



PROFIBUS DP/V2

Technology &
Services

High-Performance Protocol Software and Professional Project Services



Protocol Software

Softing protocol software and project services for PROFIBUS DP/V2 create decisive surplus value for you: PROFIBUS DP/V2 by Softing saves time and resources. The modular combination of software and services offers flexibility, helps save costs and secures your investments for the future.

Protocol Software PROFIBUS DP/V2

Softing PROFIBUS software is on the cutting edge of technology. It supports the protocols DP(V0) and DP/V1 as well as the most recent extension DP/V2. The up-to-date stacks by Softing cover the entire range of application for PROFIBUS – from the process and production industries down to logistics and building automation.

PROFIBUS stacks by Softing allow for easy and fast portation. They can be scaled according to individual requirements. Based on the well-tried Softing PROFIBUS technology, they allow for specific customization.

Like all existing Softing PROFIBUS stacks, the protocol software DP/V2 has been successfully tested in interoperability tests with implementations by other manufacturers.

The version DP/V2 of the Softing PROFIBUS protocol software supports the following

- **DP/V2 Master functionality**
 - masters class 1 and class 2
 - isochronous mode
 - lateral communication between slaves
 - clock synchronization
- **acyclic services (DP/V1)**
 - with back- and foreground mode
- **alarm model (DP/V1)**
- **process data preprocessing**
- **master redundancy (optional)**
- and others



Production automation: PROFIBUS DP/V2 synchronizes high-speed drives with a precision of $< 1 \mu\text{s}$

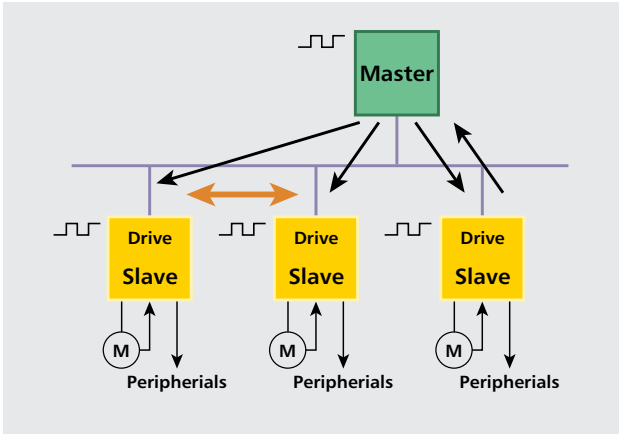
Isochronous Mode

The isochronous mode permits fast and deterministic data exchange due to clock synchronization within the bus system. A cyclic and equidistant clock pulse is transferred from the master to all bus stations.

Master and slaves can be synchronized to this signal with a precision of $< 1 \mu\text{s}$ for all applications. This opens up entirely new possibilities of application, for instance in drive engineering. In addition to synchronization of the message interchange on the bus, control algorithms of individual bus stations can be synchronized in time with higher-level automation systems. Speed and current controllers, for instance, achieve highest control quality due to this equidistant time frame.

Lateral Communication Between Slaves

Lateral communication enables two DP Slaves to directly interchange data: the master ensures that the slave publishes its data on the bus with a request for "Data-eXchange-Broadcast" (DXB request), thus making them available to other slaves. Since the process data are available in the process peripherals without taking the roundabout way via the master application, very fast control systems can be implemented with lateral communication.



Isochronous Mode and Lateral Communication, e.g. in coating robots

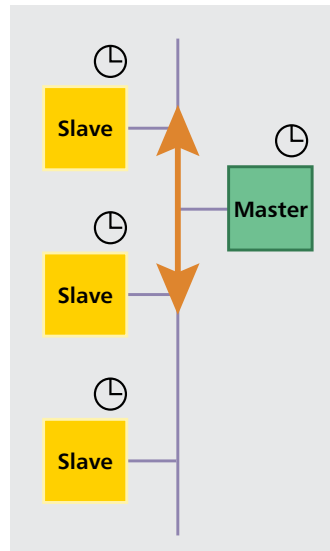
PROFIBUS DP/V2 is an important step towards distributed solutions: it can help drives, for instance, to read the actual values of other drives or peripheral devices and to use them internally as desired values. For dynamic applications, such as paper finishing machines, individual transport units can be directly interconnected in this way.



