DDR

User's Guide

ND040012E

NEWCON
DATA AB

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WARNING   Hazards which could result in personal injury

CAUTION   Hazards which could result in equipment or property damage

NOTE   Alerts user to pertinent facts and conditions

Although **DANGER** and **WARNING** hazards are related to personal injury, and **CAUTION** hazards are associated with equipment or property damage, it should be understood that operation of damaged equipment could, under certain operational conditions, result in degraded process performance leading to personal injury or death. Therefore, comply fully with all **DANGER**, **WARNING**, and **CAUTION** notices.

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NOTICE

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1 Introduction

1.1 Purpose

The purpose of this document is to give an overview of the product *DDR* (**D**isk **D**rive **R**eplacement) which is a replacement for the old 5.25" floppy disk drives DSMD 110/111/112/113 used in the ABB Master systems. The product uses a flash memory for storage (SD memory card). An installed DDR will be handled as a normal floppy disk drive by the ABB Master system.

This document shall also be an aid for users when use and install the *DDR* product.

1.2 References

1.2.1 Documents

Document	Identity	Version
SDBackup Release Notes	ND040013E	1.1
ABB MasterView 850/1 User's Manual	7650 129-201	

1.2.2 General

This document is valid for the *DDR* of type NDDD 001, NDDD 002, NDDD 003 and NDDD 004.

2 General Description

This document describes the product *DDR* (**D**isk **D**rive **R**eplacement) which is a replacement for the old 5.25-inch floppy disk drives DSMD 110/111/112/113 used in the ABB Master systems. The product uses a flash memory for storage (SD memory card). An installed DDR will be handled as a normal floppy disk drive by the automation system.

The product *DDR* is fully compatible with ABB Master system using the DSMD 110/111/112/113 floppy disk drive, for example the MasterView product family 810/830/850 and also MasterPiece 200 and TESSELATOR 8400/9800. The unit can also be used in a standard PC.

*Figure 1 **DDR** unit of type NDDD 002 mounted in a MasterView 830 cabinet.*

2.1 Overview

The following *DDR* products are available:

- **NDDD 001**, a circuit board mounted unit for 19-inch rack. For use in MasterView 850 or 19-inch rack based MasterView 810/830.

- **NDDD 002**, a frame mounted unit for small cabinet based MasterView 810/830.

- **NDDD 003**, a circuit board mounted unit for 19-inch rack. For use in MasterPiece 200 and TESSELATOR 8400.

- **NDDD 004**, a unit mounted on a frame or a standalone unit. Can be equipped with an external 5V power supply. For use together with MasterPiece 200.

- **SDBackup**, a PC software product for backups of the SD card directly to a PC hard drive.

NDDD 001

The *DDR* unit of type **NDDD 001** replaces the floppy disk drive DSMD 113, the entire circuit board, used in the standard MasterView 850 or 19-inch rack based MasterView 810/830. The *DDR* unit is mounted on a 19-inch circuit board.

NOTE: Removing the old DSMD 113 unit and installing the new *DDR* unit can be done without switching the power off on the Master system.

Figure 2 DDR unit of type NDDD 001.

NDDD 002

The *DDR* unit of type **NDDD 002** replaces the floppy disk drive in a small cabinet based system like MasterView 810/830. The *DDR* unit is mounted on a frame and is delivered with a signal adaptor and a connection to external 5V power supply. It can also be used in a PC.
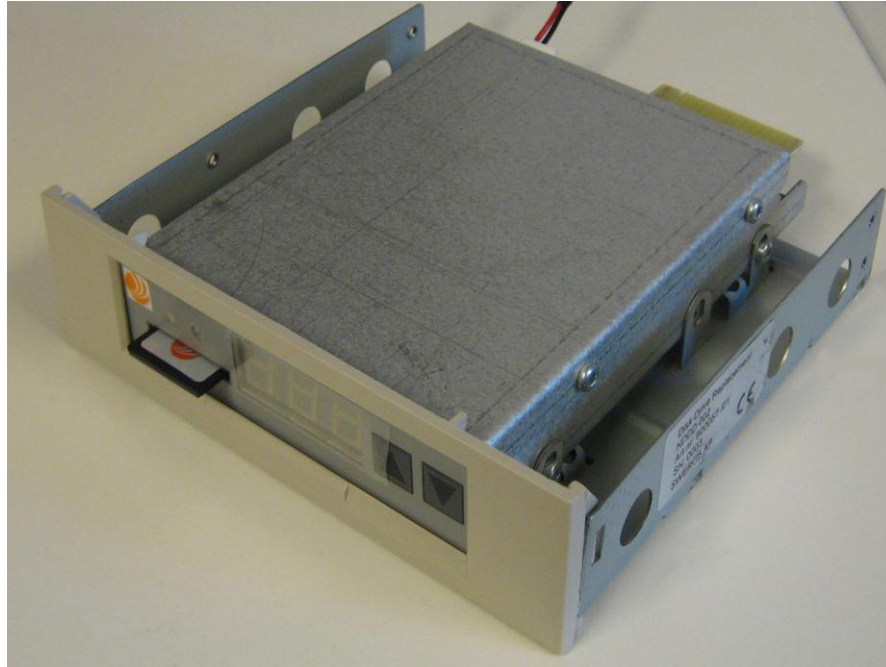
Figure 3 DDR unit of type NDDD 002.

NDDD 003

The *DDR* unit of type **NDDD 003** replaces the floppy disk drive DSMD 110, the entire circuit board, used in MasterPiece 200 and TESSELATOR 8400. The *DDR* unit is mounted on a 19-inch circuit board.

NOTE: Removing the old DSMD 110 unit and installing the new *DDR* unit can be done without switching the power off on the system.

Figure 4 DDR unit of type NDDD 003.

