

BMW-A001

TUTORIAL

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For your own safety and the safety of others, and to prevent damage to the device and vehicles upon which it is used, it is important that the safety instructions presented throughout the product user manual be read and understood by all persons operating or coming into contact with the device.

There are various procedures, techniques, tools, and parts for servicing vehicles, as well as in the skill of the person doing the work. Because of the vast number of test applications and variations in the products that can be tested with this equipment, we cannot possibly anticipate or provide advice or safety messages to cover every circumstance. It is the automotive technician's responsibility to be knowledgeable of the system being tested. It is crucial to use proper service methods and test procedures. It is endanger your safety, the safety of others in the work area, the device being used, or the vehicle being tested.

Before using the device, always refer to and follow the safety messages and applicable test procedures provided by the manufacturer of the vehicle or equipment being tested. Use the device only as described in this manual. Read, understand, and follow all safety messages and instructions in this manual.

Safety Messages

Safety messages are provided to help prevent personal injury and equipment damage. All safety messages are introduced by a signal word indicating the hazard level.

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury to the operator or to bystanders.

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to the operator or to bystanders.

Safety Instructions

The safety messages herein cover situations Auro is aware of. Auro cannot know, evaluate or advise you as to all of the possible hazards. You must be certain that any condition or service procedure encountered does not jeopardize your personal safety.



When an engine is operating, keep the service area WELL VENTILATED or attach a building exhaust removal system to the engine exhaust system. Engines produce carbon moloxide, an odorless, poisonous gas that causes slower reaction time and can lead to serious personal injury or loss of life.

SAFETY WARNINGS

- Always perform automotive testing in a safe environment.
- Wear safety eye protection that meets ANSI standards.
- Keep clothing, hair, hands, tools, test equipment, etc. away from all moving or hot engine parts.
- Operate the vehicle in a well ventilated work area, for exhaust gases are poisonous.
- Put the transmission in PARK (for automatic transmission) or NEUTRAL (for manual transmission) and make sure the parking brake is engaged.
- Put blocks in front of the drive wheels and never leave the vehicle unattended while testing.
- Be extra cautious when working around the ignition coil, distributor cap, ignition wires and spark plugs. These components create hazardous voltages when the engine is running.
- Keep a fire extinguisher suitable for gasoline, chemical, and electrical fires nearby.
- Do not connect or disconnect any test equipment while the ignition is on or the engine is running.
- Keep the test equipment dry, clean, free from oil, water or grease. Use a mild detergent on a clean cloth to clean the outside of the equipment as necessary.
- Do not drive the vehicle and operate the test equipment at the same time. Any distraction may cause an accident.
- Refer to the service manual for the vehicle being serviced and adhere to all diagnostic procedures and precautions. Failure to do so may result in personal injury or damage to the test equipment.
- To avoid damaging the test equipment or generating false data, make sure the vehicle battery is fully charged and the connection to the vehicle DLC is clean and secure.
- Do not place the test equipment on the distributor of the vehicle. Strong electromagnetic interference can damage the equipment.



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Introduction

This manual introduces how to conduct BMW key learning with Auro OtoSys IM100 Smart Mode and Expert Mode.

Two options are available when accessing the IMMO function:

- Smart Mode the IM100 tablet will read the vehicle information and analyze the IMMO part information automatically.
- Expert Mode user can make selections step by step to locate the IMMO part.

> Procedures before getting started:

- 1. Connect the IM100 tablet to the programmer UP200 via included mini USB cable.
- 2. Dismount the ECU module from the vehicle, refer to appendix on page 30.
- 3. Connect the ECU module to the Emergency coil stretched out from COM7.
- Connect one end of the included OBD cable to the IM100 tablet, while the other end needs to be connected to the wire harness stretched out from COM8 on the ECU module. The wire harness is not included, you could DIY, details in Appendix on *page 31*.
- 5. Make sure the WiFi service is available in case the operation data needs to be sent.

NOTE

Illustrations used in this manual are samples, and the actual testing screens may vary by vehicle. Observe the menu titles and on-screen instructions to make correct selections and operations.



Figure 1 Sample Overall Structure

Key Learning via Smart Mode

1. Turn on the IM100 tablet, tap **OtoSys** on the main interface screen, then **IMMO**. A vehicle menu displays and a disclaimer prompts up. Tap **Accept** to continue.



Figure 2 Sample Main Interface



Figure 3 Sample OtoSys Screen

2. Tap **BMW** on the vehicle menu, tap **Smart Mode** on the Mode Select interface. The Vehicle Information interface displays.

