

# SE-DAB+

## MSX DAB+ RECEIVER



### Discription:

The SE-DAB

### Features:

- Default address is &h20-&27
- Main controller is an ARM® 32-bit Cortex®-M4 CPU with FPU, Adaptive real-time accelerator (ART Accelerator™) allowing 0-wait state execution from Flash memory, frequency up to 168 MHz, memory protection unit, 210 DMIPS/ 1.25 DMIPS/MHz (Dhrystone 2.1), and DSP instructions
- 

- System updatable with a DFU cable and pc software

### Applications:

- SymbOS MSX...



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## 1.0 System

### 1.1 IO ports

#### 1.1.0 MSX address range &h20 - &h27

&h20	Command functions / response
&h21	Data read/write buffers

The address can be changed in the Firmware on request

#### 1.1.1 Error table

0	oke
..	

### 1.2 Card overview

### 1.3 UPDATE using DFU

#### 1.3.1 Install update software

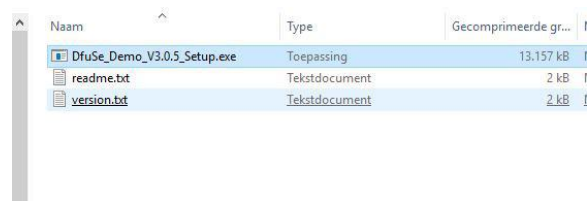
Program: DfuSe\_Demo\_V3.0.5 (en.stsw-stm32080.zip)

Download from TMTLOGIC site:

<http://www.tmtlogic.com/tmtlogic.com/index.php/support>

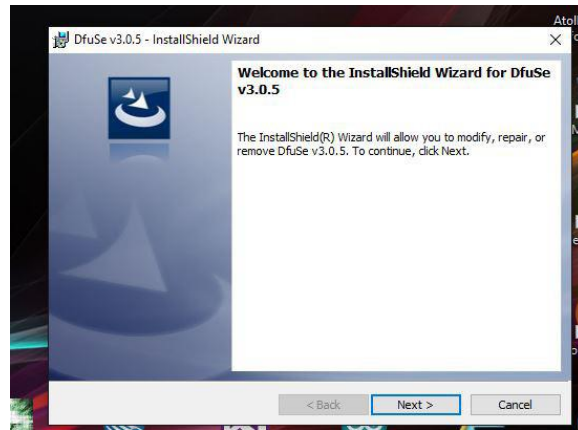
or download from STMicroelectronics site

[http://www.st.com/content/st\\_com/en/products/development-tools/software-developmenttools/stm32-software-development-tools/stm32-programmers/stsw-stm32080.html?](http://www.st.com/content/st_com/en/products/development-tools/software-developmenttools/stm32-software-development-tools/stm32-programmers/stsw-stm32080.html?)

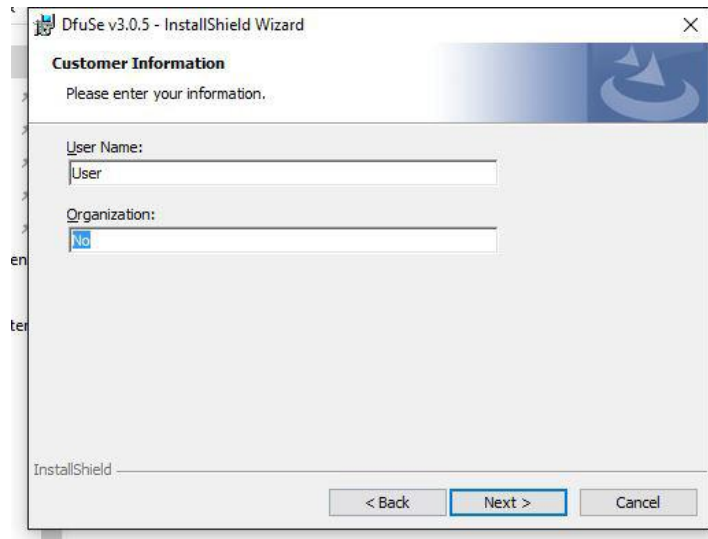


Naam	Type	Gecomprimeerde gr...
DfuSe_Demo_V3.0.5_Setup.exe	Toepassing	13.157 kB
readme.txt	Tekstdocument	2 kB
version.txt	Tekstdocument	2 kB

