

### Product Overview

**VCL-SafeComm-E** is a family of Ethernet Link Protection Switches that provide 1+1 Automatic Ethernet Failover Protection between an "active" and "standby" equipment or IP networks. VCL-SafeComm-E is available in 2 variants.



**VCL-SafeComm-F**, which provides 1+1 Automatic Ethernet Failover Protection between two (Main and Standby) RTUs, Servers, Routers, Switches. The VCL-SafeComm-F can be used to provide equipment redundancy for applications which require 99.99% up-time. The VCL-SafeComm-F automatic fail-over protection automatically switches to the "standby" equipment in the event of failure of the "primary" equipment to ensure that the 99.99% up-time requirements are always being met. In the event of failure of the "primary / working" equipment, the VCL-SafeComm-F, Ethernet Failover Switch shall automatically switch and reroute all Cables to "secondary"/"standby" equipment. This ensures that downtime that would have otherwise occurred upon the failure of the "primary" equipment without automatic Ethernet failover capability, never occurs.

**VCL-SafeComm-N**, which provides 1+1 Automatic Ethernet Failover Protection between 2, IP Networks. The VCL-SafeComm-N can be used to provide link protection between IP networks across diverse domains such as fiber-radio; or fiber-satellite; or fiber-PSDN (Public Switched Data Network) to provide automatic fail-over protection to the "standby" network in the event of failure of the "primary" network.

VCL-SafeComm-N, Ethernet Network Protection Switch shall automatically switch and reroute all Ethernet traffic to "secondary"/"standby" IP network in the event of the failure of the "active" / "primary" network. This ensures minimum network downtime, which otherwise would have occurred upon the failure of the "primary" network.

### Applications:

- 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 / equipment upon the failure of the "primary" transmission network / equipment.

- VCL-SafeComm-N may be used to provide automatic fail-over protection and switching across diverse IP domains such as fiber-radio; or fiber-satellite; or fiber-PSDN (public switched data network).
- Automatic Link Test Feature. Continuously Tests both "active" and "standby" IP links 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-Enigmatron Firewall to provide firewall redundancy, enhanced security and resilience to hostile such as "DoS" (Denial of Service) and "Hack" attacks.

### Features and Benefits:

- Fail-Safe. Never becomes a point of failure. Automatically reverts to and reconnects the "primary link" / "primary equipment" even in a power down condition.
- User configurable link test parameters.
- User configurable switching parameters.
- Built-in real-time clock / real-time logging maintains a history of all events.
- Serial Management Interface (USB) for local access.
- SNMP Management and Monitoring.
- 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 the receipt of the scripted message such as an SNMP Trap.
- Switching initiated through external triggers such as "Dry Contact Alarm Relays".
- Manual Switching through front-panel buttons with front-panel button locking facility to prevent accidental switching.

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

Automatically switches between “Active” and “Standby” Equipment or Networks upon failure of the “Active” Equipment / Network.

- Completely eliminates the need to move (reconnect) cables. Automatically re-routes the traffic to the “Active” Equipment / Network.
- Failsafe: Never becomes a point of failure. Automatically reverts to and reconnects 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; or Script (Message) based switching
  - User programmed timed switching based upon “Wall-Clock” (Time of Day)

### Shelf Description:

The Ethernet Failover Switch is fitted in a 19-inch 1U shelf that provides access to all external interfaces.

- Option of single and dual (redundant) power supplies.
- User and Network side Ethernet Interfaces, Access and Management ports (RS232, USB and 10/100BaseT Ethernet interfaces), external alarm outputs and external (alarm inputs) triggers

