Modification Instructions for Exchanging and Programming the NVRAM of the UNIDOS

⚠ CAUTION

Improper execution of service tasks.

Hazards to Persons! Equipment Damage!

Danger of electrostatic discharge effects which may damage the electronics!

The following service tasks must only be performed by specially trained staff.

Follow these instructions with care and at your own risk.

Further service tasks may only be carried out by PTW or by persons authorized by PTW.

⚠ CAUTION

After exchanging the NVRAM you have to perform a safety test according to IEC62353: Medical electrical equipment – Recurrent test and test after repair of medical electrical equipment !

NOTE

PTW assumes no liability for equipment damage caused by following the steps presented in this technical note.

NOTE

The internal battery powering the NVRAM lasts approximately 10 years. The steps described in chapter 2 of this document are supposed to prevent a deficiency of the NVRAM in the UNIDOS due to an exhausted internal battery.

The procedure presented in this technical note is only applicable if the NVRAM in the UNIDOS is still functional. If the internal battery is already exhausted, the procedure will not work.

1) Requirements

- One PC (Windows, Linux or Mac OS) with USB interface
- One programmer Batronix BX32 Batupo
- Software Batronix ProgExpress (The CD with the software is enclosed in the programmer package. You can find the latest versions of the software for the different operating systems as free download on www.batronix.com)
- One new NVRAM M48T08-150PCI from ST Microelectronics in 28-pin DIP package (PTW-No. L333005)
- Two screwdrivers for cross-recessed screws; one small and one large
- One small screwdriver for slotted screws, or a pair of tweezers
- Measurement tools to perform a safety test according to IEC62353: Medical electrical equipment – Recurrent test and test after repair of medical electrical equipment
- A precision current source (calibrator), e.g. from Keithley Inc. to check the calibration

Figure 1: UNIDOS, NVRAM, programmer and tools

2) Step-by-Step Guide

Step 1: Install the Software and the Hardware Driver

a) Install the ProgExpress Software on your PC. It is possible that an error message appears during the installation process, informing you that the software failed to pass the Windows logo test. If this is the case, click the ***Continue installation*** button to complete the installation.

b) Connect the Batronix BX32 Batupo programmer to the USB port of your PC. It should be automatically identified. Follow the instructions on the screen to install the hardware driver.

Step 2: Remove the NVRAM from the UNIDOS

a) Disconnect the UNIDOS from the mains supply.

b) Remove the small metal covering at the back panel of the UNIDOS next to the text that says “Ni Cd Accumulators only” and take out all accumulators.

c) Use the large cross-head screwdriver to remove the four screws at the UNIDOS front panel in order to open the housing.

Figure 2: Position of the 4 screws on front panel

d) Unplug the flat ribbon cable. Be careful not to damage the electronics when doing so.

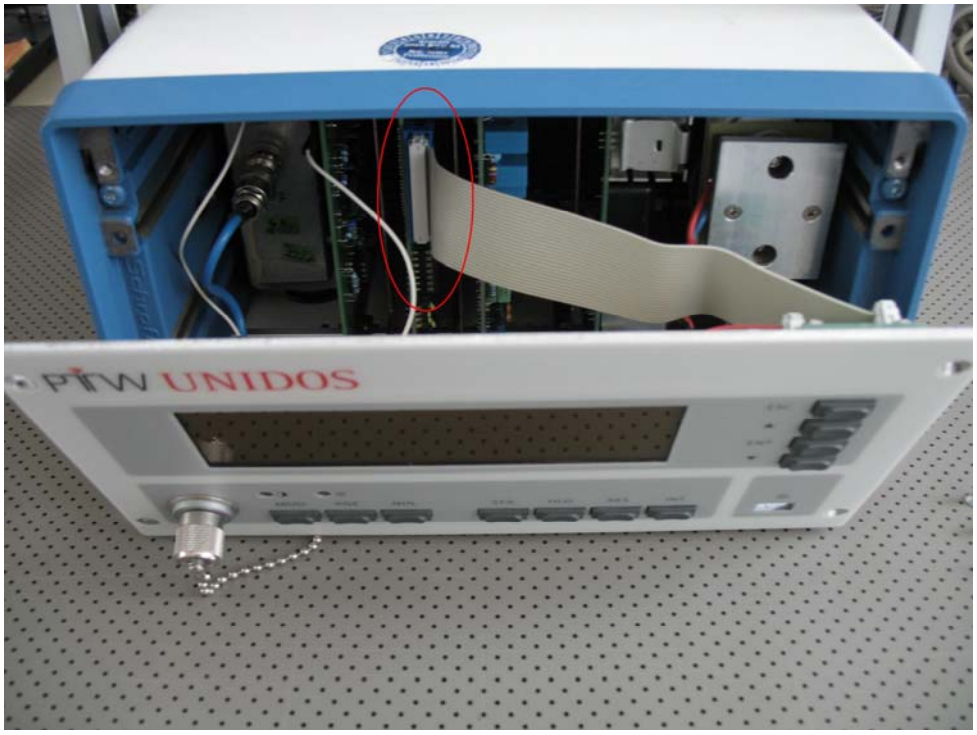

Figure 3: Flat ribbon cable attached

e) Use the small cross-head screwdriver to loosen the two screws on the left metal plate (see Figure 4).

