

# IPCOMM ERM1

## 1-Port Ethernet A/B switch with integrated digital I/O

**ERM1 is a network selector for manual or voltage-based control of a single Ethernet connection. ERM1 is suitable to physically switch between or enable/disable 10 Gigabit Ethernet lines.**

ERM1 is designed for use in industrial applications and has no rotating parts. No fan is required due to the low power requirement.

It is suitable for use in the extended temperature range from -40 °C to 85 °C and meets the specific requirements of the IEC 61850-3 standard regarding electromagnetic compatibility for automation in substations.

- 10M/100M/1G/10G Ethernet
- Transparent data transmission
- Conduct-through Power over Ethernet (PoE)
- Telecontrol using digital I/O

### UTILIZATION AS AN ON/OFF SWITCH

- Emergency shutdown of networks
- Remote maintenance access to siloed systems
- Sealing off conference rooms
- Switching surveillance cameras on and off
- Network kill switch
- Device protection



### APPLICATION AS AN A/B SWITCH

- Changeover to backup networks
- Redundant ISP integration
- Redundancy coupling for standalone systems
- Shared use of network devices

### CONTROL OPTIONS FOR THE ETHERNET RELAYS

#### • Digital I/O interface

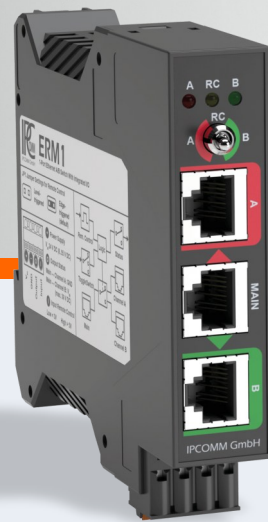
For voltage-controlled switching, ERM1 is equipped with one digital input. A jumper setting specifies whether the line switching is level- or edge-triggered. The connection status is returned via a digital output, to a programmable logic controller (PLC), for example.

#### • Mechanical 3-way switch

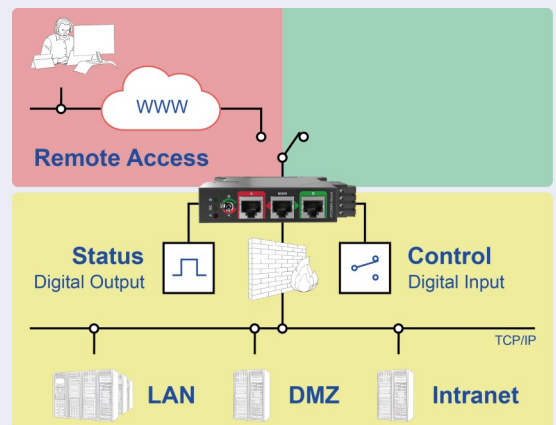
Manual changeover from one network connection to the other is performed using a 3-way toggle switch at the front of the device. Its position takes precedence over the voltage-based remote control. The current switching status is displayed by three LEDs for visual feedback.

For the changeover, the A/B network selector uses bistable relays that maintain their state even during power outages. Established connections will not be affected.

As all eight contacts of an RJ45 connection are switched over one-to-one, ERM1 can also be used to control serial connections (RS-485, RS-232, RS-422).



### Secure Remote Maintenance



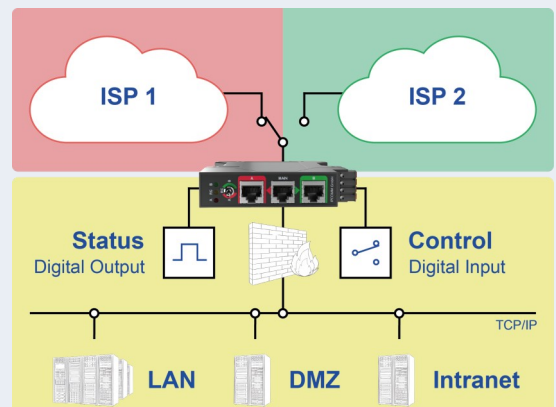
With the increasing degree of networking between machines and industrial facilities, the need for remote maintenance access to optimize costs is likewise growing.

At the same time, this raises the risk of cyber attacks, especially if legacy systems or those with deprecated security mechanisms are deployed.

With ERM1, the consequential exposure to attacks can be minimized. Maintenance connections can be physically disconnected while not required.

Thus potential attackers have no opportunity to exploit an idle port to implant malicious code.

### Redundant ISP Integration



With ERM1, you can easily toggle between two Internet service providers (ISPs) to maintain smooth access to telecommunication lines even in the event of disruptions and outages of one provider.

While the connection to one of the providers is set active, the other remains disconnected from the network. In case of service quality issues with the active provider, ERM1 can be used to seamlessly switch to the alternative provider.



