DAC200 / HA200 - Firmware update V 1.01

Introduction

The recommended and safest way to update the firmware of a T+A DAC200 or HA200 is to use the T+A MP200 streamer. The MP200 will download the latest firmware and update the DAC/HA 200 over the T+A E2_Link.

T+A also provides an official and approved USB→E2_Link programming adapter and a programming tool for Windows PCs to allow a firmware update without the use of a MP200.

Non-official DIY update

If neither a MP200 nor a T+A programming adapter is at hand, the firmware update can also be done with a DIY „home-brew“ programming adapter consisting of a USB→RS232 converter, a RS232→TTL level converter and a short piece of Ethernet cable with RJ45 (T568B) plug.

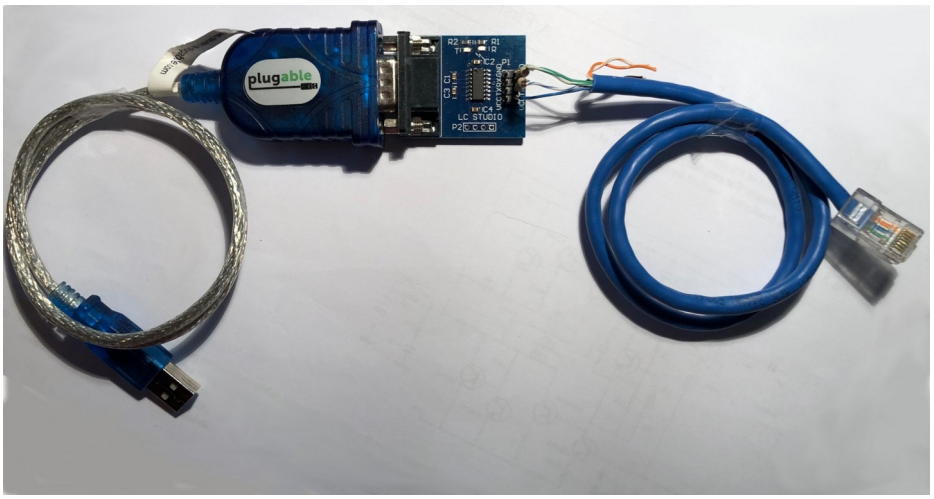
Important note: This “DIY” update is not approved by T+A and it will be at your own risk !

For the update the T+A E2Link interface on the back panel of the DAC/HA devices is used.
The E2_Link uses a T+A proprietary serial protocol – this protocol is not standard RS232.

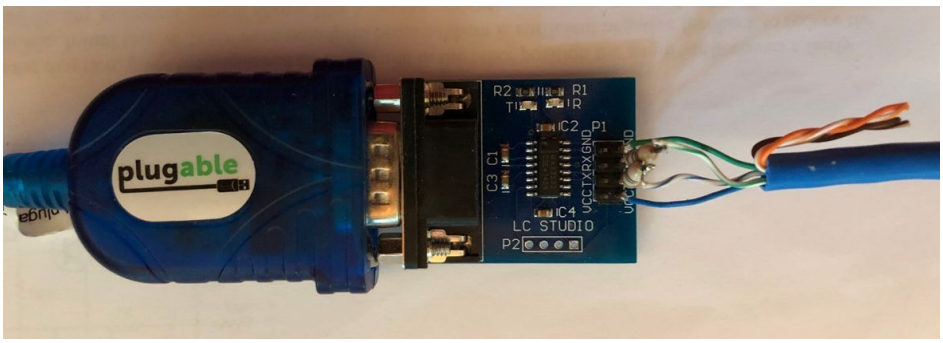
The method described in this document uses a standard USB→RS232 converter and a special programming software which mimics the T+A E-Link bus protocol. Because the timing of the serial communication is very critical, not all USB→RS232 converters on the market are suited.

Programming Adapter (DIY version)

My programming adapter consists of a ***plugable*** USB→RS232 adapter with *prolific pl2303* chip set and a *LC STUDIO* RS232→TTL level converter.



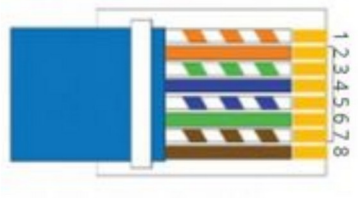
DIY
USB→E_Link
programming
adapter



Wire connections to RJ45 cable

100 Ohm series resistors in TX and RX wires

RJ45 (T568B) E2-Link connections



1	orange/white	NC	
2	orange	NC	
3	green/white	RS232 – RX	(*)
4	blue	VCC (+5V)	
5	blue/white	RS232 – TX	(*)
6	green	GND	
7	brown/white	NC	
8	brown	NC	

(*)
It is recommended to use protective 100 Ohm series resistors in the RX and TX lines (see picture above).

The designations “RS232-RX” and “RS232-TX” refer to the T+A device side of the RS232 connection – i.e. the T+A device sends data on TX (blue/white) and receives data on RX (green/white).