### Application Diagrams

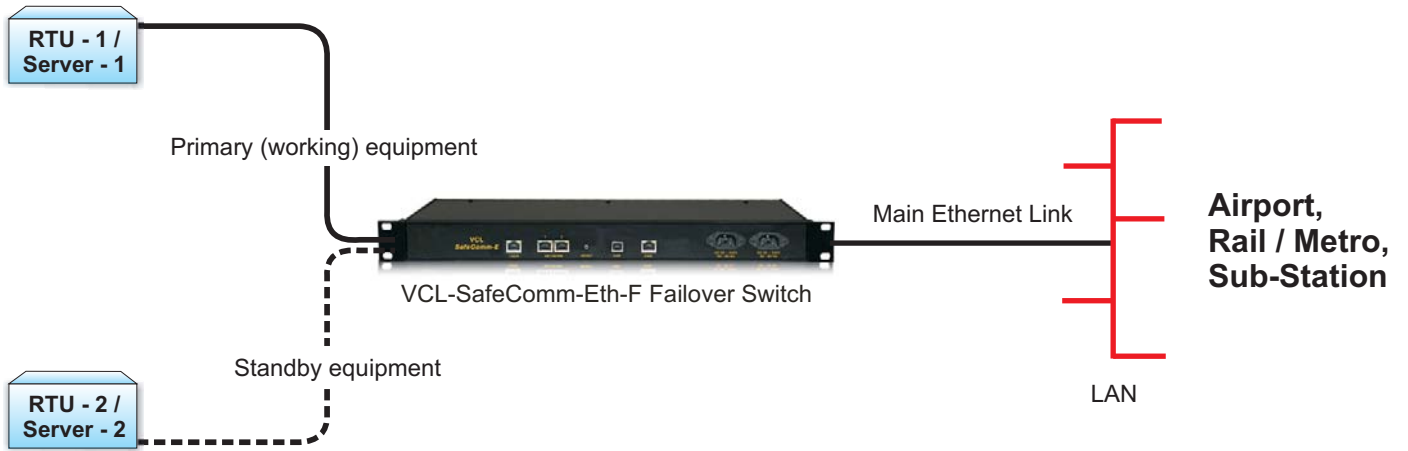
#### VCL-SafeComm-F providing 1+1 Equipment Protection

1. Provides 1+1 Equipment Protection
2. Failsafe: Never becomes a point of failure. Automatically reverts to the primary link even in power down condition.
3. Fast automatic switching to standby equipment upon the failure of primary equipment. Ensures that the 99.99% availability requirements are always met for mission critical applications.
4. Completely eliminates re-routing of Ethernet cables. Ethernet cables are automatically moved to the available (working) equipment.
5. Essential for Air-Traffic Control, Railway and Metro Signaling Networks, Sub-Stations, Oil and Gas pipelines and Industrial Installations requiring minimum service interruption due to equipment failure.
6. Disaster Recovery.

**Application Diagrams : (Ordering Part#: VCL-2478-SafeComm-Eth-F)**

**To provide 1+1 Equipment Failover Protection - Explained**

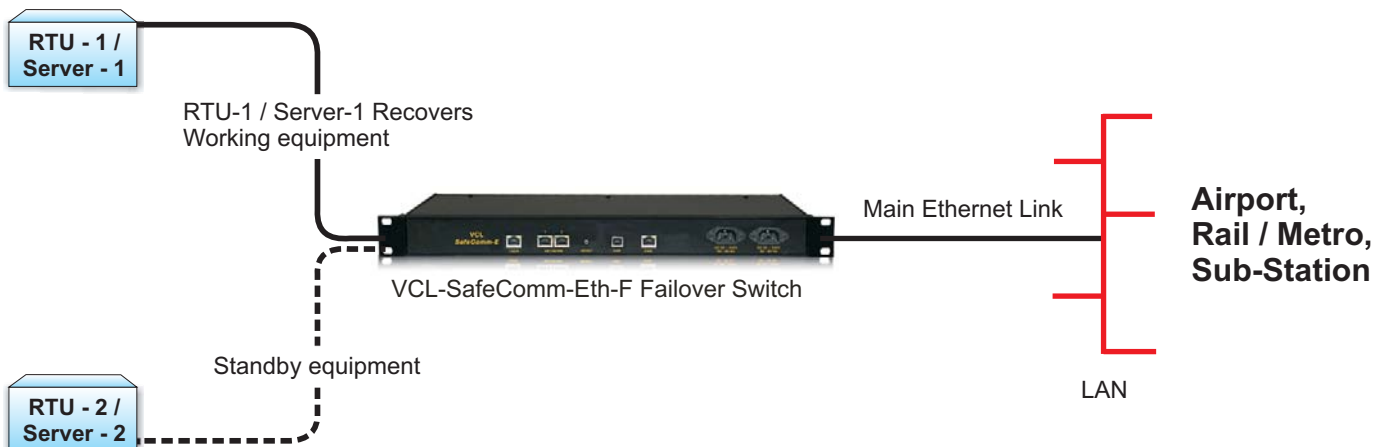
**Ethernet link is connected to RTU-1 / Server-1**



