

## PCMCIA/JEIDA CARD READER/WRITER WITH SCSI INTERFACE

The MCDISK-D (Memory Card Disk) is a card reader/writer for PCMCIA/JEIDA compatible memory cards. MCDISK-D can handle a wide variety of cards of any size: SRAM, ROM, OTP, E(E)PROM, FLASH and PC-ATA disks (mechanical/silicon) as well as user specific I/O cards. To interface those cards to the host equipment MCDISK-D has an SCSI interface. The SCSI interface is widely used for connecting mass storage devices like hard disks to microcomputers.

MCDISK-D comes in a compact desktop case. One MCDISK-D model offers a double card slot which allows for simultaneous use of two memory cards. Memory cards and disks up to Type IV (14.2 mm thickness) can be used.

However, although the reader/writer device is economically priced, no concessions have been made in its performance. It provides a fully professional yet highly economic solution to individual demands for data transfer and storage. This makes the MCDISK-D ideal for use in many industrial, business and home applications with SCSI data input and/or output.

## TECHNICAL FEATURES

- Desktop case with compact dimensions: 158x199x41 mm
- Interfaces PCMCIA/JEIDA Memory Cards to any system with an SCSI interface
- Double card slot version available
- Separate SCSI ID for dual-slot versions can be configured
- SRAM, ROM, OTP, E(E)PROM, FLASH, I/O card and PC-ATA disk support
- Card sizes 512 Byte up to 64 MByte (PC-ATA: 4 GByte)
- Memory card types I, II, III and IV are supported
- Supports direct access to entire memory card (raw access)
- Built-in socket- and card services feature transparent access to card data for PCMCIA-unaware host systems
- High data security through block check capability
- Local 68HC11 processor
- SCSI interface with 33C93 SCSI controller
- Standard SCSI command set
- Two SCSI-2 connectors allow for SCSI bus chaining
- Switchable active SCSI termination
- UL listed
- FCC Class B compliance
- Low power consumption, typ. 150 mA (no card inserted)
- Needs external power unit, 9VAC/600mA min.



## References :

- MS-MCDISK-D-1 Rev. B: PCMCIA/JEIDA Reader/Writer, double PCMCIA/JEIDA (type I...IV) card slot  
 MS-MCDISK-D-2 Rev. B: PCMCIA/JEIDA Reader/Writer, single PCMCIA/JEIDA (type I...IV) card slot  
 MS-MCDISK-D-3 Rev. B: PCMCIA/JEIDA Reader/Writer, single PCMCIA/JEIDA (type I/II slot) card slot (ON REQUEST)

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## INTRODUCTION

### I. ABOUT THIS MANUAL

This manual assists the installation procedure by providing all the information necessary to handle and configure the MCDISK-D reader/writer as well as connect it to a host system.

The MCDISK-D reader/writer is designed to work with most host systems which are fitted with an SCSI interface. It is a simple procedure to set up the unit, nevertheless, before attempting any installation, please read through all applicable sections of this manual and follow the instructions herein.

For those involved in writing drivers or special applications that directly interface to the MCDISK-D, a Technical Reference Manual provides information required to drive the MCDISK-D on the SCSI command level. Related closely to this product are three more publications that supply information about PCMCIA and SCSI interface as well as application and card usage with the MCDISK.

- MCDISK Technical Reference Manual (supplied by MPL AG or your local MCDISK supplier)
- MCDISK Application Note (supplied by MPL AG or your local MCDISK supplier)
- PCMCIA PC Card Standard (July 1993, Release 2.1)
- ANSI SCSI-2 Standard (X3.131-199x, Revision 10h)

### II. SAFETY PRECAUTIONS AND HANDLING

For personal safety and safe operation of the MCDISK-D, follow all safety procedures described here and in other sections of the manual.



**WARNING:** Electrical equipment may be hazardous if misused.

- Handle the unit carefully, i.e. dropping or mishandling the read/write unit can cause damage to internal assemblies.
- Keep the unit away from all sources of liquids, such as coffee cups, drinking glasses, washing facilities etc.
- Do not expose the unit to moisture (damp, wet weather etc.).
- For the purpose of heat dissipation, allow adequate ventilation to the unit by not covering it with paper or other material.
- Use the unit always in the temperature range from 5 °C...40°C.
- Use only a power supply as defined in section 3.2.1.
- Keep this manual available for reference.



**WARNING:** There are no user-serviceable components inside the MCDISK-D!

For your protection and that of your MCDISK-D disconnect the power input immediately if any of the following conditions exists:

- Something has been spilt onto the case.
- The unit has been damaged in any way, e.g. through dropping.
- The unit has been exposed to excess moisture or rain.
- You suspect that the unit requires servicing or repair.
- The power input cable has been damaged.