NDDD 004

The *DDR* unit of type **NDDD 004** replaces the floppy disk drive DSMD 110 and can be used together with MasterPiece 200.

The *DDR* unit is delivered with a signal adaptor. The unit can be mounted on a frame if necessary. The unit uses external 5V power supply. An external 5V power supply can be delivered with the unit.
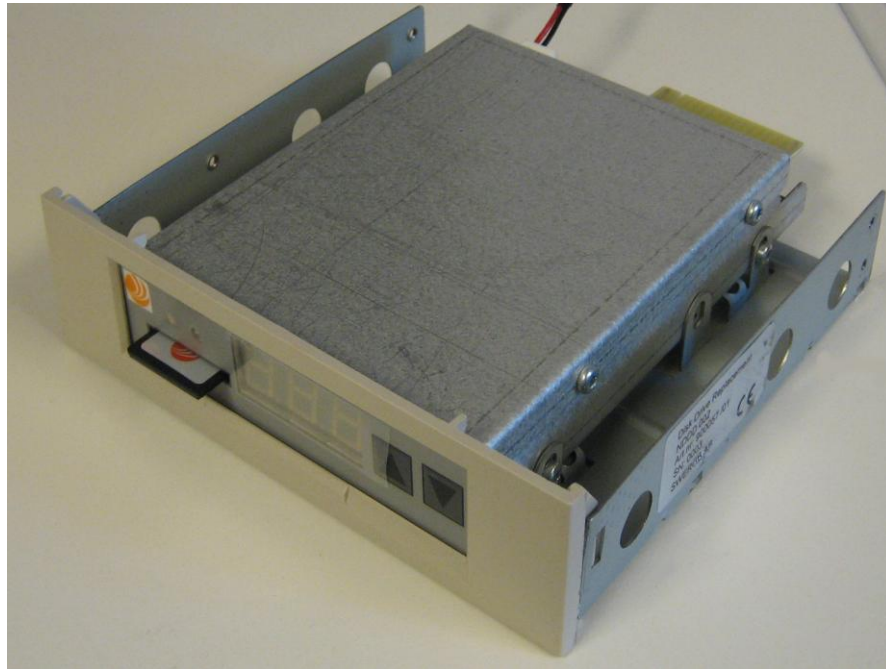
*Figure 5 **DDR** unit of type NDDD 004 mounted on a frame.*

SDBackup

The PC software product **SDBackup** allows easy backups of the SD memory card directly to a PC hard drive. The backup can later be restored to a SD memory card.

The product **SDBackup** works with any PC compatible SD card device handling 1 Gbyte SD memory card on Microsoft Windows 8/7/Vista/XP/2000.

The program reads data from the SD card and stores disk files in the backup folders on the hard drive. The data can be later be restored to the SD card or copied to another SD card. The created files are on binary format, not possible to edit by the user.
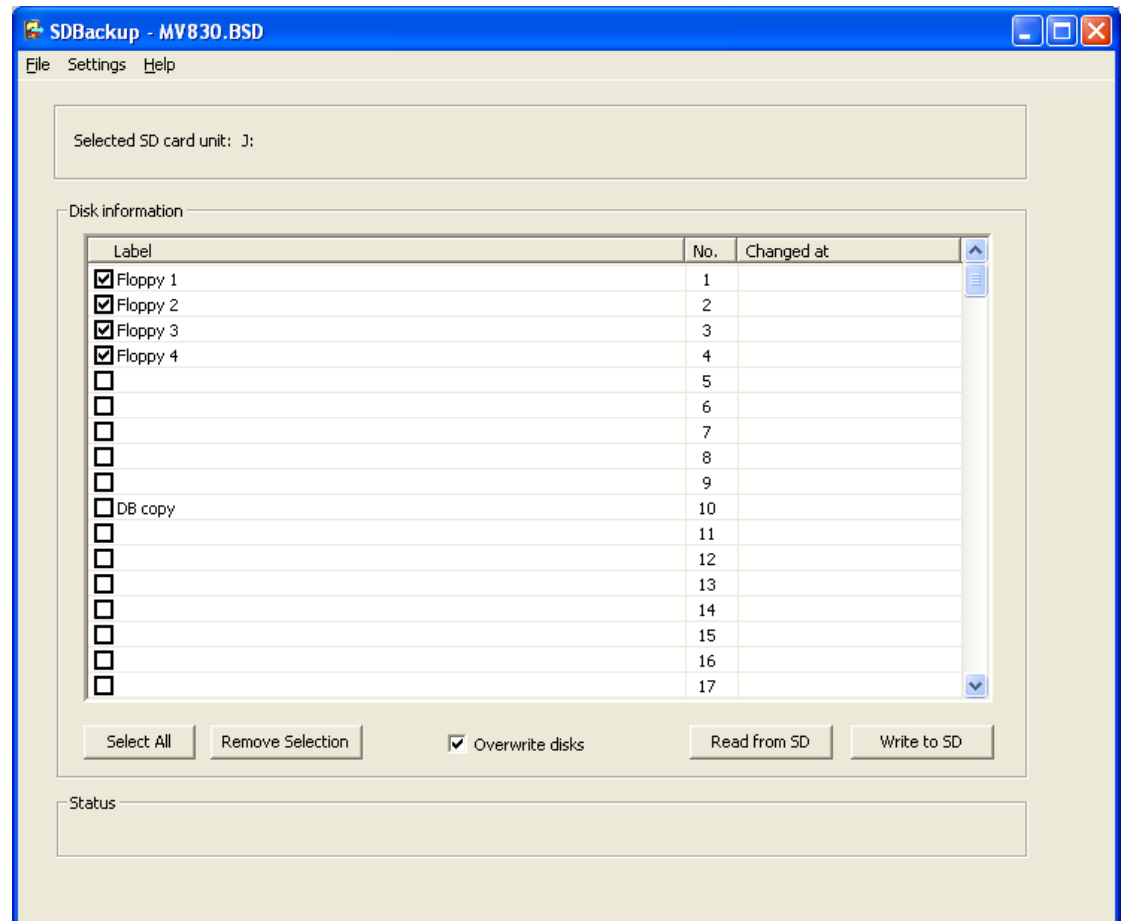
*Figure 6 The **SDBackup** software product.*

