

# VCL-SAFEComm-E-GE

## 1+1 AUTOMATIC ETHERNET FAILOVER / AB / FALLBACK SWITCH



### Product Overview

VCL-SafeComm-E is a family of Ethernet Failover Protection Switches that provide 1+1 Automatic Ethernet Failover / AB Fallback Protection between an "active" and "standby" equipment; or between "main" and "standby" networks which are connected to the network through an Ethernet interface.

VCL-SafeComm-E-GE - 100/1000BaseT Gigabit Ethernet Failover (19 Inch Rack Mount) unit which supports a maximum of 1000MBits/sec. data throughput on its primary and standby interfaces. The VCL-Safecomm-E-GE - 100/1000BaseT Fast Ethernet Failover (19 Inch Rack Mount) unit features 1+1 redundant power supplies.

Number of interfaces available in Gigabit Ethernet version: Three

- 1 x 100/1000 Gigabit Ethernet Interface: Network A (Primary)
- 1 x 100/1000 Gigabit Ethernet Interface: Network B (Standby)
- 1 x 100/1000 Gigabit Ethernet Interface User (Protected)

1+1 AC or DC power supply available in 19 Inch Rack Mount version.

**Use Case # 1:** The VCL-Safecomm-E-GE, Ethernet Failover equipment provides 1+1 Automatic Ethernet Failover Switching / Fallback Protection between two, Main and Standby Switches, Servers, RTUs or any other similar terminals to provide equipment redundancy in applications which require 99.99% terminal equipment up-time. The Ethernet 1+1 fail-over protection automatically switches to the "standby" terminal equipment in the event of failure of the "primary" terminal equipment to ensure that the 99.99% terminal equipment up-time requirements are always being met.

**Use Case # 2:** The VCL-Safecomm-E-GE, Ethernet Failover equipment provides 1+1 Automatic Ethernet Failover / AB Fallback Switch provides protection between an "active" and "standby" IP / Ethernet / MPLS Networks (including "active" and "standby" Gateways and Routers) to provide 1+1 automatic ethernet fail-over protection between two distinctly separate networks through an ethernet interface.

## Features and Benefits

- Fail-Safe. Never becomes a point of failure. Automatically reverts to and reconnects to the “primary network” / even in a power down condition.
- End-to-End network Link monitoring
- User configurable link test parameters.
- User configurable switching parameters.
- Built-in real-time clock (RTC) / real-time logging maintains a history of all events.
- Serial Management Interface (USB) for local access.
- Remote access over TCP-IP networks. Allows the user to access and carry out maintenance, or / and switch the links remotely, if required
- Password Controlled Access. Maintains a complete log of all logins.
- Script Assisted Switching. Automatically initiates switching upon receipt of the scripted message / SNMP Trap.
- Switching initiated through external triggers such as “Dry Contact Alarm Relays”.
- Manual Switching through front-panel buttons automatic front panel locking to prevent accidental switching.
- The data connection through the VCL-Safecom-E-GE between the local area network and the WAN is completely transparent. The VCL-Safecom-E-GE is a simple failover switch and does not provide any data routing between its data ingress and data egress ports.
- SNMP Management and Monitoring, SSH, NMS, Syslog.

## Applications

- Enhances network availability and reliability.
- Eliminates network downtime by automatically / seamlessly switch to the "backup" / “standby” network in the event of the complete and total failure of the primary/ active IP network.
- Disaster Recovery. To provide automatic failover protection in mission critical applications requiring minimum downtime.
- To switch between and automatically re-route IP traffic to the “standby” network upon the failure of the “primary” transmission network, simultaneously for “end-to-end” network availability.
- Alerts the user upon the failure of any one of the two “active”/“primary”, or "secondary"/“standby" IP transmission network.
- Enhances availability and reliability.
- Eliminates network downtime by automatically / seamlessly switch to the "backup" / “standby” equipment / network in the event of the complete and total failure of the primary/ active equipment / IP network.
- May also be used in combination with VCL-Firewall to provide firewall redundancy, enhanced security and resilience to hostile such as “DoS” (Denial of Service) and “Hack” attacks.
- VCL-Safecom-E-GE may be used to provide automatic fail-over protection and switching across diverse IP domains such as fiber-radio; or fiber-satellite (VSAT); or fiber-PSDN (public switched data network).
- Automatic Link Test Feature. Concurrently tests both “active” and “standby” IP links, for “end-to-end” network availability.
- Alerts the user upon the failure of any one of the two “active” / “primary”, or "secondary" / “standby” IP transmission network.