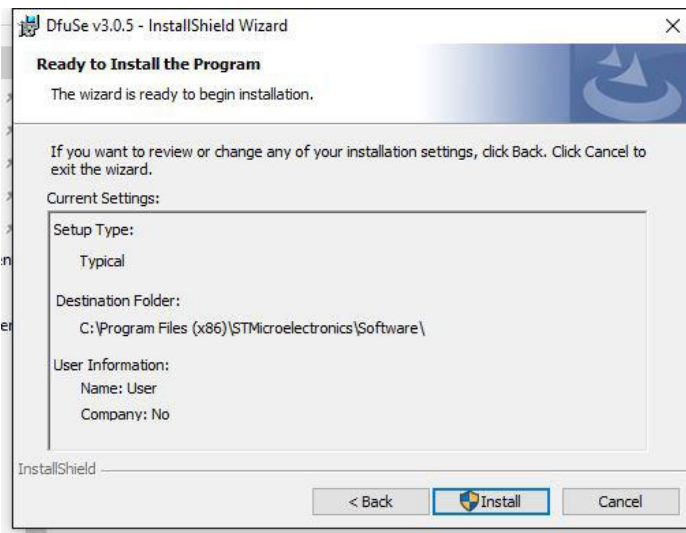
Start DfuSe\_Demo\_V3.0.5\_Setup..exe



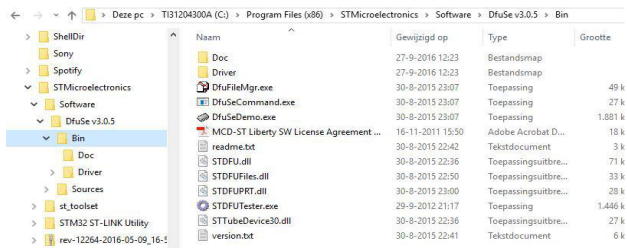
Select NEXT



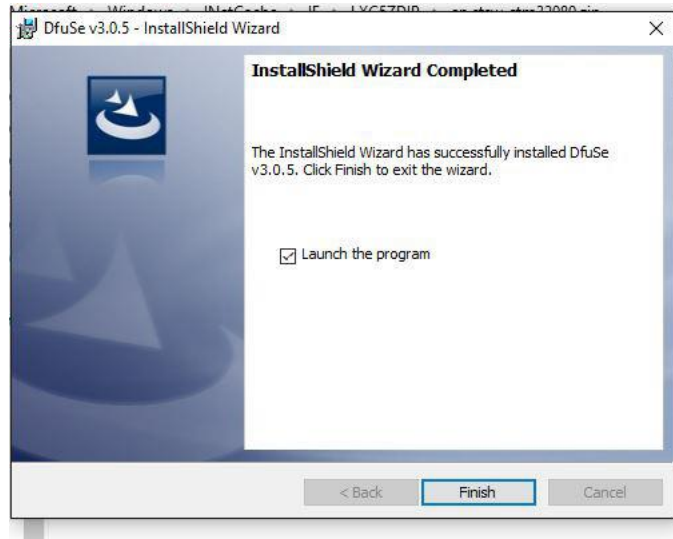
Change your name and click NEXT



Select INSTALL



The software is installed here:



Select Finish

Program is ready for use.

### 1.3.2 Update the SE-DAB

Download de update file for the SE-DAB (SEDABxxxxx.dfu file) and save this

Run Window program: **DfuSe\_Demo\_V3.0.5**

Connect the SE-DAB with the male-male USB DFU cable on your pc.



A Red led will start burning on the SE-DAB

If it is correctly, the computer will start looking for a driver.

When Windows ask for search in windows update, skip it.

Wait a few minutes..... !

When windows not search to driver press de Reset button from the SE-ONE

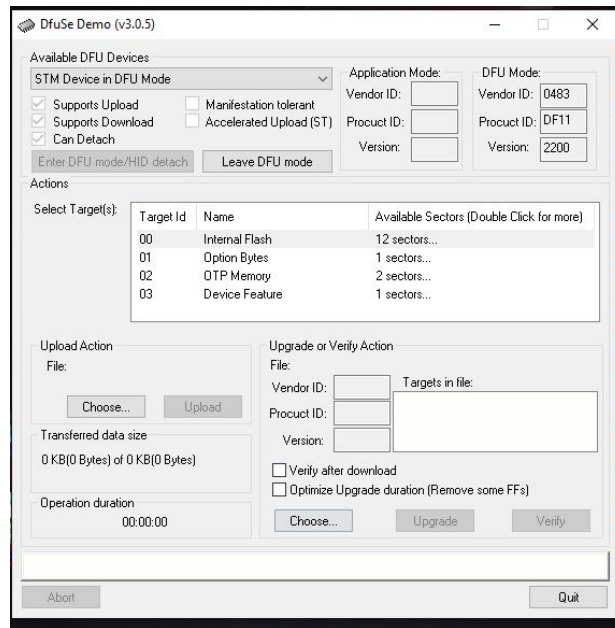
If windows cannot found this driver, you can do it manual.

