Classification	☑ tDS ☑ tGW ☐ PETL/tET/tPET ☐ DS/PDS/PPDS ☐ tM-752N ☐ I/O Card ☐ VXC Card ☐ VxComm ☐ Other				
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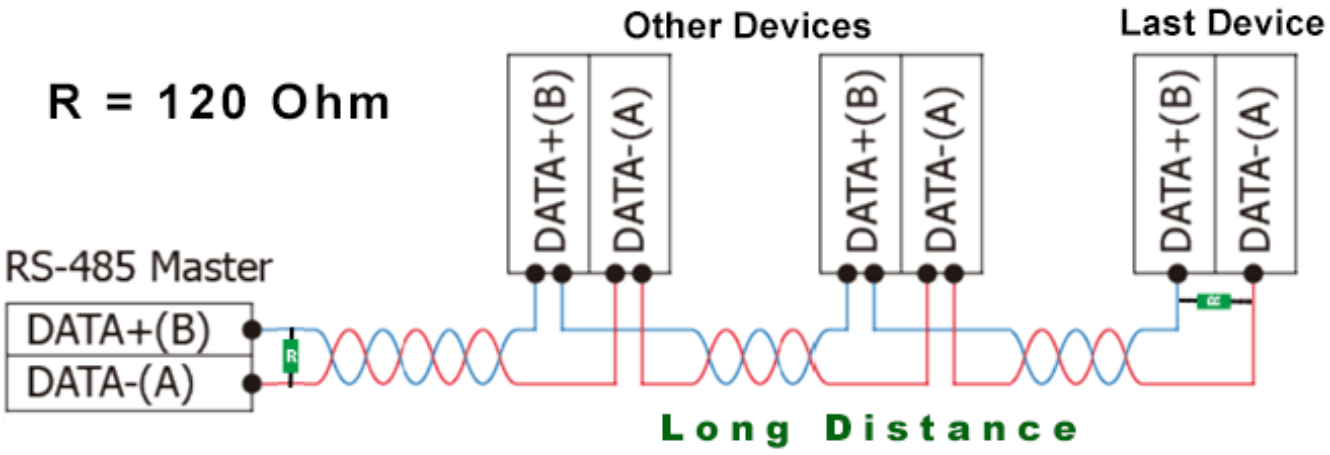
Q: How to prevent poor communication on the RS-485 interface in long distance transmission

A: In this situation, you need to consider the problems related to impedance matching, voltage level and signal attenuation. It is possible to encounter poor communication or instability when operating the RS-485 interface in a long-distance communication application. In order to eliminate or prevent the occurrence of this problem, you can try the following:

1. If communication is unstable, add termination resistors (120 Ohm) on both sides of the RS-485 twisted-pair cable bus.

   The following figure illustrates the configuration.



2. Reduce the Baud Rate for the serial port.

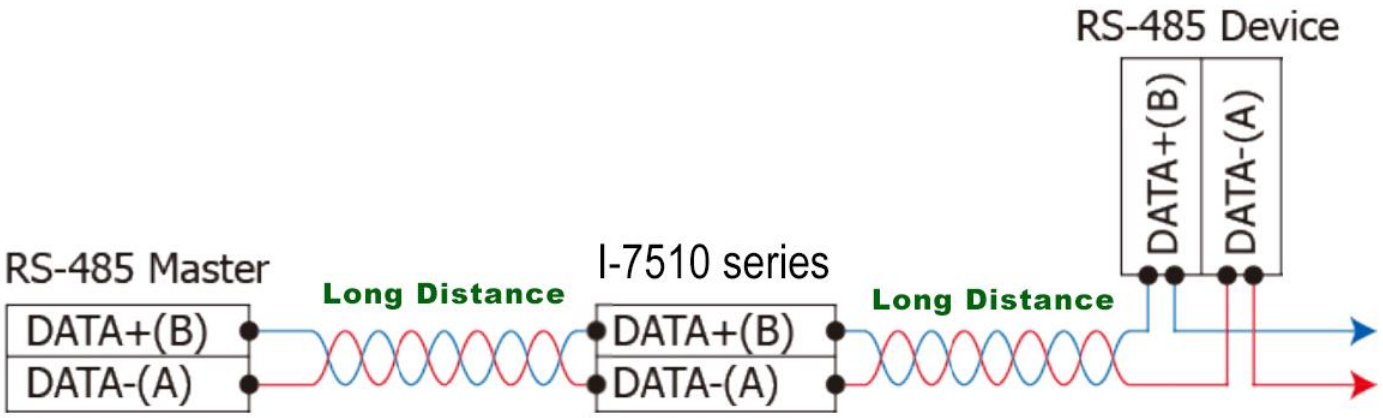
   In a typical configuration, the distance that a signal can be reliably transmitted becomes shorter as the Baud Rate is increased. As an example, we use the Belden 9841 2P twisted-pair cable

   Max. 1,200 m at 9.6 kbps

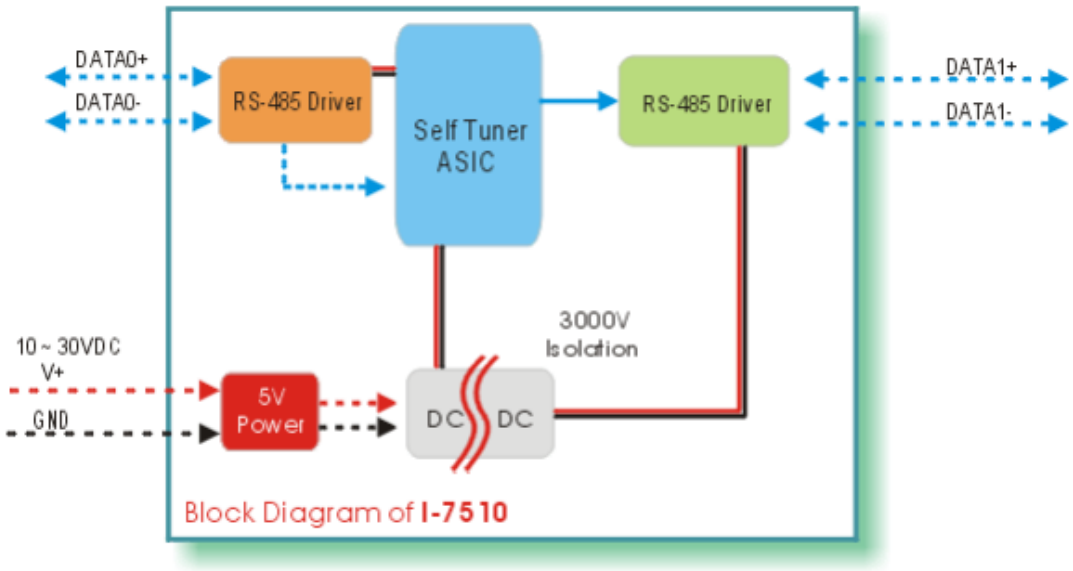
   Max. 400 m at 115.2 kbps

3. Situations where the distance is too long, or where there is excessive load, will cause the signal from the RS-485 to attenuate. Use a Repeater such as the ICPDAS I-7510 series, for example, to enhance the signal.

The following figure illustrates how to configure the I-7510 series.



Block Diagram for the I-7510



4. Connect the GND pin on the devices to prevent environmental interference.