WDC Marvell USB utility description

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WD Marvell USB drive family

Drive family	Drive family code	Form factor	USB*
Venus	A04	2.5	2.0
Shasta 2D	A27	2.5	2.0
Shasta 3D	BG7	2.5	2.0

WD USB 3.0 HDDs are not supported.

Purpose and features

Fig. 2.1. HDD WDC Marvell USB appearance.

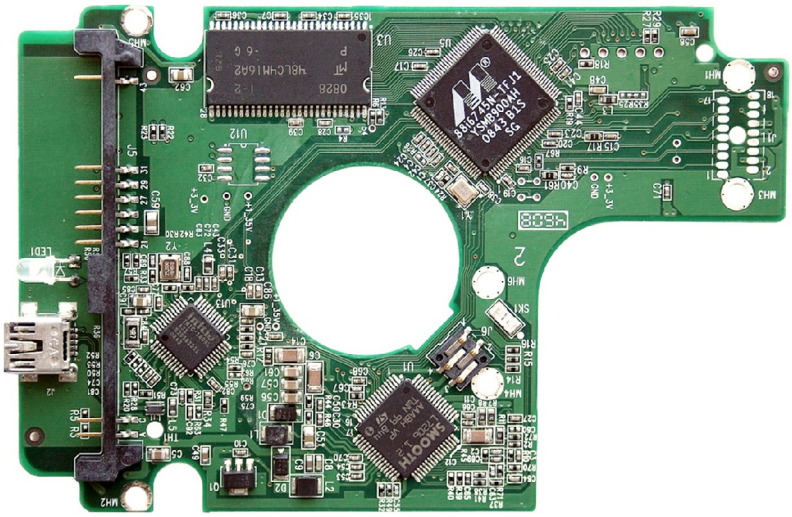

Fig. 2.2. WDC Marvell USB HDD controller board appearance.

The WDC Marvell USB utility is intended for the testing and restoration of USB HDD manufactured by Western Digital (Fig. 2.1). The utility can be used to test external WD HDD connected via the WD SATA – USB adapter (Fig. 2.3).

