Main characteristics

• SIC-A provides any-to-any protocol conversion that permit the integration of equipment with proprietary and legacy protocols in a modern infrastructure with the most recent protocols and redundant topologies.

• SIC-A can work as a multi-protocol converter, as an unmanaged Redbox or as a redundant protocol gateway.

• SIC-A can manage up to 3000 data points of the most common protocols (Modbus, IEC 60870, DLMS, DNP3, ...) or up to 800 data points of advanced protocols as IEC 61850.

• The device provides with HSR (High-availability Seamless Redundancy) is one of the chosen redundancy protocols for the substation automation as per the IEC 61850 standard. This redundancy is the evolution of the existing Parallel Redundancy Protocol (PRP).

• It is especially suited for applications that demand high availability and very short switch over time because it provides zero recovery time in case of the failure of any component. A good example of application may be the protection of automatized electrical substations or the control of synchronized drives, for instance.

Main applications

• Redbox

SIC-A Working as a Redbox allows the connection of HSR networks with traditional ones.

In case of PRP redundancy, SIC-A is not denominated Redbox, it would be a device that allows the integration into 2 independent networks through a 3rd Ethernet port.
• **Protocol Gateway**

SIC-A device is able of communicating through serial communication RS-232 or RS-485 with multiple equipment with a Master serial protocol (Modbus, IEC69870-5-101, IEC60870-5-103, DLMS…) and dispose the information into an Ethernet protocol as IEC 61850 or IEC 60870-5-104. This way, devices with conventional protocols can be integrated in Ethernet networks with advanced protocols.

• **Redundant Protocol Gateway**

It is the result of the combination of the functionality of a Gateway and the HSR redundancy. With this configuration, SIC-A allows the integration of equipment with serial communications in a HSR redundant network with an advanced protocol as IEC 61850 or IEC 60870-5-104.

• **Most complete topology**

2 SIC-A in their topology of Redbox allow connecting a HSR redundant network with another PRP network. This is a useful application that permits to coexist new networks with existing ones.

In the same way, SIC-A in its topology of PRP Gateway, would allow to integrate serial equipment with conventional protocols in a PRP network with an advanced Ethernet protocol as IEC61850, IEC 60870-5-104, etc.
Technical specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose of device</td>
<td>-</td>
<td>Protocol Gateway – Redbox – Protocol Redundant Gateway</td>
</tr>
<tr>
<td>Assembly (mounting) type</td>
<td>-</td>
<td>Mounted on standard 35 mm DIN bar and Wall mounting</td>
</tr>
<tr>
<td>Protection degree</td>
<td>-</td>
<td>IP20</td>
</tr>
<tr>
<td>Operating temperature range °C</td>
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<td>-40 to +85</td>
</tr>
<tr>
<td>Consumption</td>
<td>W</td>
<td>6 maximum</td>
</tr>
<tr>
<td>Auxiliary Power</td>
<td>Vdc/Vac</td>
<td>24*-110 / 48-230 ±20%</td>
</tr>
<tr>
<td>Weight</td>
<td>Kg</td>
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</tr>
<tr>
<td>Diameter of adapters on terminals mm²</td>
<td></td>
<td>0.5-2.5</td>
</tr>
</tbody>
</table>

Main specifications

Management
- EasyConnect Configuration utility

System Protocols
- TCP/IP, UDP/IP, SMTP, POP, HTTP, FTP, SNMP, ICMP, DHCP, BOOTP, Telnet, DNS, ARP, PPPoE, DDNS

Device Security
- NERC/CIP Compliant, SSHv2

Communication Security
- SSL based VPN tunnel using Blowfish/AES/3DES

Logic Programming
- AND/OR/NOT/Bit SHIFT/Split/Index support for digital and analog data, Delay operations

Network Management
- SNMP Agent

Protocol Support
- IEC 60870-5-101/103/104, DNP3 serial/TCP, Modbus RTU/ASCII/TCP, IEC 62056-DLMS, IEC 61850, IEC 61400

Supported Data Point
- IEC 61850: 800
- DNP3, IEC 60870, Modbus and other proprietary protocols: 3000

Devices Supported
- 20 (10 over serial RS-485 recommended)

Serial interfaces
- 1 or 2 RS-485 - Terminals and/or 1 or 2 RS-232- DB9 *

Ethernet interfaces
- 1 RJ45 or 1 LC SFP 100Base-FX 1300nm *

HSR/PRP interfaces**
- 2 RJ45 or 2 LC SFP 100Base-FX 1300nm *

Time Synchronization
- NTC/SNTP/MEA, Protocol Specific (IEC 104/DNP3, etc.)
- RTC on-board

Redundancy**
- Unmanaged. Compliant implementation of both PRP (IEC 62439-3-4) and HSR (IEC 62439-3-5).

* Model dependent
** Redundant functionality and redundant ports will be disabled if SIC-A2 model is selected

Dimensions and cutout pattern SIC-A
### Redundancy Protocols Gateway (PRP/HSR)

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
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<tbody>
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</table>

#### Advanced protocol Gateway with redundancy

- **FUNCTION**
  - Redbox Protocol Gateway
  - Redundant Protocol Gateway

- **POWER SUPPLY**
  - 24V*-110 / 48-230 Vdc-Vac ±20%

- **ETHERNET PORT**
  - RJ45
  - RJ45 + SFP LC Connector

- **REDUNDANCY PORT**
  - RJ45
  - RJ45 + SFP LC Connector

- **SERIAL PORTS**
  - 2 x RS232 (DB9)
  - RS232 (DB9) + RS-485 (Terminal)

- **REDUNDANCY TYPE**
  - None
  - HSR
  - PRP

- **MASTER / CLIENT PROTOCOL**
  - None
  - Modbus RTU
  - IEC 60870-5-103
  - DNP3.0 Serial
  - IEC 60870-5-101
  - DLMS/COSEM
  - IEC 61850

- **SLAVE/SERVER PROTOCOL**
  - None
  - IEC 61850
  - DNP3.0 TCP/IP
  - IEC 60870-5-104
  - MODBUS TCP/IP
  - IEC 60870-5-101

- **ADAPTATION**
  - -

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*A SIC-A Gateway using optical fiber will require a minimum voltage supply of 48 Vdc for its correct working.*

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SIC A 2 C 0 0 B 0 B C A