→ connect the “TX” wire (blue/white) to the RX pin of the computer COM-port
→ connect the “RX” wire (green/white) to the TX pin of the computer COM-port

Hint:
The LC STUDIO RS232-TTL level shifter has 2 LEDs for RX and TX which permit an easy chek if TX and RX lines are connected correctly:

- connect the LC STUDIO level shifter to the E2Link socket T+A device (don’t connect it to the PC COM port)
- switch the T+A device ON
- press one of the input buttons on the front panel of the DAC200
- the TX LED (close to resistor R2) should blink each time one of the input buttons of DAC200 is pressed

The +5V VCC voltage for the RS232→ TTL level converter is delivered from the T+A device via pin4 of the E2_Link.

Notes:
(1) In stead of a USB→RS232 plus RS232→TTL adapter a direct USB→5V RS232 adapter might be used.

(2) The firmware update was tested with a Prolific PL2303 USB→RS232 adapter.

(3) Please make sure to use only adapters with an **original** **Prolific** chip set – there are quite a few (very cheap) adapters with non-original Chinese fake Prolific chips on the market: These non original Prolific chip sets will probably not work properly in this application !

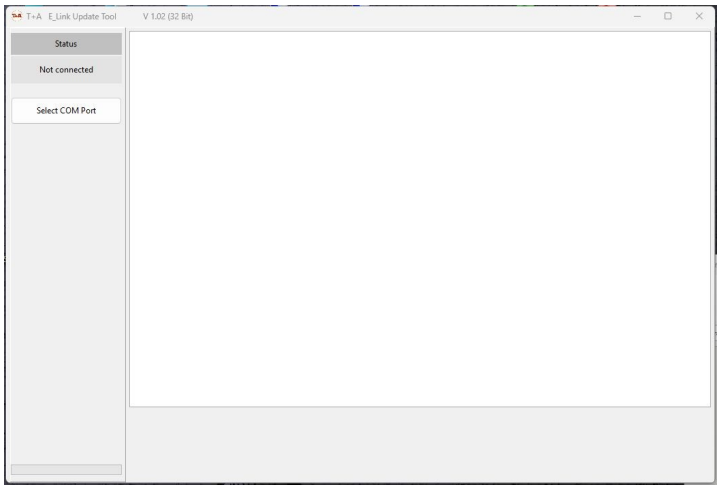
(4) FTDI FT232R based USB→RS232 converters will also work, but the latency for these chips must be set to 1ms.
The latency for FTDI chips can be set in the Windows device manager:
Device_Manager -> Ports(COM&LPT) -> USB_Serial_Port (COMx) -> Port Settings -> Advanced -> Latency_Timer

Document history

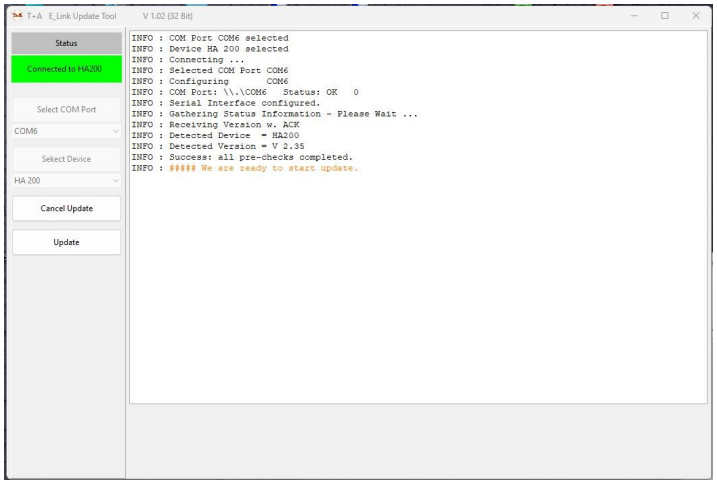
V 1.00	22.04.2023	initial version
V 1.01	26.04.2023	clarification to “TX” & “RX” added
		Hint to RX/TX test with LC_Studio level shifter added