**WARNING:** To disconnect power, pull the power connector from the back of the unit (ensure that you pull the connector, not the cord!). For this reason, always ensure that the power input connector is easily accessible!

### III. RADIO AND TELEVISION INTERFERENCE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Shielded cables and I/O cords must be used for this equipment to comply with the relevant FCC regulations.

Changes or modifications not expressly approved in writing by MPL AG may void the user's authority to operate this equipment.

### IV. EQUIPMENT SAFETY

Great care is taken by MPL that all its products are thoroughly and rigorously tested before leaving the factory to ensure that they are fully operational and conform to specification. However, no matter how reliable a product, there is always the remote possibility that a defect may occur. The occurrence of a defect on this device may, under certain conditions, cause a defect to occur in adjoining and/or connected equipment. It is the users responsibility to ensure that adequate protection for such equipment is incorporated when installing this device. MPL accepts no responsibility whatsoever for such kind of defects, however caused.

## 1. SPECIFICATIONS AND COMPATIBILITY

This chapter summarises the unit specifications, provides a reference regarding compatibility to host systems and a table of the various MCDISK-D models.

### 1.1 SPECIFICATIONS

Three MCDISK-D models are available (see table 1.3), identified by an extension: D-1, D-2 or D-3. In the table below, model differences are indicated by this extension in parenthesis.

#### Performance:

Transfer rate	2.5 MByte/sec
Average throughput with SRAM card	0.9 MByte/sec
Latency	0 ms

#### Interfaces:

SCSI standard	SCSI-2
SCSI bus connectors	High density 50-pin/female
SCSI bus configuration	8-bit/single-ended
PCMCIA standard	Release 2.1
PCMCIA card slots	2 (D-1) 1 (D-2, D-3)
PCMCIA card types	Type I - IV (D-1, D-2) Type I / II (D-3)

#### Power Requirements (without card):

9 VAC (+/- 5%)	150 mA
Requires external power unit , see section 3.2	

#### Memory Card Current Consumption:

One card	450mA max.
Total two cards	700mA max.
Total peak	800mA, 1.5sec

#### Operating Environment:

Temperature	5°C ... 40°C
Relative humidity (non-condensing)	10% ... 90%

#### Physical:

Height	41 mm (1.6")
Width	158 mm (6.2")
Length	199 mm (7.85")
Weight	0.60 kg (1.32 lbs)

### 1.2 COMPATIBILITY

MCDISK-D operates with various system platforms using standard driver software. Some host systems do not fully support MCDISK-D and require special driver software. MPL AG provides a "MCDISK Application Note" where two major subjects are reflected:

- The actual status of software and hardware support for different host systems, including a description of the categories of use (file system, binary image transfer, SCSI level access).
- A list of MCDISK-compatible PCMCIA cards and ATA-disks, tested by MPL AG or MCDISK users.

### 1.3. PRODUCTION VERSIONS OF MCDISK-D

MCDISK-	D-1	D-2	D-3 <sup>2</sup>
SCSI-2 connectors	2	2	2
PCMCIA connectors	2	1	1
Read	SRAM ROM FLASH EEPROM OTP ATA-Disks	SRAM ROM FLASH EEPROM OTP ATA-Disks	SRAM ROM FLASH EEPROM OTP
Write	SRAM FLASH EEPROM <sup>1</sup> OTP <sup>1</sup> ATA-Disks	SRAM FLASH EEPROM <sup>1</sup> OTP <sup>1</sup> ATA-Disks	SRAM EEPROM <sup>1</sup>
I/O access	yes	yes	yes
Card types	I, II, III, IV	I, II, III, IV	I, II

Table 1.3: MCDISK-D models

<sup>1</sup> Depends on card used

<sup>2</sup> This model is on request only. No support for +12V FLASH cards

## 2. SETTING UP

This chapter (and the next one) provides all the information required to configure the MCDISK-D reader/writer. It describes the setting of the SCSI ID, the SCSI termination characteristics and the connection of the SCSI bus cable and the AC power unit.

If you have any doubts on configuration, contact your MCDISK-D supplier or an authorised dealer of your host computer.



**WARNING:** Before you commence, review and observe the safety precautions described at the beginning of this manual to avoid personal injury or damage to equipment.