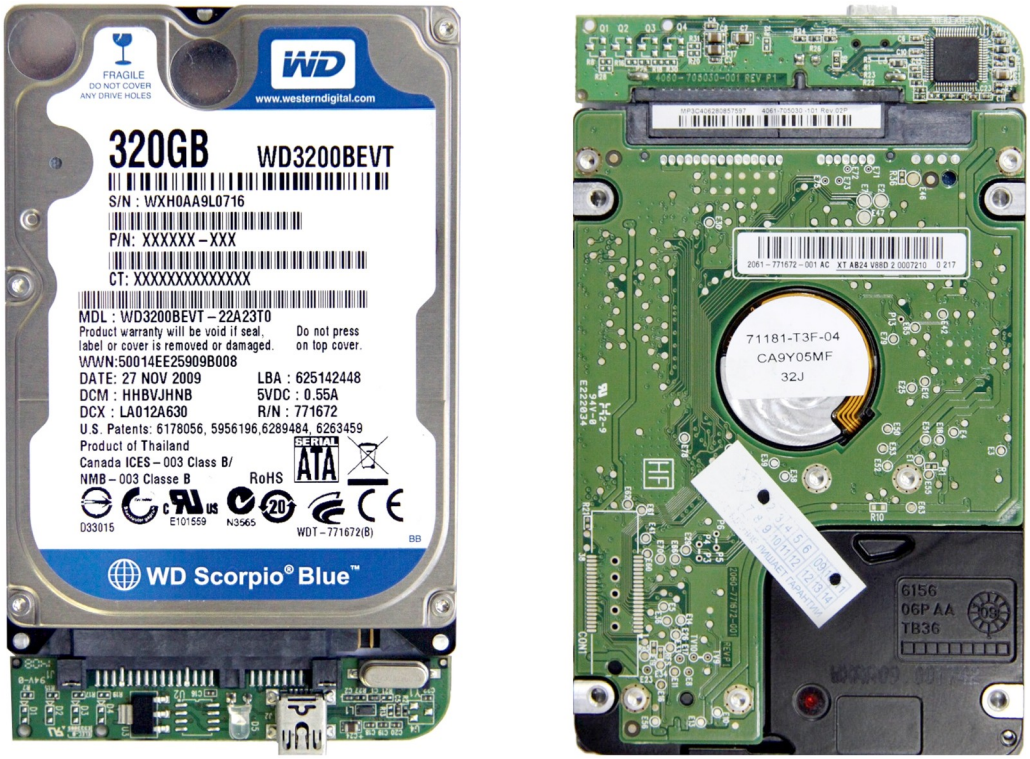

Fig. 2.3. WDC Marvell SATA HDD connected using the SATA - USB adapter.

Connection

Since the HDD has no PATA/SATA interface, a standard computer USB port and USB 2.0 cable are used for the connection. The drive is powered via the USB interface by the internal power adapter of the host computer.

Limitations

A requirement of working with the WDC Marvell USB utility is the detection of the HDD by the operating system. After connection to the host computer the HDD must appear in «Disk Management». If the HDD is not detected by the operating system it is impossible to work with it over the USB interface. In that case you are required to use a compatible PCB with the SATA interface (see section "Installing the SATA board"), or solder the SATA interface connector onto the PCB (see section "Adding the SATA connector"). Please note that the USB/SATA bridge installed on the PCB is not designed to handle non-standard HDD behavior caused by a damaged HDD. A HDD with damage to the service area or internal HDA components can cause the drive to freeze. Work with such a HDD is impossible over the USB interface and the HDD must therefore be connected via the SATA interface.

The methods for working with USB WD Marvell drives are, in many aspects, similar to those used with SATA WDC Marvell drives, except for the option to start a drive using modification of the heads map in RAM with subsequent data recovery in Data Extractor via individual magnetic heads. If a WD USB drive suffering from damaged heads, or any other complex damage, needs to be restored, you need to install a compatible SATA board or solder on a SATA connector (see sections 1.1.6 and 1.1.7.).

The current version of the suite supports USB drives on the level of manufacturer-specific utilities only. Therefore, some standard tools of the PC-3000 kernel are not available for such HDDs. For example, you cannot control the HDD power supply or display the values of HDD registers. Heads map creation in Data Extractor is also not supported.

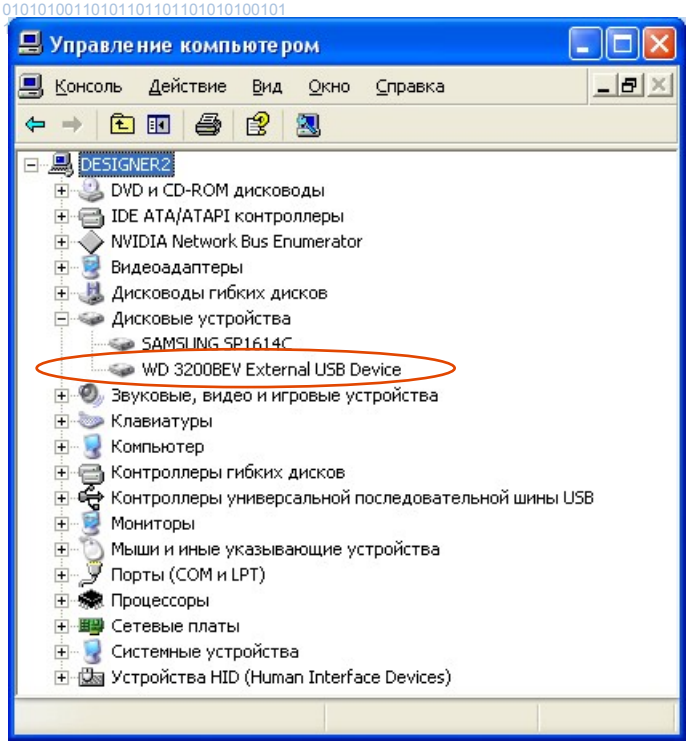

Fig. 4.4.