**Equipment 1 fails. Ethernet link automatically switches to RTU-2 / Server-2**



**Equipment 1 recovers - Ethernet link automatically reverts and reconnects to RTU-1 / Server-1**

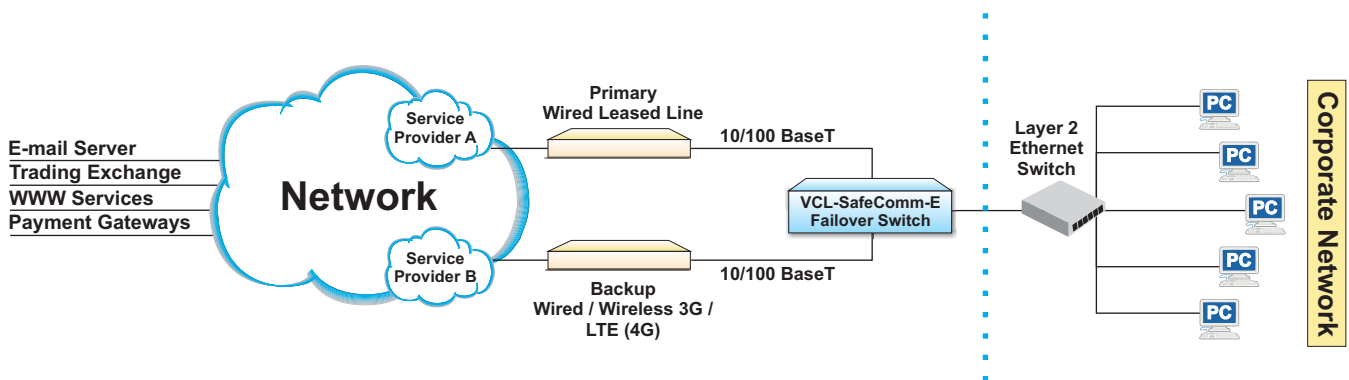


## Application Diagrams

### VCL-SafeComm-N providing 1+1 Network Protection

1. Provides 1+1 Network Protection
2. Failsafe: Never becomes a point of failure. Automatically reverts to the primary link even in power down condition.
3. Fast automatic network switching upon network failure. Eliminates Network Downtime.
4. Completely eliminates re-routing of Ethernet cables. Ethernet cables are automatically moved to the available network port.
5. Essential for Offices, Banks, ATMs, Industrial Installations requiring minimum service interruption due to network outage.
6. Disaster Recovery.

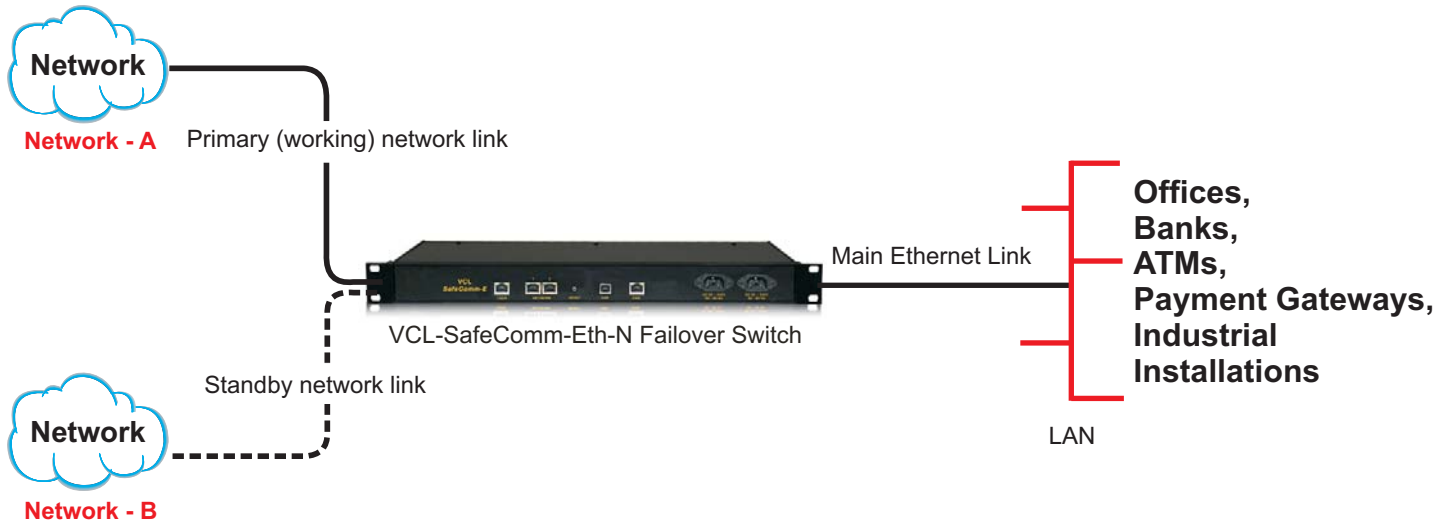
## Automatic Network Protection / Switching Solution