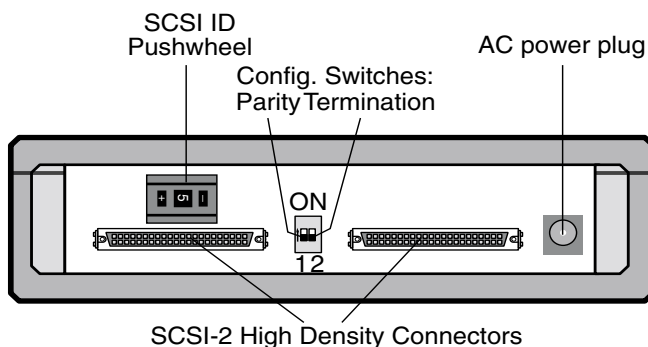
### 2.1 SET-UP OVERVIEW

Set-up of MCDISK-D is a step by step procedure:

1. Remove the MCDISK-D from its cover.
2. Set the unit's SCSI ID.
3. Terminate the SCSI bus if required. Match the SCSI parity configuration.
4. Connect the SCSI bus cable to the unit (see chapter 3)
5. Connect the external AC power unit (see chapter 3).
6. Before starting to work with MCDISK-D, make sure that adequate ventilation to the unit is guaranteed.

### 2.2 REAR PANEL VIEW

SCSI ID switch (push wheel), termination/parity switch, SCSI connectors and AC power plug are located on the rear panel of MCDISK-D (all models). Part descriptions in this and the next chapter relate to these rear panel items.



**Fig. 2.2: Rear panel MCDISK-D**

### 2.3 SCSI ID

Each device on the SCSI bus must have a unique SCSI ID number. The numbers range from 0 .. 7 which allows for a maximum of eight SCSI devices on the bus. Before setting the SCSI ID for MCDISK-D, an ID must be chosen that is not yet used by other SCSI devices. Most host computer systems already use SCSI ID 0 for the internal SCSI hard disk drive. In principle, SCSI ID 7 is used by the host computer itself. Check the documentation of the host computer and the attached peripheral SCSI devices to verify the available SCSI ID numbers.

On the MCDISK-D, the desired SCSI ID number can be adjusted by simply pressing the push wheels +/- buttons. SCSI ID 7 cannot be selected (host computer's own ID).



**WARNING:** Ensure that each SCSI device has a unique SCSI ID number. If not, serious corruption of data and/or failure of the host computer may result!

## 2.4 DUAL SCSI ID FEATURE (MCDISK-D-1 ONLY)

The Dual SCSI ID feature allows to use a separate SCSI ID for each slot on the double-slot MCDISK-D-1. This allows standard driver software (without SCSI LUN support) to be used to access both slots. In Dual SCSI ID mode, the MCDISK-D-1 appears like two separate SCSI devices on the bus, and can thus be handled by the host drivers as if two single-slot MCDISks were connected.

The Dual SCSI ID feature is disabled by default and can only be enabled for units with firmware version V3.3 or newer. To enable this feature, an internal jumper must be set as follows:

1. Make sure you have firmware V3.3 in your MCDISK unit. If not, DO NOT TRY to set the jumper. Dual SCSI ID feature will not work!
2. Use a suitable screwdriver to gently slide the four gray plastic tabs on the top cover of the MCDISK-D-1 case outwards.
3. Use a suitable Philips screwdriver to open the four screws.
4. Remove the top half of the MCDISK case gently. Be careful to lift only the case, and leave the front and rear metal panel inserted in the bottom half of the case.
5. Insert (or remove, if you want to disable the Dual SCSI ID feature) a jumper at the position indicated by Figure 2.4
6. Make sure that you have set the right jumper.
7. Replace the top half of the case. Note that it only fits correctly one way around.
8. Replace the screws
9. Slide the gray plastic cover tabs back until they snap in place.

With the Dual SCSI ID feature enabled, the MCDISK-D-1 uses two SCSI IDs on the bus: To access the lower slot, the SCSI ID configured as described in paragraph 2.3 is used. To access the upper slot, a second SCSI ID which is one number higher than the SCSI ID configured is available.

