

R-DT-UHF-NEO2-USB

UHF RFID Device

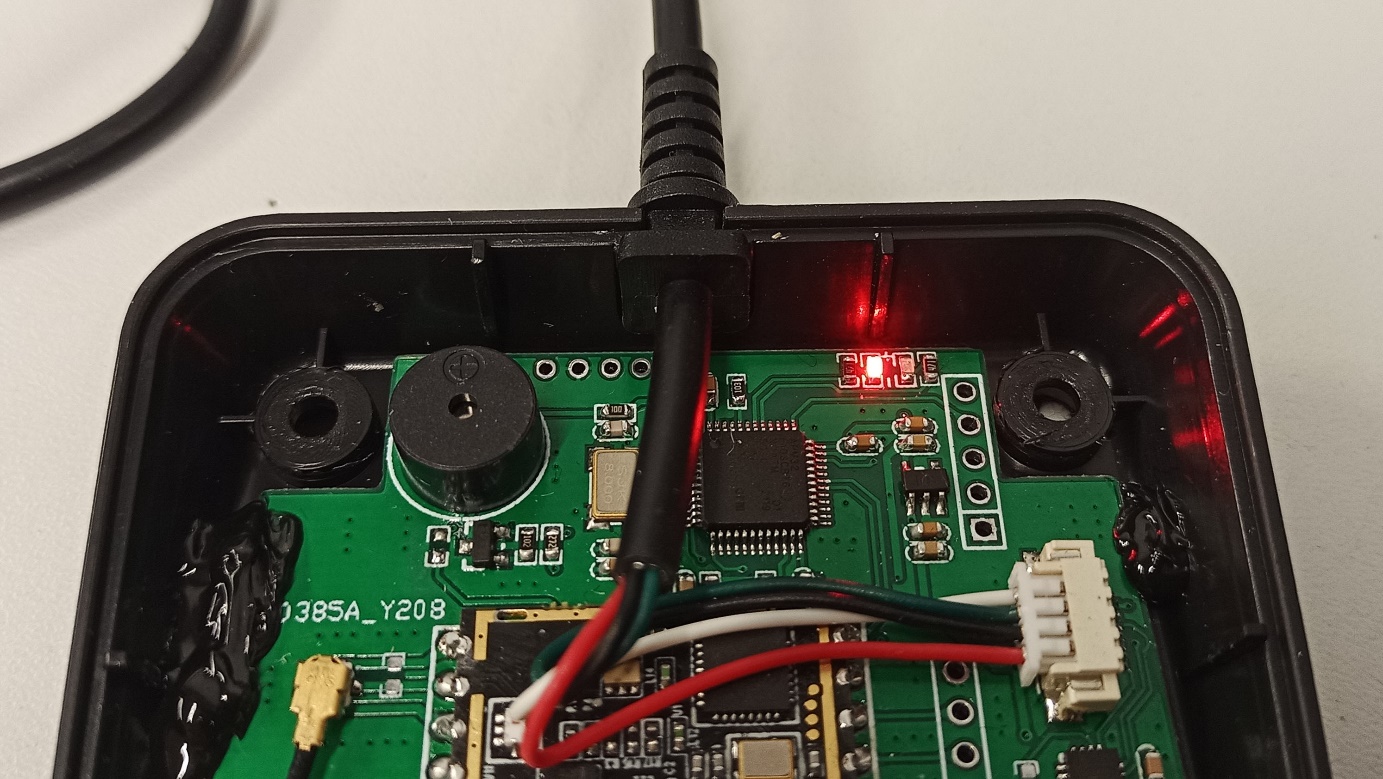
Test v1.8

# Preparation

Flash FW binary file “NEO2\_UHF-IDTpro\_230327.hex” onto “Geehy APM32F103CB”

# LED Standard Colour

The standard colour should be BLUE. RED is only for signalling action (incoming/outgoing telegrams).