⊘NOTE

You can click on the icon near the top-right corner to record the operation data. If you encounter any difficulties, click on the icon again to send us the data and problems, so that our engineers could help.



Figure 4 Sample Vehicle Menu

BMW v1.03.08		F	ø	-	0	8	1		
			Mc	de selectio	n			E 12.3V	
Sm	Smart mode		Expert mode				Update ECU data		
306									
Car								ESC	
* 6		9 G	è 🏠	Dig.				₩ ♥77% 6 :37	

Figure 5 Sample Mode Select Screen

BMW v1.03.08	M	(Free	Ø	-	0		1	Q Search
			Vel	nicle Inform	ation			EE 12.26V
Vehicle Info Vehicle details	ormation							۵
Date: 2017/12	2/29	Ĩ	lime: 06:38:0	6				
Model series:	F049	1	Type/Descrip	tion: HZ11				
Odometer(km	i): 0	١	/IN:					
Integration Le	vel(shipment)	Ī	ntegration Le	vel(current)		Integrat	ion Level(last)	
F056-16-07-50	06	F	056-17-03-5	02		F056-17	-03-502	
Time criterion	:0716	F	aint code: 0/	475		Upholst	ery code: KCSV	/
E-Wort:		ŀ	070, KLED, L	EDH				
H0-Wort:								
							ок	ESC
+ 1		9 G	₽ ()	5	Î	5		💬 🗢 77% 🖬 6:38

Figure 6 Sample Vehicle Information Screen

3. Tap **OK** on the vehicle information screen. Coding files will be backup automatically. Save the coding files





Figure 7 Sample Saving Screen



Figure 8 Sample Saving File Screen

 Disassemble the EEPROM chip and connect it to the programmer. Tap **OK** to modify EEPROM data automatically. Install the EEPROM chip back to the module when operation over.

⊘NOTE

Tap **Diagram** for more details about disassembling the chip, or refer to Appendix on *page 33*.



Figure 11 Sample Processing Screen





Figure 12 Sample Information Screen

5. Tap **OK** to program as information displayed.



Figure 13 Sample Information Screen





Figure 14 Sample Programming Screen

6. Tap **OK** to restore EEPROM data automatically. Disassemble the EEPROM chip and connect it to the programmer again.

NOTE Tap **Diagram** for details of disassembling the EEPROM chip, or refer to *page 33*.



Figure 15 Sample Information Screen







Figure 17 Sample Information Screen

7. Tap **OK** after setting back the EEPROM chip, proceed to restore coding files as displayed.

BMW v1.03.08	M	3	ø	•	1	8	1	
_				Smart mod	e			EB (9)
Notice: T 1. Please 2. Please 3. Please correctly	The restoration e make sure the make sure the make sure the displays the	n of codir hat the ve hat the O hat the po voltage.	ng file is a chicle pov BD diagn ower icor	about to s wer is OK lostic cab h on the to	start! le is corn p right c	ectly con orner of t	nected. he diagno	stic tool
								ок
* 1	â 🗊 🛛	() ()	<u>ه</u>	File.		-		🕶 🕿 75% 🖬 7:06
	Fiau	re 18	Samp	le Info	ormat	ion Se	creen	
BMW		I.	Ö	-	8	B	1	
V1.03.08			F	Restore codi	ng			E월 (1.99V
					-			16%
		Res	toring co	ding files	please	wait.		
*		() ()	<u>ه</u>	51b	R (72		₽ ♥ 75% ■ 7:06

Figure 19 Sample Information Screen

8. Tap **OK**, start Key learning after the coding file restoration. Proceed as information displayed.





Figure 20 Sample Notice Screen

9. Tap **OK** to the Key Status interface, tap **Read password**. Proceed as information displayed.

NOTE

Without working key, you could conduct All-lost mode, the ISN code is needed.



