GRID AUTOMATION PRODUCTS

500FSD Analog Modems
DIN rail serial networking

- Modern product for robust field-proven technology
- Cost-efficient solution for traditional telecontrol tasks
- Partyline capability
- Small footprint
ABB 500FSD is a product series of ruggedized FSK-based analog modems especially designed to support critical infrastructure companies by robust communication technology offering low cost and minimal downtime for traditional serial communication tasks.
Serial communication for SCADA applications
Analog modems for small stations

The 500FSD series out of the EDS500 product-family is a product series of ruggedized FSK-based analog modems. It is especially designed to support critical infrastructure companies by enabling communication for traditional serial devices like RTUs or IEDs. The 500FSD product series interoperates with any standard FSK-based technology but is also capable to achieve higher data rates by enhanced technology. The devices are used in a variety of markets which require the need for cost-efficient reliable communication.

Utilities
500FSD devices are used for a wide range of applications in the energy, water, gas and fluid distribution:

• As communication device in subtransmission and distribution networks for telecontrol, telemetering and smart grids to interconnect substations
• As communication device along pipelines to attach RTU, IED or PLC driven valves, pump stations and depots
• As general replacement to transmit legacy serial protocols

Transportation
The device series 500FSD is suited for railway, waterway and highway applications:

• Within train stations to connect ticket machines and other low-bandwidth applications
• Along railway tracks to communicate to interlockings, signals, points and auxiliary systems like point heatings
• In highway environments to connect dynamic road signs, fog or ice sensors
• Along waterways to connect water level and fog sensors or watergates

Oil & Gas
The product series can be used for pipeline monitoring and control as well as wellhead automation for small production facilities.

Connectivity
The 500FSD series of analog modems consists of multiple products allowing to establish wide area connections via customer-owned copper cables.

The devices provide a serial interface (V.24 / RS-232) and a combined two/four wire line interface. A variety of communication schemes are supported to provide connectivity to clients and other communication devices:

• 24 channels each 50 bps (ITU-T/CCITT R.35)
• 12 channels each 100 bps (ITU-T/CCITT R.37)
• 6 channels each 200 bps (ITU-T/CCITT R.38a)
• 2 channels each 600 bps
• 1 channel 1200 bps (ITU-T/CCITT V.23)
• 1 channel 2400 bps
• 1 channel 9600 bps

500FSD devices can be used in point-to-point (end-to-end) and multidrop (partyline) applications. The transmission is transparent, supporting byte oriented (e.g. IEC 60870-5-101, IEC60870-5-103, IEC 62056-21, RP570/71, DNP, Modbus, SEAB 1F, TG809 or SINAUT) as well as pulse based (e.g. quantity pulse or relay contacts) transmission procedures. The specified bit rate defines the maximum bit rate allowed, lower bit rates can still be transmitted.

Modulation
500FSD products rely on FSK based modulation technology with adjustable attenuation and equalizer to compensate line characteristics. 500FSD20 is able to report bad line quality via an isolated alarm relay.
Multi-channel
500FSD10 and 500FSD11 are cost-efficient modems allowing to communicate on a 1200 bps V.23 or 9600 bps channel on one wire pair. The device 500FSD20 is in addition able to operate in multi-channel environments allowing multiple separate data streams on the same cable. Using this frequency multiplexing based technology it is possible to separate and run multiple services on a single two or four wire cable. This can also be used to separate the send and receive channels to allow full duplex on two wire installations.

Benefits
The wide area of applications enable the 500FSD product series to be used in any cost-efficient environment using serial communication. Its simplicity and robustness provide ease of installation as well as long product lifetime.

Analog serial modems of the 500FSD product series allow to implement real physical two or four wire shared bus topologies (all modems connect to the same cable) with ranges of up to 30 km.

The compact case without moveable parts for easy installation on DIN rail, a wide area power supply (24 ... 60 V) with small power consumption, extended temperature range and integrated overvoltage protection complete the concept of the 500FSD product series.

RTU560 integration
All products of the 500FSD series are also available as plugin modules for RTU560.
Network Structures

Numerous network structures like point-to-point, lines, and stars can be realized with the devices of the 500FSD product series.

**Line**
A line topology usually follows the physical path of an infrastructure installation, e.g. an energy line or pipeline. 500FSD analog modems realize a line topology by physically connecting all modems to the same copper cable via two or four wires. In this so called partyline or multidrop configuration the application protocol provides a polling scheme to query and control the different stations.

**Point-to-Point**
Point-to-point connections can be used if possible by the physical environment or if high throughput is required. The point-to-point connection can utilize either two or four wires. In four wire mode the connection can be operated full duplex allowing symmetric protocols to be used (e.g. symmetric IEC 60870-5-101). If two wires are used full duplex operation can be achieved by using 500FSD20 and frequency-separated channels in transmit and receive direction.
**Star**

The star topology is used in centralized applications with a central connection point. The different connections for the stations are bundled in the control center and are attached to a single 500FSD analog modem. For start topologies two or four wire cabling is possible.

**Multidrop Star**

By combining star and line topology a multidrop star can also be realized. It connects multiple transmission lines to a central point like a control center.
Ordering Information

DIN rail products

ANALOG MODEM PRODUCTS

500FSD series analog modems.

<table>
<thead>
<tr>
<th>Type</th>
<th>Identnumber</th>
<th>Max. Bit Rate</th>
<th>Standards</th>
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<tbody>
<tr>
<td>500FSD10</td>
<td>R0001</td>
<td>1200 bps</td>
<td>ITU-T V.23</td>
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<tr>
<td>500FSD11</td>
<td>R0001</td>
<td>9600 bps</td>
<td>Proprietary</td>
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<td>500FSD20</td>
<td>R0001</td>
<td>50 - 2400 bps</td>
<td>ITU-T R.35, R.37, R.38A, V.23</td>
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### Ordering Information

Accessories for use with 500FSD series of analog modems.

<table>
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<th>Type</th>
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<th>Description</th>
<th>Remark</th>
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<tbody>
<tr>
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<td>1SVR427032R0000</td>
<td>100...240 VAC to 24 VDC / 60 W</td>
<td>Power Supply</td>
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<tr>
<td>CP-E 48/1.25</td>
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<td>100...240 VAC to 48 VDC / 60 W</td>
<td>Power Supply</td>
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<td>100...240 VAC to 48 VDC / 240 W</td>
<td>Power Supply</td>
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<td>500CAB03</td>
<td>1KGT038909R0001</td>
<td>Configuration cable RJ12 / DB9-F*</td>
<td>Serial Cable 2.5 m</td>
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<td>500CAB04</td>
<td>1KGT038910R0001</td>
<td>Adapter cable CMC RJ45 / DB9-F</td>
<td>Serial Cable 0.5 m</td>
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<td>1KGT038913R0001</td>
<td>Adapter cable 500FSD / 500NMD</td>
<td>Serial Cable 1.2 m</td>
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<td>500CAB08</td>
<td>1KGT038915R0001</td>
<td>Standard cable RJ45 / DB9-F</td>
<td>Serial Cable 2.8 m</td>
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<td>1KGT038916R0001</td>
<td>Adapter cbl. RTUS0 R345 / RJ45</td>
<td>Serial Cable 1.2 m</td>
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<tr>
<td>500LTD01</td>
<td>1KGT026200R0001</td>
<td>Line transformer for 500FSD</td>
<td>10 kV isolation</td>
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<tr>
<td>500NMA01</td>
<td>1KHW027870R0001</td>
<td>Configuration stick for backup*</td>
<td>Memory Stick</td>
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* for 500FSD20 only
Additional Information

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