

NP-34 Interfaces

As perfectly explained on **Chris Chung's NP34** page on Github, there are several ways to update the firmware of the **NP-34** calculator.

There are also several options for exchanging programs and data :

- either extract all the RAM from the **MSP430G2955** (firmware **NP-34** + "RAM" of each emulated calculator)
- either extract the "RAM" from one of the emulated calculators

FIRMWARE	@F000	@F100	@F200	@F300	@F400	@F600	@F700	@F800	@F900	@FA00	@FC00
NP-34	RAM ?	RAM 37E	RAM 22	RAM 25	RAM 29C	RAM 27	RAM 31E	RAM 32E	RAM 33C	RAM 34C	RAM 38C

As for the 5 emulated programmable calculators (**25, 29C, 33C, 34C, 38C**) five interface tools allow the exchange of programs and data from each of these calculators between the NP-34 and a PC.

3 exchange formats are possible with 2 communication possibilities with the **NP-34** :

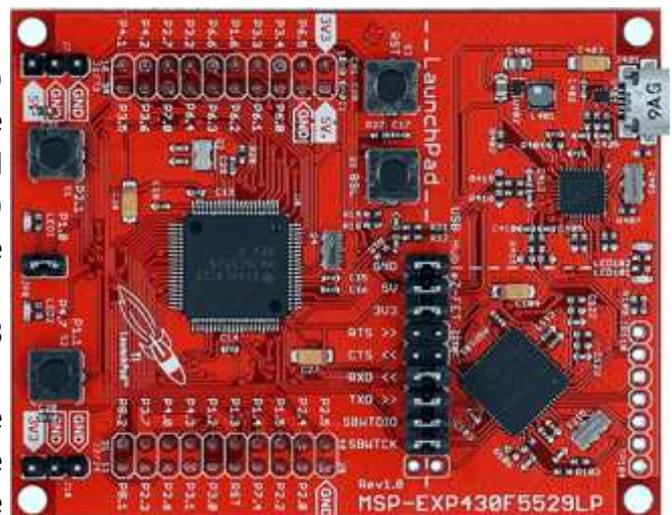
- with a **TI LaunchPad MSP-EXP430F5529LP** via the firmware loading procedure and handling IntelHex files with **.hex** or **.ram** extensions.
- with a **USB TTL UART** dongle via the "RAM" dump file procedure specific to each calculator.

1) IntelHex files :

Whether using a **USB TTL** dongle (and **BSL Scripter**) or a **TI LaunchPad** (and **MSPFLASHER**), the procedure involves recovering the entire **NP-34** RAM (containing the firmware and the calculators' "RAM") and extracting the portion corresponding to the calculator in question.

In the **PH25** or **PH29** or **PH33** or **PH34** or **PH38** interface the program and data are thus decompiled. To send the programs and data to the calculator the reverse process is carried out by rebuilding a file containing the firmware and the "RAM" of the calculator concerned.

This **.hex** file is re-injected into the calculator as new firmware.

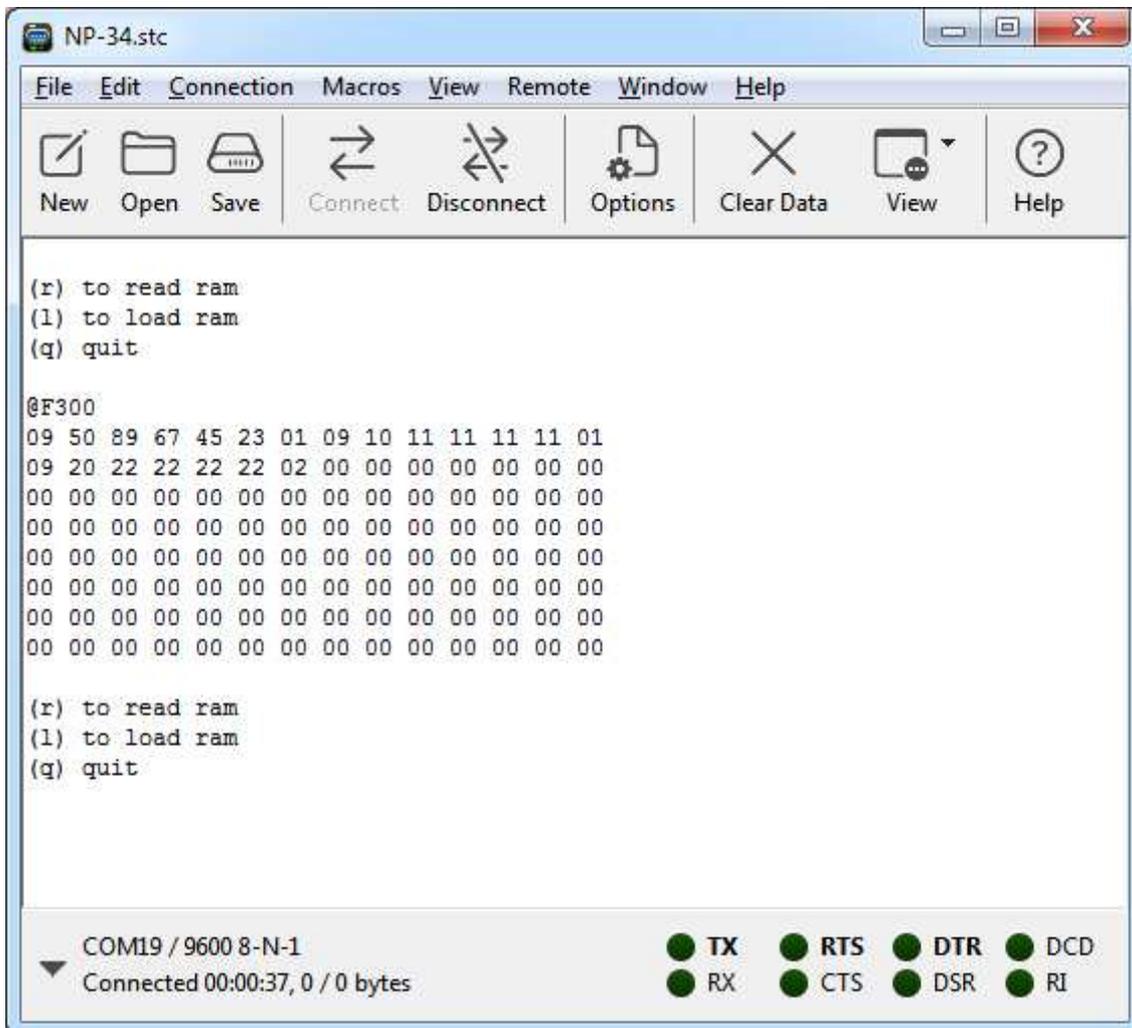


The interfaces can also read and write **.ram** extension files which are actually just the "RAM" parts in IntelHex format without the firmware part.

Several **.ram** files can be concatenated using **NP34_Fusion.xls** to create **.hex** file to send to the **NP-34**.

2) DUMP files :

With a **USB TTL** dongle in **UART (Universal Asynchronous Receiver Transmitter)** communication mode and a "Serial Terminal" software (**CoolTerm, Putty, RealTerm, TeraTerm,...**), the calculator can read or load the "RAM" portion of an emulated calculator.



The "Dump" tab of each **PHxx_interface** allows you to exchange these "RAM" dumps (copy/paste) with the terminal software.

This data can be saved in **.dmp** files and can be decompiled to restore the corresponding programs and registers.

