

# **BMW FXX ATM Emulator**

User and Installation Manual

Revision 2.1      07/2017

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## Revision history

Rev 2.1 07/2017

## Designation

"BMW FXX ATM emulator" module designed for use in BMW F-Series, G-series cars, when replacing or installing head unit HU EVO not equipped with built-in system GPS receiver, without the need to install ATM ECU. The module also provides the following functions:

- activation of the navigation
- «Video in motion»
- protocol matching for correct functioning of Sport Displays
- gyro sensor protocol matching for correct functioning of navigation system
- KAFAS1 and HU EVO protocol matching

"BMW FXX ATM emulator" module can also be used in conjunction with the "BMW EXX NBT Retrofit", "BMW EXX NBT MOST Retrofit", "BMW EXX NBT Extended Retrofit", "BMW FXX NBT MOST Retrofit" modules when installing head unit HU EVO, not equipped with a built-in GPS receiver, without the need to install an ATM unit.

## Technical description

The appearance of the module shown in Fig. 1. The module contains 16 pin connector «System» for connection to the vehicle systems, FAKRA type connector «GPS» for connection of external GPS antenna, a set of eight (DIP SWITCH type) switches S1 to enable/disable available module features, two led indicators "CAN" and "ETH" to indicate various modes of operation and system statuses, USB connector for firmware update and module diagnostic.

Connector «System» has the following inputs and outputs:

- "CAN1H" (yellow), "CAN1L" (blue) for connection to the CAN bus from vehicle side
- "CAN2H" (yellow/black), "CAN2L" (blue/black) for connection to the CAN bus from HU side
- "OABRP", "OABRN" for connection to the HU OABR bus
- output "RAD ON" (white/red), for replacement of the head unit RAD ON signal
- input "+12V" (red), module positive power wire
- input "GND" (black), module negative power wire

Connector «System» pinout shown in Figure 2, switches features given in Table 1.



Figure 1. Module appearance

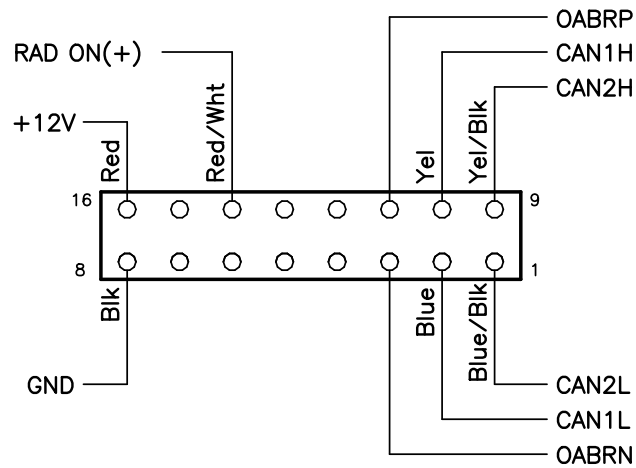


Figure 2. «System» connector pinout

## Connections

Connection of the "BMW FXX ATM emulator" module depends on using in conjunction with other modules and is performed either between head unit and car, or parallel to the CAN bus of the head unit, and to the OABR interface of the head unit, according to schematic shown in Fig.3, using the supplied cable (Figure 4). Cable consists 16-pin socket for connecting to the module «System» connector, 20-pin socket for connecting to the OABR connector of head unit (position A42\*3B Figure 6.), and wires for connect to CAN bus and power. Cable diagram shown in Figure 5. Appearance and head unit connector A42\*3B pins numbering shown in Figure 7. "RAD ON" connection should be used in case, when head unit do not provide RAD ON signal output.

## Module operation



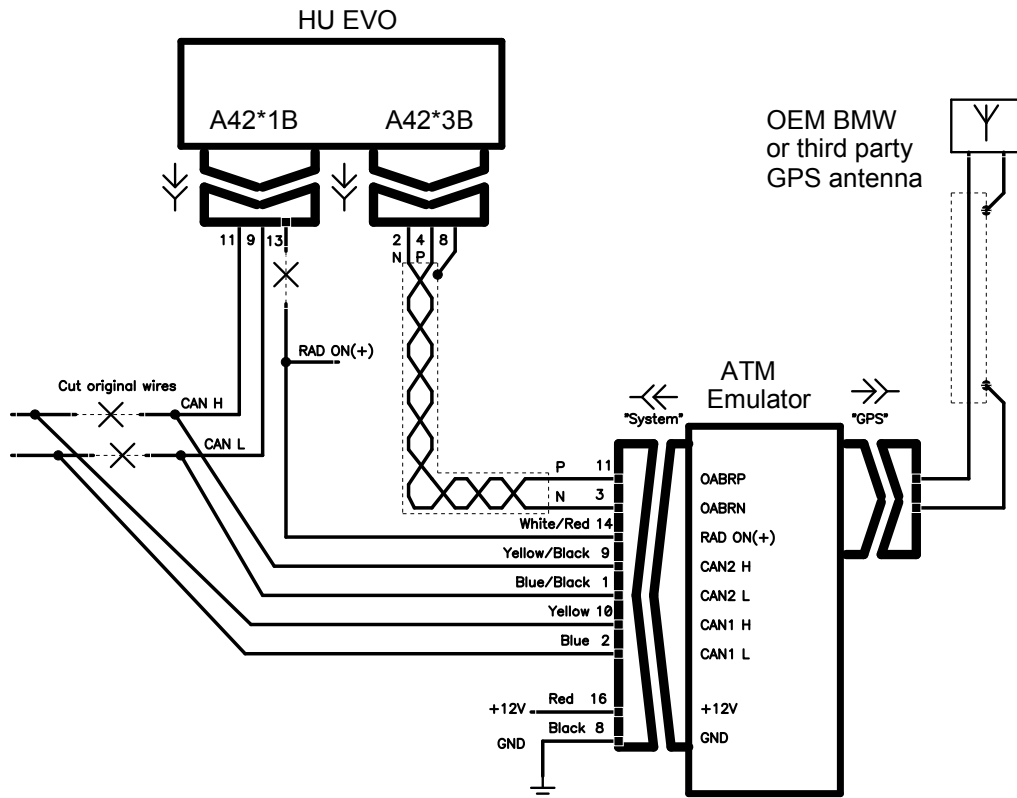
**Attention: When first power-up, module "learns" to the car and can not be used with any other.**