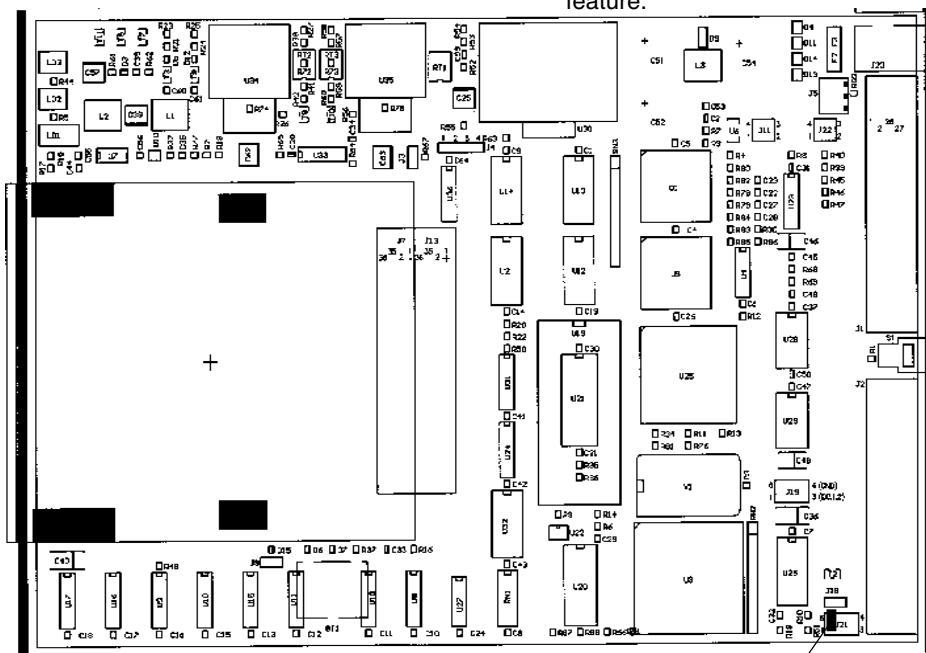
The Dual SCSI ID feature is disabled when the SCSI ID is set to 6.

For example:

- If the SCSI ID is configured as 3 and Dual SCSI ID feature is enabled, the MCDISK-D-1 appears under SCSI ID 3 and 4 on the bus.
- If the SCSI ID is configured as 6, even if Dual SCSI ID feature is enabled, the MCDISK-D-1 appears only under SCSI ID 6 (as SCSI ID 7 is reserved for the host computer). This can be used to disable the Dual SCSI ID feature without opening the case again.

**Note:** The Dual SCSI ID feature works only if SCSI timeout are strictly held as defined in the SCSI-II standard. Some host adaptors have features like "Fast SCSI scan" that violate the SCSI timeout periods, because this is not relevant for many SCSI devices (including the MCDISK with Dual SCSI ID feature disabled). If you have SCSI problems, try disabling those "Fast SCSI scan" features.

**Note:** Please refer to the MCDISK TECHNICAL REFERENCE MANUAL for details about the Dual SCSI ID feature.



J21 Pin 1-6 enables the Dual SCSI Feature

**Fig. 2.4.: Dual SCSI Feature jumper J21**

## 2.5 TERMINATION

### 2.5.1 SCSI BUS TERMINATION

Both ends of the SCSI bus cable must be terminated. Generally, one end is already terminated at the host computer. The other end must be terminated by the last SCSI device on the SCSI bus.



**WARNING:** Ensure that no more than two devices on the SCSI bus are terminated. Otherwise serious corruption of data and/or damage to the SCSI bus devices may result!

When the MCDISK-D is the last device on the SCSI bus, it must be terminated by setting the termination configuration switch to the ON position (Switch No. 2). In all other cases, this switch must be set to the OFF position!

The figure below shows an SCSI chain configuration where the MCDISK-D is in a middle position (and therefore not terminated).

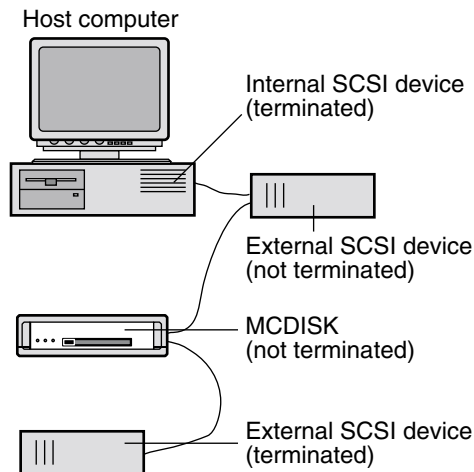


Fig. 2.5.1: SCSI bus configuration

### 2.5.2 TERMINATOR POWER (TERMPWR)

Generally, the host computer is the only device on the SCSI bus required to provide TERMPWR for the bus. Since the MCDISK-D is a peripheral SCSI device, power for the terminator networks must be supplied from the SCSI bus cable (TERMPWR line).

The MCDISK-D contains internal components to provide switchable Active Termination of the SCSI bus. Compared to Passive Termination, Active Termination is far less sensitive to TERMPWR voltage variations, which, amongst other things, increases data security.