You can find the drivers in the map "Driver".

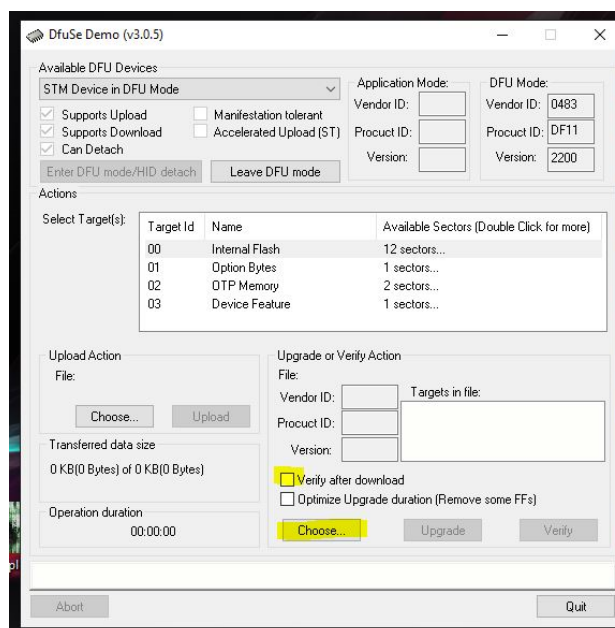
C:\Program Files (x86)\STMicroelectronics\Software\DfuSe v3.0.5\Bin\Driver



When windows not search to driver, press the Reset button of the SE-DAB

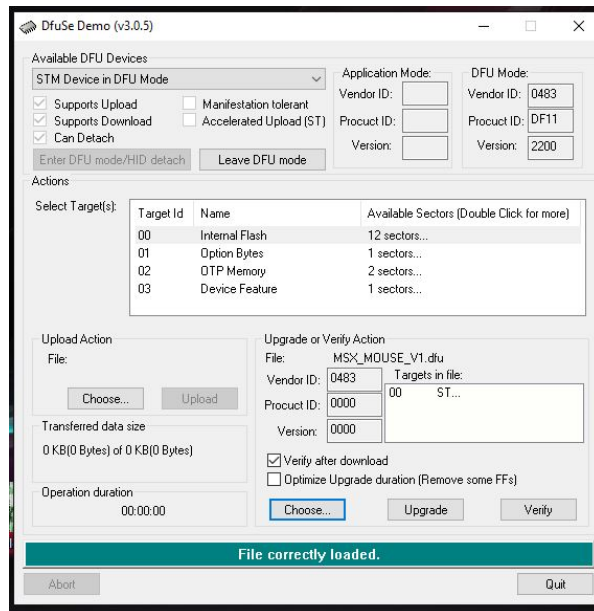


Check the select target(s).  
When this field is empty, the SE-DAB is not connect .



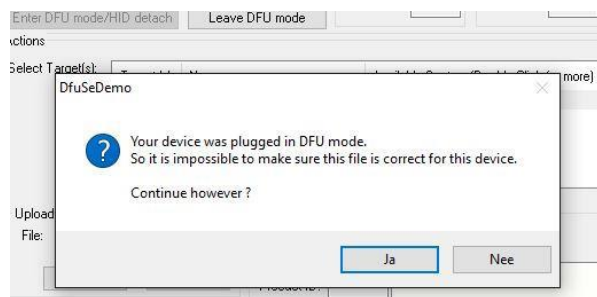
Select Verify after download and click Choose





Open the SEDABxxxxxx.dfu file

Select Upgrade.



Are you sure it's a SEDABxxxxxx DFU file?

Note: when you download a UMJA or SEONE DFU file, you can cause damage to this!

Click yes

Remove the SE-DAB from the PC

The SE-DAB is ready for use!



**CAUTION!!**

Use only the "DFU cable" for updating the SE-DAB.

Not for anything else. This can cause serious damage.

## 2.0 Command instructions DAB mode

### 2.1 Global functions

2.1.1 00h v Reset buffer port 0  
reset intern write buffer pointers

2.3.5 F0h Get internal status byte SE-DAB

Bit 3 Dab+ text available

```
if (inp(&h20) == 1) return    check busy?  
out &h20, &hF0              Get status byte  
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error  
print inp(&h21)              status byte = 8 = text available
```

2.3.6 27h v (01,06) Get radio module play mode

return data: 0=DAB, 1=FM, 2=BEEP, 255=Stream stop

```
if (inp(&h20) == 1) return    check busy?  
out &h20, &h27              Get play mode  
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error  
print inp(&h21)              0=DAB, 1=FM, 2=BEEP, 255=Stream stop  
print inp(&h21)              chr$(13)      end string
```