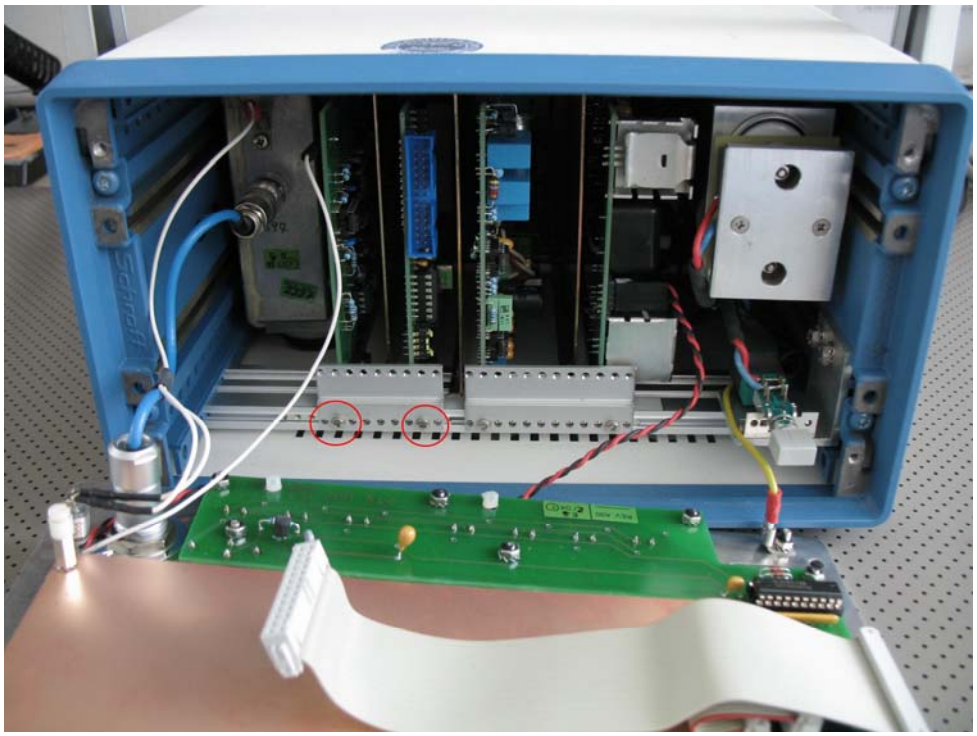

Figure 4: Flat ribbon cable unplugged; Position of screws on left metal plate

f) After loosening the screws, slide the metal plate to the left (see Figure 5).

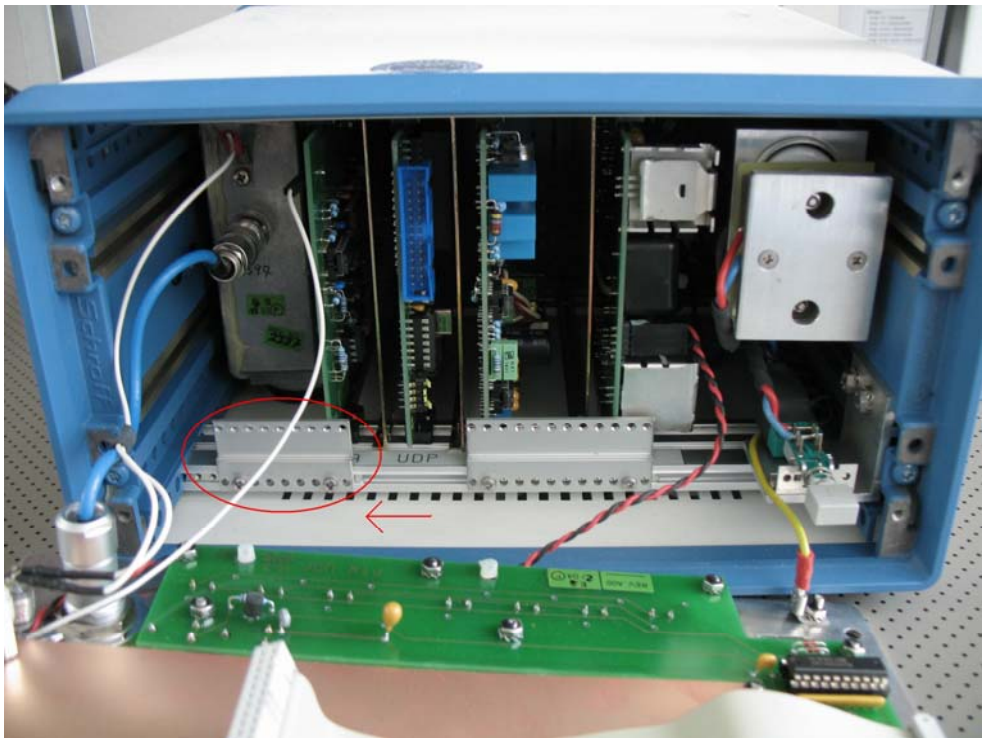

Figure 5: Screws loosened, metal plate moved to the left side

g) Carefully pull out the printed circuit board that carries the NVRAM (labeled with “UDP”, see Figure 6).