# On opening the dialog “Reader Settings”

Error messages

ERR: Read GPIO data – OK, because the hardware uses no GPIOs

ERR: Could not read attenuation – Get the Transmitted Power

ERR: Could not read sensitivity – Does the new hardware no have a setting comparable to this?

OK: Read modulation depth

ERR: Could not read frequency – OK, the reader will be fixed for European frequencies

ERR: Could not read lbt params – OK, because the function is not comparable

OK: Read Gen2 Link Frequency

OK: Read Gen2 Coding

OK: Read Gen2 EPC Size

OK: Read Gen2 Send Handle

OK: Read Gen2 Send PC

OK: Read Gen2 Send RN16

ERR: Could not read Gen2 Q – OK, the Q value is only important for large amounts of tags

OK: Read Gen2 Q Method

OK: Read Gen2 Session

OK: Read Gen2 Inventory Rounds

ERR: Could not read Gen2 Selection Mask #1 – OK, not important four typical applications

ERR: Could not read Gen2 Selection Mask #2 – OK, not important four typical applications

OK: Read Gen2 Query NXP Brand ID

# Heartbeat

Default setting is heartbeat ON. OK.

Heartbeat telegram when the device is idle: 52 46 45 01 9001 02 01 03 00 04 C5

When the device is scanning (cyclic inventory): 52 46 45 01 9001 02 02 03 00 10 04 D6

This command switches the heartbeat OFF: 52 46 45 01 0302 02 01 03 00 04 55

This command sets the heartbeat to 3 seconds: 52 46 45 01 0302 02 03 03 01 0BB8 04 E5

# Inventory-Single (50-01) – NOT IMPLEMENTED SO FAR!

As the single inventory has no parameters at all, the telegram is always: 52 46 45 01 50 01 02 00 04 07

Suggestion how to implement this

Send “Single Inventory Command”: BB 00 22 00 00 22 7E

# Inventory-Cyclic (50-02) – DURATION PARAMETER not IMPLEMENTED SO FAR!

The Inventory Cyclic has 2 Parameters:

* INVENTORY\_OFF/ON (0x00/0x01)
* Duration of the inventory. This is a 32 bit long number of milliseconds of inventory. The value range is from 000000001 (1 ms) to FFFFFFFF (4’294’967’295 ms = 1193 hours)

>> 52 46 45 01 5002 02 05 03 01 000003E8 04 E8 — do inventory cyclic for 1 second

>> 52 46 45 01 5002 02 05 03 01 00002710 04 34 — do inventory cyclic for 10 seconds

>> 52 46 45 01 5002 02 05 03 01 FFFFFFFF 04 03 — do inventory cyclic for a very long time

>> 52 46 45 01 50 02 02 01 03 00 04 06 — immediately stop inventory cyclic

After start of the inventory cycle the RFID device sends these two telegrams:

<< 52 46 45 01 90 03 02 01 03 10 04 D7 – state changed interrupt

<< 52 46 45 01 50 02 02 01 03 00 04 06 – inventory cyclic confirmation

After finishing the inventory cycle, the RFID device sends this telegram.

<< 52 46 45 01 90 03 02 01 03 00 04 C7 – state changed interrupt

<< 52 46 45 01 50 02 02 01 03 00 04 06 – inventory cyclic confirmation

Suggestion how to implement this

Send “Multiple Inventory Command” with a duration of 0xFFFF = 65535 seconds: BB 00 27 0003 22 FFFF 4A 7E

Do the timing in the mainboard MCU.

Then shut off with “Stop Multiple Inventory Command”: BB 00 28 00 00 28 7E

# Read-From-Tag (50-03) – OK

# Write-To-Tag (50-04) – NOT IMPLEMENTED SO FAR!

EPC: 12 34 56 78 90 12 34 56 78 90 12 34

Telegram from PC to RFID

>> 52 46 45 01 50 04 02 1B 03 0C 12 34 56 78 90 12 34 56 78 90 12 34 03 00 02 00 00 00 00 06 AA BB CC EE FF 99 04 62

The Bytes in Detail

52 46 45 = Start of Telegram

01 = SOH

5004 = Command Code

02 = STX

1B = Length

03 = ETX

0C = unsigned char tagIdCount

12 34 56 78 90 12 34 56 78 90 12 34 = unsigned char tagId[tagIdCount]

