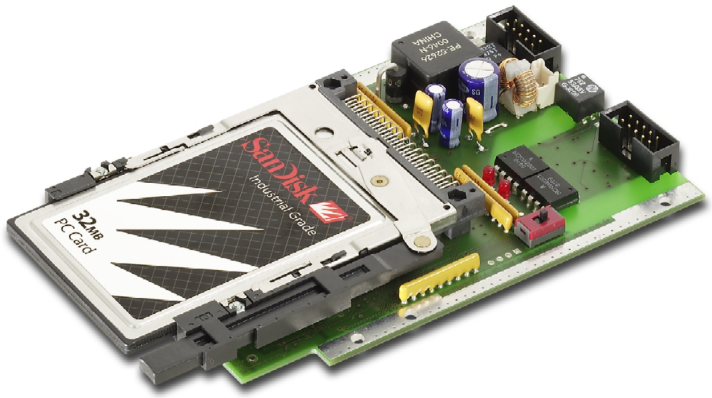
DOS-Drive Modul

- ❑ **Universal application platform with integrated Memory Card interface**
- ❑ **Compact and economical solution for use in standard sets**
- ❑ **16-Bit microcontroller Infineon C163, programmable for own applications**
- ❑ **Software libraries for reading and writing ATA Flash Cards in DOS format**
- ❑ **2 asynchronous serial interfaces**
- ❑ **Flexible power supply 8 to 32V DC**
- ❑ **Options: High-Speed CAN interface, real time clock with lithium battery**



Fields of application

ATA Flash Cards get more and more important as an universal, flexible and reliable medium for data exchange between devices and computers.

With ***DOS-Drive Modul*** a new type of system is available, which **reduces the development time** and utilizes ATA Flash Cards for varied systems:

- ➢ **Control technology**
- ➢ **Measurement technology**
- ➢ **Medical technology**

DOS-Drive Modul manages data and directories in **DOS format**. For this a **software library** with tested functions is available, which allows an own application to read and write ATA Flash Cards. Therefore various information can be managed comfortable **under Windows**, e.g. production data or machine programs.

Robust data storage

As **storage media ATA Flash Cards** e.g. from **SanDisk** are supported, which are popular because of their reliability and robustness. At present cards are available with capacities between 16 MByte and 2 GByte.

Universal application platform

DOS-Drive Modul offers the advantages of the 16-Bit microcontroller **Infineon C163**. Totally 64 KByte of program memory (Flash) and 128 KByte of data memory (SRAM) are available.

For development of own applications the usage of the BSO Tasking C Compiler is necessary.

Support for Design-In

Normally ***DOS-Drive Modul*** will be integrated into own systems and machines as an OEM-component. That's why the delivery package is limited to the basic hardware.

For development of own applications a **Software Development Kit (DOS-Drive Modul SDK)** is available, that has to be purchased once and contains the following components:

- ✓ **Library for FAT File System**
- ✓ **Library for Sector Access**
- ✓ **Library FlashMemory Access**
- ✓ **Complete device documentation**

An **example application** with C source code and configuration files for compiling completes the package.

For ***DOS-Drive Modul SDK*** a license will be granted to protect the interests of both sides. CSM expects that the customer signs a license agreement before delivery.

Software libraries

The delivery content includes the following software libraries:

❑ Library FAT File System

The library **FAT File System** is available for the application to access the card and the file system. With this data on the storage medium can be read, written or deleted. Up to 16 files can be opened at the same time. The File System supports the usage of 12- and 16-Bit FAT.

The application program doesn't come in contact with the special details of the management or the programming of the ATA Flash Card. For this the library has suitable functions following **POSIX:**

- Create, open and close of files: `CreateFile(), OpenFile(), CloseFile()`
- Read or write from/to files: `ReadFile(), WriteFile()`
- Positioning in a file: `SeekFile(), FlushFile()`
- Renaming and deleting files: `RenameFile(), DeleteFile()`
- Working with file attributes: `GetFileMode(), SetFileMode(), GetFileDateAndTime()`
- Directory maintenance: `MakeDir(), ChangeDir(), RemoveDir()`
- Directory read: `ReadDir()`
- Formatting of data medium: `FormatVolume()`
- Read status of card and File System, e.g. card size, cluster size, number of free clusters: `FileStatusInfo()`

❑ Library Sector Access

The library **Sector Access** can be used for direct access to the Memory Card. For this Low level Functions are available:

- Read/write of a 512 byte sector: `ReadSector(), WriteSector()`
- PC Card inserted? Card changed? Card write protected?: `GetSlotStatus()`
- Storage capacity of the card: `GetSizeOfCard()`

❑ Library FlashMemory Access

DOS-Drive Modul provides an internal flash segment (8 KByte), which is specially reserved for the application. The library **FlashMemory Access** allows to read, write and delete this storage area.