3   The *DDR* Unit

3.1   Overview

The *DDR* unit uses a flash memory for storage (SD memory card), mounted in the front of the unit. The SD card used in the *DDR* is pre-formatted at delivery with the capacity of storing data corresponding to a maximum of 200 diskettes (1.44 MB format). An installed *DDR* unit will be handled as a normal disk drive by the ABB Master systems with the "Active Disk" indicated by the display on the front of the unit.
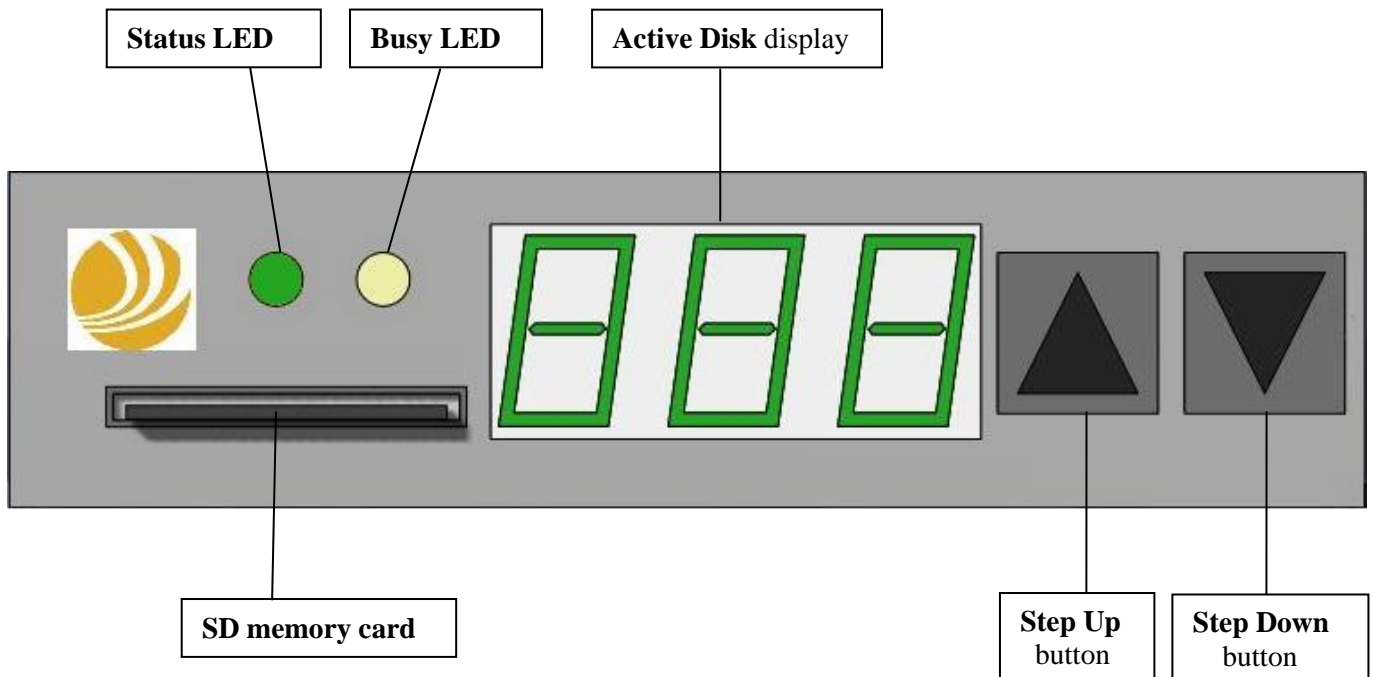
*Figure 7 Front of the **DDR** unit.*

The built-in **Step Up** and **Step Down** buttons on the front of the *DDR* unit are used to change the "Active Disk". At power on disk 001 will always be activated. By pressing the **Step Up** and **Step Down** buttons simultaneous, disk 200 is selected. Keeping one of the buttons pressed increases the speed of selection.

On the front of the unit are also two LED's located, the **Status LED** and the **Busy LED**.

Status LED is indicating the operation status of the *DDR* unit. The following indications are present:

- **Green:** Indicates normal operation.

- **Red:** Indicates an error on the SD card or the *DDR* unit.

- **Off :** Indicates that the unit has no power.

Busy LED is indicating the access status of the *DDR* unit. The following indications are present:

- **On** (Yellow)**:** Indicates busy status. The *DDR* unit is busy at the moment for example by reading/writing information from/to the SD memory card. The unit is not ready to send/receive information from the ABB Master system!

- **Off:** Indicates ready status. The *DDR* unit is ready to send/receive information from the ABB Master system!

IMPORTANT :
Do not ever make any floppy disk operations in the ABB Master system, for example DUMP, LOAD etc, when the **Busy LED** is **On**!

Do not ever remove the SD memory card from the *DDR* unit when the **Busy LED** is **On**! Wait until it is **Off** before removing the SD memory card, otherwise the *DDR* unit can enter an error state which later causes read or write errors when accessing the SD memory card!

3.2   Memory Handling

The *DDR* unit uses the following two types of memories:

- **SD card memory:** Stores permanent data on maximum 200 disks. Each disk represents a floppy disk (1.44 MB format) in the ABB Master system.

- **RAM memory:** The built-in RAM in the *DDR* unit is loaded with data from the "Active Disk" on the SD memory card at the following situations:

  - When a disk is activated by using the step buttons.
  - When mounting the SD memory card in the unit.
  - At power on.

