

IamaPLC Communication: Profibus

Profibus (usually styled as PROFIBUS, as a portmanteau for *Process Field Bus*) is a standard for fieldbus communication in automation technology and was first promoted in 1989 by BMBF (German department of education and research) and then used by Siemens. It should not be confused with the Profinet standard for Industrial Ethernet. Profibus is openly published as type 3 of IEC 61158/61784-1.



There are two variations of PROFIBUS in use today; the most commonly used PROFIBUS DP, and the lesser used, application specific, PROFIBUS PA:

PROFIBUS DP (*Decentralised Peripherals*) is used to operate sensors and actuators via a centralised controller in production (factory) automation applications. The many standard diagnostic options, in particular, are focused on here.

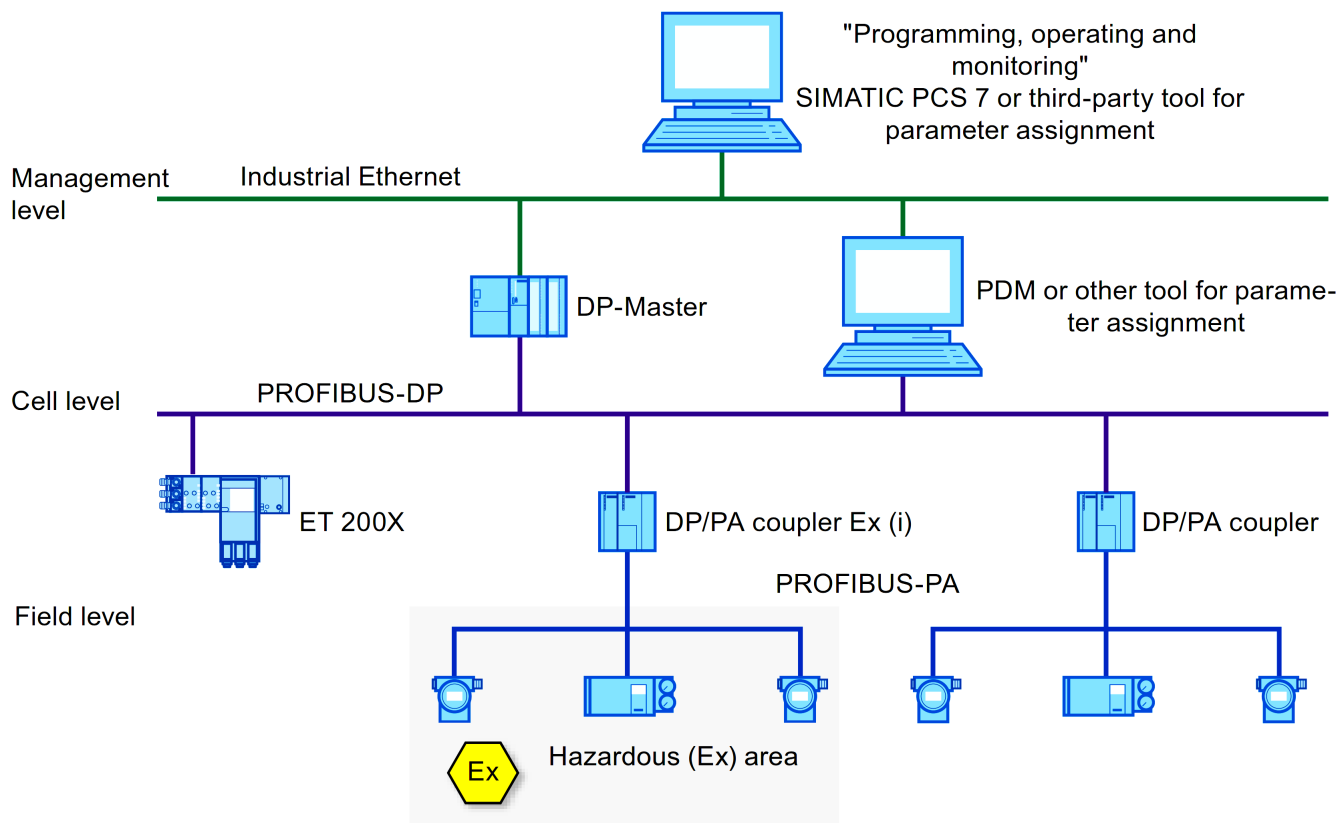
PROFIBUS DP uses two core screened cable with a violet sheath, and runs at speeds between 9.6 kbit/s and 12 Mbit/s. A particular speed can be chosen for a network to give enough time for communication with all the devices present in the network. If systems change slowly then lower communication speed is suitable, and if the systems change quickly then effective communication will happen through faster speed. The [RS-485](#) balanced transmission used in PROFIBUS DP only allows 31 devices to be connected at once; however, more devices (up to 126) can be connected or the network expanded with the use of hubs or repeaters (4 hubs or repeaters to reach 126). A Hub or a Repeater is also counted as a device.

PROFIBUS PA (*Process Automation*) is used to monitor measuring equipment via a process control system in process automation applications. This variant is designed for use in explosion/hazardous areas (Ex-zone 0 and 1). The Physical Layer (i.e. the cable) conforms to IEC 61158-2, which allows power to be delivered over the bus to field instruments, while limiting current flows so that explosive conditions are not created, even if a malfunction occurs. The number of devices attached to a PA segment is limited by this feature. PA has a data transmission rate of 31.25 kbit/s. However, PA uses the same protocol as DP, and can be linked to a DP network using a coupler device. The much faster DP acts as a backbone network for transmitting process signals to the controller. This means that DP and PA can work tightly together, especially in hybrid applications where process and factory automation networks operate side by side.

PROFIBUS PA runs at fixed speed of 31.25 kbit/s via blue sheathed two core screened cable. The communication may be initiated to minimise the risk of explosion or for the systems that intrinsically need safe equipment. The message formats in PROFIBUS PA are identical to PROFIBUS DP.

In excess of 30 million PROFIBUS nodes were installed by the end of 2009. 5 million of these are in the process industries.

PROFIBUS DP and PROFIBUS PA should not be confused with PROFINET.



Sources

Wikipedia ([here](#))

Profibus topics on lamaPLC

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[Profibus](#), [Profibus PA](#), [profibus DP](#), [communication](#), [fieldbus](#), [bus](#), [IEC 61158](#), [IEC 61784-1](#), [Profinet](#), [RS-485](#)

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