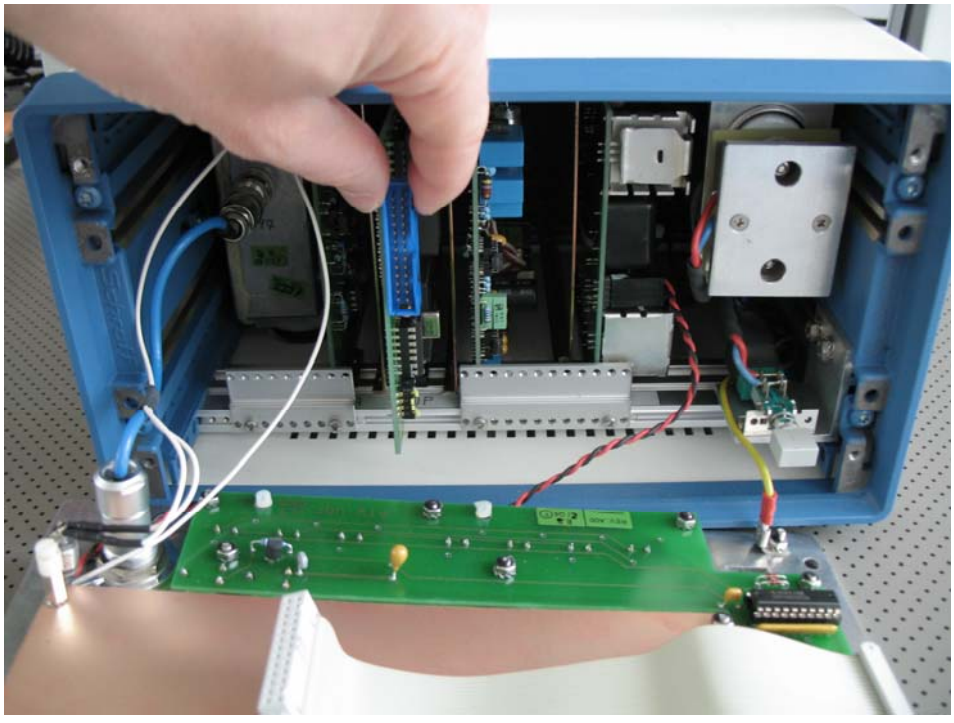

Figure 6: Pull out the printed circuit board

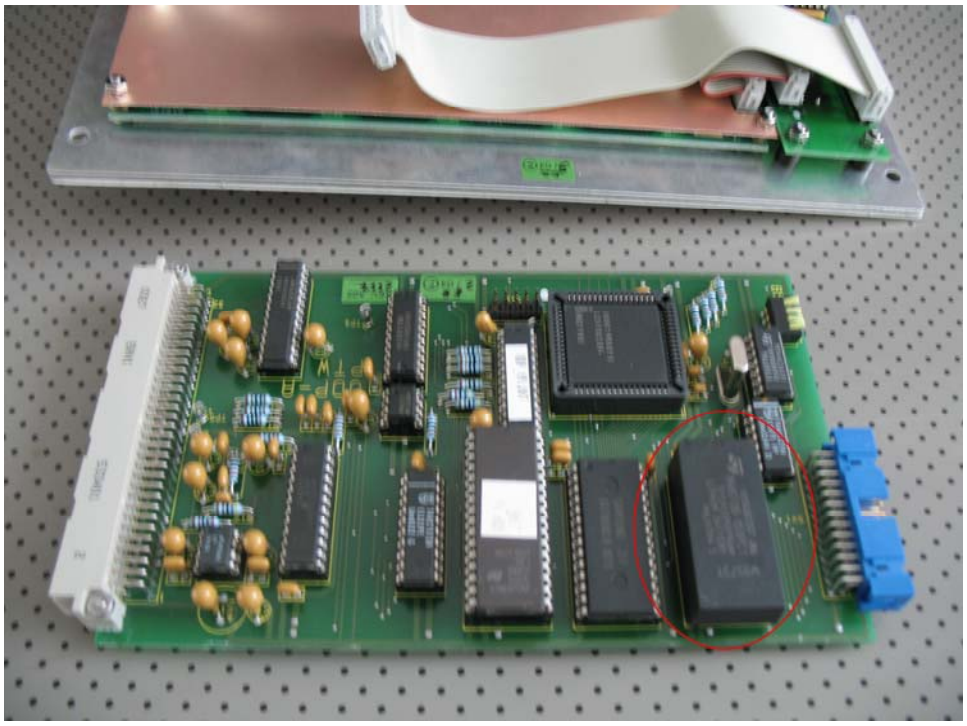

Figure 7: Printed circuit board with NVRAM

h) Carefully remove the NVRAM chip with the small slotted screwdriver or the pair of tweezers (see Figure 8). Put this original NVRAM chip on conductive foam to avoid the risk of ESD and damage to the pins. Keep the original chip separate from the new, empty chip, you will need it later.

