PROFIBUS COMPETENCY CENTRE, AUSTRALIA TECHNICAL SERIES		
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SUBJECT: DP TERMINATION		

When electrical signals travel down a cable, any electrical discontinuity like a change in resistance, capacitance or the end of the wire, can cause reflections to occur. Similar to an echo, the reflected signal can cause multiple signals to appear on the line. The higher the data speed the worse the signal corruption or distortion by the reflection.

In order to minimise reflections at the end of a cable the ends must be terminated with a correctly chosen resistance that matches the cable characteristic impedance. The resistance absorbs the energy of the signal and significantly reduces the reflection (theoretically to zero). PROFIBUS RS485 uses "active termination" which means that the resistor network must be supplied with 5V. This 5v must always be applied to the terminations even if some devices in a segment are switched off, otherwise bus disruption will occur.

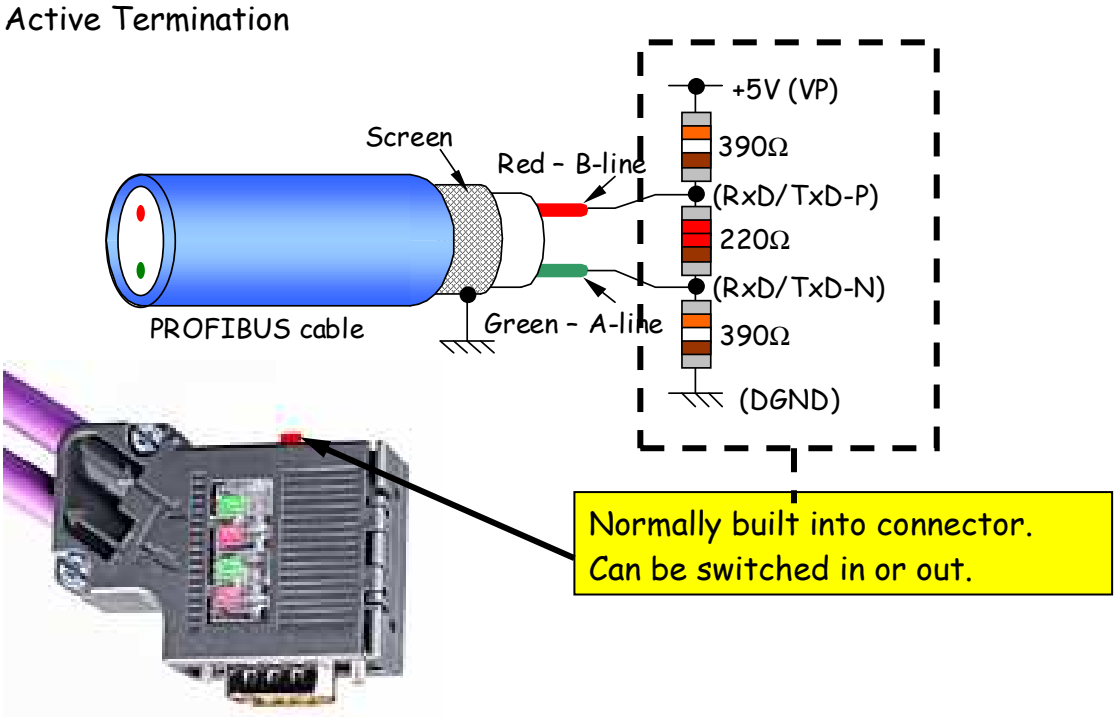

Fig. 1 RS485 (DP) Termination[i]

Correct termination must occur ONLY at each end of each segment in the Profibus network. Many Profibus devices and connectors have switchable, built-in termination resistors. It is essential that these terminations are set in the correct position, including those which may be inside the device on a circuit board, or set by the device software.

References:

[i] CPIC Presentation L02 Verwer Training & Consultancy Ltd.
The New and Rapid Way to PROFIBUS DP, Manfred Popp

http://www.profibuscentre.com.au
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