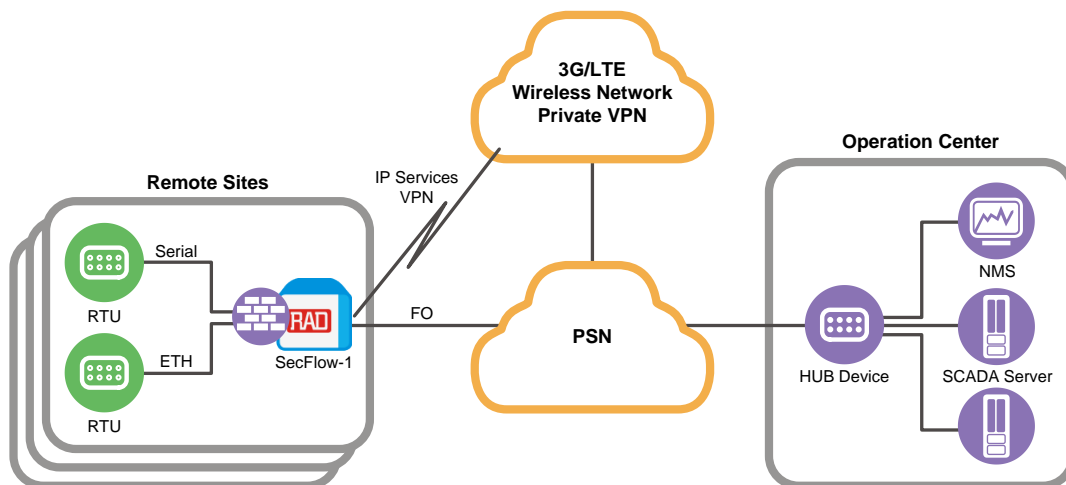


Figure 1. Distribution Automation and Smart Meter Backhaul

SecFlow-1

Ruggedized SCADA-Aware Router Gateway

Alarm Port

2 input and 2 output dry contacts

GENERAL

Physical

Height: 106 mm (4.17 in)

Width: 44.7 mm (1.76 in)

Depth: 120 mm (4.72 in)

Weight: 0.6-1.0 kg (1.3-2.2 lb)

Power

48 VDC: 20-60 VDC

24 VDC: 11-36 VDC

Power Consumption

8W

Environment

Temperature:

Operating: -40 to +70°C (-40 to 158°F)

Storage: -40 to +85°C (-40 to 185°F)

Operation humidity: up to 95%

Operating temperature of SF1-ACADP:

-20 to +70°C (-4 to 158°F).

Rugged enclosure - fanless, IP30 rated

Substation automation per IEC 61850-3/
IEEE1613 EMI

Vibration and shock resistance per
EN50121-4

Ordering

SF1/48VDC/1UTP1GBE/2RS232/HSPAP

48 VDC (20-60 VDC), 10/100BaseT Ethernet port and Gigabit Ethernet SFP port, 2 RS-232 serial interfaces, cellular interface

SF1/48VDC/1UTP1GBE/2RS232/LTENA

48 VDC (20-60 VDC), 10/100BaseT Ethernet port and Gigabit Ethernet SFP port, 2 RS-232 serial interfaces, LTE cellular modem with North American bands

SF1/48VDC/1UTP1GBE/2RS232/LTEVZ

48 VDC (20-60 VDC), 10/100BaseT Ethernet port and Gigabit Ethernet SFP port, 2 RS-232 serial interfaces, LTE modem with North American Verizon bands

SF1/24VDC/1UTP1GBE/2RS232/LTEVZ

24 VDC (11-36 VDC), 10/100BaseT Ethernet port and Gigabit Ethernet SFP port, 2 RS-232 serial interfaces, LTE modem with North American Verizon bands

SF1/48VDC/1UTP1GBE/2RS232/LTEEU

48 VDC (20-60 VDC), 10/100BaseT Ethernet port and Gigabit Ethernet SFP port, 2 RS-232 serial interfaces, LTE cellular modem with European bands

SF1/24VDC/1UTP1GBE/2RS232/LTEEU

24 VDC (11-36 VDC), 10/100BaseT Ethernet port and Gigabit Ethernet SFP port, 2 RS-232 serial interfaces, LTE cellular modem with European bands

SF1/24VDC/1UTP1GBE/2RS232/HSPAP

24 VDC (11-36 VDC), 10/100BaseT Ethernet port and Gigabit Ethernet SFP port, 2 RS-232 serial interfaces, cellular interface

SF1/48VDC/1UTP1GBE/2RSM

48 VDC (20-60 VDC), 10/100BaseT Ethernet port and Gigabit Ethernet SFP port, 1 RS-232 and 1 RS-485

SF-ESEC-LIC

License for enhanced security features (SCADA-aware Firewall and X.509)

OPTIONAL ACCESSORIES

CBL-SF-RJ45-CONSOLE

Console port cable

CBL-RJ45/DB9/NULL

Serial port cable

SF1-ACADP

Optional AC/DC DIN-rail power supply

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Your Network's Edge