2.3.6 21h Get module status

return data: 0=PLAYING,  
1=SEARCHING,  
2=TUNING,  
3=STOP,  
4=SORTING,  
5=RECONFIGURATION,  
6.. \Not define

```
if (inp(&h20) == 1) return    check busy?  
out &h20, &h21              Get play mode  
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error  
                             Example:STOP  
print chr$(inp(&h21))         "S"          year  
print chr$(inp(&h21))         "T"  
print chr$(inp(&h21))         "O"  
print chr$(inp(&h21))         "P"  
print chr$(inp(&h21))         chr$(13)      end string
```

2.1.2 70h v Get firmware version

```
if (inp(&h20) == 1) return    check busy?  
out &h20, &h70              Get Frimware version  
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error
```

example 1 april 2018

print chr\$(inp(&h21))	"2"	year
print chr\$(inp(&h21))	"0"	
print chr\$(inp(&h21))	"1"	
print chr\$(inp(&h21))	"8"	
print chr\$(inp(&h21))	"0"	month
print chr\$(inp(&h21))	"4"	
print chr\$(inp(&h21))	"0"	day
print chr\$(inp(&h21))	"1"	
print chr\$(inp(&h21))	chr\$(13)	end string

### 2.3.11 2Dh v (01.0C) Set volume

Volume Level = 0..16

if (inp(&h20) == 1) return	check busy?
out &h20, &h0	reset intern write buffer pointers
out &h21, 15	volume Level = 0..16
out &h20, &h2D	Set volume
while (inp (&h20) == 1);	wait processing 0 = oke 1 = busy 2 = error

### 2.3.12 2Eh v (01.0D) Get volume

return set volumeLevel: 0..16

if (inp(&h20) == 1) return	check busy?
out &h20, &h2E	Get volume
while (inp (&h20) == 1);	wait processing 0 = oke 1 = busy 2 = error
	example value = 14
print inp(&h21)	14

### 2.3.22 71h v Reset SE-DAB //Hardware reset

if (inp(&h20) == 1) return	check busy?
out &h20, &h71	Reset SE-DAB

### 2.3.22 72h v SE-DAB Logbook

if (inp(&h20) == 1) return	check busy?
out &h20, &h71	Get SE-DAB logbook
while (inp (&h20) == 1);	wait processing 0 = oke 1 = busy 2 = error

print chr\$(inp(&h21))	"T"	
print chr\$(inp(&h21))	"E"	
print chr\$(inp(&h21))	"X"	
print chr\$(inp(&h21))	"T"	
print inp(&h21)	chr\$(13)	next line

print chr\$(inp(&h21))	"T"	
print chr\$(inp(&h21))	"E"	
print chr\$(inp(&h21))	"X"	
print chr\$(inp(&h21))	"T"	
print inp(&h21)	chr\$(13)	next line
print inp(&h21)	chr\$(10)	end string

2.2.2 79h v Set vu on/off

if (inp(&h20) == 1) return	check busy?	
out &h20, &h0	reset intern write buffer pointers	
out &h21, 1	0 = false	
	1 = true;	
out &h20, &h79	Set vu enable	
while (inp (&h20) == 1);	wait processing 0 = oke 1 = busy 2 = error	

2.2.2 80h v Set VU meters values

if (inp(&h20) == 1) return	check busy?	
out &h20, &h0	reset intern write buffer pointers	
out &h21, 127	0-255	left
out &h21, 132	0-255	Right
out &h20, &h80	Set vu meters	
while (inp (&h20) == 1);	wait processing 0 = oke 1 = busy 2 = error	

2.2.2 81h v Get VU meters values

if (inp(&h20) == 1) return	check busy?	
out &h20, &h81	Get vu meters	
while (inp (&h20) == 1);	wait processing 0 = oke 1 = busy 2 = error	
print inp(&h21)	127	Left channel
print inp(&h21)	123	Right channel

2.2.2 82h v Get VU meters values (0-100)

if (inp(&h20) == 1) return	check busy?	
out &h20, &h82	Get vu meters	
while (inp (&h20) == 1);	wait processing 0 = oke 1 = busy 2 = error	
print inp(&h21)	27	Left channel
print inp(&h21)	99	Right channel

2.2.2 21h v Get DabModule status

if (inp(&h20) == 1) return	check busy?	
out &h20, &h21	Get vu meters	
while (inp (&h20) == 1);	wait processing 0 = oke 1 = busy 2 = error	
print chr\$( inp(&h21))	"P"	
print chr\$( inp(&h21))	"L"	

```

print chr$( inp(&h21))      "A"
print chr$( inp(&h21))      "Y"
print chr$( inp(&h21))      "I"
print chr$( inp(&h21))      "N"
print chr$( inp(&h21))      "G"
print inp(&h21)             <13>