Figure 21 Sample Information Screen



BMW v1.03.08	M	Ŧ	ø	-	- Û		1			
~~~~				Key Learning	-			🖼 (1.91V)		
	Key1			C856B235			Use	d		
	Key2			7656B235			Use	d		
	Key3			FFFFFFF			Free Free			
	Key4			FFFFFFF						
	Key5			FFFFFFF			Free			
	Кеуб			FFFFFFF			Free			
				FFFFFFFF	-		•			
				Read	ord W	nte kev	Erase key	Close		
* *		0 5	<u>ک</u>	54. 1	a .	7				

Figure 22 Sample Key Status Screen



Figure 23 Sample Notice Screen





Figure 25 Sample Information Screen

 Tap OK, back to the Key Status interface, tap Write key. Proceed as information displayed until "Write key successful" displays. The key status of successfully learned key(s) would be "Used".

#### **NOTE**

- The key frequency should be the same.
- Repeat "Write key" to get more than one key learned.
- Tap Erase Key to delete keys, just choose the corresponding key number and press Erase Key. Erased original keys cannot be learned.

BMW V1.03.08	M	Ŧ	ø	0	1	8	1			
		_		Key Learnir	ng			<b>E</b> (1.83)		
	Key1			C856B23	5		Use	d		
	Key2			7656B23	5		Use	d		
	Key3		FFFFFFF				Free			
	Key4			FFFFFFF	F		Free			
	Кеуб			FFFFFFF	F					
	Kevi7			FFFFFFF	-		Froo			
				Repass	ad word	Write key	Erase key	Close		
* *		0 G		5th	8	50		<b>₩</b> ♥ 75% <b>7</b> 7:18		

Figure 26 Sample Key Status Screen



Figure 27 Sample Information Screen





Figure 28 Sample Information Screen

BMW 1.03.08	M	Ŧ	Ø	-	1		1			
			1	Key Learnin	g			E9 (1.8		
							Key Di Linoc			
	Key1			C856B235	;		Us	ed		
	Key2			7656B235	6		Us	ed		
	Key3			FFFFFFF			Free			
	Key4		FFFFFFF 59198084 FFFFFFF				Free			
							Free			
	Кеуб									
	Kou7			FFFFFFFF	FEFE		Froo			
				Repass	ad word	Write key	Erase key	Close		
6 4		0 5	۰ ۵	SI.	0			m ⊕ 75k ≣7		

Figure 29 Sample Key Status Screen



### Key Learning via Expert Mode

1. Turn on the IM100 tablet, tap **OtoSys** on the main interface screen, then **IMMO**. A vehicle menu displays and a disclaimer prompts up. Tap **Accept** to continue.



Figure 30 Sample Main Interface



Figure 31 Sample OtoSys Interface

2. Tap **BMW** on the vehicle menu, then the Function Select screen displays. Tap **Expert Mode** and proceed as information displayed.

#### ⊘NOTE

Turning on the data recording function is recommended. Click the pen icon on the top-right corner before operation, click it again to send the data for help.



Figure 32 Sample Vehicle Menu

BMW V1.03.08		F	Ø	-	Ŵ		1		
			M	lode selecti	on			<b>Ē</b> ∰ )2.3V	
Sr	Smart mode			pert mo	de	ι	Update ECU data		
VIII Car				•				ESC	
5 1		6 6	<u>م</u>	sik.				<b>₽?</b> 77% <b>6</b> :37	

Figure 33 Sample Model Select Screen



Figure 34 Sample Information Screen

3. Tap FEM/BDC, the Function Interface displays.



Figure 35 Sample Expert Mode Screen

4. Tap Vehicle information on the Function Interface. Read the vehicle information.



V1.03.08	M	000	0	a little a	100		/		
		_		FEM/BDC			_		<b>1</b> 11
Keyless	power o	n	E		Version detect				
Vehicle i	nformati	on	Codir	ng opera	E	PROM	oper	ation	
Programming operation			Vehic	le freque	епсу		Key	statu	s
Kov I VIN.WBA3B16070NP/ Dar Briv/F56/F49	eernina 16997		Keyens	ahlad/die	sahlad	_	Read ondee		
* *		<b>9</b> (	F 🗅	File.	<b>a</b> 7	2			<b>₩ 😤 75% </b>
A A	Fig	o c ure 3 æ	₽ ▲ 6 Sam Ø	ele Fu	nctio	n Sci	reen		Search
A A	Figu	ore 3	r ♪ û 6 Sam O Vehi	ple Fu	inctio	n Sci	reen		Search
MW 100.08 Atte: 2017/12/29 oodel series: F049 oodel series: F049	Figu	o ( ure 3	A	ple Fu e	inctio	n Sci	reen		Search
MW 10308 ate: 2017/12/29 iodel series: F049 dometer (km): 0 tegration Level(sh	Figu Market State	o cure 3	A      Constraints	ple Fu ele Informa on: HZ11 el(current)	Inctio	n Sci	reen	st)	प्र २ ७४ । Search
MW 10008 atte: 2017/12/29 oddel series: F049 dometer(Km): 0 tegration Level(sh 356-16-07-506	Figu Market States Sta	o cure 3	A      Constraints	ple Fu	Inction	Integrati F056-17	on Level(la	st)	Search
