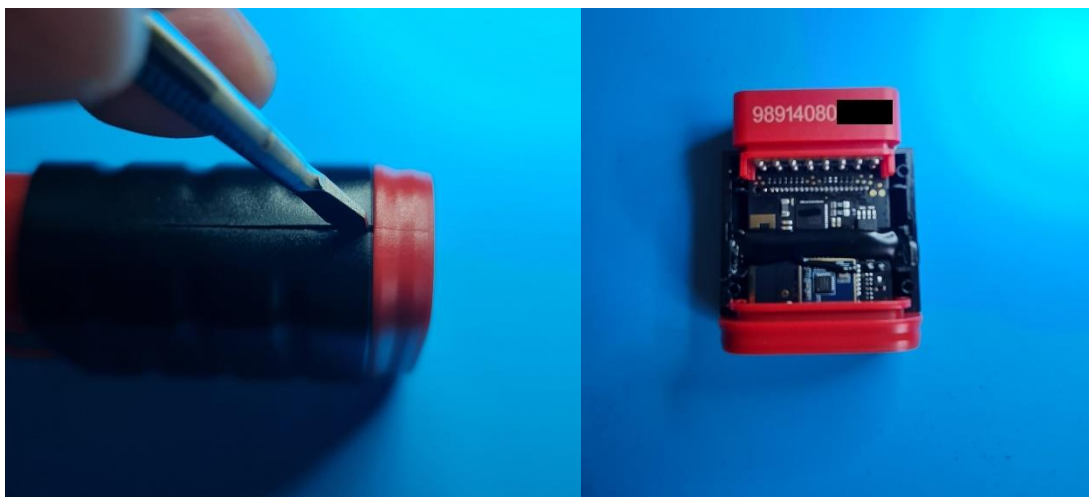


Disassembly and Programming THINKSAFE (MUCAR)

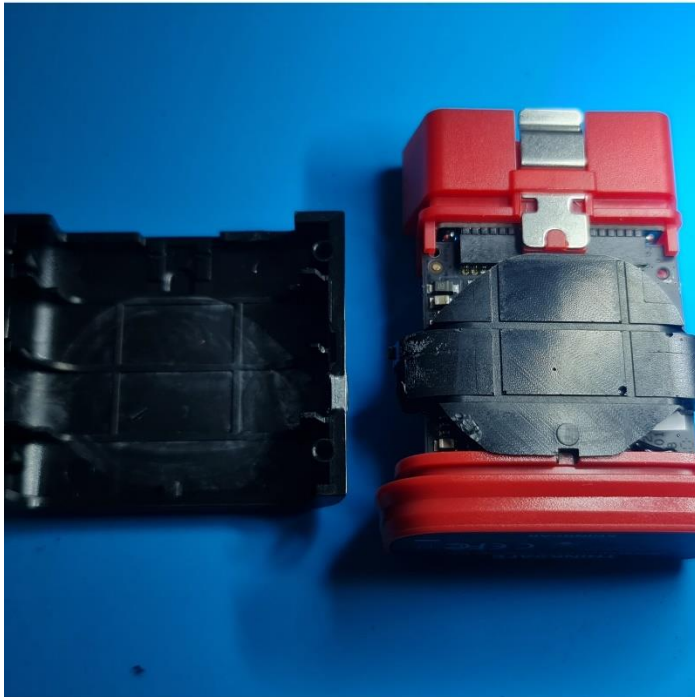


Carefully open the case of the device, as a rule, the cover on the serial number side is not glued well.

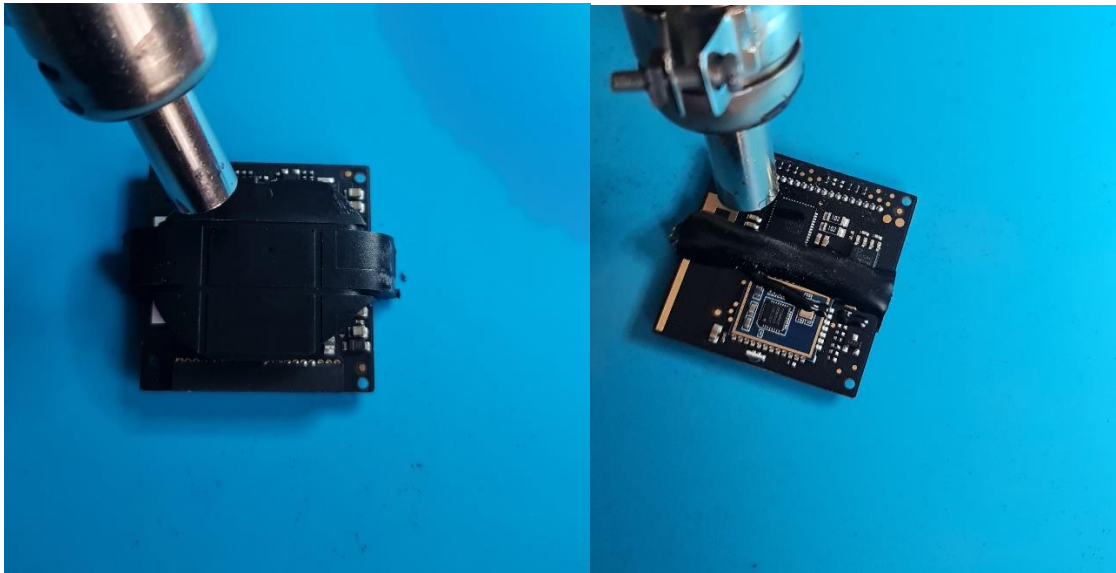


Carefully tear off the second cover from the epoxy. (if it comes off badly, the case can be slightly heated)