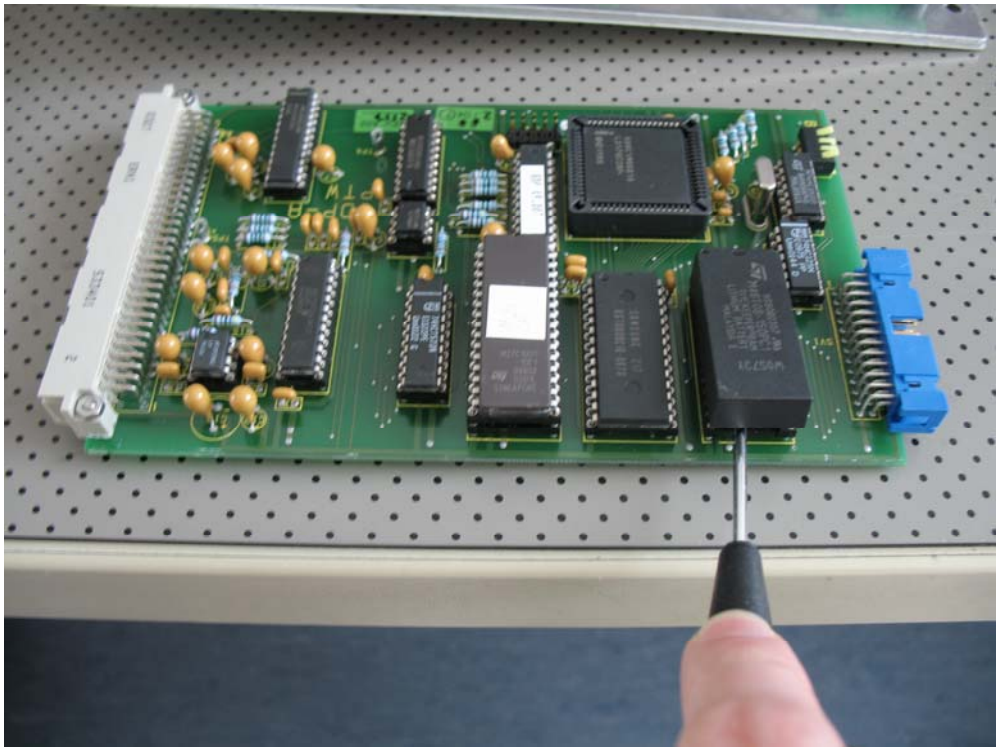

Figure 8: Remove the NVRAM

Step 3: Copy the Data from the Old Chip to the New Chip

a) Make sure the Batronix BX32 Batupo programmer is connected to the USB port of your PC.

b) Start the ProgExpress Software on your PC.

c) Select “Copy data from a chip to another chip”. The connected programmer should be identified automatically (see Figure 9).

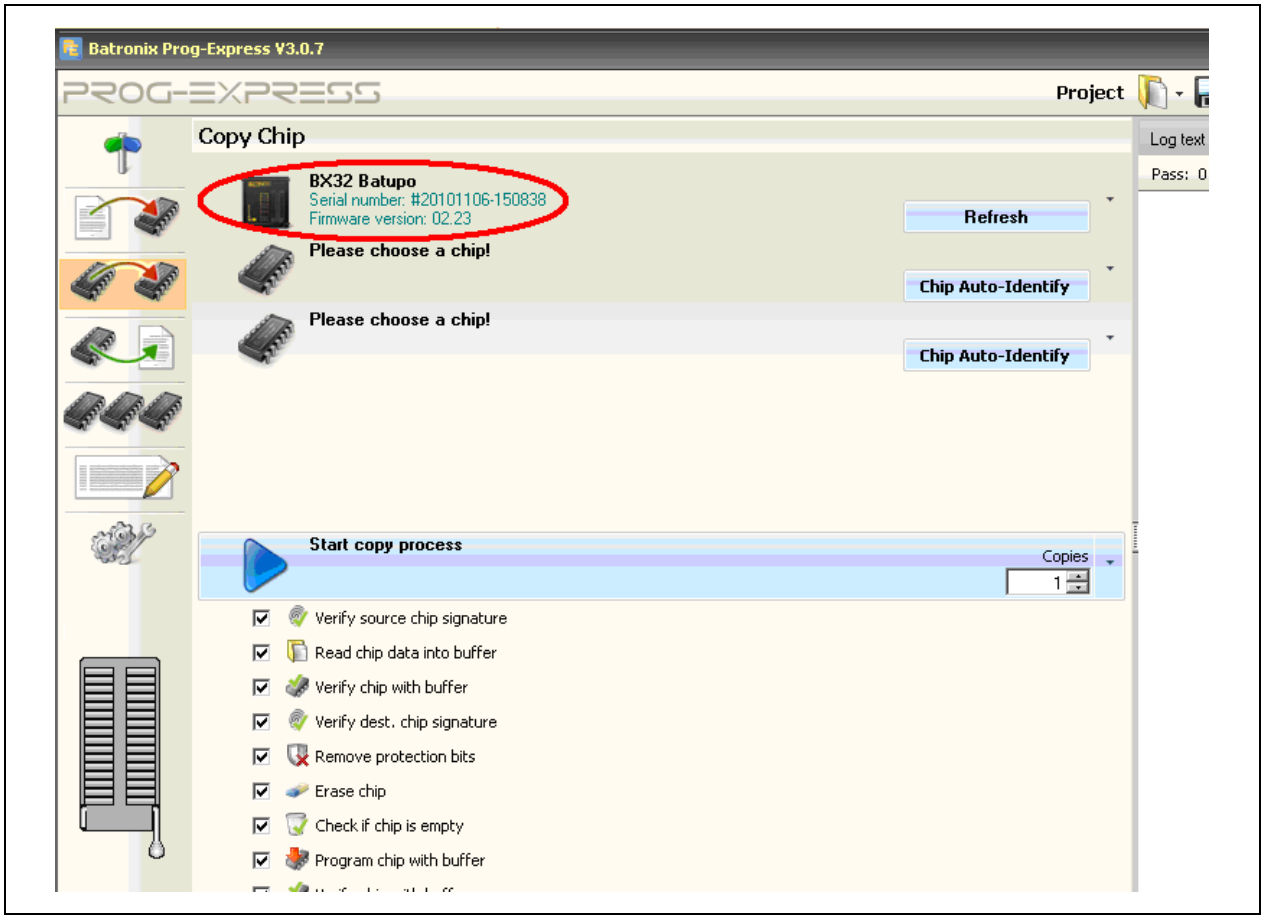

Figure 9: Program with selection "Copy data from a chip to another chip"

d) Click on the first entry “Please choose a chip!”. The chip browser opens.

e) In the chip browser, select ***NVRam→ST→M48T08→DIP Version→-150PCI*** (see Figure 10)

f) Click on the second entry “Please choose a chip!” and repeat the selection described in 5).