The RAM memory is the *DDR* unit's working memory. No disk operations in the ABB Master system can be handled correctly before the RAM is loaded and **Busy LED** on the *DDR* unit is **Off**. When data in the ABB Master system is written to the *DDR* it will first pass through the RAM memory and then it will be written to the SD memory card.

IMPORTANT:
Remember not to force any operations on the *DDR* unit, always wait until the **Busy LED** is **Off** before performing next step!

NOTE:

- It can take up to 30 seconds to transfer the data from/to the SD memory card. During this operation the **Busy LED** on the *DDR* unit is **On** (Yellow).

- The position of the write-protect switch on the SD memory card is not detected by the *DDR* unit. The SD memory card is always writable.

- The SD memory card cannot be read directly by any PC, because there is no file system present on the card. A special program *SDBackup* has to be used to make backup images on the PC. See section 4.

- Never format the SD memory card in a PC before using it in the *DDR* unit, the SD memory card will then be unusable!

- Only use pre-formatted SD memory cards delivered from us in the *DDR* unit!

- Changing SD memory card in the *DDR* unit can be done with the power on!

- Never remove the SD memory card from the *DDR* unit when the **Busy LED** on is **On** (Yellow)!

3.3 Connections

3.3.1 NDDD 001 Connections

The signal interface on the *DDR* unit of type **NDDD 001** is connected to the X2 connector (lower) on the circuit board. The power interface of the *DDR* unit is connected to the X1 connector (upper) on the circuit board.

The 19-inch circuit board with the *DDR* unit shall be inserted in the MasterView 810/830/850 rack at the same location as the old DSMD 113 floppy disk drive. The X1 connector of the circuit board shall be connected to the backplane and the X2 connector shall be connected to the signal interface of the DSMC 112 floppy disk controller.

3.3.2 NDDD 002 Connections

The signal interface adaptor shall be mounted on the *DDR* unit of type **NDDD 002** according to the Figure *8*.

NOTE: The position of the yellow dot on the signal interface adaptor and on the *DDR* unit!

Figure 8 Connections for NDDD 002.

3.3.3   NDDD 001 and NDDD 002 Strapping

The Figure 9 shows the strapping of the *DDR* unit of type **NDDD 001** or **NDDD 002** when used in an ABB MasterView 810/830/850 system, default at delivery.

NOTE: The JP6 strap, inside the *DDR* unit, shall be in position **MST**, default at delivery!
The JP6 strap is present only on DDR units with part number 900057/02!

Figure 9 Strapping for NDDD 002 for use in ABB MasterView systems.

The Figure 10 shows the strapping of the *DDR* unit of type **NDDD 002** when used in a PC.

NOTE: The JP6 strap inside the *DDR* unit shall be in position **HD**!
The JP6 strap is present only on DDR units with part number 900057/02!

Figure 10 Strapping for NDDD 002 for use in a PC.

3.3.4   NDDD 003 Connections

The signal interface on the *DDR* unit of type **NDDD 003** is connected to the X2 connector (lower) on the circuit board. The power interface of the *DDR* unit is connected to the X1 connector (upper) on the circuit board.

The 19-inch circuit board with the *DDR* unit shall be inserted in the MasterPiece 200 or TESSELATOR 8400 rack at the same location as the old DSMD 110 floppy disk drive. The X1 connector of the circuit board shall be connected to the backplane and the X2 connector shall be connected to the signal interface of the DSMC 110 floppy disk controller.

3.3.5   NDDD 004 Connections

The signal interface adaptor shall be mounted on the *DDR* unit of type **NDDD 004** according to the Figure 11.

NOTE: The position of the yellow dot on the interface adaptor and on the *DDR* unit!