Utility start

The WDC Marvell USB utility is started in the same way as all the other utilities in the PC-3000 UDMA suite. In the Utility selection window, double-click the WDC Marvell Marvell USB utility. Considering the PC-3000 diagnostic ports are not used when working with a WD USB HDD, the port settings will be ignored. Whether or not a regular start or start with specific parameters has been selected, no operations will be performed on the WD USB drive when the utility is started.

When the utility window opens it will display a list of connected disk devices for selection of the appropriate connected HDD (Fig. 5.5).

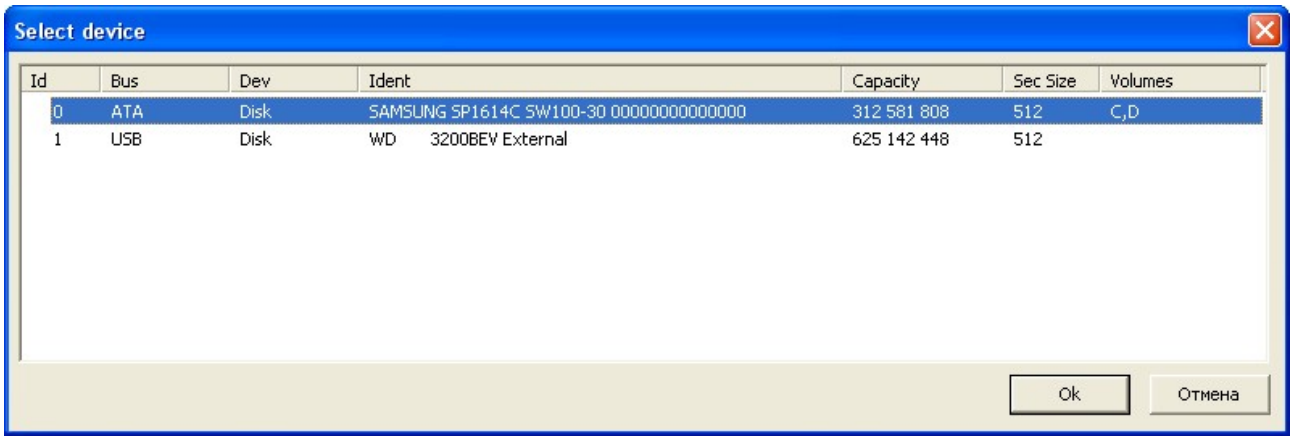

Fig. 5.5.

The HDD ID fields will be empty when the utility starts as this information has not yet been read.

Further procedures for work with the utility are standard and do not differ from the WDC Marvell utility procedure. When the initialization process is complete the utility reads the HDD ID and populates the HDD ID fields.

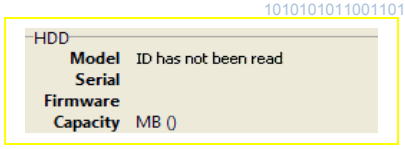

Fig. 5.6.

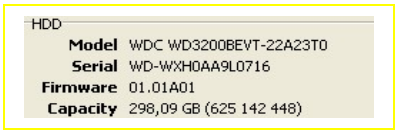

Fig. 5.7.

Installing the SATA board

A compatible PCB from a regular SATA HDD can be installed on a USB WDC Marvell drive to allow access over the SATA interface. To do so you will have to transfer the native firmware from the USB HDD to the SATA board. You will need to read the ROM from the controller board of the USB drive and write it to the donor SATA board. If reading the native ROM via the USB interface fails, installation of a donor board is only possible if the USB board contains an external U12 ROM chip soldered onto it. In that case the donor PCB should be borrowed from the same drive family and it should also have an external ROM chip installed. To adapt the SATA board for the target drive, you have to solder the U12 ROM chip from its original USB board to the SATA donor board.

Warning! 2061-701675 PCB in the Shasta 2D and Shasta 3D drive families may contain two ROM chips. One of them (U12) contains the drive firmware. The other (U14) is used to store the configuration and firmware for the SATA-USB bridge.

Adding the SATA connector

The controller board of USB WDC Marvell drives can be converted into a regular SATA PCB which will allow further work with such a drive using the full functionality of the regular WDC Marvell utility. To do that, you will need a Molex 67490-125 SATA Header Standard connector (see Fig. 7.8).

