Product Overview

VCL-SafeComm-EF is a family of Ethernet Failover Switches that provide 1+1 Automatic Ethernet Failover Protection between an “active” and “standby” equipment that is connected to the network through an Ethernet Interface.

VCL-SafeComm-E is available in 2 variants.
1. VCL-SafeComm-EF
2. VCL-SafeComm-EN

VCL-SafeComm-EF provides 1+1 Automatic Ethernet Failover Protection between two (Main and Standby) RTUs, Servers, Routers, Switches. The VCL-SafeComm-EF can be used to provide equipment redundancy for applications which require 99.99% up-time. The VCL-SafeComm-EF 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-EF, 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-EF is also available in a small form factor Desktop / DIN Rail version. Ordering Part Number VCL-SafeComm-EF-DIN.

VCL-SafeComm-EN which provides 1+1 Automatic Ethernet Failover Protection between 2, IP Networks. The VCL-SafeComm-EN 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-EN, 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 - VCL-SafeComm-EF:

- Enhances equipment availability and reliability.
- Eliminates equipment downtime by automatically / seamlessly switch to the “backup” / “standby” equipment in the event of the failure of the primary/ active equipment.
- Disaster Recovery. To provide automatic failover protection in mission critical applications requiring minimum equipment downtime.
- To switch between and automatically re-route IP traffic to the “standby” terminal equipment upon the failure of the “primary” terminal equipment.
- VCL-SafeComm-EF may be used to provide automatic fail-over protection and switching between two terminal equipment such as RTUs, SCADA Servers, Railway Signaling Equipment etc.
- Automatic Test Feature. Concurrently tests both “active” and “standby” equipment, for “end-to-end” link and terminal equipment availability.
- Alerts the user upon the failure or unavailability of any one of the two “active”/“primary”, or “secondary” / “standby” terminal equipment.

Features and Benefits:

- Fail-Safe. Never becomes a point of failure. Automatically reverts to and reconnects the “primary terminal equipment” / even in a power down condition.
- User configurable 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.
- 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 / SNMP Trap.
- Manual Switching through front-panel buttons.
User programmable criterion for switching between Primary and Standby (Protected) Terminal Equipment:

- Automatically switches between “active” and “standby” equipment upon failure of the “connected” equipment.
- Completely eliminates the need to move (reconnect) cables. Automatically re-routes the traffic to the “available” equipment.
- Failsafe: Never becomes a point of failure. Automatically reverts to and reconnects the primary equipment 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 connectivity with the terminal equipment
  - Heartbeat;
  - Script (Message) based switching
  - User programmed timed switching based upon “Wall-Clock” (Time of Day)
- Manual Failover Switching:
  - Manual Switching through front-panel buttons.

Application Diagrams

VCL-SafeComm-N providing 1+1 Network Protection

1. Provides 1+1 Ethernet Equipment Fail Over Protection
2. Failsafe: Never becomes a point of failure. Automatically reverts and connects to the primary equipment even in power down condition.
4. Completely eliminates re-routing of Ethernet cables. Ethernet cables are automatically moved to the available equipment port.
5. Essential for any application that requires 1+1 Terminal / Equipment redundancy such as Sub-Stations, Airports and Air Traffic Control Centers, Railway Signaling Networks and Industrial Installations etc., requiring minimum service interruption due to equipment failure.
6. Disaster Recovery.

VCL-SafeComm-EF-DIN - Chassis Description:

The VCL-SafeComm-EF-DIN, Ethernet Failover Switch is available in a small form factor, compact DIN Rail / Desktop version for various applications that provides access to all external interfaces, including User and Network side Ethernet Interfaces, Access and Management ports.

Switching parameters include:

- Network Interface(s) to go down. Loss of signal on the network interface.
- Gateway(s) (Routers) to 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 Safecomm-E. 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 Safecomm-E and the user programmed network target IP address is lost through the “primary” network / route, the Safecomm-E automatically switches to the “standby” network / route.
- All switching events are time-stamped and logged in 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 Safecomm-E 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.
Application Diagrams: (Ordering Part#: VCL-2478-SafeComm-EF-DIN)

To provide 1+1 Terminal / 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
## Technical Specifications

### Specifications:

<table>
<thead>
<tr>
<th>Number of Ethernet Interfaces</th>
<th>3</th>
</tr>
</thead>
</table>

### 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: Serial login, Telnet, SSH (with option to disable clear text login for users).

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

### DC Power Supply Specifications:
- Input DC voltage: 12V DC (nominal)
- Range of input voltage: 9V to 14V DC Input
- Input voltage reversal: Provided
- 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: Provided
- Short circuit protection: Provided

### Power Supply Options:
- AC power (100 to 240V AC, 50/60 Hz)
- DC Power 12VDC; 110VDC; 220VDC

### Power Consumption:
- < 10W at ambient (steady state 24°C)

### Local / Remote Management and Monitoring Ports:
- USB
- 10/100BaseT Ethernet Rj45

### Local / Remote Communication Options:
- CLI Control Interface (HyperTerminal or VT100)
- Telnet / SSH (option to disable clear text communication to comply with NERC security requirements)

### Security and Protection:
- Password Protection with password strength monitor
- SSH

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

### Mechanical Specifications:
- Height: 34 mm
- Width: 154 mm
- Depth: 134 mm
- Weight: 220 g

### Command Language:
- English text commands
- Graphical User Interface (GUI) - English

### MTBF and Equipment MTBF:
- Never becomes a point of failure
- Per MIL-HDBK-217F: ≥ 17 years @ 24C
- Per Telcordia SSR 332, Issue 1: ≥ 26 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

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Part No.</th>
<th>Product Description</th>
</tr>
</thead>
</table>
| 1      | VCL-2478-SafeComm-EF-DIN | 1+1 Automatic Ethernet Equipment Failover Switch  
- Provides 1+1 Automatic Ethernet Failover Protection between 2 Ethernet Terminals / 2 Ethernet Equipment  
- Management: Telnet (RJ45 (F) Port), Serial Port (USB), EMS, Graphical User Interface (GUI)  
- Installation Kit: System Core Cables, Mounting Hardware, Documentation, User Manual  
- Add Power Supply Option from below |

### *Add Power Supply Options*

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Part No.</th>
<th>Product Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12VDC</td>
<td>1 x 12VDC Power Supply Input</td>
</tr>
<tr>
<td>2</td>
<td>AC220</td>
<td>1 x 110~240V, 50/60Hz AC Power Supply Input</td>
</tr>
<tr>
<td>3</td>
<td>Dc220</td>
<td>1 x 100-220V DC Power Supply Input</td>
</tr>
</tbody>
</table>

Technical specifications are subject to changes without notice.  
All brand name and trademarks are the property of their respective owners.

Revision 2.4A - August 30, 2017