MW incose ate: 2017/12/29 todel series: F049 dometer(km): 0 ttegration Level(st 56-19-07-505 ime criterion: 0710	Figu () ipment)	s c ure 3	Contraction Contra	cle Information cle Information cle Cle Cle Information cle Cle Information cle Cle Infor	Inction	Integratii F056-17- Upholste	on Level(la 03-502 ry code: Ki	st)	Search
ate: 2017/12/29 lodd series: F049 dometer(km): 0 ttegration Leve(sh 056-16-07-506 ime criterior: 0716 -Wort:	Figu ipment)	s c ure 3	Vehi Constraints Vehi Vehi Time: 07-20.51 Type/Description Vin: Integration Leve Posto-17-03-60 Paint code: 0A7 A070,KLED,LEI	Cle Information Cle Informatio	Inction	Integrati F056-17- Upholste	on Level(la 03-502 ry code: Kl	st)	Search
AW 1 0205 ate: 2017/12/29 lodel series: F049 dometer(km): 0 ategration Level(sh 056-16-07-506 ime criterion: 0716 Wort: 0-Wort:	Figu mipment)	© Cure 3	A	DIE Fu Cle Informa cle Informa on: HZ11 el(current) 2 75 DH	inctio	Integrati F056-17 Upholste	on Level(la 03-502 ery code: Ki	st)	Search

Figure 37 Sample Vehicle Information Screen

5. Go back to the Function Interface, tap **Coding operation** to coding operation interface.



BMW v1.03,08		F	ø	-	Ũ		1		
				FEM/BDC	c	_		E组 (2.07V	
Keyle	Keyless power on			ECU rese	et		Version detect		
Vehicl	Vehicle information			ng oper	ation	E	EPROM o	peration	
Program	Programming operation			cle frequ	iency		Key status		
Ko	w learning		Kev en	ahlad/d	ieahlad		Read	odes	
VIN Ear.								ESC	
*		9 C	<b>₽</b> @	site.		7		₩ 🗢 75% 🖬 7:20	

Figure 38 Sample Function Screen

6. Tap **Backup coding**. The backup proceeds automatically. Tap **Confirm** to save files when completed. Then tap **OK** to the Function interface.



Figure 39 Sample Coding Operation Screen





Figure 40 Sample Saving File Screen

7. Tap **EEPROM operation** to the Model Selection interface.

#### **NOTE**

Tap **Diagram** for more details about disassembling the EEPROM chip, or refer to *page* 33 for more details.



Figure 41 Sample Function Screen

7.1 Tap M95128 or M95256 according to the ECU module. Take M95256 as an example here, tap M95256 > Read operation. Procedure completed, save the file, go back to the EEPROM data operation interface.

#### 

Check the ECU module in ECU information at the bottom of the vehicle information interface.





Figure 42 Sample Model Select Screen

BMW v1.03.08		F	ø	-	0	8	1		
			-	ST->M9525	б	P0 10			
Rea	d operatior		Mo	dify data	a file		Write operation		
VIN							-		
Car							Help	ESC	
* 1		9 G	۵ ۵	5 de		7		🕶 🤿 100% 🗐 5:58	

Figure 43 Sample EEPROM Data Operation Screen

7.2 Tap **Modify data file**. Then select the original one to modify. Modified successfully, save and name the edited file. Go back to the EEPROM data operation interface.



BMW v1.03.08		F	ø	•	0	8	1		
			ST	r->M95256	5			0V	
Rea	d operation	n	Modi	ify data	file		Write operation		
								-	
VIN Car:							Help	ESC	
100 m	_						нер	ESC	
*		9 G	1M	Die Con	Ĩ			🕶 🗢 98% 🖥 6:33	

Figure 44 Sample EEPROM Data Operation Screen



Figure 45 Sample File Select Screen



Figure 46 Sample File Saving Screen



7.3 Tap **Write operation** on the EEPROM data operation interface. Select the modified file in the last step. Written successfully, tap **OK**, back to the Function Interface.



Figure 47 Sample EEPROM Data Operation Screen



Figure 48 Sample Information Screen

8. Tap **Programming operation** > **ECU preprocessing**. The programming starts automatically.



The options ECU upgrade and ECU repair are tapped only when needed.



BMW v1.03.08	Ŵ	(Pee	ø	-	Ū.		1		
			_	FEM/BDC	ç	_	E3 (2)		
Keyless power on			E	ECU rese	et		Version detect		
Vehicl	e informatior	n	Codi	ng oper	ation	E	EPROM o	peration	
Programming operation			Vehic	cle frequ	iency		Key status		
Key learning			Kov on	ahlad/d	icahlad		Read codes		
