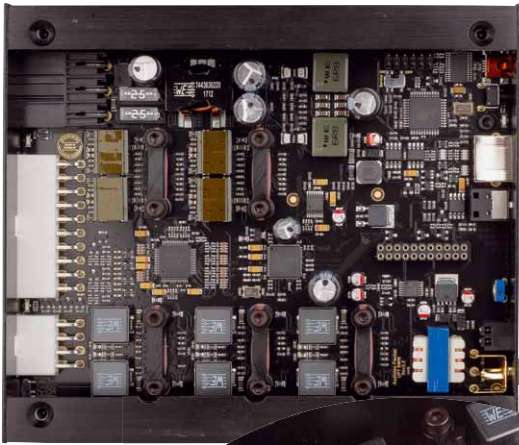


## Match UP 7BMW – 7-channel DSP power amp for BMW



# Leading-Edge Technology

► With the UP 7BMW, Match presents its first vehicle-specific DSP amp. We want to find out what's new or different about it.



The three large channels (below) each have a chip; the four small channels share two chips

is specially made for BMW, for the signal input is perfectly matched to the BMW signal and there is a type-specific DSP setup with specially pre-set EQs, crossovers, etc. for each model. The special input section is required because BMW uses a signal between normal low-level and high-level, which of course wants to be optimally processed. A universal UP version for standard factory radios is in the making.

As usual with Match, the Up 7BMW is ultra-compact and its inside is crammed accordingly. Seven amplifier channels are distributed across 5 amp chips, using the same high-performance TI types as those of the noble Helix V Eight from the same company.

This is complemented by the complete DSP equipment from the 32-bit DSP ADAU1451 and the Burr-Brown converter PCM3168A, a setup known e.g. from the top model PP 86DSP. Like all compact Match amplifiers, the UP also uses an efficient and variable step-up power supply and is ready for start-stop operation. In the BMW, the 7 channels cover the front - consisting of midrange speaker in the door and tweeter, sub - meaning the underseat woofers - and rear speakers in the back doors. In addition, there is the often neglected center, which we will return to in greater detail in a minute. The „small“ channels front and rear each share a two-channel

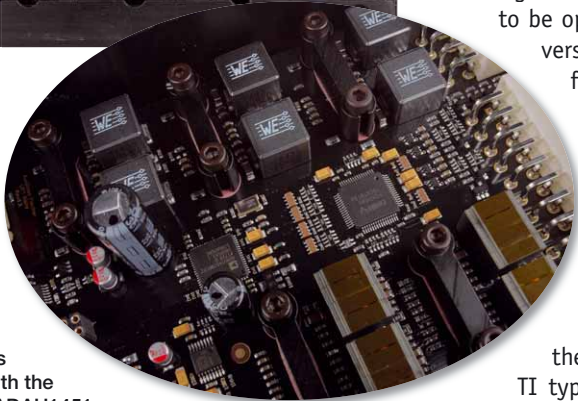
amplifier IC; for the 20-cm woofers and the center a whole chip each is available, which can provide more power into 2 ohms thanks to parallel connection of the two channels. The underseat woofers, which at BMW are 2-ohm types, are certainly happy about this. The technically identical center channel seems comparatively oversized for the small BMW speaker, which is why Match modestly arranges it among the series of small channels. At 4 ohms, the 3 large channels hardly differ from the 4 smaller ones. We measure just under 65 watts at all of them. At 2 ohms, the 3 big ones awake to full life, and there is almost 150 watts - full power for the woofers. Even the distortions are exemplarily low, so that you can only say that the UP amp design is squeaky clean. If you need even more bass power, you will find a processed cinch output for an additional bass amp - you can never have too much of a good thing.

