

# 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
- Stateful Firewall
- IEC 61850-3/IEEE1613 design
- 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 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 to 70°C) without fans, and EMI immunity (IEC61850-3, IEEE1613, and EN50121-4).

### MARKET SEGMENTS AND APPLICATIONS

SecFlow-1 addresses the following Industrial IOT:

- Distributed automation in secondary substations
- Smart meter concentration
- Water Resources Management
- Retail
- Out-of-band management using cellular uplink

### INTEROPERABILITY

SecFlow-1 operates with SecFlow-2.

### ROUTER AND VPN SERVICES

SecFlow-1 features static routing, OSPF, BGP, VRF and NAT.

The device features a VPN gateway with two operation modes:

## SECFlow

- 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 web-based interface.

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

### Stateful Firewall

Based on pre-defined rules, the stateful firewall monitors and manages all the traffic passing through the device. Packets that are out of communication context or not allowed are dropped, and the relevant events are reported to the management system.



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### Specifications

#### ETHERNET INTERFACES

##### 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 INTERFACES

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)

Modbus RTU/TCP and DNP3

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 DMVPN

L3 IPsec VPN

#### ROUTER

Static routing, OSPFv2, BGP, VRF, IPv4, NAT

#### MANAGEMENT

##### Control Port

Interface: RS-232

Connector: RJ-45

Telnet/SSH

Web-based interface

RADview

SNMP traps

##### Management Options

CLI with password-protected access and authorization levels

SFTP

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

#### TIMING

Local time setting

SNTP

#### SECURITY

SFTP client

Stateful Firewall (early availability)

#### IPsec

X.509 certification

#### RESILIENCY

Conditioned/scheduled system reboot

OSPF v2

Cellular ISP redundancy (SIM cards backup)

#### DIAGNOSTICS

Statistic counters per interface

Syslog

LEDs

2 input and 2 output dry contacts

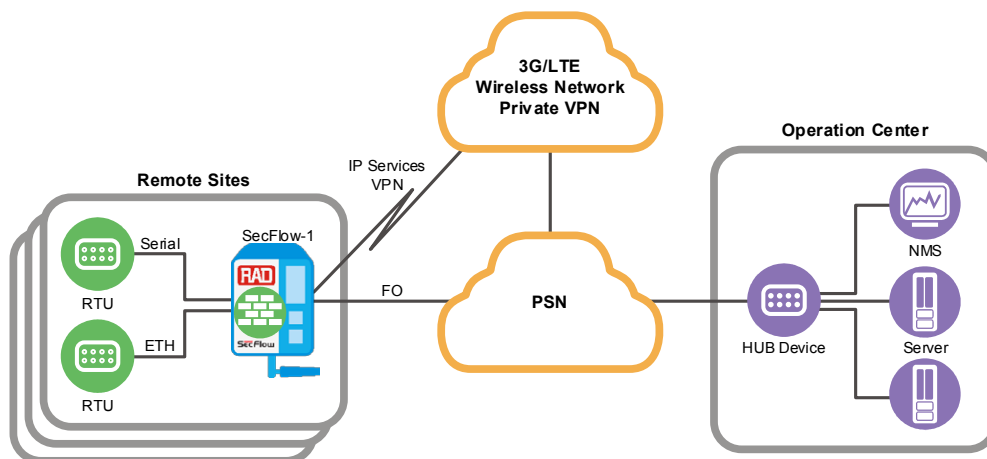


Figure 1. Industrial IoT Backhaul

## SecFlow-1

## Ruggedized SCADA-Aware Router Gateway

## 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 90%

Operating temperature of SF1-ACADP:  
 -20 to 70°C (-4 to 158°F)

Rugged enclosure – fanless, IP30 rated

Substation automation per IEC 61850-3/  
 IEE1613 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

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

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

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

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

## OPTIONAL ACCESSORIES

**CBL-SF-RJ45-CONSOLE**

Console port cable

**CBL-RJ45/DB9/NULL**

Serial port cable

**SF1-ACADP**

AC to 48 VDC power supply

**SF-ANT3G-2M**

Outdoor antenna for SF-1/SF-2 3G cellular  
 modem, 2m connecting cable

**SF-ANT3G-5M**

Outdoor antenna for SF-1/SF-2 3G cellular  
 modem, 5m connecting cable

**SF-ANT4G-2M**

Outdoor antenna for SF-1/SF-2 4G cellular  
 modem, 2m connecting cable

**SF-ANT4G-5M**

Outdoor antenna for SF-1/SF-2 4G cellular  
 modem, 5m connecting cable

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