

DAB+ Partners
Digital Radio for Local Radio

Multiplex.

A **DAB multiplex** (mux) is actually the most important link between the various radio stations and the DAB transmitter. During the test period there have been many experiments with the multiplex and its stability. One thing: the stability of the multiplex determines the stability of the whole system. Some stations have a working multiplex, others don't. Abroad, there are entire regions that run without problems with this multiplex and accompanying software defined modulators.

The Multiplex revolves around a computer containing the software to download the various radio stations re-sampling, encoding and adjusting the bitrate used for DAB and finally merging all those signals into an ETI stream. This ETI stream is transported to the transmitter network. The most optimal is if each station samples at 48 kHz and encodes the transmitted bitrate in AAC, but the practice is different.

But building a well-functioning MUX with this Linux-based open source software can still be difficult. HFPrints works together with a few software engineers to ensure that this software runs stably. After a one-time installation and configuration, it can be easily operated by a webpage.

DAB partners have opted for an industrial mini PC from PC engines, which works more stable than a Raspberry Pi that sometimes fails with a full multiplex.

The fact is that the DAB partner multiplex is more than ten times cheaper than the professional multiplexes, which with 9 users quickly exceeds 10000 euro. Due to a changed template, this multiplex comes close to the expensive colleagues.

These low budget multiplexes are full in use by small radio stations, because the open source software is available to everyone and is completely free on the internet. (<https://www.opendigitalradio.org>)

There are 2 options for a multiplex:

1:

Your own mux (in-house). One of our engineers, Jan de Vries of Radio Westerwolde (NL) configured the software for a Multiplex that works with 6 to 12 stations. This with an adjustable bitrate in EEP1 or 2 (EEP1 gives the largest range with the transmitter). In this case, the mini computer can be mounted in the exciter (control transmitter) and then also control the other transmitters via the internet connection.

What does such an open source software multiplex cost? Multiplex (mini PC) with software € 400.00

Configuration with the wishes of all radio stations is on an hourly rate, on average around 100 euros.

If everything is neatly built in a 19" housing without exciter, but with all connections and power supply, € 800.00

2:

A Multiplex in the cloud. With a multiplex in the cloud, management is done by DAB partners. With this we take care of your concerns. Optionally, the multiplex can be expanded with a remote and remote monitoring. All know-how for the Linux machine is then in the hands of DAB Partners.

Because the connections go through a stable internet provider, the quality is guaranteed.

Prices: Configuring the multiplex is between 200 and 500 euros. Monthly cost including data is between 100 and 125 euros (depending on the number of stations on this multiplex). Modifications apply at a normal hourly rate.

Internal connections between the transmitters.