03 = unsigned char memoryBank, 03 = User Memory Bank

0002 = unsigned short startAddress in blocks

00000000 = unsigned long accessPassword

06 = unsigned char byteCount

AABBCCEEFF99 = unsigned char data [byteCount]

04 = EOT

Cs = Checksum

Reply from RFID to PC

<< 52 46 45 01 50 04 02 01 03 00 04 00

Suggestion how to implement this

Use the command “Write Data to Memory Bank”.

# Lock Tag (50-05) – NOT IMPLEMENTED SO FAR!

Suggestion how to implement this

Use the command “Lock Memory Bank”.

# Kill Tag (50-06) – NOT IMPLEMENTED SO FAR!

Suggestion how to implement this

Use the command “Kill the Tag”.

# Read/Set Attenuation

This is an important command, because with the powerful antenna, users will want to reduce the TX power.

Get the Transmitted power + Set the Transmitted Power

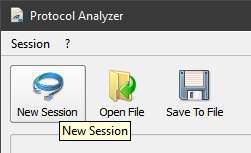
To be compatible, you need to calculate the attenuation. Full TX power = 0 attenuation. Low TX power = 19 steps attenuation.

|  |  |  |
| --- | --- | --- |
| **Attenuation** | **dBm** | **mW** |
| 0 | +20 | 100 |
| 1 | +19 | 79 |
| 2 | +18 | 63 |
| 3 | +17 | 50 |
| 4 | +16 | 40 |
| 5 | +15 | 32 |
| 6 | +14 | 25 |
| 7 | +13 | 20 |
| 8 | +12 | 16 |
| 9 | +11 | 13 |
| 10 | +10 | 10 |
| 11 | +9 | 8 |
| 12 | +8 | 6 |
| 13 | +7 | 5 |
| 14 | +6 | 4 |
| 15 | +5 | 3 |
| 16 | +4 | 2,5 |
| 17 | +3 | 2 |
| 18 | +2 | 1,6 |
| 19 | +1 | 1,3 |

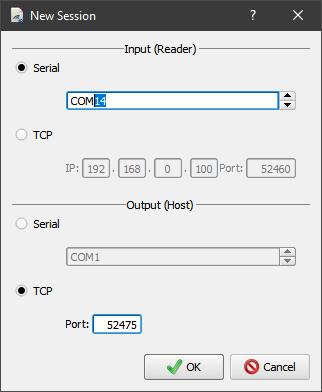
# Use the Protocol Analyser

## Prepare the Protocol Analyser

Connect the RFID Device, start “Protocol Analyzer” and click on [New Session].