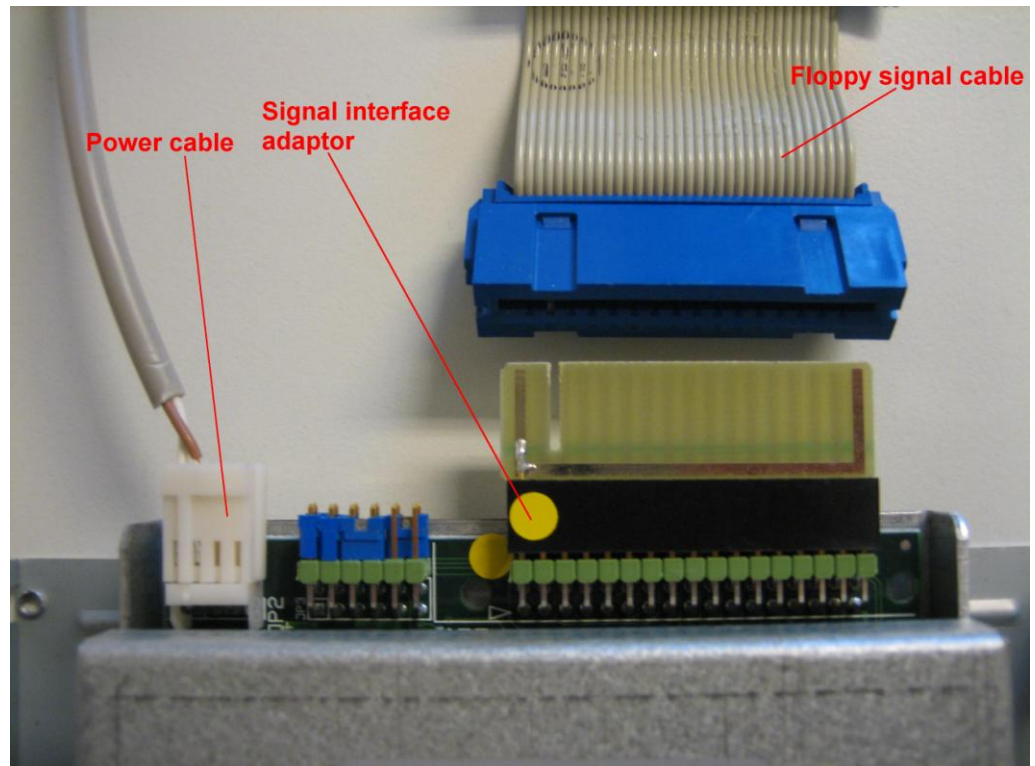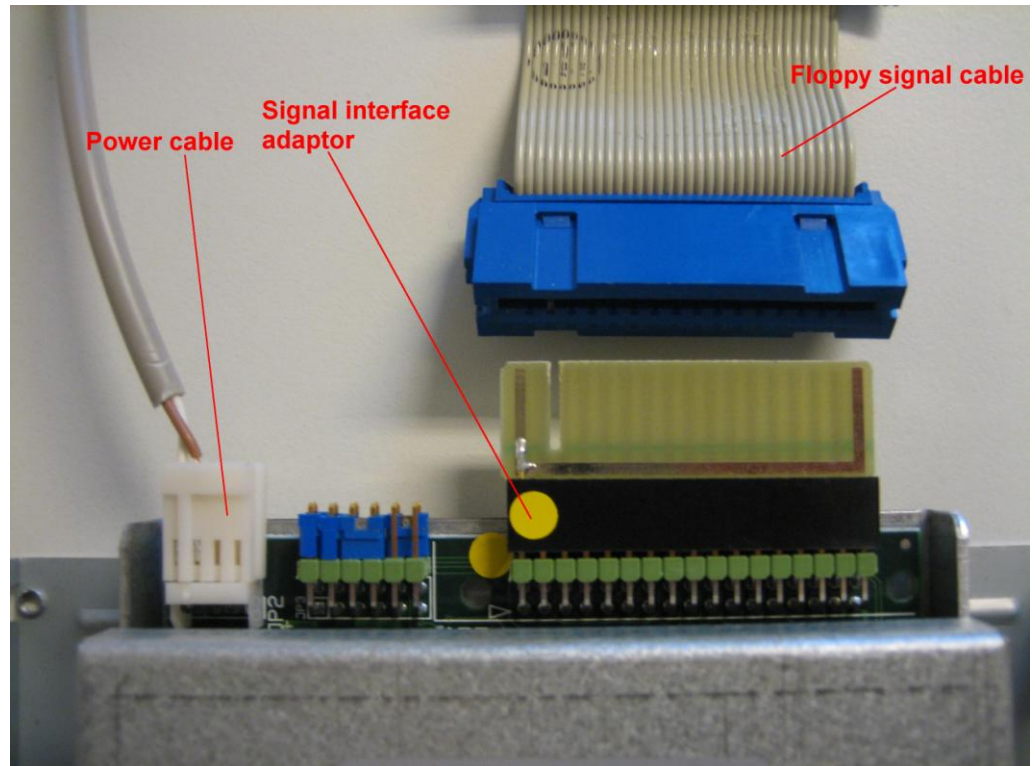*Figure 11 Connections for NDDD 004.*

3.3.6   NDDD 003 and NDDD 004 Strapping

The Figure 12 shows the strapping of the *DDR* units of type **NDDD 003** and **NDDD 004** when used in an ABB MasterPiece 200 or TESSELATOR 8400 system, default at delivery.
NOTE: The JP6 strap, inside the *DDR* unit, shall be in position **S2**, default at delivery!

Figure 12 Strapping for NDDD 004 for use in ABB MasterPiece 200.

The Figure 13 shows the strapping of the *DDR* unit of type **NDDD 004** when used in a PC.

NOTE: The JP6 strap, inside the *DDR* unit, shall be in position **HD**!

Figure 13 Strapping for NDDD 004 for use in PC.

3.4 NDDD 001 - Installation and Operation

We recommend the procedure described in step 1 – step 5 below, to transfer the system information from floppy disks used in a 19-inch rack based ABB Master system, for example a MasterView 850, to a SD memory card using the *DDR* of type **NDDD 001**.

NOTE: The *DDR* unit can also, as an option, be delivered with a pre-programmed SD memory card containing a copy of the MasterView system software and data from your 5.25-inch floppy disks! Please contact us!

CAUTION: Be very carefully when performing operation inside the MasterView rack with the power on!

1. Switch the system power on.

2. Load the MasterView system information from the 5.25-inch floppy disks using the LOAD button on the DSPC 171 CPU board.

3. Carefully remove the old DSMD 113 floppy unit from the 19-inch rack with the system power on, see Figure 14. Do not touch any other circuit boards in the rack!

Figure 14 Remove the old DSMD 113 unit from the MasterView rack.

4. Gentle insert the new **NDDD 001** circuit board with the *DDR* unit into the 19-inch rack with the system power on, see Figure 15. Do not touch any other circuit boards in the rack! The **Status LED** on the *DDR* unit shall be **On** (Green). Wait until the **Busy LED** on the *DDR* unit is **Off** (approx. 30 sec).

Figure 15 Insert the new NDDD 001 circuit board in the MasterView rack.

5. The *DDR* unit is now ready to use. Use the **Step Up** and **Step Down** buttons on the *DDR* unit to select the "Active Disk". Use the DUMP and LOAD buttons on the DSPC 171 CPU board to perform the system dump or load operations!

IMPORTANT: Remember not to force any operation always wait until the **Busy LED** is **Off** before performing next step! So when storing information on the SD memory card it can take up to 30 seconds until the *DDR* is ready for the next step of the operation after that the STATUS display on the DSPC 171 CPU has indicated to take the step, see Figure 16.