```

### 2.3.3 23h x (01.01) Play Stop FM/DAB

```

if (inp(&h20) == 1) return    check busy?
Out &h20, &h23               Play Stop
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error

```

### 2.3.7 29h v (01.08) Get signal strength

DAB: signalStrength = 0..18, bitErrorRate= niet ingebouwd  
 FM: signalStrength = 0..100

```

if (inp(&h20) == 1) return    check busy?
out &h20, &h29               Get signal strength
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error
                             example value = 17
print inp(&h21)              17

```

## 2.2 DAB SYSTEM

### 2.2.1 10h v (00,00) Test for DAB module is ready for communication

```

if (inp(&h20) == 1) return    check busy?
out &h20, &h10               Test for DAB module is ready for communication
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error

```

### 2.2.2 11h x (00,01) Clean DAB module database and reset module

```

if (inp(&h20) == 1) return    check busy?
out &h20, &h11               Clean DAB module database and reset module
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error

```

### 2.3.2 22h v (01.00) Play DAB station : 1- max stations in database

```

if (inp(&h20) == 1) return    check busy?
out &h20, &h0                reset intern write buffer pointers
out &h21, &h1                Station 1
out &h20, &h22               Play DAB station
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error

```

### 2.3.4 25h x (01,03) Search DAB bands for programs zone:

```

1= BAND_3 (EUR)
2=CHINA-BAND
3=BAND_L

```

```

if (inp(&h20) == 1) return      check busy?
out &h20, &h0                  reset intern write buffer pointers
out &h21, &h1                  1=BAND-3, 2=CHINA-BAND, 3=L-BAND
out &h20, &h25                 Search DAB bands for programs
while (inp (&h20) == 1);      wait processing 0 = oke 1 = busy 2 = error

```

2.3.5 26h x (01.04) Stop search DAB bands for programs

```

if (inp(&h20) == 1) return      check busy?
out &h20, &h26                 Stop search
while (inp (&h20) == 1);      wait processing 0 = oke 1 = busy 2 = error

```

2.3.6 28h x (01.07) Get DAB station number,

```

if (inp(&h20) == 1) return      check busy?
out &h20, &h28                 Get DAB station index, get tuned FM station frequency
while (inp (&h20) == 1);      wait processing 0 = oke 1 = busy 2 = error
                                example radio station number 5
print inp(&h21)                5

```

2.3.8 2Ah x (01.09) Set stereo mode

1 = stereo, 0 = force mono

```

if (inp(&h20) == 1) return      check busy?
out &h20, &h0                  reset intern write buffer pointers
out &h21, &h1                  1 = stereo, 0 = force mono
out &h20, &h2A                 Set stereo mode
while (inp (&h20) == 1);      wait processing 0 = oke 1 = busy 2 = error

```

2.3.9 2Bh x (01.0A) Get stereo mode

0=force mono, 1=auto detect stereo

```

if (inp(&h20) == 1) return      check busy?
out &h20, &h2B                 Get stereo mode
while (inp (&h20) == 1);      wait processing 0 = oke 1 = busy 2 = error
                                example value = 1
print inp(&h21)                1

```

2.3.10 2Ch v (01.0B) Get stereo type

return data: 0=stereo, 1=join stereo, 2=dual channel, 3=single channel (mono)

```

if (inp(&h20) == 1) return      check busy?
out &h20, &h2C                 Get stereo type
while (inp (&h20) == 1);      wait processing 0 = oke 1 = busy 2 = error
                                example value = 0

print chr$( inp(&h21))          "s"
print chr$( inp(&h21))          "t"
print chr$( inp(&h21))          "e"
print chr$( inp(&h21))          "r"

```

```

print chr$( inp(&h21))      "e"
print chr$( inp(&h21))      "o"
print inp(&h21)             <13>
print inp(&h21)             <10>

```

### 2.3.13 2Fh v (01.0E) Get program type

```

0=N/A,
1=News,
2=Curent Affairs,
3=Information,
4=Sport,
5=Education,
6=Drama,
7=Arts,
8=Science,
9=Talk,
10=Pop music,
11=Rock music,
12=Easy listening,
13=Light Classical,
14=Classical music,
15=Other music,
16=Weather,
17=Finance,
18=Children's,
19=Factual,
20=Religion,
21=Phone in,
22=Travel,
23=Leisure,
24=Jazz & Blues,
25=Country music,
26=National music,
27=Oldies music,
28=Folk Music,
29=Documentary,
30=undefined,
31=undefined