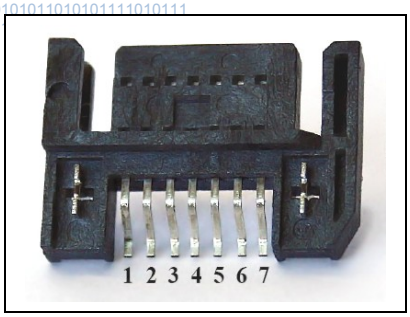

Fig. 7.8. Molex 67490-125 SATA Header Standard.

Ввод	Назначение
1	Ground
2	A+(Transmit)
3	A-(Transmit)
4	Ground
5	B-(Receive)
6	B+(Receive)
7	Ground
-	L-key

1. Example of SATA connector installation on a 2061-701615 controller board (Venus drive family)

2061-701615 PCB appearance of the WD3200BMVU-11A04S0 drive is shown on the Fig. 2.2.

To install a missing SATA connector, you have to unsolder first the capacitors C13, C18, C31, and C33 in order to disconnect the USB bridge chip.

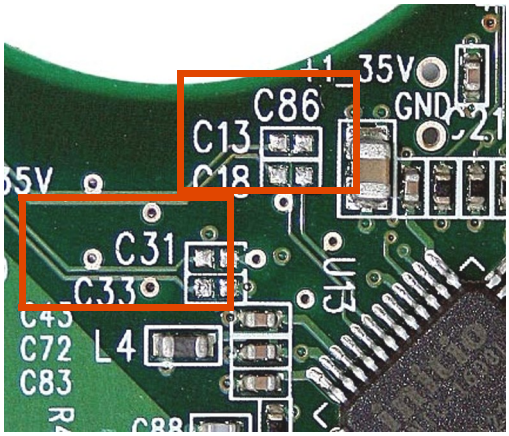

Fig. 7.9. Locations for unsoldering of the C13, C18, C31, C33 capacitors.

Clean up the soldering mask over the common ground contact to solder the connector to it. Outputs 1, 4 and 7 of the SATA connector must be connected to ground.

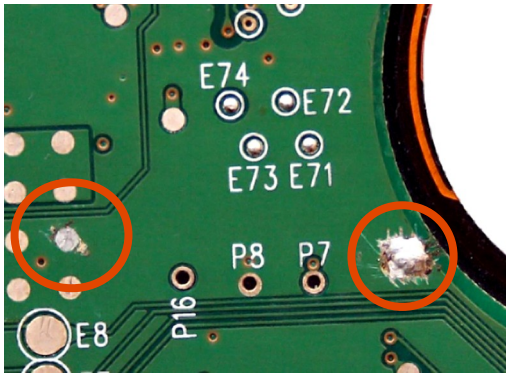

Fig. 7.10. Soldering mask clean-up locations.

Solder the contact pads of the board as follows: E71, E72 and E73, E74 to the SATA connector as illustrated in the photograph:

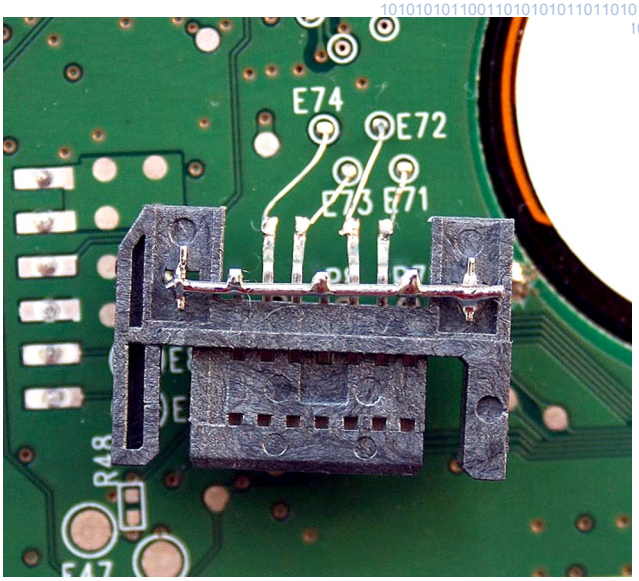

Fig. 7.11. Outputs 2, 3, 5, 6 of the SATA connector are soldered to the E71, E72, E73, E74 contact pads.