Figure 16 The NDDD 001 unit is busy, Busy LED in On.

3.5 NDDD 002 - Installation and Operation

We recommend the procedure described in step 1 – step 12 below, to transfer the system information from floppy disks used in a small cabinet based automation system, for example a MasterView 810/830, a SD memory card using the *DDR* of type **NDDD 002**.

NOTE 1: The *DDR* unit can also be delivered with a pre-programmed SD memory card containing a copy of the MasterView system software and data from your 5.25-inch floppy disks! Please contact us!

NOTE 2: The information in a running MasterView 810/830 system can be stored on a SD memory card without switching the power off on the MasterView system, if the *DDR* unit is using an external power supply for example not located in the MV810/830 system! Useful if the old 5.25-inch floppy disk drive is broken! Step 1 & 3, described below, can then be made later when the information has been stored on the SD memory card!

CAUTION: Be very careful when performing operation inside the MasterView cabinet with the power on!

1. Mount the signal interface adaptor on the *DDR* unit, see section 3.3.2.

2. Switch the system power off.

3. Remove the covering side plates on the MasterView cabinet.

4. Connect the power cables of the new *DDR* unit to the screw terminals according to Figure 17.

Figure 17 The 0V and +5V power screw terminals in the MasterView cabinet.

5. Switch the system power on.

6. Load the MasterView system information from the floppy disks using the LOAD button on the DSPC 171 CPU board.

7. Remove the power cable and the signal cable from the old DSMD floppy unit in the MasterView 810/830 cabinet, see Figure 18.
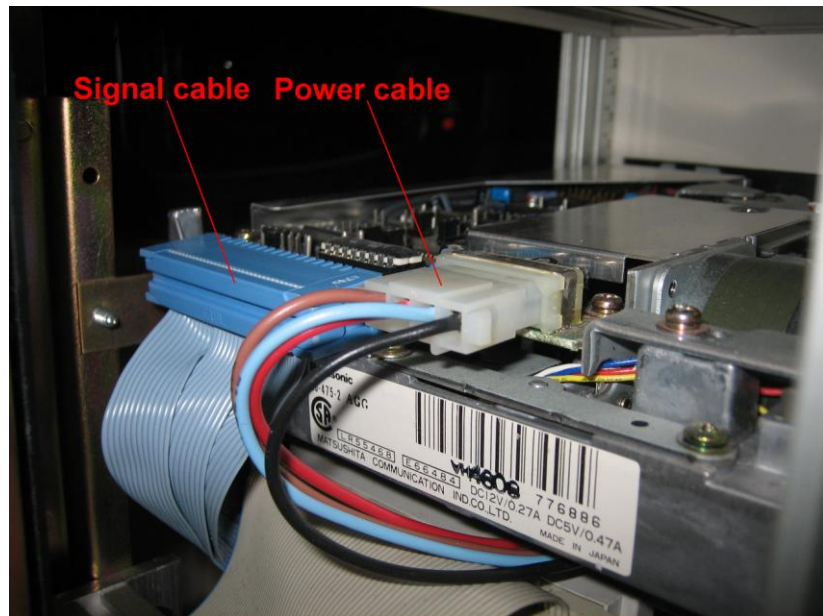
Figure 18 The connection cables to the old DSMD floppy unit.

8. Remove the old DSMD floppy unit from the cabinet.

Figure 19 Remove the old DSMD floppy unit for the MasterView cabinet.

9. Mount the *DDR* unit inside the MasterView cabinet.

10. First, connect **only** the power cable, see step 3, to the *DDR* unit according to Figure 20. The **Status LED** on the *DDR* unit shall then be **On** (Green). If not check the power cables, see step 3. Wait until the **Busy LED** on the *DDR* unit is **Off** (approx. 30 sec).

Figure 20 Connect the power cable to the DDR unit.

11. Second, connect the signal cable to the *DDR* unit according to Figure 21. If the **Busy LED** on the *DDR* unit is **On** (Yellow), the signal cable is incorrectly connected! Turn the contact to the other direction!
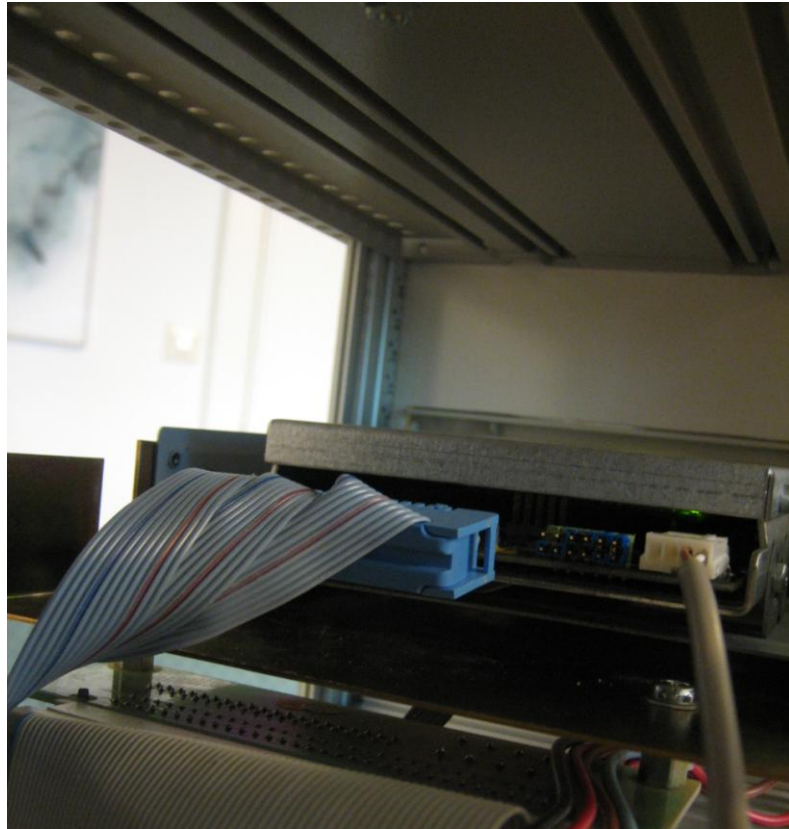
*Figure 21 Connect the signal cable to the **DDR** unit.*

12. The *DDR* unit is now ready to use. Use the **Step Up** and **Step Down** buttons on the *DDR* unit to select the "Active Disk". Use the DUMP and LOAD buttons on the DSPC 171 CPU board to perform the system dump and load operations!