Figure 2.5.2 shows the terminator circuit as used on the MCDISK-D:

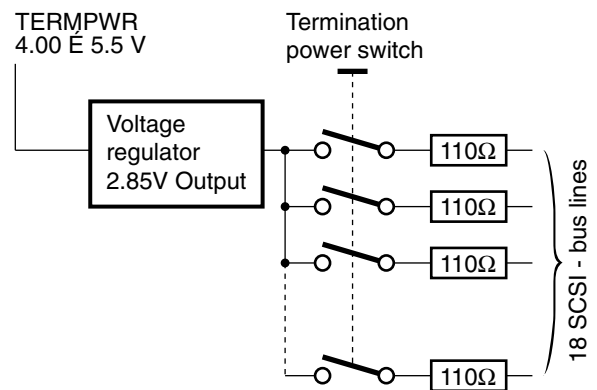


Fig. 2.5.2: Active termination

## 2.6. PARITY

The SCSI parity configuration of the MCDISK-D should match that of the host computer. Check the host computer documentation to verify its setting. On delivery, the MCDISK-D's parity is disabled (Switch No. 1 to OFF) which should be correct for most system integrations. The parity can be enabled by setting the parity configuration switch to the ON position.



### 3. SCSI BUS AND POWER CONNECTION

This paragraph provides directions for connecting the SCSI bus cable and the power unit to the MCDISK-D.



**WARNING:** Before you begin, review and observe the safety precautions described at the beginning of this manual to avoid personal injury or damage to equipment.

#### 3.1 SCSI BUS CONNECTION

Two SCSI bus connectors are located at the rear of the unit. Inside the MCDISK-D, the connectors are pin-for-pin connected together and therefore allow for a simple SCSI bus chaining.

The connectors are of the "high-density" type as described in the SCSI-2 standard. Therefore, the MCDISK-D accepts cables only where one cable end has a connector of the following type: D-Sub high-density, 50-pin male (also called DB50M mini).

Generally, the cable is not included with the MCDISK-D as the connector at the other end of the cable is fully dependant on the type of connector fitted on your host system or nearest peripheral in the SCSI chain. The most commonly used connectors for connecting to the host system are:

- Centronics 50-pin male, standard (various SCSI hosts/peripherals)
- Centronics 50-pin male, high-density / mini (newer SCSI hosts/peripherals)
- D-Sub 50-pin male, high-density / mini (like MCDISK-D)
- D-Sub 25-pin male, standard (all Macintosh models)

To obtain the right cable for your needs, contact your local MCDISK dealer or an authorised dealer of your host computer.

When connecting the SCSI bus cable(s) to the MCDISK-D, carefully align the connectors to avoid bending or damaging the connector pins.



**WARNING:** The total SCSI cable length must not exceed 6 meters (20 feet). Shielded cables and I/O cords must be used for this equipment to comply with the relevant FCC regulations.

### 3.2 POWER CONNECTION

#### 3.2.1 AC POWER UNIT

The MCDISK-D requires an external direct plug-in AC transformer unit.

The input rating of this unit must correspond to the rating of your local mains supply (e.g. 120VAC/60 Hz for USA; 230VAC/50 Hz for Europe).

The output rating of the power unit is defined by the input rating of the MCDISK-D and must be 9VAC / 1000mA (minimum 600mA). In each case, the power unit output must be specified to be within 9VAC  $\pm$ 5% at 600mA.

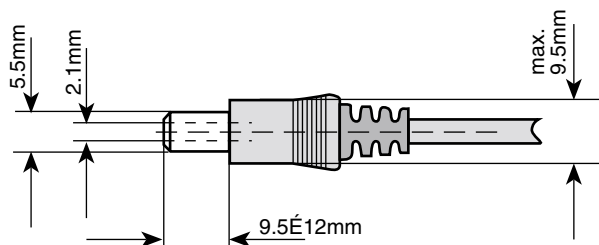


**NOTE:** This product is intended to be supplied by a Listed Direct Plug-In Transformer Unit marked "Class 2" with output rated 9V AC, minimum 600 mA.



**WARNING:** Only a power unit with the above specifications must be used. The use of any other type of power unit may seriously damage your MCDISK! The use of an incorrect power unit with your MCDISK will render the warranty void!

The physical dimensions of the power connector needed for the MCDISK-D are shown below.



**Fig. 3.2.1: Physical dimensions of the power connector**

The power unit is not included with the MCDISK-D due to the wide variety of power supply ratings and AC mains connector pin types. A power unit can be obtained from your local MCDISK supplier or a local electronics distribution outlet.