Heat the resin well with a soldering gun (300°C with low airflow)



After heating, the epoxy resin is easily crumbled and removed. If the resin has become hard again, heat it again.
(Use a plastic tool to avoid damaging the board)



Programmer connection:

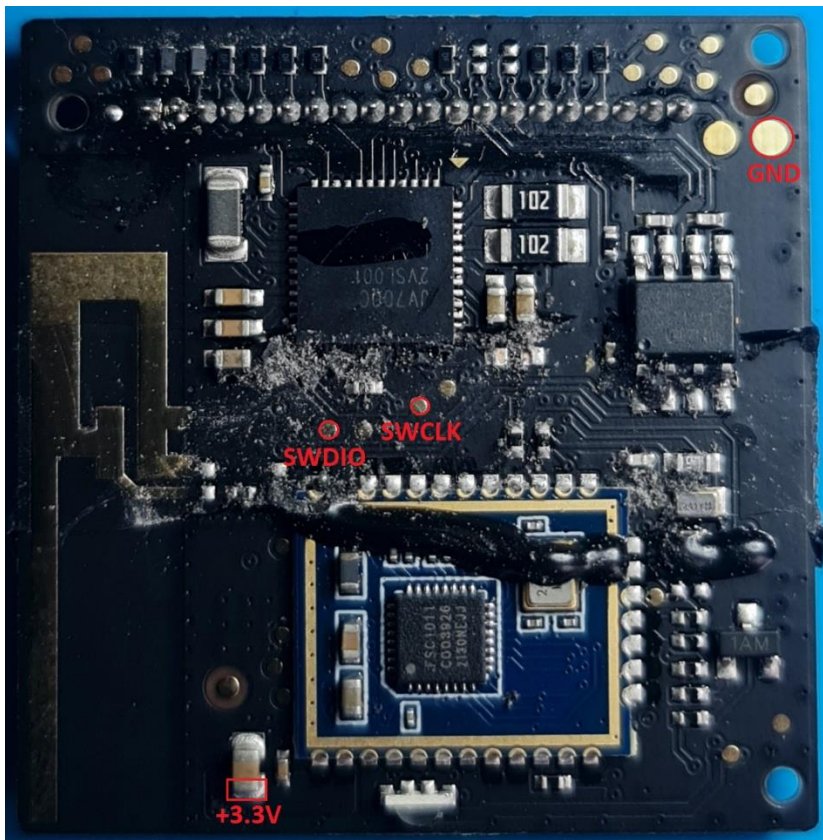
You can use any SWD compatible programmer:

GD Link (recommended)

ST-Link (compatible with STM32F1xx)

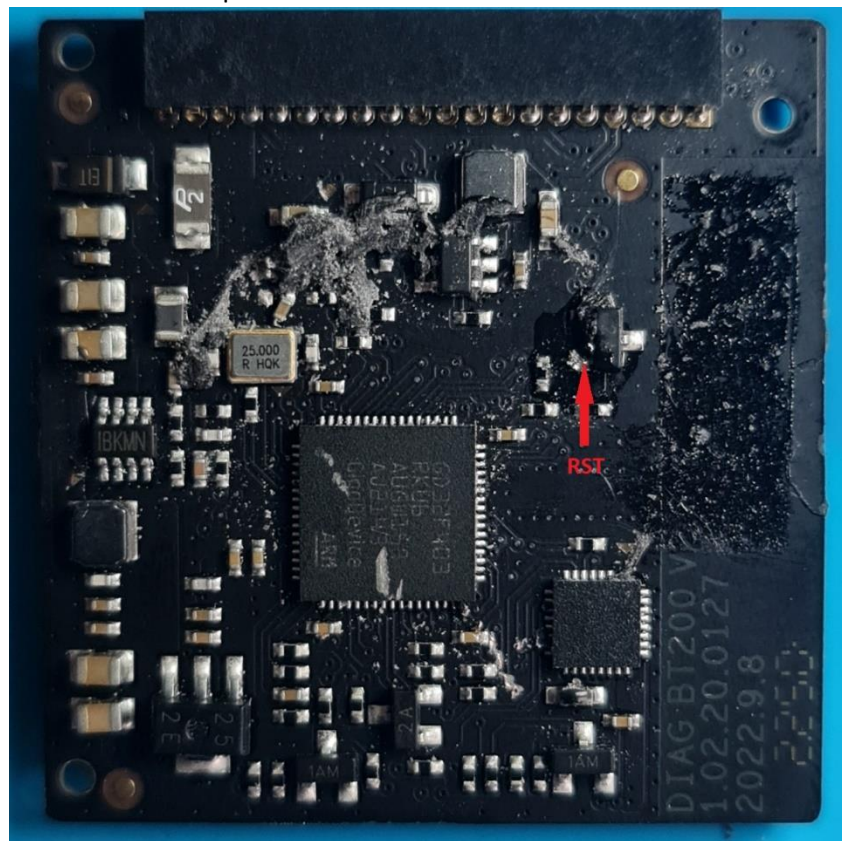
j-Link (compatible with STM32F1xx)

Connect the corresponding programmer pins as shown below:

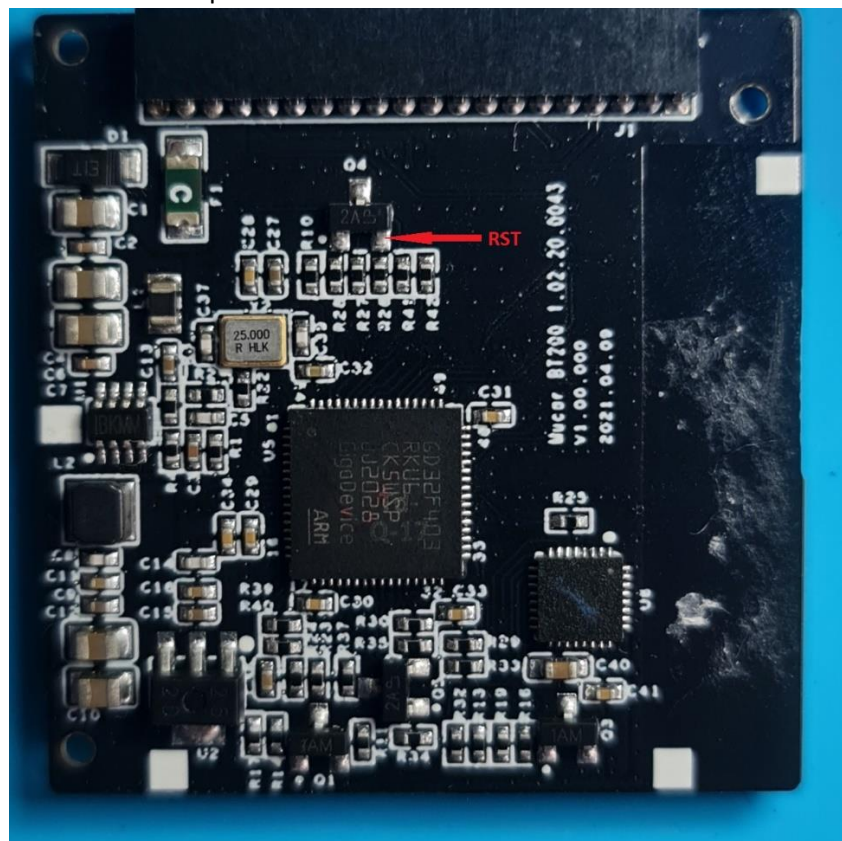


RESET contact connection:

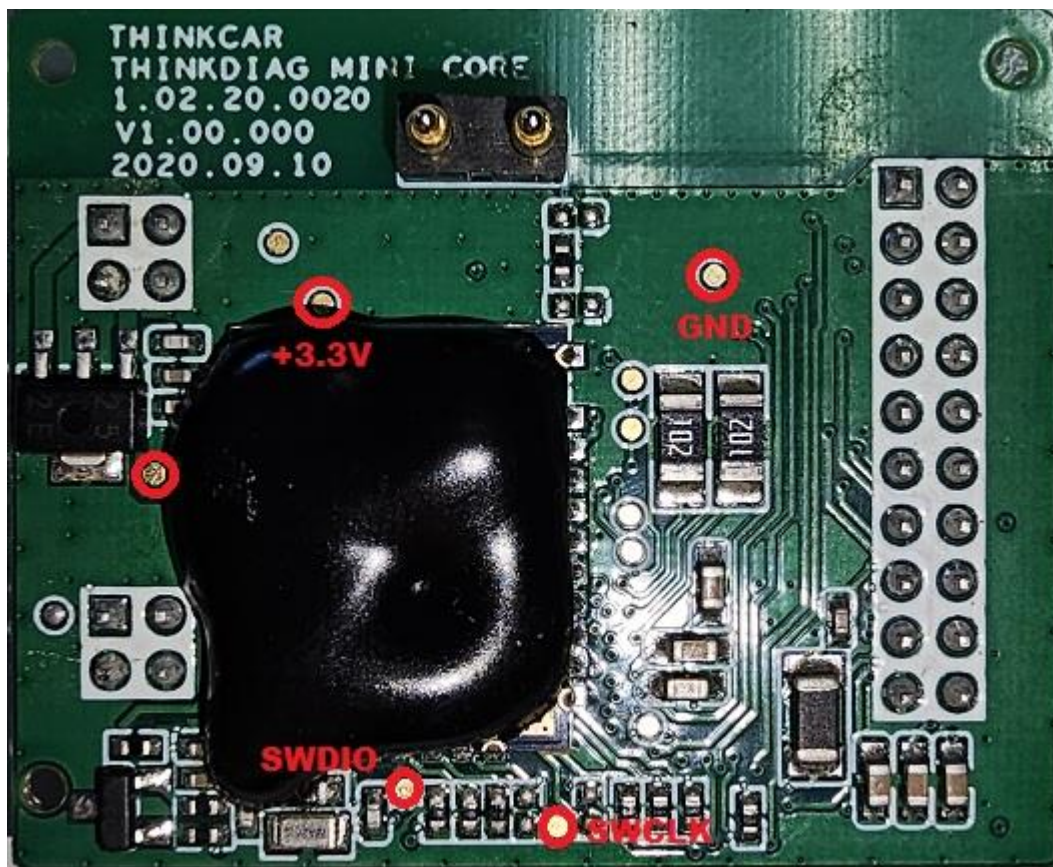
New hardware implementation



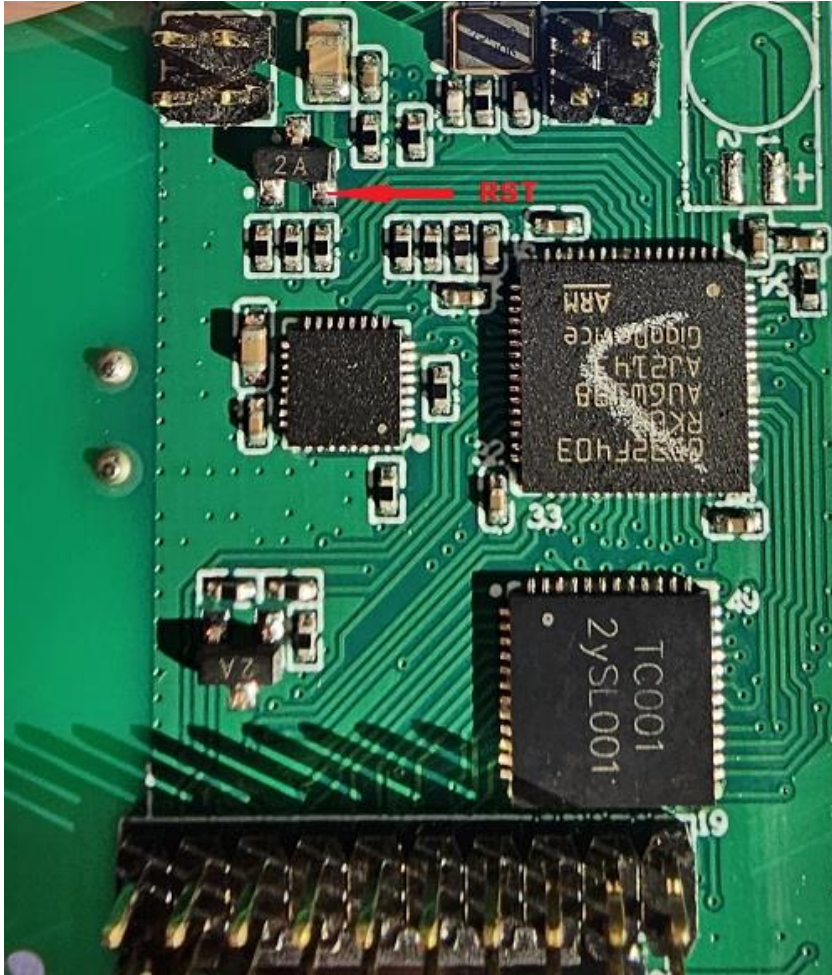
Old hardware implementation



Programmer connection (two-board THINKDIAG MINI version):



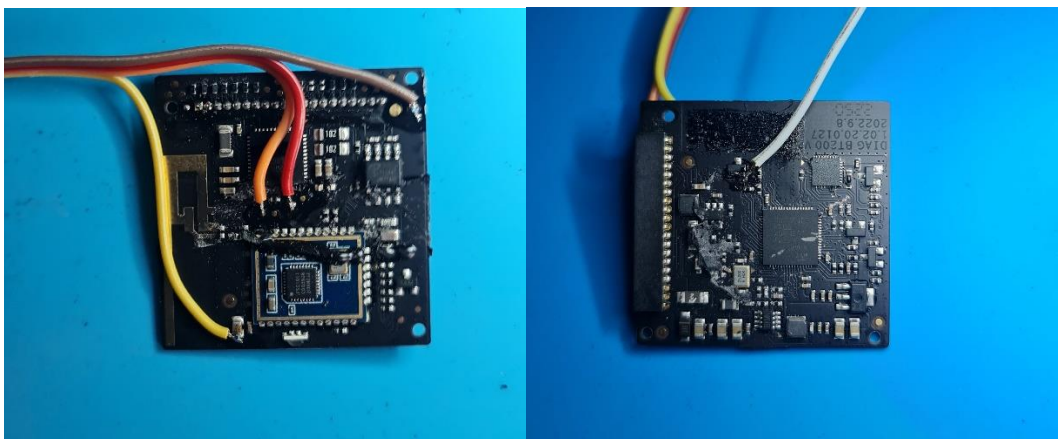
RESET contact connection (two-board THINKDIAG MINI version):