IMPORTANT: Remember not to force any operation always wait until the **Busy LED** is **Off** before performing next step! So when storing information on the SD memory card it can take up to 30 seconds until the *DDR* is ready for the next step of the operation after that the STATUS display on the DSPC 171 CPU has indicated to take the step, see Figure 22.

Figure 22 The NDDD 002 unit is busy.

4   Backup of SD Memory Card

The PC software product **SDBackup** is available as an option to the **DDR** unit, which allows easy backups of the SD memory card directly to a PC hard drive. The backup can later be restored to a SD memory card.

The software product **SDBackup** runs on a standard PC under the Microsoft Windows 8, Windows 7, Windows Vista, Windows XP or Windows 2000 operating systems. The program works with any PC compatible SD card device handling 2 Gbyte SD memory cards.

SDBackup reads data from SD cards and stores "diskettes" in the backup folders on the hard drive. The data can later be restored to the SD memory card or copied to another SD memory card. The created files are on binary format, not possible to edit.
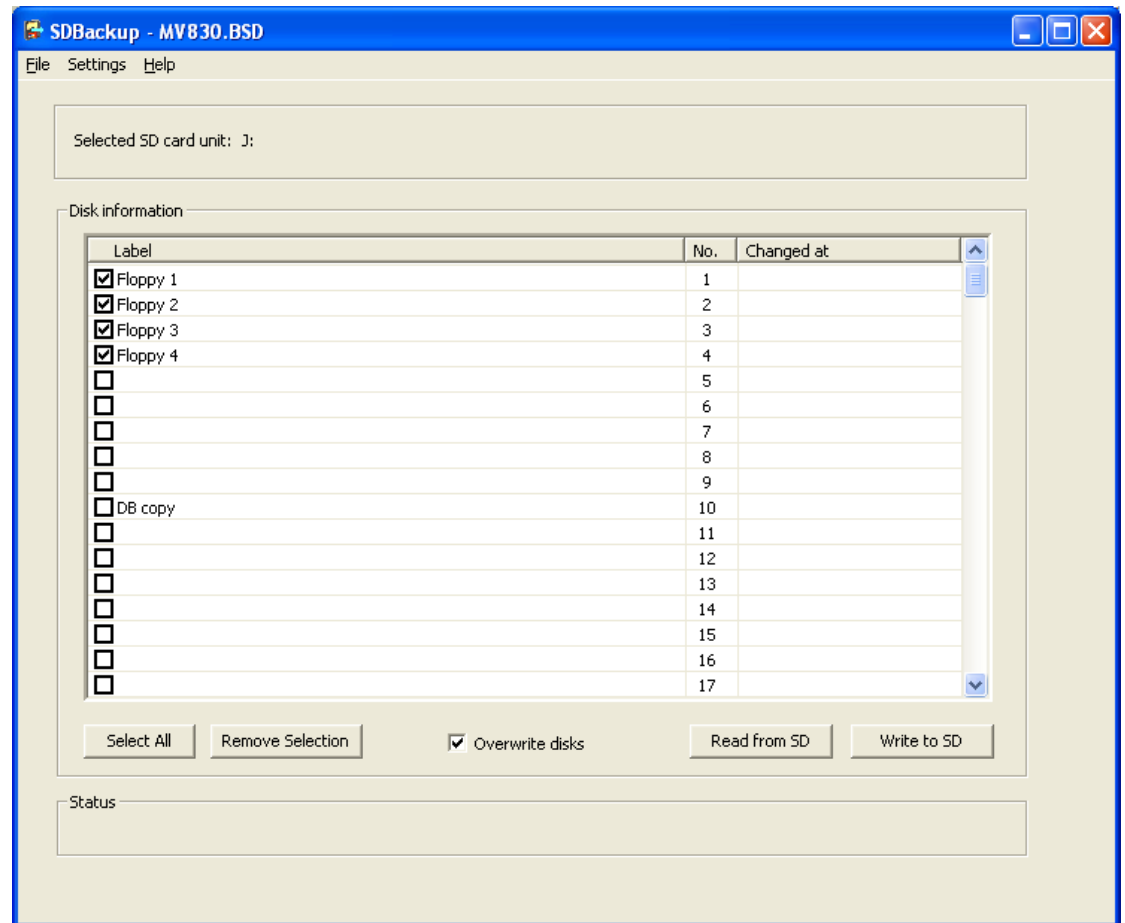
*Figure 23 The **SDBackup** application.*

For information about how to install the **SDBackup** program, see the document "**SDBackup** Release Notes". The document can be downloaded from our product web site at, http://www.tessem.nu, see the Download section.

For more detailed information about how to use the **SDBackup** program, see the built-in **Help Application**.

5   Troubleshooting

5.1   The *DDR* Unit

This section describes some possible error situations and guidelines how to solve the problem.

- The **Status LED** on the *DDR* unit of type NDDD 002 is **Off**?

  => Check the power cables, see section 3.5

- The **Status LED** on the *DDR* unit of type NDDD 001 is **Off**?

  => Check if the circuit board is correctly inserted in the 19-inch rack. Is correct slot used and check that the X2 contact of the circuit board is connected to the disk drive controller board, DSMC 112, see section 3.4.