When ignition turn on, or connected over USB cable, module will displays their status via "CAN" and "ETH" indicators. In the normal state indicator "CAN" indicates CAN bus activity, and should blink at a frequency of about 10Hz. Indicator "ETH" should produce a short single flashes with a frequency of 1Hz. If there is no indication on the "CAN" indicator, CAN wires should be verified for the correctness and reliability connection to the CAN buses from the car and head unit. If there is no indication on the "ETH" indicator, OABR wires should be verified for the correctness and reliability connection to the OABR bus of head unit.

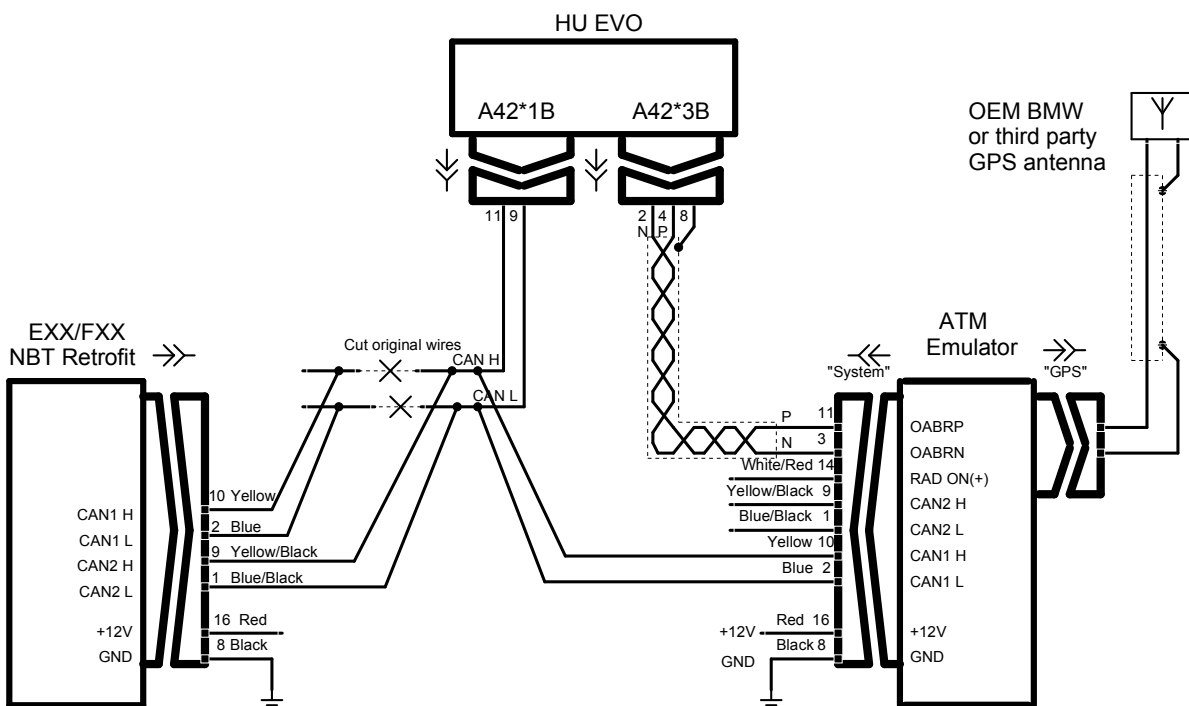
When module connected only over USB cable to the computer, it goes into Boot mode and provides the ability to download firmware. In Boot mode both LEDs blink alternately by double flashes series.

In the normal state module emulates ATM ECU, receives the signal from the built-in high accuracy and precision GPS receiver and transmits it to the head unit. Additional module features can be set using switches.