## User programmable criterion for switching between Primary and Standby (Protected) Networks

- Automatically switches between “active” and “standby” networks upon failure of the “connected” network.
- Completely eliminates the need to move (reconnect) cables. Automatically re-routes the traffic to the “available” network.
- Failsafe: Never becomes a point of failure. Automatically reverts to and reconnects to the primary link even in power down condition.
- Switching criterion is completely user programmable.
- Automatic Failover Switching criterion includes:
  - Loss of Signal
  - Loss of Link; Loss of end-to-end link connectivity
  - Heartbeat; Script (Message) based switching
  - User programmed timed switching based upon “Wall-Clock” (Time of Day)
  - Triggers generated by external dry contact relays of connected equipment
  - Packet counters (Unicast, Multicast and Broadcast) based switching
- Manual Failover Switching:
  - Manual Switching through front-panel buttons with automatic front panel locking to prevent accidental switching.
  - Manual switching through CLI command.

## Shelf Description

- The Ethernet Failover Switch is available as a 19-inch 1U shelf that provides access to all external interfaces.
- 1+1 Redundant power supplies.
- User and Network side Ethernet Interfaces, Access and Management ports (USB and 10/100BaseT Ethernet interfaces), external alarm outputs and external (alarm inputs) trigger connectors.

## VCL-SafeComm-E-GE providing and reliability

1. Provides 1+1 Network / Link Protection
2. Failsafe: Never becomes a point of failure. Automatically reverts to the primary link even in power down condition.
3. End-to-End network Link monitoring
4. Fast automatic network switching upon network failure. Eliminates Network Downtime.
5. Completely eliminates re-routing of Ethernet cables. Ethernet cables are automatically moved to the available network port.
6. Essential for any application that requires 1+1 Network / Link / Path redundancy including small / medium office establishments, PoS (point-of-sale) equipment, banking establishments, hotels, ATMs, smaller Industrial Installations etc., requiring minimum service interruption due to network outage.
7. Disaster Recovery.



## Switching parameters include:

- Network Interface(s) go down. Loss of signal on the network interface.
- Gateway(s) (Routers) go down and the routers(s) are unreachable.
- External triggers (such as the closing of an external alarm relay of your either of your routers). The user may use / may not use this option.
- Script assisted switching (and SNMP trap generated by any one of your routers to initiate switching due to router / network failure). The user may use / may not use this option.
- The actual network to become unreachable. This is done by programming a network target IP address in the VCL-Safecomm-E-GE. The network target IP address is the last point (or an omnipresent point) in a network that can be programmed by the user which can be a Google DNS server (such as 8.8.8.8), or user's corporate server (such as 161.170.140.127), if you are working in protected VPN. If, in the event, the connectivity between VCL-Safecomm-E-GE and the user programmed network target IP address is lost through the "primary" network / route, the VCL-Safecomm-E-GE automatically switches to the "standby" network / route.
- Packet counters (Unicast, Multicast and Broadcasts) based switching.
- All switching events are time-stamped and logged in VCL-Safecomm's non-volatile memory. The logs may be viewed by the network administrator at any time for network quality analysis.
- Recovery / fallback parameters to the primary route / primary network is also user programmable. These can be "automatic recovery to the primary network" upon the restoration of the primary route / primary network, or upon the failure of the standby / alternate network. One note to add here is the VCL-Safecomm-E-GE simultaneously tests both active and standby routes so the system is always aware of the status of both networks. Switching to a "dead" route shall never occur under any condition.
- The data connection through the VCL-Safecomm-E-GE between the local area network and the WAN is completely transparent. The VCL-Safecomm-E-GE is a simple failover switch and does not provide any data routing between its data ingress and data egress ports.

## Technical Specifications

Specifications	
<b>Number of Ethernet</b>	3
	1 x 100/1000 Gigabit Ethernet Interface: Network A (Primary)
<b>Interfaces</b>	1 x 100/1000 Gigabit Ethernet Interface: Network B (Standby)
	1 x 100/1000 Gigabit Ethernet Interface User (Protected)
<b>Guaranteed Maximum Data Throughput</b>	1000Mbps on 1000Mbps connection
<b>Interface Type</b>	10/100/1000BaseT-X
<b>Conformity</b>	IEEE-802.3



**Management and Control Ports**

Serial Management Port            USB, RS232  
 10/100 BaseT for remote management

**NMS (with Telnet) Specifications**

OAM Network Interface            RJ-45 Ethernet, 10/100BaseT  
 Compatibility                        Ethernet Version 2.0 IEEE802.3  
 Monitoring and Management        Serial login, Telnet, SSH (with option to disable clear text login for users.)