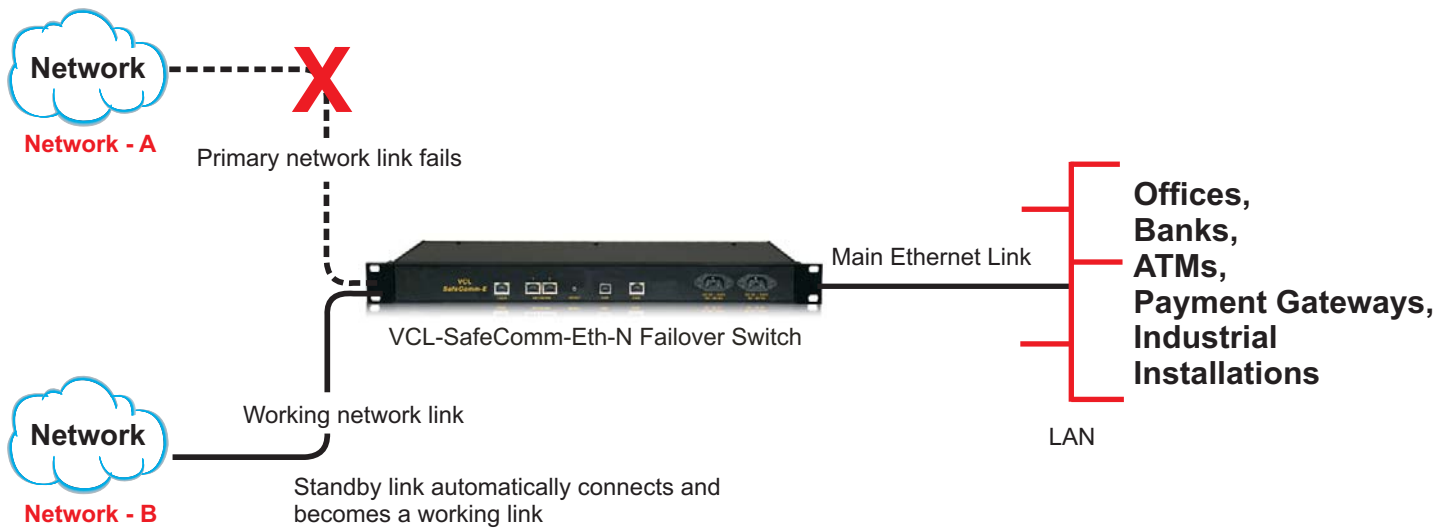
**Application Diagrams : (Ordering Part#: VCL-2478-SafeComm-Eth-N)**

**To provide 1+1 Network Protection - Explained**

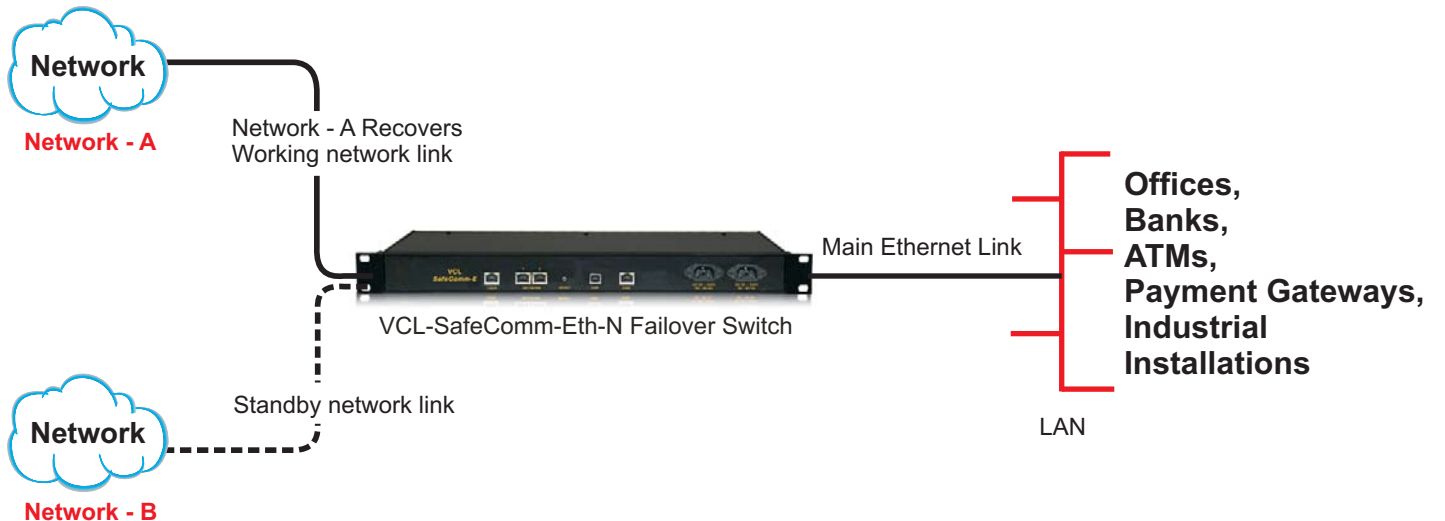
**Ethernet link is connected to Network A**