Process automation: PROFIBUS DP/V2 handles alarms securely

Clock Synchronization

The DP service clock synchronization ensures that user data can be assigned to the time they were received. For this purpose, a bus station provides all other stations with a globally valid time signal at regular intervals. Thus, the stations can label user data that they have received with a time stamp. Historic data, alarms and events, measured values etc. can be definitely assigned to the times they have occurred, for all individual bus stations.



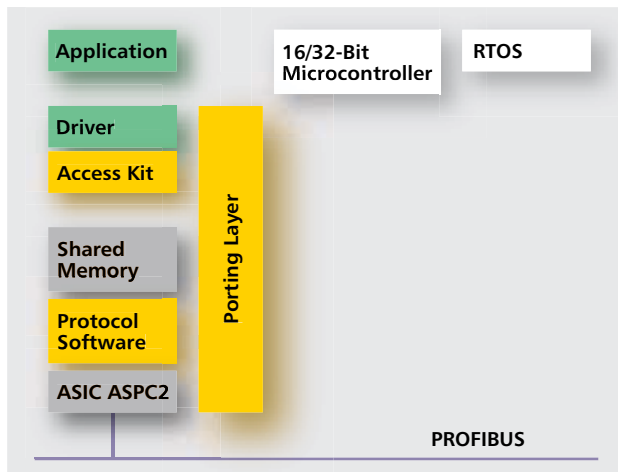
Clock Synchronization, e.g. for industrial process measurement and control in power plants

Acyclic Services

The DP functions for prioritized communication make it possible to transfer acyclic read and write functions between master and slaves, independently of the cyclic user data traffic. The transfer of acyclic data takes place "in the background", i.e. with low priority, in parallel to the fast cyclic data exchange. With the back- and foreground assignment, the relationship between cyclic and acyclic data can be set as desired. This enables the user to read out e.g. status information during operation from a field device by means of an engineering tool, change limit value settings or optimize slave parameters.

Alarm Model

The alarm model supports the event-driven transmission of time-critical alarms and messages and ensures that none of the events is lost. For this purpose, the model uses the acyclic services of the DP protocol, i.e. a slave signals to the master a diagnostic message. Then the master transfers the alarm data from the slave to the application with the next bus cycle. In turn, the master application confirms to the slave that the information has been received correctly. Thus, the alarm model guarantees very short transmission times.



PROFIBUS DP/V2 on a single processor system

Process Data Preprocessing

The PROFIBUS Stack DP/V2 by Softing minimizes the workload for the application. It compares the process data currently received by the slave with the data of the preceding bus cycle. If the value or status of the

input data has changed, the DP/V2 Stack automatically transmits a change message to higher protocol layers. This saves workload for the application processor and minimizes the response times of the entire system.

Master Redundancy

With its extension "redundancy solution", the Softing Protocol Stack DP/V2 offers the master redundancy which is important for fault-tolerant systems. Thus, the DP/V2 software by Softing meets all requirements in terms of high availability and fault tolerance. The "redundancy solution" is a manufacturer-specific software solution. It is integrated harmoniously in the DP/V2 Master. No technical modifications of DP Slaves are necessary to make them fit for use. The redundant DP Master can be completely preconfigured and remains in the stand-by status (DP status STOP) during normal operation. With the "redundancy solution", the DP data and the DP Master status (CLEAR, OPERATE) are harmonized by a separate connection on the application level – the "redundancy link".

To a very high Degree Scalable and Portable

The Softing DP/V2 Stack supports the commercially available processor chips and a wide range of real-time operating systems. Due to the modern and flexible software architecture and especially the scalability, the protocol software can be inexpensively ported on nearly any platform.

