



# TECHNICAL INFORMATION

## TITLE: RS-232 to RS-485 CONVERTERS FOR USE WITH STARTCO PRODUCTS

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This document describes some of the serial-communications converters that are compatible with Startco products and software. Limitations for specific applications are listed.

All converters require “data only” capability when used with Startco communications software. In this mode of operation, the RS-485 transceiver on the converter is set to transmit when RS-232 data is detected and set to receive when no RS-232 data is detected. The delay to switch from transmit to receive (baud rate timeout) is critical and varies between converters. For Modbus or A-B DF1 network operation with Startco products, this delay should be no more than 2.5 ms. The exception is when the converter is used for flash update applications.

The following table summarizes the interface and time-out requirements for flash-update modes.

PRODUCT	INTERFACE	BAUD RATE	TIMEOUT
SE-330 <sup>(1)</sup>	RS-232	19200	N/A
MPU-32 <sup>(1)</sup>	RS-232	57600	N/A
MPU-16A <sup>(2)</sup>	RS-485	9600	3 ms
FPU-16 <sup>(2)</sup>	RS-485	9600	3 ms
MPS	RS-485	57600	250 us

(1) Converter not required.

(2) Applies to communications firmware update only.

Startco recommends the SE-485-DIN for industrial networks, and the SE-485-PP for short-distance applications or in applications where RS-485 communications is only required to perform flash updates.

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### Startco Part Number SE-485-DIN (Recommended)

- Network capability to 1200 meters.
- Switch selection for baud rates from 9600 to 57600.
- Flash-update compatible.
- Optical isolation.
- Transient suppression.
- DIN rail mount.
- 24 Vdc supply required.
- DB9 socket connector pin-out compatible with PC and SLC500
- Modified version of B&B Electronics 485LDRC9

Switch settings for RS-485 communication:

SW1: Half Duplex, ON

SW2: Half Duplex, ON

SW3: 2-Wire, ON

SW4: 2-Wire, ON

SW5: Termination resistance set as required.

SW6 to SW8: Selects baud rate timeout for the specific application. Setting range is 9600 to 57600 Baud.

### Startco Part Number SE-485-PP (B&B Electronics 485SD9TB)

- Limited distance in self-powered mode.
- 15 meters maximum recommended in both self-powered and powered modes. This converter does not use a true differential line driver.
- No termination resistors required.
- Flash-update compatible.
- No isolation from RS-232 side.
- No transient suppression.
- DB9 socket connector pin-out compatible with PC and SLC500

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**Startco Part Number SE-485 (B&B Electronics 485CSP2)**

- Network capability to 1200 meters.
- Transient suppression.
- Requires 12-Vdc supply (power adapter included).
- Resistor selects baud-rate timeout.
- Flash-update compatible with proper resistor installed.
- Not recommended for new installations, use SE-485-DIN
- DB25 socket connector.

**B&B Electronics 485LDRC9**

- Network capability to 1200 meters.
- Switch selection for baud rates from 2400 to 19200.
- Requires resistor modification for compatibility with the flash-update program in MPS applications.
- Optical isolation.
- Transient suppression.
- DIN rail mount.
- 24 Vdc supply required.
- DB9 socket connector pin-out compatible with PC and SLC500

Switch settings for RS-485 communication:

SW1: Half Duplex, ON

SW2: Half Duplex, ON

SW3: 2-Wire, ON

SW4: 2-Wire, ON

SW5: Termination resistance set as required.

SW6 to SW8: Selects baud rate timeout for the specific application. Default setting range is 2400 to 19200 Baud. Requires resistor modification for use with MPS flash-update software.

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## Dataforth DCP485 Series

- Network capability to 1200 meters.
- Optical isolation.
- DB9 connector pin-out compatible with PC and SLC500
- DIN rail mount, 24 Vdc supply required.
- Transmit-to-receive delay of 2.5 ms for the “-S” is NOT compatible with MPS flash-update software. Requires model DCP485-S-7 for MPS flash upgrade.

Switch Settings for RS-485 communication:

### RS-232 Side

SW1: AUTO, ON

SW2: RTS/DTR, OFF

SW3: RTS, OFF

SW4: DTR, ON

Mode set to DCE

### RS-485 Side:

SW1: RD Cont En, OFF

SW2: RD Ctrl'd, ON

SW3: TD Ctrl'd, ON

SW4: TD Cont En, OFF

SW5: Pull Dn, ON

SW6: RD Term, as required.

SW7: Pull Up, ON

SW8: TD Term, as required.

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**Black Box IC109A-R2, IC109AE, IC109C**

- Network capability to 1200 meters.
- Optical isolation.
- Flash-update compatible.
- DB25 socket connector.

Switch settings for RS-485 communications:

XW1: Position A for DCE operation.

Jumper W8: B-C half-duplex position.

Jumper W5, W9: Not used when W15 set to "data-only".

Jumper W15: B-C position for "data-only".

Jumper W16: A or B position for 0 or 0.1 ms turnaround delay.

Jumper W17: Set timeout based on baud rate:

1. For 4800 and 9600 baud, select 2 ms
2. For 19200 and 38400 baud, select 0.7 ms
3. For MPS flash update, select 0.15 ms
4. For MPU-16A or FPU-16 flash update, select 0.7 ms.

S2: Enable or disable termination resistor.

S3: Line bias OFF.

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