❑ Economical usage of memory

- **FAT File System** and **Sector Access** only need about 10 KByte for program code and about 3 KByte for variables and constants.
- **FlashMemory Access** needs about 0.5 KByte for program code and some Bytes for variables.

Loading of firmware

The function **Load Firmware** is fix installed in the ***DOS-Drive Modul***. At power up this function checks, if a **FirmwareCard** is plugged-in and transmits the program code of the application into the module.

After removing the FirmwareCard the current programmed application will be executed, when the device is powered up again.

Double serial interface

DOS-Drive Modul provides two asynchronous serial interfaces which are equipped with transceivers for RS232.

The first interface can be used e.g. for the communication with a host system. The second interface, which optional is available with **optocouplers**, is available for additional tasks (communication with an external printer, modem, etc.)

Example program

The delivery content of ***DOS-Drive Modul SDK*** includes the example program DDMterm, which demonstrates the most important functions of the software.

DDMterm is delivered as **C source code** and communicates with a PC terminal application (e.g. Hyperterminal for Windows) via the first serial interface. The following instructions can be sent from the terminal to the ***DOS-Drive Modul***:

- **VERSION:** Prompt of current version e.g. „DDMterm V1.0“
- **STATUS:** Prompt of PC Card slot status (e.g. card inserted, valid DOS-Format)
- **TYPE „file“:** Opens the specified file and outputs the content to the terminal
- **PRINT „text“:** Outputs the specified text to the second serial interface
- **FLASH „text“:** Write/read of the specified text to the internal flash segment

Additional options

❑ **High-Speed CAN interface**

Optional ***DOS-Drive Modul*** can be equipped with a High-Speed CAN interface (ISO 11898). For this the CAN 2.0B compatible controller type Philips SJA1000 is used.

❑ **RTC**

Optional ***DOS-Drive Modul*** can be delivered with a real time clock and a lithium battery with clip. For this a module type Philips PCF8583 is used.

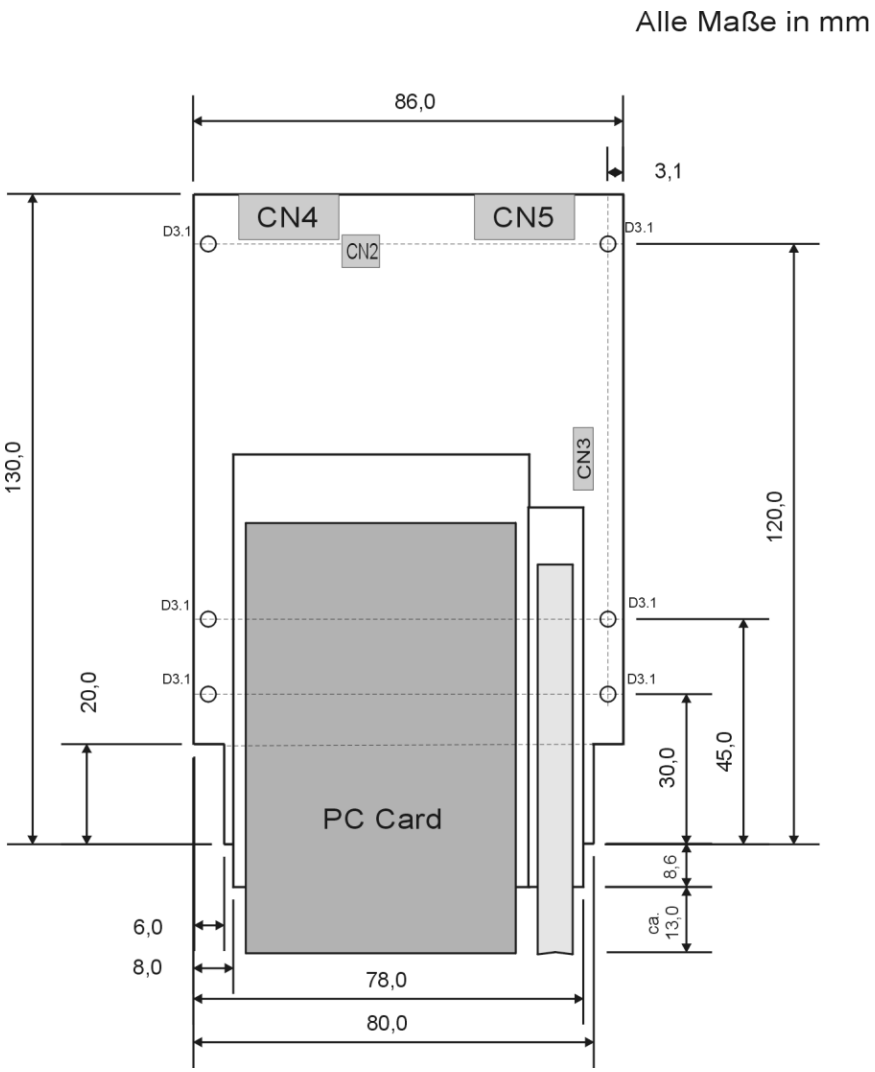
For the activation of the CAN controller and the RTC a corresponding knowledge is necessary. Advisory service, training or development services on demand.