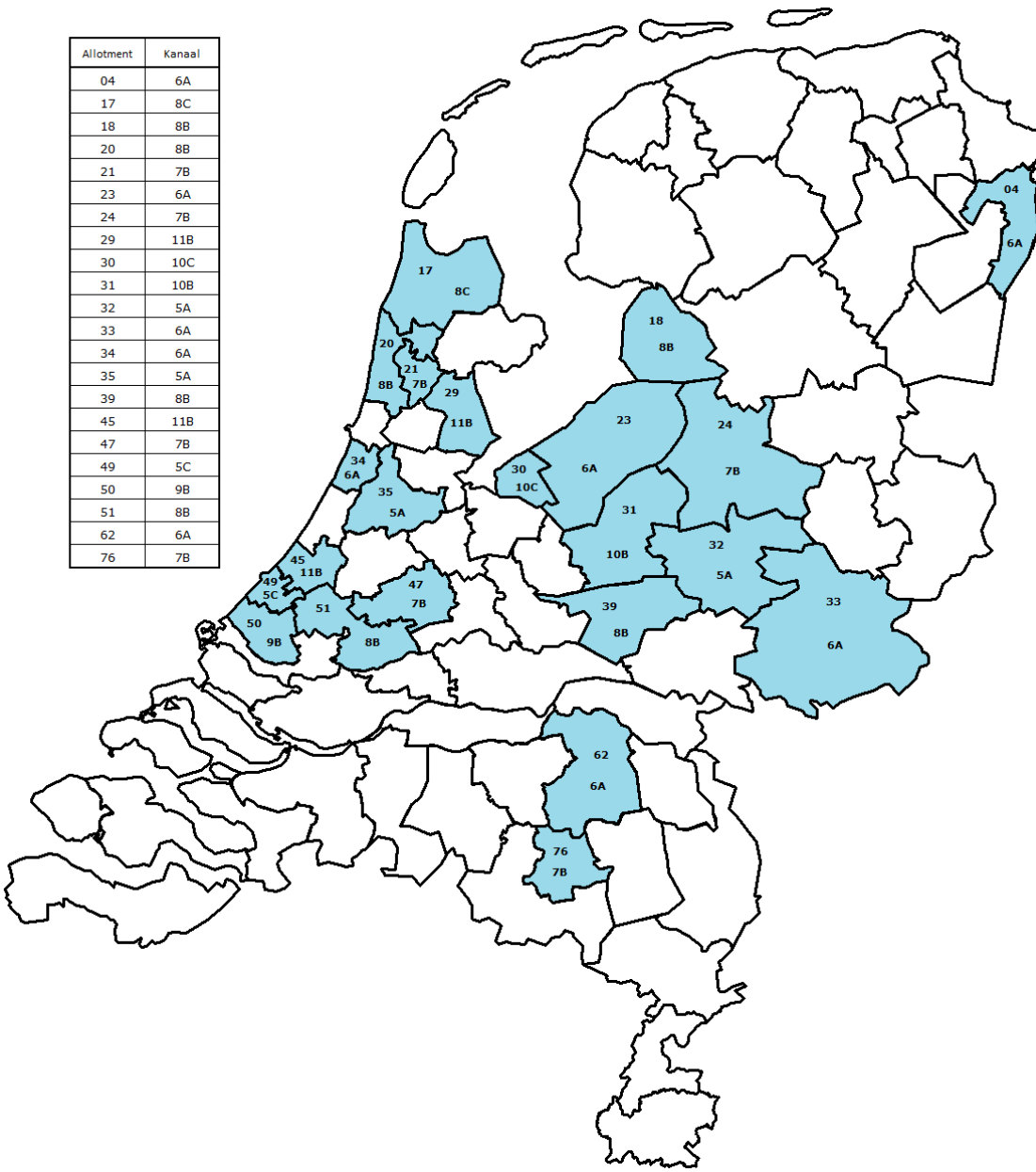
In case the multiplex is remote, this will run via the internet. If you have your own computer, we can offer a radio connection set.

If there is no internet at the transmitter location, DAB partners can ensure that the signal is delivered via a 5 GHz Ubiquity radio link.

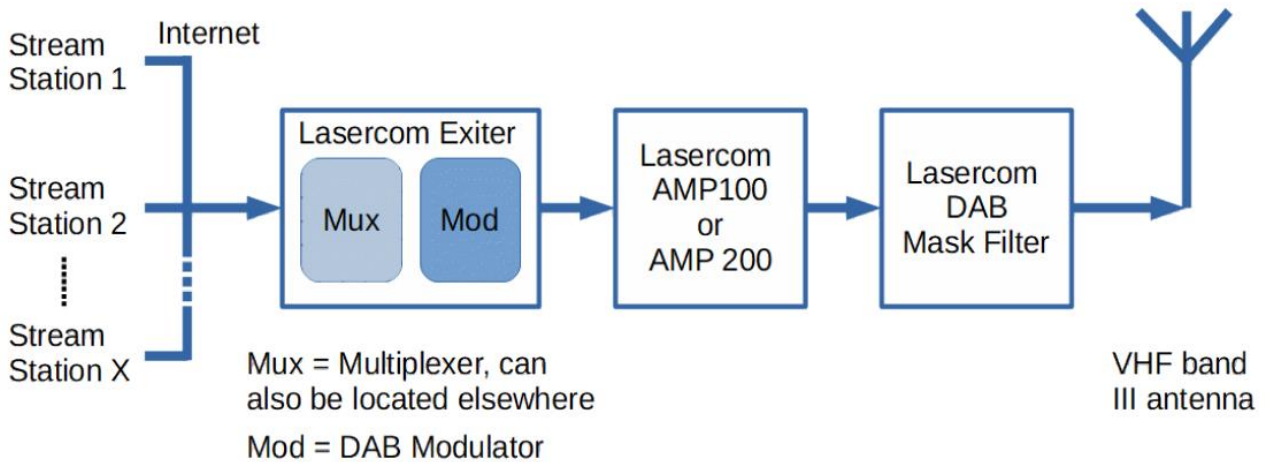
Advice is to include an extra router with the transmitter, so that the internet is separated from the transmitter. One could use a Raspberry Pi for control.

In blue the Dutch allotments issued in 2020 where DAB stations can be switched on. Now at the end of 2020 there are 21 allotments on air, of which DAB Partners has taken care of 13.