## Technical data

<b>Power supply</b>	<ul style="list-style-type: none"> <li>• <math>V_{IN}</math>: 24 V DC</li> <li>• Max. 150 mA (typ. 3 - 5 mA)</li> <li>• Line cross-section 0.129 - 3.31 mm<sup>2</sup> (solid or stranded wire)</li> <li>• The ground (GND) is galvanically connected directly to the protective earth (PE)</li> </ul>
<b>Interfaces</b>	<ul style="list-style-type: none"> <li>• 3x RJ45 Ethernet relay ports</li> <li>• 10M/100M/1G/10G Ethernet</li> <li>• 1x digital control input</li> <li>• Input voltage: 0 – 24 V DC</li> <li>• 1x digital status output</li> <li>• Output voltage: 0 – 24 V DC</li> <li>• 1x 3-way switch for manual control</li> </ul>
<b>Status LEDs</b>	<ul style="list-style-type: none"> <li>• A: Switching state MAIN &lt;&gt; Port A</li> <li>• B: Switching state MAIN &lt;&gt; Port B</li> <li>• RC: Remote control over digital input</li> </ul>
<b>Housing</b>	<ul style="list-style-type: none"> <li>• Plastic, IP30</li> <li>• 35 mm DIN-Rail mounting</li> <li>• No rotating parts</li> </ul>
<b>Dimensions (W x H x D)</b>	• approx. 22.5 mm x 105.5 mm x 123.4 mm
<b>Weight</b>	• approx. 0.13 kg
<b>Operating environment</b>	<ul style="list-style-type: none"> <li>• Operating temperature -40 °C to 85 °C</li> <li>• Storage temperature -40 °C to 85 °C</li> <li>• Relative humidity 5% to 90% not condensing</li> </ul>
<b>Approval</b>	• CE (Industrial)
<b>Standards</b>	<ul style="list-style-type: none"> <li>• EN IEC 61000-6-2:2019</li> <li>• EN 61000-6-2:2005 +AC:2005</li> <li>• EN IEC 61000-6-4:2019</li> <li>• EN 61000-6-4:2007 +A1:2011</li> <li>• EN 61000-6-5:2015</li> <li>• EN 61850-3:2014</li> <li>• FCC Part 15 Subpart B</li> <li>• ICES-003 (Issue 7)</li> </ul>
<b>Conformity</b>	• RoHS, REACH, WEEE, UKCA, FCC, ICES

The *ERM1* network selector is available as a pure hardware solution. For more demanding control options or more complex circuits, we recommend the **4-Port Ethernet Line Breaker ipELB**.

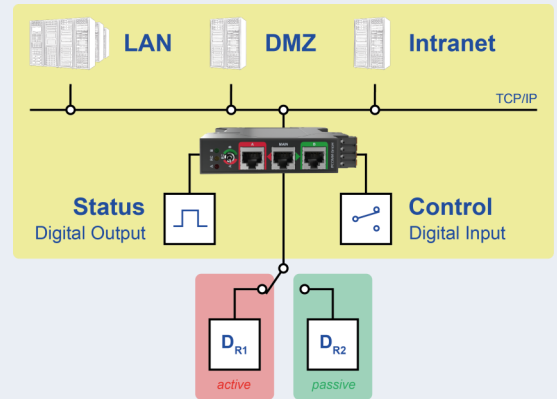
For further information on *ERM1*, see [www.ipcomm.de/ERM1](http://www.ipcomm.de/ERM1)



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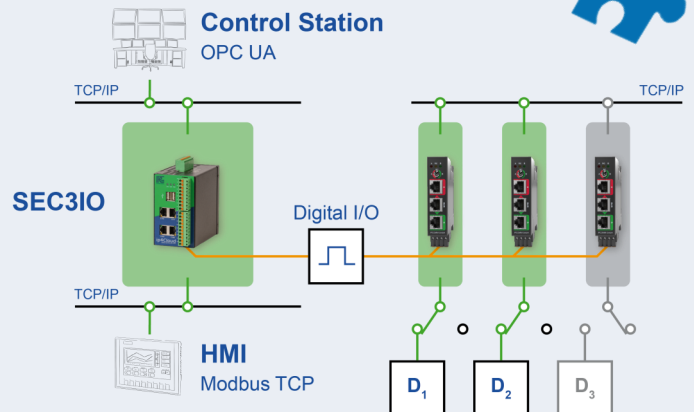
## Redundancy Coupling for Standalone Systems



Redundant systems are commonly deployed to ensure the operation and reliability of critical systems. Yet many devices do not meet this requirement. With *ERM1* even these devices can be used for redundant operation.

This is achieved by connecting two identically configured devices (e.g. by assigning the same IP addresses) to the Ethernet ports of the *ERM1*. The passive component remains physically separated from the network. If the active component fails, its connection can be cut while the connection to the passive device is activated.

## Advanced Control Options



To meet higher demands on the monitoring and control options of the *ERM1*, the integration of **ip4Cloud/SEC3IO** offers numerous additional functionalities. On the one hand, it enables the automation of the *ERM1* network selector using standardized communication protocols (e.g. SNMP, REST, OPC UA, MQTT). On the other hand, the status of an *ERM1* 1-port Ethernet A/B switch can be monitored and controlled via its integrated web interface.

With the integrated 8x digital I/O interface of the **SEC3IO**, up to eight *ERM1* instances can be managed effortlessly. Additionally, powerful functions are available for data processing, which can be used for capturing and setting switching states to control *ERM1*.