**AC Power Supply Specifications**

Range of input AC                    90V~240V AC, 50Hz/60Hz. Voltage

**48VDC Power Supply Specifications**

Input DC voltage - Dual Inout        48V DC (nominal)  
 Range of input voltage                18V to 72V DC  
 Input Voltage reversal Protection    Provided in the system  
 Short Circuit Protection                Provided in the system

**110VDC~220VDC Power Supply specifications**

Input DC voltage - Dual Inout        110VDC or 220VDC (nominal)  
 Range of input voltage                85V to 290V DC  
 Input Voltage reversal Protection    Provided in the system  
 Short Circuit Protection                Provided in the system

**Power Supply Options**

AC power (90 to 240V AC, 50/60Hz)  
 DC power 24VDC; 48VDC; 110VDC; 220VDC

**Power Consumption**

<10W at ambient (steady state 24 °C)

**Local / Remote Management and Monitoring Ports**

USB  
 10/100BaseT Ethernet, RJ45  
 2 x External Alarm Trigger Inputs  
 1 x Dry Contact External Alarm Relay Output

### Local / Remote Communication Options

Telnet / SSH (Option to disable clear text communication to comply with NERC security requirements)

CLI Control Interface (HyperTerminal or VT100)

### Security and Protection

Password Protection with password strength monitor

SSH

### Environmental (Equipment)

Operational	-10 to +65 °C (Typical +25 °C)
Cold Start	0 °C
Storage	-20 to +70 °C
Humidity	95% non-condensing
Cooling	Convention Cooled. No cooling fans are required.

### Mechanical Specifications

Height	44 mm (1U)
Width	480 mm (DIN 19-inch)
Depth	225 mm
Weight	3.5Kg
Rack Mount	19" Rack mounting