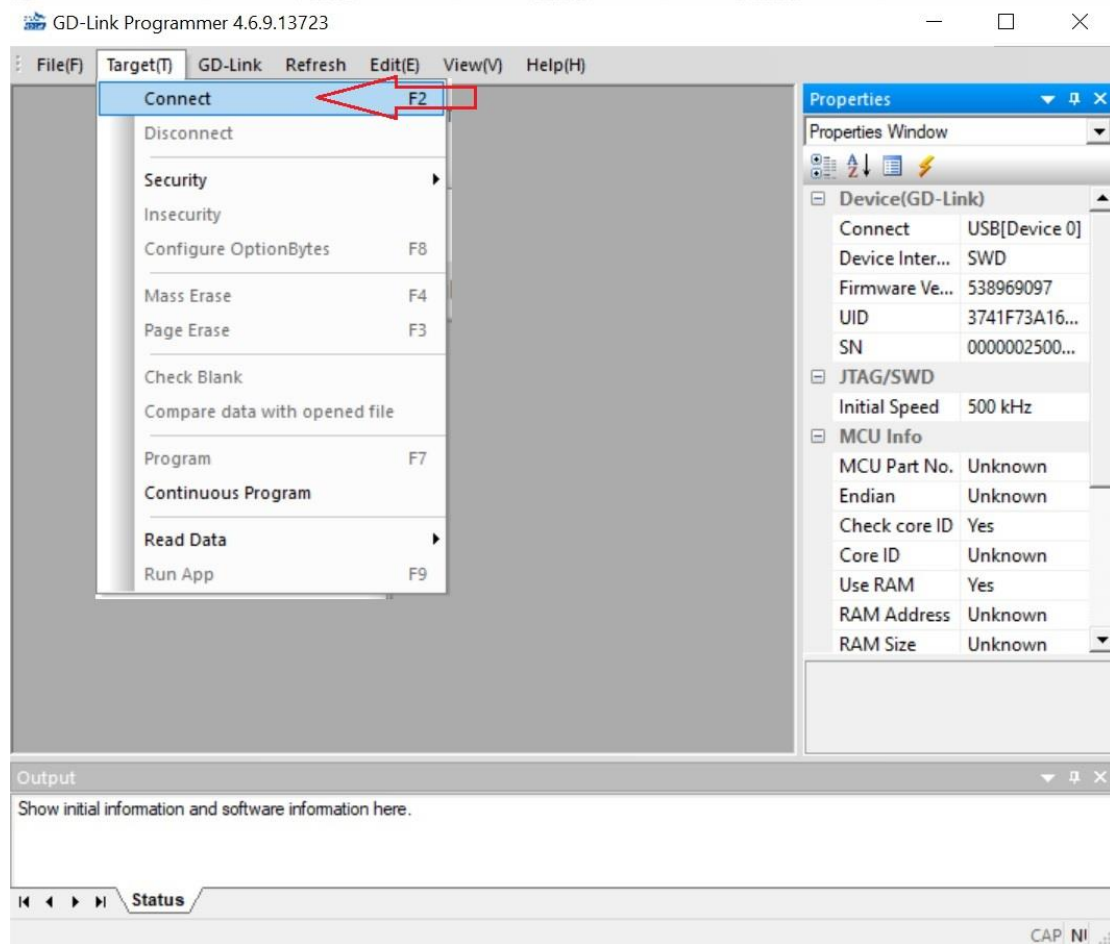
Note: on many Chinese programmer clones, the RESET contact does not work or does not work correctly. The device can be reset manually by closing the RST contact to ground or by interrupting the power supply. After the reset you have approximately 200ms to connect the programmer then the SWD port will be reconfigured.