```

```

if (inp(&h20) == 1) return      check busy?
out &h20, &h0                  reset intern write buffer pointers
out &h21,3                      station channel 3
out &h20, &h2F                  Get program type
while (inp (&h20) == 1);      wait processing 0 = oke 1 = busy 2 = error
                                example value = 19

print chr$(inp(&h21))          "F"
print chr$(inp(&h21))          "a"
print chr$(inp(&h21))          "c"
print chr$(inp(&h21))          "t"
print chr$(inp(&h21))          "u"
print chr$(inp(&h21))          "a"

```

```

print chr$(inp(&h21))    "I"
print inp(&h21)          chr$(13)    end string

```

2.3.14 30h v (01.0F) Get DAB station short name

```

if (inp(&h20) == 1) return    check busy?
out &h20, &h0                reset intern write buffer pointers
out &h21,3                   station channel 3
out &h20, &h30h              Get program shor name
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error
                             example value = NOS
print chr$(inp(&h21))        "N"
print chr$(inp(&h21))        "Oa"
print chr$(inp(&h21))        "S"
print inp(&h21)              chr$(13)    end string

```

2.3.15 31h v (01.0F) Get DAB station long name

```

if (inp(&h20) == 1) return    check busy?
out &h20, &h0                reset intern write buffer pointers
out &h21,3                   station channel 3
out &h20, &h31              Get program long name
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error
                             example value = NOSLONG
print chr$(inp(&h21))        "N"
print chr$(inp(&h21))        "O"
print chr$(inp(&h21))        "S"
print chr$(inp(&h21))        "L"
print chr$(inp(&h21))        "O"
print chr$(inp(&h21))        "N"
print chr$(inp(&h21))        "G"
print inp(&h21)              chr$(13)    end string

```

2.3.16 32h v 01.10Get DAB text event

return: 1=new text, 2=text is same, 3=no text

```

if (inp(&h20) == 1) return    check busy?
out &h20, &h32              Get dab text event
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error
                             example value = 3
print inp(&h21)              3

```

TODO: is string

2.3.17 33h v (01,11) Get sampling rate (DAB/FM)

return sampleRate: "32kHz", "24kH", "48kHz"

```

if (inp(&h20) == 1) return    check busy?
out &h20, &h33              Get sample rate

```



```

while (inp (&h20) == 1);      wait processing 0 = oke 1 = busy 2 = error
                               example value = 48khz
print chr$(inp(&h21))         "4"
print chr$(inp(&h21))         "8"
print chr$(inp(&h21))         "k"
print chr$(inp(&h21))         "h"
print chr$(inp(&h21))         "z"
print inp(&h21)                chr$(13)      end string

```

### 2.3.18 34h x (01.12) Get data rate (DAB)

```

return xxxkbps

if (inp(&h20) == 1) return    check busy?
out &h20, &h34               Get data rate
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error
                               example value = 123kbps
print chr$(inp(&h21))        "1"
print chr$(inp(&h21))        "2"
print chr$(inp(&h21))        "3"
print chr$(inp(&h21))        "k"
print chr$(inp(&h21))        "b"
print chr$(inp(&h21))        "p"
print chr$(inp(&h21))        "s"
print inp(&h21)              chr$(13)      end string

```

### 2.3.19 35h v (01.13) Get DAB signal quality

```

return: 0..100

0..19 = playback stop
20..30 = the noise (short break) appears
100 = the bit error rate is 0

if (inp(&h20) == 1) return    check busy?
out &h20, &h35               Get signal quality
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error
                               example value = 76
print inp(&h21)              76

```

### 2.3.20 36h

### 2.3.21 37h v (01.15) Get DAB program ensemble short name ths is an group channels

```

if (inp(&h20) == 1) return    check busy?
out &h20, &h0                 reset intern write buffer pointers
out &h21,3                    station channel 3
out &h20, &h37                Get program ensemble short name
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error
                               example value = TEXT
print chr$(inp(&h21))        "T"
print chr$(inp(&h21))        "E"
print chr$(inp(&h21))        "X"
print chr$(inp(&h21))        "T"

```

```
print inp(&h21)          chr$(13)      end string
```

2.3.22 38h x (01.15) Get DAB program ensemble long name ths is an group channels

```
if (inp(&h20) == 1) return    check busy?  
out &h20, &h0                reset intern write buffer pointers  
out &h21,3                    station channel 3  
out &h20, &h38                Get program ensemble long name  
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error  
                             example value = TEXT  
  
print chr$(inp(&h21))        "T"  
print chr$(inp(&h21))        "E"  
print chr$(inp(&h21))        "X"  
print chr$(inp(&h21))        "T"  
print inp(&h21)              chr$(13)      end string
```

2.3.23 39h v (01.16) Get DAB stations index (number of programs in database)

```
if (inp(&h20) == 1) return    check busy?  
out &h20, &h39                Get number programs in database  
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error  
                             example value = 25  
  
print inp(&h21)              25
```