### **3.2.2 CONNECTING THE POWER UNIT**

Connect the input side of your direct plug-in transformer unit to an AC outlet. Since there is no power switch on any models of the MCDISK-D, power is applied by inserting the power connector of the AC power unit (output side) into the AC power plug on the rear of the MCDISK-D.

The green LED on the front panel will light indicating that power is applied to the MCDISK-D. The red LED will also light indicating that there is no PCMCIA card inserted in the unit.

If the unit fails to switch on (i.e. the green LED doesn't light) then immediately remove the power cord! The cause could be an internal malfunction. Refer to the next section.

### **3.2.3 ELECTRONIC FUSE**

The MCDISK-D is protected by an electronic fuse. The fuse protects the MCDISK-D in case of malfunction by disconnecting the power input from the internal circuit. If this happens, the green power LED will go off and will stay off as long as the fault condition is present.

If you suspect that the fuse has opened, unplug the power cord. Once the power source is disconnected the fuse will connect the power input to the internal circuit again (electronic fuse!). Wait for one minute. Then plug in the power cord again while watching for the green power LED. If the LED just blinks once or does not light at all, immediately unplug the power cord and check through the procedures in the "Setting Up" section.

If, after repeating these procedures the MCDISK-D still fails to operate then remove the power cord and contact your local MCDISK supplier.

The fuse does NOT need to be replaced following operation.



**WARNING:** There are no user serviceable parts inside the MCDISK-D!

## 4. OPERATION

This chapter provides information about the use of the PCMCIA cards and the LED indicators.

The illustration below identifies the items visible on the front panel of the three MCDISK-D models (D-1, D-2 and D-3).

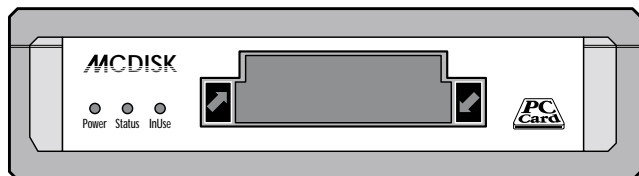


Fig. 4.1 Front panel of MCDISK-D-1

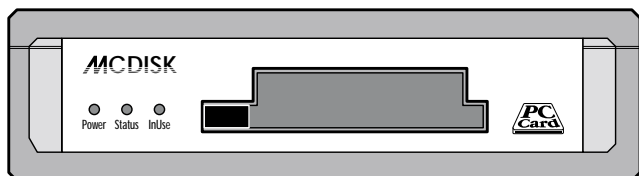


Fig. 4.2 Front panel of MCDISK-D-2

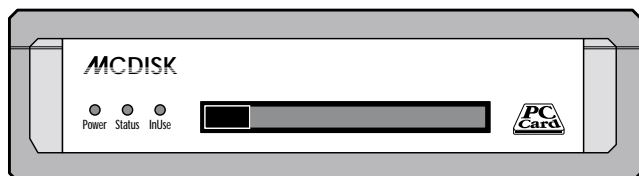


Fig. 4.3 Front panel of MCDISK-D-3

### 4.1 PCMCIA CARD TYPES

The MCDISK-D models have been designed to accept up to four different PCMCIA card types:

- Type I: Thickness 3.3 mm, no raised substrate area
- Type II: Thickness 5.0 mm, 48 mm wide raised substrate area
- Type III: Thickness 10.5 mm, 51 mm wide raised substrate area
- Type IV: Thickness 14.2 mm, 51 mm wide raised substrate area

Dependant on the MCDISK-D model, the usable card types are:

#### MCDISK-D-1:

The lower card slot accepts all four types of cards. Due to the front panel cut-out, the upper card slot only accepts type I - III cards.

Type I and II cards in the lower and type I - III cards in the upper slot can be inserted simultaneously. Type IV cards must be inserted in the lower slot, fully occupying the space of both slots.

#### MCDISK-D-2:

This single slot model accepts type I - IV cards.

#### MCDISK-D-3:

Only type I and II cards can be used.

### 4.2 CARD POWER CONSUMPTION

For heat dissipation purpose the PCMCIA card current consumption has to be considered.

The current consumption of a single card must never exceed 450mA. This corresponds to a maximum power consumption of 2.25 W with 5V technology cards.

If two cards are used simultaneously, then the total current consumption must never exceed 700mA (e.g. 450mA for the first card, 250mA for the second card).

The total peak current must not exceed 800mA for a maximum period of 1.5sec, independent of one or two cards being used. When providing power for the



**WARNING:** Never exceed the current ratings indicated above. If exceeded, serious damage and/or failure of the MCDISK-D may result! Note also the specifications of your AC direct plug-in transformer unit.