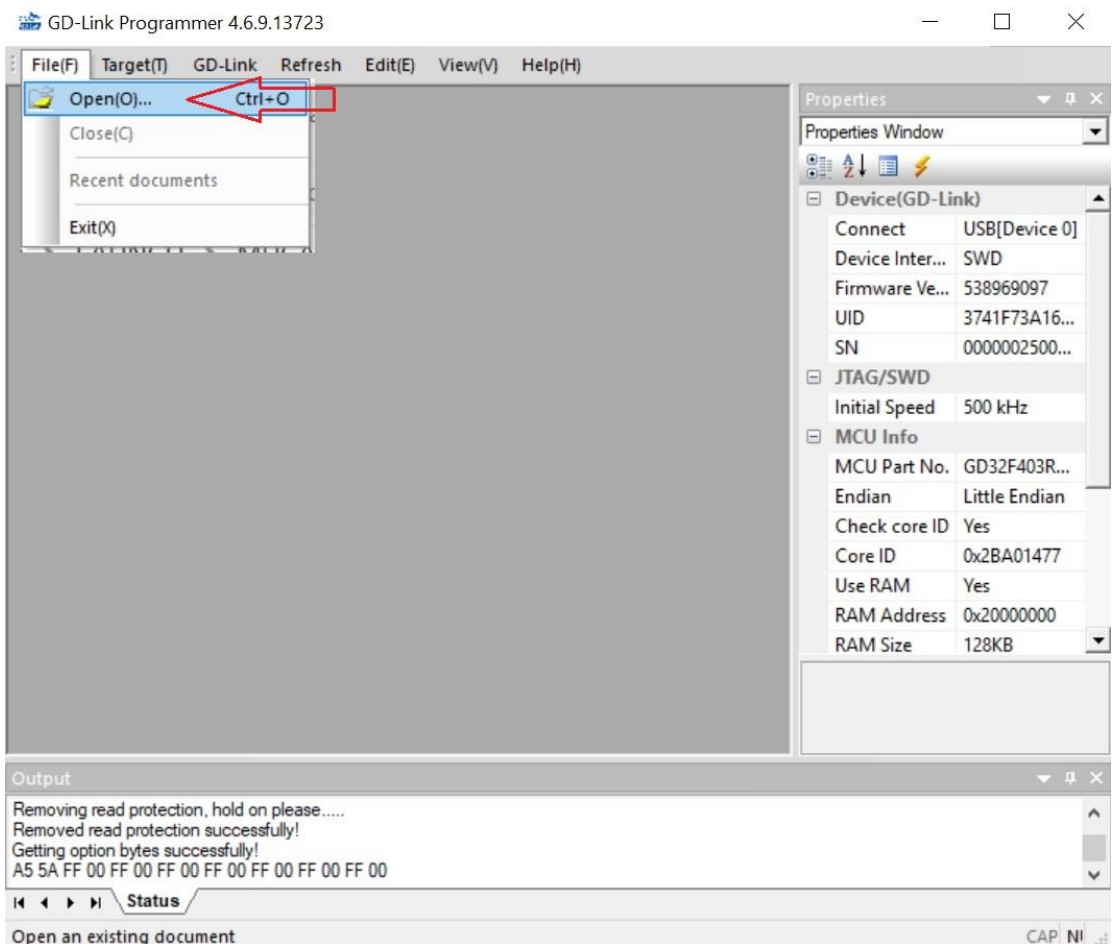
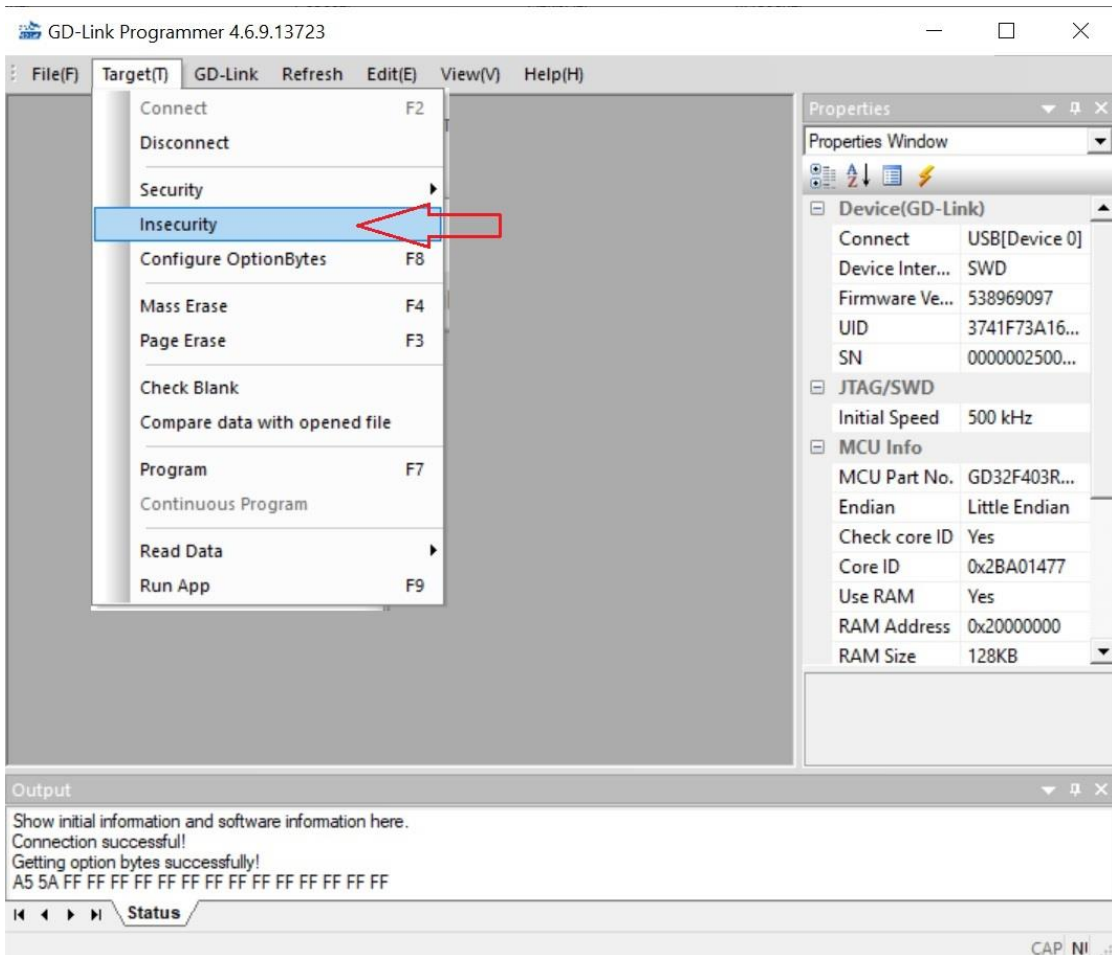
In my case, the RESET did not work on the GD-Link clone. I used J-Link V9.4 and the unprotect utility JLinkSTM32.exe (select item [2] STM32F1xxx) and then GD-Link for programming.