2.3.24 3Ah v (01.17) Test DAB program is active (on-air)

return: 0=off-air, 1=on-air

```
if (inp(&h20) == 1) return    check busy?  
out &h20, &h0                reset intern write buffer pointers  
out &h21,3                    station channel 3  
out &h20, &h3A                Test dab program is active  
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error  
                             example value = 1  
  
print inp(&h21)              1
```

2.3.25 3Bh v (01.1A) Get DAB program service short name

```
if (inp(&h20) == 1) return    check busy?  
out &h20, &h3B                Get program service short name  
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error  
                             example value = TEXT  
  
print chr$(inp(&h21))        "T"  
print chr$(inp(&h21))        "E"  
print chr$(inp(&h21))        "X"  
print chr$(inp(&h21))        "T"  
print inp(&h21)              chr$(13)      end string
```

2.3.26 3Ch x (01.1B) Get DAB search index (number of programs found in search process)

```
if (inp(&h20) == 1) return    check busy?  
out &h20, &h3C                Get program search index  
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error
```

```
print inp(&h21)          example value = 123
                        123
```

2.3.27 3Dh (01.1C) Set the power bar

2.3.28 3Eh (01.1D) Get the DAB/FM power bar values

2.3.29 3Fh (01.1E) BBEEQ

2.3.30 40h ? (01.20) Set head room level app F kan nog wel is de main volume zijn ??

Volume Level = 0..12

```
if (inp(&h20) == 1) return    check busy?
out &h20, &h0                reset intern write buffer pointers
out &h21,12                  volumeLevel = 0..12
out &h20, &h40               Set head room level
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error
```

2.3.31 41h moet nog ? (01.21) Set preset

```
presetIndex = 0..9
programIndex = DAB: programIndex, FM: frequency
presetMode = 0=DAB, 1=FM
```

```
if (inp(&h20) == 1) return    check busy?
out &h20, &h0                reset intern write buffer pointers
out &h21,1                    presetIndex 0-9
out &h21,0                    presetMode = 0=DAB, 1=FM
```

```
example(123.8 Mhz)
out &h21, asc("1")           1
out &h21, asc("2")           2
out &h21, asc("3")           3
out &h21, asc(".")           .
out &h21, asc("8")           8
```

```
out &h20, &h41               Set preset
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error
```

2.3.32 42h moet nog ? (01.22) Get preset

```
if (inp(&h20) == 1) return    check busy?
out &h20, &h0                reset intern write buffer pointers
out &h21,1                    presetIndex 0-9
out &h21,0                    presetMode = 0=DAB, 1=FM
```

```
out &h20, &h42               Get play mode
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error
example fm freq = 100.3
```

```
print inp(&h21)              "1"
print inp(&h21)              "0"
print inp(&h21)              "0"
print inp(&h21)              "."
print inp(&h21)              "4"
```

print inp(&h21)                      chr\$(13)              end string

2.3.33 43h (01.23)

2.3.34 44h (01.24)              Get program sorter

return data = 0=sort by ensembleID, 1=sort by service name, 2=sort by active and inactive program

```
if (inp(&h20) == 1) return              check busy?
out &h20, &h44                      Get program sorter
while (inp (&h20) == 1);              wait processing 0 = oke 1 = busy 2 = error
example value = 2
print inp(&h21)                      2
```

2.3.35 45h x (01.25)                      Set program sorter

Sort Method:  
0=sort by ensembleID,  
1=sort by service name,  
2=sort by active and inactive program

```
if (inp(&h20) == 1) return              check busy?
out &h20, &h0                      reset intern write buffer pointers
out &h21,2
out &h20, &h45                      sort method
while (inp (&h20) == 1);              wait processing 0 = oke 1 = busy 2 = error
```

2.3.36 46h v (01.26) Get Drc ? audio compressie

0=DRC off, 1=DRC low, 2=DRC high

```
if (inp(&h20) == 1) return              check busy?
out &h20, &h46                      Get Drc
while (inp (&h20) == 1);              wait processing 0 = oke 1 = busy 2 = error
example value = 2
print inp(&h21)                      2
```

2.3.37 47h v (01.27) Set DRC audio compressie

0=DRC off, 1=DRC low, 2=DRC high

```
if (inp(&h20) == 1) return              check busy?
out &h20, &h0                      reset intern write buffer pointers
out &h21,2
out &h20, &h47                      set DRC
while (inp (&h20) == 1);              wait processing 0 = oke 1 = busy 2 = error
```