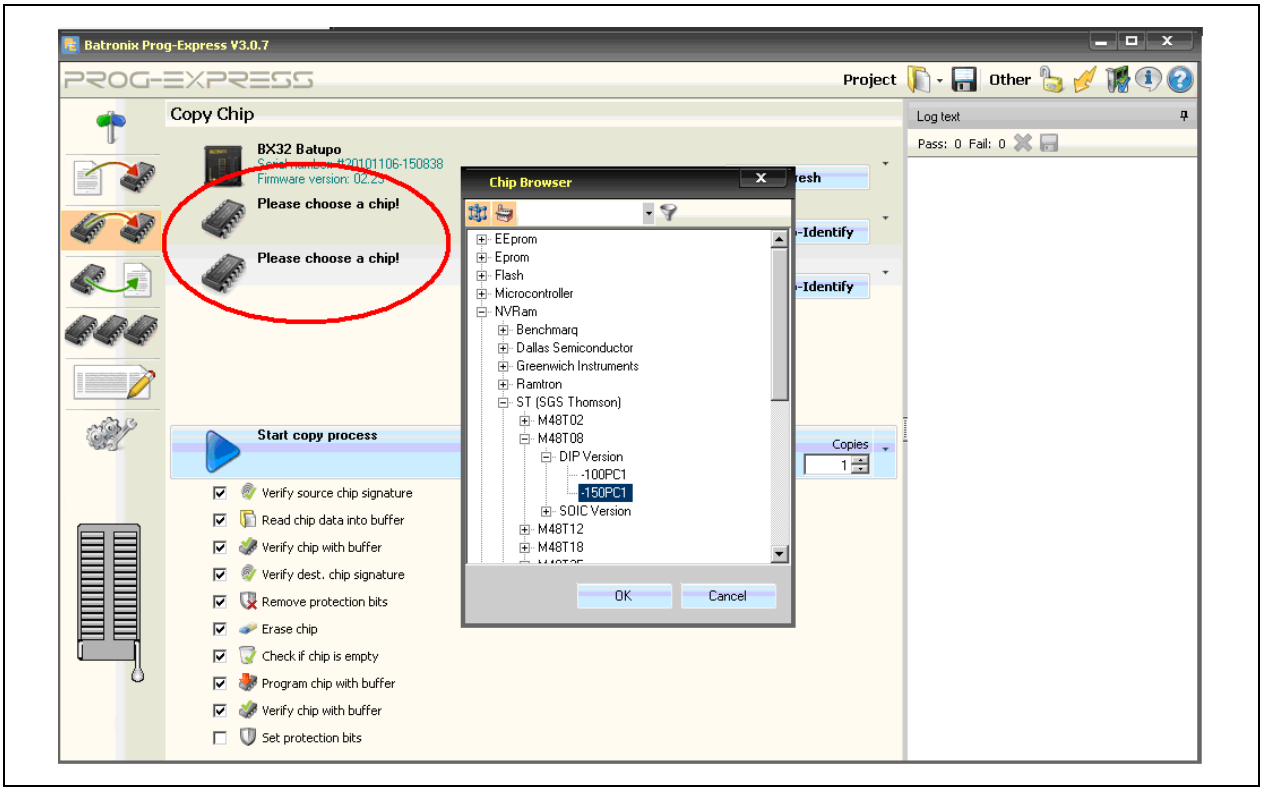

Figure 10: Chip browser with chip selection

g) If you have correctly selected the chips, it should look like this:

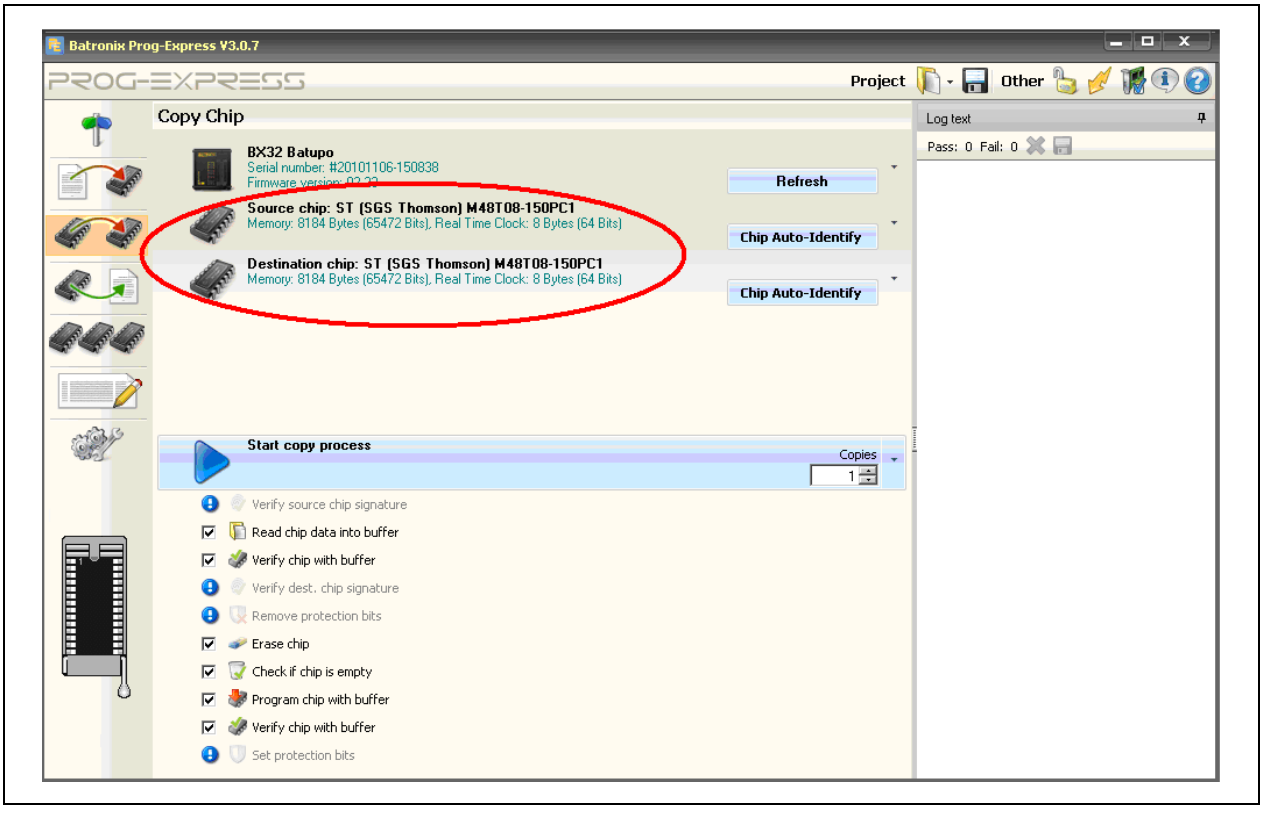

Figure 11: The correct chips are selected.

h) Insert the **original** NVRAM chip, **the one you took from the UNIDOS**, into the programmer. The chip has to be aligned to the lower end of the connector; the mark of the chip has to be on the upper end of the connector (see Figure 12). The two rows at the top of the connector will stay empty. Pull the lever to lock the chip in place.

Figure 12: NVRAM inserted into the programmer; the mark of the chip and the lever are encircled

i) In the software, click on the “start copy process” button. Once the software has copied the data, it will prompt you to insert the “destination chip” (see Figure 13). Remove the original NVRAM chip from the programmer and insert the **new, empty** NVRAM chip. Click OK.

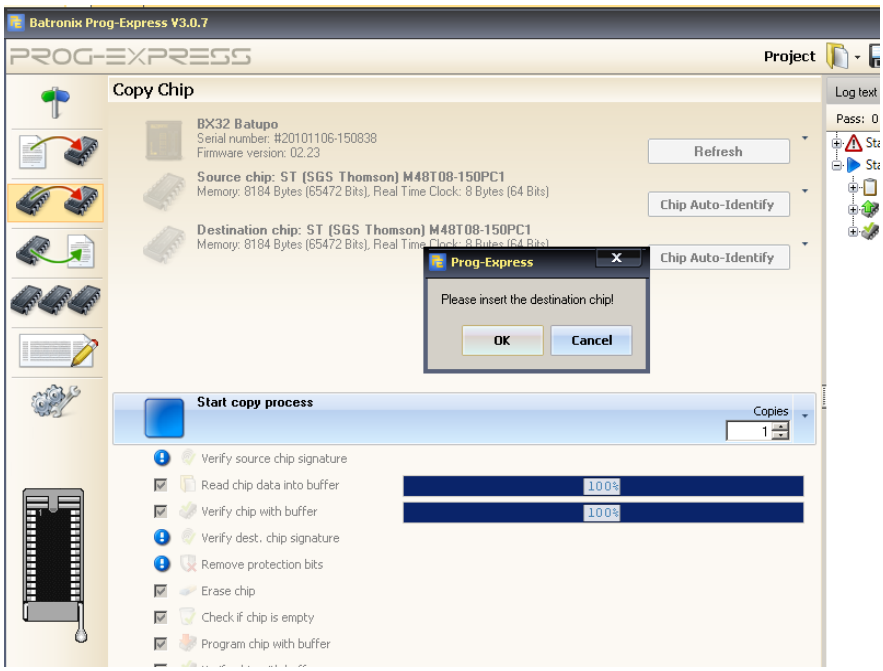

Figure 13: Copy is made, insert new, empty chip for programming

j) After the software has copied the data to the new chip, make sure there was no failure during the process. You can check this in the log text on the right hand side (see Figure 14). If the copying process was not successful, repeat Step 3 numbers c)-i).