### 4.3 CARD HANDLING

Follow the instructions as described in this section when inserting and ejecting PCMCIA cards. Refer to Figures 4.1 - 4.3 to locate indicated items.

#### 4.3.1 INSERTING A CARD

When inserting a card into one of the card slots of the MCDISK-D, care must be taken to ensure that the card is inserted correctly. Follow these steps to insert the card:

1. Orientate the memory card so that the printed surface (e.g. with manufacturer name/logo) is up and the 68-pin connector points towards the MCDISK-D card slot. Note that some cards have an arrow indicating direction of insertion.
2. Insert the card into the slot. It should slide easily into the slot until approx. 15 mm remain exposed and the card comes to a soft stop. At this point gentle pressure is required to make the final connection between the memory card and the card slot connector.  
If the card comes to a sudden stop earlier than described above, do not press any further! Key guides on the card and in the card slot ensure that the card cannot be fully inserted (does not reach the connector) when inserted the wrong way! Remove the card, check orientation and try again.
3. When the card is fully inserted a small portion of the card will remain exposed from the card slot opening. The red LED on the front of the MCDISK-D will go off indicating that the card is present. If the red LED remains lit then the card has not been inserted correctly or cannot be operated by the MCDISK-D (e.g. bad card type).



**WARNING:** Do NOT use excessive force to overcome any resistance when inserting the card. This should not be necessary and will severely damage both the card and the MCDISK-D.

#### 4.3.2 EJECTING A CARD

To remove a card from the card slot, there is a card eject button.

The double slot model has two eject buttons. The eject button at the left hand side of the card slots serves the upper card slot, the eject button on the right hand side the lower card slot. Arrows are printed on the eject buttons that point to the card slot they serve.

To remove the PCMCIA card push the corresponding eject button. The card is released from the connector inside and it may now be pulled free.



**CAUTION:** Do NOT attempt to pull the card free without first pressing the card eject button!  
Do NOT attempt to remove the card when the yellow LED is lit (see also next section)!



**WARNING:** Avoid the situation where foreign objects, dust, liquids etc. can enter the MCDISK-D through the card slot opening. This can cause severe damage.

## 4.4 LED INDICATORS

The MCDISK-D is equipped with three or four LED indicators. Refer to Figures 4.1 - 4.3 for the location of the indicators.

### 4.4.1 BASIC INDICATIONS

The green (leftmost) LED is the power indicator. It is lit whenever the unit has power applied to it.

The two yellow (rightmost) LEDs are the access/lock ("InUse") indicators for the upper and lower slot (for single slot models: only one yellow LED). They are illuminated temporarily whenever an access to a memory card in any of the slots takes place. They are illuminated permanently if the card inserted in this slot is mounted on the host computer as a SCSI bus volume (the card is "locked" by the host computer).



**CAUTION:**  
Don't eject the PCMCIA card when the yellow LED is lit!

The red (middle) LED is the status indicator. It is illuminated when the MCDISK-D is not operable due to one of the following reasons:

- There is no card inserted. If a card is inserted correctly, the red LED will go off.
- There is a card inserted, but it cannot be accessed by the MCDISK-D. Such errors can have various causes: the unit is attempting to write to a write-protected or read-only card, unknown I/O card, hardware error on a memory card, etc.

During start-up (power up or SCSI bus reset), the MCDISK-D performs some internal self tests. When everything is okay, the red and (both) yellow indicators will flash twice simultaneously to indicate proper start-up and proper SCSI connection.

### 4.4.2 ERROR SIGNALLING

In case of an error, the red and (both) yellow indicators will show a diagnostic status:

- The red and (both) yellow indicators remain unlit: Ensure that the unit is connected correctly to a powered SCSI bus. Likewise the unit cannot start-up when the SCSI bus is not or not correctly terminated (TERMPWR O.K.?). If the SCSI bus is O.K. and the indicators still remain unlit, there may be a hardware problem and the unit requires service.
- The red and (both) yellow indicators flash only once and then remain unlit: The internal RAM test has failed. The unit requires service.
- The error LED flashes repeatedly: There is an SCSI hardware problem.
- The error LED double-flashes repeatedly: This indicates a severe SCSI bus protocol error that prevents the MCDISK-D from continuing SCSI operation. The MCDISK-D needs to be reset to recover from this error. If the error is permanent, check SCSI cabling, terminators and SCSI ID's.
- The error LED triple-flashes repeatedly: The ROM contents are not O.K. The unit requires service.
- The LEDs show some other pattern than those listed above: There is a serious hardware problem, and the unit needs to be returned to your local MCDISK supplier for repair.