### New BMW software

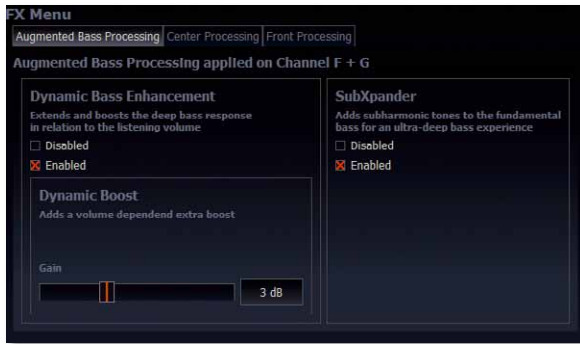
As mentioned, like all other Match and Helix DSP products, the Up 7BMW also works with the DSP Tool, except that a vehicle-specific setup is included. This could end the story at this point. A great, powerful DSP power amplifier, decisively improving the sound in 3 minutes. But that already exists and the Match team has not contented itself with it. The UP 7BMW definitely goes further. Two considerations led to the expansion of the software for the UP. First, they wanted to get the absolute maximum out of the factory speakers without destroying them by overload. Secondly, it annoyed the developers that there was no sensible solution for the center speaker (perhaps excluding Dolby Pro Logic, but this is very hard to find on the automotive retrofits market). Therefore, Match decided to take charge of the matter and to

The Match is equipped with the 32-bit DSP ADAU1451, which is also used in other DSPs of the brand

There are already several DSP amplifiers in the Match product range. Anyone who is willing to retrofit will choose the PP amps as universal 8-channel amplifiers and the M 5DSP or M 2 FX as the right small boxes for power solutions taking up a minimum amount of space. The UP 7BMW is now heralding a new generation of upgrade amps with DSP, specifically designed for a vehicle brand. It starts with the UP 7BMW, which fits into all newer BMWs with a „hi-fi system“ (option 676), i.e. into vehicles with an original amplifier in the rear, but without the „big“ „Professional“ system. That's quite a lot, and it does not matter whether it is a sedan, X-model, or other. The factory amplifier is installed in the trunk side panel of the vehicle, where it hangs on the BMW cable harness and is easily accessible. The Match now comes with an appropriate mounting plate and a matching connection cable, so that the installation is really done in minutes. If you want to install it particularly well, you can give the power amp an extra power supply. A plug with power terminals is included for this purpose. Of course, the UP 7BMW is a „normal“ DSP amplifier as we know it from Match, and it can be freely programmed with the proprietary software PC-Tool. Nevertheless, it



The Match has Molex connectors. A short cable harness for the BMW plug is included



The new FX functions allow for dynamic and spectrum-dependent interventions in bass, center and front. If required, the center signal is intricately generated by means of a particular algorithm

## Specifications

Dimensions 153 x 130 x 46 mm

### Inputs

- 4-channel high-level
- 1 x digital S/PDIF (optical)

### Outputs

- 1-channel RCA (processed)
- Remote out

DSP software (V 4.25b under test)

### Equalizer

- Fully parametric EQ with graphical representation, 30 bands per channel, +6 – -15 dB
- 20 – 20k Hz, 1-Hz increments, Q .5 – 15
- Shelf 25 – 10k Hz, Q .1 – 2
- All-pass filter 1st or 2nd order, f and Q adjustable
- Input EQ with 5 param. bands each for front, rear, sub

### Crossovers

- 20 – 20k Hz, 1-Hz increments
- Bessel, Butterworth, Chebychev, Linkwitz, User, 6 – 42 dB/oct.

### Time and level

- Run time 0 – 425 cm, 7-mm increments (.02 ms)
- Input delay 0 – 5.2 ms
- Phase 0, 180° (full range), 0 – 360° (22.5° increments)

### Features

- Mounting plate and cable harness for BMW
- User-defined routing of inputs and outputs
- Control connector for programmable remote controls and accessories
- Start-stop capability down to 6 V
- Signal-dependent switching to digital or Aux inputs
- Automatic putting through of all vehicle tones
- Power save mode
- ADEP.3 error protection circuit for factory radios with speaker recognition
- RTA real-time frequency curve measurement (with optional microphone)
- FX menu with dynamic bass, center and front processing

### Optional accessories

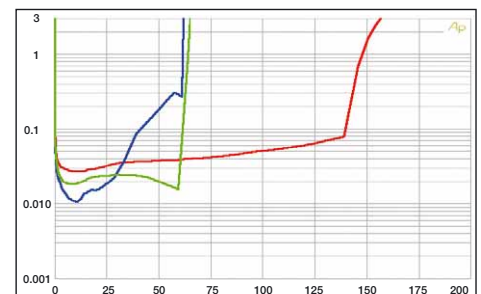
- Inputs and outputs HEC HD-Audio USB-Interface (HiRes audio up to 32 bits/192 kHz), HEC BT (Bluetooth aptX audio streaming + add. S/PDIF out), HEC Aux-in (3.5 mm jack input + add. S/PDIF out), HEC Optical-in (optical S/PDIF input)
- Wired remote control (programmable)
- Display remote control Director with memory, USB, etc.