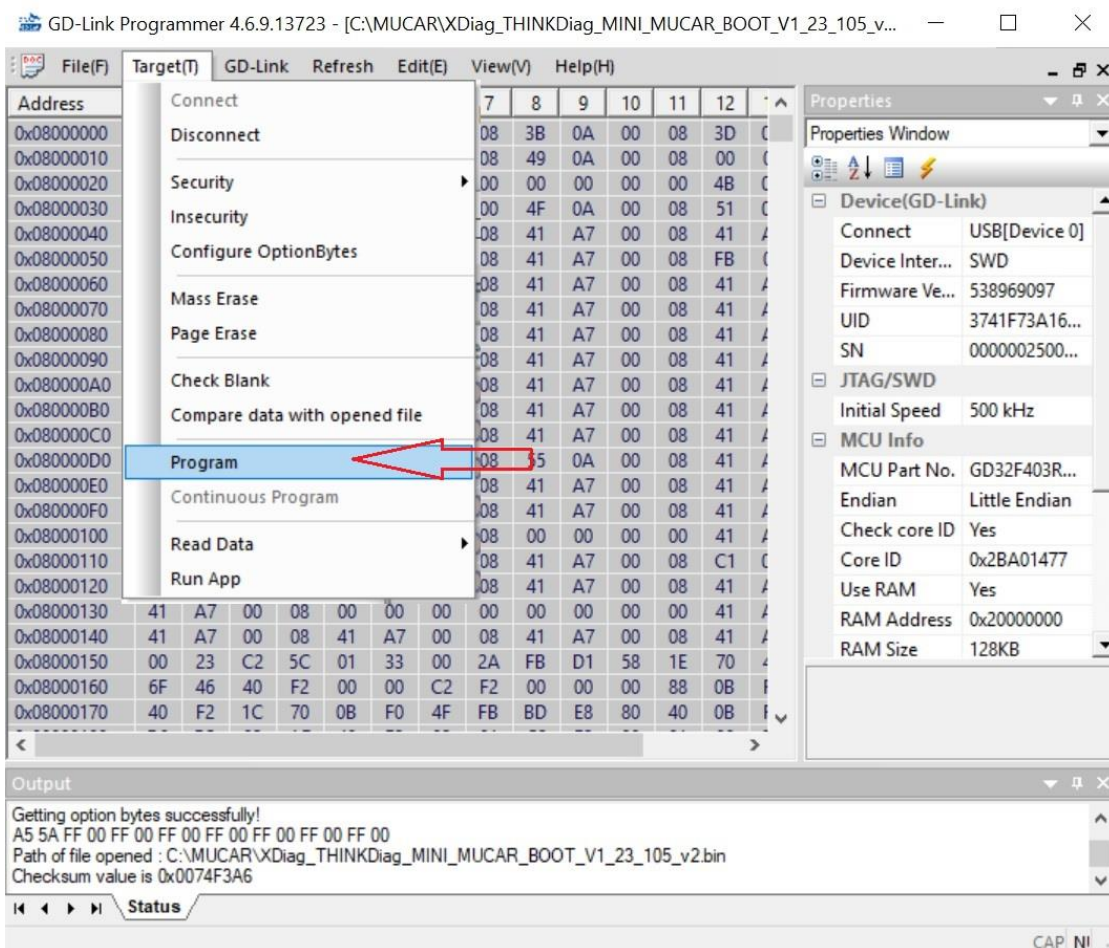
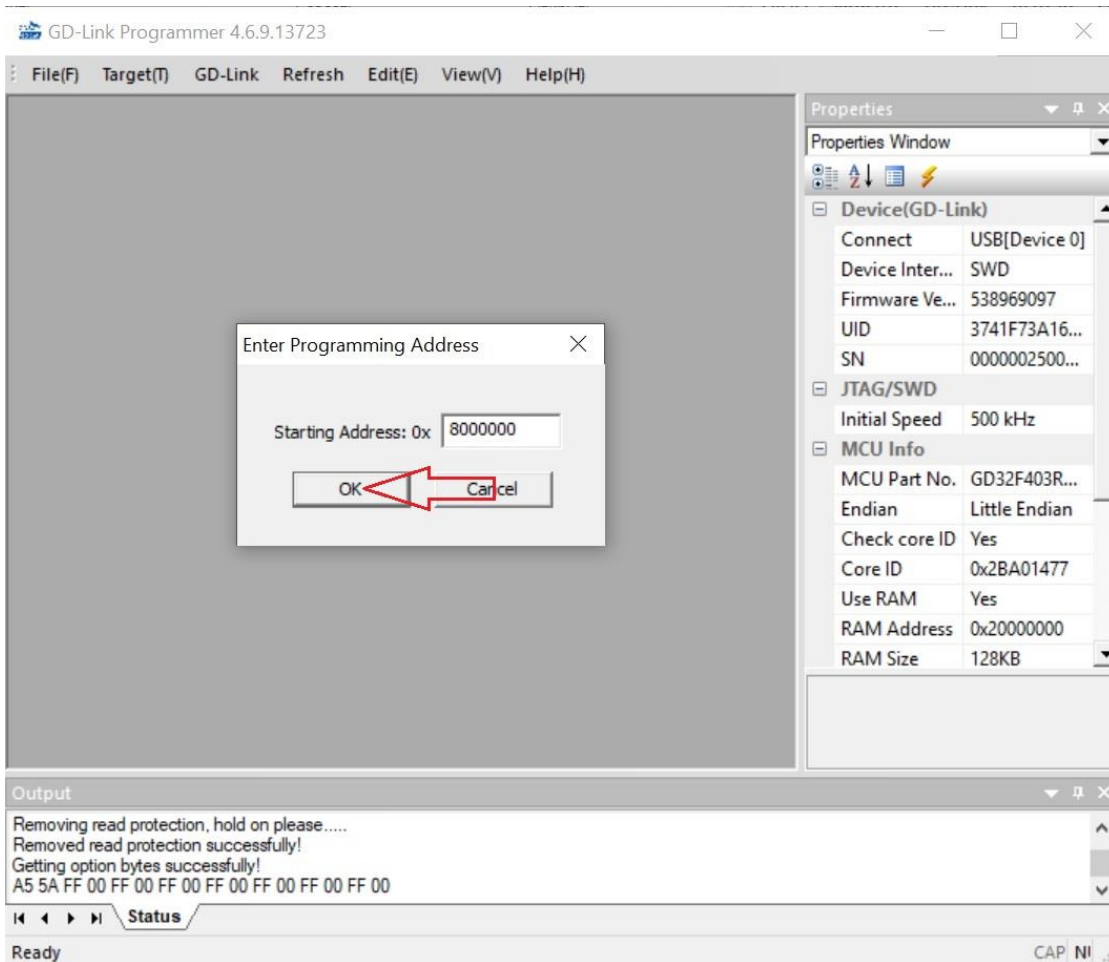
Soldering example:



Programming using GD Link Programmer V4.6.9.13723:







GD-Link Programmer 4.6.9.13723 - [C:\MUCAR\XDiag_THINKDiag_MINI_MUCAR_BOOT_V1_23_105_v...