VIN WBASB16070NP46997 Car. Bmw/F66/Fue								ESC	
* *		G	P 🕅	sil.		-		<b>₩</b> ₹ 75% <b>7</b> 7;2	

Figure 49 Sample Function Screen

ECU preprocessing     ECU upgrade     ECU repair	11.95V		1	8	(Q) eration	amming op	Progr	8-8 8-8			BMW V1.03.08
		ECU repair			ECU upgrade				ECU preprocessing		
Vik · · Hein FSC											VIN

Figure 50 Sample ECU Programming Screen





Figure 51 Sample Programming Screen



Figure 52 Sample Information Screen

9. Tap **OK** on the programming successful interface to go back to the Function Interface. Tap **EEPROM operation > M95256 > Write operation**. Select the original file to write.



BMW V1 03.08		F	ø	-	Û		1		
			FEM/BDC	с	_	EB (20			
Keyless power on			4	ECU rese	et		Version detect		
Vehicle information			Cod	ing oper	ation	E	EEPROM operation		
Programming operation		ation	Vehicle frequency				Key status		
Key learning		_	Kev enabled/disabled				Read codes		
Car. Binw/F66/Fi	Car. Bmw/F56/F48							ESC	
* 1		9 C	÷ ሰ	ting.	<b>F</b>	-		· · · · · · · · · · · · · · · · · · ·	

Figure 53 Sample Function Screen

BMW v1.03.08		Æ	Q	🖶 ST->M9525	6	1	<b>69</b> 0V	
Read operation		1	Modify data file			Write operation		
1016								
Car						Help	ESC	
6 4		0 5		trib.			····· € 100% 8 6:0	

Figure 54 Sample EEPROM Operation Screen



Figure 55 Sample Information Screen



10. Tap **OK** on the EEPROM written successfully interface, back to the Function interface. Tap **Coding operation > Restore coding**. The restoring starts automatically.



Figure 56 Sample Function Screen

Backup c	oding	Res	store cod	ing		Repair cod	ling
	Backup coding				Repair coding		
VIN-SLOKKUSC35F0F33601						Hole	ECC

Figure 57 Sample Coding Operation Screen





Figure 58 Sample Restoring Screen



Figure 59 Sample Information Screen

11. Tap OK, back to the Coding operation interface > ESC, go back to the Function Interface. Tap Key learning. The key learning process via Expert mode is the same as that via the Smart mode. Please refer to the Key learning part from step 8 to step 10 in Smart Mode.



## Appendix

### **Disassemble the ECU Module**

The FEM/BDC module is located at the A-pillar of the front passenger side.

#### > Procedures to disassemble the ECU module from the vehicle:

- 1. Unclip the front door sill cover strip at the passenger side.
- 2. Remove the bottom right instrument trim panel and disconnect plug connections behind it.
- 3. Remove the side trim panel at the passenger side.
- 4. Remove the cover at the lower part of the module.
- 5. Unlock the positive battery cable connector.
- 6. Disconnect the plug connections to the module.
- 7. Release the bolt from the module.
- 8. Remove the module from the vehicle.



### **Connect the Test Wire Harness and OBD Cable**

Details to connect the test wire harness and OBD cable are shown below. Make sure wires are connected to the right pins.

- > Procedures to connect the test wire harness and OBD cable:
  - 1. Connect cables to corresponding pins according to the number shown in the figure.
  - 2. Connect another side of the wire harness of these cables to the OBD female adapter.
  - 3. Connect the emergency coil to the corresponding pins according to the numbers.



Figure 60 Sample Overall Connection



Figure 61 Sample Corresponding Numbers



### **Disassemble the EEPROM Chip**

- > Procedures to disassemble the EEPROM chip are shown below:
  - 1. Find the chip in the ECU module.
  - 2. Disassemble the EEPROM chip and figure out the pin 1, the bevel side on the right, viewed from the cross section.
  - 3. Assemble the chip in the clamp, match the pin 1 of the chip with that on the clamp.





Picture 1: EEPROM position on FEM System



Picture 2: EEPROM position on BDC System



Picture 3: Pin 1 position



Picture 4: Pin 1 position on the clamp

Figure 62 Sample EEPROM Chip Position