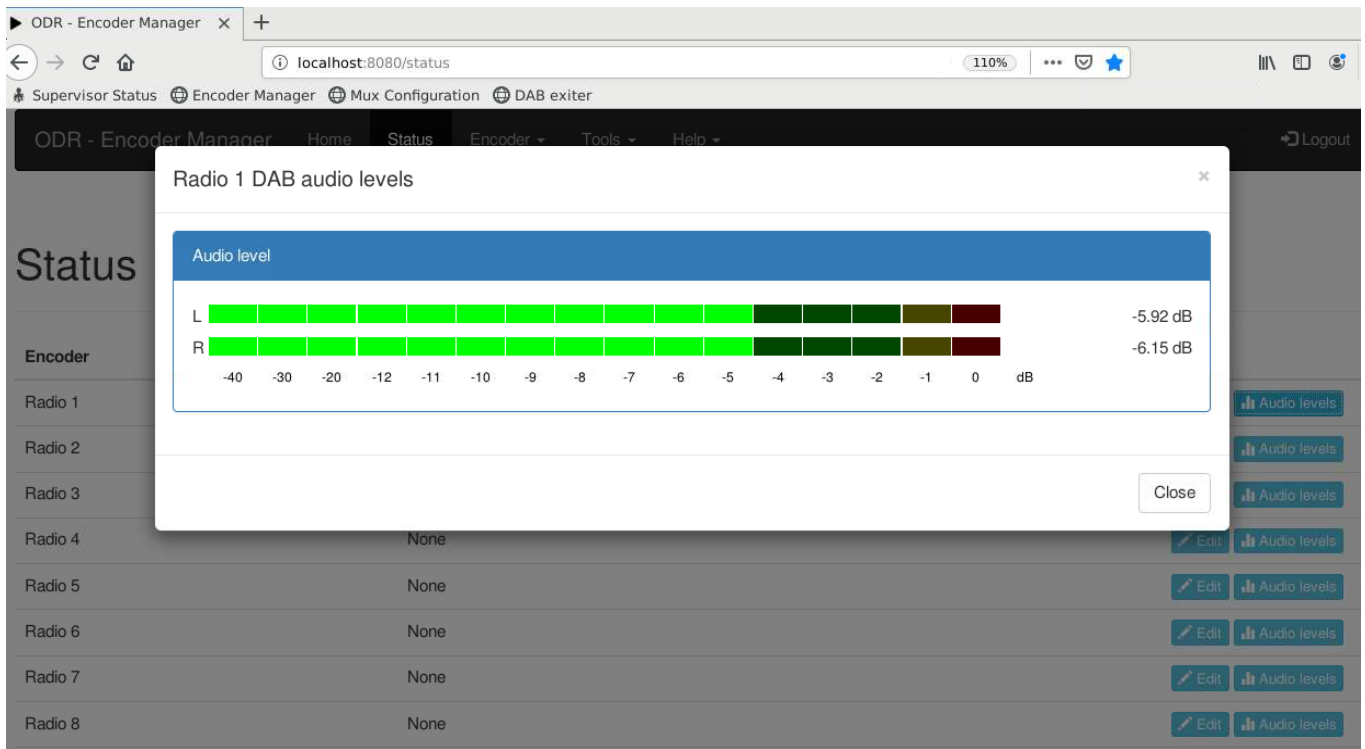
Allotment	Kanaal
04	6A
17	8C
18	8B
20	8B
21	7B
23	6A
24	7B
29	11B
30	10C
31	10B
32	5A
33	6A
34	6A
35	5A
39	8B
45	11B
47	7B
49	5C
50	9B
51	8B
62	6A
76	7B



Our full range of DAB modules consist of Exciter (optional with internal multiplex), a DAB output stage, spectrum mask filter and a VHF band 3 antenna system.



Here some screenshots of the multiplex:



Each radio station can be monitored.

Radio	Station Name	Status	Action
Radio 1	Colin Blunstone - Andorra	Running	Edit, Audio levels
Radio 2	None	None	Edit, Audio levels
Radio 3	None	None	Edit, Audio levels
Radio 4	None	None	Edit, Audio levels
Radio 5	None	None	Edit, Audio levels
Radio 6	None	None	Edit, Audio levels
Radio 7	None	None	Edit, Audio levels
Radio 8	None	None	Edit, Audio levels
Radio 9	None	None	Edit, Audio levels

Encoder	Service	Pid	Status	Description	Action
Radio 1	odr-padencoder	2016	RUNNING	pid 2016, uptime 0:20:15	Stop, Restart
Radio 1	odr-audioencoder	2017	RUNNING	pid 2017, uptime 0:20:10	Stop, Restart
Radio 2	odr-padencoder	868	RUNNING	pid 868, uptime 0:57:46	Stop, Restart

Software update. We implement a shout cast server into the multiplexer for pick up the internet streams.