File(F) Target(T) GD-Link Refresh Edit(E) View(V) Help(H)

Address	0	1	2	3	4	5	6	7	8	9	10	11	12
0x08000000	00	00	02	20	C1	A6	00	08	3B	0A	00	08	3D
0x08000010	41	0A	00	08	45	0A	00	08	49	0A	00	08	00
0x08000020	00	00	00	00	00	00	00	00	00	00	00	00	4B
0x08000030	4D	0A	00	08	00	00	00	00	4F	0A	00	08	51
0x08000040	41	A7	00	08	41	A7	00	08	41	A7	00	08	41
0x08000050	41	A7	00	08	41	A7	00	08	41	A7	00	08	FB
0x08000060	41	A7	00	08	41	A7	00	08	41	A7	00	08	41
0x08000070	41												
0x08000080	41												
0x08000090	41												
0x080000A0	41												
0x080000B0	00												
0x080000C0	41												
0x080000D0	41												
0x080000E0	41												
0x080000F0	41												
0x08000100	41												
0x08000110	41												
0x08000120	41												
0x08000130	41	A7	00	08	00	00	00	00	00	00	00	41	A
0x08000140	41	A7	00	08	41	A7	00	08	41	A7	00	08	41
0x08000150	00	23	C2	5C	01	33	00	2A	FB	D1	58	1E	70
0x08000160	6F	46	40	F2	00	00	C2	F2	00	00	00	88	0B
0x08000170	40	F2	1C	70	0B	F0	4F	FB	BD	E8	80	40	0B

GD-Link Progress

Operation: Checking Data
RealTime: Checking Data Successfully!
Time Cost: 5.891 s

100%

OK

Properties Window

Device(GD-Link)

Connect: USB[Device 0]
Device Inter...: SWD
Firmware Ve...: 538969097
UID: 3741F73A16...
SN: 0000002500...

JTAG/SWD

Initial Speed: 500 kHz

MCU Info

MCU Part No.: GD32F403R...
Endian: Little Endian
Check core ID: Yes
Core ID: 0x2BA01477
Use RAM: Yes
RAM Address: 0x20000000
RAM Size: 128KB

Output

---Programming time: 5.344 s
---Programming speed: 12.0 KB/s
---Verification OK!
---Checking complete!

Status

Ready

GD-Link Programmer 4.6.9.13723 - [C:\MUCAR\XDiag_THINKDiag_MINI_MUCAR_BOOT_V1_23_105_v...

File(F) Target(T) GD-Link Refresh Edit(E) View(V) Help(H)

Address	0	1	2	3	4	5	6	7	8	9	10	11	12
0x08000000	00	00	02	20	C1	A6	00	08	3B	0A	00	08	3D
0x08000010	41	0A	00	08	45	0A	00	08	49	0A	00	08	00
0x08000020	00	00	00	00	00	00	00	00	00	00	00	00	4B
0x08000030	4D	0A	00	08	00	00	00	00	4F	0A	00	08	51
0x08000040	41	A7	00	08	41	A7	00	08	41	A7	00	08	41
0x08000050	41	A7	00	08	41	A7	00	08	41	A7	00	08	FB
0x08000060	41	A7	00	08	41	A7	00	08	41	A7	00	08	41
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0x08000090	41												
0x080000A0	41												
0x080000B0	00												
0x080000C0	41												
0x080000D0	41												
0x080000E0	41												
0x080000F0	41												
0x08000100	41												
0x08000110	41												
0x08000120	41												
0x08000130	41	A7	00	08	00	00	00	00	00	00	00	41	A
0x08000140	41	A7	00	08	41	A7	00	08	41	A7	00	08	41
0x08000150	00	23	C2	5C	01	33	00	2A	FB	D1	58	1E	70
0x08000160	6F	46	40	F2	00	00	C2	F2	00	00	00	88	0B
0x08000170	40	F2	1C	70	0B	F0	4F	FB	BD	E8	80	40	0B

Connect

Disconnect

Security

Insecurity

Configure OptionBytes

Mass Erase

Page Erase

Check Blank

Compare data with opened file

Program

Continuous Program

Read Data

Run App

Properties Window

Device(GD-Link)

Connect: USB[Device 0]
Device Inter...: SWD
Firmware Ve...: 538969097
UID: 3741F73A16...
SN: 0000002500...

JTAG/SWD

Initial Speed: 500 kHz

MCU Info

MCU Part No.: GD32F403R...
Endian: Little Endian
Check core ID: Yes
Core ID: 0x2BA01477
Use RAM: Yes
RAM Address: 0x20000000
RAM Size: 128KB

Output

---Programming time: 5.344 s
---Programming speed: 12.0 KB/s
---Verification OK!
---Checking complete!

Status

Ready