Customized variations

For the use in projects, the ***DOS-Drive Modul*** can be offered as a customized variation (e.g. version for extended temperature range).

Please ask for our technical sales if there are any requests concerning this.

Outline of physical size:



Specification DOS-Drive Modul

Item	DOS-Drive Modul
PC Card Slots	1 x type II Front-Slot
Dimensions (W x D)	86 mm x 130 mm (without projected connectors) height of PCB max. 15 mm, on solder side max. 5 mm
Weight	approx. 100 g
Power Supply	8 to 32V DC (normal 24V) via connector JST2 (B2B-XASK-1)
Power Consumption[1)]	approx. 820 mW without PC Card approx. 890 mW with SanDisk ATA Flash Card read access approx. 1200 mW with SanDisk ATA Flash Card write access
System Kernel	microcontroller: C163 (Infineon) program memory: Flash 128 KByte 64 KByte as program memory (code) usable 8 KByte as permanent memory (data) usable data memory: SRAM 128 KByte
Serial Interface[2)]	2 x RS232 (TxD, RxD, RTS and CTS) via connector 10-pin box header max. 115200 Baud (115.2k, 57.6k, 38.4k, 19.2k, 9.6k ... Baud)
Option: CAN-Interface	Philips SJA1000 High-Speed CAN (ISO11898), max. 1MBit/s (1MBit, 500k, 250k, 125k, 83.3k, 62.5k, ...)
Option: Real Time Clock	Philips PCF8583 with clip-mounted lithium battery
PC Card Types	ATA Flash Card type II (SanDisk)
Operating Temperature	+0°C to +65°C
Storage Temperature	-20°C to +85°C
Humidity	10% to 95% (non condensing)
Conformity	The module is designed as a supplier-part for process and because of this it doesn't have a CE identification.
Development Environment	BSO Tasking C Compiler v4.0 r0 (or compatible)
System Requirements	For the communication with the example program DDMterm: PC with Windows 95/98/Me, NT 4.0, 2000 or XP as well as Hyperterm

[1)] Description for nominal voltage 24V DC

[2)] **Optional:** Indirect-coupled 4 KV for second serial interface

Shipping contents:

- ***DOS-Drive Modul***
  PCB, tested, Flash preprogrammed with Load Firmware function and example program, single packed (no cable, no assembly material, no manual)

Additional products:

- ***DOS-Drive Modul SDK***
  Disk (3 ½") with libraries for FAT File System, Sector Access and FlashMemory Access, example application DDMterm as C source code, complete device documentation
- **Omni*Drive***
  Universal PC Card Drive for USB or PC printer interface (SPP and EPP), for data exchange with PCs.