To solder the connector, you can use PEV2 copper winding wire or a similar wire type with suitable section diameter.

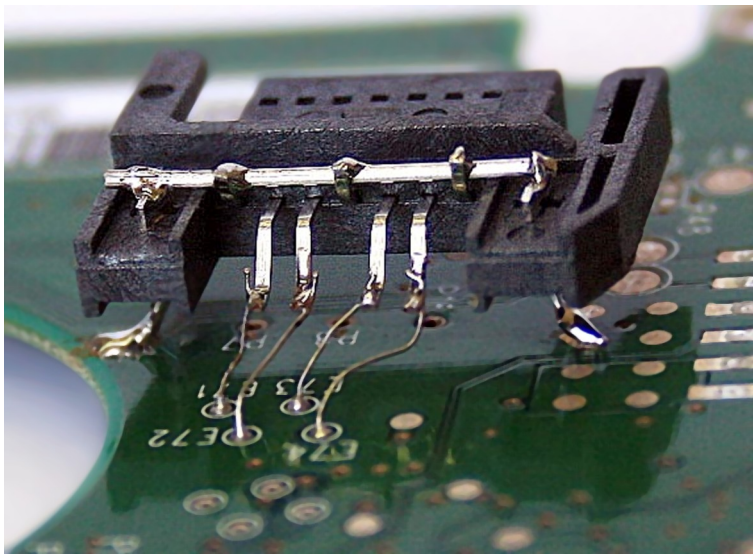

Fig. 7.12. Outputs 1, 4, 7 of the SATA connector are soldered to the ground connector of the board.

Warning! The HDD with an installed SATA board will still be powered via USB. The procedure for starting the drive is as follows: First plug in the SATA connector, and then the USB connector to provide power supply for the HDD.