2.3.38 48h ??(01.28) get bbe ? HeadRoom

```
if (inp(&h20) == 1) return              check busy?
out &h20, &h48                      Get headroom level
while (inp (&h20) == 1);              wait processing 0 = oke 1 = busy 2 = error
example value = 1
print inp(&h21)                      1
```

2.3.39 49h x (01.2B) Prune programs - delete inactive programs (!on-air)

```
if (inp(&h20) == 1) return    check busy?
out &h20, &h49              prune station
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error
```

2.3.40 4Ah (01.2E) Get RDS Pi code

```
if (inp(&h20) == 1) return    check busy?
out &h20, &h4A              Get RDS Pi code
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error
                             example value = 1
print inp(&h21)              1
```

2.3.42 4Ch x (07.00) Set notification bitmask

(ik zet meestal alle bits aan)  
BIT 0: Scan finished notification  
BIT 1: Got new FM program text notification  
BIT 2: DAB reconfiguration notification  
BIT 3: DAB channel list order change notification

BIT 4: FM RDS group notification  
BIT 5: Get new DAB radio text (DL+ type) notification  
BIT 6: Scan frequency notification

```
if (inp(&h20) == 1) return    check busy?
out &h20, &h0                reset intern write buffer pointers
out &h21,63
out &h20, &h4C              set notification
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error
```

2.3.43 4Dh v (07.01) Get notification ??

```
if (inp(&h20) == 1) return    check busy?
out &h20, &h4D              Get notification text
while (inp (&h20) == 1);    wait processing 0 = oke 1 = busy 2 = error
print inp(&h21)
```

BIT 0: Scan finished notification  
BIT 1: Got new FM program text notification  
BIT 2: DAB reconfiguration notification  
BIT 3: DAB channel list order change notification

BIT 4: FM RDS group notification  
BIT 5: Get new DAB radio text (DL+ type) notification  
BIT 6: Scan frequency notification

## 3.0 Command instructions FM mode

### 3.1 Global functions

3.1.1 00d Reset buffer port 0  
reset intern write buffer pointers

### 3.2 FM SYSTEM

3.2.1 50h v (01,00) Play FM frequentie

```
if (inp(&h20) == 1) return      check busy?
example(123.800 Mhz)

out &h20, &h00                  reset intern write buffer pointers
out &h21, asc("1")              1
out &h21, asc("2")              2
out &h21, asc("3")              3
out &h21, asc(".")              .
out &h21, asc("8")              8
out &h21, asc("0")              0
out &h21, asc("0")              0

out &h20, &h50                  Play FM frequentie
while (inp (&h20) == 1);       wait processing 0 = oke 1 = busy 2 = error
```

3.2.2 51h v (01,02) Seek FM program - searchDirection: 0=backward, 1=forward

```
if (inp(&h20) == 1) return      check busy?
out &h20, &h00                  reset intern write buffer pointers
out &h21, &h1                   searchDirection: 0=backward, 1=forward
out &h20, &h51                  Seek FM program
while (inp (&h20) == 1);       wait processing 0 = oke 1 = busy 2 = error
```

3.2.3 52h v (01,07) Get tuned FM station frequency

```
if (inp(&h20) == 1) return      check busy?
out &h20, &h52                  Get rplay mode
while (inp (&h20) == 1);       wait processing 0 = oke 1 = busy 2 = error
example fm freq = 88.300

print inp(&h21)                 " "
print inp(&h21)                 "8"
print inp(&h21)                 "8"
print inp(&h21)                 "."
print inp(&h21)                 "3"
print inp(&h21)                 "0"
print inp(&h21)                 "0"
print inp(&h21)                 chr$(13)      end string
```

### 3.2.4 29h v (01.08) Get signal strength

DAB: signalStrength=0..18, bitErrorRate= niet ingebouwd  
FM: signalStrength=0..100

```
if (inp(&h20) == 1) return      check busy?  
out &h20, &h29                Get signal strength  
while (inp (&h20) == 1);      wait processing 0 = oke 1 = busy 2 = error  
                               example value = 17  
print inp(&h21)                17
```

### 2.3.41 4Bh x (01.39) Get FM exact station

0: Current station is not exact frequency  
1: Current station is exact frequency.  
254: No station information yet

```
if (inp(&h20) == 1) return      check busy?  
out &h20, &h4B                Get FM exact station  
while (inp (&h20) == 1);      wait processing 0 = oke 1 = busy 2 = error  
                               example value = 1  
print inp(&h21)                1
```

## 4.0 History

### 4.1 Firmware

#### 3.1.1 New functions

[April, 2018]:

#### 3.1.2 Change functions

[April, 2018]:

### 3.2 Hardware

[Decembre , 2017]

Prototype PCB

[April, 2018]:

First final PCB

### 3.4 Manual

[April, 2018]:

beta manual

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