#### 4.5 DRIVER SOFTWARE

If your MCDISK supplier has provided a driver software package with your MCDISK-D, this must be loaded on the host computer before commencing to work with the MCDISK-D. Follow the instructions provided with the driver and/or the procedures laid down for installing software on the host computer provided in the host computer documentation.

#### 4.6 BATTERY REPLACEMENT

The MCDISK-D may contain a lithium battery which is used to ensure that certain essential operating information stored in the MCDISK-D is not lost when the power input to the MCDISK-D is removed. Under normal situations the battery should not need replacing throughout the life span of the MCDISK-D. However if the unit has been switched off or stored for long periods the battery may become discharged.

The battery **MUST** only be replaced by qualified service personnel of MPL or its authorised dealers and agents. There are no user serviceable parts inside the MCDISK. Opening the MCDISK-D will render the warranty void.

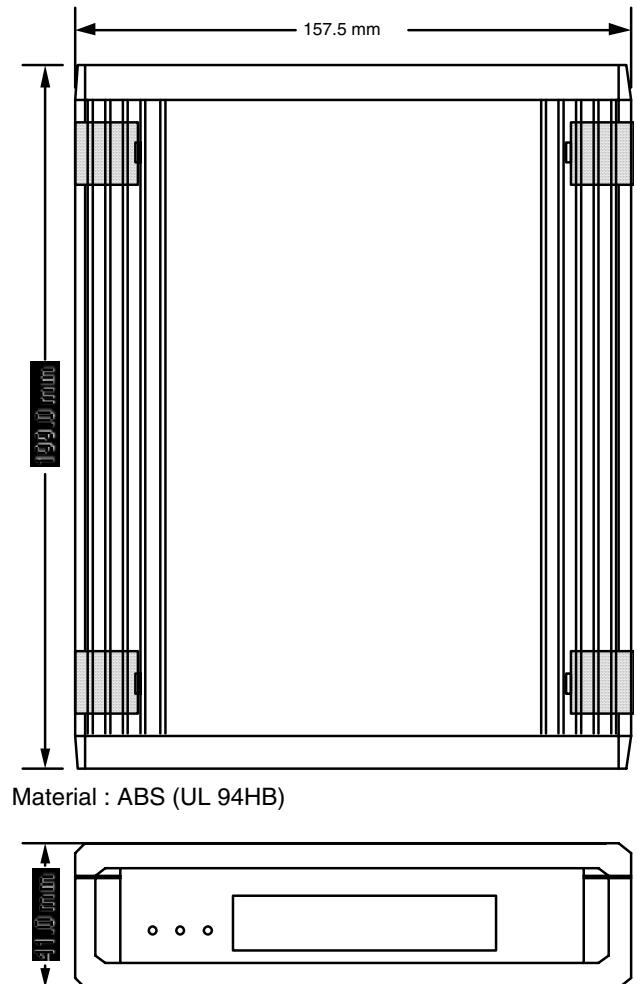
The battery inside the MCDISK-D is **NOT** rechargeable.



**WARNING:** Danger of explosion if battery is re-charged or incorrectly replaced. Replacement only to be undertaken by qualified service personnel. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries in accordance with the manufacturer's instructions.

#### 5. PHYSICAL DIMENSIONS

The drawing below provides the physical dimensions of the MCDISK-D.



**Fig. 5: Physical Dimensions MCDISK-D**

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## **DISCLAIMER**

All implied warranties on the product and manuals, including implied warranties of merchantability and fitness for a particular purpose, are limited in duration to twelve (12) months from the date of the original retail purchase of this product.

MPL has fully tested the MCDISK and reviewed the documentation. However, MPL makes no warranty or representation, either expressed, or implied, with respect to this product, its quality, performance, merchantability, or fitness for a particular purpose.

In no event will MPL be liable for direct, indirect, special, incidental, or consequential damages resulting from any defect in the product or its documentation, even if advised of the possibility of such damages. In particular MPL shall have no liability for any programs or data stored in or used with this product, including the costs of recovering such programs or data.

MPL AG reserves the right to make changes to any product herein to improve reliability, function or design.

MCDISK is a trademark of MPL AG Elektronikunternehmen.

## **AUTHOR'S NOTE**

Dear user of this product. It is my expressed wish that this product is not to be used to apply any kind of violence to anyone. Because there is no absolute criterium for violence, I trust your subjective interpretation – if it's honest for you, it's OK for me.

Disregarding my wish will not break the license agreement or any other contracts. However, ignoring it would mean not respecting the thoughts I had when putting my efforts into this product.

L. Zeller, MPL AG

Our local distributor: