VCL-SafeComm-E-FE providing 1+1 Network Protection

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-FE – 10/100BaseT Fast Ethernet Failover (19 Inch Rack Mount) unit which supports a maximum of 100MBits/sec. data throughput on its primary and standby interfaces. The VCL-SafeComm-E-FE – 10/100BaseT Fast Ethernet Failover (19 Inch Rack Mount) unit features 1+1 redundant power supplies.

Number of interfaces available in Fast Ethernet version: Three
- 1 x 1/10/100 Ethernet Interface: Network A (Primary)
- 1 x 1/10/100 Ethernet Interface: Network B (Standby)
- 1 x 1/10/100 Ethernet Interface User (Protected)

Use Case #1: The VCL-SafeComm-E, 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, 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.

VCL-SafeComm-E-FE providing 1+1 Network Protection

- Provides 1+1 Network / Link Protection
- Failsafe: Never becomes a point of failure. Automatically reverts to the primary link even in power down condition.
- Fast automatic network switching upon network failure. Eliminates Network Downtime.
- Completely eliminates re-routing of Ethernet cables. Ethernet cables are automatically moved to the available network port.
- 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.
- Disaster Recovery.
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 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 flow based switching:
  - Received Packet Counter – Unicast, Multicast and Broadcast packet counters
- Manual Failover Switching:
  - Manual Switching through front-panel buttons with automatic front-panel locking to prevent accidental switching.

Switching parameters include:

- Loss of signal on the network interface.
- Gateway(s) / Routers are unreachable.
- Received Packet Counter – Unicast, Multicast and Broadcast packet counters
- External triggers (such as the closing of an external alarm relay on either of the routers).
- Script assisted switching (and SNMP trap generated by any one of the routers to initiate switching due to router / network failure).
- The actual network (target IP) becomes unreachable. This is done by programming a network target IP address in the Safecomm-E-FE. The network target IP address is the last point (or an omnipresent point) in a WAN 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), in protected VPNs. If, in the event, the connectivity between Safecomm-E-FE and the user programmed network target IP address is lost through the “primary” network / route, the Safecomm-E-FE 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-FE 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: VCL-SafeComm-E-D providing 1+1 Network Protection**

1. Provides 1+1 Network / Link Protection
3. Completely eliminates re-routing of Ethernet cables. Ethernet cables are automatically moved to the available network port.
4. 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.
5. Disaster Recovery.

**Shelf Description:**

The Ethernet Failover Switch is available as a Desktop DIN Rail version and 19-inch rack mount options in 1U shelf that provides access to all external interfaces.
- Single and dual (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-FE providing 1+1 Network Protection

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VCL-SafeComm-E providing 1+1 Network Protection

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6. Disaster Recovery.
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 (monitoring internet connectivity)

Application Block Diagram #2 (monitoring enterprise server)
### Technical Specifications

**Specifications:**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Ethernet Interfaces</td>
<td>- 1 x 10/100 Ethernet Interface: Network A (Primary)</td>
</tr>
<tr>
<td></td>
<td>- 1 x 10/100 Ethernet Interface: Network B (Standby)</td>
</tr>
<tr>
<td></td>
<td>- 1 x 10/100 Ethernet Interface User (Protected)</td>
</tr>
<tr>
<td>Guaranteed Maximum Data Throughput</td>
<td>100Mbps</td>
</tr>
<tr>
<td>Interface Type</td>
<td>10/100BaseT</td>
</tr>
<tr>
<td>Conformity</td>
<td>IEEE-802.3</td>
</tr>
</tbody>
</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.

**48VDC Power Supply Specifications:**
- Input DC voltage: -48V DC (nominal)
- Dual Input
- Range of input voltage: -18V to -72V DC
- Input voltage reversal: Provided in the System
- Short circuit protection: Provided in the system

**110VDC~220VDC Power Supply Specifications:**
- Input DC voltage: 110VDC or 220VDC (nominal)
- Dual Input
- Range of input voltage: 85VDC to 290VDC
- Input voltage reversal: Provided in the system
- Short circuit protection: Provided in the system

**Power Supply Options:**
- AC power (100 to 240V AC, 50/60 Hz)
- 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 Relay Outputs (Dry Contacts)
- 2 x External Alarm Trigger Inputs (Dry Contacts)

**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°C to +65°C (Typical: +25°C)
- Cold start: 0°C
- Storage: -20°C to +70°C
- 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 and Equipment MTBF:**
- Never becomes a point of failure
- Per MIL-HDBK-217F: ≥ 37 years @ 24°C
- Per Telcordia SSR 332, Issue 1: ≥ 42 years @ 24°C

**Compliance:**
- CE, RoHS
- EMC FCC Part 15 Class 2
- Operation ETS 300 019 Class 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>
<tbody>
<tr>
<td>1</td>
<td>VCL-2478-SafeComm-E-FE</td>
<td><strong>Automatic Ethernet Failover Switch</strong>&lt;br&gt;- Provides 1+1 Automatic Ethernet Failover Protection between 2, IP Networks&lt;br&gt;- 19-inch, Rack Mount. - 3 x Ethernet [100Mbps RJ45 (F)]&lt;br&gt;[1 for Network A, 1 for Network B, 1 for User]&lt;br&gt;- Management: SNMP, Telnet (RJ45 (F) Port), Serial Port (USB), EMS, Graphical User Interface (GUI)&lt;br&gt;- Installation Kit: System Core Cables, Mounting Hardware, Documentation, User Manual&lt;br&gt;* Add Power Supply Option from below.</td>
</tr>
</tbody>
</table>

## Add Power Supply Options

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AC220</td>
<td>1 x 100-240V AC Power Supply Input</td>
</tr>
<tr>
<td>2</td>
<td>DC048</td>
<td>1 x (-) 48V DC Power Supply Input</td>
</tr>
<tr>
<td>3</td>
<td>DC220</td>
<td>1 x 110~220V DC Power Supply Input</td>
</tr>
<tr>
<td>4</td>
<td>AC220R</td>
<td>2 x 100-240V AC Power Supply Input [Redundant]</td>
</tr>
<tr>
<td>5</td>
<td>DC048R</td>
<td>2 x (-) 48V DC Power Supply Input [Redundant]</td>
</tr>
</tbody>
</table>

Technical specifications are subject to changes without notice.
Revision 3.0 - January 06, 2020