Programming Procedure

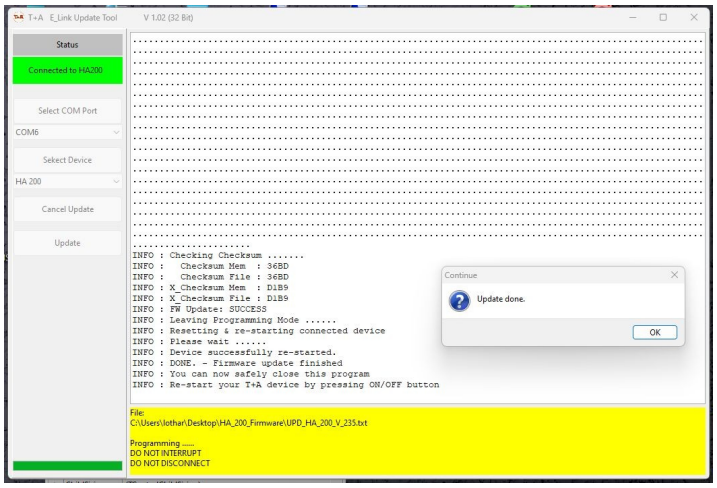
1. Start your Windows PC
2. Connect the programming Adapter to your PC and to the E2Link socket of the DAC/HA200
3. Switch ON your T+A device
4. For FTDI based USB→RS232 adapters: set the latency in Windows device manager to 1ms
5. Start the T+A E_Link Update Tool on your PC
6. Click on the „***Select COM Port***“ button (see picture below)
    - A drop-Down list will occur.
7. In the drop down list, select the COM port your programming adapter is connected to
8. Click on the button *„**Select Device**“*
9. From the drop-down list select the type of device you want to update (DAC200 or HA200)
10. Click on the connect button
    - The T+A update tool will now check the communication with the device and check if the connected device matches with the selected device type.
    - If you get any ERRORS at this stage, please check the cabling, the USB-ES232 adapter and the settings
    - If you get the response „*Success: all pre-checks completed. We are ready to start update*“, click on the „***Update***“button.
11. A file-selection window will open that permits to select the file with the new firmware.
    - Please note: The name of firmware update file must begin with „UPD_DAC_200“or „UPD_HA_200“
12. Select the firmware file by double-clicking on it
13. A „***Start flash***“ pop-up window will occur.
    - Press „***Yes***“ to start the update process or click on „***No***“ to cancel the update.
    - **Note: this is the last chance to stop the update procedure.** If you press „***Yes***“, the program memory in your T+A device will be erased and re-programmed.
14. Wait until the update process is finished.
    - The update process will last a couple of minutes.
    - Please be patient, do not disturb the programming, do not switch OFF the T+A device, do not remove any cables!
    - You will be informed about the upgrade progress by a couple of messages on the PC screen and by a progress-bar in the lower left corner of the program window.
15. After successful update, a pop-up window with the message *„**Update done**“* will appear.
    - Click on „OK“ and restart your T+A device by pressing the Power button on the front panel of the DAC/HA_200.
16. If you get a „***Programming ERROR***“ pop-up message, something went wrong.
    - By clicking on the „***Yes***“ button in this pop-up window you can re-start the update process



After program start:
select COM port.



Pre-Checks done,
Ready to start update



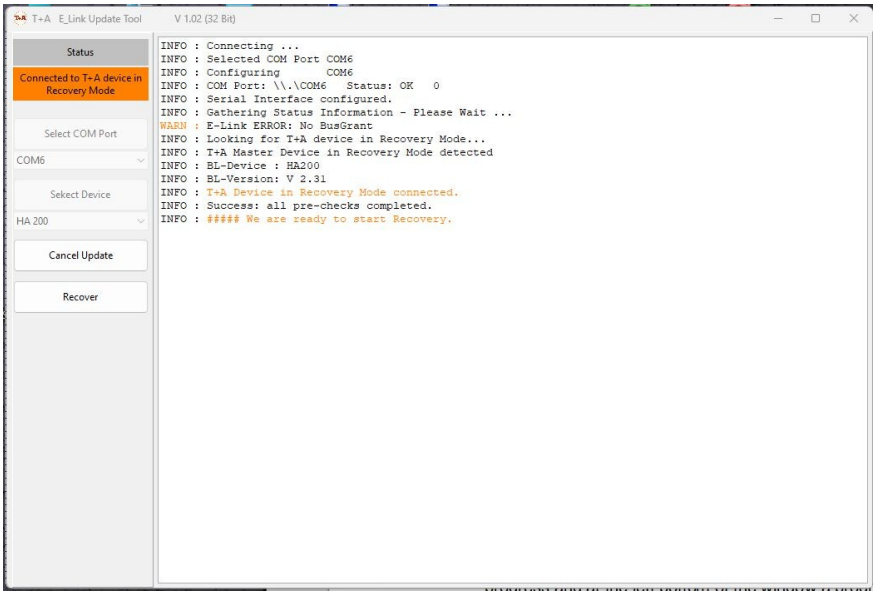
Update finished successfully

Device recovery

If during programming a severe fault occurred (like eg. a mains power interruption during programming or unplugging of the programming cable), the T+A device will be left with an erased or non functional program memory. In this case the T+A device will not work any more but it can be recovered with the help of the T+A Update Tool.

For recovery please proceed as follows:

1. Disconnect the T+A device from the mains
2. Leave it disconnected for about 2 minutes
3. Re-connect the mains
4. Start your Windows PC
5. Connect the programming Adapter to your PC and to the E2Link socket of the DAC/HA200
6. For FTDI based USB→RS232 adapters set the latency in Windows device manager to 1ms
7. Start the T+A E_Link Update tool
   - The update tool will show the information that it has discovered a T+A device in *Recovery Mode*
8. Select „***Recover***“
9. Select the file with the device firmware
10. In the „***Start Flash***“ pop-up window select „***Yes***“
11. Wait until the program flash process has terminated.
12. After successful device recovery, a pop-up window with the message „***Update done***“ will appear.
    - Click on „***OK***“ and restart your T+A device by pressing the POWER button on the front panel of the DAC/HA_200.



Update Tool after discovery of a T+A device in recovery mode