program appropriate algorithms. This is not trivial, because the simple solution of applying a mono sum or difference to the center leads to unsatisfactory results. Even if its level is correctly adjusted, such a standard center always pushes its way into the foreground, unduly centering the stage, and does not integrate properly into the sound. Therefore, many installers unceremoniously disconnect the center to prevent interference. In some vehicles, however, you are happy to have a suitable center – especially if the stage should not be good only at the driver's seat. The Match setup is thus designed to be „universally compatible“. It is symmetrical and offers the same good sound both to the left and right. Nevertheless, a time alignment exists and also is important, because it still synchronizes front, center and sub with each other. Only that it is not just front left and right, so that the passenger also has a good sound experience. For tuning purposes, there is a new FX menu in the software, in which the new sound algorithms for bass processing, center processing and front processing can be switched on and off and where parts of this can be adjusted. For the front channels, there is a new „StageXpander“, which expands the acoustical stage image by skillfully adjusting the phase; furthermore, there is a „ClarityXpander“ for front and center, which purposefully adds harmonics, which results in an extra kick especially in the case of vocals. Finally, we find the „augmented bass processing“, which is divided into three functions and has the goal of making the bass sound louder, deeper and more accented. The „SubXpander“ adds lower frequencies to the music by adding non-existent fundamental waves to the harmonics present in the music. This works effectively for MP3s whose compression in part does the opposite. A more exciting feature is the „dynamic bass enhancement“, behind which a limiter/compressor can be found, tailored precisely to the BMW woofers and protecting them from overload.

At the same time, the function curtails the lower frequency end with a subsonic filter. The whole thing happens dynamically, i.e. in a level-dependent manner. When hearing the music at low levels, there is full depth and even a bit more bass in the lower regions, and when it gets loud, the DSP relieves the woofer with respect to dangerously low frequencies. The third feature is a dynamic bass boost emphasizing certain „favorite frequencies“ of the BMW underseat woofers. That is all very nice, but basically not new. The limiter function is part of the standard command set of the DSP and there are various sound enhancers, e.g. in the studio area, responsible for all these „dirty tricks“ – courtesy of psychoacoustics. What is really new about the Match algorithms is that they are virtually twice as dynamic. When playing music, the DSP first acts as a measuring system and analyzes what comes in. Then (as usual) it controls in a level-specific way and (now also) intervenes by spectral analysis, depending on the music. The center channel is thus computed differently if we have a jazz singer in the middle and only string bass and saxophone on the outside, than if a big band were playing, where the information is widely scattered from left to right. And the center channel is also constantly limited in bandwidth and volume-controlled, while we are at it. All of this inures to the benefit of the front and even the bass processing, so we get something completely unique and new.

## Sound

As a test vehicle, we had an X4 at our disposal, which still has a lot of room for improvement with its standard equipment. Already with the additional power of the UP 7BMW, a distinct sound improvement can be achieved. With the very clear equalizing it turns out nicely: The sound is already very good and should make many BMW drivers happy. What really works perfectly is the „RealCen-



The front and rear channels (blue) easily deliver 60 W into 4 ohms. The big channels are 2-ohm stable (red)



The supplied mounting plate makes installation in the trunk very easy

ter”, which fits seamlessly into the sound. Together with the runtime correction, the middle of the stage is perceived a bit on this side of the rear view mirror. Instead of being squeezed on the one side and strongly stretching on the opposite side, the musical happenings are distributed nicely and evenly across the dashboard - great! And to be sure this is true also for the passenger seat perspective. A comparison with the „RealCenter“ deactivated demonstrates that the center loudspeaker can be located overly dominating in the middle, the right and left-hand sides only playing secondary roles. All in all, the vehicle is perfectly tuned with the right shot of warmth for perfect male voices and clearly audible instruments. Next comes the bass reproduction test, where the bass comes across pleasantly strong. If all features are activated, it becomes almost too much for people with a sensitive nature. However, the greatest thing is the resistance test with loads of level. If you max the volume all the