2. Example of SATA connector installation on a 2061-701675 controller board (Shasta 2D, Shasta 3D drive families)

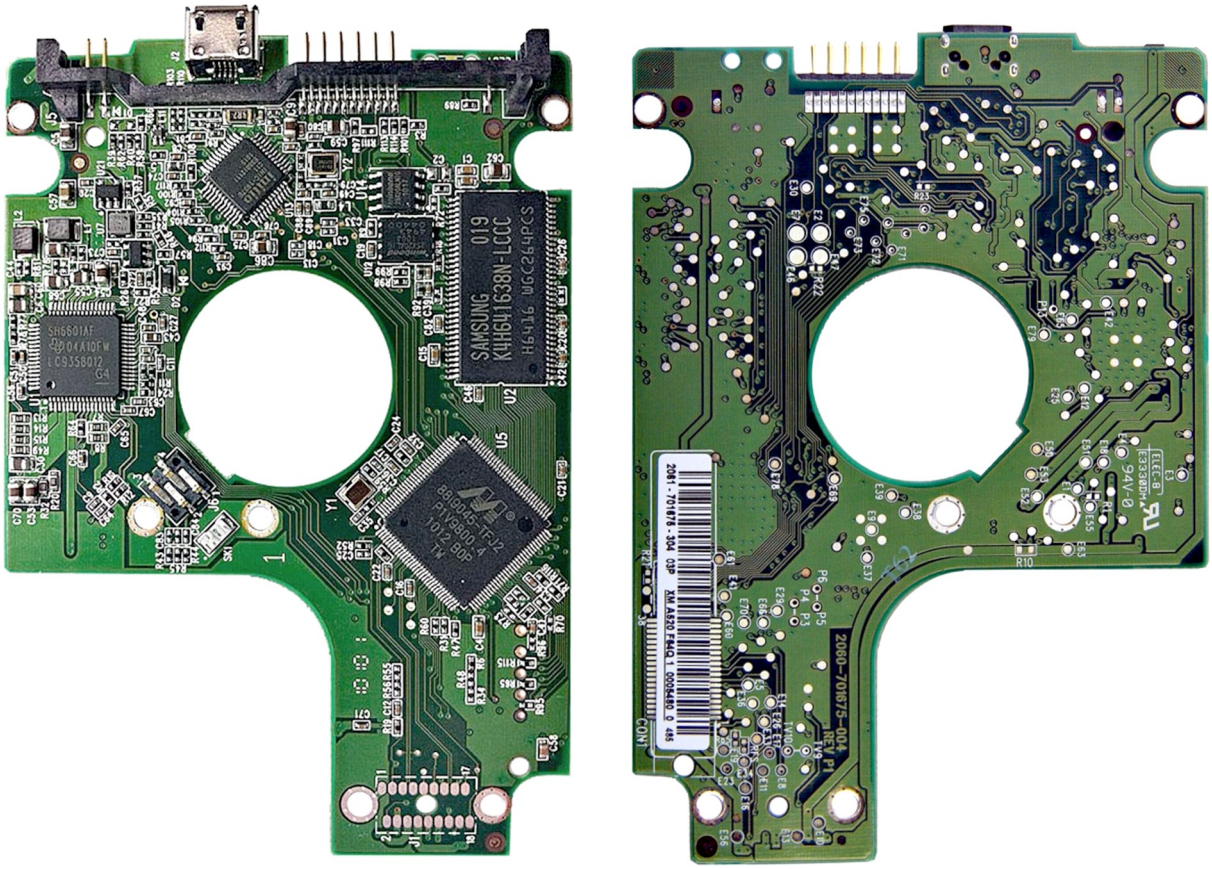

Fig. 7.13. 2061-701675 PCB appearance.

To install a missing SATA connector, you have to unsolder first the capacitors C13, C18, C31, and C33 in order to disconnect the USB bridge chip.

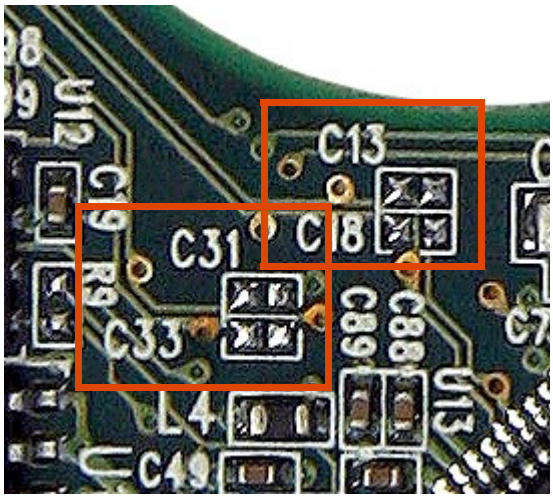

Fig. 7.14. Locations for unsoldering of the C13, C18, C31, C33 capacitors.

Clean up the soldering mask over the common ground contact to solder the appropriate Ground contacts of the connector to it. Outputs 1, 4 and 7 of the SATA connector must be connected to ground.

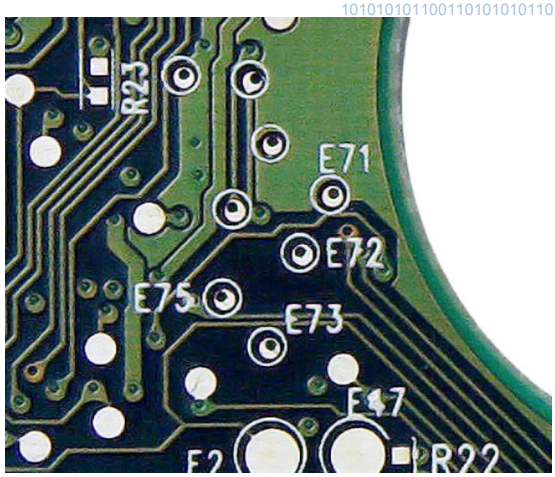

Fig. 7.15. Soldering mask clean-up locations.

Solder the SATA connector to the contact pads of the board as follows: E71, E72, E73, E75 and the "ground" bus as shown in the table:

SATA	1	2	3	4	5	6	7
PCB	ground	E71	E72	ground	E73	E75	ground

To solder the connector, you can use PEV2 copper winding wire or a similar wire type with suitable section diameter. Conductor wires must have as short a length as possible.