

# Communication standards, protocols

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## Process automation protocols

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- [AS-i](#) – Actuator-sensor interface, a low level 2-wire bus establishing power and communications to basic digital and analog devices
- [BSAP](#) – Bristol Standard Asynchronous Protocol, developed by Bristol Babcock Inc.
- [CC-Link Industrial Networks](#) – Supported by the CLPA
- [CIP](#) (Common Industrial Protocol) – can be treated as application layer common to [DeviceNet](#), [CompoNet](#), [ControlNet](#) and [EtherNet/IP](#)
- [ControlNet](#) – an implementation of [CIP](#), originally by [Allen-Bradley](#)
- [DC-BUS](#) – communication over DC power lines, originally by [Yamar Electronics Ltd](#)
- [DeviceNet](#) – an implementation of [CIP](#), originally by [Allen-Bradley](#)
- [DF-1](#) - used by [Allen-Bradley](#) ControlLogix, CompactLogix, PLC-5, SLC-500, and MicroLogix class devices
- [DirectNet](#) – Koyo / Automation Direct proprietary, yet documented PLC interface
- [EtherCAT](#)
- [Ethernet Global Data \(EGD\)](#) – [GE Fanuc PLCs](#) (see also [SRTP](#))
- [EtherNet/IP](#) – IP stands for "Industrial Protocol". An implementation of [CIP](#), originally created by [Rockwell Automation](#)

- [Ethernet Powerlink](#) – an open protocol managed by the Ethernet POWERLINK Standardization Group (EPSG).
- [FINS](#), [Omron](#)'s protocol for communication over several networks, including ethernet.
- [FOUNDATION fieldbus](#) – [H1](#) & HSE
- [HART Protocol](#)
- [HostLink Protocol](#), [Omron](#)'s protocol for communication over serial links.
- [Interbus](#), Phoenix Contact's protocol for communication over serial links, now part of PROFINET IO
- [MECHATROLINK](#) – open protocol originally developed by [Yaskawa](#), supported by the MMA
- [MelsecNet](#), and MelsecNet II, /B, and /H, supported by [Mitsubishi Electric](#).
- [Modbus PEMEX](#)
- [Modbus Plus](#)
- [Modbus](#) RTU or ASCII or TCP
- [OSGP](#) – The Open Smart Grid Protocol, a widely use protocol for smart grid devices built on ISO/IEC 14908.1
- [OpenADR](#) – Open Automated Demand Response; protocol to manage electricity consuming/controlling devices
- [Optomux](#) – Serial ([RS-422/485](#)) network protocol originally developed by [Opto 22](#) in 1982. The protocol was openly documented<sup>[1]</sup> and over time used for industrial automation applications.
- [PieP](#) – An Open Fieldbus Protocol
- [Profibus](#) – by PROFIBUS International.
- [PROFINET IO](#)
- [RAPIEnet](#) – Real-time Automation Protocols for Industrial Ethernet
- [Honeywell SDS](#) – Smart Distributed System – Originally developed by [Honeywell](#). Currently supported by Holjeron.
- [SERCOS III](#), Ethernet-based version of SERCOS real-time interface standard
- [SERCOS interface](#), Open Protocol for [hard real-time](#) control of motion and I/O

- [GE SRTP](#) – [GE Fanuc PLCs](#)
- [Sinec H1](#) – [Siemens](#)
- [SynqNet](#) – [Danaher](#)
- [TTEthernet](#) – [TTTech](#)
- [MPI](#) – [Multi Point Interface](#)

## Industrial control system

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- [MTConnect](#)
- [OPC](#)
- [OPC UA](#)

## Building automation protocols

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[1-Wire](#) – from Dallas/Maxim

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- [BACnet](#) – for building automation, designed by committee [ASHRAE](#).
- [C-Bus](#) Clipsal Integrated Systems Main Proprietary Protocol
- [CC-Link Industrial Networks](#), supported by [Mitsubishi Electric](#)
- [DALI](#)
- [DSI](#)
- [Dynet](#)
- [EnOcean](#) – Low Power Wireless protocol for energy harvesting and very lower power devices.
- [KNX](#) – World standard for building control. Previously [EIB/EHS/BATIBus](#)
- [LonTalk](#) – protocol for [LonWorks](#) technology by [Echelon Corporation](#)
- [Modbus](#) RTU or ASCII or TCP
- [oBIX](#)
- [VSCP](#)
- [xAP](#) – Open protocol
- [X10](#) – Open industry standard
- [Z-Wave](#) - Wireless RF Protocol
- [ZigBee](#) – Open protocol for Mesh Networks

- [INSTEON](#) - SmartHome Labs Pro New 2-way Protocol based on Power-BUS.

## Power system automation protocols

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- [DNP3](#) – Distributed Network Protocol
- [IEC 60870-5](#)
- [IEC 61850](#)
- [IEC 62351](#) – Security for IEC 60870, 61850, DNP3 & ICCP protocols

## Automatic meter reading protocols

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- [ANSI C12.18](#)
- [DLMS/IEC 62056](#)
- [IEC 61107](#)
- [M-Bus](#)
- [ZigBee Smart Energy 2.0](#)
- [Modbus](#)
- [ANSI C12.21](#)
- [ANSI C12.22](#)

## Automobile / Vehicle protocol buses

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- [Controller Area Network \(CAN\)](#) – an inexpensive low-speed serial bus for interconnecting automotive components
- [DC-BUS](#) – physical layer for communication over DC power lines, originally by [Yamar Electronics Ltd](#)
- [FlexRay](#) – a general purpose high-speed protocol with safety-critical features
- [IDB-1394](#)
- [IEBus](#)
- [J1708](#) – RS-485 based SAE specification used in commercial vehicles, agriculture, and heavy equipment.
- [J1939](#) and [ISO11783](#) – an adaptation of CAN for agricultural and commercial vehicles
- [Keyword Protocol 2000 \(KWP2000\)](#) – a protocol for automotive diagnostic devices (runs either on a [serial](#) line or over CAN)

- [Local Interconnect Network](#) (LIN) – a very low cost in-vehicle sub-network
- [Media Oriented Systems Transport](#) (MOST) – a high-speed multimedia interface
  - [Vehicle Area Network](#)