way up, the sound stays clean and emits a mighty lot of pressure and volume. No buzz or distortion noise disturbs the sound, only now and then you can feel the woofer under the seat working hard at the limit, however, without reaching it. This is perfect tuning, which is only possible with precise knowledge of the vehicle equipment and which really gets everything out. But things were to get even worse: At full volume, you can turn the basses even further on in the sound menu of the radio. And what happens? The sound changes even more in the direction of the dominant bass, but nothing is distorted - try this with a standard hi-fi system... All in all, the BMW sound with the UP 7BMW is scarily good. It sounds clean, pleasant, error-free and perfectly well balanced at EVERY volume. Finally, a note to the audiophile disciples: All effects in the FX menu can be individually switched on and off, do not worry! For example, if you want to retrofit woofers, you can operate them without a limiter. However, we by no means want to miss the „RealCenter“; even the „dynamic bass enhancement“ has a major effect. The rest may remain switched off for use with audiophile program material, but this of course depends strongly on personal taste. And finally, the UP 7BMW also sounds very good as a normal power amp. Even when adjusted at shallow levels in our listening room, it easily asserts its mastery.

**Conclusion**

The Match UP 7BMW goes one crucial step further as compared to other upgrade solutions. Never before has there been a sound retrofit appliance matched so accurately and perfectly to the vehicle and the existing material. Simply the perfect Match!

*Elmar Michels*

Settings for crossovers and equalizers are made in the main window. In addition, there is a mute button and dampers for phase and level



**Match UP 7BMW**

Distribution	Audiotec Fischer, Schmallenberg, Germany	
Hotline	+49 2972 9788 0	
Internet	www.audiotec-fischer.com	

Sound	40 %	1,1	■ ■ ■ ■ ■
Bass	8 %	1,5	■ ■ ■ ■ ■
Neutrality	8 %	1,0	■ ■ ■ ■ ■
Transparency	8 %	1,0	■ ■ ■ ■ ■
Spatial imaging	8 %	1,0	■ ■ ■ ■ ■
Dynamics	8 %	1,0	■ ■ ■ ■ ■

Lab	35 %	1,4	■ ■ ■ ■ ■
Power	20 %	1,5	■ ■ ■ ■ ■
Damping factor	—	—	—
Signal-to-noise ratio	5 %	1,5	■ ■ ■ ■ ■
Noise	10 %	1,0	■ ■ ■ ■ ■

Practice	25 %	0,7	■ ■ ■ ■ ■
Features	15 %	0,5	■ ■ ■ ■ ■
Build quality electronics	5 %	1,0	■ ■ ■ ■ ■
Build quality mechanics	5 %	1,0	■ ■ ■ ■ ■

**Specifications**

Channels	7
Power 4 Ohm	4 x 62 + 3 x 64
Power 2 Ohm	4 x 0 + 3 x 146
Power 1 Ohm	—
Bridged Power 4 Ohm	—
Bridged Power 2 Ohm	—
Sensitivity max. mV	2000
Sensitivity min. V	8,3
THD+N (<22 kHz) 5 W	0,014/0,018
THD+N (<22 kHz) Half Power	0,032/0,022
Signal-to-noise ratio dB(A)	82/82
Damping factor 20 Hz	42/47
Damping factor 80 Hz	43/47
Damping factor 400 Hz	42/46
Damping factor 1 kHz	41/45
Damping factor 8 kHz	12/17
Damping factor 16 kHz	4/6

**Features**

Low pass	20 – 20k Hz
High pass	20 – 20k Hz
Band pass	20 – 20k Hz
Bass boost	-15 – 6 dB/20 – 20k Hz
Subsonic filter	via HP
Phase shift	via DSP
High-level inputs	•, 4CH
Separate gain control (Autosense)	•, DC
RCA outputs	•, mono
Start/stop capable	6 V
Dimensions (L x W x H in mm)	153 x 130 x 46
Others	Digital input, 8-channel-DSP, extension slot, Plug & Play

**Bewertung**

Price	800 Euro		
Sound	40 %	1,1	■ ■ ■ ■ ■
Lab	35 %	1,4	■ ■ ■ ■ ■
Practice	25 %	1+	■ ■ ■ ■ ■

**Match UP 7BMW**

**Absolute Top Class**  
 Top Class  
 Upper Class  
 Middle Class  
 Lower Class

**1,1**  
 Price-Performance:  
 Very good