### Command Language

English text commands

Graphical User Interface (GUI) - English

### MTBF and Equipment MTBF

Never becomes a point failure

Per MIL-HDBK-217F:  $\geq 37$  years @ 24 °C

Per Telcordia SSR 332, Issue 1:  $\geq 42$  years @24 °C

### Compliance

EMC FCC Part 15 Class 2

Operation ETS 300 019 Class 3.2

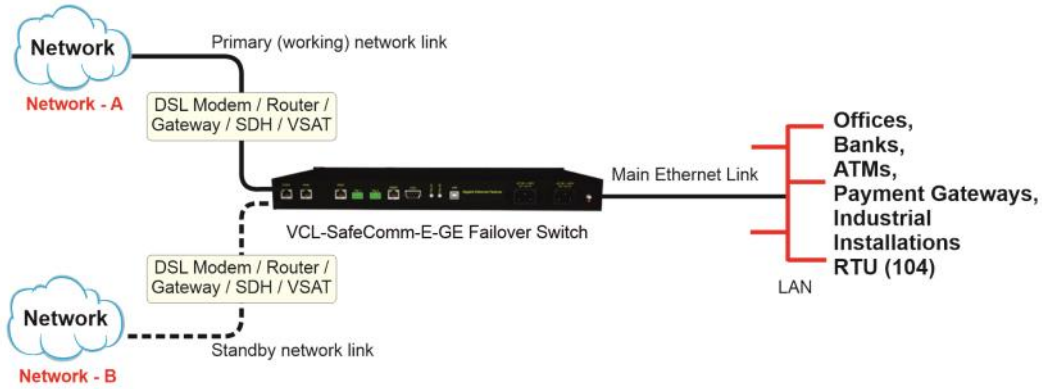
Storage ETS 300 019 Class 1.2

Transportation ETS 300 019 Class 2.3

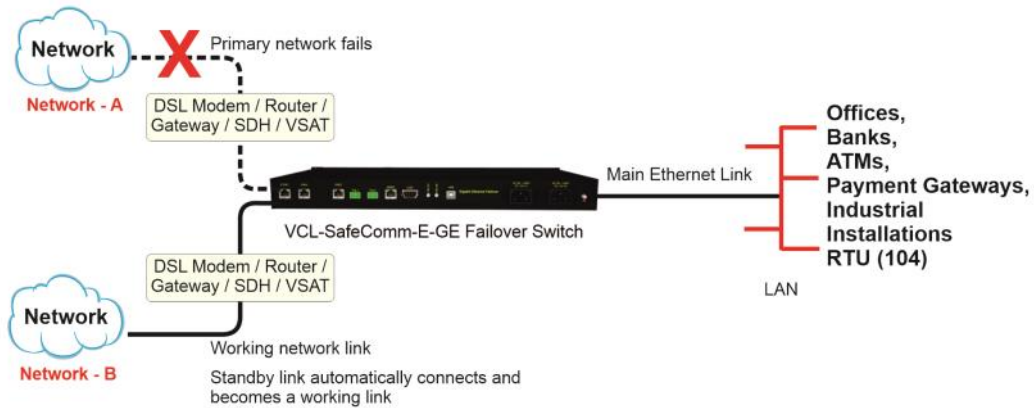
# Application Diagrams

To provide 1+1 Network Protection – Explained

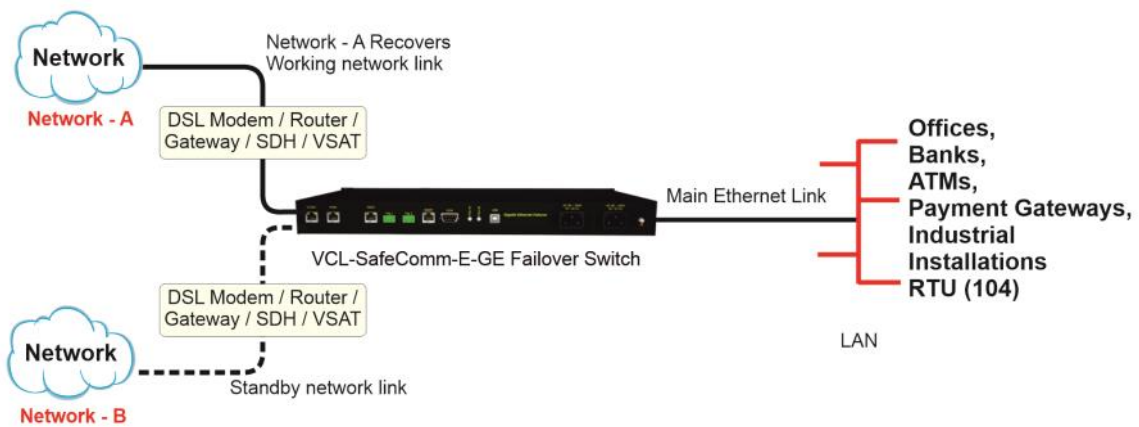
Ethernet link is connected to Network A



Network A fails. Ethernet link automatically switches to Network B

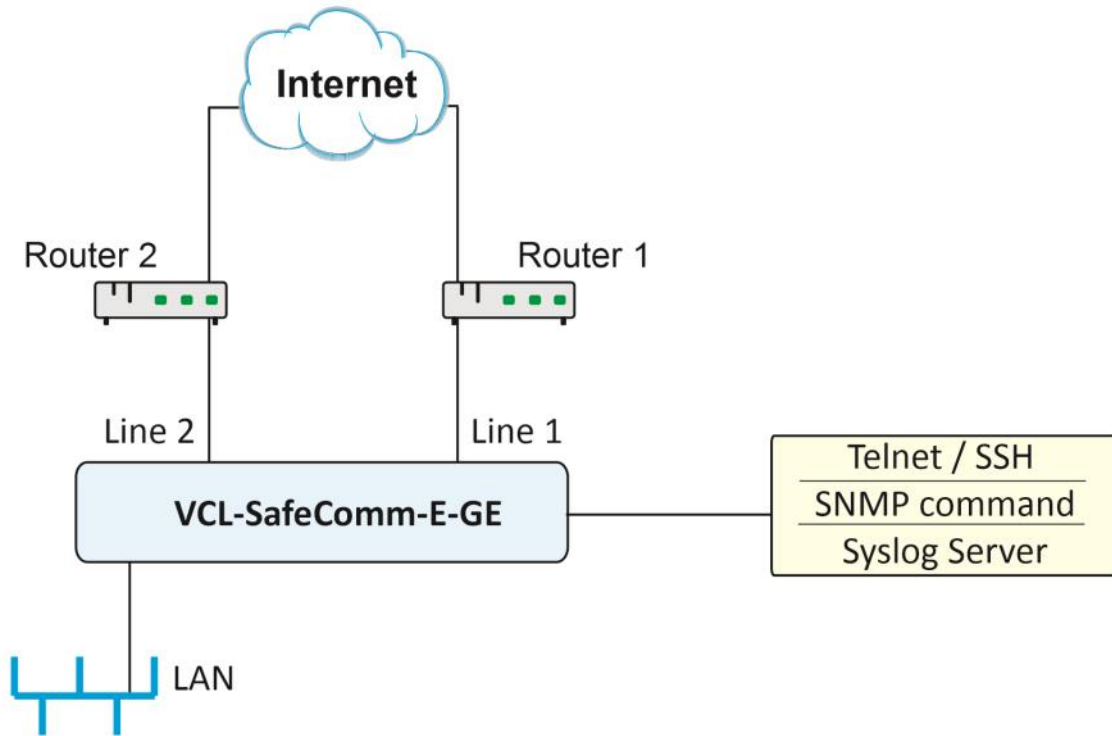


Network A recovers - Ethernet link automatically reverts and reconnects to Network A