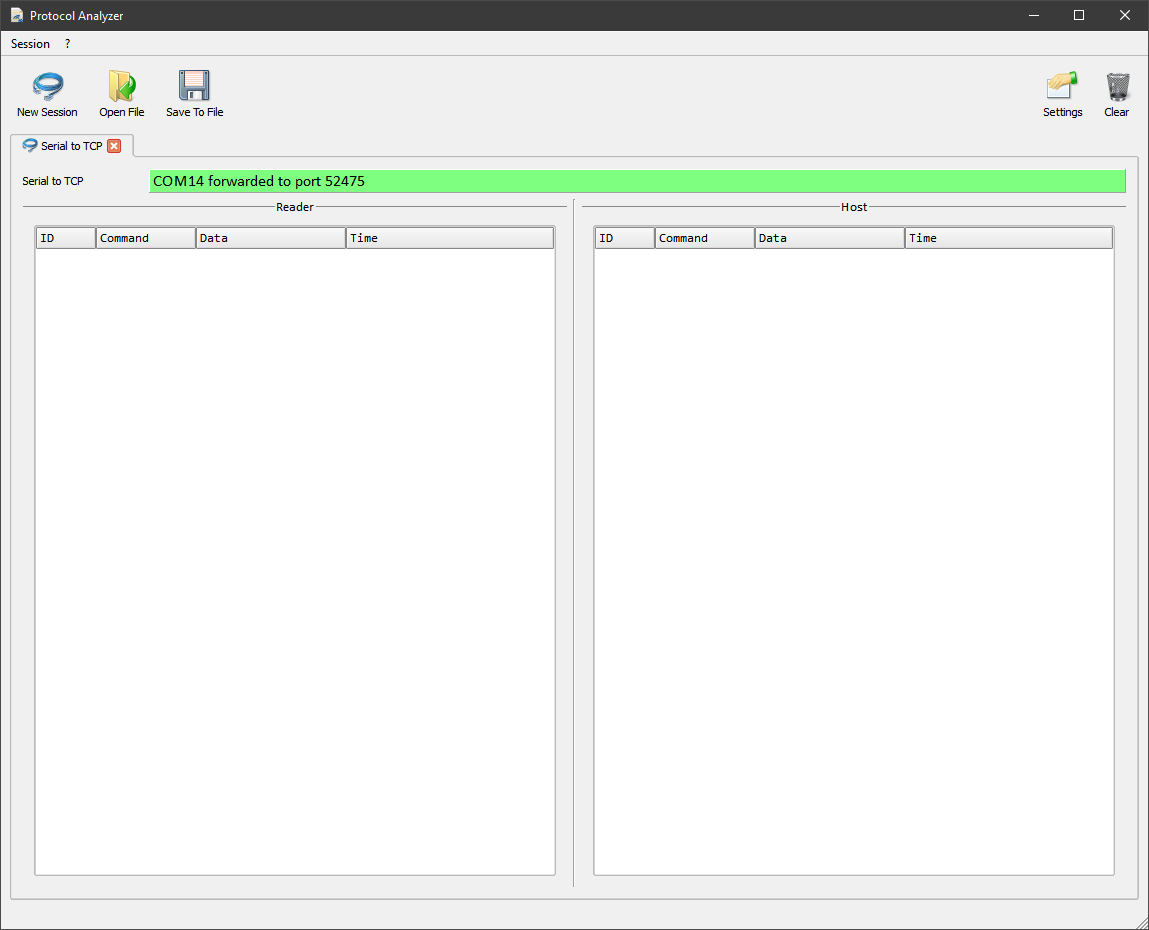


In this dialog, select the COM port where the RFID device can be found. You can change the TCP port if you need to.



Now you see two columns.

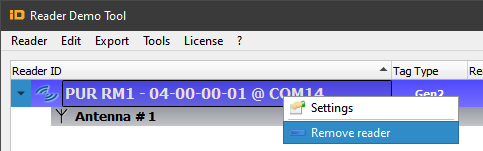
LEFT Side: Replies from the RFID device to the PC. RIGHT Side: Commands from the PC.



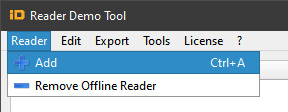
## Prepare the Reader Demo Tool or Reader Suite

After start of the software, it will automatically detect and connect the reader.

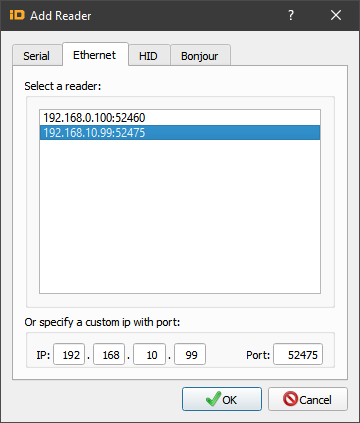
Remove the reader using the context menu or menue entry “Reader”.