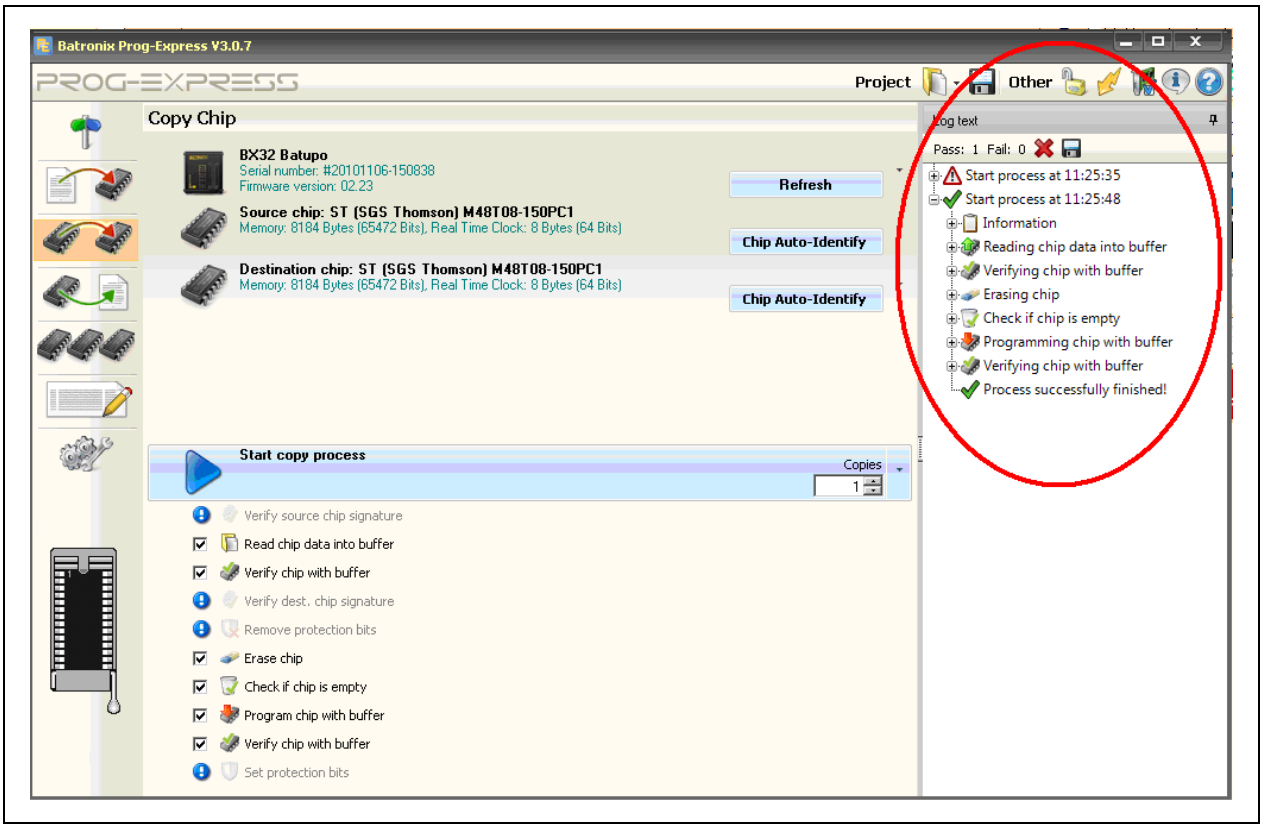

Figure 14: Copying process successfully completed

Step 4: Reassembling the UNIDOS

a) Take the new, copied chip out of the programmer and insert it into the socket on the printed circuit board. The mark of the chip must match with the mark of the socket on the board (see Figure 15 and Figure 16). Be careful not to damage the pins of the chip when inserting it into the socket.