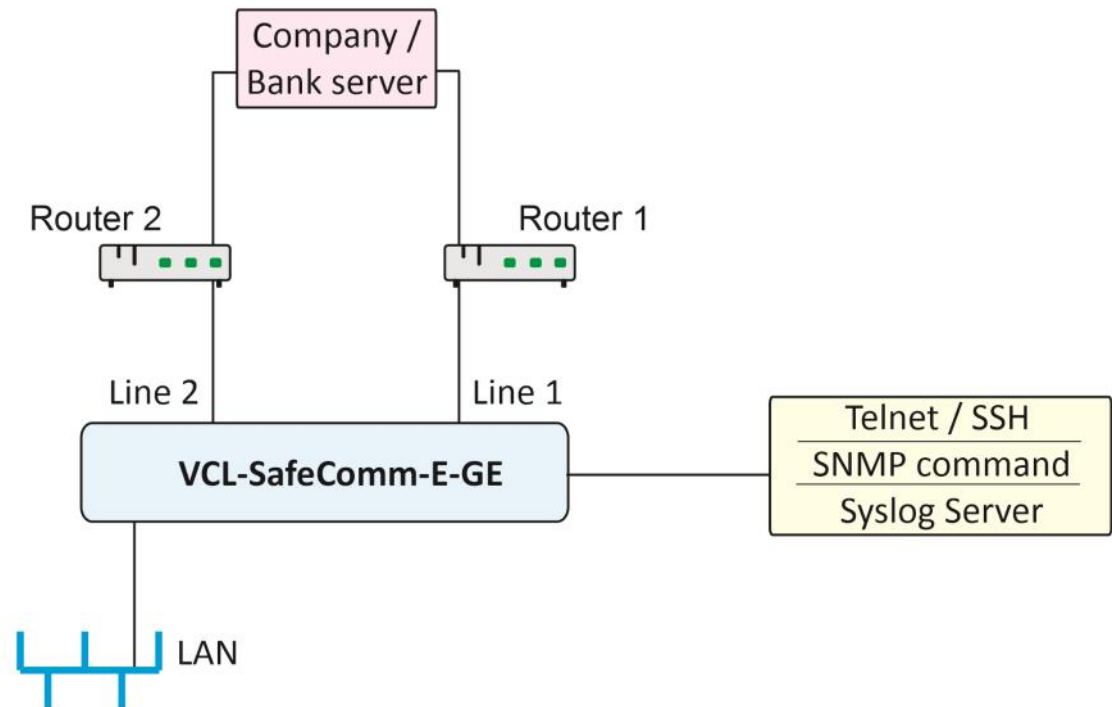




## Application Block Diagram #1



## Application Block Diagram #2





## Ordering Information

Core Unit without PSUs	
VCL-SafeComm-E-GE	<p>Gigabit Ethernet Failover Switch</p> <ul style="list-style-type: none"> <li>- Provides 1+1 Automatic Ethernet Failover Protection between two (Main and Standby) Ethernet Switches, Gateways, Terminals, Servers, Routers, RTUs, etc</li> <li>- 19-inch, Rack Mount</li> </ul> <p>Supports:</p> <ul style="list-style-type: none"> <li>- 3 x Gigabit Ethernet [1000Mbps RJ45 (F)] [1 for Network A, 1 for Network B, 1 for User]</li> <li>- Management: SNMP, Telnet (RJ45 (F) Port), Serial Port (USB, DB-9 COM), EMS, Graphical User Interface (GUI)</li> <li>- Installation Kit: System Core Cables, Mounting Hardware, Documentation, User Manual</li> </ul> <p><i>*Add Power Supply Option from below</i></p>
Power Supply Options	
ACDC	1 x 90-240V AC Power Supply Input, 1 x 48V DC Power Supply Input
AC220R	2 x 90-240V AC Power Supply Input (Redundant)
DC048R	2 x (-)48V DC Power Supply Input (Redundant)
DC220R	2 x 110-220V DC Power Supply Input (Redundant)



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