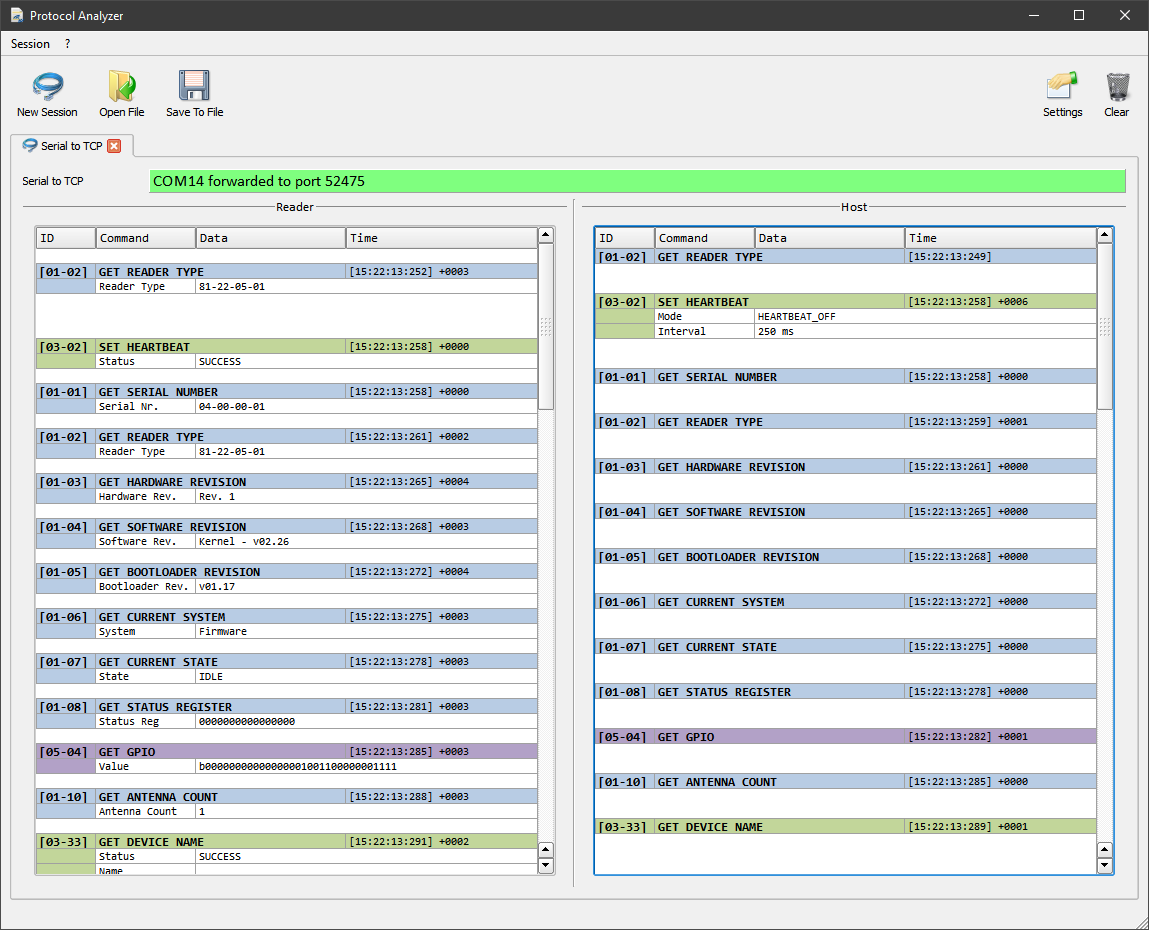
Now manually connect to the reader.



In the dialog “Add Reader” change to the tab “Ethernet” and select the reader with the previously chosen port number. The IP address is your PC.



Now the reader is connected to the PC software. And all communication is logged in the Protocol Analyzer.



For recording and analysing single commands:

[Clear] the view

Do the command.

[Save to File] and to a Screenshot

## Reading the Protocol Streams

In the files you store with [Save to File] you see these lines:

[13:46:56:228] H 52464501010202000455

[13:46:56:240] R 5246450101020204038122050104f5

H = Host (PC) sends to RFID device

R = Reader replies to RFID device

The Heartbeat telegrams are ignored in the default setting.