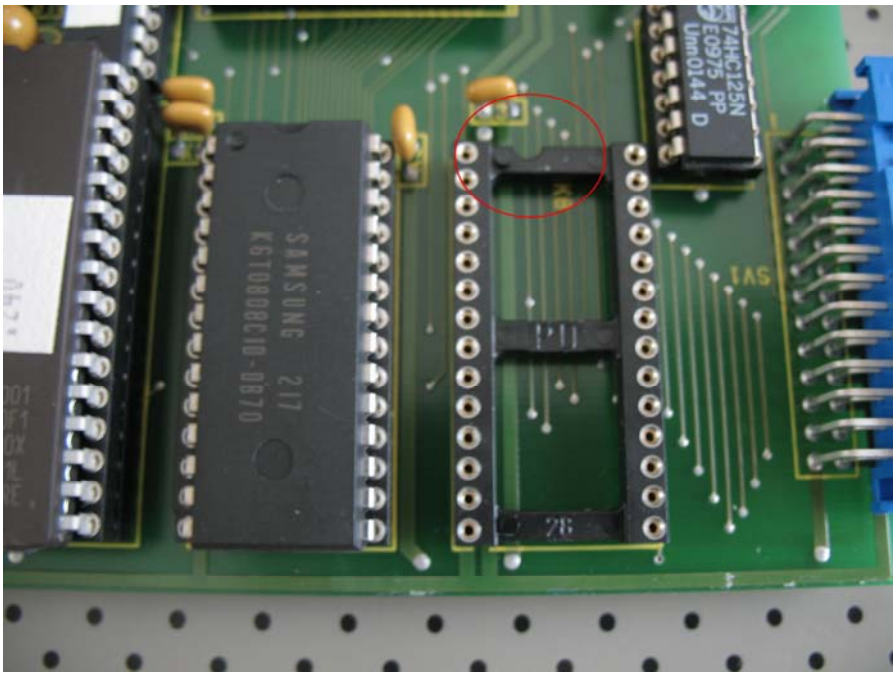

Figure 15: Mark on the socket

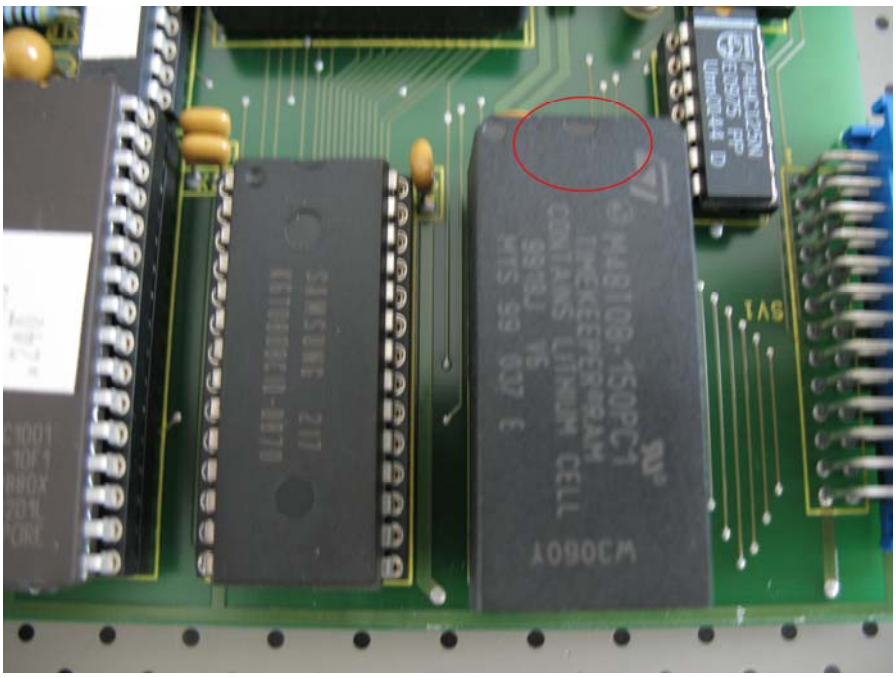

Figure 16: Mark on the chip

b) You now have to reassemble the UNIDOS. Take care not to change the setting of the DIP switch while doing so.

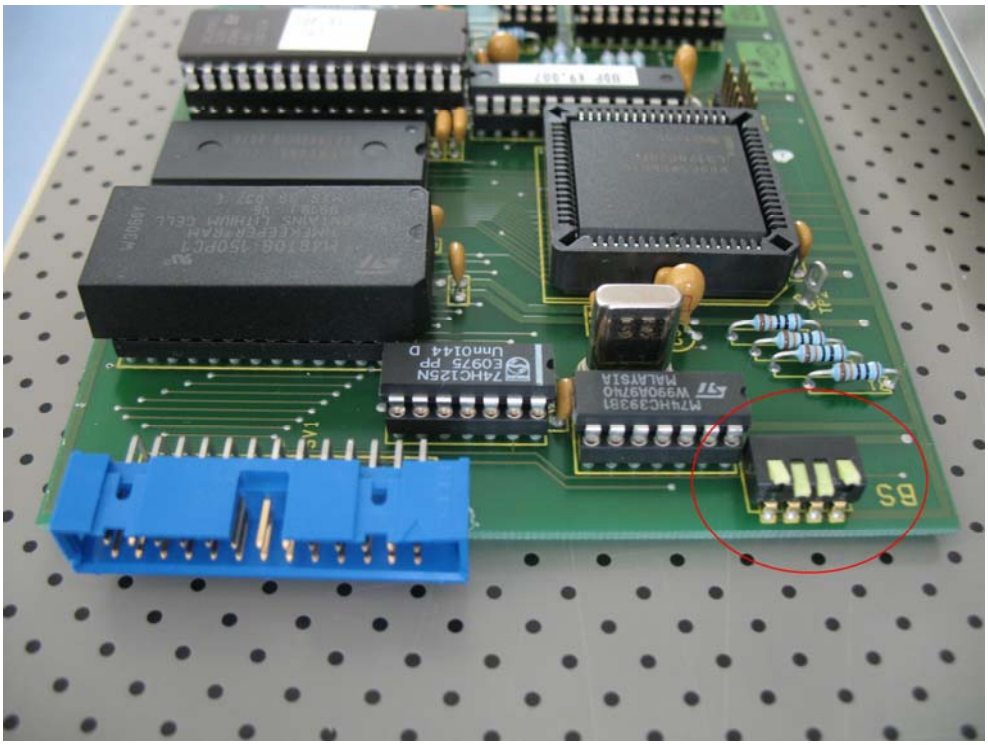

Figure 17: Setting of the DIP switch

c) To reassemble the UNIDOS you have to follow the procedure described in Step 2 in reverse order.

d) Start by pushing the printed circuit board back into the same position in which it was before (see Figure 6).

e) Slide the left metal plate to the right and use the small cross-head screwdriver to fasten the two screws on the metal plate (see Figure 4).

f) Plug in the flat ribbon cable (see Figure 3).

g) Close the front panel of the UNIDOS and use the large cross-head screwdriver to screw in the front panel screws (see Figure 2).

h) Insert the accumulators at the back of the UNIDOS and screw on the small metal covering.

Step 5: Adjusting the Time Settings of the UNIDOS

a) Power up the UNIDOS and check if it works correctly.

b) Enter the Setup menu of the UNIDOS, open the Miscellaneous menu and enter the current date and time.

Step 6: Testing the UNIDOS

a) Test the UNIDOS with at least three measuring points in each measuring range to check the calibration. Use a precision current source (calibrator), e.g. from Keithley Inc..

b) Perform a safety test according to IEC62353: Medical electrical equipment – Recurrent test and test after repair of medical electrical equipment.

Step 7: Documenting the Modification

Fill in the form on page 14 to document the modification process. The filled-in form should be kept with the documentation of the respective UNIDOS.

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Documentation form: UNIDOS NVRAM Exchange

The internal battery powering the NVRAM in UNIDOS lasts approximately 10 years. The NVRAM chip should be exchanged before the battery is exhausted. Fill in the form below and keep a copy of this page to document at which date the NVRAM exchange took place.

Serial number of the UNIDOS:	
Date of NVRAM exchange:	
Confirmation that safety test IEC62353 was performed:	
Name:	
Signature:	