- When connecting the signal cable to the *DDR* unit NDDD 002 the **Busy LED** is **On** (Yellow)?

  => The signal cable is incorrectly connected! Turn the contact to the other direction!

- When inserting the *DDR* unit NDDD 001 in the 19-inch rack the **Busy LED** is **On** (Yellow)?

  => Check that the X2 contact is connected to the disk drive controller board, DSMC 112, see section 3.4.

- The CPU circuit board in the automation system (DSPC 171) indicates an error code on the display rather than next floppy disk number at LOAD or DUMP operation?

  => Check that the *DDR* unit is ready to send/receive information from the automation system; the **Busy LED** is **Off** when the operation starts! Repeat the LOAD or DUMP operation.

  => Perhaps an SD card has earlier been removed from the *DDR* unit when the **Busy LED** was **On**? Then the *DDR* unit can enter an error state which later causes read or write errors when accessing the SD card during the LOAD or DUMP operation. Requires toggling of the power on the *DDR* unit, or the entire system. Repeat the LOAD or DUMP operation.

- The display on the front of the *DDR* unit is black, no digits are shown?

  => If the display lights up by removing the SD card and inserting it again the *DDR* unit has probably enter an error state. This scenario can occur if any signal, in the signal interface, is present before the *DDR* unit is powered on. Check that the *DDR* unit has +5V power before the signals are turned on. If it is difficult to get a continuous +5V supply to the *DDR* unit inside the Master system, an external 5V power supply can be a solution.

5.2   The *SDBackup* Software Product

This section describes some possible error situations and guidelines how to solve the problem.

- The program can't find a "backup_diskxxx.ddr" file during writing information to the SD card?

  => Check the file is present in the same folder as the backup information file, the "backup.BSD", for the current backup.

  => If the name on the ".BSD" file has been changed by the user, the same changes must be made on all the ".ddr" files!

- SD card unit error when reading from or writing to SD card?
  => Check that the SD card is mounted in the card device.

6 How to Report Errors

6.1 The *DDR* Unit

If an error is detected should a written report be generated as soon as possible! Please be as specific as you can be about the problem you are experiencing; what kind of error, its nature and the circumstances when it was discovered. Model, serial number, system configuration, photo, and description of the command sequences related to the error should, if possible, be included in the report.

The following information is required when reporting errors:

- System Problem Report (SPR) describing the problem.
  An empty template (**DDRSPR.doc**) can be downloaded from our product web site at, http://www.tessem.nu, see the Download section.

- Photos of the faulty unit installed in the system etc.

Send a mail with all the necessary information to Technical Support at tessem@newcon.se

6.2 The *SDBackup* Software Product

If an error is detected should a written report be generated as soon as possible! Please be as specific as you can be about the problem you are experiencing; what kind of error, its nature and the circumstances when it was discovered. System messages, printouts, screen dumps related to the error should, if possible, be included in the report.

The following information is required when reporting errors:

- System Problem Report (SPR) describing the problem.
  An empty template (**SDBackupSPR.doc**) is included in the folder:

  "…\SDBackup"

- Hardcopy or screen dumps of the program window and any eventually presented dialog boxes.

Send a mail with all the necessary information to Technical Support at tessem@newcon.se

7 Technical Data

7.1 The *DDR* Unit of type NDDD 001 and NDDD 002

7.1.1 Technical Specification

Part number	900057 or 900057/02
Interface	34 pin floppy interfaces
Capacity	200 x 1.44Mbyte (HD format) diskettes
Environmental	Operating temperature 8 C to 50 C
Dimensions	143 x 103 x 27 mm
Weight	0.5 kg
Power Voltage	DC 4.6 to 5.3 V
Typical Current Consumption	300 mA
System Requirements	ABB MasterView 810/830/850. Replaces DSMD 11x floppy disc drives handling 1.2 Mbyte formatted discs.
Warranty	One-year limited
Supported SD Memory Cards	1 Gbyte SD memory card, part no. 900054 (delivered with 900057) or 2 Gbyte SD memory card, part no. 900061 (delivered with 900057/02). Each DDR unit is delivered with one SD memory card.

7.2 The *DDR* Unit of type NDDD 003 and NDDD 004

7.2.1 Technical Specification

Part number	900057/02
Interface	34 pin floppy interfaces
Capacity	200 x 1.44Mbyte (HD format) diskettes
Environmental	Operating temperature 8 C to 50 C
Dimensions	143 x 103 x 27 mm
Weight	0.5 kg
Power Voltage	DC 4.6 to 5.3 V
Typical Current Consumption	300 mA
System Requirements	ABB MasterPiece 200, TESSELATOR 8400 Replaces DSMD 110 floppy disc drive handling 320 Kbyte formatted discs.
Warranty	One-year limited
Supported SD Memory Cards	2 Gbyte SD memory card, part no. 900061. Each DDR unit is delivered with one SD memory card.

7.3   The *SDBackup* Software Product

7.3.1   General Software and Hardware Requirements

The *SDBackup* runs on any PC capable of supporting the Microsoft Windows 8, Windows 7, Windows Vista, Windows XP or Windows 2000 operating system. The *SDBackup* product requires the following:

- **Operating system:**
  - Windows 8
  - Windows 7
  - Windows Vista, Service Pack 1.
  - Windows XP Professional or Home Edition, Version 2002, Service Pack 1 or 2.
  - Windows 2000, Version 5.00.2105, Service Pack 2, 3 or 4.

- **PC equipment requirements:** Standard requirements for Windows 8, Windows 7, Windows Vista, Windows XP or Windows 2000. The *SDBackup* product itself requires around 8 MB RAM.

- **SD card device:** Capable to handle 2 Gbyte SD memory cards.