The DP/V2 Stack is suitable for:

- Different processors
 - 16-bit or 32-bit
- Any real-time operating systems
 - CMX, VxWorks, pSOS, ...
- Customized hardware
 - ROM: code 256 Kbyte, optional
PROFIBUS configuration 128 Kbyte
 - RAM: 256 Kbyte ... 1Mbyte
 - Shared/DP-RAM: 8 Kbyte ... 64 Kbyte
 - ASPC2: step E2
(step D possible with restrictions)
- Customized development environments

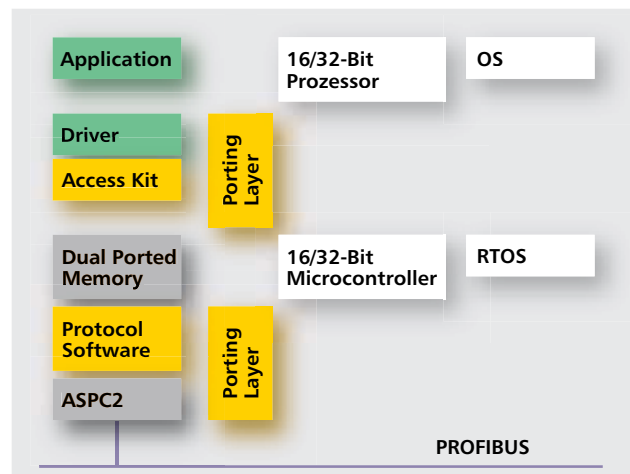
User Interface

	Purpose	Method
Service Interface	Initialization, termination Parameter sets Productive services	Messages Transactions Low priority
Event Interface	Alarm and diagnostic messages Status control Real-time services	Parallelism Determinism High priority
Statistic Interface	System overview Time info Visualization	Read-only No synchronization
DP Data Interface	Input and output data Consistency Data management	Synchronous access by event Asynchronous access by slave semaphore

The hardware-oriented protocol basis for the Softing DP/V2 is the Siemens-ASIC ASPC2. It guarantees conformity with the PROFIBUS standard and, at the same time, highest performance. The protocol software supports both the version as a dual processor system (host controller system) and as an exclusive single processor system (controller system).

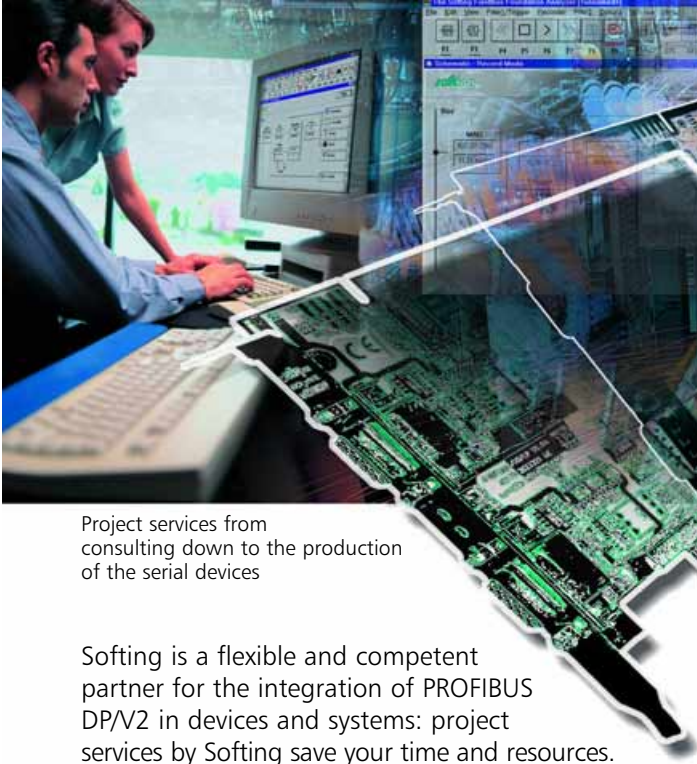
The User Interface to the PROFIBUS DP/V2

The modern architecture of the DP/V2 Stacks provides four communication interfaces: DP Data, Event, Service and Statistic. They permit prioritized processing of the PROFIBUS DP protocol. The easy-to-use user interface offers the choice of employing either all available communication interfaces or only the ones relevant to the application.



PROFIBUS DP/V2 on a dual processor system

Project Services



Project services from consulting down to the production of the serial devices

Softing is a flexible and competent partner for the integration of PROFIBUS DP/V2 in devices and systems: project services by Softing save your time and resources.

Profit from our vast Experience with PROFIBUS

Softing has more than 10 years of experience with the integration of PROFIBUS in systems and components. We actively participate in the leading PROFIBUS workgroups; therefore, we know all details of technological progress. By contributing to the further development of the PROFIBUS specifications, we ensure for our customers evolutionary solutions in conformity with market trends and, in this way, valuable investment protection.

All PROFIBUS project services by Softing are based on the central Softing PROFIBUS technology – consisting of numerous protocol implementations for very different areas of application. You will receive all project services – from consulting to the production of the serial devices – from a one-stop shop.

Project Services for your Tailor-made Solution

We adapt our software to your system – not vice versa – and accompany your PROFIBUS DP/V2 integration to the point that your specific situation requires.

■ Consulting and Feasibility Study

It is our ambition to provide you with the best solution for your demands. In thorough consultations with you, we will perform a detailed analysis of the current status and define your exact requirements. In addition to all relevant technical aspects, we will naturally take into account important economic and marketing factors and tell you which fieldbus ASICs, microcontrollers and real-time operating systems best suit your demands.

■ Specification of Hardware and Software Components

You will receive a specification tailor-made to your requirements. It will define the following: the functionality, the interface to the application, the hardware and software prerequisites and the test conditions for hard- and software.

■ Development of Hardware and Software

We develop for you customized hardware and software according to your specification – down to the function sample or even to serial production. For the creation of the fieldbus interface, we take into account all general requirements on a PROFIBUS product, such as EMC regulations and certification criteria.

- **Portation of our PROFIBUS DP/V2 Software on your Platform**

We port the PROFIBUS protocol software on your target system, i.e. on the microcontroller and the real-time operating system desired by you. For frequently used microcontrollers and real-time operating systems, adapted versions of the protocol software are available.

- **Integration in the System or Application**

Softing integrates the protocol software in your application. We will be glad to implement additional functions specified by you.

- **System Test**

We will commission the target hardware for you and test the basic functionality.



Project services with DP/V2:
the system test provides security and saves time

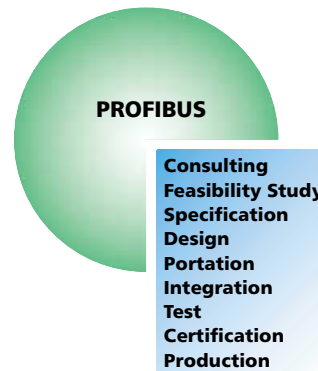
- **Support with Certification**

We will prepare all actions concerning certification by the fieldbus organization. If desired, Softing supports you with the fieldbus interface certification on site.

- **Manufacturing**

We manufacture and test the customized fieldbus interface. If desired, we will also perform brand labeling and packaging for dispatch including the manual.

All over the world, leading manufacturers of controllers, process control systems and field devices rely on Softing's know-how for the development of fieldbus interfaces. Softing's vast experience with the development of customized fieldbus products guarantees you the success of your project. The fulfilment of your requirements in terms of functionality, budget and time-to-market is a matter of course.



End-to-End Solutions or Licenses

We will be glad to provide you with a Softing end-to-end solution. As an alternative, you can buy a license for the protocol software PROFIBUS DP/V2 and for hardware designs by Softing and perform related development work yourself. In any case, Softing is a strong and competent partner for the integration of PROFIBUS in your system.

For Order Information see the next page, please.

PROFIBUS DP/V2

Order Information

Designation	Purchase order number
DP/V2 Master Protocol Software	PB-DP/V2-M-SW
DP/V2 Master extension Clock Sync/Time Stamp	PB-DP/V2-CS/TS-M-SW
DP/V2 Master extension DXB/isochronous	PB-DP/V2-DXB-ISO-M-SW
DP/V2 Master extension Master redundancy	PB-DP/V2-Red-M-SW
DP/V2 Master extension Upload/Download	PB-DP/V2-UDLD-M-SW
DP/V2 Slave Protocol Software	PB-DP/V2-SW
Portation and implementation on the target system	PB-PORT
Support contract	PB-SPT
Hardware circuit diagrams	PB-SCHEM
Hardware development	on request
Implementation	PB-IMPL
System Test	PB-SYSTEST
Manufacturing	on request

For products such as interface cards and gateways, configuration and analytic tools or servers and drivers, or for training courses on PROFIBUS DP/V2, see our catalog Softing "Industrial Communication".

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