

**PROFIBUS COMPETENCY CENTRE, AUSTRALIA TECHNICAL SERIES**

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**ORIGINATOR:** GRANT WEYMAN

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**SUBJECT:** PROFIBUS PA

PROFIBUS PA (Process Automation) is specifically designed for the process and petro-chemical industries. PA shares the same Fieldbus Data Link (OSI layer 2) as DP and FMS, however the Physical Layer is designed to meet the requirements of the process industry – Manchester Bus Powered (MBP) defined in IEC 61158-2 (identical to that used by Foundation Fieldbus).

The different transmission technology means that a “DP/PA coupler” is required to connect PA to a DP network. The common layer 2 and 7 protocol means that PA integrates transparently with the DP devices, i.e. the bus masters see no difference between the PA and DP segments.

MBP transmission uses changing current to transmit the data transmission over two wires.

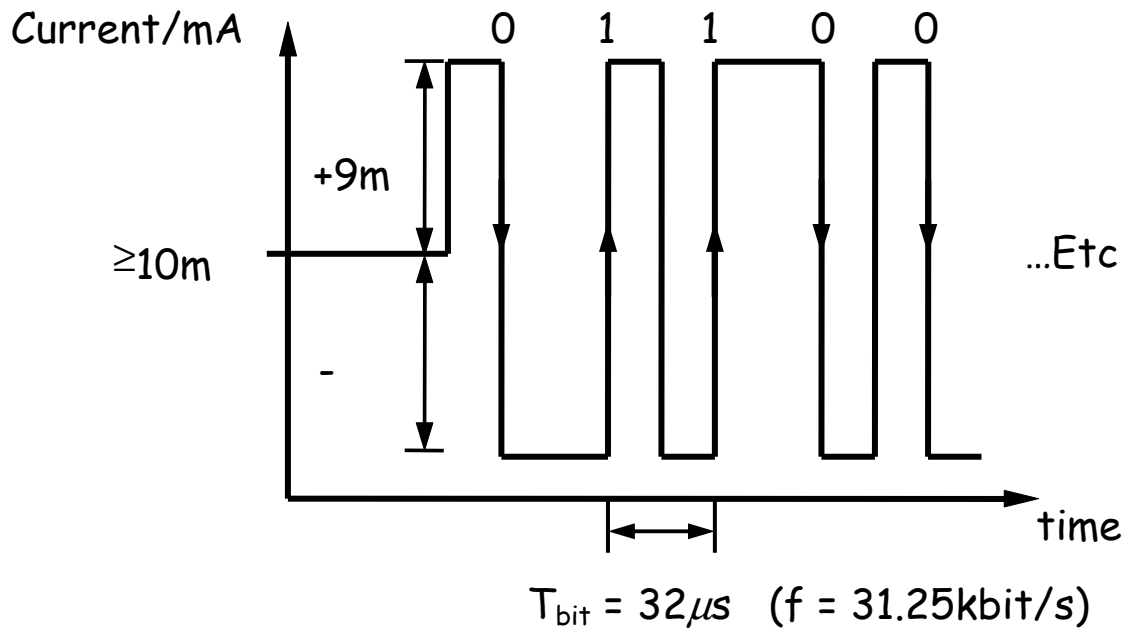


Fig. 1 Profibus PA transmission

A fixed transmission speed of 31.25 kbit/s is used and a special “Manchester coded” synchronous protocol is used. Manchester coding simply means that the individual bits are transmitted as transitions rather than simply logic levels. Like traditional analogue 4 to 20 mA current transmission, H1 transmission allows device power and data to be combined on one pair of wires. In addition PA equipment may be certified for use in *hazardous environments*, i.e. in explosive atmospheres.<sup>1</sup>

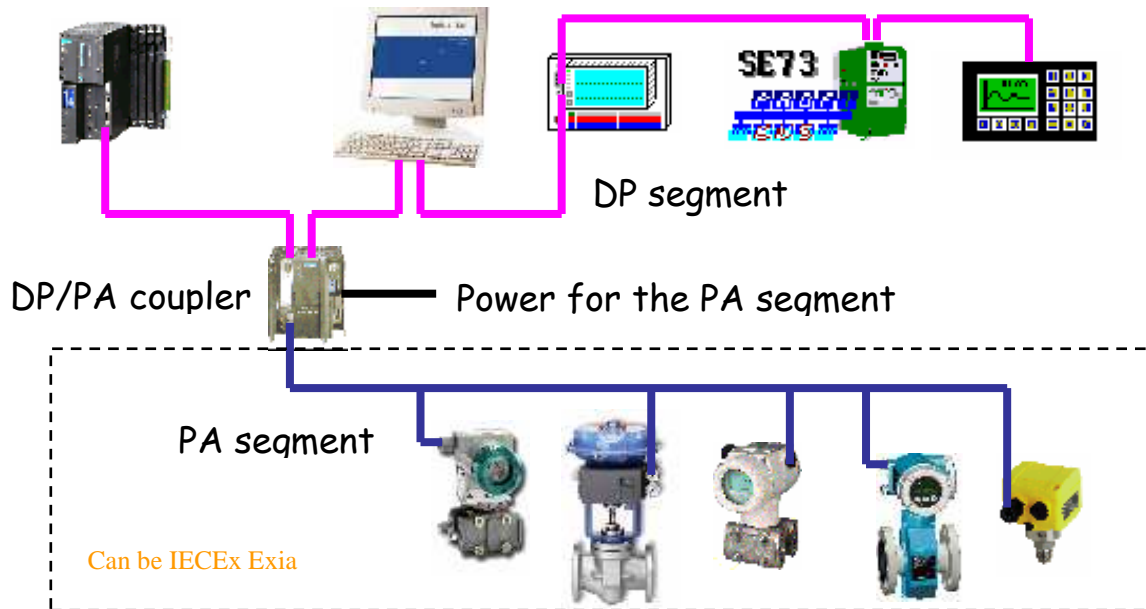


Fig. 2 Example of Network with DP & PA Segments

References:

<sup>i</sup> CPIC Presentation L02 Verwer Training & Consultancy Ltd.  
Profibus PA, Ch. Diedrich/Th. Bangemann

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