## Appendix A Schematic diagrams



a) Connection to BMW FXX/GXX series



b) Connection to BMW EXX/FXX series in conjunction with EXX/FXX NBT Retrofit Adapter

Figure 3. Module connection schematic diagram



Figure 4. Cable appearance

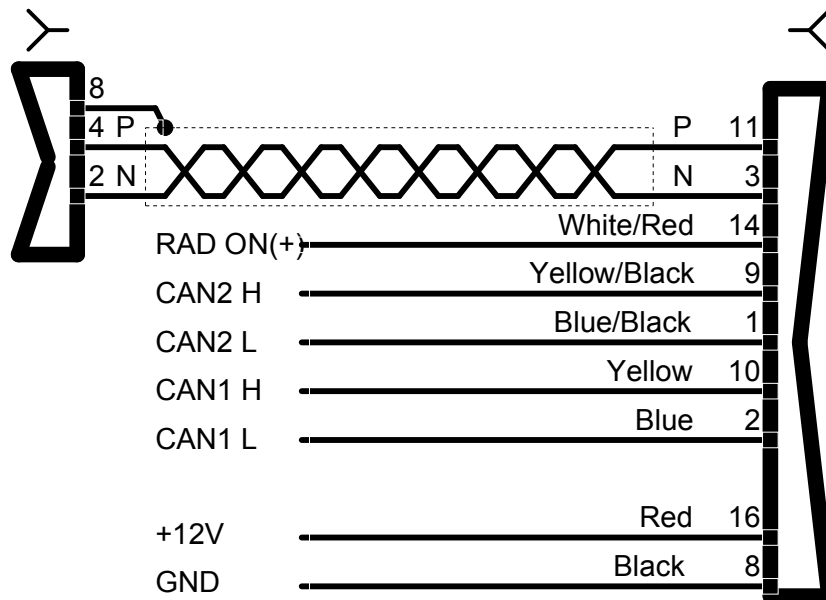


Figure 5. Cable schematic diagram.



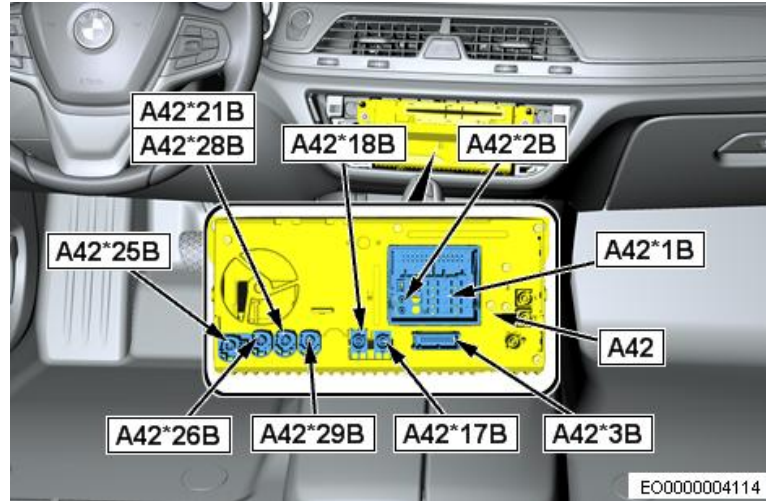


Figure 6. Head unit connectors appearance an locations

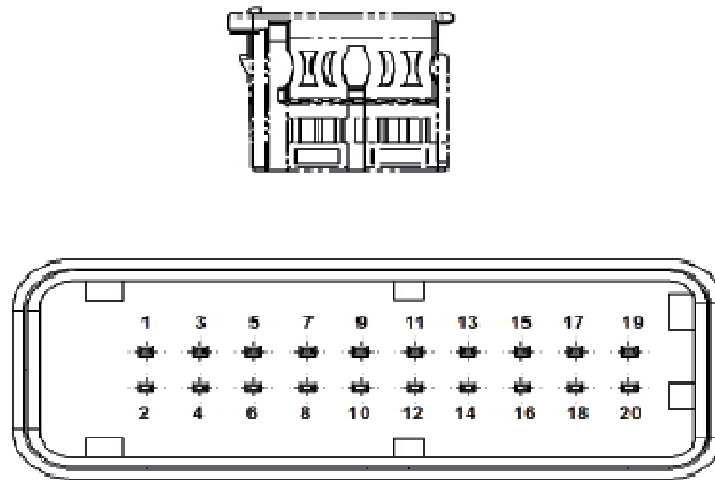


Figure 7. Head unit OABR connector appearance and pins numbering

**Appendix B**

## Switches designation

Switch	1	2	3	4	5	6	7	8
On	Navi activation <b>On</b>	Video in motion <b>On</b>	Sport indicators protocols conversion <b>On</b>	KAFAS1 protocols conversion <b>On</b>	Gyro sensor protocol conversion <b>On</b>	RFU**	RFU**	RFU**
Off	Navi activation <b>Off*</b>	Video in motion <b>Off*</b>	Sport indicators protocols conversion <b>Off*</b>	KAFAS1 protocols conversion <b>Off*</b>	Gyro sensor protocol conversion <b>Off*</b>			

**\* When module "BMW FXX ATM emulator" use in conjunction with EXX/FXX NBT Retrofit modules switches should be switched to OFF state.**

\*\*RFU – reserved for future use