**Network A fails. Ethernet link automatically switches to Network B**



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



## Technical Specifications

### Specifications:

Number of Ethernet Interfaces	3
One Ethernet Interface: Network A	
One Ethernet Interface: Network B	
One Ethernet Interface User	
Maximum Data Throughput	100Mbps
Interface Type	10/100BaseT
Conformity	IEEE-802.3

### Management and Control Ports:

- Serial Management Port - RS232 COM Port and USB Port
- 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	SNMP V2, Serial login, Telnet, SSH (with option to disable clear text login for users).

### AC Power Supply Specifications:

Range of input AC Voltage	100V~240V AC, 50Hz / 60Hz.
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### 48VDC Power Supply Specifications:

Input DC voltage - Dual Input	- 48V DC (nominal)
Range of input voltage	-18V to -72V DC
Input voltage reversal Protection	Provided in the Card
Short circuit protection	Provided

### 110VDC~220VDC Power Supply Specifications:

Input DC voltage - Dual Input	110VDC or 220VDC (nominal)
Range of input voltage	85VDC to 290VDC
Input voltage reversal Protection	Provided in the Card
Short circuit protection	Provided

### Power Supply Options:

- AC or DC
- Dual Redundant
  - 1+1 AC power (100 to 240V AC, 50/60 Hz)
  - 1+1 DC 24V
  - 1+1 DC -48V
  - 1+1 DC 110~220V

### Power Consumption:

- < 10W at ambient (steady state 24°C)

### Local / Remote Management and Monitoring Ports:

- RS-232C
- USB
- 10/100BaseT Ethernet RJ45
- 2 x External Alarm Relay Contacts
- 2 x External Trigger Inputs.

### Local / Remote Communication Options:

- Telnet / SSH  
(option to disable clear text communication to comply with NERC security requirements)
- CLI Control Interface (HyperTerminal or VT100)
- SNMP V2 Traps (MIB File provided).

### Security and Protection:

- Password Protection with password strength monitor
- SSH

### Environmental (Equipment):

Operational:	-10C to +65C (Typical: +25C)
Cold start	0C to +50C
Storage	-20C to +70C
Humidity	95% non-condensing
Cooling	Convention Cooled. No cooling fans are required.

### Mechanical Specifications:

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

### Command Language:

- English text commands
- Graphical User Interface (GUI) - English

### MTBF:

- Per MIL-HDBK-217F: ≥ 37 years @ 24C
- Per Telcordia SSR 332, Issue 1: ≥ 42 years @ 24C

### 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

## Ordering Information

### Core Unit without PSUs

S. No.	Part No.	Product Description
1	VCL-2478-SafeComm-Eth-F	Automatic Ethernet Equipment Failover Switch <ul style="list-style-type: none"> <li>- Provides 1+1 Fail-Over Protection between 2 customer-side Ethernet Equipment / customer-side Ethernet Terminals</li> <li>- 19-inch, Rack Mount</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> * Add Power Supply Option from below
2	VCL-2478-SafeComm-Eth-N	1+1 Automatic Network Protection Switch <ul style="list-style-type: none"> <li>- Provides 1+1 Automatic Network Protection between 2 Ethernet Uplinks / 2 Ethernet Networks</li> <li>- 19-inch, Rack Mount</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> * Add Power Supply Option from below

### \*Add Power Supply Options

1	AC220	1 x 100-240V AC Power Supply Input
2	DC048	1 x (-) 48V DC Power Supply Input
3	DC220	1 x 110~220V DC Power Supply Input
4	AC220R	2 x 100-240V AC Power Supply Input [Redundant]
5	DC048R	2 x (-) 48V DC Power Supply Input [Redundant]
6	DC220R	2 x 110~220V DC Power Supply Input [Redundant]

Technical specifications are subject to changes without notice.  
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Revision 2.2B - February 20, 2017

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