lumbergautomation
A **BELDEN** BRAND

PROFIBUS Modules with Plug-N-Play Connectivity Reduce Overall Installation and Maintenance Costs.

PROFIBUS Introduction

Standardized Open Fieldbus System

PROFIBUS (PROcess FIeld BUS) is a standardized, open Fieldbus in compliance with the international standard EN 50170. To meet various demands in automation technology, PROFIBUS is subdivided into four different profiles:

PROFIBUS–FMS (Field Message Specification)

A protocol for communication between different control systems (PLCs or PCs). It was the first implementation of Profibus. This protocol is superseded by PROFInet..

PROFINET

An Industrial Ethernet implementation of Profibus. PROFINET is designed to work everywhere: from communication with the corporate network over the data exchange between PLC's and IPC's, to I/O and motion control.

PROFIBUS–PA (Process Automation)

An intrinsically safe bus system for process technology.

PROFIBUS–DP (Decentral Periphery)

A transmission protocol for communication between the control system and decentral input/output stations.

The Lumberg Automation I/O Stations Support the PROFIBUS-DP Protocol.

PROFIBUS applications will play a vital role in the future of fieldbus systems thanks to the support of most large control system manufacturers and the development of PNO (PROFIBUS User Organization), which is independent of manufacturers. PROFIBUS field devices are currently available for practically every application, such as binary and analog I/O modules, robot control systems, visualization systems, etc.

About Lumberg Automation PROFIBUS Products

To ensure the best application of PROFIBUS-DP in the decentralized sector, components must meet maximum electromechanical demands. Thanks to the materials used for the housings and sealing technologies, Lumberg Automation's PROFIBUS-DP components offer excellent protection for electronic equipment in harsh environments.

Modules are available with M23 connection technology for hybrid cables (power supply and bus line in one cable) and M12 connectors with external power supply.

Transmission Media

- Shielded, twisted-pair, 2-wire cable (according to RS485)
- Fiber optic cable
- Hybrid cable for the transmission of data and power supply.

Network Topology

- Line structure with active bus termination (resistance network) at both ends of a segment.
- A segment is the bus sector between two terminating resistors. If repeaters are not used, the entire network consists of one segment.
- Mono- and multi-master systems are possible.

Bus Access

- Token-passing method between masters.
- Master-slave communication (cyclic polling) between master and slaves.

Number of Participants

- 32 per segment.
- Repeaters can be used to expand the bus to 126 participants.

Standard Transmission Rates and Segment Length

This depends on the transmission rate (Baud rate), the segment lengths and the number of repeaters which can be switched serially. (Table 1: Standard transmission rates and segment length).

Be Certain with Belden

Bus Cycle Time

The bus cycle time depends – among others things – on the following important factors:

- Number of participants.
- Amount of data for each participant.
- Transmission rate.

The bus cycle time must be specified individually for each application.

Configuration of the Nodes

The individual participants are commissioned via GSD files (configuration file) which are provided by the manufacturer for each module type. The GSD files for the Lumberg Automation bus modules can be obtained from **www.lumberg–automationusa.com** or by calling **717–217–2299**.

Addressing

An individual address is allocated to each participant via rotary address switches (address 1...99) or addressing tools (address 1...126). The following addressing tools are available for the software programming of the modules:

- Lumberg Handheld **0903 UTL 101** for all modules with M12 bus connection.
- Profibus interface in conjunction with a software tool, like COMProfibus or STEP7.

Diagnostic system

The structure of the diagnostic system is defined in the international standard EN 50170, volume2 and is comprised of 29 bytes as a maximum. The diagnostic system is generally subdivided into two different parts:

- Bytes 0 to 5 comprise the system or standard diagnostic which each PROFIBUS slave must contain and which must be structured identically (e.g. station status, master PROFIBUS address, manu facturer's identification).
- From byte 6 the unit-related diagnostic begins which can be structured optionally and individually for each slave. Byte 6 generally comprises the length of the extended diagnostic.
- The actual diagnostic then begins with byte 7. As an example, byte 7 may indicate a short circuit or overload.

Bits	9.6k	19.2k	45.45k	93.75k	187.5k	500k	1.5M	3M 6M 12M
Length (meters)	1200	1200	1200	1200	1000	400	200	100
Max. Number of Repeaters	7	7	7	7	7	7	4	4

Table 1: Admissable transmission rates and line lengths

Product Characteristics

Especially suitable for robotic applications (resistance to torsion).

Very good resistance to oils, coolants and lubricants as well as emulsions.

Suitable for use in C-Tracks.

Very good resistance to flying weld slag (e.g.) unfinished constructions).

Very good resistance to acids, lye and chemical cleaning agents.

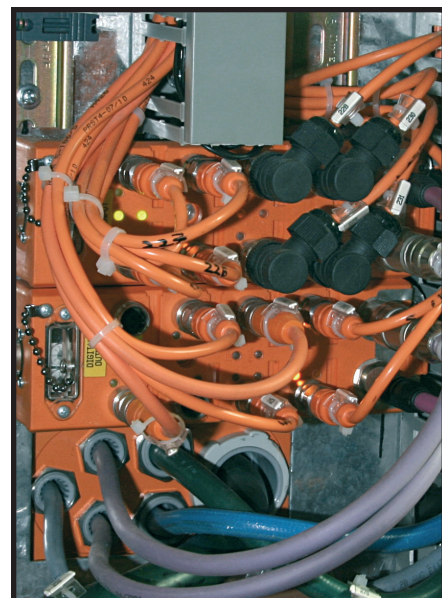Very good electromagnetic resistance (EMC) and shieldedsystems.

Very good vibration and shock resistance.

UL approved.

UL/CSA approved.

PROFIBUS modules with M23 or M12 connections.